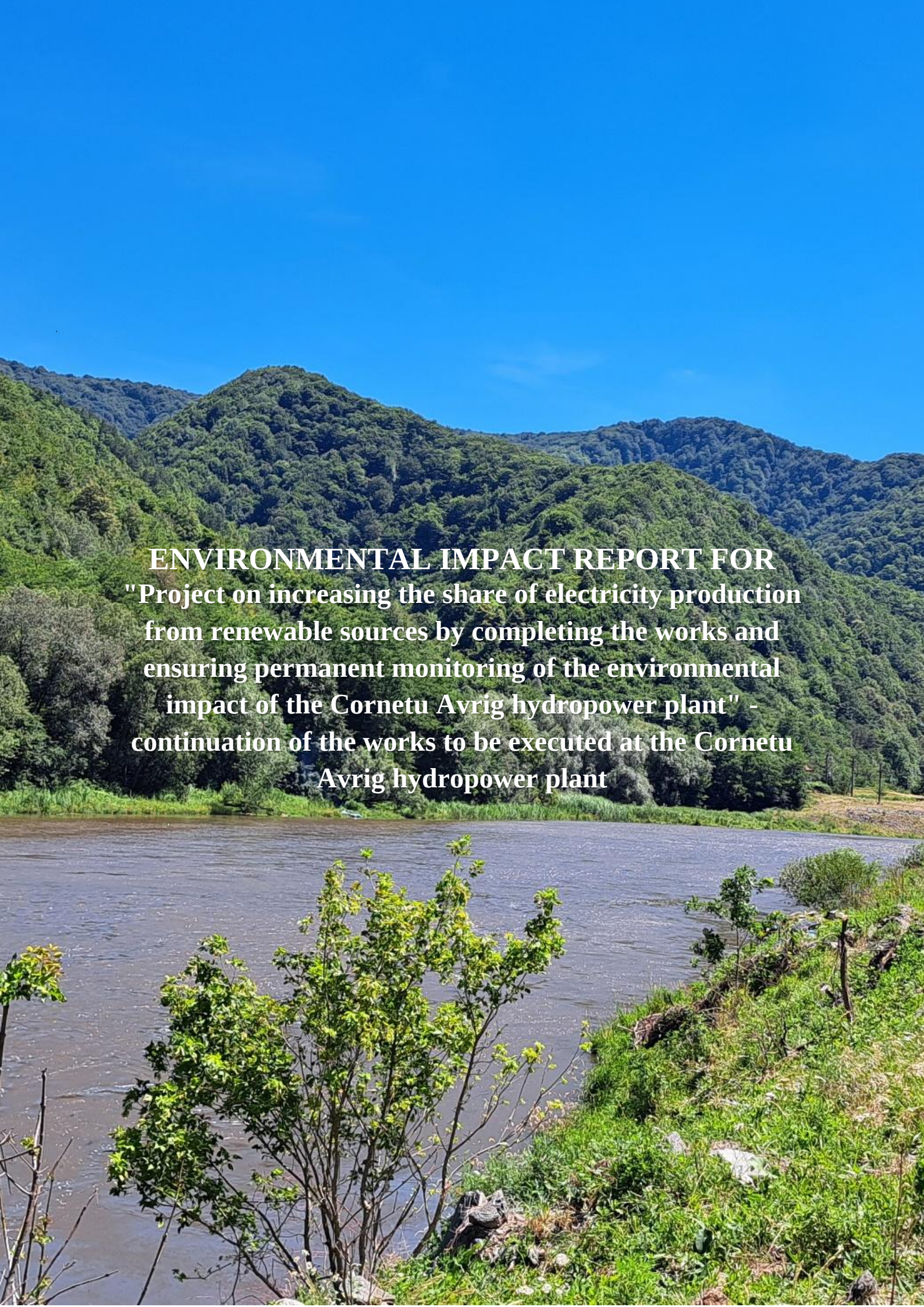

ENVIRONMENTAL IMPACT REPORT FOR

"Project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu Avrig hydropower plant" - continuation of the works to be executed at the Cornetu Avrig hydropower plant

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GENERAL INFORMATION ABOUT THE PROJECT BENEFICIARY

Project name: ***"Project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu Avrig hydropower plant" - continuation of the works to be executed at the investment objective of the Cornetu Avrig hydropower Project"***

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1. PROJECT DESCRIPTION

1.1 Project location:

a) Administrative location

The project is located in the counties of Sibiu (CHE Racovița and CHE Lotrioara) and Valcea (CHE Câineni).

The location of the Câineni hydropower plant is located within the perimeter of the administrative unit of Câineni (Valcea County), on the Olt river, on the banks and on the first terrace, on the sector between Câinenii Mari and the administrative territorial boundary between Sibiu and Valcea counties.

The location of the Lotrioara hydropower development is located within the perimeter of the municipalities of Boița and Turnu Roșu (Sibiu County) and Câineni (Valcea County), on the Olt river and on the banks and the first terrace, on the sector between Boița and the section of the confluence of the Olt and Lotrioara.

The location of the Racovița hydropower project is located within the perimeter of the municipalities of Avrig, Racovița, Turnu Roșu and Tălmaciu (Sibiu County), on the Olt river and on the banks and the first terrace, in the sector between Avrig and Turnu Roșu.

The hydropower facilities within the investment objective are developed along the DN7 / Sibiu-Pitești highway (Boița-Cornetu area) and the railroad, except for the Racovița CHE which is developed immediately upstream of the entrance to the Olt river gorge.

The Olt river basin is located in the central and southern part of the country, bordering the Siret, Ialomița-Buzău and Argeș-Vedea basins to the east, the Danube to the south, the Mures basin to the north and the Jiu basin to the west.

The coordinates of the components of the hydropower scheme in the 1970 stereographic projection system are as follows:

Table 1 - Main Stereo 70 coordinates of the site

Hydropower plant	Point	X (m)	Y (m)
CHE Câineni	A	444160,0	445877,0
	B	444201,0	445877,0
	C	444283,0	445877,0
CHE Lotrioara	A	441973,7	451832,3
	B	441911,7	451778,7
	C	441880,9	451752,1
CHE Racovita	A	447028,0	465172,0
	B	447086,5	465164,8
	C	447150,2	465156,5

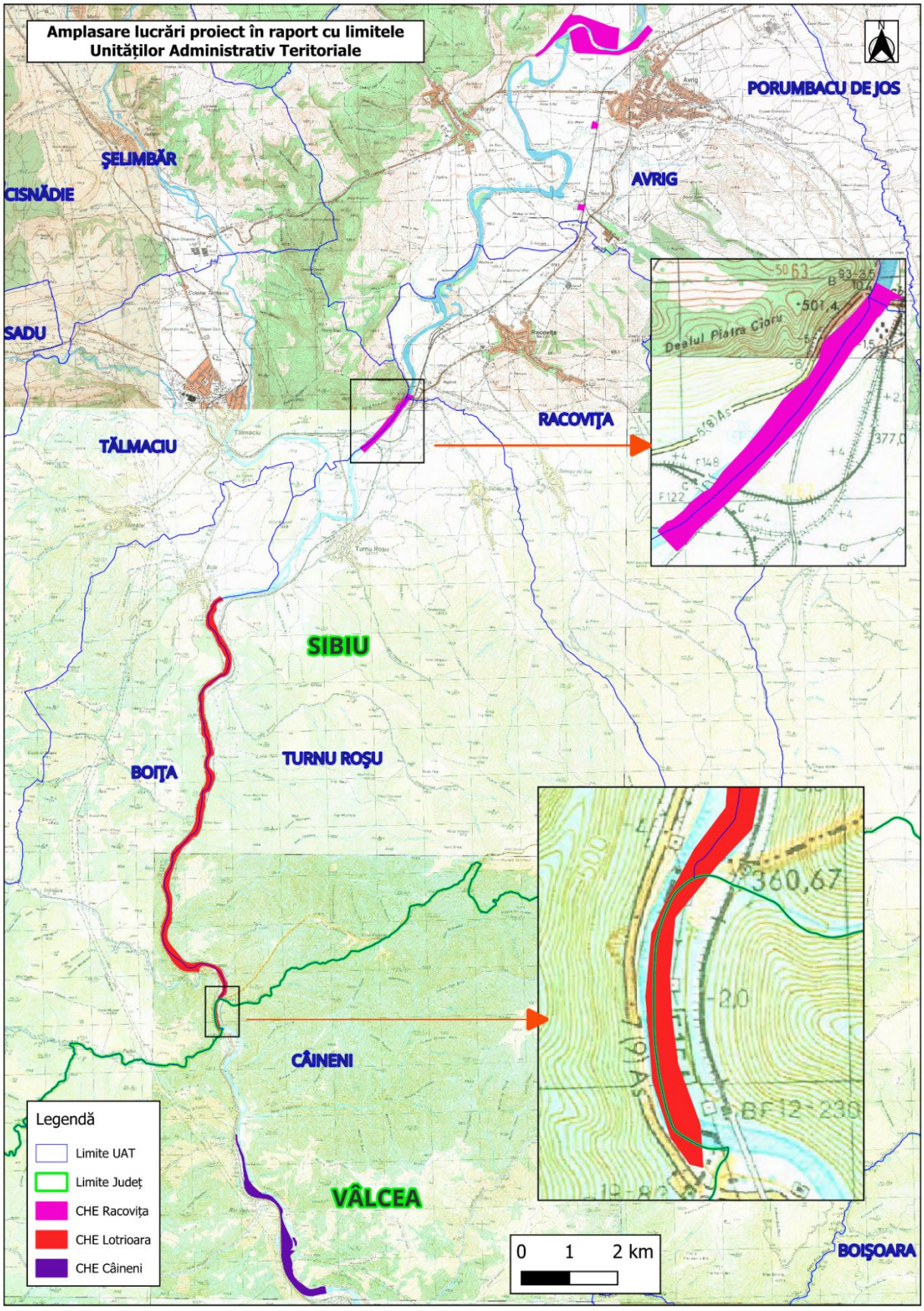

Figure 1 Location of works in relation to the boundaries of the TSUs and county boundaries

b) Location in relation to protected areas

"The project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the hydropower development of the Olt river defileu on the Cornetu-Avrig sector" can be divided into 3 main areas:

- It is partially implemented in ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu Sud-Vest, ROSPA0003 Avrig-Scorei-Făgăraș and ROSPA0098 Făgăraș Piedmont.
- Zone 2 CHE Lotrioara - It is partially implemented in ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu South-West, ROSAC0122 Făgăraş mountains, ROSAC0085 Frumoasa and ROSPA0043 Frumosa;
- Zone 3 CHE Câineni - It is partially implemented in ROSAC0132 Middle Oltul - Cibin - Hârtibaciu.

At the same time, in the vicinity of the project site there is also the protected natural area of national interest 2.696 (INSPIRE code RONPA0713) Eocene limestones of Turnu Roșu - Porcești. The distances of the project sites from protected areas of national and Community interest are shown in the table below.

Table 2 - Tabular presentation of the interventions and components of the project - remaining works to be implemented in relation to protected areas

Stage	Type of intervention	Component	Location	Of Community interest							Of national interest
				Distance from ROSAC0132	Distance from ROSAC0122	Distance from ROSAC0304	Distance from ROSAC0085	Distance from ROSPA0043	Distance from ROSPA0003	Distance from ROSPA0098	Distance to 2.696 Eocene limestones from Turnu Roşu - Porcești
Completion of the remaining works to be carried out and included in the project "*Hydropower development of the Olt river gorge on the Cornetu-Avrig sector" proposed to be implemented by the Project "Increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the hydropower development of the Olt river gorge on the Cornetu-Avrig sector"*	**CHE Câineni** - Dam-type power plant located in front, aligned with the spillway dam, remaining 50% to be executed.	Central embankments: - excavations and embankments - fillings; Central. Construction: - concreting; - metal fabrications; - concrete protections Central architecture: - Interior compartments; - Interior enclosures; - Interior and exterior joinery - Interior finishes - Exterior finishes - Terrace: non-circulating thermal waterproof insulated terrace type roof including sheet metal; - Metal fabrications 110 kV station. Embankments, Construction and Architecture: - Embankments - Concrete - Metal fabrications - Hedgerows Central exterior amenities: - Embankments - Concrete - Hedgerows - Exterior protective metal railings, including priming and alkyd painting - Concrete platform	The location of the Câineni hydropower plant is located within the perimeter of the administrative unit of Câineni (Valcea County), on the Olt river, on the banks and on the first terrace, on the sector between Câinenii Mari and the administrative territorial boundary between Sibiu and Valcea counties.	The Natura 2000 site overlaps with the CHE Câineni site on an area of 19.62 ha (0.67% of the total area of the protected natural area).	The Natura 2000 site does not overlap with the CHE Câineni site, being located at a distance of about 350 m from the boundaries of this Natura 2000 Site.	The location of the Câineni hydropower plant is at least 8.2 km from the boundary of the protected natural area.	The Natura 2000 site does not overlap with the CHE Câineni site, being located at a distance of about 480 m from the boundaries of this Natura 2000 Site.	The location of the Câineni hydropower plant is at least 480 m from the boundary of the protected natural area.	The Natura 2000 Site does not overlap with the CHE Câineni site, being located at a distance of about 23 km from the boundaries of this Natura 2000 Site.	The Natura 2000 site does not overlap with the CHE Câineni site, being located at a distance of about 5.2 km from the boundaries of this Natura 2000 Site.	Over 13.2 km
	CHE Câineni - Overflow dam	Spillway. Embankments: - Excavation of walls upstream right and left bank and downstream left bank - Preparing wall foundations - Fillings Spillway dam. Construction: - Concrete - Sealing screen - Sealing joints with PVC tape Spillway dam. Architecture: - Carpentry aluminum profiles: PVC profile doors and windows with insulated glazing - Finishing: plastering, flooring - Metal fabrications - Closing technological voids: walls sandwich panels with polyurethane foam core - 6 cm thick - Concrete platform										Over 13.2 km

	CHE Câineni - Runaway canal	The escape channel. Embankments: - Channel excavations on the run; Runaway channel. Construction: - 15 cm concrete slabs with non-tight joints - Weep holes - Concreting spur culvert spur									Over 13.5 km
	CHE Câineni - Câineni reservoir dikes	Embankments and counterchannels. Left bank dike. Embankments: - Breakwater and counterchannel foundation preparation - Excavation of the downstream culvert - Filling embankments with borrow pit material - Canopy landscaping - slope grassing Embankments and counterchannels. Left bank dike. Constructions: - Reinforced concrete wall 20 cm thick - Concrete slope closure spur - Kelly screen guide beams - Sealing screen 60 cm (0 - 12 m deep) - Parapet sparge val - Plain concrete wall 10 cm thick with non-tight joints Embankments and counterchannels. Right bank dike. Embankments: - Breakwater and counterchannel foundation preparation - Filling embankments with borrow pit material - Canopy landscaping L = 6 m - Grassing the slope -Anchor protections platform Kelly screen Embankments and counterchannels. Right bank dike. Constructions: - Reinforced concrete wall 20 cm thick - Reinforced concrete wall 15 cm thick - Concrete spur - Kelly screen guide beams - Sealing screen 60 cm (0 - 12 m deep) - Parapet sparge val - Concrete counter-channel and cassette									Over 11.3 km
	CHE Câineni - Water diversion	Water Diversion Phase I (dam and power plant): Toughly: - Mechanical digging in silt - Filling embankments with borrow pit material Construction: - Breaking simple concrete (wall, screen) - Armed concrete smashers Water diversion phase II (start of accumulation): Embankments - Filling embankments with borrow pit material - Mechanical digging in silt Construction: - Prefabricated block closure prism - Protection made of rock									Over 13.5 km
	CHE Câineni - Access road to the hydrotechnical node	Access roads, bridges and protection DN and CF (length 2.700m): - Embankments - Ballast fill/foundation									Over 13.5 km

		- Digging - Road clothing - Drilled pilots - Waterproofing geocomposite - Riprap - Resistance structure, L=21.00 m - Path and parapet, L=21.00 m - Stack infrastructure									
	CHE Lotrioara, 99% to be executed	Central. Embankments: - Excavation and embankments - Fillings Central. Construction: - Sealing screen 80cm - Kelly screen beam 20cm - Concrete - Metal fabrications - Concrete protections Central. Architecture: - Interior compartments - Interior enclosures - Interior and exterior joinery - Interior finishes - Exterior finishes - Terrace: non-circulating, non-insulating, heat-insulating terrace roof, including sheet metal - Metal fabrications 110 kV substation. Embankments, Construction and Architecture: - Embankments - Concrete - Metal fabrications - Hedgerows Central exterior amenities: - Embankments - Concrete - Hedgerows - Exterior protective metal railings, including priming and alkyd painting - Concrete platform	The location of the Lotrioara hydropower project is located within the perimeter of the municipalities of Boița and Turnu Roșu (Sibiu County), on the Olt River, on the banks and on the first terrace, on the sector between Boița and the confluence of the Olt River with the Lotrioara River.	The Natura 2000 site overlaps with the CHE Lotrioara site on an area of 88.25 ha (3.03% of the total area of the protected natural area).	The Natura 2000 site overlaps with the CHE Lotrioara site only marginally, on an area of 15.43 ha (0.008% of the total area of the protected natural area).	The Natura 2000 site overlaps only marginally with the CHE Lotrioara site, on an area of 0.02 ha (0.00009% of the total area of the protected natural area).	The Natura 2000 site ROSAC0085 Frumoasa overlaps only marginally with the CHE Lotrioara site, on an area of 4.07 ha (0.003% of the total area of the protected natural area).	The Natura 2000 site ROSPA0043 Frumoasa overlaps with the CHE Lotrioara site only marginally, on an area of 4.07 ha (0.003% of the total area of the protected natural area).	The location of the CHE Lotrioara hydropower plant is at least 12 km from the boundary of the protected natural area.	The location of the CHE Lotrioara hydropower plant is at least 2.7 km from the boundary of the protected natural area.	Over 8.3 km
	CHE Lotrioara - Overflow dam	Spill weir. Embankments: - Excavations - Fillings - Demolition of existing infrastructure Spillway dam. Construction: - Concrete - Sealing screen 60 cm (0 - 12 m deep) - Sealing joints with PVC tape - Reinforced concrete beam - Metal fabrications - Upstream regularization wall Spillway dam. Architecture: - Carpentry aluminum profiles: PVC profile doors and windows with insulated glazing - Finishing: plastering, flooring - Metal fabrications									Over 8.3 km

		- Closing technological gaps: walls sandwich panels sandwich panels insulating core polyurethane foam - 6 cm thick - Concrete platform									
	CHE Lotrioara - Upstream regularization (channel)	- concreting - clay plug									Over 8.3 km
	CHE Lotrioara - Reservoir	-									Over 3.3 km
	CHE Lotrioara - The Runaway and High Waters Canal	Channel run: embankments: Channel excavations on the run Channel run: construction: 15 cm concrete slabs with non-tight joints Weep holes Concreting spur culvert spur									Over 8.4 km
	CHE Lotrioara - Roads, bridges, accesses and protections DN7 and CF	Access roads, bridges and protection DN and CF (total length of 4. 790 m): - Embankments - Ballast fill/foundation - Digging - Road clothing - Drilled pilots - Waterproofing geocomposite - Riprap - Concrete cassette C25/30 - Prefabricated beams - Over concrete slab - Path and parapet - Seal spur made of C25/30 - Concrete elevation - Sealing screen - End beams/ Guide beams - Technology platform									Over 8.3 km
	CHE Lotrioara - Water diversion	Water diversion phase I Embankments - Mechanical digging in silt - Filling embankments with borrow pit material - Demolition of a cofferdam/bridge ramp Construction - Kelly screen 0-12 m of 50 cm concrete - Concrete guide beams Water diversion phase II Embankments - Filling embankments with borrow pit material - Demolishing the batardou Construction - Kelly screen 0-12 m of 50 cm concrete - Concrete guide beams - Anrocum protection - Pal metal planks									Over 8.3 km
	CHE Racovița - remaining to be executed 5%	DMS Tranche III a: - embankments - concreting DMD upstream Bradu pod: - stubbornly - slope protection with geomaterials - counterchannel excavations	The location of the Racovița hydropower project is located within the perimeter of the municipalities of Avrig, Racovița, Turnu Roșu and Tălmaciu (Sibiu County),	The Natura 2000 site overlaps with the CHE Racovița site on an area of 234.57 ha (8.06% of the total area of	The location of the Racovița hydropower plant is located at a distance of at least 4 km from the boundary of the protected natural area.	The Natura 2000 site overlaps with the CHE Racovița site only marginally, on an area of 1.13 ha (0.005% of the	The location of the Racovița hydropower plant is located at a distance of at least 3.72 km from the	The location of the Racovița hydropower plant is located at a distance of at least 3.72 km from the	The Natura 2000 site overlaps with the CHE Racovița site on an area of 78.58 ha	Areas of overlap	Over 2.1 km

		Protection of bridges CF downstream of the leak channel Protection of Mârșa and Avrig CF bridges excavation of the runaway channel section 2	on the Olt river and on the banks and the first terrace, in the sector between Avrig and Turnu Roșu.	the protected natural area).		total area of the protected natural area).	common boundary of the two protected areas.	common boundary of the two protected areas.	(2.67% of the total area of the protected natural area).		

b.1.) Natura 2000 sites

The following table shows the relationship of the project sites in relation to the ecological network of Natura 2000 protected areas.

Table 3 Project locations in relation to protected areas

home hydropower	Natura 2000 site in the area of influence	Natura 2000 site area	Natura 2000 site area crossed by the project (ha)	Intersection share of total Natura 2000 site area (%)
CHE Racovița	ROSAC0132	2.910,5	22,90	0,79
	ROSAC0304	22.840,8	0,29	0,001
	ROSPA0003	2.943,7	26,93	0,91
	ROSPA0098	71.201,70	0,09	0,0001
CHE Lotrioara	ROSAC0132	2.910,5	88,25	3,03
	ROSAC0122	198.620,5	15,43	0,008
	ROSAC0085	137.256,1	4,07	0,003
	ROSAC0304	22.840,8	0,02	0,00009
	ROSPA0043	130.890,8	4,07	0,003
CHE Câineni	ROSAC0132	2.910,5	19,62	0,67

General data on the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu

The site of the Racovița CHE - works still to be carried out crosses an area of 22.90 ha within the special conservation area ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu (0.79% of the total area of the protected natural area). The site of the Lotrioara CHE crosses an area of 88.25 ha within the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu (3.03% of the total area of the protected natural area). The site of the CHE Câineni development crosses an area of 19.62 ha within the special area of conservation ROSAC0132 Middle Oltul - Cibin-Hârtibaciu (0.67% of the total area of the protected natural area).

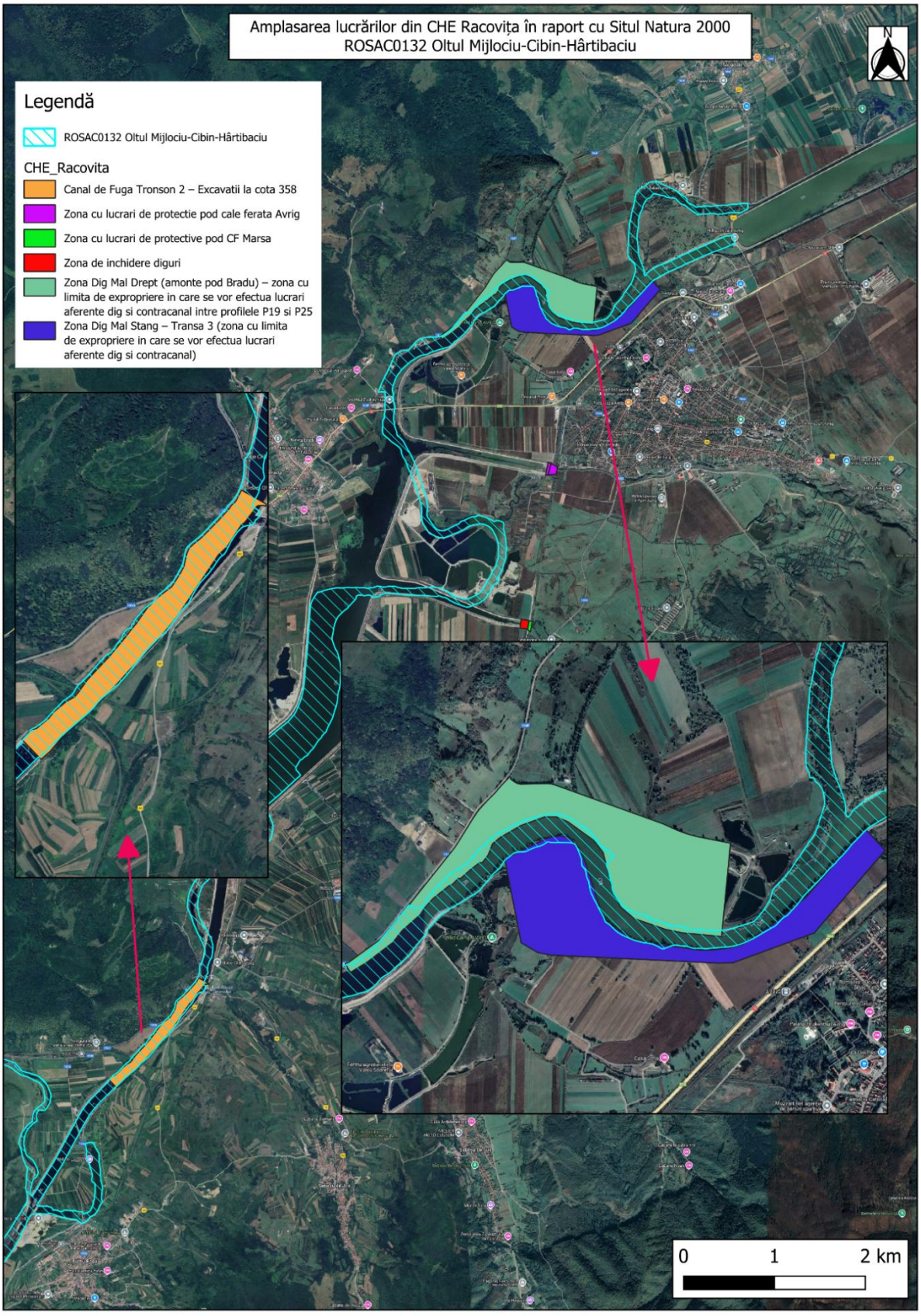

Figure 2 - Aspect of the relationship between the Racovița CHE and the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu

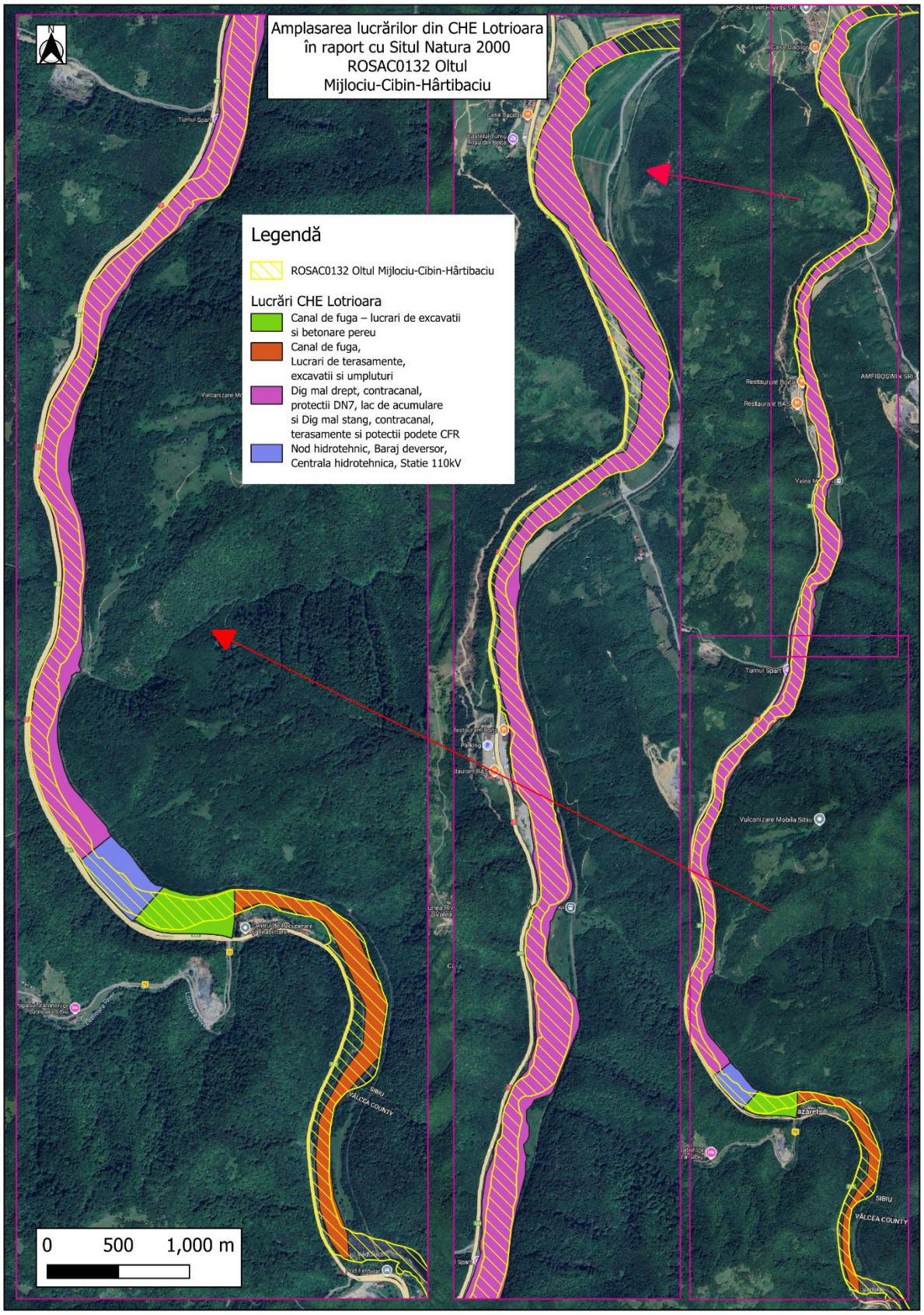

Figure 3 - Aspect of the relationship between the CHE Lotrioara and the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu

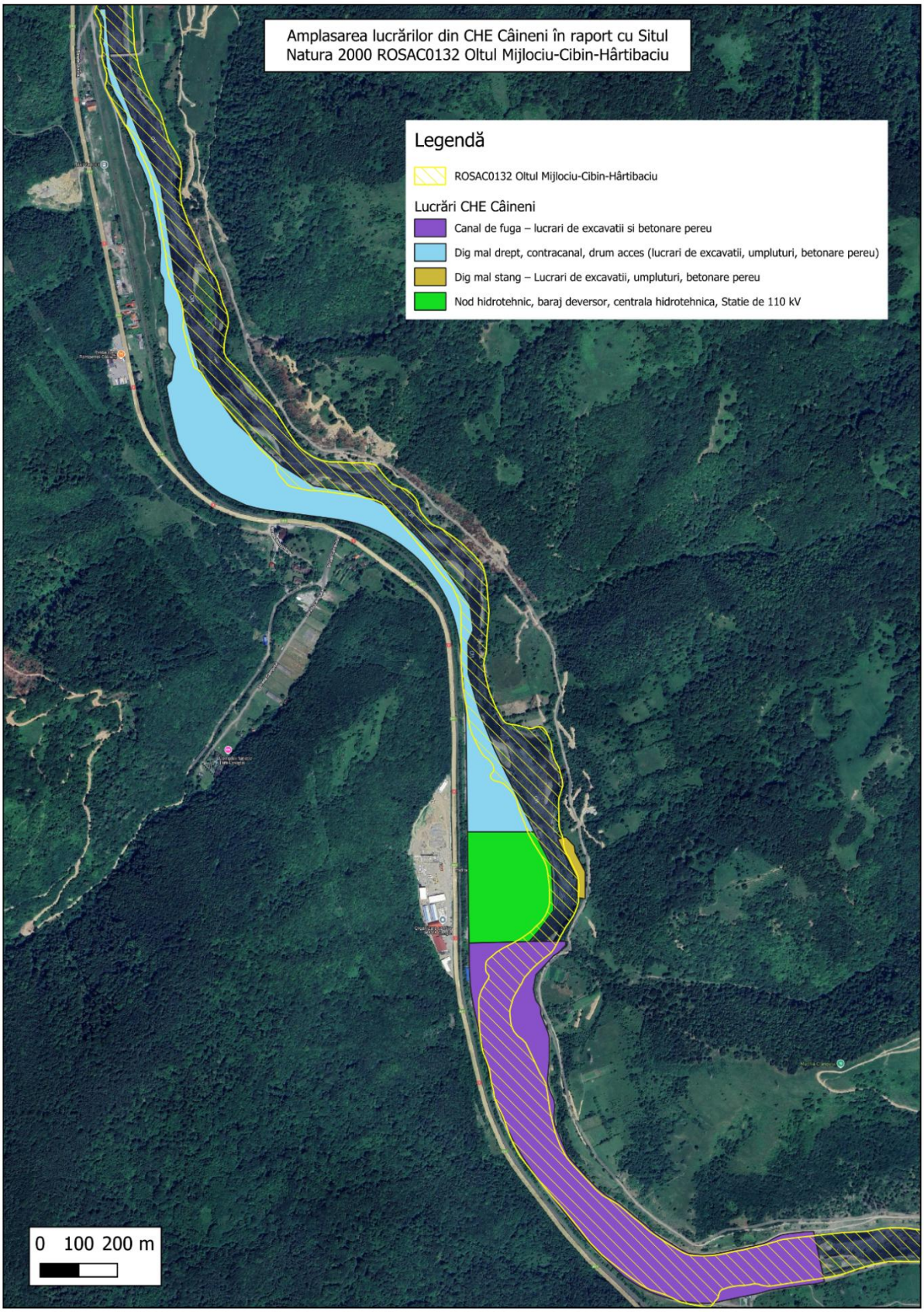

Figure 4 - Aspect of the relationship between the CHE Câineni CHE and the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu

The Special Area of Conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, covering 2,826 ha, extends over the administrative territories of the counties of Sibiu (66%), Brasov (25%) and Valcea (9%).

special conservation area ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu benefits from a Integrated Management Plan in force, approved by Order of the Minister of Environment, Water and Forests no. 1.166/2016 on the approval of the Management Plan of the protected areas ROSPA0099 Podișul Hârtibaciului, ROSAC0227 Sighișoara-Târnava Mare, ROSAC0144 Gorun and oak forest on the Purcărețului Hill, ROSAC0143 Gorun and oak forest at Dosul Fânațului, ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSAC0303 Hârtibaciu Sud-Est, ROSAC0304 Hârtibaciu Sud-Vest, Nature Reserve "The secular oaks of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The shagbark oak reserve" - Criș village .

The conservation management of the special area of conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu is currently ensured by the National Agency for Protected areas.

In the following table are presented, according to the Natura 2000 Standard Form of the special area of conservation ROSAC0132 Middle Oltul Cibin Hârtibaciu revised on 17.02.2024, the types of habitats of community interest within the protected natural area.

Table 4 - List of habitat types of community interest in the perimeter ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu and assessment of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its manual of completion, according to the Natura 2000 Standard Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Habitat name	Cover (ha)	Reprez.	Supr. rel.	Status conserv.	Global evaluation
1.	4060	Alpine and boreal forests	0	C	C	C	C
2.	9110	*Luzulo-Fagetum* beech forests	58	C	C	C	C
3.	92A0	Glades with *Salix alba* and *Populus alba*	19,85	B	C	B	B

Repres. = Representativity = measure for how typical a habitat is of the site (A - excellent representativity, B - good representativity, C - significant representativity, D - insignificant representativity);

Rel. supr. = Relative area = The area of the site covered by the natural habitat relative to the total area covered by that natural habitat type within the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = State of conservation = The degree of conservation of the structures and functions of the natural habitat type in question, as well as the possibilities for restoration/reconstruction (A = excellent conservation, B = good conservation, C = fair or poor conservation).

The following table presents the species of conservation interest for which the special area of conservation ROSAC0132 Middle Oltul - Cibin - Hârtibaciu has been designated, as well as the estimated population numbers and the evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Natura 2000 Standard Form revised on 17.02.2024.

Table 5 - List of species listed in Annex II of Council Directive 92/43/EEC for which ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu has been designated and assessment of the populations at the Natura 2000 site level, according to the Natura 2000 Standard Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Species name	Type	Resident population	Sit. Pop.	Conserv.	Isolation	Global
Mammal species listed in Annex II to Council Directive 92/43/EEC								
1.	1355	*Lutra lutra*	P	-	C	B	C	B
2.	1337	*Castor fiber*	P	-	C	B	C	B
3.	1166	*Triturus cristatus*	P	-	C	B	C	B
4.	1130	*Aspius aspius*	P		C	C	C	C
5.	5266	*Barbus petenyi*	P	10.000 - 15.000	C	B	C	B
6.	6963	*Cobitis taenia*	P	5.000 - 10.000	C	B	C	B
7.	2522	*Pelecus cultratus*	P	50 - 100	C	B	C	C
8.	5339	*Rhodeus amarus*	P	2.000 - 5.000	C	B	C	B
9.	6143	*Romanogobio kesslerii*	P	1.000 - 5.000	C	B	C	B
10.	6145	*Romanogobio uranoscopus*	P	-	C	C	C	C
11.	5197	*Sabanejewia aurata*	P	10.000 - 15.000	C	B	C	B
12.	1160	*Zingel streber*	P	-	D	-	-	-
13.	1159	*Zingel zingel*	P	50 - 100	C	C	B	C
14.	4056	*Anisus vorticulus*	P	-	D	-	-	-
15.	4057	*Chilostoma banaticum*	P	-	A	B	A	B
16.	4045	*Coenagrion ornatum*	P	-	C	B	C	B
17.	1037	*Ophiogomphus cecilia*	P	-	C	B	C	B
18.	1032	*Unio crassus*	P	-	A	C	C	B
19.	1220	*Emys orbicularis*	P	-	C	B	C	B

Pop. = population status = the size and density of the population of the species present in the site in relation to the populations present in the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = Conservation = the degree of conservation of the habitat features that are important for the species concerned and the possibilities for recovery (a-excellent conservation, b-good conservation, C-fair or poor conservation);

Isolation = population size and density of the species present in the site in relation to the populations present in the national territory (A- almost isolated population, B- non-isolated population but at the limit of its range, C- non-isolated population with a wide range; Global = overall assessment of the value of the site for the conservation of the species concerned (A- excellent value, B-good value, C-significant value).

Table 6 - The conservation status of habitats of Community interest within the special area of conservation ROSAC0132 Middle Oltul - Cibin - Hârtibaciu

Natura 2000 Code	Habitat name	State of preservation according to PM			
		Surface occupied	Specific structure and function	Overall state	Outlook
4060	Alpine and boreal forests	Habitat not identified in the area			
9110	Luzulo-Fagetum beech forests	unfavorable	unfavorable-inadequate	unfavorable-inadequate	unfavorable-inadequate
92A0	*White Salix* and *white Populus alba*	-	-	favorable	-

Table 7 - The conservation status of species of Community interest within the special area of conservation ROSAC0132 Middle Oltul - Cibin - Hârtibaciu

No. crt.	Natura 2000 Code	Species of Community interest	Global conservation status of the species	Conservation status of the species according to the conservation objectives set by ANANP
1.	1355	*Lutra lutra*	satisfactory	unfavorable - inadequate
2.	1337	*Castor fiber*	satisfactory	unfavorable - inadequate
3.	1166	*Triturus cristatus*	appropriate	the presence of the species has not been identified on the site
4.	1130	*Aspius aspius*	the presence of the species has not been identified on the site	the presence of the species has not been identified on the site
5.	5266	*Barbus petenyi*	satisfactory	unfavorable - inadequate
6.	6963	*Cobitis taenia*	satisfactory	unfavorable - inadequate
7.	2522	*Pelecus cultratus*	inappropriate	unfavorable - bad
8.	5339	*Rhodeus amarus*	satisfactory	unfavorable - inadequate
9.	6143	*Romanogobio kesslerii*	satisfactory	unfavorable - inadequate
10.	6145	*Romanogobio uranoscopus*	the presence of the species has not been identified on the site	the presence of the species has not been identified on the site
11.	5197	*Sabanejewia balcanica*	satisfactory	unfavorable - inadequate

No. crt.	Natura 2000 Code	Species of Community interest	Global conservation status of the species	Conservation status of the species according to the conservation objectives set by ANANP
12.	1160	*Zingel streber*	the presence of the species has not been identified on the site	the presence of the species has not been identified on the site
13.	1159	*Zingel zingel*	inappropriate	unfavorable - bad
14.	4056	*Anisus vorticulus*	the presence of the species has not been identified on the site	unknown
15.	4057	*Chilostoma banaticum*	the presence of the species has not been identified on the site	unknown
16.	4045	*Coenagrion ornatum*	untreated	unknown
17.	1037	*Ophiogomphus cecilia*	the presence of the species has not been identified on the site	unknown
18.	1032	*Unio crassus*	inappropriate	unfavorable - inadequate
19.	1220	*Emys orbicularis*	inappropriate	favorable

General data for the special conservation area ROSAC0122 Făgăraș mountains

The site of the CHE Lotrioara development marginally intersects an area of 15.43 ha within the special area of conservation ROSAC0122 Făgăraș Mountains (0.008% of the total area of the protected natural area).

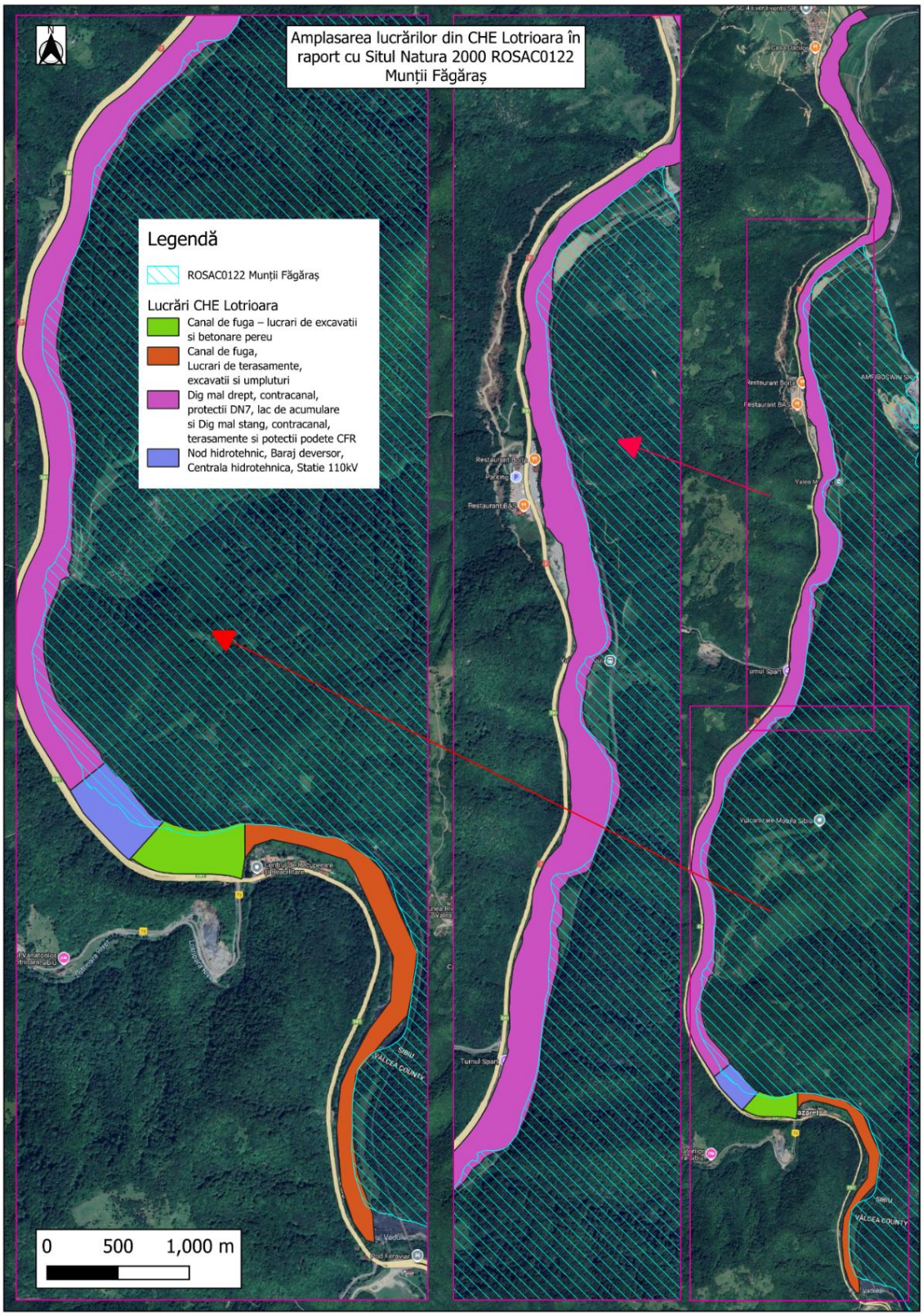

Figure 5 - Aspect of the relationship between the Lotrioara CHE and the special area of conservation ROSAC0122 Făgăraș Mountains

The Special Area of Conservation ROSAC0122 Făgăraș Mountains, covering 198,620.5 ha, extends over the counties of Argeș, Brașov, Sibiu and Valcea and has been

designated for the conservation of 29 habitat types of Community interest (of which 11 are forest) and 35 species of wild fauna and flora of Community interest.

Currently, the special conservation area ROSAC0122 Făgăraș Mountains benefits from a Management Plan approved by the Order of the Minister of Environment, Water and Forests No. 1.156/2016. The management plan was developed by the Association Făgăraș mountains, as a result of the implementation of the project "*Integrated management of the Natura 2000 sites Făgăraș mountains and Făgăraș Piedmont*", SMIS code 36867, co-financed by the European Regional Development Fund through the Operational Program Environment Sector 2007-2013.

The conservation management of the special area of conservation ROSAC0122 Făgăraș Mountains is currently ensured by the National Agency for Protected areas.

Following the specific activities of inventory, mapping and assessment of the state of conservation of the natural capital of community interest in the perimeter of the special area of conservation ROSAC0122 Făgăraș mountains, activities that were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the habitats and species of community interest were reassessed. In order to revise the Natura 2000 standard form of the special area of conservation ROSAC0122 Făgăraș mountains, the data were partially updated in the RNI-IBIS application.

The following table presents the re-evaluated data on the types of habitats of conservation interest identified as being present within the perimeter of the Natura 2000 site ROSAC0122 Făgăraș Mountains.

Table 8 - List of habitat types of Community interest for which ROSAC0122 Făgăraș Mountains has been designated and the assessment of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 regarding the approval of the content of the Natura 2000 Standard Form and its completion manual, based on the inventory, mapping and assessment studies carried out for the elaboration of the Integrated Management Plan for the Natura 2000 sites ROSAC0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont

No. crt.	Natura 2000 Code	Habitat name	%	Represent	Supr. rel.	Conserv	Global
1.	3220	Herbaceous vegetation on the banks of mountain rivers	0,001	A	C	B	B
2.	4060	Alpine and boreal forests	9,82	A	B	A	A
3.	4070*	Clumps of *Pinus mugo* and *Rhododendron myrtifolium*	2,95	A	B	A	A
4.	4080	Sub-arctic *Salix* stands	0,06	A	B	B	B
5.	6150	Boreal and alpine meadows on siliceous substrate	6,8	A	B	B	B
6.	6170	Alpine and subalpine calcareous grasslands	0,1	B	C	B	B
7.	6230*	Species-rich montane *Nardus* meadows on siliceous substrates	1,26	B	B	B	B

No. crt.	Natura 2000 Code	Habitat name	%	Represent	Supr. rel.	Conserv	Global
8.	6410	Meadows with *Molinia* on calcareous, peaty or clayey soils (Molinion caeruleae)	0,007	C	C	C	C
9.	6430	Lowland, montane to alpine and alpine tall-grass lowland communities	0,13	A	C	B	B
10.	6440	Alluvial meadows in Cnidion Doubts	0,09	B	B	B	B
11.	6520	Mountain meadows	0,63	A	C	A	A
12.	7140	Transitional peat bogs and oscillating peat bogs (not attached to the substrate)	0,001	A	C	A	A
13.	7220*	Petrifying springs with travertine formation (Cratoneurion)	0,001	A	C	B	B
14.	8110	Siliceous groocias from mountain to alpine (Androsacetalia alpinae and Galeopsietalia ladani)	0,009	A	A	A	A
15.	8120	Calcareous and calcareous shale scree from montane to alpine (Thlaspietea rotundifolii)	0,002	A	C	A	A
16.	8210	Rocky slopes with chasmophytic vegetation on calcareous rocks	0,001	A	C	A	A
17.	8220	Rocky slopes with chasmophytic vegetation on siliceous rocks	0,14	A	B	A	A
18.	8310	Caves closed to the public	0,001	D			
19.	9110	Luzulo-Fagetum beech forests	13,09	A	B	B	A
20.	9130	Asperulo-Fagetum beech forests	3,18	B	C	B	B
21.	9170	Galio-Carpinetum oak forests with hornbeam	0,14	C	C	A	A
22.	9180*	Tilio-Acerion forests on steep slopes, ravines and gullies	0,03	C	A	A	A
23.	91D0*	Forest peatland	0,02	C	A	A	B
24.	91E0*	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	0,21	C	B	B	A
25.	91K0	Illyric forests of *Fagus sylvatica* (Aremonio-Fagion)	1,89	B	B	B	B
26.	91L0	Illyric oak-oak forests with hornbeam (Erythronio-Carpinion)	0,49	C	C	B	B
27.	91V0	Dacian beech forests (Symphyto- Fagion)	26,32	A	B	B	A
28.	9410	Acidophilous *Picea abies* forests of the montane region (Vaccinio - Piceetea)	22,99	A	B	B	A

No. crt.	Natura 2000 Code	Habitat name	%	Represent	Supr. rel.	Conserv	Global
29.	9420	Alpine forests of *Larix decidua* and/or *Pinus cembra* in the montane region	0,11	A	A	A	A

Repres. = Representativity = measure for how typical a habitat is of the site (A - excellent representativity, B - good representativity, C - significant representativity, D - insignificant representativity);

Rel. supr. = Relative area = The area of the site covered by the natural habitat relative to the total area covered by that natural habitat type within the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = State of conservation = The degree of conservation of the structures and functions of the natural habitat type in question, as well as the possibilities for restoration/reconstruction (A = excellent conservation, B = good conservation, C = fair or poor conservation).

The following table presents the species of conservation interest for which the special area of conservation ROSAC0122 Făgăraș Mountains has been designated, as well as the assessment of the populations evaluated in the framework of the Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont and the evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its manual of completion.

Table 9 - List of species listed in Annex II of Council Directive 92/43/EEC for which ROSAC0122 Făgăraş mountains has been designated and the assessment of the populations at the Natura 2000 site level, based on the inventory, mapping and assessment studies carried out for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraş mountains and ROSPA0098 Făgăraș Piedmont

No. crt.	Natura 2000 Code	Species name	Resident population	Pop.	Conserv.	Isolation	Global
1.	1303	*Rhinolophus hipposideros*	500-800 i	B	B	C	B
2.	1304	*Rhinolophus ferrumequinum*	50-100 i	C	C	C	C
3.	1307	*Myotis blythii*	500-1.000 i	C	B	C	B
4.	1308	*Barbastella barbastellus*	500-1.000 i	C	B	C	B
5.	1310	*Miniopterus schreibersii*	250-500 i	C	B	C	B
6.	1321	*Myotis emarginatus*	150-300 i	C	B	C	B
7.	1323	*Myotis bechsteinii*	500-1.000 i	C	B	C	B
8.	1324	*Myotis myotis*	2.000-3.000 i	C	B	C	B
9.	1352*	*Canis lupus*	121-161 i	B	A	C	A
10.	1354*	*Ursus arctos*	417-527 i	B	A	C	A
11.	1355	*Lutra lutra*	312-520 i	B	A	C	A
12.	1361	*Lynx lynx*	61-107 i	B	A	C	A
13.	1166	*Triturus cristatus*	V	C	C	C	C

No. crt.	Natura 2000 Code	Species name	Resident population	Pop.	Conserv.	Isolation	Global
14.	1193	*Bombina variegata*	C	C	B	C	B
15.	2001	*Triturus montandoni*	R	C	B	B	B
16.	4008	*Triturus vulgaris ampelensis*	V	C	C	C	C
17.	5266	*Barbus petenyi* (*B. meridionalis*)	P	C	C	B	C
18.	6965	*Cottus gobio* all others	R	C	C	B	C
19.	1014	*Vertigo angustior*	P	D	-	-	-
20.	1060	*Lycaena dispar*	R	C	B	C	B
21.	1065	*Euphydryas aurinia*	V	D	-	-	-
22.	6199*	*Euplagia (Callimorpha) quadripunctaria*	C	C	A	C	A
23.	1083	*Lucanus cervus*	R	C	B	C	B
24.	6966*	*Osmoderma eremita* complex	P?	-	-	-	-
25.	1087*	*Rosalia alpina*	R	C	B	C	B
26.	6908	*Morimus asper funereus*	R	C	B	C	B
27.	1927	*Stephanopachys substriatus*	P?	-	-	-	-
28.	4012	*Carabus hampei*	V	D	-	-	-
29.	4054	*Pholidoptera transsylvanica*	C	C	A	B	B
30.	4057	*Chilostoma banaticum*	R	C	B	C	B
31.	1389	*Meesia longiseta*	P?	-	-	-	-
32.	1393	*Drepanocladus vernicosus*	P?	-	-	-	-
33.	4070*	*Campanula serrata*	C	C	A	C	A
34.	4116	*Tozzia carpathica*	R	B	B	A	B
35.	4122	*Poa granitica* ssp. *disparilis*	V	A	B	A	B

Pop. = population status = the size and density of the population of the species present in the site in relation to the populations present in the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = Conservation = the degree of conservation of the habitat features that are important for the species and the potential for recovery (a - excellent conservation, b - good conservation, C - fair or poor conservation);

Isolation = population size and density of the species present in the site in relation to the populations present in the national territory (A - almost isolated population, B - non-isolated population but at the edge of its range, C - non-isolated population with a wide range; Global = overall assessment of the value of the site for the conservation of the species (A - excellent value, B - good value, C - considerable value).

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the conservation status of the habitats of community interest within the protected natural area is presented in the following table.

Table 10 - Conservation status of habitats of community interest within the special area of conservation ROSAC0122 Făgăraş mountains (according to the Management Plan)

No. crt.	Habitat of Community Interest	Conservation status of the habitat type in terms of area occupied	Conservation status of the habitat type in terms of structure and specific functions	Conservation status of the habitat type in terms of its future prospects	Overall conservation status of the habitat type
1.	3220 - Herbaceous vegetation on the banks of mountain rivers	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
2.	4060 - Alpine and boreal forests	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
3.	4070* - Clumps of *Pinus mugo* and *Rhododendron myrtifolium*	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
4.	4080 - Sub-arctic *Salix* tussocks	unknown	favorable	unknown	unknown
5.	6150 - Boreal and alpine meadows on siliceous substrate	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
6.	6170 - Alpine and subalpine calcareous grasslands	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
7.	6230* - *Nardus* mountain meadows rich in species on siliceous substrates	unfavorable - inadequate	unfavorable - bad	unfavorable - inadequate	unfavorable - bad
8.	6410 - Meadows with *Molinia* on calcareous, peaty or clayey soils - *Molinion caeruleae*	unfavorable - inadequate	unfavorable - bad	unfavorable - bad	unfavorable - bad
9.	6430 - Lowland, upland to montane and alpine, tall-grass lowland communities	unfavorable - inadequate	favorable	unfavorable - bad	unfavorable - bad
10.	6440 - Alluvial meadows of *Cnidion dubii*	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
11.	6520 - Mountain meadows	favorable	favorable	unfavorable - bad	unfavorable - bad
12.	7140 - Transitional peat bogs and oscillating peat bogs - not attached to substratum	favorable	favorable	favorable	favorable
13.	7220* - Petrifying springs with travertine formation - *Cratoneurion*	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
14.	8110 - Siliceous groocias from mountain to alpine - *Androsacetalia alpinae* and *Galeopsietalia ladani*	favorable	favorable	favorable	favorable

No. crt.	Habitat of Community Interest	Conservation status of the habitat type in terms of area occupied	Conservation status of the habitat type in terms of structure and specific functions	Conservation status of the habitat type in terms of its future prospects	Overall conservation status of the habitat type
15.	8120 - Calcareous and calcareous schistose grooves from montane to alpine - *Thlaspietea rotundifolii*	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
16.	8210 - Rocky slopes with chasmophytic vegetation on calcareous rocks	favorable	favorable	favorable	favorable
17.	8220 - Rocky slopes with chasmophytic vegetation on siliceous rocks	favorable	favorable	favorable	favorable
18.	8310 - Caves where public access is forbidden	favorable	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
19.	9110 - Beech forests of the *Luzulo-Fagetum* type	favorable	favorable	favorable	favorable
20.	9130 - *Asperulo-Fagetum* beech forests	favorable	favorable	favorable	favorable
21.	9170 - *Galio-Carpinetum* oak and hornbeam forests	favorable	favorable	favorable	favorable
22.	9180* - *Tilio-Acerion* forests on steep slopes, ravines and gullies	favorable	favorable	favorable	favorable
23.	91D0* - Peatland with forest vegetation	unknown	favorable	favorable	favorable
24.	91E0* - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* - *Alno-Padion, Alnion incanae, Salicion albae*	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate
25.	91K0 - Illyric forests of *Fagus sylvatica* - *Aremonio-Fagion*	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
26.	91L0 - Illyric oak and hornbeam forests - *Erythronio-Carpinion*	favorable	favorable	favorable	favorable
27.	91V0 - Dacian beech forests - *Symphyto-Fagion*	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
28.	9410 - Acidophilous *Picea abies* forests of the montane region - *Vaccinio - Piceetea*	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
29.	9420 - Alpine forests of *Larix decidua* and/or *Pinus cembra* in the montane region	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the conservation status of the species of community interest within the protected natural area is presented in the following table.

Table 11 - The conservation status of species of Community interest within the special area of conservation ROSAC0122 Făgăraș Mountains (according to the Management Plan)

No. crt.	Species of Community interest	Population conservation status of the species	Habitat conservation status of the species	Conservation status in terms of the species' future prospects	Global conservation status of the species
1.	*Campanula serrata*	unfavorable - inadequate	unfavorable - inadequate	favorable	unfavorable - inadequate
2.	*Tozzia carpathica*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
3.	*Poa granitica* ssp. *disparilis*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
4.	*Vertigo angustior*	favorable	favorable	favorable	favorable
5.	*Chilostoma banaticum*	favorable	favorable	favorable	favorable
6.	*Lycaena dispar*	favorable	favorable	favorable	favorable
7.	*Euphydryas aurinia*	unknown	favorable	favorable	favorable
8.	*Euplagia* (*Callimorpha*) *quadripunctaria*	favorable	favorable	favorable	favorable
9.	*Lucanus cervus*	unfavorable - inadequate	unfavorable - inadequate	favorable	unfavorable - inadequate
10.	*Rosalia alpina*	unfavorable - inadequate	unfavorable - inadequate	favorable	unfavorable - inadequate
11.	*Morimus asper funereus*	unfavorable - inadequate	unfavorable - inadequate	favorable	unfavorable - inadequate
12.	*Pholidoptera transsylvanica*	favorable	favorable	favorable	favorable
13.	*Barbus petenyi*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
14.	*Cottus gobio*	unfavorable - bad	unfavorable - bad	unfavorable - inadequate	unfavorable - bad
15.	*Bombina variegata*	favorable	favorable	favorable	favorable
16.	*Triturus cristatus*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
17.	*Triturus montandoni*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
18.	*Rhinolophus hipposideros*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
19.	*Myotis myotis*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
20.	*Canis lupus*	favorable	favorable	favorable	favorable
21.	*Ursus arctos*	favorable	favorable	favorable	favorable
22.	*Lynx lynx*	favorable	favorable	favorable	favorable
23.	*Lutra lutra*	favorable	unfavorable - inadequate	favorable	unfavorable - inadequate

General data on the special area of conservation ROSAC0085 Frumoasa

The location of the CHE Lotrioara development crosses an area of 4.07 ha within the special area of conservation ROSAC0085 Frumoasa (0.003% of the total area of the protected natural area).

The special conservation area ROSAC0085 Frumoasa**,** with a surface area of 137,256.10 ha, is under the administration of the National Agency for Protected areas and, together with the special avifauna protection area ROSPA0043 Frumoasa, currently benefits from an Integrated Management Plan in force, approved by Order of the Minister of Environment, Water and Forests No. 1.158/2016. The conservation management of the special conservation area ROSAC0085 Frumoasa is currently provided by the National Agency for Protected areas.

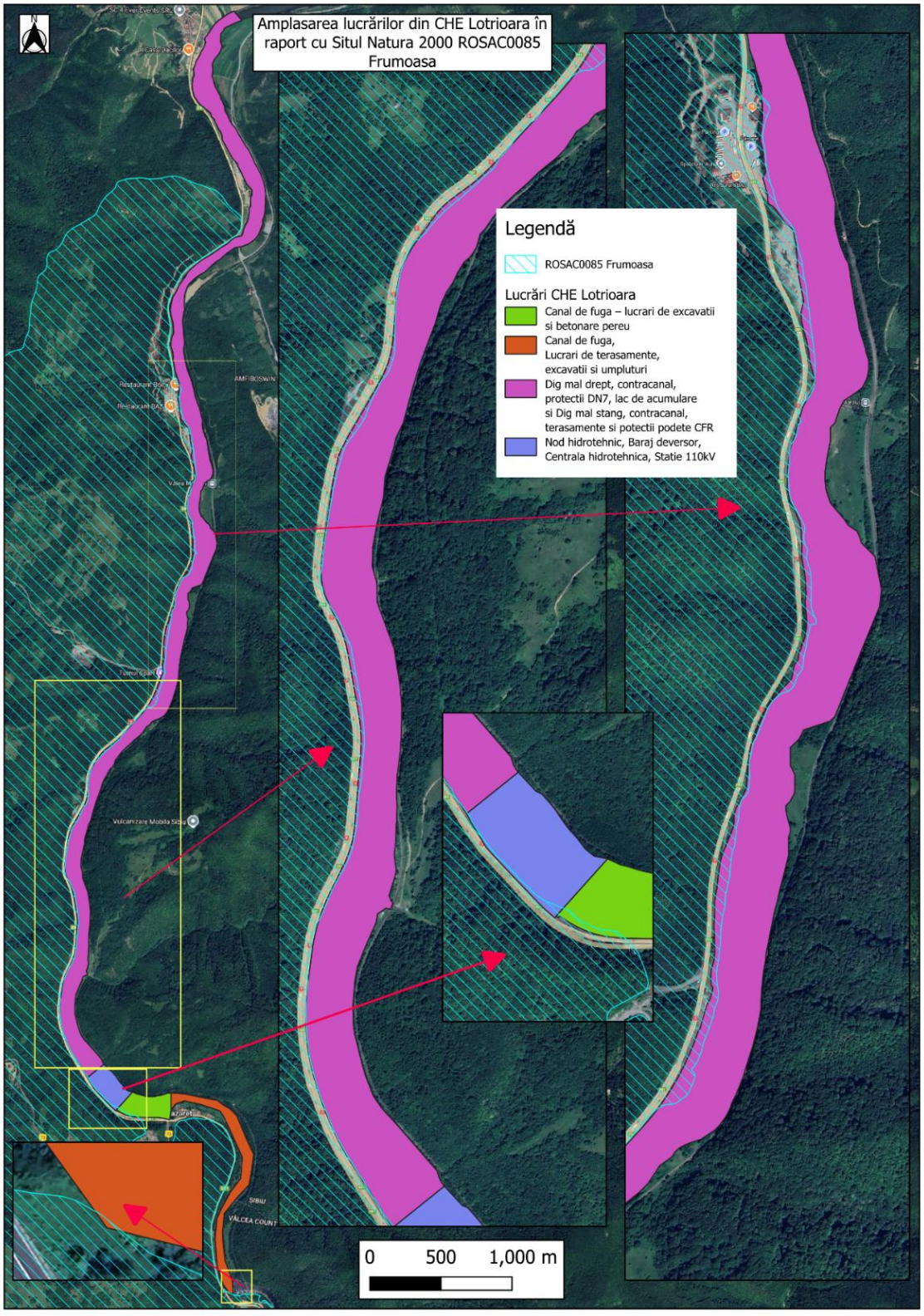

Figure 6 - Aspect of the relationship between the Lotrioara CHE and the special area of conservation ROSAC0085 Frumoasa

The following table presents the list of habitat types of community interest within ROSAC0085 Frumoasa and the evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Standard Form of ROSAC0085 Frumoasa of 17.02.2024.

Table 12 - List of habitat types of community interest within the ROSAC0085 Frumoasa and assessment of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its completion manual, according to the ROSAC0085 Frumoasa Standard Form of 17.02.2024

Habitat types				**Evaluation**			
No. crt.	**Natura 2000 Code**	**Habitat name**	**Cover (ha)**	**Reprez.**	**Supr. rel.**	**Status conserv.**	**Global evaluation**
1.	3220	Herbaceous vegetation on the banks of mountain rivers	30	D	-	-	-
2.	4060	Alpine and boreal forests	12.500	A	C	A	A
3.	4070*	Clumps of *Pinus mugo* and *Rhododendron myrtifolium*	4.000	B	C	B	B
4.	4080	Sub-arctic *Salix sp.*	3	A	A	A	A
5.	40A0	Subcontinental peri-pan-Pannonian sub-continental tufts	4	C	C	B	B
6.	6150	Boreal and alpine meadows on siliceous substrate	1.600	B	C	B	B
7.	6230*	Species-rich montane *Nardus* meadows on siliceous substrates	160	B	B	B	B
8.	6410	Meadows with *Molinia* on calcareous, peaty or clayey soils (Molinion caeruleae)	342	B	C	B	B
9.	6430	Lowland, montane to alpine and alpine tall-grass lowland communities	210	B	C	B	B
10.	6520	Mountain meadows	5.500	B	C	B	B
11.	7110*	Active Turbidity	200	B	C	B	B
12.	7140	Transitional peat bogs and oscillating peat bogs (not attached to substrate)	0	D	-	-	-
13.	7230	Alkaline swamps	27	C	C	C	C
14.	8110	Siliceous siliceous groocias from the montane to the alpine (*Androsacetalia alpinae* and *Galeopsietalia ladani*)	30	D	-	-	-
15.	8220	Rocky slopes with chasmophytic vegetation on siliceous rocks	200	B	B	B	B

Habitat types				Evaluation			
No. crt.	**Natura 2000 Code**	**Habitat name**	**Cover (ha)**	**Reprez.**	**Supr. rel.**	**Status conserv.**	**Global evaluation**
16.	9110	*Luzulo-Fagetum* beech forests	15.441	A	B	B	B
17.	9130	*Asperulo-Fagetum* beech forests	266	C	C	B	B
18.	9170	*Galio-Carpinetum* oak forests with hornbeam	733	C	C	B	C
19.	91D0*	Forest peatland	642	C	C	B	B
20.	91E0*	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	70	A	B	B	B
21.	91V0	Dacian beech forests (*Symphyto- Fagion*)	11.913	A	B	B	B
22.	9410	Acidophilous *Picea abies* forests of the montane region (*Vaccinio - Piceetea*)	78.907	A	B	B	B

Repres. = Representativity = measure for how typical a habitat is of the site (A - excellent representativity, B - good representativity, C - significant representativity, D - insignificant representativity);

Rel. supr. = Relative area = The area of the site covered by the natural habitat relative to the total area covered by that natural habitat type within the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = State of conservation = The degree of conservation of the structures and functions of the natural habitat type in question, as well as the possibilities for restoration/reconstruction (A = excellent conservation, B = good conservation, C = fair or poor conservation).

Following the specific activities of inventory, mapping and assessment of the conservation status of the natural capital of community interest within the perimeter of the special area of conservation ROSAC0085 Frumoasa, activities that were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, the habitats of community interest were reassessed.

It is noted that, for habitats of community interest, the ROSAC0085 Frumoasa Standard Form has been adequately revised based on the data provided by the Management Plan. The only differences are that in the case of some habitats for which the Management Plan provided a minimum and a maximum area covered, the average of this range has been entered in the form, and in the case of habitat 9170 - Oak oak oak oak forests with hornbeam type *Galio-Carpinetum*, the Management Plan considers this habitat as unrepresentative for the site and it is not proposed to enter it in the form.

The following table presents the list of species of community interest within ROSAC0085 Frumoasa and the evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura

2000 Standard Form and its completion manual, according to the Standard Form of ROSAC0085 Frumoasa of 17.02.2024.

Table 13 - List of species of community interest within the ROSAC0085 Frumoasa and evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the ROSAC0085 Frumoasa Standard Form of 17.02.2024

Species			Population			Sit			
No. crt.	Natura 2000 Code	Scientific name	Size (no. individuals)		Categ.	Pop.	Conserv.	Isolation	Global
			Min.	Max.					
1.	1352*	*Canis lupus*	30	40	P	B	B	C	B
2.	1355	*Lutra lutra*	32	56	P	C	B	C	B
3.	1361	*Lynx lynx*	15	25	P	C	B	C	B
4.	1354*	*Ursus arctos*	50	70	C	C	B	C	B
5.	1193	*Bombina variegata*	1.200	2.200	P	C	A	C	A
6.	1166	*Triturus cristatus*	-	-	R	C	B	C	B
7.	5266	*Barbus petenyi* (*B. meridionalis*)	5.000	10.000	P	C	B	C	B
8.	6965	*Cottus gobio* all others	6.000	24.000	P	C	B	C	B
9.	4123	*Eudontomyzon danfordi*	-	-	P	C	B	C	B
10.	6145	*Romanogobio uranoscopus*	-	-	P	C	B	C	B
11.	1085	*Buprestis splendens*	-	-	V	B	B	A	B
12.	1088	*Cerambyx pig*	-	-	P	C	B	C	B
13.	4046	*Cordulegaster heros*	-	-	P	B	B	A	B
14.	1065	*Euphydryas aurinia*	-	-	P	B	B	C	B
15.	6199*	*Euplagia (Callimorpha) quadripunctaria*	5.000	10.000	P	B	B	C	B
16.	1060	*Lycaena dispar*	2	-	R	D	-	-	-
17.	1037	*Ophiogomphus cecilia*	-	-	P	A	A	C	A
18.	4054	*Pholidoptera transsylvanica*	10.000	-	P	C	B	A	B
19.	4024*	*Pseudogarotina excellens*	-	-	P?	D	-	-	-
20.	1087*	*Rosalia alpina*	81	-	P	C	B	C	B
21.	1386	*Buxbaumia viridis*	31	31	V	C	B	C	B
22.	4070*	*Campanula serrata*	-	-	C	C	B	C	B
23.	1381	*Dicranum viride*	-	-	R	B	B	C	B
24.	1393	*Drepanocladus vernicosus*	-	-	R	C	B	C	B
25.	1389	*Meesia longiseta*	-	-	R	A	B	C	B
26.	4116	*Tozzia carpathica*	-	-	R	B	B	C	B

Pop. = population status = the size and density of the population of the species present in the site in relation to the populations present in the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = Conservation = the degree of conservation of the habitat features that are important for the species and the potential for recovery (a - excellent conservation, b - good conservation, C - fair or poor conservation);

Isolation = population size and density of the species present in the site in relation to the populations present in the national territory (A- almost isolated population, B- non-isolated population but at the limit of its range, C- non-isolated population with a wide range; Global = overall assessment of the value of the site for the conservation of the species concerned (A- excellent value, B-good value, C-significant value).

The standard form for the special area of conservation ROSAC0085 Frumoasa at the time of designation of the protected natural area mentioned the following species, listed in Annex II of Directive 92/43/EEC, as being present in the protected area*: Canis lupus, Lutra lutra, Ursus arctos, Lynx lynx, Triturus cristatus, Bombina variegata, Cottus gobio, Barbus peteny* (*meridionalis*), *Eudontomyzon danfordi, Ophiogomphus cecilia, Lycaena dispar, Euphydryas aurinia, Euplagia* (*Callimorpha*) *quadripunctaria, Buprestis splendens, Pholidoptera transsylvanica, Pseudogaurorotina excellens, Nymphalis vaualbum, Cordulegaster heros, Rosalia alpina, Cerambyx cerdo, Dicranum viride, Drepanocladus vernicosus, Meesia longiseta, Buxbaumia viridis, Campanula serrata* and *Tozzia carpathica.*

As a result of specific inventory, mapping and evaluation activities of the natural capital of community interest, activities which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, in the perimeter of ROSAC0085 Frumoasa the presence of the following 8 species of conservation interest has not been identified: *Triturus cristatus, Eudontomyzon danfordi, Ophiogomphus cecilia, Euphydryas aurinia, Buprestis splendens, Pseudogaurotina excellens, Nymphalis vaualbum* and *Meesia longiseta.*

However, when reviewing the ROSAC0085 Frumoasa Standard Form on the basis of the information provided by the Management Plan, it was found that, apart from *Nymphalis vaualbum*, all other species not identified within the Natura 2000 site perimeter remained under conservation management.

Also, for the species of community interest *Lycaena dispar*, *Rosalia alpina* and *Buxbaumia viridis*, it is noted that in the ROSAC0085 Frumoasa Standard Form the number of individuals identified in the field during the inventory, mapping and assessment campaign of the species was entered, this being an error in the interpretation of the information provided by the Management Plan.

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, the conservation status of the habitats of community interest within the protected natural area is presented in the following table.

Table 14 - Conservation status of habitats of community interest within the special area of conservation ROSAC0085 Frumoasa (according to the Management Plan)

No. crt.	Habitat of Community Interest	Conservation status of the habitat type in terms of area occupied	Conservation status of the habitat type in terms of structure and specific functions	Conservation status of the habitat type in terms of its future prospects	Overall conservation status of the habitat type
1.	3220 - Herbaceous vegetation on the banks of mountain rivers	not assessed	not assessed	not assessed	not assessed
2.	4060 - Alpine and boreal forests	favorable	favorable	favorable	favorable
3.	4070* - Clumps of *Pinus mugo* and *Rhododendron myrtifolium*	favorable	favorable	favorable	favorable
4.	4080 - Sub-arctic *Salix sp.*	favorable	favorable	favorable	favorable
5.	40A0 - Subcontinental peri-pan-Pannonian tussoclines	favorable	favorable	favorable	favorable
6.	6150 - Boreal and alpine meadows on siliceous substrate	unfavorable - bad	unfavorable - bad	unfavorable - bad	unfavorable - bad
7.	6230* - Species-rich montane *Nardus* meadows on siliceous substrates	unfavorable - bad	unfavorable - bad	unfavorable - bad	unfavorable - bad
8.	6410 - Meadows with *Molinia* on calcareous, peaty or clayey soils (Molinion caeruleae)	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
9.	6430 - Lowland, upland to montane and alpine, tall-grass lowland communities	unfavorable - inadequate	favorable	unfavorable - inadequate	unfavorable - inadequate
10.	6520 - Mountain meadows	unfavorable - inadequate	unfavorable - bad	unfavorable - inadequate	unfavorable - bad
11.	7110* - Active turbidation	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
12.	7140 - Transitional peat bogs and peat bogs oscillating (not substrate-fixed)	not assessed	not assessed	not assessed	not assessed
13.	7230 - Alkaline swamps	not assessed	not assessed	not assessed	not assessed
14.	8110 - Siliceous groocias from mountain to alpine (Androsacetalia alpinae and Galeopsietalia ladani)	not assessed	not assessed	not assessed	not assessed
15.	8220 - Rocky slopes with chasmophytic vegetation on siliceous rocks	favorable	favorable	favorable	favorable

No. crt.	Habitat of Community Interest	Conservation status of the habitat type in terms of area occupied	Conservation status of the habitat type in terms of structure and specific functions	Conservation status of the habitat type in terms of its future prospects	Overall conservation status of the habitat type
16.	9110 - Beech forests of the Luzulo-Fagetum type	favorable	favorable	favorable	favorable
17.	9130 - Asperulo-Fagetum beech forests	favorable	favorable	favorable	favorable
18.	9170 - Galio-Carpinetum oak and hornbeam forests	not assessed	not assessed	not assessed	not assessed
19.	91D0* - Peatland with forest vegetation	not assessed	not assessed	not assessed	not assessed
20.	91E0* - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	unfavorable - inadequate	unfavorable - inadequate	favorable	unfavorable - inadequate
21.	91V0 - Dacian beech forests (Symphyto-Fagion)	favorable	favorable	favorable	favorable
22.	9410 - Acidophilous *Picea abies* forests of the montane region (Vaccinio - Piceetea)	favorable	favorable	unfavorable - inadequate	unfavorable - inadequate

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, the conservation status of the species of Community interest within the protected natural area ROSAC0085 Frumoasa is presented in the following table.

Table 15 - Conservation status of species of Community interest within the special area of conservation ROSAC0085 Frumoasa (according to the Management Plan)

No. crt.	Species of Community interest	Population conservation status of the species	Habitat conservation status of the species	Conservation status in terms of the species' future prospects	Global conservation status of the species
1.	1352* *Canis lupus*	favorable	favorable	favorable	favorable
2.	1355 *Lutra lutra*	favorable	favorable	favorable	favorable
3.	1361 *Lynx lynx*	favorable	favorable	favorable	favorable
4.	1354* *Ursus arctos*	favorable	favorable	favorable	favorable
5.	1193 *Bombina variegata*	favorable	favorable	favorable	favorable
6.	1166 *Triturus cristatus*	unidentified species	unidentified species	unidentified species	unidentified species
7.	5266 *Barbus petenyi* (*B. meridionalis*)	favorable	favorable	favorable	favorable
8.	6965 *Cottus gobio*	favorable	favorable	favorable	favorable
9.	4123 *Eudontomyzon danfordi*	unidentified species	unidentified species	unidentified species	unidentified species

No. crt.	Species of Community interest	Population conservation status of the species	Habitat conservation status of the species	Conservation status in terms of the species' future prospects	Global conservation status of the species
10.	6145 *Romanogobio uranoscopus*	unidentified species	unidentified species	unidentified species	unidentified species
11.	1085 *Buprestis splendens*	unknown	unknown	unknown	unknown
12.	1088 *Cerambyx pig*	unknown	favorable	unknown	unknown
13.	4046 *Cordulegaster heros*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate	unfavorable - inadequate
14.	1065 *Euphydryas aurinia*	unknown	unknown	unknown	unknown
15.	6199* *Euplagia (Callimorpha) quadripunctaria*	favorable	favorable	favorable	favorable
16.	1060 *Lycaena dispar*	favorable	unfavorable - inadequate	unknown	unfavorable - inadequate
17.	1037 *Ophiogomphus cecilia*	unknown	unknown	unknown	unknown
18.	4054 *Pholidoptera transsylvanica*	favorable	favorable	favorable	favorable
19.	4024* *Pseudogarotina excellens*	unknown	unknown	unknown	unknown
20.	1087* *Rosalia alpina*	unknown	unfavorable - inadequate	favorable	unfavorable - inadequate
21.	1386 *Buxbaumia viridis*	unfavorable - inadequate	unfavorable - inadequate	unfavorable - bad	unfavorable - bad
22.	4070* *Campanula serrata*	favorable	favorable	favorable	favorable
23.	1381 *Dicranum viride*	unknown	unfavorable - bad	unfavorable - inadequate	unfavorable - bad
24.	1393 *Drepanocladus vernicosus*	unfavorable - inadequate	unfavorable - inadequate	unknown	unfavorable - inadequate
25.	1389 *Meesia longiseta*	unidentified species	unidentified species	unidentified species	unidentified species
26.	4116 *Tozzia carpathica*	unknown	unfavorable - inadequate	favorable	unfavorable - inadequate

General data on the special area of conservation ROSAC0304 South-West Hârtibaciu

The site of the Racovița CHE crosses an area of 0.29 ha within the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest (0.001% of the total area of the protected

natural area). The location of the development CHE Lotrioara crosses an area of 0.02 ha within the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest (0.0001% of the total area of the protected natural area).

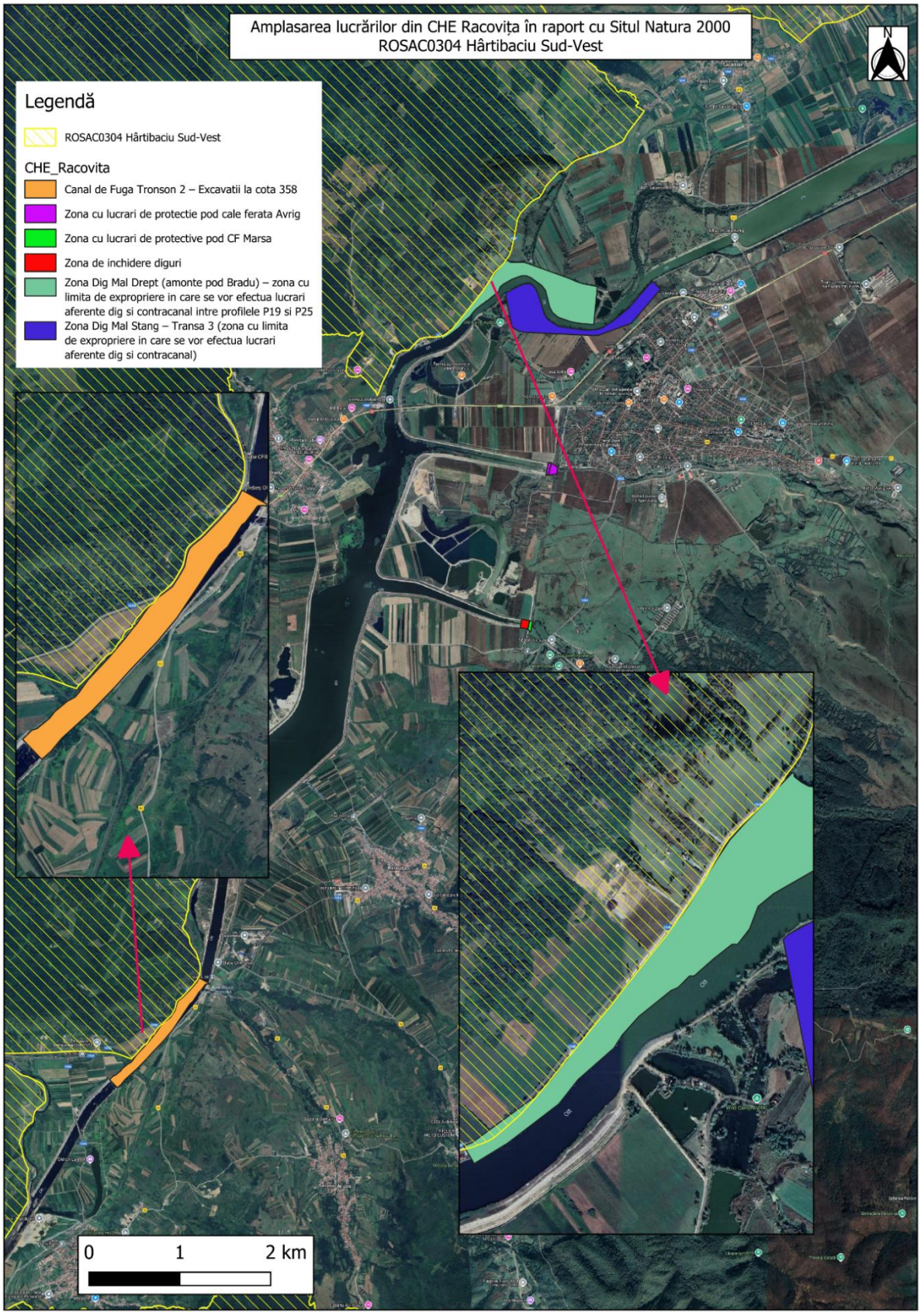

Figure 7 - Aspect of the relationship between the Racovița CHE and the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest

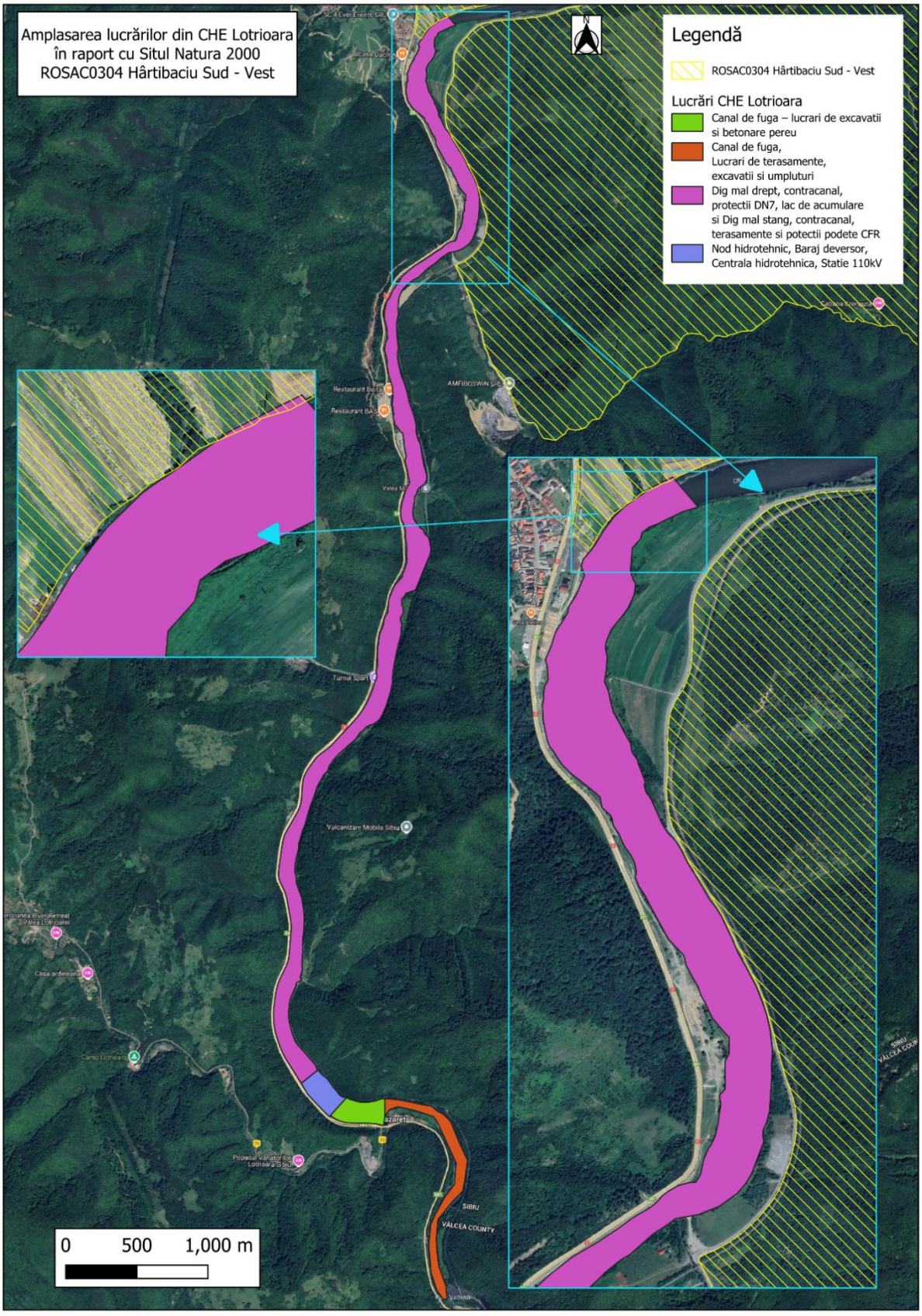

Figure 8 - Aspect of the relationship between the Lotrioara CHE and the special area of conservation ROSAC0304 Hârtibaciu South-West

The Special Area of Conservation ROSAC0304 Hârtibaciu Sud-Vest, currently managed by the National Agency for Protected areas, has an area of 22,840.80 ha (according to vector data provided on the website of the central competent authority for environmental protection) and covers areas belonging to Sibiu County.

Currently the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest benefits from a Management Plan in force, approved by Order of the Minister of Environment, Waters and Forests no. 1.166/27.06.2016 on the approval of the Management Plan of the protected areas ROSPA0099 Podișul Hârtibaciului, ROSCI0227 Sighișoara-Târnava Mare, ROSCI0144 Gorun and oak forest on the Purcărețului Hill, ROSCI0143 Gorun and oak forest at Dosul Fânațului, ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu Sud-Est, ROSAC0304 Hârtibaciu Sud-Vest, Nature Reserve "The secular oaks of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The shagbark oak reserve" - Criș village.

The conservation management of the special conservation area ROSAC0304 Hârtibaciu Sud-Vest is currently ensured by the National Agency for Protected areas.

In the following table are presented, according to the Natura 2000 Standard Natura 2000 Format of the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest revised on 17.02.2024, the types of habitats of community interest within the perimeter of the protected natural area.

Table 16 - List of habitats of community interest within ROSAC0085 Frumoasa and evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Standard Form of ROSAC0085 Frumoasa of 17.02.2024

No. crt.	Natura 2000 Code	Habitat name	Cover (ha)	Reprez.	Supr. rel.	Status conserv.	Global evaluation
1.	40A0	Peri-pan-Pannonian subcontinental scrublands	0	B	C	B	B
2.	6110*	Calcareous or basophilous rocky grasslands with *white Alysso-Sedion*	0	B	C	B	B
3.	6190	Pannonian cliff meadows (*Stipo-festucetalia palentis*)	0	B	C	B	B
4.	6210	Semi-natural dry grassland and scrub-covered facies on calcareous substrate (*important sites for orchids)	1	B	C	B	B
5.	8120	Calcareous and calcareous shale scree from montane to alpine (*Thlaspietea rotundifolii*)	0	B	C	B	B
6.	8210	Rocky slopes with chasmophytic vegetation on calcareous rocks	0	B	C	B	B
7.	8230	Siliceous rocks with pioneer vegetation of *Sedo-*	0	B	C	B	B

No. crt.	Natura 2000 Code	Habitat name	Cover (ha)	Reprez.	Supr. rel.	Status conserv.	Global evaluation
		Scleranthion or *Sedo albi-Veronicion dillenii*					
8.	9110	*Luzulo-Fagetum* beech forests	456	B	C	B	B
9.	9130	*Asperulo-Fagetum* beech forests	799	B	C	B	B
10.	9170	*Galio-Carpinetum* oak forests with hornbeam	1.827	A	C	B	B
11.	91I0*	Eurosiberian forest vegetation with *Quercus* sp.	45	D	-	-	-
12.	91V0	Dacian beech forests (*Symphyto- Fagion*)	228	C	C	B	C
13.	91Y0*	Eurosiberian forest vegetation with *Quercus* sp.	2.969	A	C	B	B

Repres. = Representativity = measure for how typical a habitat is of the site (A - excellent representativity, B - good representativity, C - significant representativity, D - insignificant representativity);

Rel. supr. = Relative area = The area of the site covered by the natural habitat relative to the total area covered by that natural habitat type within the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = State of conservation = The degree of conservation of the structures and functions of the natural habitat type in question, as well as the possibilities for restoration/reconstruction (A = excellent conservation, B = good conservation, C = fair or poor conservation).

As a result of analyzing the data provided by the Management Plan of the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest, it was found that only the following 8 types of habitats of community interest were identified as present within the protected natural area.

Table 17 - List of habitat types of community interest in the perimeter of ROSAC0304 Hârtibaciu Sud-Vest identified within the protected natural area as a result of the inventory and mapping activities that were the basis for the elaboration of the Management Plan

No. crt.	Habitat name	ROSAC0304 South-West Hartibaciu	
		FS*	IT**
1.	9110 - Beech forests of the *Luzulo-Fagetum* type	+	+
2.	9130 - *Asperulo-Fagetum* beech forests	+	+
3.	9170 - *Galio-Carpinetum* oak and hornbeam forests	+	+
4.	91E0* - Alluvial forests of *Alnus glutinosa and Fraxinus excelsior*	-	+
5.	91I0* - Eurosiberian forest vegetation with *Quercus spp*.	+	+
6.	91V0 - Dacian *beech-Symphyto-Fagion* forests.	+	+
7.	91Y0 - Dacian oak and hornbeam forests	+	+
8.	92A0 - Glades with *Salix alba* and *Populus alba*	-	+

* FS-standard form; **IT-field inventory

From the analysis of the data provided in the above table it can be seen that the habitats of Community interest **91E0* - Alluvial forests of *Alnus glutinosa and Fraxinus excelsior*** and **92A0 - *Salix alba* and *Populus alba*** were identified as being present within the perimeter of the Natura 2000 site ROSAC0304 Hârtibaciu Sud-Vest following the inventory and mapping activities.

In the following table are presented, according to the Natura 2000 Standard Natura 2000 Form of the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest revised on 17.02.2024, the species of community interest within the perimeter of the protected natural area.

Table 18 - List of species listed in Annex II of Council Directive 92/43/EEC for which ROSAC0304 Hârtibaciu Sud-Vest has been designated and assessment of the populations at the Natura 2000 site level, according to the Natura 2000 Standard Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Species name	Categ.	Pop.	Conserv.	Isolation	Global
Mammal species listed in Annex IV to Council Directive 92/43/EEC							
1.	1308	*Barbastella barbastellus*	C	C	B	C	C
2.	1352*	*Canis lupus*	C	C	A	C	A
3.	1337	*Castor fiber*	P	C	A	C	B
4.	1355	*Lutra lutra*	C	C	A	C	A
5.	1323	*Myotis bechsteinii*	C	C	B	C	C
6.	1307	*Myotis blythii*	C	C	B	C	C
7.	1324	*Myotis myotis*	C	C	B	C	C
8.	1304	*Rhinolophus ferrumequinum*	C	C	B	C	C
9.	1303	*Rhinolophus hipposideros*	C	C	B	C	C
10.	1354*	*Ursus arctos*	C	C	A	C	A
Species of amphibians and reptiles listed in Annex IV to Council Directive 92/43/EEC							
11.	1188	*Bombina bombina*	C	C	C	C	C
12.	1193	*Bombina variegata*	C	C	A	C	A
13.	1166	*Triturus cristatus*	C	C	B	C	B
14.	4008	*Triturus vulgaris ampelensis*	P	C	A	B	A
15.	1220	*Emys orbicularis*	C	C	C	C	C
Invertebrate species listed in Annex IV to Council Directive 92/43/EEC							
16.	1083	*Lucanus cervus*	C	C	B	C	B

Pop. = population status = the size and density of the population of the species present in the site in relation to the populations present in the national territory (A: 100≥p>15%, B: 15≥p>2%, C: 2≥p>0%);

Conserv. = Conservation = the degree of conservation of the habitat features that are important for the species concerned and the possibilities for recovery (a-excellent conservation, b-good conservation, C-fair or poor conservation);

Isolation = population size and density of the species present in the site in relation to the populations present in the national territory (A - almost isolated population, B - non-isolated

population but at the edge of its range, C - non-isolated population with a wide range; Global = overall assessment of the value of the site for the conservation of the species (A - excellent value, B - good value, C - considerable value).

According to the data provided in Annex no. 17. to the Management Plan - *Situation of the species of community interest identified in the protected areas Hârtibaciu - Târnava Mare - Olt on each site* , the following table presents the species of community interest identified in the perimeter of the protected natural area as a result of the inventory and mapping activities that were the basis for the elaboration of the Management Plan.

Table 19 - List of species of community interest within the perimeter ROSAC0304 Hârtibaciu Sud-Vest identified within the perimeter of the protected natural area as a result of the inventory and mapping activities that were the basis for the elaboration of the Management Plan

No. crt.	Nature Code 2000	Species name	ROSAC0304 South-West Hartibaciu	
			FS	EN
1.	1303	*Rhinolophus hipposideros*	+	+
2 .	1304	*Rhinolophus ferrumequinum*	+	-
3 .	1307	*Myotis blythii/oxygnathus*	+	+
4 .	1308	*Barbastella barbastellus*	+	+
5 .	1323	*Myotis bechsteinii*	+	+
6 .	1324	*Myotis myotis*	+	+
7.	1318	*Myotis dasycneme*	-	+
8.	1321	*Myotis emarginatus*	-	+
9.	1310	*Miniopterus schreibersii*	-	+
10.	1337	*Castor fiber*	+	+
11.	1352	*Canis lupus*	+	+
12.	1354	*Ursus arctos*	+	+
13.	1355	*Lutra lutra*	+	+
14.	1166	*Triturus cristatus*	+	-
15.	1188	*Bombina bombina*	+	-
16.	1193	*Bombina variegata*	+	+
17.	1220	*Emys orbicularis*	+	-
18.	4008	*Triturus vulgaris ampelensis*	+	-
19.	1083	*Lucanus cervus*	+	-

* FS-standard form; **IT-field inventory

From the analysis of the information provided in the above table, it can be seen that the **following species** (marked in red) **were not identified as present** following the inventory and mapping activities that were the basis for the elaboration of the Management Plan for the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest: ***Rhinolophus ferrumequinum, Triturus cristatus, Bombina bombina, Bombina bombina, Emys orbicularis, Triturus vulgaris ampelensis*** and ***Lucanus cervus***.

Also, from the analysis of the information provided in the table above, it can be seen that following the inventory and mapping activities that were the basis for the elaboration of the Management Plan for the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest, **3 new species of community interest** (marked in blue in the table) were identified as present: ***Myotis dasycneme, Myotis emarginatus*** and ***Miniopterus schreibersii***. The management plan does not clarify whether these species have significant populations within the perimeter of the

special area of conservation ROSAC0304 Hârtibaciu Sud-Vest, populations that would lead to the revision of the Natura 2000 Standard Form.

From the analysis of the information provided by the Natura 2000 standard form of the special area of conservation ROSAC0304 Hârtibaciu Sud-Vest, it can be seen that it has not been updated with the information obtained from the implementation of the project that had as main result the elaboration of the Management Plan. This is certainly due to the fact that the information provided by the Management Plan has not been entered in the IBIS database.

From the analysis of the information provided by the Management Plan of the protected areas ROSPA0099 Podișul Hârtibaciului, ROSCI0227 Sighișoara-Târnava Mare, ROSCI0144 Gorun and oak forest on the Purcărețului Hill, ROSCI0143 The gorun and oak forest at Dosul Fânațului, ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu Sud-Est, ROSCI0304 Hârtibaciu Sud-Vest, Nature Reserve "The secular oaks of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The downy oak reserve" - Criș village, it is noted that this document does not provide relevant information on the current conservation status of habitats and species of conservation interest at the level of the site of Community importance ROSCI0304 Hârtibaciu Sud-Vest, but only an assessment of the entire area analyzed, called Protected areas Hârtibaciu-Târnava Mare-Olt, which includes 10 protected areas, of which 6 are sites of Community importance.

General data on the special protection area ROSPA0003 Avrig-Scorei-Făgăraș

The site of the Racovița CHE development crosses an area of 26.93 ha within the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș (0.91% of the total area of the protected natural area).

The 3.024 ha Special Protection Area ROSPA0003 Avrig - Scorei - Făgăraș, covering the counties of Brasov and Sibiu, has been designated for the conservation of 25 species of wild birds of Community interest.

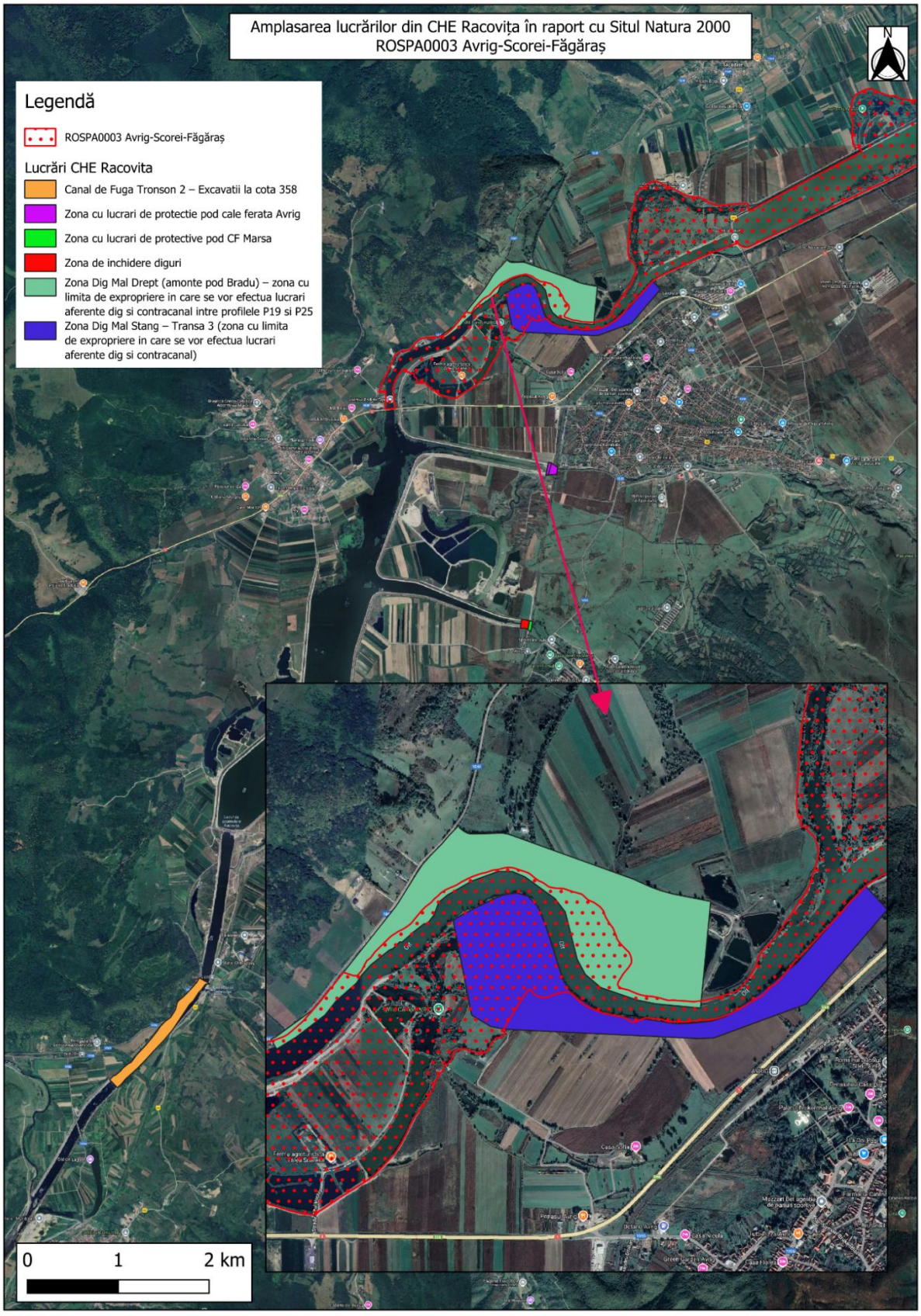

Figure 9 - Aspect regarding the relationship between the Racovița CHE and the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș

Currently, the special avifaunistic protection area ROSPA0003 Avrig - Scorei - Făgăraș

benefits from a Management Plan in force, approved by the Order of the Minister of Environment, Water and Forests no. 1.291/2017 on the approval of the Management Plan and the Regulation of the Natura 2000 Site ROSPA0003 Avrig-Scorei-Făgăraș.

The conservation management of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș is currently ensured by the National Agency for Protected areas.

In the following tables are presented the species of conservation interest for which the special protection area ROSPA0003 Avrig-Scorei-Făgăraș has been designated, as well as the estimated population numbers and the evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its manual of completion, according to the Natura 2000 Standard Form revised on 17.02.2024.

Table 20 - List of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0003 Avrig-Scorei-Făgăraș has been designated and the assessment of the population numbers at the Natura 2000 site level and its completion manual, according to the Natura 2000 Standard Natura 2000 Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Species name	Resident population	Breeding	Wintering	Passage
1.	A320	*Ficedula parva*	-	-	-	R
2.	A022	*Ixobrychus minutus*	-	40 p	-	-
3.	A339	*Lanius minor*	-	RC	-	-
4.	A246	*Lullula arborea*	-	RC	-	-
5.	A068	*Mergus albellus*	-	-	10-15 i	RC
6.	A094	*Pandion haliaetus*	-	-	-	10 i
7.	A151	*Philomachus pugnax*	-	-	-	RC
8.	A234	*Picus canus*	10-20 p	-	-	-
9.	A307	*Sylvia nisoria*	-	20-30 p	-	-
10.	A229	*Alcedo atthis*	40 p	-	-	-
11.	A255	*Anthus campestris*	-	-	-	R
12.	A091	*Aquila chrysaetos*	-	-	-	4 i
13.	A222	*Asio flammeus*	-	-	R	-
14.	A224	*Caprimulgus europaeus*	-	60 p	-	-
15.	A081	*Circus aeruginosus*	-	1-2 p	-	-
16.	A082	*Circus cyaneus*	-	-	-	40 i
17.	A122	*Crex crex*	-	80-160 p	-	-
18.	A238	*Dendrocopos medius*	10-12 p	-	-	-
19.	A429	*Dendrocopos syriacus*	10-20 p	-	-	-
20.	A236	*Dryocopus martius*	7-10 p	-	-	-
21.	A379	*Emberiza hortulana*	-	1-2 p	-	-
22.	A103	*Falco peregrinus*	-	-	-	2 i
23.	A097	*Falco vespertinus*	-	-	-	40 i
24.	A321	*Ficedula albicollis*	-	-	-	RC
25.	A031	*Ciconia ciconia*	-	120-140 p	-	-

Table 21 - List of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0003 Avrig-Scorei-Făgăraș has been designated and the assessment of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Natura 2000 Standard Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Species name	Sit. Pop.	Conserv.	Isolation	Global
1.	A320	*Ficedula parva*	D	-	-	-
2.	A022	*Ixobrychus minutus*	C	B	C	B
3.	A339	*Lanius minor*	D	-	-	-
4.	A246	*Lullula arborea*	D	-	-	-
5.	A068	*Mergus albellus*	C	B	C	C
6.	A094	*Pandion haliaetus*	C	B	C	C
7.	A151	*Philomachus pugnax*	D	-	-	-
8.	A234	*Picus canus*	D	-	-	-
9.	A307	*Sylvia nisoria*	C	B	C	C
10.	A229	*Alcedo atthis*	C	C	C	C
11.	A255	*Anthus campestris*	D	-	-	-
12.	A091	*Aquila chrysaetos*	D	-	-	-
13.	A222	*Asio flammeus*	D	-	-	-
14.	A224	*Caprimulgus europaeus*	C	B	C	B
15.	A081	*Circus aeruginosus*	D	-	-	-
16.	A082	*Circus cyaneus*	C	B	C	C
17.	A122	*Crex crex*	C	B	C	B
18.	A238	*Dendrocopos medius*	D	-	-	-
19.	A429	*Dendrocopos syriacus*	D	-	-	-
20.	A236	*Dryocopus martius*	D	-	-	-
21.	A379	*Emberiza hortulana*	D	-	-	-
22.	A103	*Falco peregrinus*	D	-	-	-
23.	A097	*Falco vespertinus*	D	-	-	-
24.	A321	*Ficedula albicollis*	D	-	-	-
25.	A031	*Ciconia ciconia*	C	A	B	B

According to the data provided by the Management Plan of the special avifaunistic protection area ROSPA0003 Avrig - Scorei - Făgăraș, as well as the specific conservation objectives formulated by the National Agency for Protected areas (ANANP), the conservation status of the wild bird species of community interest within the protected natural area is presented in the following table.

Table 22 - The conservation status of species of Community interest within the special protection area ROSPA0003 Avrig - Scorei - Făgăraș (according to the Management Plan)

No. crt.	Natura 2000 Code	Species name	Habitat conservation status of the species according to the Management Plan	Conservation status of the species according to the conservation objectives set by ANANP
1.	A320	*Ficedula parva*	Untreated	favorable
2.	A022	*Ixobrychus minutus*	Untreated	favorable
3.	A339	*Lanius minor*	Untreated	favorable
4.	A246	*Lullula arborea*	Untreated	favorable
5.	A068	*Mergus albellus*	B - good	favorable
6.	A094	*Pandion haliaetus*	Untreated	favorable
7.	A151	*Philomachus pugnax*	Untreated	favorable
8.	A234	*Picus canus*	Untreated	favorable
9.	A307	*Sylvia nisoria*	B - good	favorable
10.	A229	*Alcedo atthis*	C - medium or low	favorable
11.	A255	*Anthus campestris*	Untreated	favorable
12.	A091	*Aquila chrysaetos*	Untreated	favorable
13.	A222	*Asio flammeus*	Untreated	favorable
14.	A224	*Caprimulgus europaeus*	B - good	favorable
15.	A081	*Circus aeruginosus*	Untreated	favorable
16.	A082	*Circus cyaneus*	B - good	favorable
17.	A122	*Crex crex*	Untreated	favorable
18.	A238	*Dendrocopos medius*	Untreated	favorable
19.	A429	*Dendrocopos syriacus*	Untreated	favorable
20.	A236	*Dryocopus martius*	Untreated	favorable
21.	A379	*Emberiza hortulana*	Untreated	favorable
22.	A103	*Falco peregrinus*	Untreated	favorable
23.	A097	*Falco vespertinus*	Untreated	favorable
24.	A321	*Ficedula albicollis*	Untreated	favorable
25.	A031	*Ciconia ciconia*	A - excellent	favorable

General data for the special protection area ROSPA0043 Frumoasa

The location of the CHE Lotrioara development crosses an area of 4.07 ha within the special avifauna protection area ROSPA0043 Frumoasa (0.003% of the total area of the protected natural area).

The upstream part of the CHE Câineni development site is adjacent to the special avifauna protection area ROSPA0043 Frumoasa. The special avifaunal protection area ROSPA0043 Frumoasa, covering an area of 130,890.80 ha, is under the administration of the National Agency for Protected areas and currently benefits, together with the special conservation area ROSAC0085 Frumoasa, from an Integrated Management Plan in force, approved by Order of the Minister of Environment, Water and Forests No. 1.158/2016.

The conservation management of the special avifaunal protection area ROSPA0043 Frumoasa is currently ensured by the National Agency for Protected areas.

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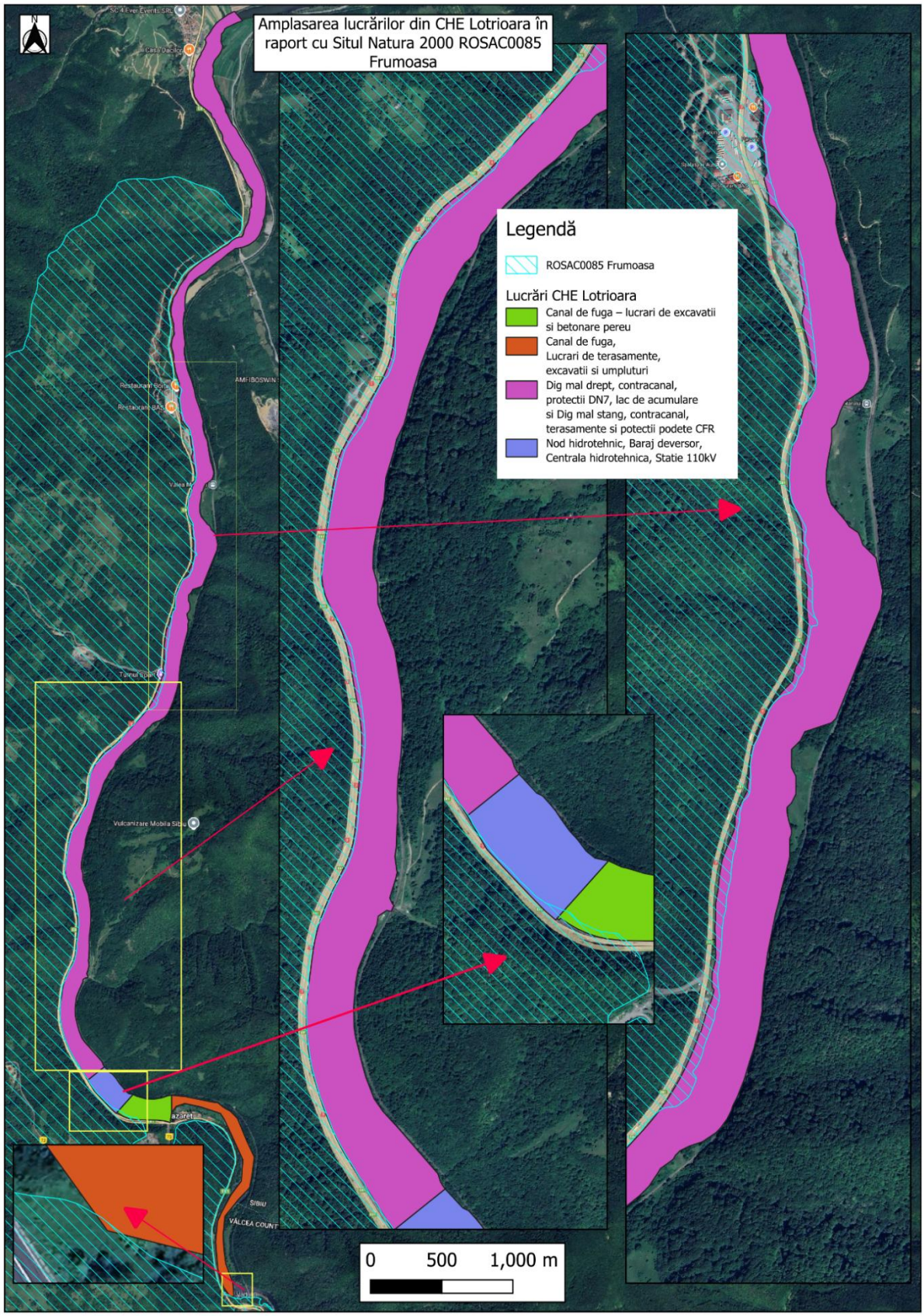


Figure 10 - Detail of the relationship between the CHE Lotrioara and the special protection area ROSPA0043 Frumoasa

The following table shows the list of species of community interest within ROSPA0043 Frumoasa and the evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Standard Form Natura 2000 and its completion manual, according to the Standard Form of ROSPA0043 Frumoasa of 17.02.2024.

Table 23 - List of the species of community interest within ROSPA0043 Frumoasa and evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 regarding the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Standard Form of ROSPA0043 Frumoasa of 17.02.2024

Species			Population			Sit			
No. crt.	**Natura 2000 Code**	**Scientific name**	**Size (p-pairs, i-individends)**		**Categ.**	**Pop.**	**Conserv.**	**Isolation**	**Global**
			Min.	**Max.**					
1.	A223	*Aegolius funereus*	300 p	350 p	C	B	B	C	B
2.	A104	*Bonasa bonasia*	500 p	600 p	P	B	B	C	B
3.	A224	*Caprimulgus europaeus*	50 p	60 p	P	C	B	C	B
4.	A239	*Dendrocopos leucotos*	150 p	230 p	P	C	B	C	B
5.	A236	*Dendrocopos martius*	300 p	400 p	P	C	B	C	B
6.	A321	*Ficedula albicollis*	7.000 p	12.000 p	C	C	B	C	B
7.	A320	*Ficedula parva*	1.200 p	2.000 p	C	C	B	C	B
8.	A217	*Glaucidium passerinum*	100 p	200 p	-	B	B	C	B
9.	A241	*Picoides tridactylus*	250 p	300 p	P	C	B	C	B
10.	A220	*Strix uralensis*	70 p	80 p	C	C	B	C	B
11.	A108	*Tetrao urogallus*	300 i	500 i	C	B	B	C	B

The analysis of the information provided in the Management Plan shows that all species listed in the Standard Form of ROSPA0043 Frumoasa have been identified as being present in the perimeter of the protected natural area, but it is noted that the numbers in the form have not been revised in accordance with the data in the Management Plan, in many cases the differences are significant.

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, the conservation status of the species of birds of Community interest within the protected natural area ROSPA0043 Frumoasa is presented in the following table.

Table 24 - The conservation status of species of Community interest within the special protection area ROSPA0043 Frumoasa (according to the Management Plan)

No. crt.	Species of Community interest	Population conservation status of the species	Habitat conservation status of the species	Conservation status in terms of the species' future prospects	Global conservation status of the species
1.	A223 *Aegolius funereus*	favorable	favorable	favorable	favorable
2.	A104 *Bonasa bonasia*	favorable	favorable	favorable	favorable
3.	A224 *Caprimulgus europaeus*	favorable	favorable	favorable	favorable
4.	A239 *Dendrocopos leucotos*	favorable	favorable	favorable	favorable
5.	A236 *Dendrocopos martius*	favorable	favorable	favorable	favorable
6.	A321 *Ficedula albicollis*	favorable	favorable	favorable	favorable
7.	A320 *Ficedula parva*	favorable	favorable	favorable	favorable
8.	A217 *Glaucidium passerinum*	favorable	favorable	favorable	favorable
9.	A241 *Picoides tridactylus*	favorable	favorable	favorable	favorable
10.	A220 *Strix uralensis*	favorable	favorable	favorable	favorable
11.	A108 *Tetrao urogallus*	favorable	favorable	favorable	favorable

General data on the special protection area ROSPA0098 Făgăraș Piedmont

The site of the Racovița CHE development crosses an area of 0.09 ha within the special avifauna protection area ROSPA0098 Făgăraș Piedmont (0.0001% of the total area of the protected natural area).

The special avifaunistic protection area ROSPA0098 Făgăraș Piedmont, covering an area of 71201.70 ha, is under the administration of the National Agency for Protected areas and currently benefits, together with the special conservation area ROSPA0098 Făgăraș Piedmont, from an Integrated Management Plan in force, approved by Order of the Minister of Environment, Water and Forests No. 1.156/2016.

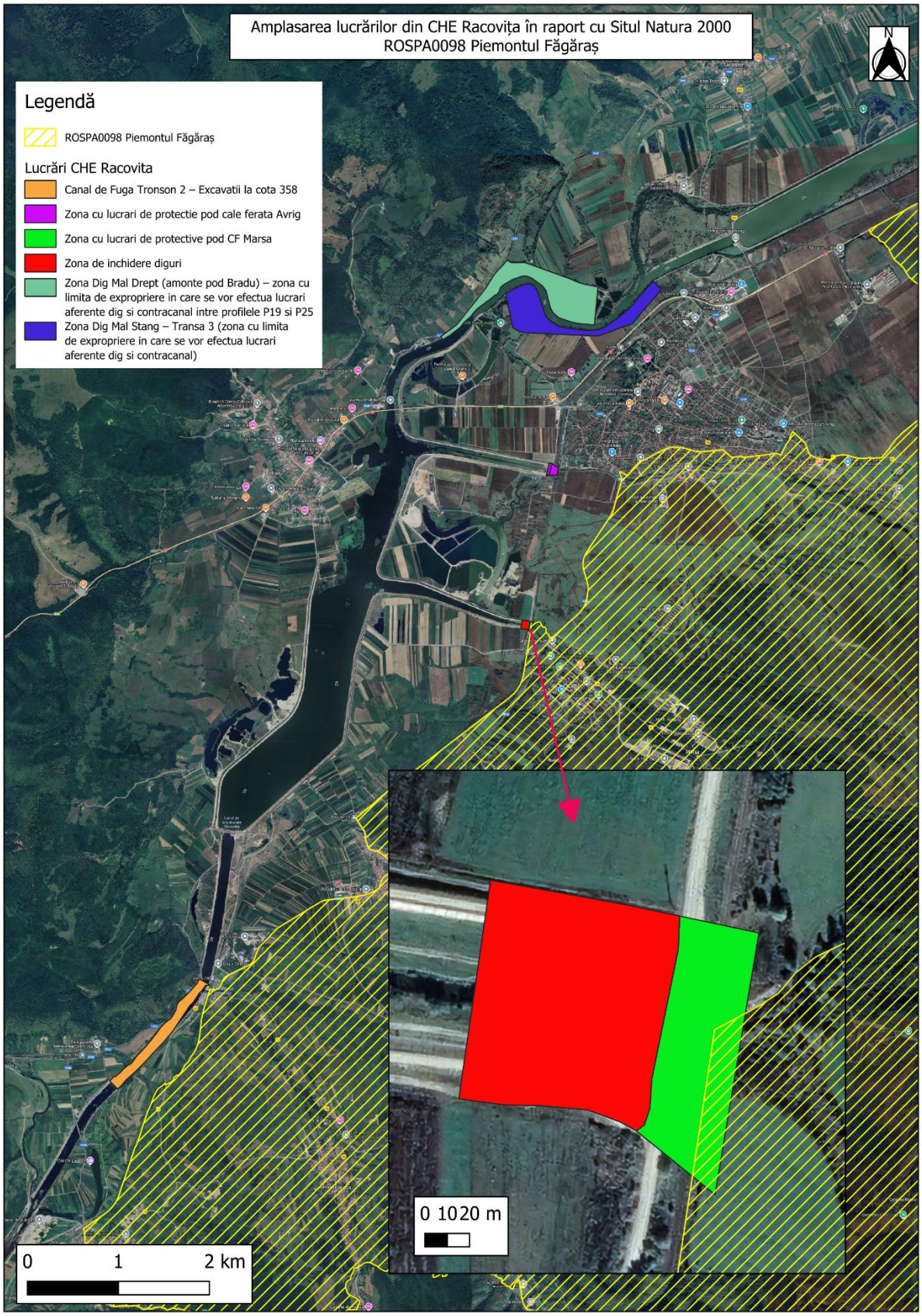


Figure 11 - Detail of the relationship between the Racovița CHE and the special protection area ROSPA0098 Făgăraș Piedmont

ROSPA0098 Făgăraș Piedmont has been declared for the conservation of 25 species of wild birds listed in Annex 1 of the Birds Directive, as follows:

Table 25 - Bird species present in ROSPA0098 Făgăraș Piedmont - according to the FS

Species					Population						Sit			
Group	Code	Scientific name	S	NP	Type	Size		Unit. measure	Categ.	Data quality	AIBICID	AIBIC		
						Min.	Max.		CIRIVIP		Pop.	Conserv.	Isolation	Global
B	A091	*Aquila chrysaetos*			C	3	5	i	P?	DD	D			
B	A089	*Pomarina eagle*			R	40	50	p	C		C	B	C	B
B	A104	*Bonasa bonasia (Ierunca)*			P	75	105	p	C		C	B	C	B
B	A031	*Ciconia ciconia*			R	45	55	p	C		C	B	C	B
B	A030	*Ciconia nigra*			R	10	15	p	C		B	B	C	B
B	A080	*Circaetus gallicus*			R	5	8	p	R		B	B	C	B
B	A081	*Circus aeruginosus*			R	2	3	p	R		D			
B	A082	*Circus cyaneus*			W	40	60	i	C		B	B	C	B
B	A122	*Crex crex*			R	100	150	p	R		C	C	C	C
B	A239	*Dendrocopos leucotos*			P	250	300	p	C		C	B	C	B
B	A238	*Dendrocopos medius*			P	30	50	p	R		C	B	C	C
B	A429	*Dendrocopos syriacus*			P	20	40	p	C		C	B	C	C
B	A236	*Dryocopus martius*			P	70	90	p	C		C	B	C	B
B	A379	*Emberiza hortulana*			R	2	5	p	P?	DD	D			
B	A103	*Falco peregrinus*			C	1	3	i	P?	DD	D			
B	A321	*Ficedula albicollis*			R	13500	16900	p	C		B	B	C	B
B	A320	*Ficedula parva*			R	2100	2500	p	C		C	B	C	B
B	A217	*Glaucidium passerinum*			P	10	20	p			C	B	C	C
B	A338	*Lanius collurio*			R	5700	9400	p	R		C	B	C	B
B	A339	*Lanius minor*			R	40	80	p	R		D			
B	A246	*Lullula arborea (Woodland woodlark)*			R	1000	2000	p	R		B	B	C	B
B	A072	*Pernis apivorus*			R	60	90	p	C		B	B	C	B
B	A234	*Picus canus*			P	200	250	p	C		C	B	C	B
B	A220	*Strix uralensis*			P	50	60	p	C		C	B	C	B
B	A307	*Sylvia nisoria*			R	20	30	p	P?	DD	D			

Species					Population						Sit			
Group	Code	Scientific name	S	NP	Type	Size		Unit. measure	Categ.	Data quality	AIBICID	AIBIC		
						Min.	Max.		CIRIVIP		Pop.	Conserv.	Isolation	Global
B	A108	*Tetrao urogallus*			P	25	35	i	P		C	B	C	B

According to the data provided by the Integrated Management Plan of the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the conservation status of the species of birds of Community interest within the protected natural area ROSPA0098 Făgăraș Piedmont is presented in the following table:

Table 26 Conservation status of ROSPA0098 species

No. crt.	Species of Community interest	Conservation status in terms of population species	Habitat conservation status species	Conservation status in terms of prospects of the species in the future	Global conservation status the species
1.	*Ciconia nigra*	favorable	favorable	unknown	favorable
2.	*Ciconia ciconia*	favorable	favorable	favorable	favorable
3.	*Pernis apivorus*	favorable	favorable	unknown	favorable
4.	*Circaetus gallicus*	favorable	favorable	unknown	favorable
5.	*Circus aeruginosus*	unknown	favorable	unknown	unknown
6.	*Circus cyaneus*	favorable	favorable	favorable	favorable
7.	*Pomarina eagle*	favorable	favorable	unknown	favorable
8.	*Aquila chrysaetos*	favorable	favorable	favorable	favorable
9.	*Falco peregrinus*	favorable	favorable	favorable	favorable
10.	*Bonasa bonasia*	favorable	favorable	favorable	favorable
11.	*Tetrao urogallus*	favorable	favorable	favorable	favorable
12.	*Crex crex*	favorable	favorable	unknown	favorable
13.	*Strix uralensis*	favorable	favorable	unknown	favorable
14.	*Picus canus*	favorable	favorable	favorable	favorable
15.	*Dryocopus martius*	favorable	favorable	unknown	favorable
16.	*Dendrocopos medius*	favorable	favorable	unknown	favorable
17.	*Dendrocopos leucotos*	favorable	favorable	unknown	favorable
18.	*Dendrocopos syriacus*	unknown	favorable	favorable	favorable
19.	*Lullula arborea*	favorable	favorable	favorable	favorable
20.	*Sylvia nisoria*	favorable	favorable	unknown	favorable
21.	*Ficedula parva*	favorable	favorable	unknown	favorable
22.	*Ficedula albicollis*	favorable	favorable	unknown	favorable
23.	*Lanius collurio*	favorable	favorable	favorable	favorable
24.	*Lanius minor*	unfavorable -rea	unfavorable -rea	unknown	unfavorable -rea
25.	*Emberiza hortulana*	favorable	favorable	unknown	favorable

b.2.) Protected areas of national interest

In the area of the project site there is only one protected natural area of national interest, namely 2.696 (INSPIRE code RONPA0713) Eocene limestones of Turnu Roșu - Porcești.

2.696 (INSPIRE code RONPA0713) Eocene limestones from Turnu Roșu - Porcești

The protected natural area, with the status of a monument of nature, is located in the north-western sector of the Făgăraș Mountains, in Sibiu County, on the administrative territory of the municipality of Turnu Roșu, in the south-west of the village of the same name.

The natural monument was declared by Law No.5/2000 on the approval of the National Spatial Plan - Section III - protected areas, code 2.696, by the Decision of the Council of Ministers 458/03.04.1954 and Decision No.12/28.09.1994 of the Sibiu County Council.

The protected area overlaps with ROSCI0304 Hârtibaciu de Sud-Vest in the southern sector and ROSPA0098 Făgăraș Piedmont in the northern part of the protected area.

The Eocene limestones of Turnu Roșu were formed 60 million years ago, in the S, SV part of the municipality of Turnu Roșu, having the appearance of a limestone patch that was deposited at the north-western end of the crystalline Făgăraș Mountains. The marine fauna contained in the limestones of Turnu Roșu has attracted the attention of researchers since 1850, when 63 species of sharks were described on the basis of fossils found in this area. A rich collection of shark teeth can be found at the Natural History Museum in Sibiu.

By restudying the collections, 23 species belonging to 19 genera were described, such as: Notidanus, Galeocerdo, Otodus, Lanna, Sphyrina, Carchorocles. Studies also considered other groups such as numuli, molluscs, macrofauna, calcareous algae, microfauna. Among the fossil species identified at Turnu-Roșu, we can mention: *Numulites,* foraminifera *Nodosaria, Bulimina,* gastropods or snails *Velates, Terebellum, Strombus, Cepatia cepaceea, Globularia patula, Ampullospira hybrida,* corals *Flavia, Calamophyllia,* bivalves *Ostrea, Spondylus, Pecten, Pecten, Cardium, Crassa,* echinoderms *Cidaris, Echinolampas, Echinantus pellati,* brachipods *Terebratula picta* and vertebrates - bones and teeth of fish, crocodilian teeth, vertebrae of sirenids.

The great importance of these fossils lies in the possibility of reconstructing the paleoenvironment of the Eocene, a tropical sea with well aerated waters, which favored the development of a rich marine fauna.

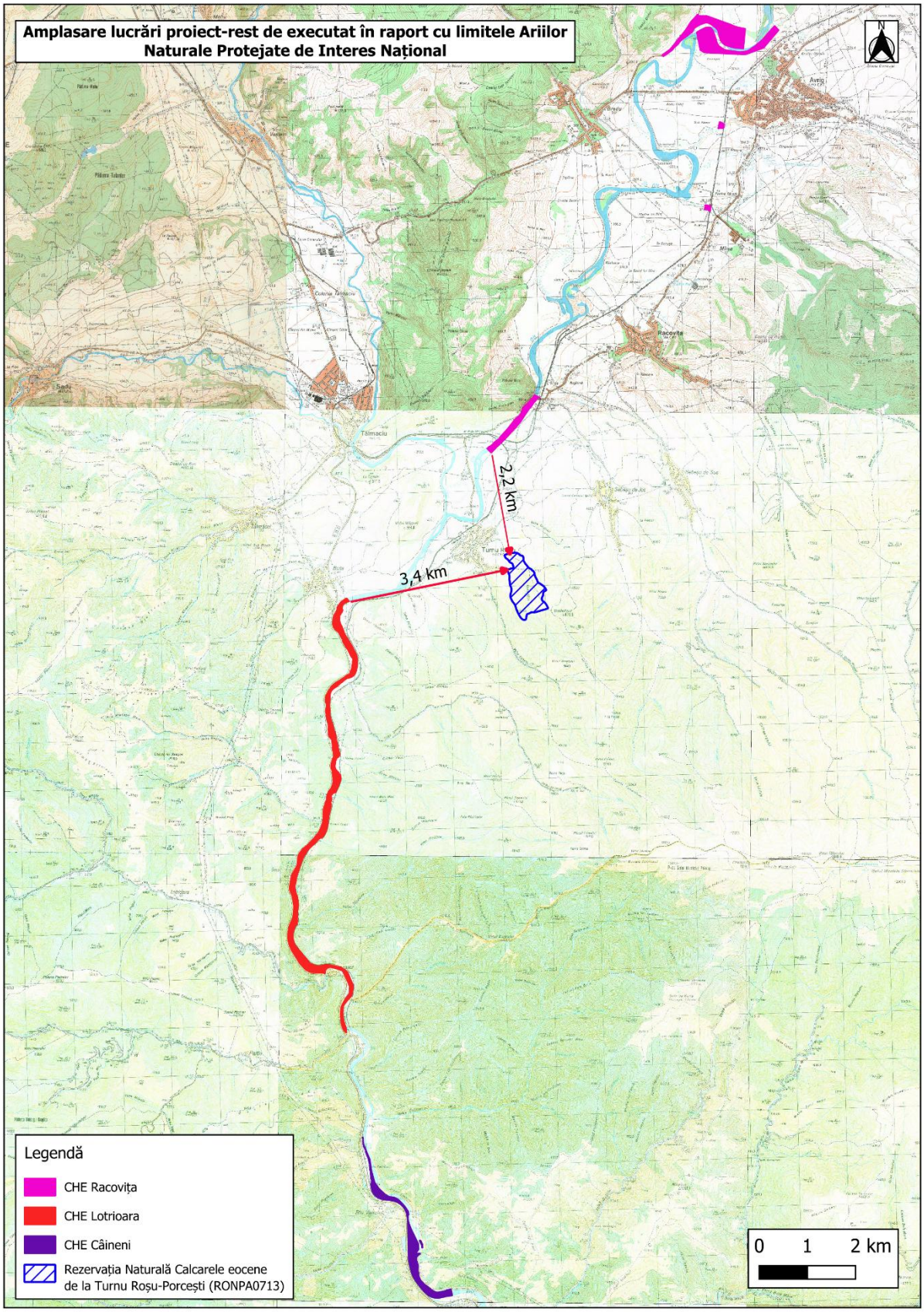

Amplasare lucrări proiect-rest de executat în raport cu limitele Ariilor Naturale Protejate de Interes Național
2,2 km
3,4 km
Legendă
CHE Racovița
CHE Lotrioara
CHE Căineni
Rezervația Naturală Calcarele eocene de la Turnu Roșu-Porcești (RONPA0713)
0 1 2 km

Figure 12 Location of the project in relation to the nature reserve *2.696 (INSPIRE code RONPA0713) Eocene limestones from Turnu Roșu - Porcești*

c) Land Regime

The works on the investment objective "AHE of the Olt river gorge on the Cornetu-Avrig sector" are realized on the territory of the administrative-territorial units Avrig, Racovița, Tălmaciu and Turnu Roșu in Sibiu County, respectively Câineni and Racovița in Valcea County.

The investment objective "The hydropower development of the Olt river on the Cornetu-Avrig sector" was approved by the Decree of the Council of State no. 24/03.02.1989.

The works for the realization of the investment at the two fall steps that are the subject of this documentation have started on the basis of the following regulatory acts:

- step CHE LOTRIOARA

"Authorization for works execution no. 65/06.08.1990" - issued by Sibiu County Council

- step CHE CÂINENI

"Authorization for execution of works no. 98/26.05.1990" - issued by Valcea County Council

For lack of funding, work on these two drop steps has been halted:

- Lotrioara fall step in 1995;
- fall step Câineni in 2013.

In order to continue the works on these two investment objectives, SPEEH Hidroelectrica/SH Sebeș requested the Valcea County Council for an opinion on the possible need to issue a new urban planning certificate.

Based on the provisions of the "Methodological Norms for the application of Law 50/1991 *on the authorization of the execution of construction works*", republished, with subsequent amendments and additions, the Valcea CJ communicated (address no. 12671/25.09.2018) the following: *'in the situation in which the term of validity of the authorization has expired, including the one granted for the extension of the initial validity, for the issuance of a new building permit in order to complete the works to be executed, the validity of the urban planning certificate as well as the permits and agreements issued with the first authorization is maintained, provided that the construction is carried out in accordance with the provisions of the initial authorization'.*

Technical Regime

The total area needed to complete the project is 10,964,397 square meters, divided as follows:

Stair step	ATU	Total (sqm)
CHE Racovița	Racovița	1.109.458
	Avrig	4.291.898
	Tălmaciu	80.969
	Turnu Roșu	277.191
	Total	**5.759.516**
Che Lotrioara	Boița	463.889

	Turnu Roșu	514.852
	Total	**978.741**
CHE Câineni	Caineni	1.018.255
CHE Robești	Caineni	1.494.827
CHE Cornetu	Racovita (VL)	1.713.058
	Total	**10.964.397**

In order to acquire ownership of the land occupied by the development, the procedures were started in accordance with the provisions of Law no. 255/2010 *on expropriation for reasons of public utility, necessary for the realization of objectives of national, county and local interest.*

d) Climatic, geological, geomorphological and hydrological description of the site

Climate and relief features

Thermal regime

The climate of the entire area is typically continental, with moderate winters and partly cool summers, rich in precipitation. The hilly relief, however, has a strong imprint on the climatic features, imprinting regional and local nuances of the dominant climatic type, which is defined as a temperate continental climate, with oceanic influences, of the lowland and high hills, the Transylvanian Depression, the forest district, the complex topoclimate of the Târnavelor Plateau. The average amount of precipitation is 681 millimeters per year, the rainiest months being May, June and July. In spring, after the sprouting period, 67 cold air masses coming from the Făgăraș Mountains cause repeated, sudden frosts, sometimes causing significant agricultural damage. The average annual temperatures recorded over the catchment area range from 7.7°C to 10.3°C. As regards the multiannual average temperatures, the lowest values were recorded in January with an average of - 3.46°C, and the highest in August with an average of 19.2 °C, as can be seen in the detailed studies in Annex 9. More detailed climate analyses and maps of the indicators listed above are also presented in Annex 9 - Detailed study of the physical environment

Rainfall regime

The lowest amounts of precipitation are in the winter months, with a minimum in February and an average of 25.72 millimeters/m2 . The highest amount of precipitation is recorded in June-95.91 millimeters/m2 as can be seen in the detailed studies in Annex No. 9. This increase is due to both cyclonic activity of Atlantic origin and thermal convection of air masses penetrating the Carpathian chain. It can be observed how altitude conditions the mean annual precipitation amounts, from about 600 millimeters in the extreme north-western and south-eastern parts of the site to more than 650 millimeters in the central part of the site. The Hârtibaciu-Târnava Mare-Olt region is characterized by the following wind directions: east, south-east, south, south-west, south-west, west.

Wind regime

Winds are strongly influenced by the relief, both in direction and speed. The mean annual frequencies recorded at Sibiu in 2015 indicate the predominance of E (21.3%) and W (14.9%) winds, and at Dumbrăveni of E (25.8%) and NE (18.2%). The mean annual frequency in 2015 of atmospheric calm is 6.8% Sibiu and 13.6% at Dumbrăveni. Mean annual wind speeds in 2015 range between 1.2 and 2.7 m/s at Sibiu and between 1.2 and 2.2 m/s at Dumbrăveni. Between late winter in the depressions of Sibiu and Făgăraș blows a foehn wind from the mountains called Vântul Mare. This wind causes strong warming and sudden snow melt. In situations of atmospheric calm, the dispersion of atmospheric pollutants is unfavorable. It is observed that in the N-NE part of Sibiu county, in the Dumbrăveni area, the frequency of days with atmospheric calm is higher than in the rest of the county, here being favored the stagnation of atmospheric pollutants for longer periods.

Nebulosity

The average values of the nebulosity are higher than in the extra-Carpathian areas, so the mean annual total nebulosity is approx. 6.2 at Sibiu (in tenths of a canopy). The months with high cloudiness are those of the cold season when the average value reaches 7.4 tenths of a canopy in December at Bratei. The average annual number of clear days is 94.7 days in Sibiu. Most clear days are recorded in the months of July-October, and the fewest in the cold season. In the case of cloudy days (cloudiness greater than 7.5 tenths of a canopy) the situation is reversed, most cloudy days are recorded in winter, when the frequency of thermal inversions is maximum. The total cloud cover in the area shows two maxima and two minima (double variation). The main maximum occurs in December (6.9-7.6) and the secondary maximum in May (5.8-6.4), while the main minimum occurs in August (3.9-5.1) and the secondary minimum in March (5.5-6.5). The cloudiness is most clearly observed at the 300 m level. The annual number of clear days varies between 110-115 days and cloudy days between 109-116 days. The number of overcast days varies between 138-140 days, so overcast days predominate in the area (> 38% of the time). On days with high cloudiness and temperature inversions, characteristic of the cold season, the vertical dispersion of atmospheric pollutants is also unfavorable. It can be concluded that in the course of a year, in Sibiu County, the periods with unfavorable weather conditions for the vertical dispersion of pollutants are those of the cold season when cloudy days, with thermal inversions and atmospheric calm are frequent. This is also the season when additional emissions of dust and flue gases from surface sources such as residential heating installations occur.

Urban topoclimatic differences are characterized by slight deviations from the mean values of the climatic elements listed above. These deviations are the result of changes in environmental conditions through the artificialization of active surfaces. Thus, the multiannual average temperature is somewhat higher due to the sheltering and overheating effect of paved streets in summer, reduced evaporation by asphalting or concreting surfaces and the implied decrease in air humidity, more frequent occurrence of atmospheric calm and increased pollution. Under conditions of continued atmospheric calm, associated with thermal stratification of the air due to frequent temperature inversions and haze, lower air pollutants

(exhaust gases from heavy traffic, mineral dust from anthropogenic activities in industry, agriculture, transport, organic dust, etc.) are a real risk factor.

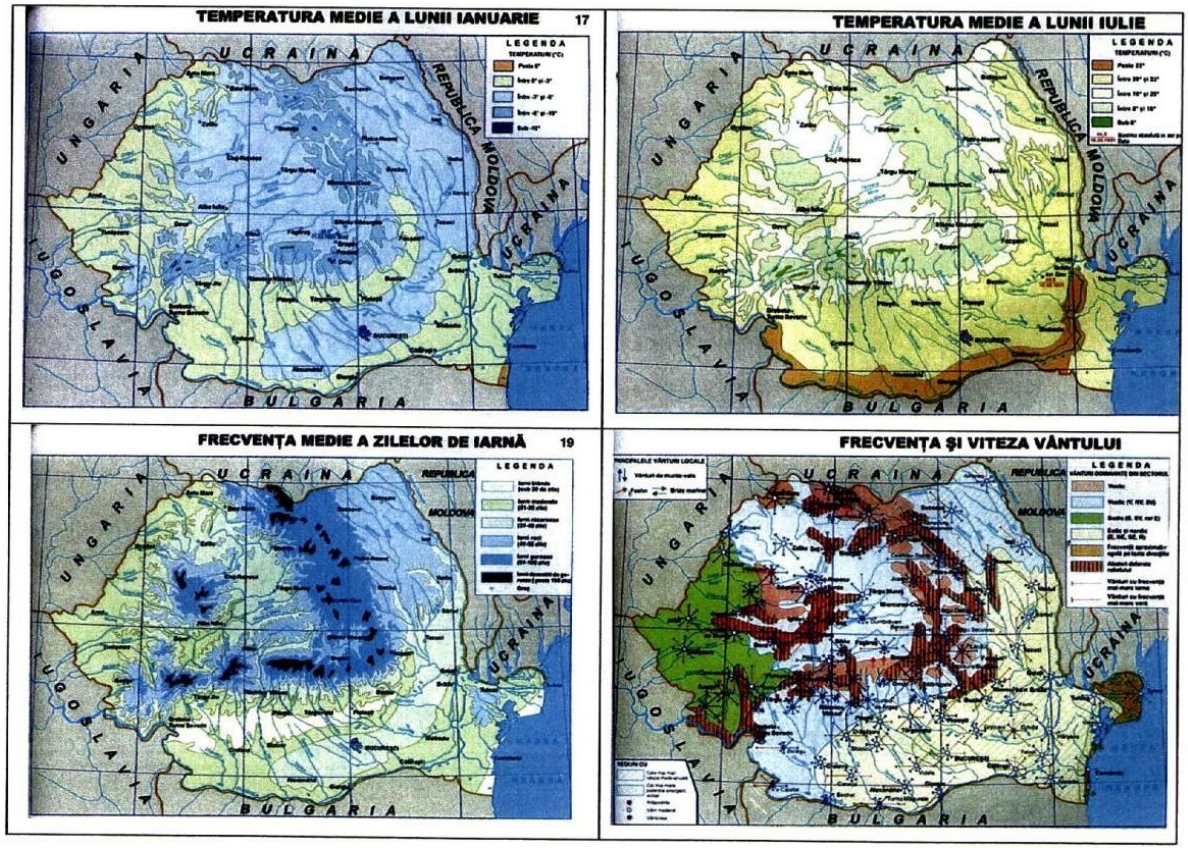


Figure 13 Climate data of Romania

Geomorphologic and geological data

From the geomorphologic point of view, the perimeter falls in the Sibiului Depression at the contact with the Cindrel Mountains.

The Sibiului Depression is located at the morphologic and structural contact between the Transylvanian Plateau and the Cindrel Mountains, and determines clear boundaries well marked by steep cliffs. The southern boundary follows the contact between the crystalline-Mesozoic and the neogene formations, materialized by a 350-400 m steep cliff. The contact with the mountain is materialized by glacises, of abrupt widening of the valleys at the outlet in depressions. Erosion cliffs with heights of 150-200 m separate the depression from the Hârtibaciului Plateau to the east and from the Amnaș Plateau to the northwest and west. The southern extensions of these plateaus, like spurs, enclose the depression. In the west, the Sibiului Depression is continued by the small Sălistei depression.

Both depressions have an asymmetric relief, with deluvial fragmentation, but alluvial alluvial sediments predominate. The relief between 380 and 650 m is arranged from south to north in steps generally corresponding to the major stages of evolution of the depression. On the south side, at the contact with the mountain, the hilly relief is developed on unconsolidated rocks, alternating marls, sandy clays, sands and gravels. In the Cibin meadow the largest area is occupied alluvial soils and gleic soils.

Geologically, the bedrock in the Transylvanian basin is Pannonian and Sarmatian. The Pannonian is composed of gravels, sands, marly clays, and the Sarmatian of gray loams, sands

and gravels, which represent the final part of the Neogene fill of the Transylvanian Depression. Over these sediments were deposited Quaternary (Upper Holocene) surficial layers of clays, sandy clays, gravels.

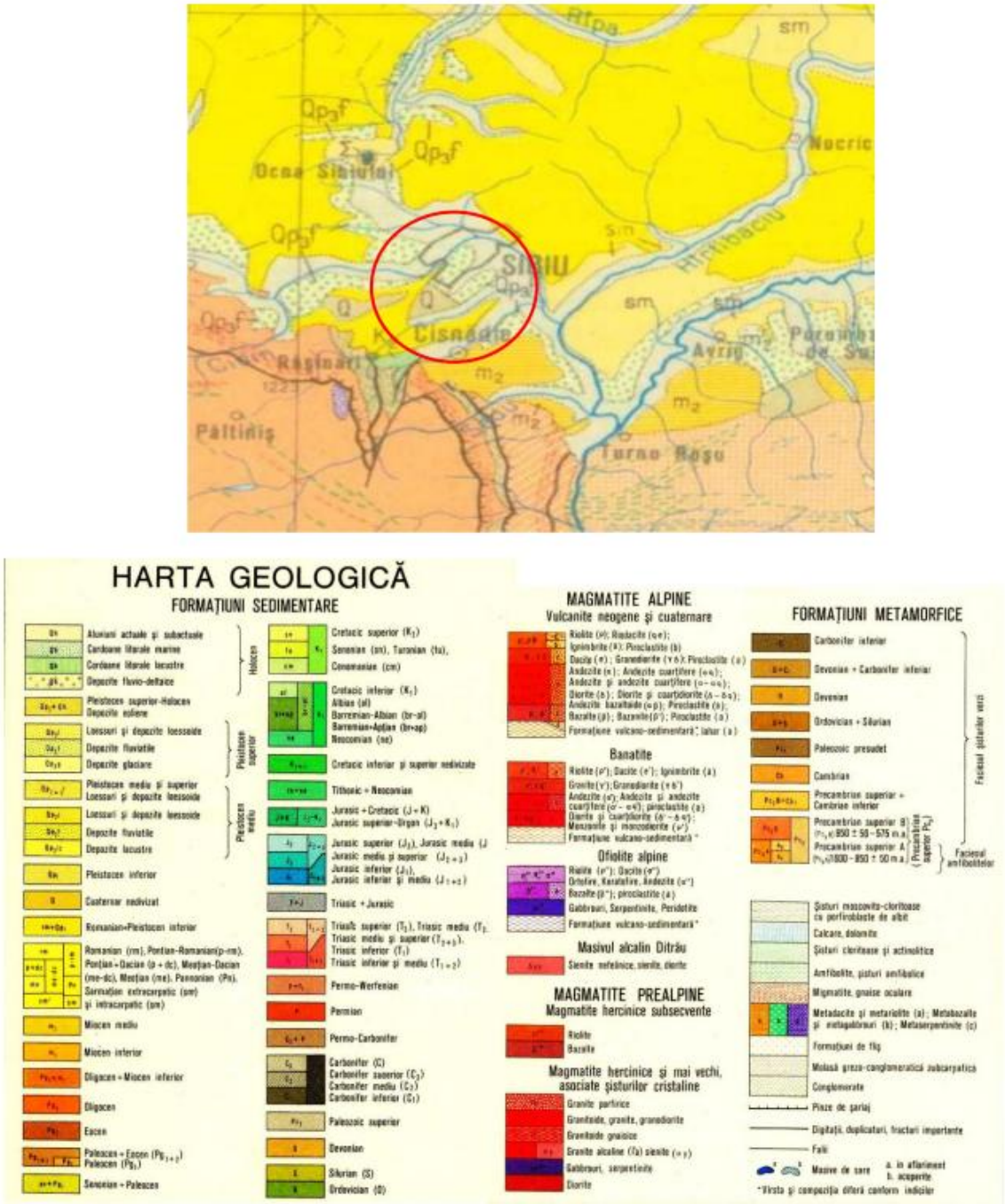


Figure 14 Geologic map

Tectonics of the region

The studied site is in the macroseismic zone with intensity I = 7 on the MSK scale. The seismic parameters of the area are established according to the "Seismic Design Code - Part I - Design Requirements for Buildings" - P100-1/2013.

Hydrogeological data

From the hydrological point of view, the valleys that cross the area are tributary to the Cibinului watershed. The brooks originate in the Cindrel Mountains at altitudes of 800-900 m, so they have a good hydrogeological supply and regime. They are strongly influenced by climatic conditions, the water flow being semi-permanent. In periods of high rainfall, the streams swell in a short time, transporting large quantities of water and silt, which they deposit in the meadow areas and at the confluence with the main emissary - the Cibin River. The banks of the valleys are generally narrow and relatively deep with banks 1 -2 m high, wider in the spillway and confluence areas. No seeps were intercepted at the time of borehole drilling. According to the hydrogeologic map, an aquifer is expected to be encountered. However however, the map does not provide any information on the depth of the aquifer or the hydrostatic level.

Placed at risk

Following the analysis of the existing documentary material in the archive and field observations, according to the "Normative on geotechnical documentation for construction, indicative NP 074/2007", the following conditions are preliminary for the studied site:

Table 27 Placed at risk areas

FACTORS INFLUENCING GEOTECHNICAL RISK	DESCRIPTION OF THE SITUATION AT THE STUDY SITE	ESTIMATED SCORE
Field conditions	Difficult terrain: potentially slippery	5 points
Groundwater	With normal exhaustion	3 points
Importance of construction	Deosebită	4 points
Neighbors	Major risk	3 points
Seismicity	Design seismic zone ag = 0.20g	2 point
ESTIMATED TOTAL SCORE		17 points

In conclusion, for the objective to be designed, an approximate total score of 17 points is estimated, thus a "major" geotechnical risk, i.e. a classification in geotechnical category 3. The same "major" geotechnical risk is obtained using the standard NP 074/2014.

Description of the river network

The hydrological data corresponding to the area of interest have been updated and extended up to 2018 in the documentation "Hydrological study for watercourses in the Olt catchment area - Olt AHE investment objective" prepared by INHGA in February 2021 at the request of ISPH Project Development. The calculation period adopted is 1978 - 2018.

The parameters of the power plants on the Cornetu - Avrig sector of the Olt river were determined and approved according to the development dynamics of water consuming uses

and the perspective assessments made before 1989 and no longer correspond to the current economic conditions.

As a result of the reduction in industrial activity and the shrinking of irrigated agricultural areas, the water requirements of the uses have decreased substantially, thus increasing the turbinable flows on the Oltul gorge.

Data on water consumption were taken from the "Study of water consumption in the Olt river basin in the Voila reservoir - Rm. Vâlcea" - AQUAPROIECT 2002.

These studies are the main source of hydrological and water consumption data used in this volume.

Water management calculations took into account:

- water consuming uses in the Olt river basin;
- hydrograph changes due to diversions to the Lotru development;
- the useful volumes of existing lakes;
- normalized probabilities of satisfying the uses (80% irrigation, 90% water supply).

The available mean flow hydrographs were obtained by subtracting from the natural flow hydrographs the flows derived to the Lotru scheme and the upstream consumptions of the respective sections.

Energy parameters

The two variants of the layout analyzed in the feasibility study are:

- ✓ **Variant A** - realization of the Cornetu - Avrig AHE in the approved variant, according to the constructive solution of Decree no. 24/1989 (updated with the current hydrological data);
- ✓ **Variant B** - realization of the Cornetu - Avrig AHE in the optimized version (with lowering the NNR at Lotrioara, Câineni and Robești).

The construction and equipment characteristics of the plants for the two variants analyzed are presented in the tables below.

Table 28 **Variant A**

The	Racovița	Lotrioara	Caineni	Robești	Cornetu
NNR (mdMB)	373,5	360,0	348,0	336,0	324,0
NmE (mdMB)	371,5	358,0	346,0	334,0	322,0
Downstream quota (mdMB)	360,0	348,0	336,0	324,0	312,0
Gross H ()	13,5	12,0	12,0	12,0	12,0
Total volume (mil. m^3)	14,2	5,3	5,8	6,8	7,3
Useful volume (mil. m^3)	7,1	2,3	1,9	2,5	3,5
Installed flow (m^3/s)	2 x 165	2 x 165	2 x 165	2 x 165	2 x 165

Table 29 **Variant B**

The	Racovița	Lotrioara		Caineni	Robești	Cornetu
		Var. B1	Var. B2			
NNR (mdMB)	373,5	357,0	357,0	347,0	335,0	324,0
NmE (mdMB)	371,5	356,5	356,5	346,0	333,5	322,0
Downstream quota (mdMB)	358,0	347,0	347,0	335,0	324,0	310,0
Gross H ()	15,5	10,0	10,0	12,0	11,0	14,0
Total volume (mil. m^3)	18,31	2,61	2,61	4,97	6,22	5,62
Useful volume (mil. m^3)	6,07	0,35	0,35	1,00	2,35	2,08
Installed flow (m^3/s)	2 x 165	2 x 165	2 x 90	2 x 165	2 x 165	2 x 165

The following elements have been taken into account for the assessment of the energy production of the five hydropower plants on the Cornetu - Avrig sector:

- the average monthly and annual flows in natural regime in the sections of Racovița, Lotrioara, Câineni, Robești and Cornetu dams over a period of 40 years (Annexes 2 ÷ 6); the calculation period adopted is 1978 - 2018;

- the existing diversions to the Lotru hydropower scheme, the average values of the derived flows being:

- 0.33 m^3/s in the Lotrioara section (abstractions from the Sadu river basin);

- 1.96 m^3/s in the Câineni section (catchments in the Sadu, Lotrioara and Vadului river basins);

- 2.18 m^3/s in the Robești and Cornetu sections (abstractions from the Sadu, Lotrioara, Vadului and Uria basins);

- the quantities of water abstracted from the Olt river basin upstream of the respective sections (AQUAPROIECT 2002 data). At the present stage, in the five sections they total:

- 1.42 m^3/s in the Racovița dam section;

- 1,81 m^3/s in the sections of Lotrioara, Câineni, Robești and Cornetu dams, distributed as follows:

Table 30

Section	Alim. with water	Irrigation	Fish farming	Total
b. Racovița	1,12	0,13	0,17	1,42
b. Lotrioara, Câineni, Robești and Cornetu	1,49	0,14	0,18	1,81

- the duration and utilization curve of the mean daily flows on the river Olt at the hydrometric station Sebeș Olt (Annex 7);

- Characteristic values of the ecological/environmental flow on the Olt river, downstream of the sections of the five dams, specific to the hydrological flow regime:

Table 31

Section	Racovița	Lotrioara	Caineni	Robești	Cornetu
Qeco. small waters (m^3/s)	20,40	23,67	25,20	26,19	26,30
Qeco. average water (m^3/s)	22,35	26,64	28,37	29,48	29,62
Qeco. large waters (m^3/s)	40,22	46,98	50,03	51,99	52,24

They are necessary to meet the requirements of safe runoff and the protection of aquatic fauna in the Olt river bed only when the power plant is not operating and the water level in the downstream lake falls below the minimum operating level (emptying of the lake);

- the installed flow rates of the units;
- capacity curves of Racovița, Lotrioara, Câineni, Robești and Cornetu reservoirs (Annexes 8 ÷12);
- gross falls at the dam sites studied;
- fall losses due to edema and local load losses;
- the efficiency of the turbines and generators that power plants are equipped with;
- the availability coefficient of the clusters of 0.98 (corresponding to an overhaul/repair period of one week/year).

The main characteristics of the arrangement and the energy parameters obtained for the five steps of the Olt River AHE, Cornetu - Avrig sector, in the two analyzed variants, are presented in the tables below.

Variant A Table 32

CHE / Parameters	Racovița	Lotrioara	Caineni	Robești	Cornetu
Inflow (m^3/s)	83,8	98,2	104,5	108,6	109,2
Available flow (m^3/s)	82,4	96,1	100,8	104,6	105,2
Installed flow (m^3/s)	330	330	330	330	330
Flow rate (m^3/s)	78,3	90,4	94,3	97,6	98,1
Upstream (mdMB)	373,5	360,0	348,0	336,0	324,0
Downstream quota (mdMB)	360,0	348,0	336,0	324,0	312,0
Gross drop (m)	13,5	12,0	12,0	12,0	12,0
Installed capacity (MW)	31,0	29,3	29,0	29,0	30,7
Energy produced (GWh/year)	67,8	71,1	73,7	77,8	79,5

The energy characteristics of the AHE Cornetu - Avrig at final profile, in **Variant A**, are:
Total Pi = 149.0 MW;
In total = 369.9 GWh/year.

Variant B Table 33

CHE / Parameters	Racovița		Lotrioara		Caineni	Robești	Cornetu
	Racovita 1	Racovita 2	Var. B1	Var. B2			
Inflow (m^3/s)	83,8	83,8	98,2	98,2	104,5	108,6	109,2
Available flow (m^3/s)	82,4	82,4	96,1	96,1	100,8	104,6	105,2
Installed flow (m^3/s)	330	330	330	180	330	330	330
Flow rate (m^3/s)	78,3	78,3	90,3	80,0	94,3	97,6	98,1
Upstream (mdMB)	373,5	373,5	357,0	357,0	347,0	335,0	324,0
Downstream quota (mdMB)	358,0	358,0	347,0	347,0	335,0	324,0	310,0
Gross drop (m)	10,5	10,5	10,0	10,0	12,0	11,0	14,0
Installed capacity (MW)	31,5	16,4	20,7	14,0	26,5	25,8	33,2
Energy produced (GWh/year)	71,6	45,6	58,3	53,2	73,6	72,7	90,9

The energy characteristics of AHE Cornetu - Avrig at final profile are:

Var. B.1.1/B.1.2: ***Total Pi = 137,7 MW;*** ***In total = 367.1*** *GWh/year*

Var. B.2.1/B.2.2: ***Total Pi = 131,0 MW;*** ***In total = 362.0 GWh/year***.

It is noted that, at present, the Racovița CHE operates with the upstream level restricted to 372.50 mdMB (1 m below NNR) and with the downstream level at 362.00 mdMB - the upper level of the bottom sill (built in 2005 in order to stabilize the Olt river embankment in the section of the C.F. railway bridges), compared to 358.00 mdMB - the project level. These modifications lead to a reduction of the gross head from 15.5 m to 10.5 m and of the maximum flow "swallowed" by the turbine from 165.0 m^3/s to 156.6 m^3/s. Under these conditions, the average annual energy production at the Racovița CHP is reduced to approx. 45.6 GWh/year.

Annexes 13 ÷ 17 show the available flows in the sections of Racovița, Lotrioara, Câineni, Robești and Cornetu dams during the analyzed period (1978 - 2018).

Annexes 18 ÷ 23 show the flows used at CHE Racovița, Lotrioara, Câineni, Robești and Cornetu for the analyzed variants.

In Annexes 24 ÷ 28 are presented the estimated energy production at CHE Racovița, Lotrioara, Câineni, Robești and Cornetu in variant A.

In Annexes 29 ÷ 36 are presented the estimated energy production at CHE Racovița, Lotrioara, Câineni, Robești and Cornetu in variant B.

Seismic zoning data

According to the standards, the seismic zonations of the Romanian territory present the following intensities (i) for the Cornetu Avrig development area:

- ✓ according to STAS 11.100/1-77 I = 6;

- ✓ according to SR 11.100/1-93 I = 6, with a return period of 50 years;
- ✓ according to P100-92 I = 6 (microseismic zone F).

There is a significant underestimation of the expected maximum intensities, compared to the assessments of the same intensities, under the recent strong seismic activation in the area.

Based on recent analysis of the seismicity of the area, the following parameters of maximum expected earthquakes have resulted:

- ➢ DBE level   I = 7,5 a_{max} = 160 cm/s^2;
- ➢ ERM level   I = 8,5 a_{max} = 320 cm/s^2; Vrâncean regional earthquake
- ➢ DBE level   I = 6 a_{max} = 50 cm/s^2;
- ➢ ERM level   I = 7 a_{max} = 100 cm/s^2.

According to the seismic zoning maps (P100-1/2013), the site is located in seismicity zone 7, which corresponds to a ground acceleration of ag=0.20g, with a period of the corner of the seismic spectrum Tc=0.7 s, for an earthquake with a mean return period of 225 years.

Zonation of the territory of Romania in terms of peak design ground acceleration values, ag for earthquakes with mean recurrence interval IMR=225 years (P100-1/2013).

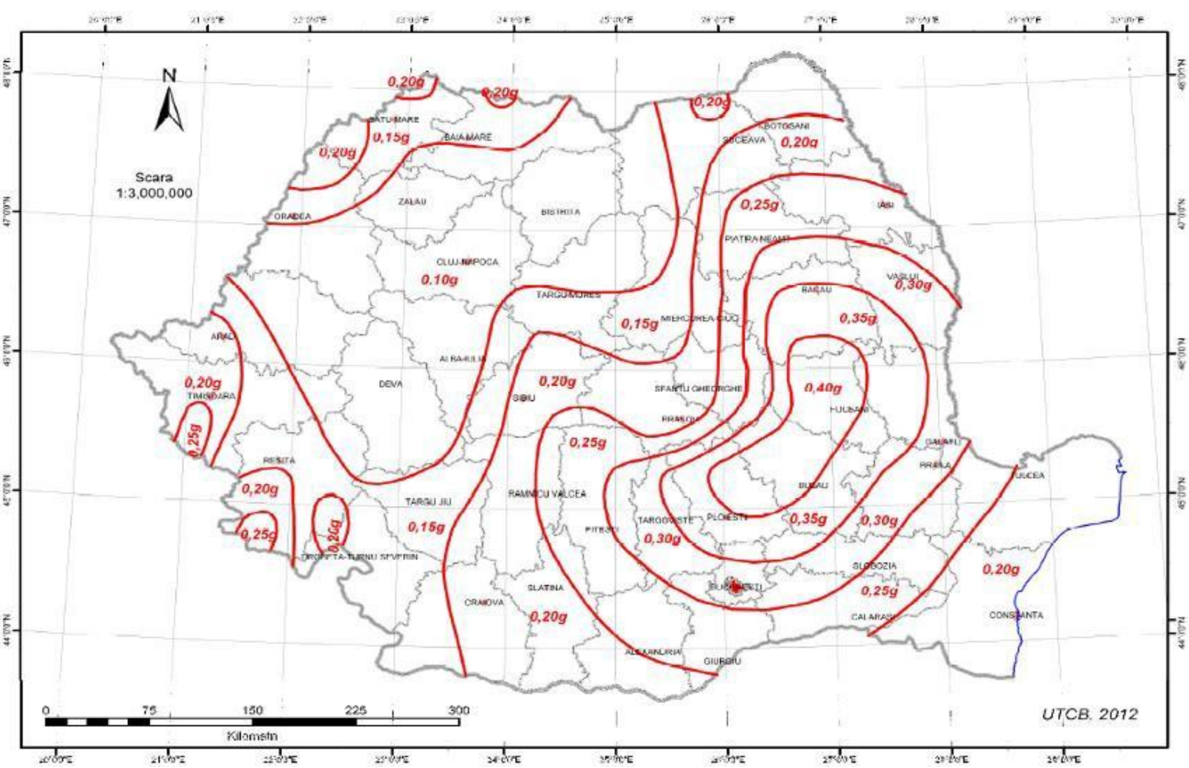


Figure 15 Romania's seismic zoning

1.2. Physical characteristics of the entire investment objective

A. Work carried out/components realized

Taking into account the specific nature of the works and the progress of the project, we present below a detailed description of the works already completed.

A. The Cornetu, Robești and Racovița developments had a very slow pace of execution, with PIFs, thus:

- Cornetu - 2001 (group 1), 2002 (group 2);
- Robești - 2012;
- Racovița - 2019 (with level restriction at 372.50 mdMB - minimum energy and with works still in progress on the tailrace and the embankments of the development).

CHE Racovița

Situation of the Racovița CHE storage

The physical status of the works at Racovița CHE on 31.12.2020 is as follows:

- The spillway dam and power plant are in operation and had PIF in 2019;
- the dikes are executed as follows:
  - DMD tr. I - is completed to the final elevation along its entire length (fills, depth sealing, base beam, bulkhead, bulkhead seals, counterchannel);
  - DMS - section I and II completed on the whole length (fills, depth sealing, retaining beam, bulkhead, bulkhead sealing, counterchannel) except for the closures in the railway on the Mârșa and Avrig streams (last 10 m);
  - DMS Section III is 60% completed;
- the run-off channel is executed at the final elevation as follows:
  - between profile P0 and profile P8 (upstream of the temporary road bridge that was demolished in 2020) for a length of approx. 1570 m;
  - the outlet of the stream coming from the sorting plant;
  - between profile P15 and profile P25 (downstream end of the canal) for a length of approx. 1735 m;
  - the outlets of the Cibin brook and the meander of the Olt river on the left bank of the Cibin river.

The development operates with a level restriction of 372.50 mdMB compared to 373.50 mdMB which is the normal level of retention until all the works on the left bank embankment will be completed, including the protection of the railroad bridges crossing p. Mârșa and p. Avrig.

The situation of the railroad bridges on the runaway canal

The Racovița Runoff channel flows into the Lotrioara reservoir. Approximately 2.75 km downstream of the hydro-technical junction, the runoff channel is crossed by 2 railroad bridges: Brașov-Podu Olt and Piatra Olt-Podu Olt. The bridge at km 369+509 on the Piatra Olt-Podu Olt line was built in 1887, and the planks were replaced in 1918 and 1940. The bridge at km 127+011 on the Brașov-Podu Olt line was built in 1892, the old planks were replaced in 1940.

In the Approval Decree no. 24/03.02.1989, the above-mentioned railroad bridges were considered as a related investment financed by the Ministry of Transport and Telecommunications. In all the variants studied for the crossing of the Olt river, a new bridge was envisaged, between the two existing bridges, which had the advantage that it could be built without affecting rail traffic.

As no funds for related works were included in the budget of the Ministry of Transport after 1990, the works on the railway bridges over the runaway canal were stopped. Work on the Racovița CHE and the tailrace canal also continued at a reduced pace.

The elevation of the embankment of the runaway channel in the area of the railroad bridges will be:

- 357,57 mdMB under the bridge km 369+509 Turnu Roșu - Copșa Mică line,
- 357,59 mdMB under the bridge km 127+011 Brasov - Podu Olt line.

The construction of the escape channel at the final elevations of the project, the route of which is inscribed between the railway bridge culverts, by excavating 3.00 - 4.00 m below the current elevation of the Olt River in this section, results in an embedment of their piers of about 1.00 m, which is unacceptable for the safety and stability of the bridges.

In order to put into operation the Racovița CHE, at the project parameters, it is necessary to execute the run-off and high water channel at the project elevations. For this purpose, it is mandatory to carry out works to make the railroad bridges infrastructure safe, either by reinforcing them or by building a new infrastructure, depending on the solution agreed by MTI-CNCFR and Hidroelectrica SA.

Between 2003 and 2005, TRAPEC SA prepared expert reports on the CF bridges and a solution study, which were not finalized at that time. The recommended option consisted in strengthening the piers and the bridge culverts.

In 2005, about 280 m downstream of the railway bridges, following the excavations at the final elevations of the section III of the runaway canal, a temporary sill was built to stabilize the Olt river embankment and to make the railway bridges safe, based on a project developed by TRAPEC-SA Bucharest. The provisional sill was designed so that it would function until the implementation of the solutions for the consolidation of the infrastructures of the railway bridges and implicitly until the possibility of excavating the final depth of the escape channel. The construction solution chosen allows it to be demolished quickly.

The temporary sill is still in operation.

Since 2010, with the progress of the works on the leakage channel, the diversion of water through the dam and the approach of the PIF deadline, the efforts to solve the intersection of the leakage channel with the railway bridges were resumed (see the attached address of the Ministry of Transport and Infrastructure - National Railway Company no. 12/2/87/2011).

Thus, in 2011 the contract was finalized with PROIECT CF - RIMSCO SRL which contained:

- Geotechnical study in the area of both bridges;
- Technical expertise.

The expertise showed that the current infrastructure does not meet the new current standards and the current metal decking is outdated in all verification requirements. The solution recommended by the certified technical expert is new infrastructure.

The expertise recommends 4 options to make the CF bridges safe, which are analyzed in the "Solution Study".

It is also recommended that the materials put in place must be AFER approved, and that the builder must also be authorized and approved for this type of work.

- Risk study prepared by UTCB - Faculty of Hydrotechnics

The modeling of the influence of the presence of the two CF bridges on the Racovița CHE outlet channel, in the current situation and in the situation of excavation of the channel at the projected elevation, was carried out by mathematical modeling, using the HEC-RAS calculation program.

On the basis of mathematical modeling, it was found that in both situations, the subsidence produced constitutes a risk situation for the piers of the railway bridge piers, reaching their invert.

The study also draws attention to the affluence that is still occurring.

- Solution Study

The solution study technically details the 4 variants proposed on the basis of the risk study and the geotechnical study by the bridges expert, Mr. Cornel Veștemean, and estimates their costs.

Following the techno-economic analysis the solution study recommends the choice of variant IV.

In variant IV, the safety works propose the construction of a new double track bridge on a definitive route variant and a new double track bridge deck with ballasted track. The works in this variant are carried out under rail traffic on the existing route on both lines.

The maximum duration of closure will be 1 day required to connect the new route to the existing route.

In order to finalize the solution for the intersection of the runaway canal with the railway bridges, it will be necessary for the two ministries involved - the Ministry of Transport and the Ministry of Energy - to work together.

Pending the completion and execution of the solution of the intersection of the runaway channel with the CF bridges, the commissioning of the Racovița CHE implies an operation with the maintenance of the provisional threshold. Under these conditions, in 2019, the threshold was rehabilitated after the damage of the last years.

Currently, for the protection of the railroad bridges on the route of the runaway canal, the work was elaborated: *"AHE of the Olt river gorge on the Cornetu-Avrig sector. CHE Racovita. Updating of the risk study documentation for the Olt river CF bridges: bridge km 127+011 Brasov - Podu Olt, bridge km 369+509 Piatra Olt - Podu Olt"*. This involved the redoing of topo-bathymetric, geological and geotechnical surveys and a new set of hydraulic modeling calculations.

The study was requested by the expert as part of the documentation "Assessment of the safe operational status of the Racovița dam and reservoir for the renewal of the safe operation authorization".

As a result CHE Racovita was studied in two variants:

"Racovita 1" variant

- **with CF** (railroad**) Bridge Protections** on the Racovița runaway canal.

"Racovita 2" variant

- **without CF** (railroad) **bridges** on the Racovița runaway canal.

B. The Câineni and Lotrioara developments are in various stages of completion, as follows:

CHE Câineni

The works were carried out as follows:

a) between 1989 and 2000 were executed:

- execution enclosure and site organization;

- The dam:

- The embankment of the spillway dam is executed, and the piers and the piers are concreted in elevation up to the level of the first sheet, including the opening for the outlet of the left bank float:
- the energy dissipater is concreted all the way up to the boundary of the fixed riser;
- the upstream right bank wall one section;
- At the shelter of the Phase I diversion enclosure, i.e. the upstream embankment, the downstream embankment and the left bank embankment wall, seepage has been kept at a low level, which has allowed the works to be maintained in good condition for 12 years.

- **Central:**
  - in the area of the intake: above the elevation of the intake invert, from -3,334 downstream to +2,56 upstream, at both turbines;
  - in the area of the connection with upstream regularization: in full;
  - in the area of the penstock valve: above elevation -4,64 m;
  - in the vacuum area:
    - above the elevation of the inclined prefabricated floor over the aspirators, elevations -8.50 and -4.80 at turbine T1;
    - above -4.64 at turbine T2;
  - in the assembly block area: above elevation +3.75;
  - the invert slabs of the stilling basin are fully executed;
  - The status of the remaining work on the stilling basin is as follows:
    - left bank wall (dividing stack):
      - Section I: above -8.00 and -5.64;
      - Section II: above -5.64;
      - Section III: above the +0.15 level;
    - wrong wall:
      - Section I: above -0.65;
      - Section II: above the +2.35 level;
      - Section III: above the +2.20 level.

b) Between 2000 and 2010 the work was stopped;

c) Between 2010 - 2013 the works were resumed:
  - the concrete protections on the right bank and the outlet of the Uria stream;
  - concreting of the spillway embankments at the dam;
  - fixed rizberma entirely;
  - the entire left bank upstream wall;
  - the first section of the right bank upstream wall was modified;
  - upstream regularization;
  - began the filling of the right embankment embankment connection section, the Kelly type screen on approx. 650 m and the counterchannel foundation on three sections:
    - Hydropower plant:
      - Downstream piers - are concreted up to elevation -1,15;
      - Penstock valve- are concreted up to +3,30;

- Outlet area - is concreted up to under the outlet ceiling, elevations +3,90 ~+7,95;
- Intermediate and center stacks area up to +7.95 and +7.55 respectively;
- The left and right bank channels - are concreted up to +9.65 in the inlet area and up to +3.30 in the spiral and downstream chambers;
- Downstream piles - concreted at elevation -0,55;
- Downstream pressure wall - concreted to elevation -1,15;
- The stilling basin is completed, except for the right bank wall which is completed up to +6.33.

d) After 2013 the works were stopped.

Mechanical equipment is in various stages of construction and assembly, as follows:

- The turbines are in custody at UCM Resita, in various stages of execution;
- The elements of the vacuum truck are purchased and are in custody at Energomontaj Porțile de Fier Slatina;
- the built-in parts are mounted in the suction and penstock valve area - suction tube cone lining and penstock valve manhole for T1 and T2, suction access manhole T1 and T2, suction access manhole T1 and T2, support bracket for T1 and T2 discharge ring, and partially, hydraulic measuring pipes, air vent pipes, built-in confections, built-in plates;
- other equipment is not contracted.

Electrical equipment is in various stages of completion:

- The generators are in custody at UCM Resita, in various stages of execution;
- other equipment is not contracted.

CHE Câineni was studied in two variants:

Câineni variant 1 *- with access variant 1 and without 400 station*

Câineni 2 variant *- with access variant 1 and 400 kV station*

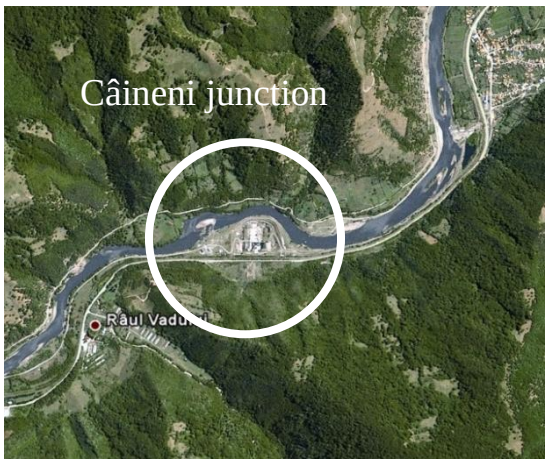


Photo 1 Enclosure of the Câineni node

Photo 2 Construction site and state of works at the Câineni node

The state of works on:

Photo 3 View from upstream to downstream - opening no. 3 where the spillway profile remained unlogged on a strip 4 m wide

Photo 4 Energy sink - view from on the arrester crest

Photo 5 Fixed rhizber executed at the final bend

Photo 6 Two sections of downstream wall completed up to 339,50 mdMB

Photo 7 Left bank upstream wall and upstream regularization

Photo 8 Upstream right bank first section executed

Photo 9 Right bank embankment - connection area with the power plant - Kelly type screen and fillings in the embankment body on approx. 1,0 m height

Photo 10 Right bank embankment - upstream connection with the power plant - Kelly type screen platform fill washed by high waters on approx. 4-5 m wide and collapsed guide beams

Photo 11 Central and plunge basin - view downstream

Photo 12 Power plant - downstream pile area

Photo 13 Central - penstock valvearea

Photo 14 Central - outlet area

Photo 15 Power plant - upstream view-port area

Photo 16 Power plant - intake area and penstock valve - downstream view

CHE Lotrioara

The works were carried out at a very slow pace between 1989-2000, as follows:

- NH - is entirely on the left bank, near the railroad;
- spillway dam - the first embankment blades from the two spillway fields located on the left bank (openings 3 and 4) and the separator pile (in the middle of the spillway dam) were concreted;
- technological and social organization - of which a concrete platform remains.

All of the completed manholes are currently below water level.

Electro-mechanical equipment is not contracted, purchased or installed.

Photo 17 CHE Lotrioara as seen from satellite

Photo 18 Partition stack positioned on middle of the spillway dam

Photo 19 Flooded execution enclosure

B. Work still to be carried out

Table 34 Works and Quantities for the items still to be executed (remaining to be executed)

Material name	UM	Quantity
I - CHE Câineni		
I.1. Dam-type power plant		
Central. Embankments		
Excavation and embankments	mc	24.283
Fillings	mc	25.000
Central. Construction		
Concrete	mc	20.375
Metal fabrications	kg	125.000
Concrete protections	mp	2.500
Central. Architecture		
Interior compartments	mc	292
Interior enclosures	mp	1495
Interior and exterior joinery	mp	743
Interior finishes	mp	18075
Exterior finishes	mp	561,8
Terrace: non-circulating, non-insulating, heat-insulating terrace roof, including sheet metal	mp	1488
Metal fabrications	kg	7579
110 kV substation. Embankments, Construction and Architecture		
Embankments	mc	190
Concrete	mc	100
Metal fabrications	kg	15.000
Hedgerows	ml	167
Exterior central		
Embankments	mc	950
Concrete	mc	396
Hedgerows	ml	363
Exterior protective metal railings, including priming and alkyd painting	kg	11.207
Concrete platform	mp	1000
Spillway dam		
Spillway. Embankments		
Excavation of walls upstream right and left bank and downstream left bank	mc	3000
Preparing wall foundations	mp	650
Fillings	mc	33.000
Spillway dam. Construction		
Concrete	mc	12.227
Sealing screen 60 cm (O - 12 m deep)	mp	250
Sealing joints with PVC tape	m	700
Spillway dam. Architecture		
Carpentry aluminum profiles: PVC profile doors and windows with insulated glazing	mp	88.00
Finishing: plastering, flooring	mp	780
Metal fabrications	kg	10.600
Closing technological voids: walls sandwich panels insulating polyurethane foam core - Gem thickness	mp	62
Concrete platform	mp	360
Funaway channel		
Canal run. Embankments		
Channel excavations on the run	mc	478.625
Canal run. Construction		
15 cm concrete slabs with non-tight joints	mp	7.000
Weep holes	m	270

Concreting spur culvert spur	mp	750
The reservoir develops in the floodable area on either side of the minor bed of the Olt River and has the shape of a channel and is delimited on the right bank by the railroad defense embankment (2.700 m, of which the watertight screen was executed on about 650 m) and on the left bank by a dike connecting with the slope (150 m); Characteristic parameters of the Câineni reservoir:		
Câineni reservoir embankments		
Embankments and counterchannels. Left bank dike. Embankments		
Breakwater and counterchannel foundation preparation	mp	8.000
Excavation of the downstream culvert	mc	1.000
Filling embankments with borrow pit material	smc	450
Canopy landscaping	mc	150
Grassing the slope	smp	45
Embankments and counterchannels. Left bank dike. Constructions		
Reinforced concrete wall 20 cm thick	mp	4.000
Concrete slope closure spur	m	50
Kelly screen guide beams	m	150
Sealing screen 60 cm (O - 12 m deep)	m	1.500
Parapet sparge val	m	150
Plain concrete wall 10 cm thick with non-sealed joints	mp	400
Embankments and counterchannels. Right bank dike. Embankments		
Breakwater and counterchannel foundation preparation	m	3.500
Filling embankments with borrow pit material	smc	2.800
Canopy landscaping L = 6 m	m	2.800
Grassing the slope	spm	147
Kelly screen platform protections	mc	9.022
Embankments and counterchannels. Right bank dike. Constructions		
Reinforced concrete wall 20 cm thick	mp	16.000
Reinforced concrete wall 15 cm thick	mp	10.000
Concrete spur	m	1.800
Kelly screen guide beams	m	1.000
Sealing screen 60 cm (O - 12 m deep)	mp	10.000
Parapet sparge val	m	2.800
Concrete counter-channel and cassette	mc	7.500
Water diversion		
Water diversion phase I (dam and power plant)		
Embankments		
Mechanical digging in silt	mc	23.000
Filling embankments with borrow pit material	smc	26
Construction		
Breaking simple concrete (wall, screen)	mc	297
Scattering armed sticks	mc	1.460
Water diversion phase II (start accumulation)		
Embankments		
Filling embankments with borrow pit material	smc	90
Mechanical digging in silt	mc	9.000
Construction		
Prefabricated block closure prism	mc	873
Protection made of rock	mc	2.000
Access road to the hydrotechnical node		
Access roads, bridges and protection DN and CF (length 2.700 m)		
Embankments	mc	836
Ballast fill/foundation	mc	7.020
Dig	mc	638
Road clothing	mp	3.601
Drilled pilots	mc	954
Waterproofing geocomposite	mp	3.755

Riprap	mc	1.712
Resistance structure, L=21.00 m	buc	7
Path and parapet	mp	986
Stack infrastructure	mc	315
CHE Lotrioara		
Dam-type hydropower power plant		
Central. Embankments		
Excavation and embankments	mc	145.393
Fillings	mc	47.972
Central. Construction		
Sealing screen 80 cm	mp	230
Kelly screen beam 20 cm	m	30
Concrete	mc	31.652
Metal fabrications	kg	57.650
Concrete protections	mp	1.500
Central. Architecture		
Interior compartments	mc	69
Interior enclosures	mp	348
Interior and exterior joinery	mp	174
Interior finishes	mp	14.823
Exterior finishes	mp	129
Terrace: thermo insulated terrace roof	mp	909
Metal fabrications	kg	14.257
110 kV substation. Embankments, Construction and Architecture		
Embankments	mc	4.222
Concrete	mc	1.403
Metal fabrications	kg	20.000
Concrete platform enclosures	ml	10
Exterior central		
Embankments	mc	950
Concrete	mc	396
Hedgerows - edged netting	ml	341
External protective metal railings, including	kg	6.591
Alkyd priming and painting	mp	1.633
Concrete platform		
Weir		
Spillway. Embankments		
Excavations	mc	52.000
Fillings	mc	12.160
Demolition of existing infrastructure	mc	8.000
Spillway dam. Construction		
Concrete	mc	38.532
Sealing screen 60 cm (O - 12 m deep)	mp	1.488
Sealing joints with PVC tape	m	200
Reinforced concrete beam	m	124
Metal fabrications	kg	40.000
Upstream regularization wall	mp	2.100
Spillway dam. Architecture		
Carpentry aluminum profiles: PVC profile doors and windows with insulated glazing	mp	88.00
Finishing: plastering, flooring	mp	780
Metal fabrications	kg	10.600
Closing technological voids: walls sandwich panels with polyurethane foam core - 6 cm thick	mp	62
Concrete platform	mp	360

II.3. Upstream regularization (Channel): Upstream of the retention head, the connection with the water diversion channel through the weir is made through a protected area with concrete slabs 4.00 m x 4.00 m x 0.25 m, elastically connected with reinforcement (against entrainment). Adjacent to the concrete uprights, a clay plug will be executed, which will provide an additional degree of sealing in the upper area connecting the concrete screen with the objects of the retaining face. The protection is developed over a width of 12.00 m upstream, in front of the dam and the power station and over a width of approx. 10.00 m in front of the right-bank and left-bank connecting walls. The upstream protection zone is delimited perimeterally by a concrete spur measuring 0.50 x 1.00 square meters.		
II.4. The Lotrioara reservoir develops in the floodplain on either side of the minor bed of the Olt River and has the shape of a channel. The lake is bounded on the right bank by the embankment of the national road, with a box to catch the torrents and the difference in the catchment on the right bank and on the left bank by the railway embankment which has been protected.		
The channel of escape and high waters		
Canal run. Embankments		
Channel excavations on the run	mc	626.700
Canal run. Construction		
15 cm concrete slabs with non-tight joints	mp	10.500
Weep holes	m	500
Concreting spur culvert spur	mp	5.000
Roads, bridges, accesses and protections DN7 and CF		
DN and CF access roads, bridges and protections (total length 4.790 m)		
Embankments	mc	224
Ballast fill/foundation	mc	18.695
Dig	mc	23.070
Road clothing	mp	648
Drilled pilots	mc	1.431
Waterproofing geocomposite	mp	19.054
Riprap	mc	6.732
Concrete cassette C25/30	mc	1.445
Prefabricated beams	buc	4
Over concrete slab	mc	151
Path and parapet	mp	660
Seal spur made of C25/30	mc	10.019
Concrete elevation	mc	14.935
Sealing screen	mp	17.400
End beams/Guide beams	ml	5.800
Technology platform	ml	2.900
Water diversion: for the realization of the hydro-technical junction it will be necessary to divert water towards the left bank of the Olt river		
Water diversion phase I		
Embankments		
Mechanical digging in silt	mc	5800
Filling embankments with borrow pit material	s	143
Demolition of a cofferdam/bridge ramp	mc	69.100
Construction		
Kelly screen 0 - 12m of 50 cm concrete	mc	630
Concrete guide beams Ml	mc	60
Water diversion phase II		
Embankments		
Filling embankments with borrow pit material	mc	43.700
Demolishing the batardou	mc	45.100
Construction		
Kelly screen 0-12m of 50 cm concrete	mc	43.700
Concrete guide beams	mc	45.100
Anrocum protection	mc	3.160

Pal metal planks	ml	295
Construction of a fish passage (fish ladder)	mc	1.700
SEN connection and internal services	mp	4.300
CHE Racovița		
DMS Tranche III a		
Embankments	mc	72.600
Concreting the breakwater and counterchannel walls on a length of approx. 1750 m	mc	4.300
DMD upstream Bradu bridge		
Embankments	mc	59.164
Slope protection with geomaterials	mp	8.244
Back-channel excavation	mc	3.888
Protection of CF bridges downstream of the leak channel	mc	616.900
Protection of Mârșa and Avrig CF bridges, including Mârșa and Avrig creek closures (in the CF safety zone)		
Funaway channel		
Excavation works for the tailrace canal, section 2, on a length of approx. l431.0 m, downstream elevation 358 mdMB (tailrace canal excavations and excavations in the embankment)	mc	616.900

Supplies will be made only from authorized companies, taking into account the optimal distance from the objective.

There are utility networks on the existing project site, but given the specifics of the project, and the fact that many elements of the project are already in place, these networks will not be affected.

In the unlikely situation, which may occur exceptionally, the identified utility networks will be relocated and/or protected in accordance with the technical specifications established by the operators/owners.

TECHNOLOGICAL SAMPLES AND TESTS

For the equipment and installations installed, the Contractor shall draw up a quality assurance plan to be submitted to the Beneficiary for approval, which shall include:

- testing and verification program in the plants of the executor (for the rehabilitated equipment);
- program of tests, checks and trials in the Executor's factories (for new equipment);
- the program of on-site checks and tests during and at the end of the installation;
- the program of checks and tests for commissioning and provisional acceptance;
- program of checks and tests for final acceptance.

NATURAL RESOURCES NEEDED TO IMPLEMENT THE PROJECT - WORKS STILL TO BE EXECUTED;

The main natural resources used to realize the project are water, soil and mineral aggregates (natural stone, ballast, sand). The mineral aggregates will be purchased from existing quarries/ballast quarries also used for the realized elements included in the initial project.

The transportation of aggregates from the quarries and/or ballast pits to the project site area will be carried out by specific means of transport on national and/or local roads, as appropriate. Front loaders will also be used for transportation as part of the site/works organization.

Procurement of materials will be done gradually, in stages of construction, so that they can be put into operation and to avoid long-term stockpiling of raw materials.

In addition, the supply of the necessary natural resources will be made only from authorized companies located as close as possible to the project site.

As regards the source of supply of material resources to be used for the realization of the planned works, they will be purchased from authorized firms specialized in this respect, which will provide the materials ready to be put into operation on the project site, taking into account its specificity.

Taking into account the specific nature of the works as well as the progress of the project, we present below the quantities for the elements already completed within the project and the remaining quantities to be executed.

Supplies will be made only from authorized companies, taking into account the optimal distance from the objective.

How utilities are provided

- *Water supply*;

The water supply during the execution of the works will be carried out by the site organizations of the initial project "AHE of the Olt river gorge on the Cornetu Avrig sector".

Water will be supplied from a drilled well located near the power plant. A submersible pump and a hydro booster will provide the required flow and pressure to the consumers.

The water supply to the external and internal hydrants of the fire pumping group, located in the PSI station room, will be made from the plant's stilling basin, which is also the intangible fire reserve.

- *Sewage disposal*;

Domestic sewage from the internal sewerage of the hydropower power plant, sewage from the plant floor resulting from leaks in the installations, accidental leaks from seepage or following the extinguishing of a fire will be discharged outside into a sewage manhole. From here, through pipes, mounted buried below the depth of frost, and changeover sewer manholes, they will be directed to a compact treatment plant. The treated water, which complies with the national standard NTPA 001 and the European standard EC91 I 271, will be discharged into the stilling basin of the hydropower power plant or into a nearby outfall.

- *Providing technological water, where appropriate*;

The technological water supply during the execution of the works is ensured by the site organizations of the initial project "AHE of the Olt river gorge on the Cornetu Avrig sector".

The cooling water installation of the two hydro-generators in the plant consists of 4 horizontal centrifugal electric pumps with Q = 150 mc/h and Hp = 35 m and 2 horizontal centrifugal electric pumps with Q = 57 mc/h and Hp = 14 m.

At the dam, the heating system for the sills of the 1st and 4th sills is realized with an ecological agent. Two Warmman (Dll,2} individual heating units have been installed in the left and right bank basins, with automatic hot water preparation based on externally mounted temperature sensors.

- *Thermal agent insurance*.

The rooms will be heated with electric radiators.

The domestic hot water from the plant will be prepared locally, with an electric storage boiler, 100 l capacity.

In the engine room, heating will be achieved by recovering heat from the cooling circuit of the generators during their operation or locally with electric fan heaters (15 kW} during overhaul or repair periods.

In the PSI Station, the rooms at elevations 5.40 and +11.27 (20 kV and 10.5 kV stations, control room, office, training room, restroom and locker room), the rooms will be heated with electric radiators.

DECOMMISSIONING ACTIVITIES

The operating period of the objectives realized within the project, together with the already realized elements and components of the Cornetu - Avrig hydropower scheme, were executed and are equipped for a lifespan of over 50 years, with 10 - 15 years between the rehabilitation/modernization works specific to this type of construction.

Given the specific nature of the project and the need to use renewable energy at this stage, no decommissioning works are foreseen. At this stage we can only mention an ambiguous process of capital repair or retrofitting when this need is identified by technical expertise or determined by technological progress.

The target is expected to operate for at least 50 years.

1.3. Main characteristics of the operational phase of the investment objective

1.3.1 Technology flow

The hydropower development of the Olt river defileu on the Cornetu-Avrig sector was approved as an investment objective by Decree no. 24/03.02.1989 (Fig.nr.5).

According to the approval decree no. 24/1989 of the sector, the hydro-engineering works had their own reservoirs, spillway dams and hydropower power stations in the retention front. The provisions of the decree provided for the upgrading and modernization of the waterways.

According to the approval decree, the Cornetu CHE development included:

- Cornetu Reservoir, NNR = 324,00 mdMB; Volume in lake: ca. 7,3 mil. m3;
- Cornetu Dam: 4 spans (16 x 10); H = 21.50 m; L = 82.00 m;
- Cornetu power plant: Kaplan turbines, Qi = 2 x 165 mc/s, Pi = 30.50 MW, Em = 62.40 GWh/year.

According to the approval decree, the Robești CHE development included:

- Robești Reservoir, NNR = 336,00 mdMB; Volume in the lake: ca. 6,8 mil. m3;
- Robești Dam: 4 openings (16 x 10); H = 21.50 m; L = 82.00 m;
- Robești power plant: Kaplan turbines, Qi = 2 x 165 mc/s, Pi = 28.50 MW, Em = 56.5 GWh/year.

According to the approval decree, the CHE Câineni development included:

- Câineni reservoir, NNR = 348,00 mdMB; Volume in lake: ca. 5,8 mil. m3;
- Câineni Dam: 4 spans (16 x 10); H = 21.00 m; L = 82.00 m;
- Câineni power plant: Kaplan turbines, Qi = 2 x 165 mc/s, Pi = 28.20 MW, Em = 54.1 GWh/year.

According to the approval decree, the Lotrioara CHE development included:

- Lotrioara Reservoir, NNR = 360,00 mdMB; Volume in lake: ca. 5,3 mil. m3;
- Lotrioara Dam: 4 spans (16 x 10); H = 21.50 m; L = 82.00 m;
- Lotrioara power plant: Kaplan turbines, Qi = 2 x 165 mc/s, Pi = 27.70 MW, Em = 51.4 GWh/year.

According to the approval decree, the Racovița CHE included:

- Racovita Reservoir, NNR = 373,50 mdMB; Volume in lake: ca. 14,2 mil. m3;
- Racovita Dam: 4 openings (16 x 10); H = 21.50 m; L = 82.00 m;
- Racovita power plant: Kaplan turbines, Qi = 2 x 165 mc/s, Pi = 29.90 MW, Em = 46.4 GWh/year.

CONSILIUL DE STAT
AL
REPUBLICII SOCIALISTE ROMÂNIA

DECRET

PRIVIND APROBAREA NOTELOR DE COMANDA SI A MASURILOR PENTRU REALIZAREA UNOR OBIECTIVE DE INVESTITII HIDRO-ENERGETICE

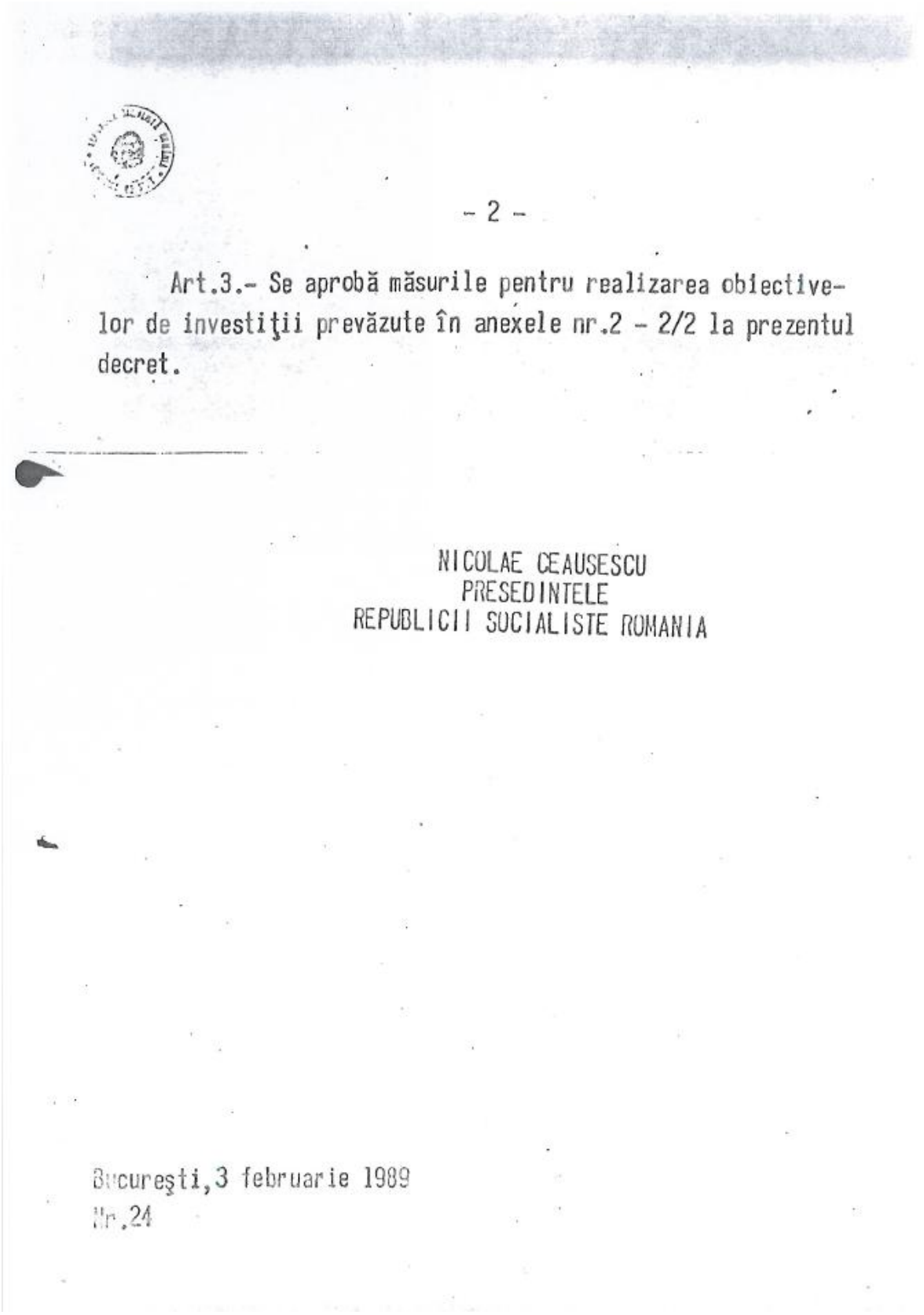
Consiliul de Stat al Republicii Socialiste România d e c r e t e a z ă :

Art.1.- Se aprobă notele de comandă şi graficele sintetice de pregătire şi realizare a obiectivelor de investiţii prevăzute în anexele nr.1 - 1/2 la prezentul decret.

Art.2.- Se aprobă începerea execuţiei lucrărilor în anul 1989, în condiţiile legii, la obiectivele de investiţii prevăzute la articolul 1 din prezentul decret.

Comitetul de Stat al Planificării şi Ministerul Finanţelor vor introduce modificările corespunzătoare în indicatorii economici şi financiari.

-/-



- 2 -

Art.3.- Se aprobă măsurile pentru realizarea obiectivelor de investiţii prevăzute în anexele nr.2 - 2/2 la prezentul decret.

NICOLAE CEAUSESCU
PRESEDINTELE
REPUBLICII SOCIALISTE ROMANIA

Bucureşti,3 februarie 1989
Nr.24

Figure16 Decree no. 24/03.02.1989

According to the Decree of approval of the sector, each step has its own reservoir, and for the reservoirs located in the Olt gorge itself (Câineni, Lotrioara and Robești), the initial provisions were aimed at the appropriate raising of the communication paths (national road and railway) and their modernization.

Table 35 Technical parameters according to Decree no. 24/1989

Stair step	Hbr (m)	Pi (MW)	At (GWh/year)	HA (no)	NNR (mdM)
Cornetu	12	30,5	62,4	2	324,0
Robești	12	28,5	56,5	2	336,0
Caineni	12	28,2	54,1	2	348,0
Lotrioara	12	27,7	51,4	2	360,0
Racovița	13,5	29,9	46,4	2	373,5
Total AHE	**61,5**	**144,8**	**270,8**		

Figure 17 *Scheme of the Olt river development on the Cornetu -Avrig sector, according to the constructive solution of Decree 24/1989*

The Olt river development scheme in the Cornetu-Avrig sector was designed on the basis of technical concepts and economic considerations, which operated in a centralized economic

system until 1989. The energy-economic indicators resulted from a somewhat arbitrary division of the investment between different beneficiaries, financed from a single centralized state fund.

After 1989, the change in the economic and social system brought about major changes, the notion of a centralized state fund disappeared and the requirements of different users and the structure of consumption changed.

Under these circumstances, some hydropower schemes in various stages of implementation could no longer be adequately financed, so that the implementation on the studied sector had the following evolution:

- the Cornetu, Robești and Racovița developments - started in 1989, had a very slow pace of execution, with PIFs, thus:
  - Cornetu - 2001 (first group) 2002 (second group);
  - Robești - 2012;
  - Racovița - 2019 (with level restriction to 272.50 mdMB - energy minimum);
- Lotrioara and Câineni developments - work was practically interrupted since 1994-1996, resumed briefly in 2010-2012 and interrupted again.

According to the Decree of approval of the sector, each step has its own reservoir, and for the reservoirs located in the Olt gorge itself (Câineni, Lotrioara and Robești) the initial provisions envisaged the appropriate raising of the communication roads and their modernization. As a result of the current situation, the variant according to the Decree approving the investment - the relocation of the sites and the elevation of the railway (CF) and the national road (DN7) - remained an objective that cannot be financially supported by the Ministry of Transport.

In the above sense, the impact of the Robești, Câineni and Lotrioara reservoirs on the railway and the national road Rm.Vâlcea - Sibiu led to the acceptance of the idea that the only way to unblock these two developments is to keep as much as possible the CF and DN7 on their current locations and to bear the costs for additional works to protect them on energy use.

The promotion of these accumulations is directly dependent on keeping the CF and DN7 in circulation on the current sites. Under these conditions, a new development scheme has been studied, in which the mentioned roads will be affected as little as possible. For the safe operation of the CF and DN, defense and protection works are necessary, all the more so as there is no possibility of modernization of the railway infrastructure in the Olt gorge.

Between 1989 and 2017, ISPH prepared on behalf of the beneficiary (MEE, RENEL, CONEL and SC HIDROELECTRICA SA) a series of studies for the continuation of the Cornetu-Avrig investment objective with a view to its completion and commissioning:

- August 1989 - Hydropower development of the Olt river on the Cornetu-Avrig sector. Phase P.E.;
- October 1997 - Hydropower development of the Olt river on the Cornetu-Avrig sector.

Completion of Robești, Câineni and Lotrioara hydropower plants in partnership with TRACTEBEL-Belgium;

- September 1998 - Study on the possibility of reducing investment in certain objectives hydropower projects in various stages of implementation. Phase III- Olt gorge;
- October 1999 - Hydropower development of the Olt river on the Cornetu-Avrig sector.

Optimizing the layout scheme;

- September 2002 - Hydropower development of the Olt river on the Cornetu-Avrig sector. Constructive solutions for the optimized scheme - Feasibility study;

- December 2003 - Technical project to be executed on 01.01.2004;

- June 2009 - A.H.E. of the Olt river gorge on the Cornetu-Avrig sector. Opportunity study on the continuation of works at CHE Câineni and CHE Lotrioara. Phase II - Study on the implications of abandoning existing works;

- December 2010 - Technical project to be executed on 01.01.2010;

- August 2017 - Hydropower development of the Olt River on the Cornetu-Avrig sector. Abandonment/conservation and safety study for the Câineni and Lotrioara passes - 2017.

The studies listed above took into account:

a) extension of the hydrological period until that date;

b) taking into account the new water consumptions in the Olt river basin, at the level of the years 2000-2017, which are lower than the forecasts of 1987;

c) to redesign the scheme to reduce the impact of the lakes on the existing railway and national road, as follows:

- variants with lower lake levels of 1 m, 2 m, 3 m, 4 m lower than the normal retention levels approved by Decree were studied;

- the front closure of the right bank embankment embankment into the slope was abandoned, as it was no longer possible to raise and relocate the CF and DN7 sites;

- for slope closures, upstream routes parallel to DN7 and CF were adopted up to the sections dictated by the design and verification flow backwaters;

- the torrents intercepted on the right bank embankment routes are transected in open concrete channels and discharged with free level in the downstream reach;

- the redevelopment variants of DN7 and CF correlated with the hydro-energetic developments have been evaluated on the basis of supporting studies prepared by TRACTEBEL, TRAPEC, etc;

d) the possibility to reduce the installed flow from 330 mc/s to 180-220 mc/s for the Lotrioara and Câineni plants;

e) the possibility of realizing a 165 mc/s group, and the second group to be put into conservation;

f) the possibility of reducing the works on the banks and protections in the area of downstream regularizations;

g) analyzing the scheme with and without the conjugation of the forebays;

(h) the possibility of using equipment offering higher reliability and efficiency.

After analyzing the results of the studies mentioned above, it was concluded that this sector can be optimized, acting on the retention rates of the reservoirs in the gorge area, namely Lotrioara (NNR - 2 m), Câineni (NNR-1 m) and Robești (NNR-1 m), without significant changes in the technical-economic indicators compared to initial variant, according to the Decree.

1.3.2 Technological sources with potential environmental impact

The operating data provided by the Beneficiary on the operation of the objectives

realized within the investment have been processed and are presented below.

Table 36 Mean monthly affluent flows on the Olt river in the Racoviţa dam section (m^3/s)

Year	IV	V	VI	VII	VIII	IX	X	Xl	XII	I	II	III	Average
1978-79	99,1	161,0	129,0	151,0	58,0	187,0	92,3	52,8	76,0	96,7	170,0	116,0	**115,7**
1979-80	236,0	117,0	106,0	116,0	189,0	69.6	55,7	54,5	55,7	35,6	56,9	121,0	**101,1**
1980-81	227,0	153,0	183,0	167,0	195,0	73.4	1I4,0	104,0	125.0	69,1	82,7	248,0	**145,1**
1981-82	126.0	300,0	100,0	128,0	88,6	117.0	74,5	101,0	140,0	105,0	50,3	132,0	**121,9**
1982-83	164,0	167,0	95,0	110,0	93,7	67,6	46,5	40,4	39,3	45,6	63,4	91,1	**85,3**
1983-84	101,0	74,0	129,0	109,0	167,0	51,0	46,8	36,2	42,9	41,2	57,7	100,0	**79,7**
1984-85	188,0	329,0	169,0	128,0	96,7	61,3	49,8	47,4	43,4	27,2	25,7	!47,0	**109,4**
1985-86	109,0	126,0	224,0	184,0	72,1	57,0	43.6	42,9	53,5	48,7	41,4	59,5	**88,5**
1986-87	80,0	52,7	62,5	53,9	50,3	29,1	29,9	28,5	21,7	29,1	50,7	45,2	**44,5**
1987-88	81,9	80,4	76,8	48,2	44.6	28,6	29,0	31,1	45,0	43,1	55,9	108,0	**56,1**
1988-89	269,0	151,0	279,0	117,0	62,5	86,2	54,9	46,6	60,3	42,2	50,7	101,0	**110,0**
1989-90	78,2	121,0	84,4	56,4	41,9	104,0	60.6	57,4	46,5	35,0	77,8	76,7	**70,0**
1990-91	59,8	86,6	78,7	55,8	33,7	28,0	32,7	30,9	34,3	30,0	23,5	44,6	**44,9**
1991-92	61,2	183,0	286,0	217.0	126,0	71,7	66,6	64,6	44,1	38,3	43,7	119,0	110,1
1992-93	138.0	72,8	131,0	72,8	41,5	32.7	39,9	37,9	28,6	23.7	23.8	105,0	**62,5**
1993-94	136,0	108,0	57,0	53,d	45,0	61,3	34,0	25,7	42,9	50,7	43.9	58,1	**59,7**
1994-95	68,5	62,6	170,0	77,4	46,0	35,5	32,4	26,7	31.3	32.0	62,8	59,2	**58,7**
1995-96	83,4	174,0	95,0	60,9	43,7	79.5	56,2	95,2	96,5	86,7	52,1	74,6	**83,2**
1996-97	181,0	119,0	57,2	47,6	49,2	93,9	57,6	45.7	59,3	51,1	50,1	84,0	**74,6**
1997-98	283,0	190,0	106,0	97,8	210,0	157,0	90,2	61,0	134,0	110,0	112,0	96,6	**137,3**
1998-99	156,0	149,0	185,0	160,0	55,7	67,8	104,0	70,6	39,4	46,7	73,1	175,0	**106,9**
1999-00	219,0	136,0	112,0	78,0	63,3	61,8	51,2	44,9	49,1	33,0	85,0	183,0	**93,0**
2000-01	205,0	70,6	40,2	50,1	27,6	38,6	24.5	21,6	22,2	21,8	26,8	64,5	**51,1**
2001-02	66,1	77,8	141,0	119,0	63.7	J32,0	78.7	61,7	49,8	66,4	130,0	81.4	**89,0**
2002-03	96,8	61,3	71,8	63,7	140,0	5I,2	61.8	87,1	41,9	59,6	38,9	86,9	**71,8**
2003-04	155,0	76,3	38,7	39,6	36,4	29,1	49,2	44,5	32,1	31,8	87,2	135,0	**65,2**
2004-05	136,0	90.7	59,2	54,1	70,4	45,8	40,9	67,6	67,1	43,7	71,4	136,0	**73,6**
2005-06	165,0	278,0	146,0	183,0	200,0	123,0	81,1	65,2	91,4	75.8	63,1	155,0	**135,6**
2006-07	261,0	131,0	163,0	79,2	76,7	66,5	44,8	53,8	40,2	59,2	90,2	123,0	**99,1**
2007-08	79,8	79,2	50,4	33,5	47,8	108,0	69,1	90,0	93.3	55.0	69.5	114,0	**74,1**
2008-09	166,0	130,0	76,0	78,5	47,7	37,9	87,2	46.3	74.0	58,7	69,2	140,0	**84,3**
2009-10	111,0	63,7	94,4	135,0	54,0	34,2	46,4	62,0	45,7	88,8	95,4	128,0	**79,9**
2010-11	163,0	149,0	162,0	249,0	122.0	64,9	51,4	47,8	114,0	70,3	60,9	83,6	**111,5**
2011-12	149,0	117,0	194,0	133,0	66,5	32,4	32,1	25,9	27,1	26,1	24,2	67,8	**74,6**
2012-13	16l,0	141,0	131,0	32,8	26,1	22,1	24,7	25,2	25.2	24,5	31,2	50,2	**57,9**
2013-14	82,9	48,1	71,0	41,7	30,0	31,9	54.0	34,8	27,9	29,8	39,3	37,2	**44,1**
2014-15	99,2	90.4	112,0	89,9	55,2	33,6	33,8	37,9	53,3	70,3	57,5	84,3	**68,1**
2015-16	108.0	102.0	87,1	61,1	35,4	30,9	39.6	32,1	37,1	33,1	64,4	44,9	**56,3**
2016-17	144.0	146,0	152,0	83,3	55,4	38,8	58.2	78,9	42,7	33,6	71,1	97,4	**83,5**
2017-18	84,2	118,0	96,3	61,8	41,7	34,6	38,5	43,0	73,5	46,0	69,1	215,0	**76,8**
Average	**139,5**	**127,1**	**120,0**	**96,9**	**76,8**	**64,4**	**54,5**	**51,8**	**56,7**	**50,4**	**62,8**	**104,8**	**83,8**

Table 37 Mean monthly affluent discharges on the Olt river in the Lotrioara dam section (m^3/s)

Year	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III	Average
1978-79	125,1	197,4	156,3	174,2	65,5	207,2	109,0	67,4	86,6	119,7	186,7	124,2	**134,9**
1979-80	267,1	139,4	133,1	134,9	213,5	82,5	66,7	63,2	64,7	50,3	69,9	136,7	**118,5**
1980-81	260,8	202,8	226,0	185,8	202,8	79,3	131,3	125,1	151.9	89,2	103,6	290,3	**170,7**
1981-82	133,6	334,1	135,8	142,9	102,7	145,6	91,1	125,1	183,1	126,8	62,4	157,2	**146,7**
1982-83	193,0	216,2	109,0	127,7	110,8	77,6	55,4	50,5	51,1	53,3	66,5	101,8	**101,1**
1983-84	121,5	81,0	138,5	117,0	163,5	50,7	46,9	42,3	44,8	46,4	60,2	107,2	**85,0**
1984-85	202,8	361,8	206,4	148,3	106,3	74,6	64,1	59,7	55.0	37,3	34,2	171,5	**126,8**
1985-86	127,7	146,5	240,3	196,5	74,8	59,7	45,6	47,9	56,0	53,0	47,4	64,0	**96,6**
1986-87	92,9	60,2	70,7	61,6	54,6	31,3	32,3	31,2	22.0	30,1	52,4	46,6	**48,8**
1987-88	89,3	106,3	92,9	54,3	46,7	32,5	32,2	34.7	49.2	49,0	60,4	115,2	**63,6**
1988-89	3D6,4	198,3	335,9	127,7	64.0	91,1	57,I	47.3	62,7	43,2	53,6	102,7	**124,2**
1989-90	87,1	139,4	99,2	67,0	52,9	109,0	72,4	70,5	60,9	45,5	83,8	78,8	**80,5**
1990-91	68,4	90.2	87,0	64,0	38,9	34,4	38,0	35.0	41,8	3J,3	30,1	51,3	**51,1**
1991-92	75.3	214,4	318,0	261,7	153,6	79,9	68,8	65.9	48.9	44.8	49,2	126,0	**125,5**
1992-93	146,5	85,8	142,9	84,1	46,7	6,7	45,0	43,9	32,2	28,2	26,2	113,4	**69,3**
1993-94	141,1	116,1	64,5	57,9	55,3	66,1	43,9	36,1	54,0	56.2	48,6	64,1	**67,0**
1994-95	79,1	80,8	197,4	92,0	54,9	41,1	42,9	35,4	41,3	40,1	73,7	71,1	**70,8**
1995-96	106,3	242,1	148,3	85,5	55,4	100,9	63,2	111,7	117,0	106,3	62,0	93,8	**107,7**
1996-97	212,6	159,9	72,9	58.6	57,9	102,7	65,2	53,6	68,5	57,6	62,1	91,1	**88,6**
1997-98	310,9	223,3	135,8	116,1	236,7	181,3	111,7	78,7	151,0	131,3	129,5	113,4	**160,0**
1998-99	173.3	189,4	276,9	224,2	79,6	98,3	146,5	97,4	55,6	57,4	90,2	199,2	**140,7**
1999-00	244,8	162,6	136.7	95,6	77,9	73,6	55,9	50,1	52,4	39,5	97,4	185,8	**106,0**
2000-01	235,8	98,3	56,5	57.8	33,1	49,3	26,4	29,0	28,3	26,3	32,7	69,3	**61,9**
2001-02	83,1	93,8	156,3	138,5	83,1	153,6	95,6	74,8	59,0	77,3	149,2	99,2	**105,3**
2002-03	106,3	74,3	86,7	75,2	158,1	63,6	71,5	95,6	55,3	67,1	44,4	95,6	**82,8**
2003-04	167,9	90,2	44,9	44,4	43,6	37.9	59,9	53,8	36,8	37,9	102,7	147.4	**72,3**
2014-05	152,8	III,7	75,6	62,0	83,2	57,1	48,2	92,9	80,4	58,2	90,2	166,2	**89,9**
2005-06	202,8	327,8	160.8	213,5	241,2	142,9	90,2	71,9	102,7	86,9	70,5	182,2	**157,8**
2006-07	314,4	155,4	173,5	98,3	97,4	82,4	58,6	64,2	50,4	70,5	94.7	141,1	**116,7**
2007-08	95,6	101,8	71,0	48.3	78,7	156,3	95,6	115,2	103.6	68,3	75,4	117,9	**94,0**
2008-09	178,7	145,6	87,6	83,4	51,5	43,9	92,9	54,1	82,5	67,5	77,8	156,3	**93,5**
2009-10	132,2	80,3	101,8	152,8	66,8	42,3	54,9	81,2	53,7	96,5	101,8	132,2	**91,4**
2010-11	Í88,5	I63,5	180,4	261,7	128,6	68,6	61,2	57,7	1277	76,1	68,5	90,2	**122,7**
2011-12	151,9	123,3	212,6	146,5	80,2	40,3	36,0	30,1	31,3	29,1	27,6	69,1	**81,5**
2012-13	167,9	167,9	149,2	40,9	28,3	24,3	27,7	29,1	29,5	29,0	36,5	62,5	**66,1**
2013-14	112,6	69,9	90,2	56,2	36.3	38,9	7J.8	46.5	34,4	35,3	49,1	47,2	**57,5**
2014-15	134,0	143,8	142,9	116,1	79.1	42,3	42,6	42,3	67.9	92,0	74,1	101,8	**89,9**
2015-16	135,8	138,5	98,3	71,8	42.3	38,7	50,6	41,1	43,2	39,4	71,3	59,9	**69,2**
2016-17	164,4	178,7	180,4	118,8	71,1	47,0	63,2	92,9	50,0	38,4	82,4	108,1	**99,6**
2017-18	94,7	150,1	119,7	77,7	53,2	41,5	48.3	52,0	76.2	58,2	86,8	236,7	**91,3**
Average	**160,1**	**154,1**	**142,8**	**113,5**	**89,3**	**75,7**	**64,6**	**62,4**	**66,6**	**59,8**	**72,1**	**117,2**	**98,2**

Year	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III	Average
1978-79	133,2	210,2	166,4	185,5	69,7	220,7	ll6,0	71,7	92,2	127,4	198,8	132,2	143,7

1979-80	284,4	148,4	141,7	143,6	227.3	87,9	71,0	67,2	68,9	53,5	74.5	145,5	126,2
1980-81	277,7	215.9	240,6	197,8	215,9	84,5	139,8	133,2	161,7	95,0	110,3	309,1	181,8
1981-82	163,6	355,7	144,6	152,2	109,4	155,0	97,0	133,2	195,0	135,1	66,4	167,4	156,2
1982-83	205,4	230,2	116,0	136,0	117,9	82,7	59,0	53,7	54,4	56,8	70,8	108,4	107,6
1983-84	129,3	86,3	I47,4	I24,6	174,1	54,0	49,9	45,0	47,7	49,4	64,1	I 14,1	90,5
1984-85	215.9	385,2	219,7	I57,9	113,2	79,4	68,3	63,5	58,6	39,7	36.4	182,6	135,0
1985-86	136,0	156,0	255,8	209,2	79,6	63,5	48,6	51,0	59,6	56,4	50,5	68,2	102,9
1986-87	98,9	64,1	75,3	65,6	58,1	33,3	34,4	33,2	23,4	32,1	55,8	49,6	52,0
1987-88	95,1	113,2	98,9	57,8	49,7	3J,6	34,3	37,0	52,4	52,2	64.3	122,7	67,7
1988-89	326,2	211,1	357,6	136,0	68,1	97,0	60,8	50,4	66,8	46,0	57,1	109,4	132,2
1989-91	92,7	148,4	105,6	71,3	56,3	116,0	77,1	75,0	64,9	48,4	89.2	83,9	85,7
1990-91	72,9	96.1	92,6	68,2	41,5	36,6	40,4	37,3	44,5	36,5	32,1	54,6	54,4
1991-92	80,2	228,3	338,6	278.7	163,6	85,0	73,2	70,2	52,0	47,7	52,4	134,1	133,7
I992-93	156,0	91,3	152,2	89,6	49,7	39,1	47,9	46,7	34,2	30,1	27,9	120,8	73,8
1993-94	150,3	123,6	68,7	61,6	58,9	70,4	46,7	38,4	57,4	59,8	5I,7	68,3	71,3
1994-95	84,3	86,0	210,2	98,0	58.5	43,8	45,7	37,7	43,9	42,7	78,5	75.7	75,4
1995-96	113,2	257,7	157,9	91,0	59,0	107,5	67,3	118,9	124,6	113,2	66,0	99,9	114,7
1996-97	226,4	170,2	77,6	62,4	61,6	109,4	69,4	57,1	72,9	61,3	66,1	97,0	94,3
1997-98	331,0	257,8	144,6	123,6	252,0	193,1	118,9	83,8	160,7	139,8	137,9	120,8	170,3
1998-99	184,5	201,6	294,8	238,7	84,7	104,6	156,0	103,7	39,2	61,2	96,1	212,1	149,8
1999-00	260,6	173,1	145,3	101,8	82,9	78,4	59,5	53,4	55,8	42,0	103.7	197,8	112,9
2000-01	251,1	104,6	60,2	61,5	35,3	52,5	28,1	30,9	30,1	28,0	34,8	73,8	65,9
2001-02	88,5	99.9	166,4	147,4	88,5	163,6	101,8	79,6	62,8	82,3	158,8	105,6	112,1
2002-03	113,2	79,1	92,3	80,1	168,3	67,7	76,1	101,8	58,9	71,4	47,3	101,8	88,2
2003-04	178,8	96,1	47,8	47,3	46,4	40,3	63,7	57,3	39,2	40,3	109,4	156,9	77,0
200J-05	162,6	118,9	80,5	66,0	88,5	60,8	51,4	98,9	85,6	62,0	96,1	176,9	95,7
2005-06	213,9	349,1	171,2	227,3	256,8	152,2	96,1	76,6	109,4	92,5	75,0	194,0	168,0
2006-07	334,8	165,5	184,5	104,6	103,7	87,7	62,4	68,4	53,6	75,0	100,8	150,3	124,3
2007-08	101,8	108,4	75,6	51,5	83,8	166,4	101,8	122,7	110,3	72,8	80,3	125,5	100,1
2008-09	190,2	155,0	93,3	88,8	54,8	46,7	98,9	57,6	87,8	71,9	82,8	166.4	99,5

Table 38 Mean monthly affluent discharges on the Olt river in the Câineni dam section (m^3/s)

Table 39 Mean monthly affluent discharges on the Olt river in the Robești dam section (m^3/s)

Year	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III	Average
1978-79	138,3	218,4	172,9	192,7	72,4	229,3	120,6	74,5	95,8	132,4	206,5	137,4	**149,3**
1979-80	295,5	154,2	147,2	149,2	236,2	91.3	73,8	69,9	71,5	55,6	77,4	151,2	**131,1**
1980-81	288,6	224,3	250,0	205,5	224,3	87,8	145,3	138,3	168,0	98,7	114,6	321,2	**188,9**

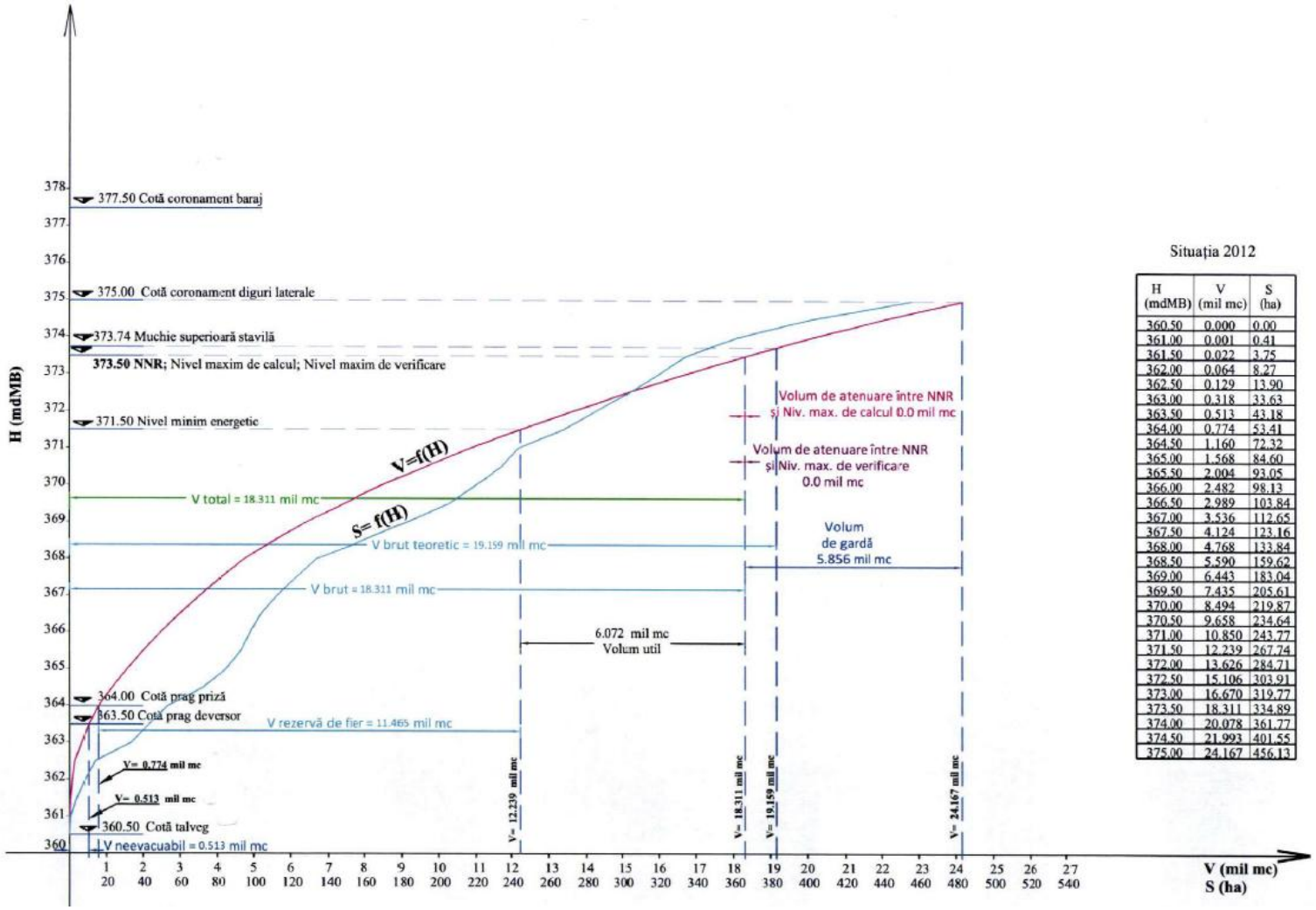
1981-82	170,0	369,6	150.2	158,1	113,6	161,1	100,8	138,3	202,6	140,3	69,0	173,9	**162,3**
1982-83	213,5	239,1	120,6	141,3	122,5	85,9	61,3	55,8	56,5	59,0	73,5	112,7	**111,8**
I983-84	134,4	89,6	153,2	129,5	180,8	56,1	51,9	46,7	49,6	51,3	66,6	118,6	**94,0**
1984-85	224,3	400,2	228,3	164,0	117,6	82,5	71,0	66,0	60,9	41,2	37,8	189,7	**140,3**
1985-86	141,3	162,1	265,8	217,4	82,7	66,0	505	53,0	62,0	58,6	52,5	70,9	**106,9**
1986-87	102,8	66,6	78,3	68,2	60,4	34,6	35,8	34,5	24,3	33,3	58,0	51,6	**54,0**
1987-88	98,8	117,6	102,8	60,1	51.7	36,0	35,7	38,4	54,4	54,3	66,8	127,5	**70,3**
1988-89	339,0	219,4	371,6	141,3	70,8	100,8	63,1	52,4	69,4	47,8	59,3	113,6	**137,4**
1989-90	96,3	154,2	109,7	74,1	58,5	120,6	80.1	78,0	67,4	50,3	92,7	87,2	**89,1**
1990-91	75,7	99,8	96,3	70,9	43,1	38,0	42,0	38,7	46,2	37,9	33,3	56,7	**56,6**
1991-92	83,3	237,2	351,8	289,5	170,0	88,s	76 1	72,9	54,1	49,5	544	139,3	**138,9**
1992-93	162,1	94,9	158,1	93,1	51,7	40,6	49,8	48,5	35,6	31,2	290	125,5	**76,7**
1993-94	156,1	128,5	71,3	64,0	61.2	73,1	48,5	39,9	59,7	62,2	53,8	71,0	**74,1**
1994-95	87,6	89,3	218,4	l0J,8	60,8	45,5	47,4	39,1	45,7	44,4	81.5	78,7	**78,4**
1995-96	117,6	267,8	164,0	94,6	61,3	111,7	70,0	123,5	129,5	117,6	68,6	103,8	**119,2**
1996-97	235,2	176,9	80,6	64,8	64,0	113,6	72,1	59,3	75,8	63,7	68,7	100,8	**98,0**
1997-98	343,9	247,1	150,2	128,5	261,9	200,6	123,5	87,1	167,0	145,3	143,3	125,5	**177,0**
1998-99	191,7	209,5	306,3	248,0	88.0	108,7	162,1	107,7	61,5	63,5	99,8	220,4	**155,6**
1999-00	270,8	179,9	151,2	105,7	86,2	81,4	61.9	55,4	58,0	43,7	107,7	205,5	**117,3**
2000-01	260.9	108,7	62,6	63,9	36,7	54,5	29,2	32,1	31,3	29,1	36,2	76,7	**68,5**
2001-02	91,9	103,8	172,9	153,2	91,9	170,0	105,7	82,7	65,2	85,5	165,0	109,7	**116,5**
2002-03	117,6	82,2	95,9	83,2	174,9	70,4	79,1	105,7	61,2	74,2	49,1	105,7	**91,6**
2003-04	185,8	99,8	49,7	49,1	48,2	41,9	66,2	59,5	40,7	41,9	113,6	163,1	**80,0**
2004-05	169,0	123,5	83,6	68,6	92,0	63,1	53,4	102,8	88,9	64,4	99,8	138,8	**99,4**
2005-06	224,3	362,7	177,9	236,2	266,8	158,1	99,8	79,6	113.6	96,2	78,0	201,6	**174,6**
2006-07	347,8	171,9	191,7	108,7	107.7	91,1	64.8	71,1	55,7	78,0	104,7	156,1	**129,1**
2007-08	105,7	112,7	78,6	53,5	87.1	172,9	105,7	127,5	114.6	75,6	83,4	130,4	**104,0**
2008-09	197,6	161,1	96,9	92,3	56,9	48,5	102,8	59,9	91.2	74,7	86,1	172.9	**103,4**
2009-10	146,3	88,8	112,7	169,0	73,9	46,8	60.8	89,8	59,4	106,7	112,7	146,3	**101,1**
2010-11	208,5	180,8	199,6	289,5	142,3	75,9	67,7	63,8	141,3	84.2	75,8	99,8	**135,8**
2011-12	168,0	136,4	235,2	162,1	88,7	44,6	39,8	33,3	34,6	32,2	30,5	76,5	**90,2**
2012-13	185,8	185,8	165,0	45,3	31,3	26,9	30,6	2,3	32,6	32,1	40,4	69,2	**75,1**
2013-14	124,5	77,4	99,8	62,2	40,1	43,1	81,6	51.5	38,0	39.0	54,4	52,2	**63,7**
2014-15	148,2	159,1	158,1	128,5	87,6	46,7	47,1	46,8	75,1	101,8	81,9	112,7	**99,5**
2015-16	150,2	153,2	108,7	79,5	46,8	42,8	55,9	45,5	47,8	43,6	78,9	66,2	**76,6**
2016-17	181,8	197,6	199,6	131,4	78,7	52,0	70,0	102,8	55,3	42,5	91,1	119,6	**110,2**
2017-18	104,7	166,0	132,4	86,0	58,9	46.0	53,5	57.5	84,3	64,4	96,1	261,9	**101,0**
Average	**177,1**	**170,4**	**158,0**	**125,6**	**98,8**	**83,7**	**71,4**	**69,1**	**73,7**	**66,2**	**79,8**	**129,7**	**108,6**

Table 40 Monthly mean affluent monthly flows on the Olt River in the Cornetu dam section (m^3/s)

Year	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III	Average
1978-79	139,0	219,5	173,8	193,6	72,8	230,4	121,1	74,9	96,2	133,1	207,5	138,0	**150,0**
1979-80	296,9	154,9	148,0	149,9	237,3	91,8	74,2	70,2	71,9	55,9	77,8	151,9	**131,7**
1980-81	290,0	225,4	251,2	206,5	225,4	88,2	146,0	159,0	168,8	99,2	115,2	322,7	**189,8**
1981-82	170,8	571,4	150,9	158,9	114,2	161,9	101,3	139,0	203,6	141,0	69,3	174,8	**163,1**
198283	214,5	240,3	121,1	142,0	123,1	86,3	61,6	56,1	56,8	59,3	73,9	113,2	**112,4**

1983-84	135,0	90,1	155,9	130,1	181,7	56,4	52,1	47,0	49,8	51,5	66,9	119,2	**94,5**
1984-85	225,4	402,2	229,4	164,8	118,2	82,9	71,3	66,3	61,2	41,4	38,0	190,7	**141,11**
1985-86	142,0	162,9	267,1	218,5	83,1	66,3	50,7	53,2	62,3	58,9	52,7	71,2	**107,4**
1986-87	103,5	66,9	78,6	68,S	60,7	34,8	35,9	34,7	24,4	33,5	58,3	51,8	**54,3**
1987-88	99,3	118,2	103,3	60,4	51,9	56,1	35,8	38,6	54.7	54,5	67,1	128,1	**70,7**
1988-89	340,6	220,4	373,4	142,0	71,1	101,3	63,5	52,6	69,7	48,1	59,6	114,2	**138,0**
1989-90	96,8	154,9	110,2	74,5	58,8	121,1	80,5	78,3	67,7	50,5	93,1	87,6	**89,5**
1990-91	76,1	100,3	967	71,2	45,3	38,2	42,2	38,9	46,5	38,1	33.5	57,0	**56,8**
1991-92	83,7	238,3	S53,5	290,9	170,8	88,8	76,5	73,3	54,3	49,7	54,7	140,0	**139,5**
1992-93	162,9	95,3	158,9	93,5	51,9	40,8	50,0	48,8	35,7	31,4	29,1	126,1	**77,0**
1993-94	156,9	l29,l	71,7	64,3	61,5	73,5	48,8	40,1	60,0	62,5	54,0	71,3	**74,5**
1994-95	88,0	89,8	219,5	102,3	61,1	45,7	47,7	39,3	45,9	44,6	81,9	79,0	**78,7**
1995-96	118,2	269,1	164,8	95,0	61,6	112,2	70,3	124,1	130,1	118,2	68,9	104,3	**119,7**
1996-97	236,3	177,7	81,0	65,1	64,3	114,2	72,5	59,6	76,2	64,0	69,0	101,3	**98,4**
1997-98	345,6	248,3	150,9	129,1	263,1	201,6	124,1	87,5	167,8	146,0	144,0	126,1	**177,8**
1998-99	192,6	210,5	307,8	249,2	88,5	109,2	162,9	108,2	61,8	63,8	100,3	221,4	**156,4**
1999-00	272,1	180,7	151,9	106,3	86,6	81,8	62,2	55,7	58,3	43,9	108,2	206,5	**117,9**
2000-01	262,2	109,2	62,9	64,2	36,8	54,8	29,3	32,3	31,5	29,2	36,3	77,1	**68,8**
2001-02	92,3	104,3	173,8	153,9	92,3	170,8	106,3	83,1	65,5	85,9	165,8	110,2	**117,0**
2002-03	118,2	82,6	96,S	83,6	175,8	70,7	79,4	106,3	61,5	74,6	49,4	106,3	**92,1**
2003-04	186,7	100,3	49,9	49,4	48,5	42,1	66,5	59,8	40,9	42,1	114,2	163,8	**80,4**
2004-05	169,8	124,1	84,0	68,9	92,4	63,5	53,6	103,3	89,4	64,7	100,3	184,7	**99,9**
2005-06	225,4	364,4	178,7	237,3	268,1	158,9	100,3	79,9	114,2	96,6	78,3	202,6	**175,4**
2006-07	349,5	172,8	192,6	109,2	108,2	91,6	65,1	71,4	56,0	78,3	105,3	156,9	**129,7**
2007-08	106,3	113,2	78,9	53,7	87,5	173,8	106,3	128,1	115,2	76,0	83,8	131,1	**104,5**
2008-09	198,6	161,9	97,4	92,7	57,2	48,8	103,3	60,2	91,7	75,1	86,5	173,8	**103,9**
2009-10	147,0	89,3	113,2	169,8	74,3	47,1	61,l	90,3	59,7	107,2	113,2	147,6	**101,6**
2010-11	209,5	181,7	200,6	290,9	143,0	76,3	68,0	64,1	142,0	84,6	76,2	100,3	**136,4**
2011-12	168,8	137,0	236,3	162,9	89,2	44,8	40,0	33,5	34,8	32,4	30,7	76,9	**90,6**
2012-13	186,7	186,7	165,8	45,5	31,5	27,0	30,8	32,4	32,8	32,3	40,6	69,5	**73,5**
2013-14	125,1	77,8	100,3	62,5	40,3	43,3	82,0	51,7	38,2	39,2	54,6	52,4	**64,0**
2014-15	149,0	159,9	158,9	129,1	88,0	47,0	47,4	47,1	75,5	102,3	82,3	113,2	**100,0**
2015-16	150,9	153,9	109,2	79,8	47,1	43,0	56,2	45,7	48,1	43,8	79,2	66,5	**77,0**
2016-17	182,7	198,6	200,6	132,1	79,0	52,2	70,3	103,3	55,6	42,7	91,6	120,2	**110,7**
2017-18	105,3	166,8	133,1	86,4	59,2	46,2	53,7	57,8	84,7	64,7	96,5	263,1	**101,5**
Average	**178,0**	**171,3**	**158,8**	**126,2**	**99,2**	**84,1**	**71,8**	**69,4**	**74,0**	**66,5**	**80,2**	**130,3**	**109,2**

- Characteristic elevations, levels and volumes of the Racovita reservoir

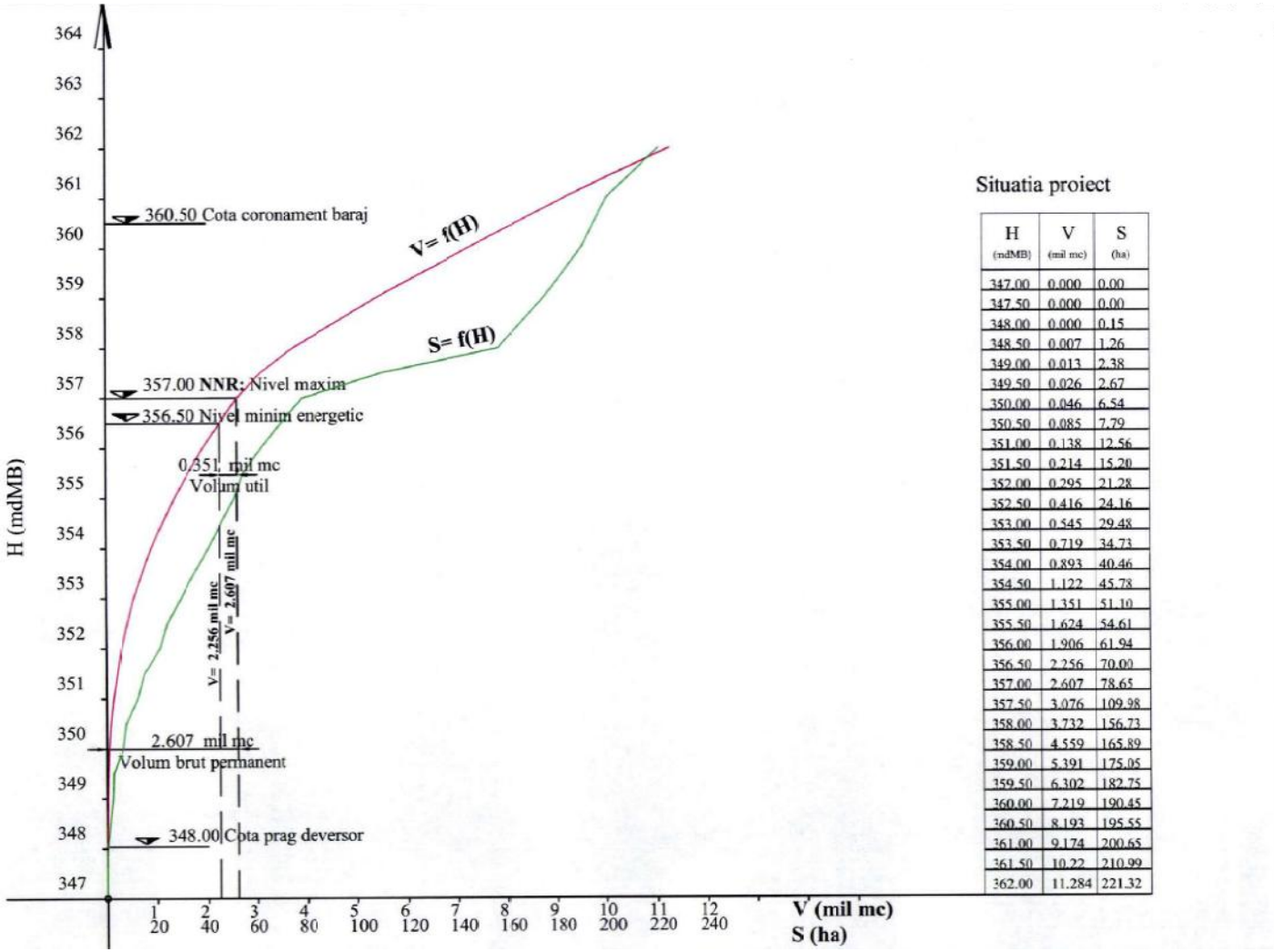


Situația 2012

H (mdMB)	V (mil mc)	S (ha)
360.50	0.000	0.00
361.00	0.001	0.41
361.50	0.022	3.75
362.00	0.064	8.27
362.50	0.129	13.90
363.00	0.318	33.63
363.50	0.513	43.18
364.00	0.774	53.41
364.50	1.160	72.32
365.00	1.568	84.60
365.50	2.004	93.05
366.00	2.482	98.13
366.50	2.989	103.84
367.00	3.536	112.65
367.50	4.124	123.16
368.00	4.768	133.84
368.50	5.590	159.62
369.00	6.443	183.04
369.50	7.435	205.61
370.00	8.494	219.87
370.50	9.658	234.64
371.00	10.850	243.77
371.50	12.239	267.74
372.00	13.626	284.71
372.50	15.106	303.91
373.00	16.670	319.77
373.50	18.311	334.89
374.00	20.078	361.77
374.50	21.993	401.55
375.00	24.167	456.13

Figure 18 Water level evolution in reservoir

- Characteristic elevations, levels and volumes of the Lotrioara reservoir

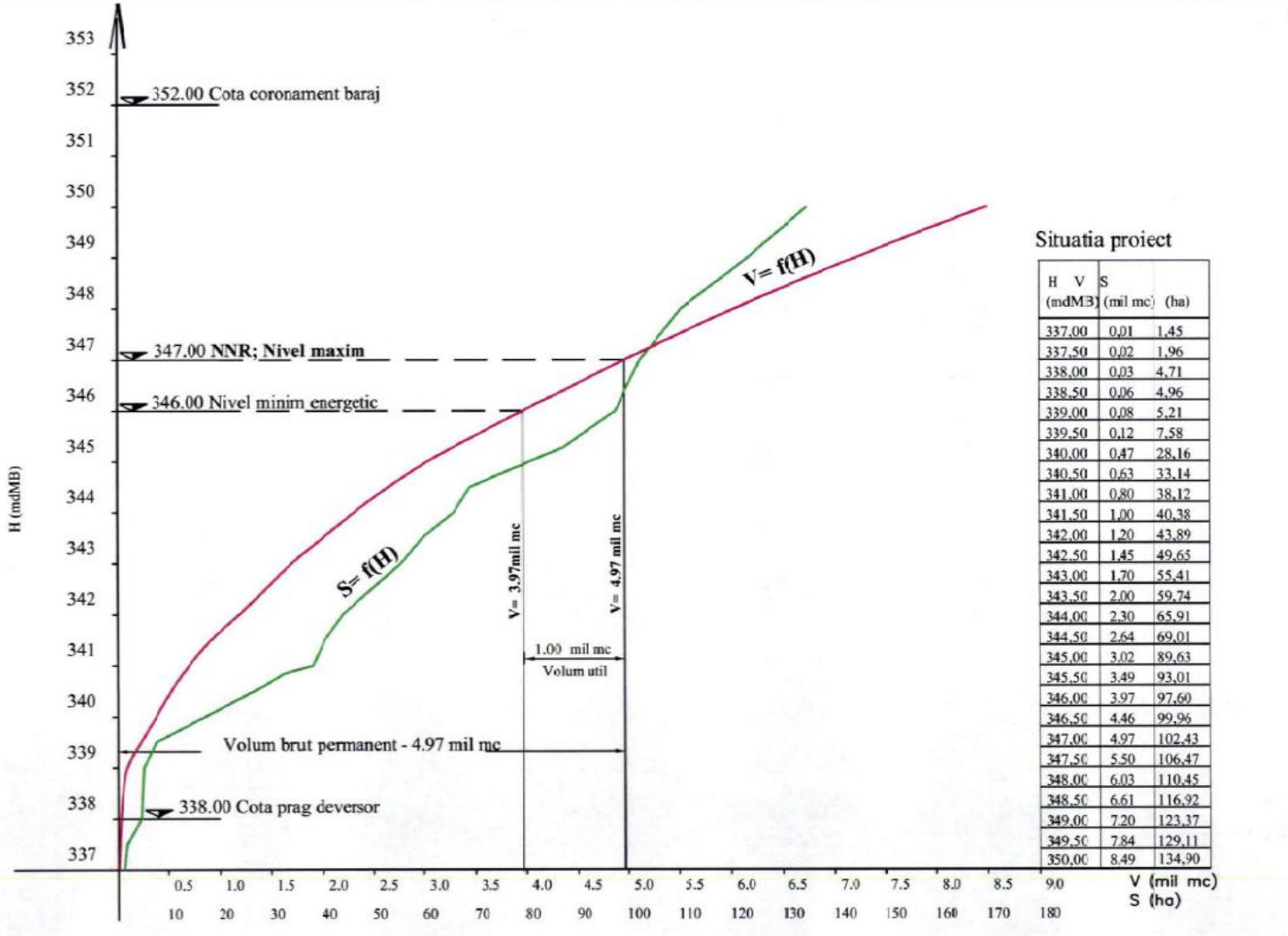


Situatia proiect

H (mdMB)	V (mil mc)	S (ha)
347.00	0.000	0.00
347.50	0.000	0.00
348.00	0.000	0.15
348.50	0.007	1.26
349.00	0.013	2.38
349.50	0.026	2.67
350.00	0.046	6.54
350.50	0.085	7.79
351.00	0.138	12.56
351.50	0.214	15.20
352.00	0.295	21.28
352.50	0.416	24.16
353.00	0.545	29.48
353.50	0.719	34.73
354.00	0.893	40.46
354.50	1.122	45.78
355.00	1.351	51.10
355.50	1.624	54.61
356.00	1.906	61.94
356.50	2.256	70.00
357.00	2.607	78.65
357.50	3.076	109.98
358.00	3.732	156.73
358.50	4.559	165.89
359.00	5.391	175.05
359.50	6.302	182.75
360.00	7.219	190.45
360.50	8.193	195.55
361.00	9.174	200.65
361.50	10.22	210.99
362.00	11.284	221.32

Figure 19 Water level evolution in the Lotrioara reservoir

- Characteristic elevations, levels and volumes of the Câineni reservoir

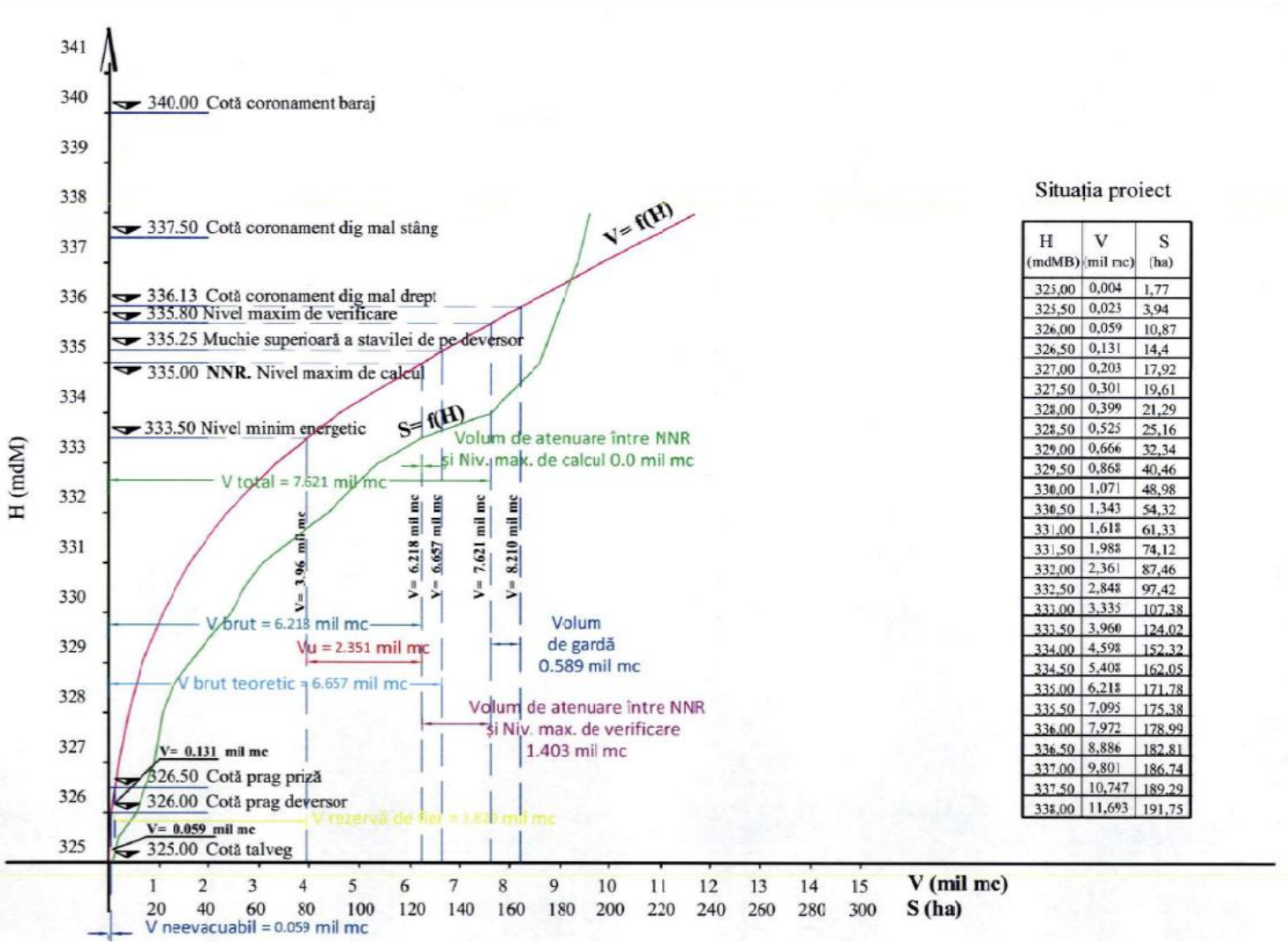


Situatia proiect

H (mdMB)	V (mil mc)	S (ha)
337,00	0,01	1,45
337,50	0,02	1,96
338,00	0,03	4,71
338,50	0,06	4,96
339,00	0,08	5,21
339,50	0,12	7,58
340,00	0,47	28,16
340,50	0,63	33,14
341,00	0,80	38,12
341,50	1,00	40,38
342,00	1,20	43,89
342,50	1,45	49,65
343,00	1,70	55,41
343,50	2,00	59,74
344,00	2,30	65,91
344,50	2,64	69,01
345,00	3,02	89,63
345,50	3,49	93,01
346,00	3,97	97,60
346,50	4,46	99,96
347,00	4,97	102,43
347,50	5,50	106,47
348,00	6,03	110,45
348,50	6,61	116,92
349,00	7,20	123,37
349,50	7,84	129,11
350,00	8,49	134,90

Figure 20 Water level evolution in the Câineni reservoir

- Characteristic levels and volumes of the Robești reservoir

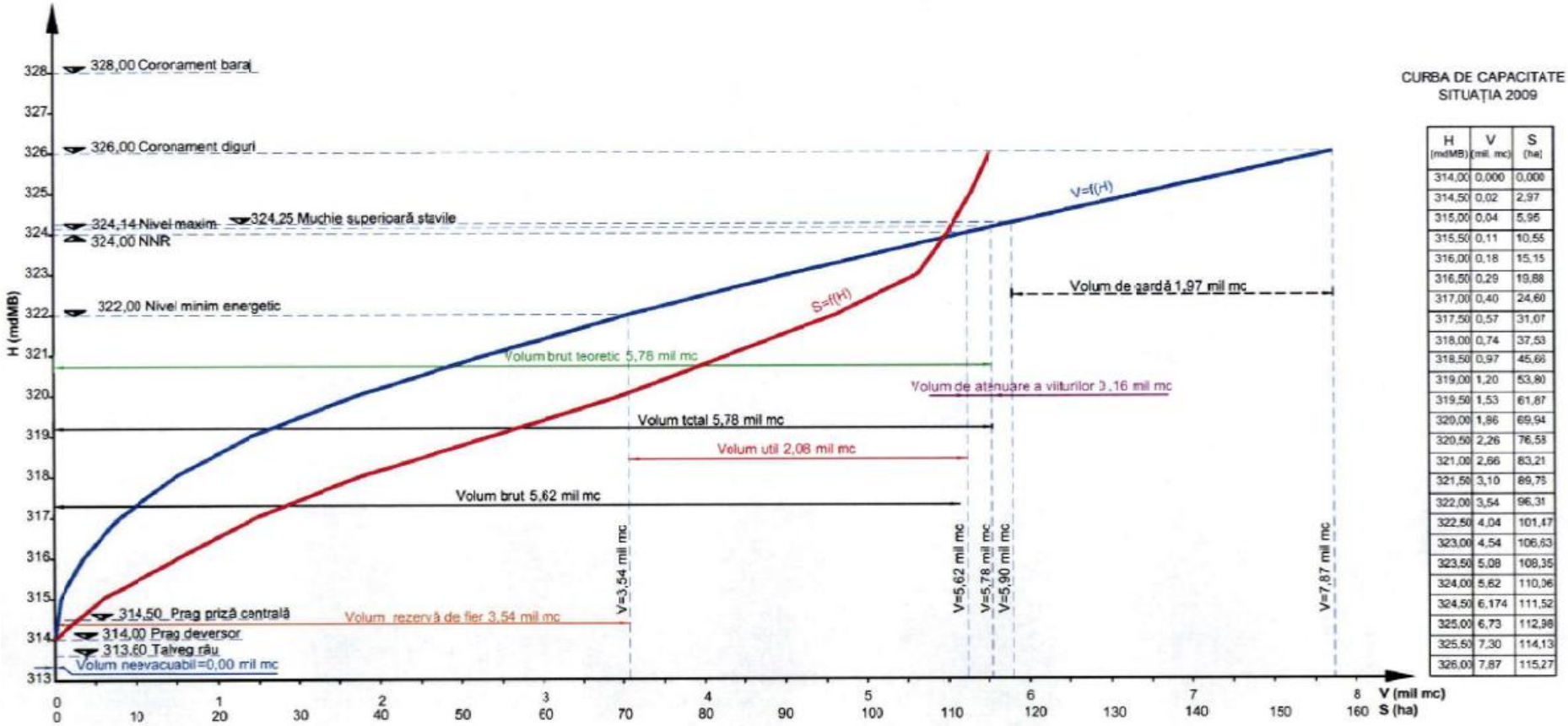


Situația proiect

H (mdMB)	V (mil mc)	S (ha)
325,00	0,004	1,77
325,50	0,023	3,94
326,00	0,059	10,87
326,50	0,131	14,4
327,00	0,203	17,92
327,50	0,301	19,61
328,00	0,399	21,29
328,50	0,525	25,16
329,00	0,666	32,34
329,50	0,868	40,46
330,00	1,071	48,98
330,50	1,343	54,32
331,00	1,618	61,33
331,50	1,988	74,12
332,00	2,361	87,46
332,50	2,848	97,42
333,00	3,335	107,38
333,50	3,960	124,02
334,00	4,598	152,32
334,50	5,408	162,05
335,00	6,218	171,78
335,50	7,095	175,38
336,00	7,972	178,99
336,50	8,886	182,81
337,00	9,801	186,74
337,50	10,747	189,29
338,00	11,693	191,75

Figure 21 Water level evolution in Robești reservoir

- Characteristic elevations, levels and volumes of the Cornetu reservoir



H (mdMB)	V (mil. mc)	S (ha)
314,00	0,000	0,000
314,50	0,02	2,97
315,00	0,04	5,95
315,50	0,11	10,55
316,00	0,18	15,15
316,50	0,29	19,88
317,00	0,40	24,60
317,50	0,57	31,07
318,00	0,74	37,53
318,50	0,97	45,66
319,00	1,20	53,80
319,50	1,53	61,87
320,00	1,86	69,94
320,50	2,26	76,53
321,00	2,66	83,21
321,50	3,10	89,75
322,00	3,54	96,31
322,50	4,04	101,47
323,00	4,54	106,63
323,50	5,08	108,35
324,00	5,62	110,06
324,50	6,174	111,52
325,00	6,73	112,98
325,50	7,30	114,13
326,00	7,87	115,27

Figure 22 Water level evolution in the Cornetu reservoir

Table 41 Monthly and annual flow rates at CHE Cornetu (m^3/s) in the period 2002-2021

Year	Month												Annual Average
	I	II	III	IV	V	VI	VII	VIII	XIX	X	XI	XII	
2002	-	-	-	18,0	51,0	85,0	71,0	137,0	67,0	73,0	100,0	58,0	**55,0**
2003	75,0	50,0	110,0	178,0	96,0	46,0	50,0	5,0	40,0	63,0	62,0	41,0	**68,0**
2004	42,0	114,0	167,0	162,0	117,0	81,0	65,0	90,0	63,0	50,0	102,0	92,0	**95,4**
2005	61,0	98,0	178,0	211,0	295,0	172,0	224,0	241,0	156,0	98,0	75,0	108,0	**159,8**
2006	95,7	79,3	199,9	318,7	164,0	196,0	103,3	95,5	86,2	57,3	65,7	50,1	**126,0**
2007	73,4	105,0	151,5	100,3	106,0	74,0	44,9	81,4	140,3	103,0	138,7	116,1	**102,9**
2008	71,9	84,6	136,2	199,5	163,9	106,7	90,8	61,6	46,2	103,1	58,4	93,4	**101,4**
2009	73,6	89,1	166,2	150,1	85,6	111,0	143,5	73,3	45,2	55,5	78,3	53,1	**93,7**
2010	106,9	108,5	136,4	205,3	178,0	179,0	259,5	142,7	78,0	65,5	60,0	127,8	**137,3**
2011	82,9	70,9	95,1	167,0	134,4	169,4	146,7	82,1	39,0	39,2	31,3	30,9	**90,7**
2012	31,5	27,8	74,5	167,8	177,1	152,3	40,8	28,8	26,0	26,8	29,7	31,1	**67,9**
2013	31,4	42,6	67,4	114,5	69,2	86,2	57,5	36,2	39,9	76,7	48,9	33,2	**58,6**
2014	35,8	49,8	49,1	121,8	127,2	139,8	106,0	75,7	40,5	41,9	39,2	67,4	**74,5**
2015	92,6	76,1	105,9	136,1	141,3	91,7	76,0	43,6	37,3	53,1	41,3	45,8	**78,4**
2016	32,3	75,0	60,9	165,2	177,5	191,8	118,3	73,8	42,9	64,2	96,1	49,9	**95,7**
2017	34,1	87,2	115,3	99,4	150,0	122,9	79,3	52,9	40,4	45,9	51,9	79,7	**79,9**
2018	57,7	92,8	184,6	164,3	73,8	87,5	218,6	113,1	49,8	36,0	35,3	40,2	**96,1**
2019	44,9	80,8	100,9	77,5	220,4	171,0	77,8	67,3	31,6	34,3	33,8	35,6	**81,3**
2020	27,7	48,9	76,3	49,4	89,4	212,5	120,8	61,6	41,2	61,2	59,6	62,4	**75,9**
2021	90.61	103.89	140.1	187.1	169.48	213.17	110.77	55.87	52.37	39.55	36.6	76.29	**106.32**
Average	**62.68**	**78,12**	**121,9**	**149,7**	**139,3**	**134,4**	**110,2**	**80,9**	**58,2**	**59,4**	**62,2**	**64,6**	**92,25**

The multi-year average flow over the period 2002 to 2021 represents 90% of the project's estimated average available flow of 102.1 m^3/s.

Figure 23 Level evolution in Lake Cornetu in the period 2008-2020

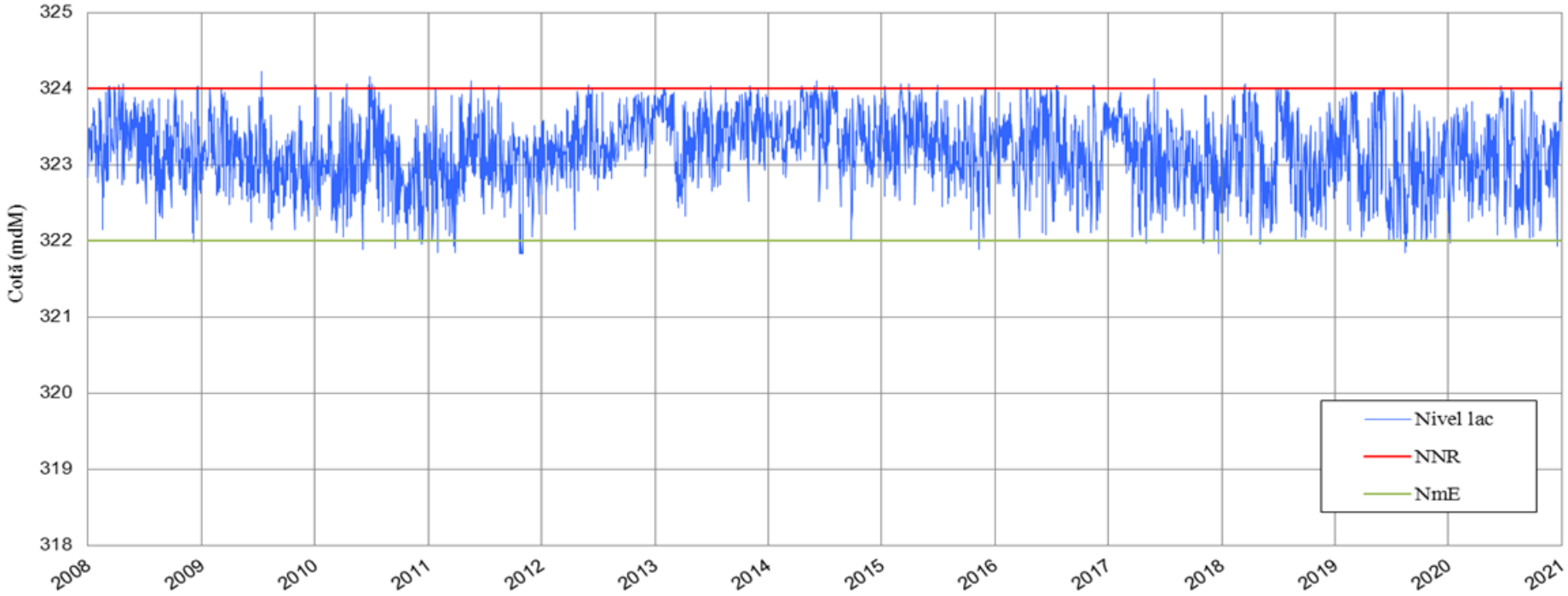


Table 42 Monthly and annual flow rates at Robești CHE (m^3/s) in the period 2012-2021

Year	Month												Annual Average
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2012	-	-	-	147,4	127,0	107,8	38,5	28,3	25,0	26,2	28,6	30,2	**46,6**
2013	30,5	40,8	6,5	108,0	65,8	77,6	55,4	34,4	39,1	73,6	48,0	32,6	**51,0**
2014	35,4	48,8	47,4	120,8	123,6	126,1	102,0	72,4	39,7	40,2	37,7	64,9	**71,6**
2015	88,5	72,5	102,8	131,7	133,5	86,4	72,9	41,4	35,3	49,8	39,3	43,0	**74,8**
2016	30,5	71,1	58,4	145,5	157,7	187,1	116,1	70,5	41,3	61,7	93,3	47,7	**90,1**
2017	32,3	82,8	110,4	92,3	137,6	117,2	73,8	48,6	36,9	41,1	47,4	73,3	**74,5**
2018	52,7	87,2	142,1	146,4	67,2	78,6	170,9	101,4	47,3	34,3	32,4	38,3	**83,2**
2019	42,1	75,7	95,5	71,3	169,6	158,0	73,9	65,7	30,4	31,7	31,0	33,2	**73,2**
2020	26,5	45,5	70,6	47,6	82,7	144,4	114,9	58,4	37,4	57,1	54,4	56,1	**66,3**
2021	76.94	93.61	117.34	163.10	142.16	182.47	98.48	52.52	47.87	35.94	32.33	68.00	**92.56**
Average	**42,0**	**62,2**	**75,6**	**117,4**	**120,7**	**126,6**	**91,7**	**57,4**	**38,0**	**45,2**	**44,5**	**48,7**	**72,4**

The multiannual average flow rate over the period 2012 - 2021 represents about 71% of the average available flow estimated at the project of 101.6 m^3/s.

Figure 24 Evolution of the water level in Lake Robești between 2008-2020

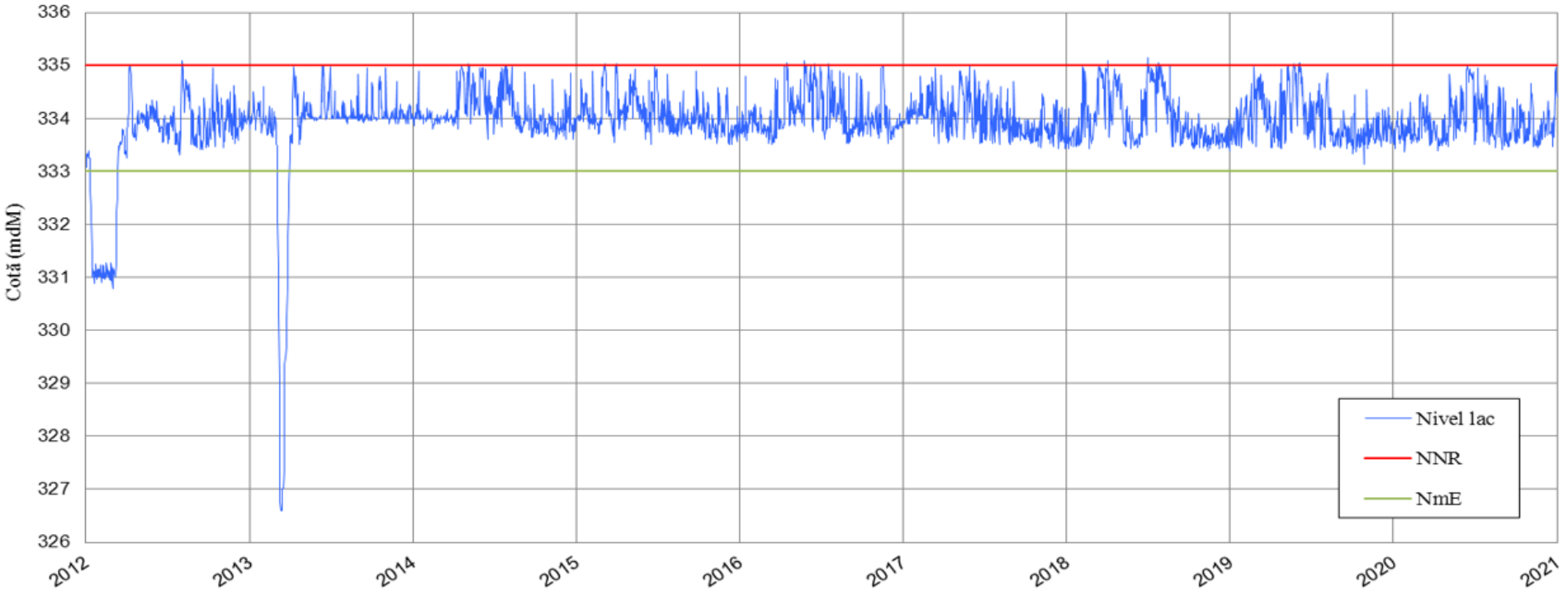
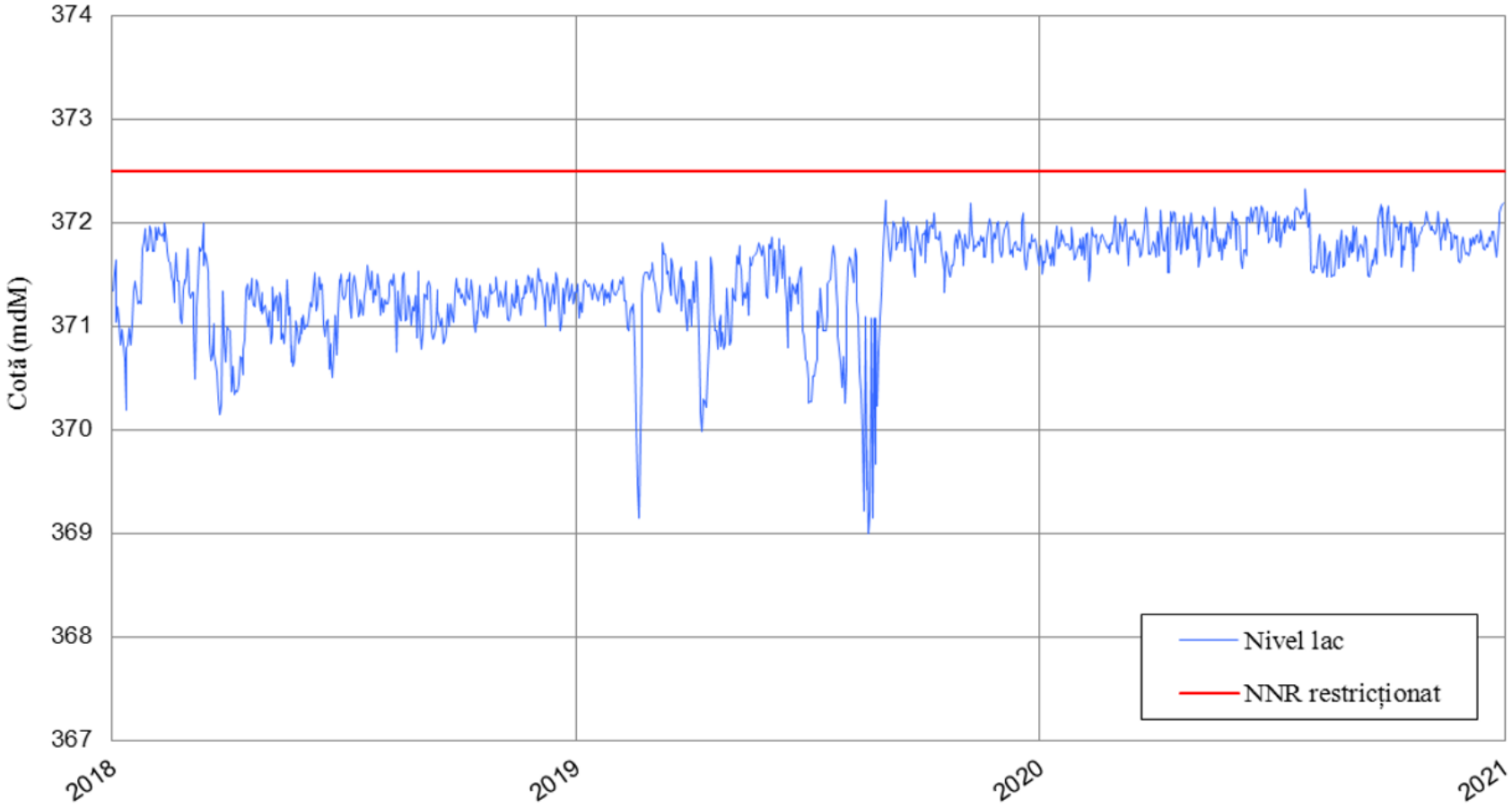


Table 43 Monthly and annual flows at CHE Racovița (m^3/s) in 2019-2021

Year	Month												Annual Average
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
2019	-	-	-	-	-	-	-	-	11,3	15,8	12,9	12,1	**13,0**
2020	9,2	28,5	47,3	27,8	61,7	172,2	89,7	33,2	18,8	37,8	37,0	34,8	**49,8**
2021	51.68	78.57	102.11	144.57	120.94	179.77	81.99	37.06	32.87	20.71	17.83	53.35	**76.79**

The average annual average flow rate used in the year 2021 represents about 97% of the average available flow estimated at the project of 79.2 m^3/s.

Figure 25 Level evolution in Lake Racovița in 2018-2020



1.3.3 Information on the production to be realized and the resources used for energy production

In order to evaluate the revenues obtained from the use of electricity and to determine the technical-economic indicators, the average energy production following the completion of the works proposed by this study was determined.

Electricity generation

- *CHE Cornetu*

Energy produced and operating hours

The table below shows the electrical energy produced by the CHE Cornetu and the operating time of the groups from commissioning to the present.

Table 44 Annual energy produced at CHE Cornetu (PIF 2002)

Nr. crt	Year	Running time (hours)		Energy produced (MWh)		
		HG1	HG2	HG1	HG2	Total
1	2002	5.035	2.550	37.843	1.917	39.760
2	2003	3.436	3.399	26.101	25.819	51.920
3	2004	3.647	4.648	33.212	42.328	75.540
4	2005	5.668	5.948	60.945	63.955	124.900
5	2006	5.078	5.175	49.601	50.549	100.150
6	2007	4.717	3.644	46.805	36.158	82.963
7	2008	4.681	4.147	43.399	38.449	81.848
8	2009	3.947	3.864	37.736	37.124	74.860
9	2010	5.439	5.027	54.908	50.568	105.476
10	2011	3.752	4.064	34.132	37.168	71.300
11	2012	2.816	3.155	24.806	28.028	52.834
12	2013	2.658	2.887	22.849	24.683	47.532
13	2014	3.292	3.455	29.291	31.325	60.616
14	2015	3.693	3.940	31.541	31.703	63.244
15	2016	4.055	3.957	37.409	38.642	76.051
16	2017	3.681	3.546	32.857	31.840	64.697
17	2018	3.973	4.193	38.365	37.013	75.378
18	2019	3.400	3.868	30.159	33.034	63.193
19	2020	3.608	3.452	30.296	30.096	60.392
20	2021					82.856
21	2022					28.167
Average		-	-	-	-	**70.652**

The two groups of CHE Cornetu operate roughly equally.

The average energy production of CHE Cornetu, from the PIF to date, has been 70.65 GWh/year, i.e. 81% of the energy estimated at the project.

- CHE Robești

Energy produced and operating hours

The table below shows the electrical energy produced by CHE Robești and the operating time of the groups from commissioning to the present.

Table 45 Annual energy produced at CHE Robești (PIF 2012)

Nr. crt	Year	Running time (hours)		Energy produced (MWh)		
		HG1	HG2	HG1	HG2	Total
1	2012	2.252	1.523	17.254	10.118	27.372
2	2013	2.574	2.541	17.569	17.464	35.033
3	2014	3.688	3.489	25.955	23.086	49.041
4	2015	3.951	4.006	25.382	25.796	51.178
5	2016	4.072	4.224	29.883	30.880	60.763
6	2017	3.849	3.971	25.874	26.568	52.442
7	2018	4.264	4.371	28.007	28.545	56.552
8	2019	3.994	3.527	26.785	23.509	50.294
9	2020	3.329	3.630	22.049	24.371	46.420
10	2021					64.374
11	2022					24.179
Average		-	-	-	-	**47.059**

The two CHE Robești groups operate roughly equally.

The average energy production of CHE Robești, from the PIF to date, has been 47.06 GWh/year, i.e. 66% of the energy estimated at the project.

- CHE Racovița

Energy produced and operating hours

The table below shows the electrical energy produced by CHE Racovița and the operating time of the groups from commissioning to the present.

Table 46 Annual energy produced at CHE Racovița (PIF 2019)

Nr. crt	Year	Running time (hours)		Energy produced (MWh)		
		HG1	HG2	HG1	HG2	Total
1	2014					0.536
2	2015					4.333
3	2016					0.000
4	2017					0.393
5	2018					0.040
6	2019	408	339	1.483	1.205	2.688

7	2020	2.650	2.836	13.335	14.230	27.565
8	2021					43.751
9	2022					13.568
AVERAGE						**28.295**

The two CHE Racovița groups operate roughly equally.

The energy production of CHE Racovița, in the years 2020-2021, was 28.30 GWh/year, i.e. 48% of the energy estimated in the project.

It should be noted that, at present, the Racovița CHE operates with the upstream level restricted to 372.50 mdM (1 m below NNR) and with the downstream level at 362.00 mdM - the upper level of the bottom sill (built in 2005 to stabilize the Olt river embankment in the section of the CF railway bridges), compared to 358.00 mdM - the design level. These modifications lead to a reduction of the gross head from 15.5 m to 10.5 m and of the maximum flow swallowed by the turbine from 165.0 m^3/s to 156.6 m^3/s.

Under these conditions, the average annual energy production at the Racovița CHE decreases to approx. 45.6 GWh/year.

1.3.4 Estimates of the workforce employed by the realization of the investment: in the realization phase, in the operation phase including the utilities provision

a) <u>Workforce</u>

a.1.) work to complete the investment

The table below gives an estimate of the workforce required to complete the investment, by professional qualification, i.e. trades specific to this type of construction work; it should be noted that not all of these posts may be filled simultaneously during the period of the investment.

Table 47 Labor required during the investment period

professional qualification / specific profession	step LOTRIOARA	step CÂINENI
- Site Manager	1	1
- Civil Engineer	2	4
- Electro-Mechanical Engineer	1	2
- TESA staff	2	2
- Foreman	2	3
- Surveyor	2	2
- Concrete Laboratory Operator	2	2
- General Transportation Vehicle Driver	3	3
- Dump Truck Driver (on-site)	3	5
- Construction Equipment Operator	3	5
- Carpenter	3	5
- Reinforcement Steel Worker	4	7
- Concrete Worker	4	7
- Unskilled Worker	10	20
TOTAL	**42**	**68**

a.2.) in service

professional qualification / specific profession	step LOTRIOARA	step CÂINENI
- shift manager	1	
- operating personnel	10	10
TOTAL	21	

b) <u>How utilities are provided</u>

Water supply

The water supply during the execution period will be done through the existing site organizations within the project "Cornetu Avrig hydropower Project".

Drinking water will be supplied to the staff by means of flat water dispensers, which will be provided by a specialized company at the established locations, with all consumables being collected and provided. In this way this activity will not generate waste on site.

- **Waste water disposal**

During the execution of the works, the site organizations will be equipped with ecological toilets, which will be emptied periodically by specialized and authorized companies.

- **Technological water supply**

The technological water supply, during the execution period, is carried out by the existing site organizations within the initial project "Cornetu Avrig hydropower Project".

- **Heat supply**

During the execution period, the containers of the site organization are equipped with equipment for the provision of thermal agent.

Heating during the operational period will be provided by electrically powered appliances, as foreseen in the initial project.

1.4. Estimation, by type and quantity, of expected waste and emissions

a) Waste generated

Implementation period

The main categories of waste that will result during this period are:

* ***sterile*** (code 17.05.04)

This category of waste will result from the following operations:

- (re)opening of the quarry;
- (re)opening technology platforms.
- completion of various works (large water unloader; sluice gates; balance surge tank; etc);
- Restoration of the upstream face of the dam;
- maintenance of existing technological roads in the works area;

**** asphalt waste*** (code 17.01.01)

This category of waste will result from the following operations:

- precast concrete to be removed from the upstream face of the dam;
- waste from concrete production/turning;
- breaking of technological platforms on completion of works.
- demolition of existing buildings on the site (including those after the works have been completed - temporary constructions);

Being inert waste, we believe that it could also be deposited at the same landfills; obviously, a possible crushing of this waste would be a positive factor in its integration into the landfills.

An alternative solution would be the transportation of this waste to an ecological landfill that will be operational in the area at the time of the works. Clearly, this solution would involve additional costs, which would be borne by the holder of the investment; it is also necessary to obtain the prior agreement of the operator of the landfill to accept this asphalt waste.

It should also be mentioned the possibility of identifying at that time local authorities/economic operators interested in using (e.g. road works/regularization etc.) such concrete waste.

It should be noted that at the time of drafting this SF it is not known when the works to complete this drop step will start.

* ***residual material - non-hazardous*** (code (assimilation): code 17.01.01)

The residual material remaining in the slurry preparation vessel required to make the sealing veil, or the injections in the adit, will be deposited at the ponds.

* ***waste material - hazardous*** (code (assimilation): code 17.06.05*)

This category includes asbestos sheets on the roofs of buildings to be demolished, including temporary constructions (sheds) that were necessary for buildings already completed.

* ***waste material - hazardous*** (code (assimilation): code 19.08.10*)

The residual material remaining in the oil separators will be managed by the contractor in accordance with its own procedures for the management of this category of waste.

* ***wood waste*** (code (assimilation): 03.03.01)

The wood material resulting from the operation of removal of woody vegetation (trees, shrubs, branches) will be returned to the municipalities in the area (if they express interest) as representative of the Romanian state.

The remaining waste (twigs, leaves, grasses, weeds) will be transported and deposited at the landfill; over time, the presence of these vegetation residues will favor the renaturation process of the landfill.

* ***Iron and steel scrap*** (code 17.04.05)

This category of waste, resulting from the rebar cutting operations, will be temporarily stored in a special container which the contractor will dispose of from the site in accordance with its own waste management procedures.

**** packaging waste paints, varnishes, primers*** (code 15.01.10*)

This category of waste, considered "hazardous", will be managed by the contractor in accordance with his own procedures for the management of this category of waste.

**** household waste*** (code 20.03.01)

The waste from the contractor's staff will be collected in bins located at the various work points and periodically transported by an economic operator authorized to carry out such activities to the (green) depot to which the household waste from the operating staff is also transported.

The management of all these types of waste will be carried out in accordance with the legislation in force at the time of the works and in compliance with the conditions/measures that will be imposed by the regulatory acts that will be issued in order to realize this investment.

SPEEH Hidroelectrica and the Executor will establish by mutual agreement the management (record keeping, transportation, completion of documents, etc.) - in accordance with the legislation in force at the time - of the different types of waste generated during this period.

It is forbidden to leave waste on water and land.

Before the works start, an "Environmental Protection Agreement" will be concluded between SPEEH Hidroelectrica and the Executor, which will clearly stipulate the obligations and responsibilities of the signatory parties.

If all these categories of waste will be managed in accordance with the legislation in force, we can consider that the *negative impact* thus generated will be *insignificant.*

Operating period

The main categories of waste that will result during this period are:

**** household waste*** (code 20.03.01)

At the moment, household waste from the operating staff is collected in bins located in the plant building and is periodically collected by an economic agent with which the operator has a service contract.

This contract will also be extended to cover the collection of household waste from the operating staff of the hydrotechnical works.

**** hazardous waste*** (lubricating oil (code 13.02.04*); transformer oil (code 13.03.10*))

All the equipment/installations to be installed will be state-of-the-art so that they will have a long period of operation (more than 25 years) until the time when the question of retrofitting and, consequently, of removing the oil from them will arise.

The management of oil removed from equipment/facilities will be done in accordance with the beneficiary's internal procedures in force at that time.

If all these categories of waste are managed in accordance with the legislation in force, the *negative impact of* waste management will be one *insignificant.*

b) Emissions

The main sources of pollution in the project area are air emissions from:

- Excavation, excavation and landscaping activities.
- Moving activities in the site organization of the materials used.
- Transportation activities

Emissions from non-road mobile sources

Execution stage

In the execution phase, non-road mobile sources will be represented by the machinery and equipment involved in the construction works (bulldozer; excavator; crane; compactor; front-end loader). The emissions from the operation of these sources have been estimated using the calculation methodology *EMEP/EEA - 1.A.4 Non road mobile machinery, Tier1*, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

Operating stage

At this stage, the non-road mobile sources will be electric generators. It should be noted that these sources will operate occasionally, only in the event of power grid failures. The pollutant emissions from these sources have been estimated using the calculation methodology EMEP/EEA - 1.A.4 Non road mobile machinery, TIER1, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

The results of the emission calculations are shown in the following table.

Table 48 Emissions from non-road mobile sources in the implementation phase

Source name	Pollutant	Mass flow			Emission concentration
		kg/h	g/h	g/s	

					(mg/m^3)*
Mobile crane	Particulates	0,015	14,09	0,004	132,19
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5
Excavator/Front Loader	Particulates	0,02	24,51	0,01	132,5
	SO_2	0,003	2,91	0,001	15,7
	NO_x	0,38	380,06	0,11	2054,4
	CO	0,13	125,50	0,03	678,4
Bulldozer	Particulates	0,02	21,01	0,01	133,0
	SO_2	0,002	2,50	0,001	15,8
	NO_x	0,33	325,77	0,09	2061,8
	CO	0,11	107,57	0,03	680,8
Compactor	Particulates	0,01	14,00	0,004	132,1
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5

* Due to the estimated mass flow rates for the calculated pollutants being below the limit value of Order no. 462/1993 - Annex 1, the maximum permissible values of pollutant concentrations of the above mentioned Order do not apply to the analyzed sources.

Emissions from unabated stationary sources

Execution stage

The uncontrolled stationary sources of air pollution during the execution period of the works proposed for the realization of the objective are represented by the earth moving activities (stripping, digging, filling, levelling, loading - unloading, transport) for the site development. These operations will mainly be sources of dust emissions into the atmosphere.

An additional source of dust is wind erosion, which accompanies construction works. This phenomenon occurs when, for a certain period of time, uncovered areas of land are exposed to wind action. Wind erosion can, however, be controlled by appropriate measures to reduce the spatial and temporal extent of unvegetated land areas.

Dust generated by material handling and wind erosion is mainly of natural origin (soil particles, mineral dust).

The cutting and welding operations of the metal elements that will make up the buildings will generate emissions of: fine particles containing mainly metal oxides (iron oxide, manganese oxide, nickel oxide, etc.), carbon monoxide resulting from the decomposition of carbon dioxide in the atmosphere in the arc zone, nitrogen dioxide resulting from the oxidation of atmospheric nitrogen due to the high temperature in the arc zone, ozone. These sources will not, however, generate significant amounts of pollutants in the atmosphere and have not been included in the calculation of atmospheric emissions.

Emission concentrations cannot be associated with the sources characteristic of the activities during the execution phase of the works, as they are free, open, undirected sources.

For the same reason, they cannot be evaluated in relation to the provisions of Order 462/1993 and other emission regulations.

Operating stage

There will be no uncontrolled stationary emission sources during operation

Emissions from mobile sources

Execution stage

During the execution of the works, the mobile sources will be the heavy goods vehicles for the transportation of construction materials and the vehicles of the employees involved in the construction works. All these sources will not operate simultaneously on the site, and their actual operating time will be short, sufficient for moving around the site and parking them in specially designated areas.

The estimation of pollutant emissions from mobile sources was carried out using the EMEP/EEA calculation methodology - 1.A.3.b.b.i-iv Road transport 2016, Tier 1, which takes into account the type of vehicle, fuel type, fuel consumption used and emission factors corresponding to the characteristic pollutants. For this purpose we considered an average number of 10 heavy-duty diesel vehicles per day, 10 light-duty diesel vehicles per day and 5 light-duty gasoline vehicles per day.

Operating stage

In the operation phase of the objective, the mobile sources will be the employees' vehicles, i.e. 10 vehicles per day (estimated).

We specify that the sources of emissions from employee vehicles will not operate simultaneously on the site, with the busiest period of a day being at the start of the shift. In addition, the duration of a vehicle's operation on the site will be as short as necessary for the time needed to drive to the parking place and to perform parking maneuvers.

Table 49 Mobile source emissions

Types of mobile sources	Fuel type	Pollutants	Emissions (g/h)	Run-time emissions (g/h)	Emissions during operation (g/h)
Employee vehicles	Diesel	CO	8,45	66,55	679,19
		NO_x	33,36	259,14	2641,58
		Particulates	2,94	22,08	225,09
		SO_2	0,07	0,39	3,34
Employee vehicles	Petrol	CO	211,36	420,96	4293,78
		NO_x	22,19	43,98	443,66
		Particulates	0,08	0,17	1,68
		SO_2	0,29	0,53	4,19

Order No 462/1993 does not set limits for mobile sources. The Ordinance indicates that pollutant emissions from road motor vehicles are limited as a preventive measure by the technical conditions laid down in the technical inspections carried out periodically throughout the period of use of road motor vehicles registered in the country.

Preventive limitation of emissions from motor vehicles is achieved through the technical conditions imposed at type-approval for registration for entry into service and throughout their service life through mandatory periodic roadworthiness tests.

c) *Demolitions*

Demolition/decommissioning works are necessary to realize the project. The related information is presented below in tabular format. It should be noted that volumes resulting from demolition have also been taken into account when estimating the amount of waste.

a) CHE Câineni

Table 50 Quantities of demolition works - CHE Câineni

Nr. crt	Material name	Quantity	UM	Comments
1	Breaking simple concrete (wall, screen)	297	mc	
2	Armed concrete smashers	1.460	mc	

b) CHE Lotrioara

Table 51 Quantities of demolition works - CHE Lotrioara - area spillway dam

Nr. crt	Material name	Quantity	UM	Comments
1	Demolition of existing infrastructure	8.000	Mc	
2	Demolition of the attic / bridge ramp phase 1	69.100	Mc	
3	Demolition of the attic/attic bridge phase 2	45.100	Mc	

d) Noise

The location of the project is located in anthropized areas, bordered mostly by 2 infrastructure objectives, on one side by the National Road DN7 and on the other side by the railway Sibiu - Rm. Vâlcea.

In order to determine the background noise in the project area, specific determinations were carried out with an integrating sound level meter on A, C weighting networks type 2250 Light BRUEL & KJAER BRUEL & KJAER.

- **Principle of the method**

For ambient noise measurements there are two main strategies:

- a single measurement is made under favorable weather conditions, while closely monitoring the source operating conditions;
- a long-term measurement or several point measurements, dispersed over time, with monitoring of meteorological conditions.

Both types of measurement require further processing of the measured data. Each result will have some uncertainty, which needs to be determined.

The principle of the method is the determination of the A-weighted equivalent continuous sound pressure level (LAeqT) using a class 1 integrating-averaging sound level meter.

Determination of LAeqT can be performed:

- by continuous measurement over the time interval T;
- by measuring the A-weighted equivalent continuous sound pressure levels over time subintervals of T in which the noise is stationary, LAeqT being obtained by calculation from the results of these measurements;
- by measuring the sound exposure levels of the individual events occurring over the time interval T, LAeqT being calculated from the results of these measurements;
- by combining the above methods.

The acoustic sources contributing to the total field exposure may or may not be distinct. Measurements shall be performed in the field, the determinations may be supplemented by computational steps, including the use of specific validated software.

- **Equipment**

- Integrating sound level meter on A,C weighting networks, class 1- Bruel&Kjaer 2250 Light, series 3011282

Technical specifications

- Class 1 precision integrating sound level meter;
- measuring range 16.4 dB - 140 dB(A);
- Frequency range 5 Hz - 18 kHz;
- frequency analysis module, provides real-time 1/1 and 1/3 octave analysis;
- frequency weightings A, B, C, Z;
- automatic/manual measurement mode;
- touchscreen;
- illuminated keyboard;

- USB interface, PC software

– Class 1 acoustic calibrator type 4231 - Bruel&Kjaer

Technical specifications

- In accordance with SR ISO 6926:2003;
- Sound pressure level 94± 0,2 dB or 114± 0,2 dB;
- Frequency 1000 Hz.

– Tripod sound level meter - Bruel&Kjaer

Determinations were carried out in the 4 project areas as follows:

- Zone 1 - DJ104F - Lake Racovița dam;
- Zone 2 - On the Racovița Dam;
- Zone 3 - Lotrioara dam;
- Zone 4 - At Câineni dam.

The values obtained are assessed in relation to:

➢ A-weighted equivalent continuous A-weighted sound pressure level, L_{AeqT} provided in SR 10009/2017 "Acoustics. Permissible limits of ambient environmental noise level", item 4.1 "Permissible limits of noise level at the boundary of functional spaces", Table 1, item 4, which states:

Table 52 Sound pressure level limits

No. crt.	**Functional spaces**	**A-weighted equivalent continuous A-weighted sound pressure level, L_{AeqT} (dB)**
1	Spaces for recreation and relaxation, medical and spa-climate treatment	45
2	School, nursery or kindergarten premises and children's playgrounds	75
3	Stadiums, open-air cinemas and theaters, open-air cultural, sporting and entertainment events[1)]	90[2)]
4	**Industrial premises and premises treated as industrial premises[3)]**	**65**
5	Markets, shopping areas, open-air restaurants[4)]	65
6	Parking[5)]	70
Note 1 - The boundary of such premises shall be deemed to be the space exclusively arranged for the specific activity and not the boundary of the property to which the premises belong, which may be wider Note 2 - The period of time to be taken into account for the application of the permissible limit is the actual period corresponding to the length of service Note 3 - Any space that has commercial manufacturing or maintenance activities (such as car service, car washes, etc.) and that is not located in an industrial zone established by the PUG. The boundary		

of the functional space is the property boundary of this space according to the cadastral plan (including land)
Note 4 - The boundary of such premises shall be deemed to be the boundary of the space for the specific activity and not the boundary of the property to which the premises belong, which may be wider
Note 5 - The boundary of this space shall be deemed to be the boundary of the space exclusively designated as a parking space and not the boundary of the property to which the space belongs, which may be wider, and the permissible limit shall apply only to parking spaces serving large economic objectives (shopping complexes, office buildings, etc.) or which are similar to parking spaces serving such objectives and shall not apply to parking spaces along arterial roads.

Table 53 Measured values of A-weighted equivalent continuous sound pressure level, L_{AeqT}

Sample code	Test method	UM	Value obtained	Permissible limit values
Zone 1	SR 6161-1/2022; SR ISO 1996-1:2016; SR ISO 1996-2:2018; PSL 28	dB(A)	**49,5**	**65**
Zone 2			**51,3**	
Zone 3			**59,4**	
Zone 4			**60,3**	

As can be seen from the table above, the noise values in the monitored area are currently below the maximum permissible thresholds.

Sources of vibration and noise during construction

During the construction works, noise sources will be temporary in nature, generating local effects for a limited time. The physical pollution associated with the project at this stage is caused by the noise and vibration generated by construction activities (vehicle and machinery engines, material handling, operation of earth-moving machinery used for site development, etc.).

The noise level regulated by STAS 10009/2017, "Urban acoustics, permissible noise level limits" is 65 dB(A) at the site boundary. According to the Order of the Ministry of Health No. 119/2014 for the approval of the Hygiene and Public Health Norms on the living environment of the population, the continuous equivalent weighted sound pressure level (AeqT), measured outside the dwelling according to the SR ISO 1996/2-08 standard, at 1.5 m height from the ground, shall not exceed 55 dB and the noise curve Cz 50. During the night (23:00 - 7:00), the continuous equivalent weighted sound pressure level shall not exceed 45 dB and the noise curve Cz 40.

In order to assess the level of impact generated by the proposed project, a noise source modeling was performed using the Sound Plan Essential 2.0 software application. A very likely scenario was considered, i.e. a scenario in which several noise sources operate simultaneously during the execution of the works, considering the following noise levels:

- 1 bulldozer 110 dB(A);
- 1 truck 105 dB(A);
- 1 compactor 100 dB(A);

- 1 crane 104 dB(A);

The sources of noise will be of temporary character, being represented by:

- ✓ construction operations loading/unloading/loading materials and equipment;
- ✓ operation of equipment and vehicles involved in construction/erection works;
- ✓ vehicular traffic necessary for carrying out the works.

Normally construction work will take place during the day between 08:00 - 18:00. There are, however, operations that need to be carried out continuously, such as pouring concrete for foundations, which may also require night work.

The results of the modeling carried out with the SoundPLAN software show that, during the construction phase, the noise level generated by the project will not have a significant impact on the quality of living in the neighboring villages at the level of the nearest receptors, the operation of the equipment used in the modeling generating a maximum noise level of about 58 dB. The noise generated by the construction activities is not able to modify the current noise level induced mainly by the motor traffic in the area.

At the level of protected areas, the noise generated by construction activities may lead to an increase in the equivalent noise level of up to 100 dB(A) over a distance of maximum 50 m, which could lead to a disturbance of species (especially birds) during the works, but given the site area in a forested area this increase will be significantly reduced in the immediate vicinity of the project.

At the same time, taking into account the location of the works in relation to inhabited areas, the noise value falls within the limits set by Order No. 119/2014.

Taking into account that the works carried out in the analyzed project will have a low contribution to the noise level generated in inhabited areas, we consider that no measures are necessary to reduce the noise level in relation to the settlements.

Sources of vibration and noise during operation

There will be no additional sources of noise and vibration during the operation of the project compared to the current road traffic.

2. DESCRIPTION OF FEASIBLE ALTERNATIVES

Alternative "zero" - the project is not finalized and the works will be dismantled

Under this alternative it is envisaged to halt the completion of the project and to dismantle the works already completed and restore the land to its original state.

Given the very long period of time in which the investments have been realized up to the present stage and the elements and volumes of works already completed, their dismantling would generate a significant negative impact on the conservation objectives of the protected areas in the area of influence.

A huge amount of waste, construction waste, ferrous waste, etc. will be generated during the decommissioning period.

The decommissioning works will be carried out over a minimum period of 5 years, during which time noise will be generated on the surface of the protected areas creating a continuous disturbance of the species, which may lead to substantial changes in their distribution patterns within the protected areas, and decreases in the population sizes of species of Community interest (e.g. breeding disturbance for bird species, noise and vibration disturbance during hibernation for chiropteran species of Community interest).

The handling of large volumes of earth and concrete has the potential to lead to increased air pollution (especially dust particles) and given the long period of time over which these works are expected to be carried out, dust deposition on the foliage of tree/shrub/plant species in the immediate vicinity of the site may occur, affecting their photosynthetic capacity, leading to drying and degradation of habitats of conservation interest.

Given that the decommissioning work on the already completed targets will take place over a long period of time and that they will have to pass through inhabited areas, there is the potential to affect the human population by creating nuisance and noise from the heavy goods vehicles transporting the waste generated.

The work to restore the land to its original state will require borrow soil, the majority of which is topsoil, and this volume can only be sourced from borrow pits, which will have an additional negative impact on the soil. Moreover, borrow soil may be contaminated with roots, bulbs, rhizomes, etc. of invasive plant species, which is a potential pathway for these species to enter the area of the protected areas, with the risk of their further spread into habitats of Community interest, leading to a subsequent degradation of the conservation status of these habitats.

Alternative "one" - completing the investment

"Romania's Energy Strategy 2022 - 2030, with the perspective of 2050" has as its vision the growth of the energy sector in conditions of sustainability, economic growth and accessibility, in the context of the implementation of the 2030 climate and energy policy framework of the Clean Energy for All Europeans legislative package, with the setting of targets for the reduction of greenhouse gas emissions, non-renewable energy sources and energy efficiency and with the perspective of Romania's implementation of the European Ecological Pact 2050. The development of the energy sector is part of Romania's development process. Growth means: using innovative clean technologies in all sub-sectors of the energy system and maintaining Romania as an energy supplier, a factor of energy stability in the South-European area; building new production capacities based on advanced clean technologies; transition from solid fossil fuels (coal, lignite, etc.) to natural gas and renewable energy sources; retrofitting and modernization of existing production capacities and their compliance with environmental

standards, strengthening of energy transmission and distribution networks; encouragement of decentralized energy production; encouragement of increased domestic consumption in energy-efficient conditions; export. The national energy system will thus be stronger, safer and more stable, and Romania will maintain its role as an energy security provider in the region.

Within the feasibility study, two variants were analyzed from the technical-economic point of view and the feasibility of the whole development:

- **Variant 1 - recalculation of the investment indicators for the approved variant, according to the constructive solution of the approval act, Decree no. 24/03.02.1989;**
- **Variant 2 - recalculation of investment indicators in the optimized variant.**

Option 1

The implementation of "Romania's Energy Strategy 2022 - 2030, with the perspective of 2050" also contributes to the completion of the works related to the Cornetu Avrig hydropower scheme, which was approved by Decree no. 24/03.02.1989, by recalculating the investment indicators for the approved variant.

According to the decree approving the sector, the hydro-engineering works had their own reservoirs, spillway dams and hydropower power stations in the retention front. The provisions of the decree envisaged the upgrading and modernization of the waterways.

According to the approval decree, the **CHE Cornetu development** included:

- Cornetu Reservoir, NNR = 324,00 mdMB; Volume in lake: ca. 7,3 mil. m^3;
- Cornetu Dam: 4 spans (16 x 10); H = 21.50 m; L = 82.00 m;
- Cornetu plant: equipped with Kaplan turbines with Qi = 2 x 165 mc/s.

According to the approval decree, the **Robești CHE development** included:

- Robești Reservoir, NNR = 336,00 mdMB; Volume in lake: ca. 6,8 mil. m^3;
- Robești Dam: 4 openings (16 x 10); H = 21.50 m; L = 82.00 m;
- Robești power plant: equipped with Kaplan turbines with Qi = 2 x 165 mc/s.

According to the approval decree, the **CHE Câineni development** included:

- Câineni Reservoir, NNR = 348,00 mdMB; Volume in lake: ca. 5,8 mil. m^3;
- Câineni Dam: 4 spans (16 x 10); H = 21.00 m; L = 82.00 m;
- Câineni power plant: equipped with Kaplan turbines with Qi = 2 x 165 mc/s.

According to the approval decree, **the Lotrioara CHE development** included:

- Lotrioara Reservoir, NNR = 360,00 mdMB; Volume in lake: ca. 5,3 mil. m^3;
- Lotrioara Dam: 4 openings (16 x 10); H = 21,50 m; L = 82,00 m;
- Lotrioara power plant: equipped with Kaplan turbines with Qi = 2 x 165 mc/s.

According to the approval decree, the **Racovița CHE** included:

- Racovita Reservoir, NNR = 373,50 mdMB; Volume in lake: ca. 14,2 mil. m^3;
- Racovita Dam: 4 openings (16 x 10); H = 21.50 m; L = 82.00 m;
- Racovita power plant: equipped with Kaplan turbines with Qi = 2 x 165 mc/s.

Each hydropower installation was planned to be classified in class a-III, of constructive importance, according to STAS 4283/1983. For this constructive importance class, the verification flow is Q 0,5% +Δ Q and the calculation flow Q_2 % according to STAS 4068/ 1983.

Each hydropower installation consists of:

- the hydrotechnical node consisting of the spillway dam and the hydropower power plant, which are adjacent.

- weir-type spillway dam with 4 spillway openings, equipped with mechanically operated segment flap gates.
- the dam-type hydropower power plant will be equipped with 2 Kaplan-type turbines with an installed flow of $Q_i = 330\ m^3/s$.

The hydro-technical node connects to access roads in the DN 7 area and to local roads, providing access to the spillway dam and the hydropower power plant.

Downstream of the hydrotechnical node, the dissipation basin at the spillway dam and the stilling basin at the hydropower power plant are being developed.

These were connected and continued with the downstream regularization, which had the dual role of discharging both the installed flows and the high waters into the downstream lake.

The connection of the normal level in the upstream reach with the levels in the downstream reach was done by the spillway dam + hydropower power plant + downstream regularization.

The hydro-technical node was connected to the slopes by dikes (frontal dams) to the hydro-power facilities located in the gorge of the Olt river, namely Lotrioara, Câineni and Robești.

For the hydropower schemes located outside the Olt river gorge, such as Racovița upstream and Cornetu downstream, the frontal weir dikes were connected with the longitudinal dikes laterally limiting the reservoirs and ensuring the transit of the floods through the reservoirs.

Cornetu landscaping

The location of the dam-power station is situated about 1 km upstream of the bridge over the Olt river, in Copăceni. In the retention front the power station is located to the left of the dam.

On both banks the lake is delimited by protective dykes that follow the minor bed of the Olt River. The embankment on the left bank is interrupted and follows the bed of the Sec stream with breakwaters, the right branch of the embankment closes in the slope in the right slope in the commune of Racovița. The right bank embankment follows the embankment of the railroad, where it closes after the Balota stop.

The national road Rm-Vâlcea - Sibiu and the railroad remained on the original elevation being protected by the right embankment upstream of Balota village.

The access to the canopy is realized from the DN on the left bank by crossing the Olt on the existing bridge downstream, and on the right bank, upstream of the Cornet station, over an existing railway overpass and then behind the right bank embankment through a connection to the embankment canopy.

Robeşti landscaping

The dam-power plant is located on the lower terrace on the right bank of the Olt, upstream of the village of Robești, in the immediate vicinity of the railroad and the national road. In the retention front the powerchamber is located to the right of the spillway dam.

On the left bank the retention is closed at the front of the slope. On the right bank, the initial project, approved in 1989, envisaged raising, relocation and doubling of the railway line in parallel with the relocation and raising of the DN.

The access to the canopy is directly from the DN, crossing the CF.

Câineni landscaping

The Câineni Accumulation develops practically between the two slopes with the CF and DN on the right bank.

From the point of view of CF and DN defense works, the situation is similar to the Robești reservoir. In the retention front the center is located to the right of the dam.

The Lotrioara development

The dam-power station is located in the minor bed of the Olt at about. 600 m upstream the Lotrioara stream. The power station is located to the right of the spillway dam.

The impoundment develops in an area of steep gorge, on the left bank having the CF embankment, and on the right bank the DN platform whose elevation is about. 2 m below the CF elevation. The lake being thus cut off on both banks, the initial project envisaged works to raise the DN and defend the CF.

Racovita development

The location of the hydrotechnical node is situated in the lower terrace area on the right bank of the Olt at approx. 1.8 km upstream of the Sebeș-Olt railway station. In the retention front the power station is located to the left of the spillway dam.

On both banks, the lake is bordered by protective dykes that follow the river bed as far as possible.

The left embankment embankment turns and follows with embankment embankments the regularized beds of the Avrig and Mirșa streams, finally closing in the railway embankment immediately downstream of the outlet of the Avrig HPP run-off channel. The right bank embankment is continuous and closes into the slope in the Bradu area.

Access to the canopy is from both banks via branches from county roads. Access to the power plant is from the left bank.

Upstream of Bradu, the lake is crossed by the DN 1, the left bank embankment was foreseen in the initial project to be closed in the embankment of the bridge over the Olt river. Also in this area, according to the initial project, a pipeline for the transportation of petroleum products was planned.

All five spillway weirs are of mobile type, equipped with 16x(8,23 +2,2)m segment flap gates and have 4(four) openings positioned as follows:

- opening 1 near the center, openings 2 and 3 further in the middle;
- opening 4 on the left bank for Robești, Câineni and Lotrioara dams and on the right bank for Cornetu and Racovița spillway dams.

All five dams have independent piers, culverts, and shaving. The permanent (baffled) joints between the piers and the invert are located in openings 4.00 m from the pier faces. In openings 1 and 4, there is a single permanent rostrum at 4.00 m from the pile, the rest of the pile being joined to the two cuels, which delimit the dam.

The piers are 4.00 m wide in elevation and are intended to support the road bridge, the metal piers and piles (under the shelter of which the maneuvers for overhaul and repair of the piers

will be carried out), to allow the installation of independent drive mechanisms for each pier, to support the bridge beams to connect the banks at the coronment.

The energy dissipation of the discharged flow is realized through the energy dissipator with two rows of teeth and downstream sill, 24 m long - at Robești and Lotrioara and 30 m long at Cornetu, Câineni and Racovița. Immediately downstream of the dissipator there is a 2.95 x 2.95 square meter concrete block or stabilized concrete slab.

The energy flows are processed by a power plant located near each dam on the left bank: Cornetu, Racovița and on the right bank: Robești, Câineni and Lotrioara. Each power station is equipped with two Kaplan turbines with a diameter of 5.8 m and an installed flow of 165 m^3/s per group.

Characteristics of spillway dams in Variant 1

Feature	*The dam*				
	Cornetu	Robești	Caineni	Lotrioara	Racovița
NNR (mdMB)	324,00	336,00	348,00	360,00	373,50
Downstream quota (mdMB)	312,00	324,00	336,00	348,00	360,00
Threshold quota (mdMB)	314,00	326,00	338,00	350,00	363,50
Canopy dimension (mdMB)	328,00	340,00	352,00	364,00	377,50
Upstream ground level (mdMB)	306,50	318,50	331,00	342,50	356,00
Invert height (mdMB)	308,00	321,50	334,00	345,00	358,00
Dam height(m)	21,50	21,50	21,00	21,50	21,50
L la coronam.(m)	82,00	82,00	82,00	82,00	82,00
Length(m)	34,00	34,00	34,00	34,00	34,00
Heatsink length(m)	30,00	24,00	30,00	24,00	30,00
Natural land quotas (mdMB)	318,00	327,00	338,00	350,00	362,00
Total volume (mil.m3)	7,30	6,80	5,80	5,30	14,20
Useful volume (mil.m3)	3,50	2,50	1,90	2,30	7,10

At the Câineni dam, adjacent to the left bank basin, a float spillway was provided to evacuate and transit the floats. This evacuator was of the vat type and had a flap valve and mechanism chamber, and the opening of the evacuation front was 16.00 m. The floats discharged by dumping over the flap were received by a catch basin.

Characteristics of hydropower plants in Variant 1

Central	**Cornetu**	**Robești**	**Caineni**	**Lotrioara**	**Racovița**
NNR (mdMB)	324,0	336,0	348,0	360,0	373,5
Downstream quota (mdMB)	312,0	324,0	336,0	348,0	360,0
Gross H (m)	12	12	12	12	13,5

Qi (m^3/s)	330	330	330	330	330
Pi (MW)	30,7	29,0	29,0	29,3	31,0
Em (GWh/year)	79,5	77,8	73,7	71,1	67,8

Version 2 - Optimized version

Option 2 - Racovita development

- completion of the remaining works to be carried out according to the submitted projects both for the embankment dams in the tail of the reservoir and for the Racovița CHE tailrace channel;
- protection works on the railroad bridges on the Racovița CHE Racovița escape channel in variants B1 and B2.
- the Racovița 2 variant does not consider the realization of protections for the railway bridges, which makes the Racovița CHE to operate with downstream level restrictions.

Option 2 - Lotrioara Development

- NNR in the reservoir is reduced from elevation 360,00 according to the Decree to elevation 357,00 mdMB. The elevation of 357.00 mdMB was imposed by the National Roads Administration Brasov, to be located one meter below the DN7 elevation in the dam section;
- the 4 dam openings will be equipped with 16m x 9m stakes, as opposed to 16m x 10m according to the Decree;
- the dam's canopy as well as the power plant's comes down to 360.50 mdMB;
- works to protect railway embankments and bridges;
- protection works for DN7 and the removal of gullies on the right slope of the gorge on a length of approx. 3000 m;
- access to the junction is realized from downstream without the need to elevate DN 7;
- protecting the historical monument of the Lotrioara reservoir.

Variant 2.1 - Lotrioara development

- the installed flow of the plant according to Decree Qi = 2 x 165 mc/s/group = 330 mc/s and
  - Variant 2.1.1 - classic central with superstructure;
  - Variant 2.1.2 - central without superstructure.

Variant 2.2 - Lotrioara development

- Qi installed flow = 2 x 90 mc/s/group = 180 mc/s
  - Variant 2.2.1 - classical power plant with superstructure - ***the technically and economically chosen variant***;
  - Variant 2.2.2 - central without superstructure.

Option 2 - Câineni development

- NNR in the reservoir = 347,00 mdMB, compared to 348,00 mdMB (according to the Decree);
- the 4 openings of the dam will be equipped with 16 m x 9 m stakes, as opposed to 16 x 10 m according to the Decree;

- the height of the crown of the dam as well as the power plant is lowered to 350.50 mdMB, respectively by 1.50 m from the initial elevation (according to the Decree);

- The installed flow of the plant remained as per the Decree, Qi = 2 x 165 mc/s/group = 330 mc/s;

- realization of the right embankment embankment for the defense of the CF (it is not necessary to raise it) located between the right embankment of the power plant and the viaduct crossing DN7 (the area where the CF crosses the right slope of the gorge) - with a length of approx. 2800 m;

- DN7 remains in its current position for the entire length of the Câineni reservoir, with no need to raise it. There will be areas where national road protection will be built;

- The connection of the hydrotechnical junction with the right bank and the right bank embankment will be an integral part of the protection of the railroad;

- the float spillway will be dispensed with as experience has shown that it is not necessary. Findings on the float inflow to the Cornetu reservoir have led to the idea of abandoning this opening. The opening will be incorporated in the left bank platform which continues with the left bank embankment;

- The starting elevation of the invert of the outlet channel at the connection with the rhizberma was changed, with the lowering of the NNR in the Câineni reservoir from 334.00 to 333.50 mdMB. As the stilling basin of the power plant (and its wall) is already built at 334.00 mdMB, the change to 333.50 mdMB will be made by means of a prism of rock fillings in front of the stilling basin;

- with the abandonment of the floating spillway, the design concept of the upstream left bank wall is modified, adopting a wall section with a variable crest elevation from 350.50 mdMB to 337.00 mdMB (upper left bank breakwater seal elevation);

- recalibration of the Olt river route in areas where it narrows significantly and especially in the area of the 400 KV pylon, in order to improve the flow conditions on the Olt river along the Câineni reservoir;

- modifications of the route of the channel on the basis of the geomorphologic evolution of the natural course of the Olt river;

- when the concreting work is resumed, the concrete on the surface of the concrete slabs on which the work has been interrupted will be removed by tamping, on approx. 5-10 cm deep, which could be altered by freeze-thaw.

The optimized variant has been studied in two solutions for completing the investment as follows:

- *variant 1* with access to the upstream hydrotechnical node on the height of the crown of the right bank embankment, along its entire length, approx. 2700 m ***(Variant "Câineni 1"*** *- with variant 1 access and without 400 kV station at Câineni* - the ***technically and economically chosen variant***, ***Variant "Câineni 2"*** *- with variant 1 access and with 400 kV station at Câineni)*;
- *variant 2* with access to the upstream hydro-technical node on the height of the crown of the right bank embankment, on a length of about 825 m.

Option 2 - Robești development

Completion of the connection to the system of CHE Lotrioara, CHE Câineni and CHE Robești by realization of a 400 KV station and of the warning - alarming system of Racovița, Câineni and Robești.

Characteristics of spillway dams in Variant 2

Feature	*The dam*				
	Cornetu	Robești	Caineni	Lotrioara	Racovița
NNR (mdMB)	324,00	335,00	347,00	357,00	373,50
Downstream quota (mdMB)	310,00	324,00	335,00	347,00	358,00
Threshold quota (mdMB)	314,00	326,00	338,00	348,00	363,50
Canopy dimension (mdMB)	328,00	340,00	350,50	360,50	377,50
Upstream ground level (mdMB)	306,50	318,50	331,00	340,50	356,00
Invert height (mdMB)	308,00	321,50	333,50	345,00	358,00
Dam height(m)	21,50	21,50	21,50	20,00	21,50
L la coronam.(m)	82,00	82,00	82,00	82,00	82,00
Length(m)	34,00	34,00	34,00	34,00	34,00
Heatsink length(m)	30,00	24,00	30,00	24,00	30,00
Natural land quotas (mdMB)	318,00	327,00	338,00	348,00	362,00
Total volume (mil.m3)	5,62	6,22	4,97	2,61	18,31
Useful volume (mil.m3)	2,08	2,35	1,00	0,35	6,07
Flow calculation with 2% allowance*	2059	2042	2007	1968	1509
Check flow with 0.5% allowance*	2869	2846	2796	2743	2128
Check flow rate with 0.5%+ΔΔΔQ*	3161	3136	3081	3023	2291

*Data is extracted from the Hydrological Study 2020

Characteristics of hydropower plants in Variant 2

Central	**Cornetu**	**Robești**	**Caineni**	**Lotrioara**		**Racovița**
				Var B.1	Var B.2	
NNR (mdMB)	324,0	335,0	347,0	357,0	357,0	373,5
Downstream quota (mdMB)	310,0	324,0	335,0	347,0	347,0	358,0
Gross H (m)	14	11	12	10	10	15,5
Qi (m^3/s)	330	330	330	330	180	330
Pi (MW)	33,2	25,8	26,5	20,7	14,0	31,5
Em (GWh/year)	90,9	72,7	73,6	58,3	53,2	71,6

The optimized variant has been studied in two solutions for completing the investment as follows:

- "Robești 1" variant *with 400 kV station at Robești;*
- "Robești 2" variant *without 400 kV station at Robești .*

Physical state of the investment - optimized variant

The physical status of the works executed up to the date of this documentation is as follows:

C. The Cornetu, Robești and Racovița developments had a very slow pace of execution, with PIFs, thus:

- Cornetu - 2001 (group 1), 2002 (group 2);
- Robești - 2012;
- Racovița - 2019 (with level restriction at 372.50 mdMB - minimum energy and with works still in progress on the tailrace and the embankments of the development).

➢ **CHE Racovita**

Situation of the Racovița CHE storage

The physical status of the works at Racovița CHE on 31.12.2020 is as follows:

- The spillway dam and power plant are in operation and had PIF in 2019;
- the dikes are executed as follows:
  - DMD tr. I - is completed to the final elevation along its entire length (fills, depth sealing, base beam, bulkhead, bulkhead seals, counterchannel);
  - DMS - sections I and II completed on the whole length (fills, depth sealing, retaining beam, bulkhead, bulkhead sealing, counterchannel) except for the closures in the railway on the Mârșa and Avrig streams (last 10 m);
- DMS Section III is 60% completed
- the run-off channel is executed at the final elevation as follows:
  - between profile P0 and profile P8 (upstream of the temporary road bridge that was demolished in 2020) for a length of approx. 1570 m;
  - the outlet of the stream coming from the sorting plant;
  - between profile P15 and profile P25 (downstream end of the canal) for a length of approx. 1735 m;
  - the outlets of the Cibin brook and the meander of the Olt river on the left bank of the Cibin river.
  - regularization and discharge of the Sebes sluice into the tailrace.

Work is currently being carried out to complete the left and right embankments upstream of the Bradu road bridge, on the section of the runaway channel located between profile P8 and upstream of the railway bridges. The regularization of the Sebeș stream and its outflow into the tailrace is also being completed.

The development operates with a level restriction of 372.50 mdMB compared to 373.50 mdMB which is the normal level of retention until all the works on the left bank embankment will be completed, including the protection of the railroad bridges crossing the p. Mârșa and p. Avrig.

The situation of the railroad bridges on the runaway canal

The Racovița Runoff channel flows into the Lotrioara reservoir. Approximately 2.75 km downstream of the hydro-technical junction, the runoff channel is crossed by 2 railroad bridges: Brașov-Podu Olt and Piatra Olt-Podu Olt. The bridge at km 369+509 on the Piatra Olt-Podu Olt line was built in 1887, and the planks were replaced in 1918 and 1940. The bridge at km 127+011 on the Brașov-Podu Olt line was built in 1892, the old planks were replaced in 1940.

In the Approval Decree No. 24/03.02.1989, the above-mentioned railway bridges were considered as a related investment financed by the Ministry of Transport and Telecommunications. In all the variants studied for the crossing of the Olt River, a new bridge was envisaged between the two existing bridges, which had the advantage that it could be built without affecting rail traffic.

As no funds for related works were included in the budget of the Ministry of Transport after 1990, the works on the railway bridges over the runaway canal were stopped. Work on the Racovița CHE and the tailrace canal also continued at a reduced pace.

The elevation of the embankment of the runaway channel in the area of the railroad bridges will be:

- 357,57 mdMB under the bridge km 369+509 Turnu Roșu - Copșa Mică line;
- 357,59 mdMB under the bridge km 127+011 Brasov - Podu Olt line.

The construction of the escape channel at the final elevations of the project, the route of which is inscribed between the railway bridge culverts, by excavating 3.00 - 4.00 m below the current elevation of the Olt River in this section, results in an embedment of their piers of about 1.00 m, which is unacceptable for the safety and stability of the bridges.

In order to put into operation the Racovița CHE, at the project parameters, it is necessary to execute the run-off and high water channel at the project elevations. For this purpose, it is mandatory to carry out works to make the railroad bridges infrastructure safe, either by reinforcing them or by building a new infrastructure, depending on the solution agreed by MTI-CNCFR and Hidroelectrica SA.

Between 2003 and 2005, TRAPEC SA prepared expert reports on the CF bridges and a solution study, which were not finalized at that time. The recommended option consisted in strengthening the piers and the bridge culverts.

In 2005, about 280 m downstream of the railway bridges, following the excavations at the final elevations of the section III of the runaway canal, a temporary sill was built to stabilize the Olt river embankment and to make the railway bridges safe, based on a project developed by TRAPEC-SA Bucharest. The provisional sill was designed so that it would function until the implementation of the consolidation solutions for the infrastructures of the railway bridges and implicitly until the possibility of excavating the final depths of the escape channel. The construction solution chosen allows it to be demolished quickly.

The temporary sill is still in operation.

Since 2010, with the progress of the works on the leakage channel, the diversion of water through the dam and the approach of the PIF deadline, the efforts to solve the intersection of the leakage channel with the railway bridges were resumed (see the attached address of the Ministry of Transport and Infrastructure - National Railway Company no. 12/2/87/2011).

Thus, in 2011 the contract was finalized with PROIECT CF - RIMSCO SRL which contained:

- Geotechnical study in the area of both bridges;
- Technical expertise.

The expertise showed that the current infrastructure does not meet the new current standards and the current metal decking is outdated in all verification requirements. The solution recommended by the certified technical expert is new infrastructure.

The expertise recommends 4 options to make the CF bridges safe, which are analyzed in the "Solution Study".

It is also recommended that the materials put in place must be AFER approved, and that the builder must also be authorized and approved for this type of work.

- Risk study prepared by UTCB - Faculty of Hydrotechnics

The modeling of the influence of the presence of the two CF bridges on the Racovița CHE outlet channel, in the current situation and in the situation of excavation of the channel at the projected elevation, was carried out by mathematical modeling, using the HEC-RAS calculation program.

On the basis of mathematical modeling, it was found that in both situations, the subsidence produced constitutes a risk situation for the piers of the railway bridge piers, reaching the invert.

The study also draws attention to the affluence that is still occurring.

- Solution Study

The solution study technically details the 4 variants proposed on the basis of the risk study and the geotechnical study by the bridges expert, Mr. Cornel Veștemean, and estimates their costs.

Following the techno-economic analysis the solution study recommends the choice of variant IV.

In variant IV, the safety works propose the construction of a new double track bridge on a definitive route variant and a new double track bridge deck with ballasted track. The works in this variant are carried out under rail traffic on the existing route on both lines.

The maximum duration of closure will be 1 day required to connect the new route to the existing route.

According to Hidroelectrica's Opinion No. 181/2011, the approved variant was also variant IV, which involves a double Cf bridge "entirely new, with ballasted track". In 2010 this variant had a value of € 6,730,000.00. The price did not include: "the value of bank protection works in the area of the bridge, demolition of the infrastructures of the two bridges and indirect costs, site organization, authorizations, taxes and permits".

In order to finalize the solution for the intersection of the runaway canal with the railway bridges, it will be necessary for the two ministries involved - the Ministry of Transport and the Ministry of Energy - to work together.

Pending the completion and execution of the solution of the intersection of the runaway channel with the CF bridges, the commissioning of the Racovița CHE implies an operation with the maintenance of the provisional threshold. Under these conditions, in 2019, the threshold was rehabilitated after the damage of the last years.

At present, for the protection of the railway bridges on the route of the runaway canal, the project *"AHE of the Olt river gorge on the Cornetu-Avrig sector. CHE Racovița. Updating of the documentation of the risk study for the Olt river CF bridges: bridge km 127+011 Brasov - Podu Olt, bridge km 369+509 Piatra Olt - Podu Olt"*. This involved the redoing of topo-bathymetric, geological and geotechnical surveys and a new set of hydraulic modeling calculations.

The study was requested by the expert as part of the documentation "Assessment of the safe operational status of the Racovița dam and reservoir for the renewal of the safe operation authorization".

As a result CHE Racovita was studied in two variants:

"Racovita 1" variant

- **with CF** (railroad**) Bridge Protections** on the Racovița runaway canal.

"Racovita 2" variant

- **without CF** (railroad) **bridges** on the Racovița runaway canal.

D. The Câineni and Lotrioara developments are in various stages of completion, as follows:

➢ **<u>CHE Câineni</u>**

The works were carried out as follows:

e) between 1989 and 2000 were executed:

- execution enclosure and site organization;

The dam:

- The embankment of the spillway dam is executed, and the piers and the piers are concreted in elevation up to the level of the first sheet, including the opening for the outlet of the left bank float:
- the energy dissipater is concreted all the way up to the boundary of the fixed riser;
- the upstream right bank wall one section;
- At the shelter of the Phase I diversion enclosure, i.e. the upstream embankment, the downstream embankment and the left bank embankment wall, seepage has been kept at a low level, which has allowed the works to be maintained in good condition for 12 years.

Central:

- in the area of the intake: above the elevation of the intake invert, from -3,334 downstream to +2,56 upstream, at both turbines;
- in the area of the connection with upstream regularization: in full;
- in the area of the penstock valve: above elevation -4,64 m;
- in the vacuum area:
  - above the elevation of the inclined prefabricated floor over the aspirators, elevations -8.50 and -4.80 at turbine T1;
  - above -4.64 at turbine T2;
- in the assembly block area: above elevation +3.75;
- the invert slabs of the stilling basin are fully executed;
- The status of the remaining work on the stilling basin is as follows:
  - left bank wall (dividing stack):
    - Section I: above -8.00 and -5.64;
    - Section II: above -5.64;
    - Section III: above the +0.15 level;
  - wrong wall:

- Section I: above -0.65;
- Section II: above the +2.35 level;
- Section III: above the +2.20 level.

f) Between 2000 and 2010 the work was stopped;

g) Between 2010 - 2013 the works were resumed:

- the concrete protections on the right bank and the outlet of the Uria stream;
- concreting of the spillway embankments at the dam;
- fixed rizberma entirely;
- the entire left bank upstream wall;
- the first section of the right bank upstream wall was modified;
- upstream regularization;
- began the filling of the right embankment embankment connection section, the Kelly type screen on approx. 650 m and the counterchannel foundation on three sections:
  - Hydropower plant:
    - Downstream piers - are concreted up to elevation -1,15;
    - Penstock valve - are concreted up to +3,30;
    - Outlet area - is concreted up to under the outlet ceiling, elevations +3,90 ~+7,95;
    - Intermediate and center stacks area up to +7.95 and +7.55 respectively;
    - The left and right bank channels - are concreted up to +9.65 in the inlet area and up to +3.30 in the spiral and downstream chambers;
    - Downstream piles - concreted at elevation -0,55;
    - Downstream pressure wall - concreted to elevation -1,15;
    - The stilling basin is completed, except for the right bank wall which is completed up to +6.33.

h) After 2013 the works were stopped.

Mechanical equipment is in various stages of construction and assembly, as follows:

– The turbines are in custody at UCM Resita, in various stages of execution;
– The elements of the vacuum truck are purchased and are in custody at Energomontaj Porțile de Fier Slatina;
– the built-in parts are mounted in the suction and spiral chamber area - suction tube cone lining and spiral chamber manhole for T1 and T2, suction access manhole T1 and T2, suction access manhole T1 and T2, support bracket for T1 and T2 discharge ring, and partially, hydraulic measuring pipes, air vent pipes, built-in confections, built-in plates;
– other equipment is not contracted.

Electrical equipment is in various stages of completion:

– The generators are in custody at UCM Resita, in various stages of execution;
– other equipment is not contracted.

CHE Câineni was studied in two variants:

Câineni variant 1 *- with access variant 1 and without 400 station*

Câineni variant 2 *- with variant 1 access and 400 kV substation.*

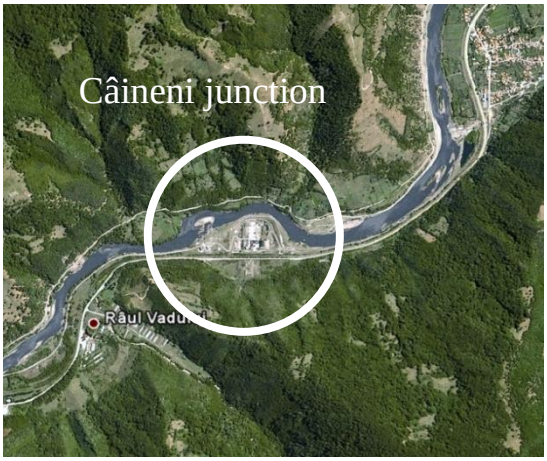


Photo 20 The enclosure of the Câineni node

Photo 21 Construction site and state of works at the Câineni node

Current state of work:

Photo 22 View from upstream to downstream - opening no. 3 where the spillway profile remained undammed on a 4 m wide strip

Photo 23 Energy sink - view from on the arrester crest

Photo 24 Fixed rhizber executed at the final bend

- **CHE Lotrioara**

The works were carried out at a very slow pace between 1989-2000, as follows:

- NH - is entirely on the left bank, near the railroad;
- spillway dam - the first embankment blades from the two spillway fields located on the left bank (openings 3 and 4) and the separator pile (in the middle of the spillway dam) were concreted;
- technological and social organization - of which a concrete platform remains.

All of the completed manholes are currently below water level.

Electro-mechanical equipment is not contracted, purchased or installed.

Conclusions of the technical expertise for the works executed at CHE Câineni and intervention measures:

In 2018, at the request of the beneficiary, a technical expertise of the works executed at CHE Câineni was carried out, according to which, following the inspection of the site of the works at the Câineni development, it was possible to assess that during the period of cessation of works, they are presented as follows:

Weir:

- The concrete put in place at the Câineni hydro-technical node: dam, upstream and downstream walls, energy dissipator, straight embankment embankment, is neat and compact, with smooth pouring faces, without segregated areas, with burrs at the level of the overflow profiles, locally with calcite exfiltrations;

Hydropower plant:

- from the analysis of the field findings it can be stated that the structural safety of the central object of the node under static and dynamic (seismic) stresses is ensured at the level of the current requirement criteria;
- The causes of cracks in the vertical walls of the plant structure can be explained by the following:
  - the fact that the walls are free at the top at the current stage of completion;
  - that the plant is founded on two lithologic layers:
    - The outlet of the power plant is founded on a coarse alluvium layer with high thickness and permeability, at elevation -8.85;
    - the area of turbines and aspirators is founded on a layer represented by a sericite-chlorite shale rock, at -17,10;
  - current loading mode, atypical for the elements of the structure;
  - continuous depletion over about 25 years;
- after tying the walls at the top by further execution works, the working stage for which they were designed is reached, and it is expected that the cracks that have appeared in the current loading stage will stabilize and not continue vertically.

- there is no subsidence or displacement of buildings, slopes or bedrock;
- The inspected works correspond to the execution plans and comply with the legislation in force.

It can be stated that it is possible to resume the execution works on all the objects included in the Câineni hydropower plant. It can also be noted that the reinforcement and concrete protection works carried out in 1989-1999 have proved their effectiveness over time.

The only areas that suffered during this period are:

- the area of the right bank embankment, which has been eroded over a length of 50-100 m and 20-25 m deep. On this area the flow section of the Olt River narrows very much, which led to its protection with riprap. However the bank was washed out on the area that was no longer Kelly type screen, and the guide beams executed or collapsed into the river bed risking to narrow the river bed even more;
- Adjacent to the railroad adjacent to the junction, there is an area where the Kelly-type screen of the enclosure battlement is stripped to a great height and the guide beams are collapsed, with the danger of failure of the railroad embankment.

At present, the Olt riverbed downstream of the junction is affected by the embankments that have been realized in order to protect the embankments of the run-off channel with concrete walls. On the right bank of the channel both the wall protections and the outlet of the Uria river into the runoff channel are completed. On the left bank the protections were not even attacked, therefore the protection battlement was not demolished, it remains in the middle of the Olt river even today. This leads to a considerable narrowing of the section where the water drains off, which may cause damage to the area's objectives in flood conditions.

Technological and social organization - during the work stoppage period the barracks and some of the machinery were withdrawn by the constructor.

Description of work to resume execution

The following intervention measures are proposed for the resumption of the execution works:

- redoing the initial execution projects, both for the adaptations to the site caused by the long period of interruption of the works and for adapting the projects to the new STAS and regulations in force at the date of resumption of works;

- *for the spillway dam:*

- at the spillway plots, only one undammed area remained, in the middle of opening 3;

- the concrete surfaces are washed with pressurized water (approx. 150 bar), and after washing the concrete area is completely dried and the concreting operations are started;

- the concreting of the upstream and downstream walls will be resumed on the upstream and downstream walls that have not yet been completed by treating the old concrete in order to work with the new poured concrete by: bushhammering, cleaning, washing.

- *for the right bank embankment:*

- restore the eroded area with fallen guide beams;

- the area already filled will be cleared, a layer of approx. 30-40 cm will be extracted in order to create the new layers of ballast;

- the concrete already poured in the counter-channel sections will be treated so that their concreting can be resumed: tamping, cleaning, washing.

- *for the central:*

- when the concreting work is resumed, the concrete on the surface of the concrete slabs on which the work has been interrupted will be removed by tamping, on approx. 5-10 cm in depth, which could be altered by the freeze-thaw phenomenon, and will be re-betonated.

When the design works are resumed, the topometric surveys will be redone to establish the physical stages carried out and a geological survey will be carried out on the levee routes to establish the nature of the foundation soil.

Conclusions and recommendations

The works on the Câineni hydropower node, reservoir and run-off canal, started in 1990, had an atypical course:

- Between 1989 and 2000, the following works were carried out: site organization, construction site, dam and power plant infrastructure;
- Between 2000 and 2010 the work was stopped;
- Between 2010 - 2013, the works were resumed: the works on the dam and the power plant were resumed, the tailrace channel was 60% completed and the works on the right embankment were started;
- Between 2013-2018 work was stopped.

The execution enclosure, realized for the dry-finishing of the headworks at the junction, has fulfilled its role well, without damage, although it has been subject to floods during its existence of approx. 28 years.

The condition of the monolithic poured concrete elements as well as of the precast elements ready for erection is good and allows immediate resumption of construction works.

The erosion upstream of the junction, in the right bank embankment, which is evolving and may endanger the transportation infrastructure works (road and rail) in the vicinity.

Select and justify the recommended optimal option

Taking into account the results of the technical-economic analysis, for the completion of the investment objective AHE Cornetu Avrig, the preparer of this documentation recommends the implementation of Variant 2 - execution of works for the optimized variant.

Choosing Option 2 has the following advantages:

- is the option that is physically and technically possible, given the work already carried out;
- a lower cost of realization of the works necessary for the completion of the Cornetu Avrig AHE;
- the duration of works to be carried out for the objects included in the investment is two years shorter than in Variant 1;
- financial performance indicators have higher values than in Variant 1.

- It does not involve any additional works, as it is completed on the basis of the work carried out so far (it does not occupy additional land).

3. DESCRIPTION OF RELEVANT ASPECTS OF THE CURRENT STATE OF THE ENVIRONMENT

a) Environmental factor water

The project site is located in the minor riverbed of the Olt, on the Cornetu-Avrig sector, in Sibiu County.

The water bodies intersected by the project are shown in the following tables along with the water body code.

The Racovița reservoir is completed, the Racovița CHE is functional and regulated by the issuance by APM Sibiu of the environmental authorization no. 20/11.02.2020, but this project proposes to complete the runoff channel.

Table 54 Water body on which the project is located

No. crt.	Name of water body	Surface water body code
1	OLT - Racovița reservoir -the Robești reservoir	RORW8.1_B8

Table 55 Water bodies crossed by the project

Nr. crt.	Name of water body	Surface water body code
1	SEBEȘ - Sebeș and the Moașa tributary	RORW8.1.119_B1
2	CIBIN - upstream confluence of Valea Lupului - upstream confluence of Olt	RORW8.1.120_B5
3	STRÂMBA - springs - confluence Olt	RORW8.1.121_B1
4	MEGIEȘ - springs - confluence Olt	RORW8.1.122_B1
5	RINDIBOU - springs - confluence Olt	RORW8.1.123_B1
6	LOTRIOARA - Lotrioara with the tributaries Brăneasa, Sfarcas, Gârcu and Pârâul Cailor, Mogoș	RORW8.1.124_B1
7	VAD - Vad and tributary Iacob	RORW8.1.125_B1
8	CURPAN - springs - confluence Olt	RORW8.1.126_B1
9	VALEA LUI VLAD - springs - confluence Olt	RORW8.1.127_B1
10	URIA - springs - confluence Olt	RORW8.1.128_B1

Table 56 Groundwater bodies in the project area

Watershed	Nr. crt	Code	Body of water	Water body type
Olt	1	ROOT07	Depression Făgăraș	Phreatic

The protected areas foreseen for the surface water bodies within the Olt River Basin Management Plans are presented *in the following table* for each intersected water body.

Table 57 Protected areas associated with water bodies near CHE Câineni and CHE Lotrioara

No. crt.	Body of water	Water body type	Protected area*
1	RORW8 1_B8	Surface	ROSAC0122 ROSAC0132 ROSAC0304 ROSPA0043 ROSAC0085
2	ROOT07	Phreatic	10 Natura 2000 sites, 3 with an area over 10 km^2 (ROSAC0122, ROSAC0132, ROSAC0304). Dependency grade A for all 3 sites.

Surface water bodies in the project area

CHE Câineni and CHE Lotrioara and the remaining works to be executed at CHE Racovița, are located on the surface water body OLT - downstream Racovița - upstream Robești RORW8.1_B8 and intersect 11 surface water bodies, located in the Olt river basin. A table of the intersected water bodies is presented below.

Table 58 Locations of the points of intersection of CHE Câineni and CHE Lotrioara with water bodies

No. crt.	Name of water body	Body code surface water	Coordinates Stereo 70 North	Coordinates Stereo 70 East
1	OLT - downstream Racovița reservoir - upstream Robești reservoir	RORW8.1_B8	465156.047	447084.436
2	SEBEȘ - Sebeș and the Moașa tributary	RORW8.1.119_B1	463405.068	446775.602
3	CIBIN - upstream confluence of Valea Lupului - upstream confluence of Olt	RORW8.1.120_B5	461126.665	444904.977
4	STRAMBA - springs - confluence Olt	RORW8.1.121_B1	457637.477	442873.269
5	MEGIEȘ - springs - confluence Olt	RORW8.1.122_B1	454657.781	442370.378
6	RINDIBOU - springs - confluence Olt	RORW8.1.123_B1	452554.551	441762.497
7	LOTRIOARA - Lotrioara with the tributaries Brăneasa, Sfarcas, Garcu and Pârâul Cailor, Mogoș	RORW8.1.124_B1	451604.532	442416.049
8	VAD - Vad and tributary Iacob	RORW8.1.125_B1	450271.391	442881.294
9	CURPAN - springs - confluence Olt	RORW8.1.126_B1	448544.650	443355.312
10	VALEA LUI VLAD - springs - confluence Olt	RORW8.1.127_B1	413545.538	443430.477
11	URIA - springs - confluence Olt	RORW8.1.128_B1	444784.569	444849.309

Groundwater bodies in the project area

Groundwater bodies in the proposed project area are shown in the table below.

Table 59 Surface areas of groundwater bodies in the project area

Bazin hydrographic	Nr. crt	Code	Surface [ha]
Olt	1	ROOT07	117691

Environmental objectives for identified surface water bodies

According to the National Administration "Romanian Waters" - Olt Water Basin Administration, 2016, Updated Management Plan of the Olt River Basin -ANEXE-, 2022 - 2027

Table 60 Environmental objectives for identified surface water bodies

Nr. crt	CA Name	CA Code	Category CA	CA types	Protected areas		Ecological status/ ecological potential		Chemical status		Achieving the environmental objective - ecological status/ ecological potential	Environmental attainment - chemical status
					Type	Objective					2016 - 2021	
1	OLT - Racoviță reservoir - upstream Robești reservoir	RORW8.1_B8	RW	RO05	VULNERABLE AREAS, PROTECTION ZONES FOR HABITATS AND SPECIES	HG 188/2002 HG 964/2000 GEO 57/2007	STAND ECOLOGICALLY GOOD	GOOD CHEMICAL STATE	3	2	No	From
2	CIBIN - valley confluence Lupului - upstream Olt confluence	RORW8-1-120 B5	RW	RO02	VULNERABLE AREAS, PROTECTION ZONES FOR HABITATS AND SPECIES	HG 188/2002 HG 964/2000	STAND ECOLOGICALLY GOOD	GOOD CHEMICAL STATE	3	2	No	From
3	SEBEȘ - Sebeș and the Moașa tributary	RORW8-1-119_B1	RW	RO01	VULNERABLE ZONES, PROTECTION ZONES PT. CATCHES, PROTECTION ZONES FOR. HABITATS AND SPECIES, PROTECTION ZONES FOR. AQUATIC SPECIES	L 107/1996 HG 930/2005 HG 188/2002 HG 964/2000 HG 202/2002	STAND ECOLOGICALLY GOOD	GOOD CHEMICAL STATE	2	2	From	From
4	STRÂMBA - springs - confluence Olt	RORW8-1-121 B1	RW	RO01	VULNERABLE ZONES, PROTECTION ZONES FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000 HG 202/2002 GEO 57/2007	STAND ECOLOGICALLY GOOD	GOOD CHEMICAL STATE	2	2	From	From
5	MEGIEȘ - springs - confluence Olt	RORW8-1-122 B1	RW	RO01	VULNERABLE AREAS, PROTECTED AREAS FOR. HABITATS AND SPECIES, PROTECTION ZONES FOR AQUATIC SPECIES		STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From
6	RINDIBOU - springs - confluence Olt	RORW8-1-123 B1	RW	RO01	VULNERABLE AREAS, PROTECTION ZONES FOR HABITATS AND SPECIES	HG 188/2002 HG 964/2000 GEO 57/ 2007	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From

Nr. crt	CA Name	CA Code	Category CA	CA types	Protected areas		Ecological status/ ecological potential		Chemical status		Achieving the environmental objective - ecological status/ ecological potential	Environmental attainment - chemical status
					Type	Objective					2016 - 2021	
7	LOTRIOARA - Lotrioara with Brăneasa, Sfarcas tributaries, Garcu and Cailor Creek, Mogoș	RORW8-1-124 B1	RW	RO01	VULNERABLE AREAS, PROTECTED AREAS FOR. HABITATS AND SPECIES, PROTECTION ZONES FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000 HG 202/ 2002 GEO 57/2007	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From
8	VAD - Vad and tributary Iacob	RORW8-1-125 B1	RW	RO01	VULNERABLE AREAS, PROTECTION ZONES FOR. HABITATS AND SPECIES, PROTECTION ZONES FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000 HG 202/ 2002 GEO 57/ 2007	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From
9	CURPAN - springs - confluence Olt	RORW8-1-126 B1	RW	RO01	VULNERABLE AREAS, AREAS PROTECTION FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000 HG202/2002 GEO57/2007	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From
10	VALEA LUI VLAD - springs - confluence Olt	RORW8-1-127 B1	RW	RO01	VULNERABLE AREAS, AREAS PROTECTION FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From
11	URIA - springs - confluence Olt	RORW8-1-128 B1	RW	RO01	VULNERABLE AREAS, AREAS PROTECTION FOR AQUATIC SPECIES	HG 188/2002 HG 964/2000 HG 202/ 2002 GEO 57/ 2007	STAND ECOLOGICAL GOOD	STAND CHEMISTRY GOOD	2	2	From	From

b) Environmental factor air

For the analyzed site air pollution is mainly caused by household heating activities, road traffic and agricultural works. As the area is not industrially developed, it is not polluted with industrial air emissions.

Sources of air pollution are grouped in the so-called typical urban sources category.

These include:

- heating of residential, commercial and institutional premises;
- food preparation;
- road traffic (own and shared);
- generating electricity;
- services (car washes, car service, use of electronic appliances, distribution of petroleum products, etc.);
- solid waste management.

These sources generate a range of air pollutants that are common to most, which in turn fall into the category of typical urban pollutants.

The fuels used for space heating are predominantly wood for dwellings and hostels and liquid fuels for hotels and other economic agents.

During dry periods, when various field works are being carried out, dust from the traffic routes of agricultural machinery is carried away. The main traffic pollutants are nitrogen oxides, sulphur dioxide, carbon dioxide and dust, VOCs. Urban aerosol, especially in areas of arterial roads with heavy traffic, also has a certain Pb content.

Due to the lack of polluting industrial activity in the area, the level of pollutant concentrations is below the limits imposed by the legislation in force. The economic sector is represented by trade, services, tourism and construction.

The source of the data presented below is Meteoblue.

In detail each diagram shows the following information:

a) The top panel shows the forecast for the Common Air Quality Index (CAQI) used in Europe since 2006. It is a number on a scale from 1 to 100, where a low value (green color) represents good air quality and a high value (red color) represents poor air quality. The CAQI color code is used in all air pollution display panels of the meteograms to indicate the pollution level.

b) Atmospheric particulate matter (PM) is microscopic matter in solid or liquid form that is suspended in the air. The sources of particles can be natural or anthropogenic. Of most concern for public health are particles small enough to be inhaled in the deepest parts of the lung. These particles are less than 10 microns in diameter (about 1/7 the thickness of a human hair) and are defined as PM10. They are a mixture of materials including smoke, soot, dust, salt, acids and metals. Particulates are also formed when gases emitted by motorized vehicles and industry undergo chemical reactions in the atmosphere. PM10 is visible to the naked eye as smog. PM10 is among the most harmful air pollutants.

c) PM 2.5 pollutants can come directly from natural sources such as dust, soot, bacteria, windblown salt, pollen, smoke from fires or from man-made (anthropogenic) sources such as industrial processes, some power plants, vehicle emissions, stoves, fireplaces and smoking. PM 2.5 fine particles are also formed when different chemicals combine in the air. For example, chemicals from coal-fired power plants or car emissions react with water vapor in the atmosphere to form new particles smaller than 2.5 microns.

d) Forecasts for concentrations of air polluting gases are shown in the third panel.

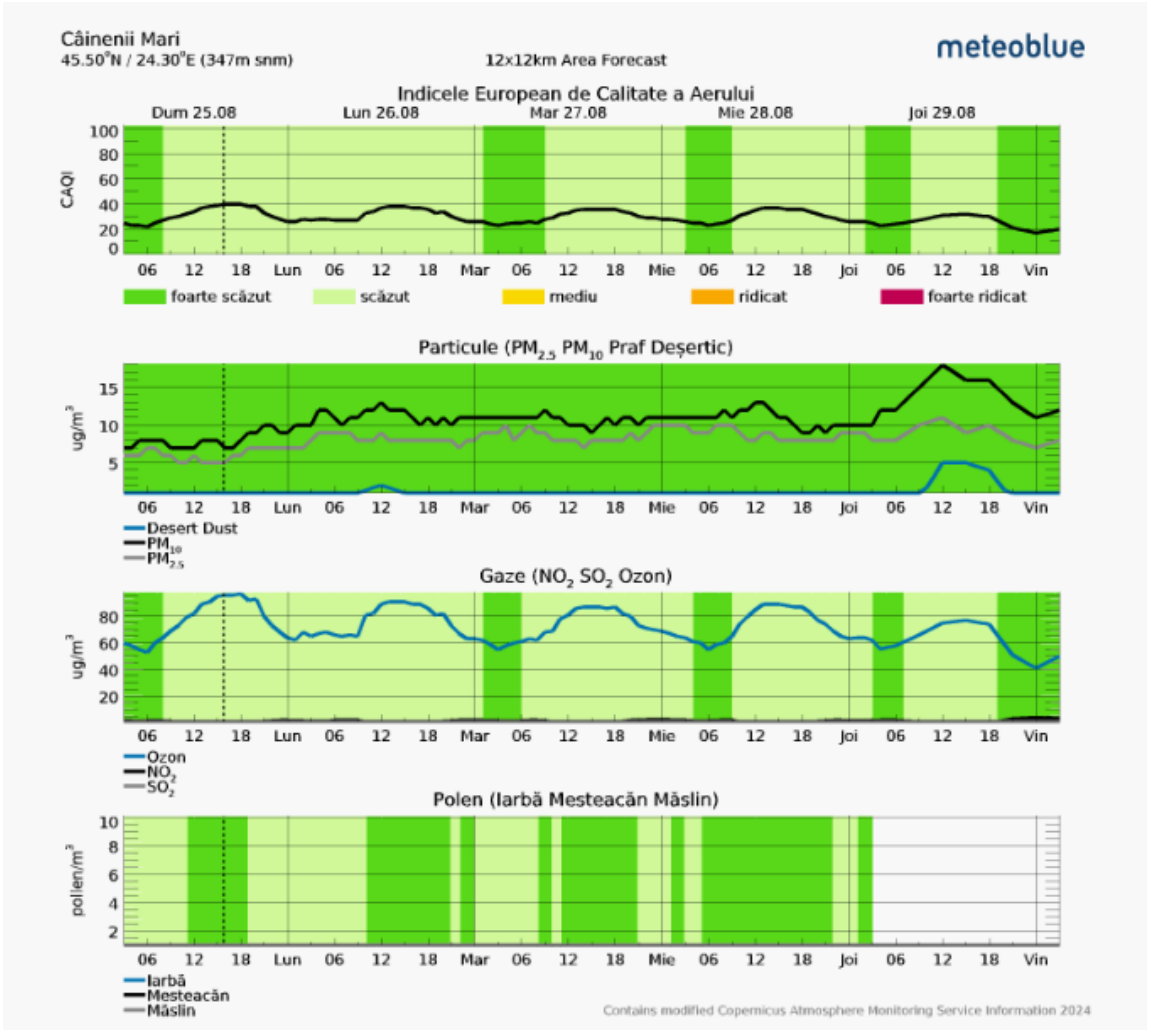


Figure 26 Modeled air quality elements in the Câineni area (source: Meteoblue)

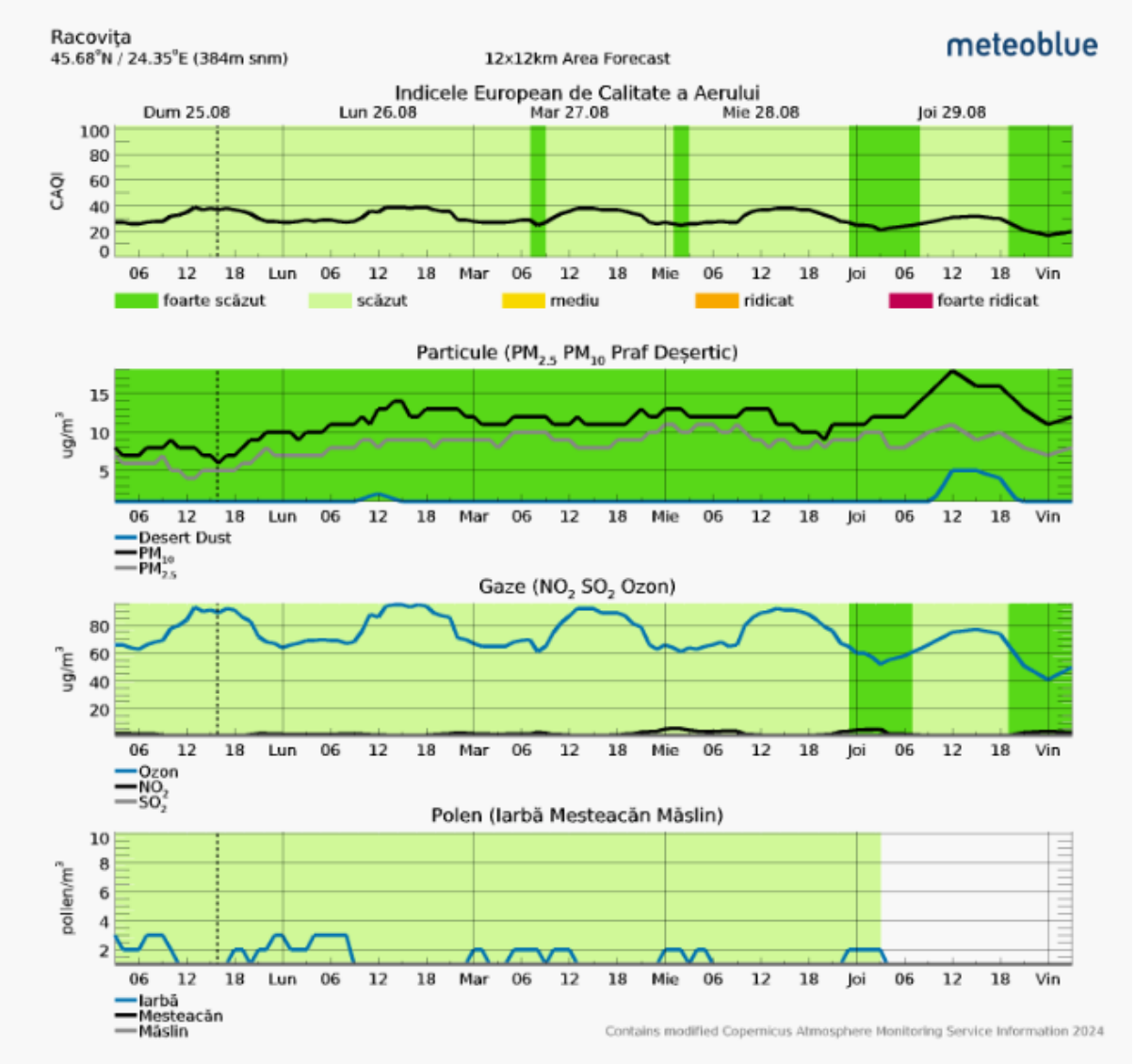


Figure 27 Modeled air quality elements in the Racovița area (source: Meteoblue)

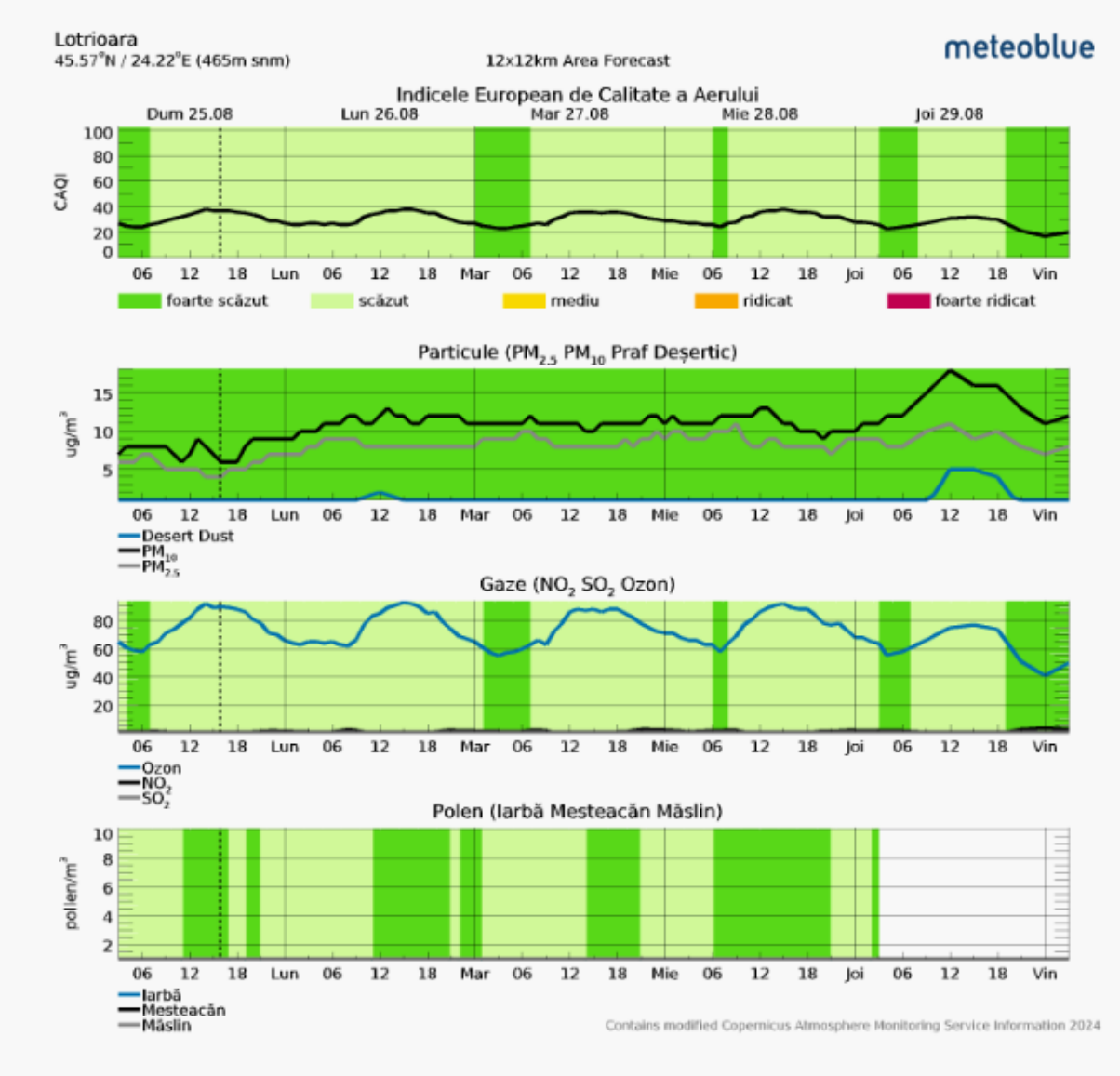


Figure 28 Modeled air quality elements in the Lotrioara area (source: Meteoblue)

c) *Soil/subsoil environmental factor*

The great diversity of physico-geographical factors, particularly lithologic and relief conditions, has determined the formation of a distinctive soil cover, both in terms of categories and their mosaic distribution across the territory. The main classes, types, and subtypes of soil, according to the Romanian Soil Taxonomy System-2003, are as follows: the first group consists of soils that reflect latitudinal-altitudinal zonality; the second group includes azonal soils - conditioned by the nature of the parent material, such as pelisols and andisols; the third group comprises eroded and/or anthropogenically modified soils - anthrosols, and poorly differentiated pedogenetic soils - protisols. The predominant soils belong to the luvisols class: preluvisols (21%), luvisols (68%), and aluviosols (11%). These soils are typical of hilly and foothill areas, where forest vegetation is dominated by evergreen trees, particularly sessile oak (*Quercus petraea*) and oak (*Quercus robur*).

The following soil types are found in the northern part of the region: forest brown, podzolic and clayey soils, podzolic clay-loam soils, poorly developed soils - regosols and alluvial soils. Podzolic forest soils formed in the gently sloping or horizontal relief units in the north of the region under a woody vegetation cover, transitioning to brown forest soils. The clayey brown forest soils were formed under gorun, oak and beech forests, on slopes with shallow and rapid water runoff, with poor infiltration and little leaching.

The soils present a high potential for the triggering and evolution of current geomorphologic processes due to their physico-mechanical and chemical properties. Within the soil envelope the following categories can be distinguished: class protisols - regosols and alluviosols, class cernisols - faeozoosols, class luvisols - luvosols, and class cambisols - eutricambosols.

The diversity of existing soils favors their varied use, depending on their specific fertility. Thus, there are areas suitable for forests, fruit plantations, meadows, field crops, fodder crops or technical and food crops such as potatoes, sugar beet, and in some places even staple crops such as wheat, maize, barley and the like.

d) Biodiversity

d.1.) General information

The "Project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the hydropower development of the Olt river defileu in the Cornetu-Avrig sector" partially overlaps with Natura 2000 Sites ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0085 Frumoasa, ROSPA0043 Frumoasa, ROSAC0122 Făgăraş mountains, ROSPA0098 Făgăraș Piedmont, ROSAC0304 Hârtibaciu Sud - Vest and ROSPA0003 Avrig - Scorei - Făgăraș.

Table 61 - Data on protected areas of Community interest potentially affected by the implementation of the analyzed project

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu	2.910,5	The protected natural area aims to conserve 2 habitats and 19 species of Community interest.	Management plan approved by MMAP Order no. 1.166/2016	ANANP Decision No 522/18.10.2021 - Annex 1	Continental (87.73%) and Alpine (12.27%)	Aquatic (lakes and rivers) and wetland habitats, deciduous forests, willow galleries, reedbeds, thickets, scrublands, etc.	Special Area of Conservation ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu partially overlaps with the Special Protection Areas for Birds ROSPA0003 Avrig-Scorei-Făgăraș and ROSPA0099 Podișul Hârtibaciului	To the north: ROSPA0099 Hârtibaciului Plateau, ROSAC0304 Hârtibaciu South-West, ROSAC0303 Hârtibaciu South-East; South: ROSPA0098 Făgăraș Piedmont; To the west in the Olt gorge: ROSAC0085 Frumoasa and

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
								ROSPA0043 Frumoasa; East in the Olt gorge: ROSAC0122 Făgăraș Mountains
ROSAC0122 Făgăraș Mountains	198.620,5	The protected natural area aims to conserve 29 habitats and 35 species of Community interest.	Management plan approved by MMAP Order no. 1.156/2016	ANANP Decision No 547/27.10.2021	Alpine (100%)	Deciduous forests, mixed forests, coniferous forests, meadows, subalpine scrublands, cliffs, rivers, rivers, arini forests, swamps, etc.	The special conservation area ROSAC0122 Făgăraș mountains partially overlaps with the special avifaunistic protection area ROSPA0098 Făgăraș Piedmont and includes the nature reserves Lacul Buda (INSPIRE Code RONPA0138), Lacul Izvorul-Mușeteică (INSPIRE Code RONPA0139), Moldoveanu - Capra Alpine Gorge (INSPIRE Code RONPA0122), Piscul Negru Cave (INSPIRE Code RONPA0123), Iezer Lake (INSPIRE Code RONPA0130), Zârna Lake (INSPIRE Code	To the north the special avifaunistic protection area ROSPA0099 Făgăraș Piedmont, to the east Piatra Craiului National Park (INSPIRE Code RONPA0011), to the south the site of community importance ROSCI0268 Valea Vâslanului and to the west the special conservation areas ROSAC0132 Oltul Mijlociu - Hârtibaciu and

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
							RONPA0131), Jgheburoasa Lake (INSPIRE Code RONPA0132), Hârtop I Lake (INSPIRE Code RONPA0133), Lake Hârtop II (INSPIRE Code RONPA0134), Lake Hârtop V (INSPIRE Code RONPA0135), Lake Mănăstirii (INSPIRE Code RONPA0136), Lake Valea Rea (INSPIRE Code RONPA0137), Lake Scărișoara Galbenă (INSPIRE Code RONPA0140), Lake Scărișoara Galbenă IV (INSPIRE Code RONPA0141), % Valea Vâlsanului (INSPIRE Code RONPA0142), Valea Bâlii (INSPIRE Code RONPA0718), Alpine Gorge of the Făgăraș Mountains between Podragu - Suru (INSPIRE Code RONPA0726),	ROSAC0085 Frumoasa and the special avifaunistic protection area ROSPA0043 Frumoasa

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
							Avenul Piciorul Boului (INSPIRE Code RONPA0801) and Golul Alpin Valea rea - Zârna (INSPIRE Code RONPA0853).	
ROSAC0085 Frumoasa	137.256,1	The protected natural area aims to conserve 22 habitats and 26 species of Community interest.	Management plan approved by MMAP Order no. 1.158/2016	ANANP Decision No 263/27.04.2023	Alpine (100%)	Deciduous forests, mixed forests, coniferous forests, meadows, subalpine scrublands, cliffs, rivers, rivers, arini forests, swamps, bogs, peat bogs, etc.	ROSAC0085 Frumoasa overlaps almost entirely with the special avifaunistic protection area ROSPA0043 Frumoasa and includes the nature reserves Cindrel Nature Park (INSPIRE code RONPA0724), Cindrel's Iezerele (INSPIRE code RONPA0722), Șuvara Sașilor (INSPIRE code RONPA0716), Iezerul Șureanu (INSPIRE code RONPA0035), Luncile Prigoanei (INSPIRE code RONPA0063), Jnepenișul Stricatul (INSPIRE code RONPA0811),	To the east ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu and ROSAC0122 Făgăraș Mountains, to the north - east ROSAC0304 Hârtibaciu South - West, to the south ROSAC0188 Parâng, and to the west ROSCI0087 Grădiștea Muncelului - Cioclovina and ROSPA0045 Grădiștea Muncelului - Cioclovina

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
							Sterpu-Dealul Negru (INSPIRE code RONPA0823) and Cristești (RONPA0824) and the natural monuments La Grumaji (RONPA0720), Masa Jidovului (RONPA0725) and Stânca Grunzii (RONPA0024).	
ROSAC0304 South-West Hartibaciu	22.840,8	The protected natural area aims to conserve 8 habitats and 16 species of Community interest.	Management plan approved by MMAP Order no. 1.166/2016	ANANP Decision No 522/18.10.2021 - Annex 2	Continental (91.46%) and Alpine (8.54%)	Deciduous forests, meadows, scrublands, arable land, etc.	The special conservation area ROSAC0304 Hârtibaciu South-West partially overlaps with the special protection areas ROSPA0099 Podișul Hârtibaciului and ROSPA0098 Făgăraș Piedmont.	To the south: ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu and ROSPA0003 Avrig-Scorei-Făgăraș; To the north and east: ROSPA0099 Hârtibaciului Plateau; South: ROSPA0098 Făgăraș Piedmont and ROSAC0122 Făgăraș Mountains;

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
								Southeast: ROSAC0085 Frumoasa.
ROSPA0003 Avrig-Scorei-Făgăraș	2.943,7	The protected nature area aims to conserve 25 species of birds of Community interest.	Management plan approved by MMAP Order no. 1.291/2017	ANANP Decision No 579/03.11.2021	Continental (100%)	Aquatic (lakes and rivers) and marsh habitats, willow galleries, reedbeds, scrubland, etc.	Partially overlaps with special area of conservation ROSAC0132 Middle Oltul - Cibin-Hârtibaciu	To the north: ROSPA0099 Hârtibaciului Plateau, ROSAC0304 Hârtibaciu South-West, ROSAC0303 Hârtibaciu South-East; South: ROSPA0098 Făgăraș Piedmont;
Rospa0043 Frumoasa	130.890,8	The protected natural area aims to conserve 11 bird species of Community interest.	Management plan approved by MMAP Order no. 1.158/2016	ANANP Decision No 218/04.07.2024	Alpine (100%)	Deciduous forests, mixed forests, coniferous forests, meadows, subalpine scrublands, cliffs, rivers, pore forests, swamps, peat bogs, etc.	It overlaps almost entirely with the special area of conservation ROSAC0085 Frumoasa and includes the nature reserves Cindrel Nature Park (INSPIRE code RONPA0724), Cindrel's Iezerele (INSPIRE code RONPA0722), Șuvara Sașilor (INSPIRE	To the east ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu and ROSAC0122 Făgăraș Mountains, to the north - east ROSAC0304 Hârtibaciu South - West, to the south ROSAC0188 Parâng, and to

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
							code RONPA0716), Șureanu Stream (INSPIRE code RONPA0035), Luncile Prigoanei (INSPIRE code RONPA0063), Jnepenișul Stricatul (INSPIRE code RONPA0811), Sterpu- Dealul Negru (INSPIRE code RONPA0823) and Cristești (RONPA0824) and the natural monuments La Grumaji (RONPA0720), Masa Jidovului (RONPA0725) and Stânca Grunzii (RONPA0024).	the west ROSCI0087 Grădiștea Muncelului - Cioclovina and ROSPA0045 Grădiștea Muncelului - Cioclovina
ROSPA0098 Făgăraș Piedmont	71.201,70	The beech forests of the Făgăraș Mountains with the extensive semi-natural open area at the foot of the mountains offer	Management plan approved by MMAP Order no. 1.156/2016	ANANP Decision No 217/04.07.2024	Alpine (51.88%) and Continental (48.12%)	Deciduous forests, mixed forests, coniferous forests, grasslands, arable land, etc.	The special avifaunistic protection area ROSPA0098 Făgăraș Piedmont partially overlaps with the special conservation area ROSAC0122 Făgăraș Mountains.	-

Name and code protected natural area	Area (ha)	Importance / Role	Management plan and the normative act by which it was approved	Decision / Note approving the conservation objectives of the protected natural area	Biogeographical region(s) where the protected natural area is located	Types of ecosystems	Overlap with other protected areas	Relations of the protected natural area of Community interest with other protected areas
		a combination of ideal habitats for many bird species. The forests harbor significant flocks of two species of woodpeckers, great owls, two species of flycatchers. Nesting here are also raptors and black storks, which forage in the open areas at the foot of the mountains, like white storks. The meadows, pastures and farmland here are home to a significant population of woodlark and field chrysalis.						

d.2.) Biodiversity in the project site area

In order to clarify all aspects related to the presence and distribution of species and habitats in the area of influence of the project, experts on different taxonomic groups have carried out field trips in the project site area, the results of the field activities are presented as follows:

A. Habitats and plants

Methodology

The methodology of inventory, mapping of plant species and Natura 2000 Habitats in the project area involved the following steps:

- Analysis of existing information for the Natura 2000 sites of interest, related to plant habitats and species. Standard forms, management plans and distribution maps of habitats and plant species of interest were analyzed.
- Conducting field observations to identify relevant elements of habitats and plant species, conservation objectives established for protected areas of Community interest. Thus, field trips were carried out, using the transect method and, where it was considered necessary, phytosociological surveys were carried out.
- Data collected from literature and field data were analyzed to assess the conservation status of the habitats and plant species targeted.

Habitats of species in the project area

For the analysis of Natura 2000 habitats in the project area, we referred to the distribution of habitats in Natura 2000 sites on the project site.

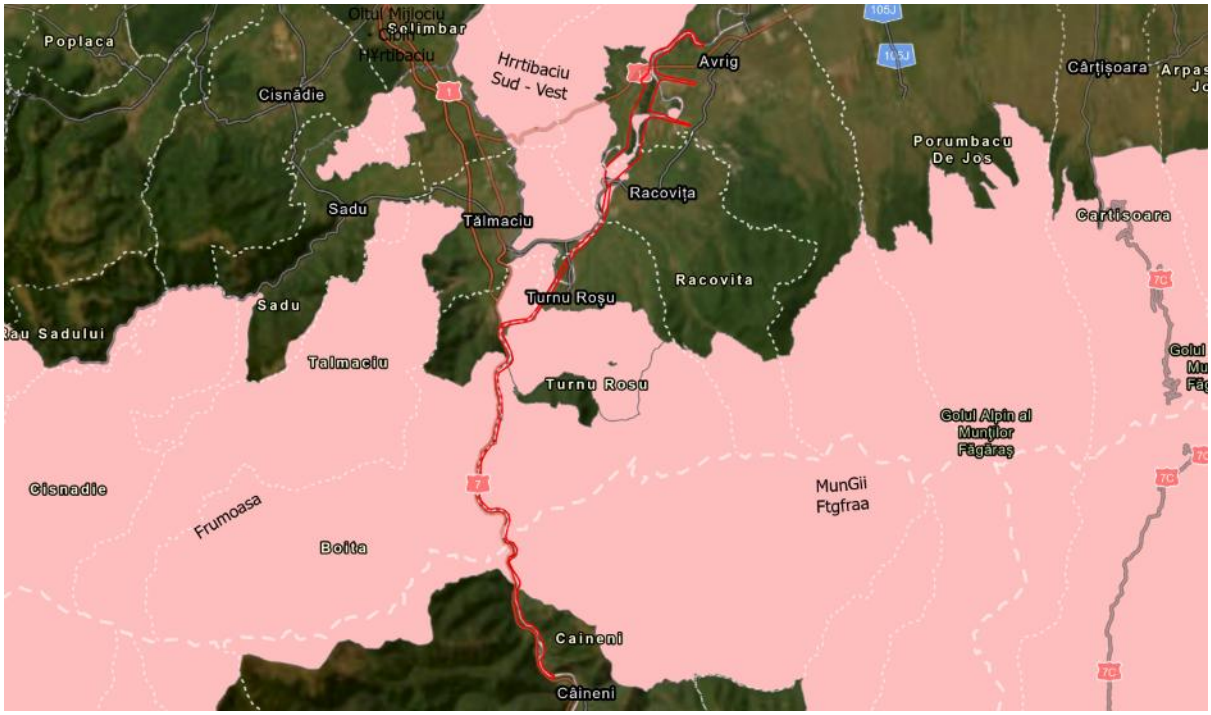


Figure 29 Location of the project in relation to Natura 2000 sites

The analysis of the intersection of Natura 2000 sites with the project area shows that it intersects the following sites:

- ROSAC0122 Făgăraș Mountains
- ROSAC0085 Frumoasa
- ROSAC0132 Middle Oltul Oltul Mijlociu-Cibin-Hârtibaciu
- ROSAC0304 Hârtibaciu South-West.

The analysis of the distribution of Natura 2000 habitats at national level on the project site reveals the presence of the following Natura 2000 habitat types in the project area:

- ✓ 9110 *Luzulo-Fagetum* beech forests
- ✓ 9170 *Galio-Carpinetum* oak forests with hornbeam
- ✓ 92A0 - Glades with *Salix alba* and *Populus alba*
- ✓ Vegetation not edifying Natura 2000 habitats.

A.3. Description of identified habitats

1. 9110 *Luzulo-Fagetum* beech forests

CLAS. PAL.: 41.11 1) Forests of *Fagus sylvatica* and, in the higher mountains, of *Fagus sylvatica-Abies alba* or of *Fagus sylvatica-Abies alba-Picea abies*, developed on acid soils of the mid-European domain of central and north-central Europe, with *Luzula luzuloides*, *Polytrichum formosum* and often, *Deschampsia flexuosa*, *Calamagrostis villosa*, *Vaccinium myrtillus*, *Pteridium aquilinum*.

The following subtypes are included:

41.111 Medio-European hilly forests of beech with *Luzulo Fagetum Fagus sylvatica* acidophilous forests in the low Hercynian and Lorraine ranges, in the hilly floor of the high Hercynian ranges, in the Jura, on the edge of the Alps, in the western sub-Pannonian and intra-Pannonian hills, accompanied to little or not at all by spontaneously occurring conifers, and generally with a mixture of *Quercus petraea*, or in some cases *Quercus robur*, in the canopy.
41.112 Medio-European montane forests of beech with Luzula Acidophilous forests of *Fagus sylvatica*, *Fagus sylvatica* and *Abies alba* or *Fagus sylvatica*, *Abies alba* and *Picea abies* in the montane and upper montane stages of the high Hercynian ranges, from the Vosges and Black Forest to the Bohemian quadrangle, Jura, Alps, Carpathians and Bavarian plateau.
2) Plants: *Fagus sylvatica, Abies alba, Picea abies, Luzula luzuloides, Polytrichum formosum* and often *Deschampsia flexuosa, Calamagrostis villosa, Vaccinium myrtillus, Pteridium aquilinum*.
HdR R4102, R4105-4107, R4110 56
Veg Festuco drymejae-Fagetum Morariu et al. 1968; Hieracio rotundati-Fagetum (Vida 1963) Täuber 1987 (syn.: Deschampsio flexuosae-Fagetum Soó 1962).

Photo 25 *Luzula luzuloides*

Photo 26 *Deschampsia flexuosa*

Habitat 9110 does not overlap with the project site and is observed in the immediate vicinity of the project site. The conservation status of this habitat in the analyzed area is favorable.

2. 9170 *Galio-Carpinetum* oak hornbeam forests (Galio-Carpinetum oak hornbeam forests)

CLAS. PAL.: 41.261, 41.262 1) *Quercus petraea* and *Carpinus betulus* forests in subcontinental climatic regions within the central European range of *Fagus sylvatica*, dominated by *Quercus petraea* (41.261). Also included are oak and lime-like forests in eastern and central-eastern European regions with continental climate east of the *F. sylvatica* range (41.262). 2).

Plant:

41.261 - *Quercus petraea, Carpinus betulus, Sorbus torminalis, S. domestica, Acer campestre, Ligustrum vulgare, Convallaria majalis, Carex montana, C. umbrosa, Festuca heterophylla*;

41.262 - *Quercus petraea, Q. robur, Tilia cordata, Acer platanoides, Carpinus betulus*. HdR R4123, R4128

Veg Carici pilosae-Carpinetum Neuhäusl et Neuhäuslova-Novotna 1964 (syn.: *Dentario bulbiferae-Quercetum petraeae* Resmeriță (1974) 1975, *Carici pilosae-Carpinetum* Chifu 1995, *Carici pilosae-Quercetum petraeae typicum* Sanda et Popescu 1999).

As. Carici pilosae-Carpinetum is a west-Carpathian variant of *Galio sylvatici-Carpinetum* Oberdorfer 1957 from central Europe. Our oak forests corresponding to this habitat are characterized by the constant presence of beech (even in a co-dominant relationship with the gorun and hornbeam) and the absence of *Galium sylvaticum* and of the south-east-Carpathian differential species (*Lathyrus hallersteini, Arum orientale, Melampyrum bihariense, Tilia tomentosa, Fagus orientalis, F. taurica*).

Habitat 9170 does not overlap with the project site and is observed in the immediate vicinity of the project site. The conservation status of this habitat in the analyzed area is unfavorable - inadequate, as it also appears in PM ROSAC0304 South - West Hartibaciu.

Photo 27 Habitat 9170 in the study area

3. 92A0 - Glades with Salix alba and Populus alba

The specific stands of this habitat are characterized as "meadow forests (fallow) of the Mediterranean and Black Sea basins, dominated by white willow *(Salix alba),* ***willow*** *(Salix fragilis)* and poplar *(Populus alba, Populus tremula, Populus nigra).* Other characteristic species are elm, anise, maple, pedunculate oak, meadow ash, etc. The large poplar species usually dominate the canopy by their height."

The white poplar biocenosis is rich in shrubs (black elder, elderberry, arbutus, hawthorn, hawthorn, hawthorn, hawthorn), frequently climbing species - lianas: curpen (*Clematis vitalba*), wild vine (*Vitis sylvestris*). The soil is often covered with *Rubus caesius* (*Rubus caesius*), but there are also many herbaceous species, among which we mention: *Carex acutiformis, C. riparia, Eupatorium hydropiper, Stachys palustris.* etc.

Photo 28 Grassy vegetation characteristic of habitat 92A0

Habitat 92A0 overlaps with the project site on an estimated area of 0.5 ha, areas of land occupied by this habitat outside the forest, for example islands formed on the course of the Olt River where tree and shrub vegetation characteristic of this type of habitat has been installed, namely specimens *of Populus alba, Salix alba*, not marked by the management plan. The conservation status of the habitat in the site area is favorable.

B. Nevertebrate

B.1. MONITORING METHODS

The area of deployment for the inventory and assessment of invertebrate species (figure below) is within or close to the Natura 2000 sites ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, in the standard form of which 5 invertebrate species of Community importance are mentioned: *Unio crassus, Anisus vorticulus, Chilostoma banaticum, Ophiogomphus cecilia and Coenagrion ornatum*, ROSAC0122 Făgăraș Mountains, in the standard form of which 11 invertebrate species of Community importance are mentioned: *Vertigo angustior, Chilostoma banaticum, Ophiogomphus cecilia, Pholidoptera transsylvanica, Lucanus cervus, Rosalia alpina, Morimus funereus, Osmoderma eremita, Carabus hampei, Stephanopachys substriatus, Maculinea teleius, Lycaena dispar, Euphydryas aurinia and Callimorpha quadripunctaria,* ROSCI0085 Frumoasa, in the standard form of which 10 invertebrate species of Community importance are mentioned: *Ophiogomphus cecilia, Cordulegaster heros, Pholidoptera*

transsylvanica, Buprestis splendens, Rosalia alpina, Cerambyx cerdo, Pseudogaurotina excellens, Lycaena dispar, Euphydryas aurinia and Callimorpha quadripunctaria, and ROSAC0304 Hârtibaciu Sud-Vest, in the standard form of which one species of invertebrate of Community importance is listed: *Lucanus cervus*

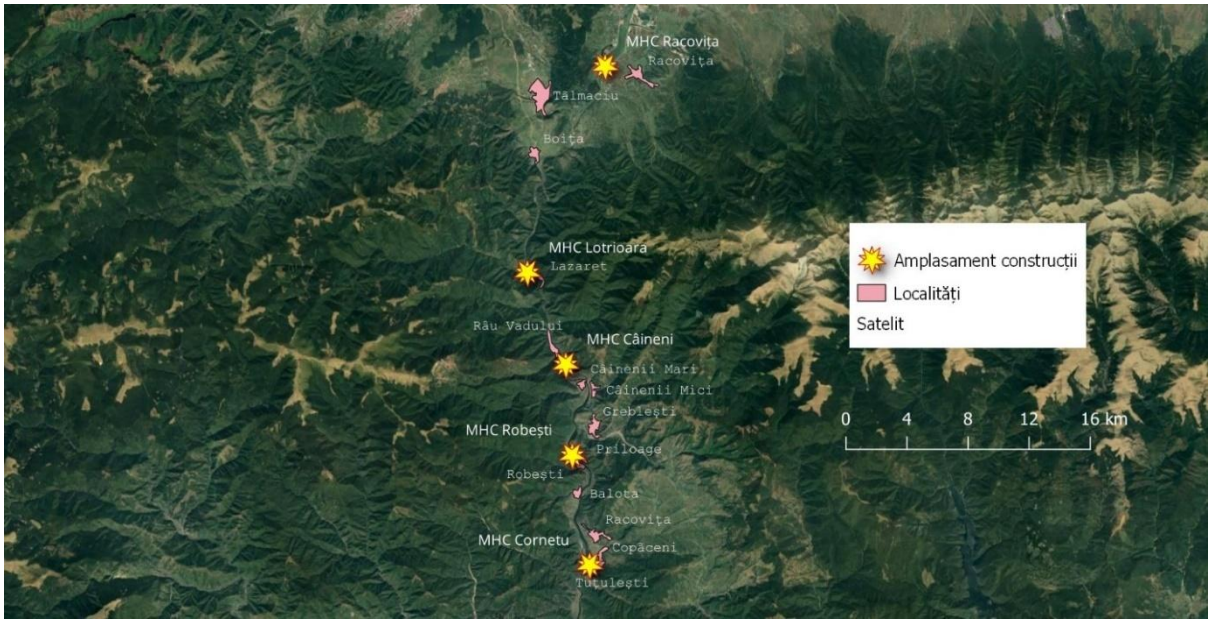


Figure 30 Location of hydro-engineering in the middle Olt basin

Diurnal line transect monitoring method

Given the specific methodology for inventorying the species in question and the fact that for most of them the diurnal visual line transect method is suitable, this was the method used in the fieldwork. The method involves traversing areas of about 500 m in length along which the flying or active individuals of the species investigated are observed, over a width of 10 m on either side of the direction of movement.

As these are species with different habitat preferences (mesophilic grasslands, forest road and forest edge areas, beech or oak forests, river bank areas with organic sediments or with emergent vegetation), transect areas were traversed crossing as many habitat types as possible, along which the target species were observed. Due to the complexity of the habitat types to be investigated, the length of the transects was variable, ranging from about 50 m, in the case of the presence of *Unio crassus*, to more than 1 km, in areas with potentially favorable habitats for several species.

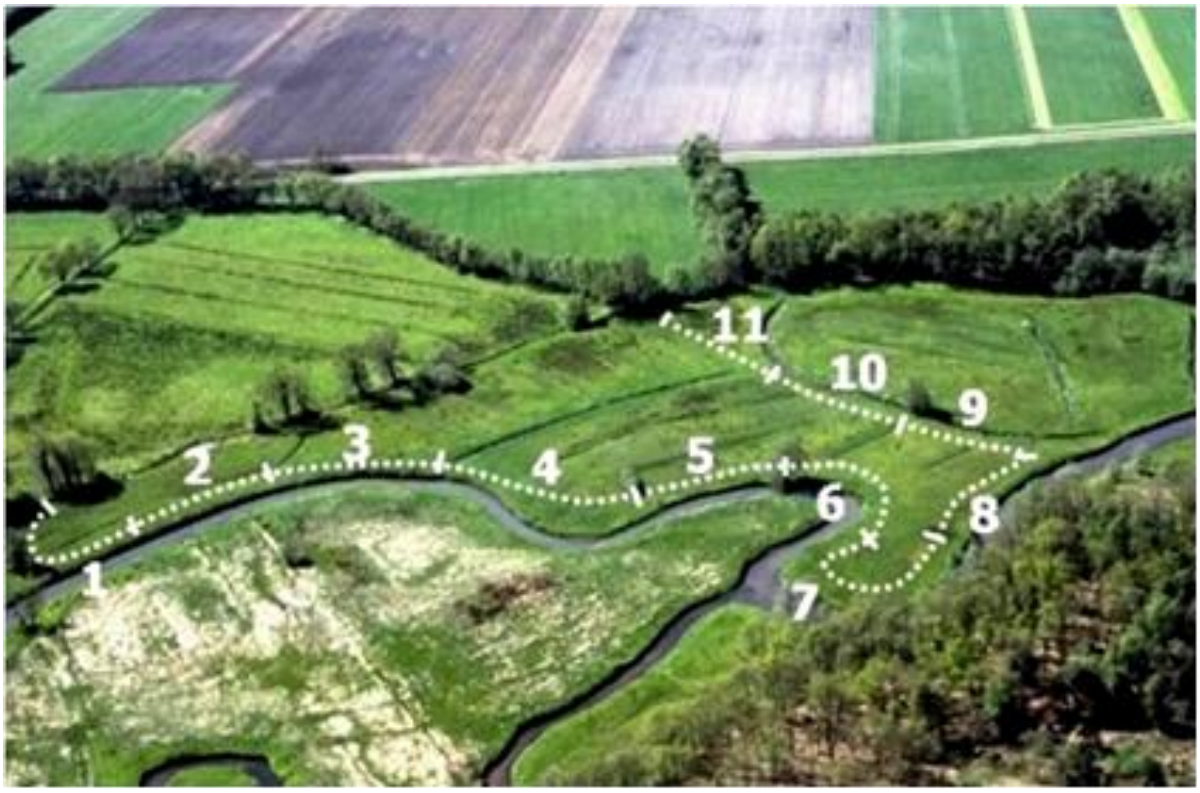


Figure 31 Line transect model for the assessment of diurnally active invertebrates (source: Van Swaay et al., 2015)

By applying the methodology, the route was traveled at a constant speed (about 1-1.5 km/h) during the period of activity of the target species, in optimal or suboptimal weather conditions (air temperature as high as possible, given the unsuitable period, wind speed below 6 km/h, wind speed below 6 km/h, cloud cover no more than 50%), during the day between 9:00-19:00, the individuals of the target species were counted in an imaginary cube with sides of 5 m, which moves in front of the assessor as he moves (Figure 16).

The placement of the monitoring transects was made according to the specific conditions at each of the 5 locations.

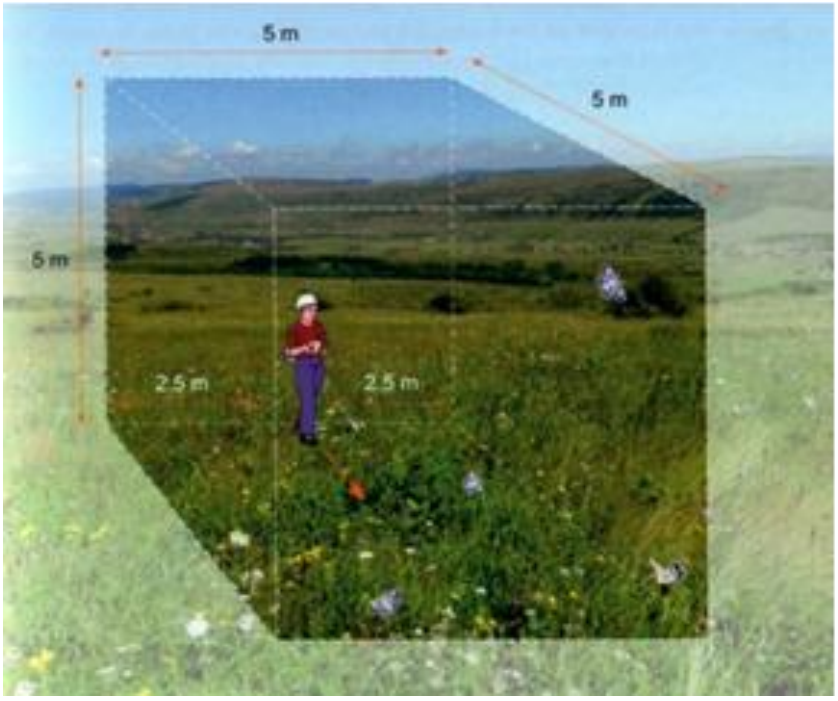


Figure 32 Imaginary cube with 5 m sides counting individuals of target species of diurnal invertebrates (source: Rákosy 2013)

Figure 33 Location of monitoring transects within the Racovita MHC

Figure 34 Location of monitoring transects within MHC Lotrioara

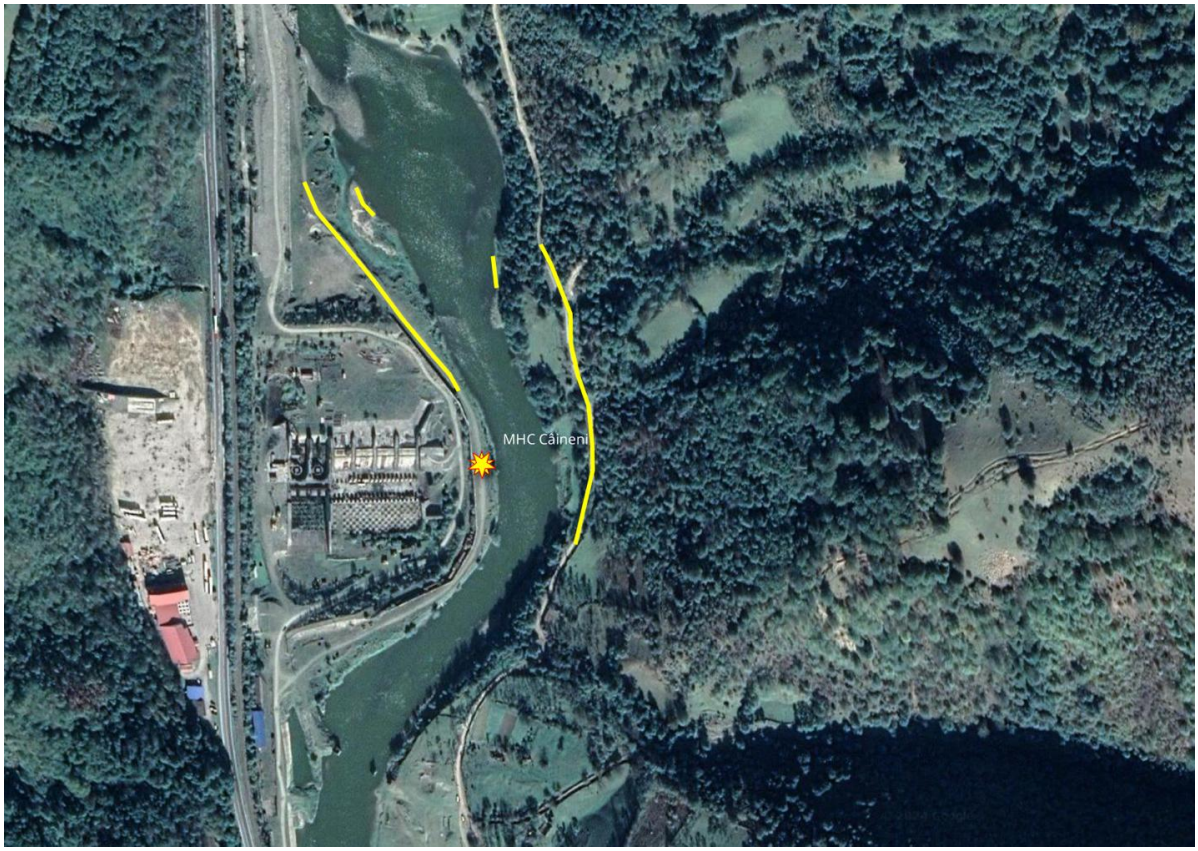


Figure 35 Location of monitoring transects within the MHC Câineni

Figure 36 Location of monitoring transects within the MHC Robești

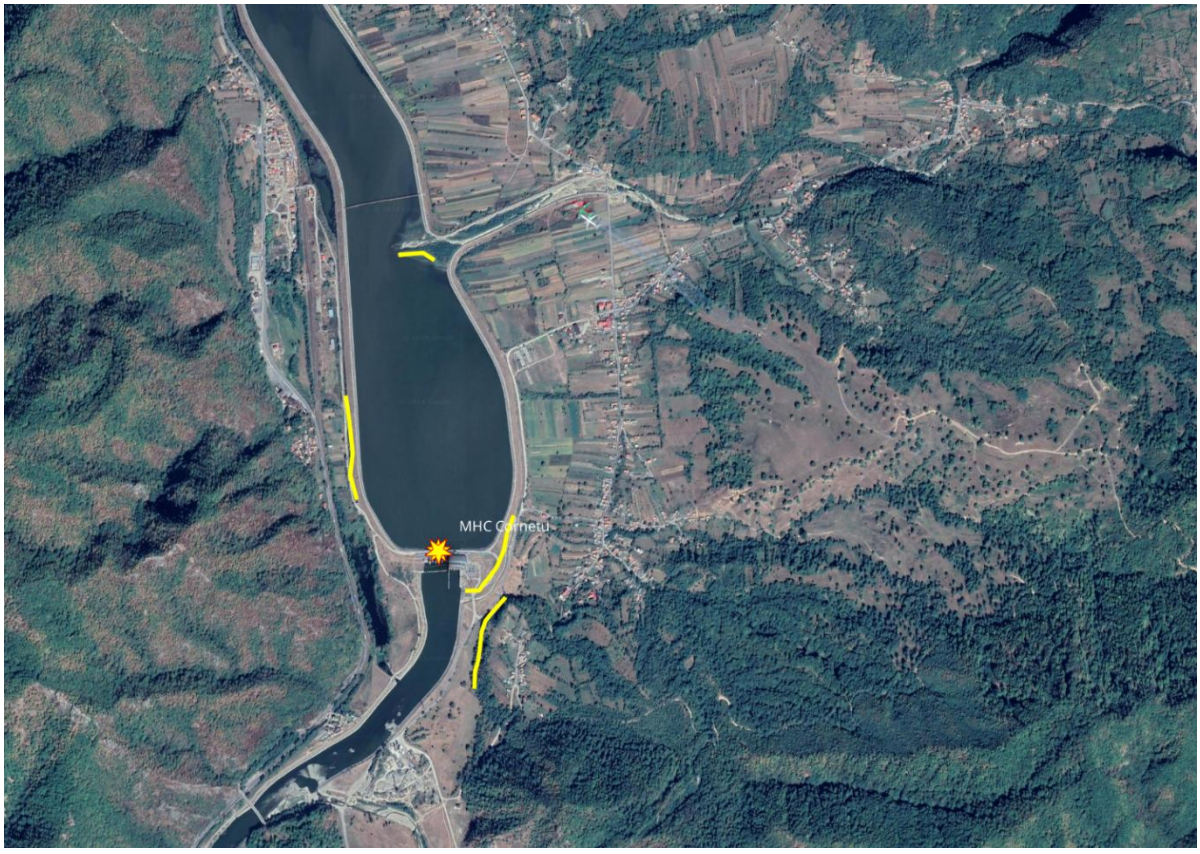


Figure 37 Location of monitoring transects within the MHC Cornetu

B.2. MONITORING RESULTS

During the monitoring period, the presence in the area of the sites of the species listed in the standard forms of the sites in the vicinity of the sites, as well as the presence of habitats favorable to host the species in question were investigated. The status of the potential presence of favorable species and habitats is presented in Table 62.

Table 62 Potential presence of protected species and their favorable habitats in the project area

Site name Natura 2000	Natura 2000 Code	Scientific name species	Source of information	Conservation status	Potential Presence of Species	The species was found	Presence of favorable habitat
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable	From	No	Yes, all CHEs
	4056	*Anisus vorticulus*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	From	No	Yes, at CHE Cornetu and Lotrioara
	4057	*Chilostoma banaticum*	Standard Form, Specific Conservation Objectives , Management Plan	unknown	From	No	No
	1037	*Ophiogomphus cecilia*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	From	No	No
	4045	*Coenagrion ornatum*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No

ROSAC0122 Făgăraș Mountains	1014	*Vertigo angustior*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
	4057	*Chilostoma banaticum*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	From	No	No
	1037	*Ophiogomphus cecilia*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	4054	*Pholidoptera transsylvanica*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
	1083	*Lucanus cervus*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable-inadequate	From	No	No
	1087*	*Rosalia alpina*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable-inadequate	No	No	No
	1089	*Morimus funereus*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable-inadequate	From	No	No

	1084*	*Osmoderma eremita*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	4012	*Carabus hampei*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	1927	*Stephanopachys substriatus*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	1059	*Maculinea teleius*	Standard Form, Specific Conservation Objectives , Management Plan	unknown	No	No	No
	1060	*Lycaena dispar*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
	1065	*Euphydryas aurinia*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
	1078*	*Callimorpha quadripunctaria*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No

ROSAC0085 Frumoasa	1037	*Ophiogomphus cecilia*	Standard Form, Specific Conservation Objectives		No	No	No
	4046	*Cordulegaster heros*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable - inadequate	No	No	No
	4054	*Pholidoptera transsylvanica*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
	1085	*Buprestis splendens*	Standard Form, Specific Conservation Objectives		No	No	No
	1087*	*Rosalia alpina*	Standard Form, Specific Conservation Objectives, Management Plan	unfavorable - inadequate	No	No	No
	1088	*Cerambyx pig*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	4024*	*Pseudogaurotin excellens*	Standard Form, Specific Conservation Objectives, Management Plan	unknown	No	No	No
	1060	*Lycaena dispar*	Standard Form, Specific Conservation Objectives,	unfavorable - inadequate	No	No	No

			Management Plan				
	1065	*Euphydryas aurinia*	Standard Form, Specific Conservation Objectives		No	No	No
	1078*	*Callimorpha quadripunctaria*	Standard Form, Specific Conservation Objectives, Management Plan	favorable	No	No	No
ROSAC0304 South-West Hartibaciu	1083	*Lucanus cervus*	Standard Form, Specific Conservation Objectives	unknown	No	No	No

During the reporting period, no invertebrate species of community interest were identified in the vicinity of the project site. The However, invertebrate communities are well-established, with 38 invertebrate species identified in the vicinity of the targets during the baseline period surveys, which are presented in Table 63. All species are relatively common nationally in habitats similar to those surveyed, and are classified as Least Concern by IUCN. In terms of inver invertebrate community, they are relatively typical for the type of habitats investigated, mostly consisting of lakeshores and river banks with grassy or shrubby vegetation, rarely wooded.

Table 63 Species of invertebrates identified during field surveys (R: CHE Racovița; L: CHE Lotrioara; C: CHE Câineni; Ro: CHE Robești; Co: CHE Cornetu)

No. crt.	Species	R	L	C	Ro	Co	IUCN assessment	GEO 57/2007	Habitats Directive
1	*Bombilus sp.*	x	x		x	x	-	-	-
2	*Bombus terrestris*		x	x		x	DD	No	No
3	*Cantharis rustica*				x		LC	No	No
4	*Cerambyx scopolii*			x	x	x	LC	No	No
5	*Cercopis sp.*		x	x	x	x	-	-	-
6	*Cetonia aurata*				x	x	LC	No	No
7	*Ladybird septempunctata*	x	x	x	x	x	DD	No	No
8	*Coenonympha pamphilus*	x	x	x	x	x	LC	No	No
9	*Colias alfacarensis*		x				DD	No	No
10	*Decticus verrucivorus*	x			x	x	LC	No	No
11	*Dorcadion bilineatum*	x	x	x	x	x	DD	No	No
12	*Walking Dorcadion*	x	x	x	x	x	DD	No	No
13	*Dorcadion tauricum*		x			x	DD	No	No
14	*Eurydema ornata*	x					DD	No	No
15	*Gryllus campestris*	x	x	x	x	x	LC	No	No
16	*Harmonia axyridis*		x			x	LC	No	No
17	*Lamia textor*		x				LC	No	No
18	*Laasiommata hag*		x			x	LC	No	No
19	*Leptopterna dolabrata*	x			x	x	DD	No	No
20	*Lumbricus terrestris*	x	x	x	x	x	LC	No	No
21	*Lycaena phleas*	x			x	x	LC	No	No
22	*Maniola jurtina*	x			x	x	DD	No	No
23	*Melitaea cynxia*	x		x	x	x	LC	No	No
24	*Oxythrea funesta*				x		DD	No	No
25	*Panorpa sp.*	x	x		x		-	-	-
26	*Pararge aegeria*		x	x	x	x	DD	No	No
27	*Peribalus strictus*	x				x	DD	No	No
28	*Pieris brasicae*	x				x	LC	No	No
29	*Pieris rapae*	x			x		LC	No	No
30	*Polygonia c-album*	x	x	x	x	x	LC	No	No
31	*Polyommatus icarus*	x			x	x	LC	No	No
32	*Psyllobora vigintiduopunctata*	x			x	x	DD	No	No
33	*Pyrhocorris apterus*		x	x		x	LC	No	No
34	*Pyrhonia tythonus*				x		LC	No	No
35	*Rhyparochromus vulgaris*	x				x	DD	No	No
36	*Tipula sp.*	x	x	x	x	x	-	-	-
37	*Vanessa atalanta*		x			x	LC	No	No
38	*Xylocopa violacea*	x		x	x		DD	No	No

Photo 29 *Ceononympha pamphilus*

Photo 30 *Pararge aegeria*

Photo 31 *Polyomatus icarus*

As presented above, there are favorable habitats in the area for some species of Community interest that are present on the standard forms of nearby sites but whose presence in the area has not been confirmed.

Unio crassus is a species of clam with elliptical or truncate-oval valves, usually less than twice the length of the shell, thick-walled, variable color from light green-brown with radiating rays to dark brown to black. The anterior region is well rounded, broad and short. The posterior part is often dilated, elongate, with an obtuse and subtruncate rostrum. The upper and lower margins are generally parallel, the lower margin straight or subrectilinear in the median area. Posterior margin and growth lines are uniformly and parallel curved. The umbo is relatively conspicuous, projecting slightly above the upper margin; occasionally it does not stand out at all, frequently being eroded by physico-chemical mechanisms. Some ecological forms may be kidney-shaped, ovoid, more or less dilated. They vary in size: length 30-70 mm, height 20-40 mm, width 20-35 mm. The cardinal teeth are strongly developed, thick, subconical, denticulate, the posterior tooth on the left valve is well developed, triangular, and the anterior tooth on the same valve is thinner, crenulate, with a slightly sloping surface. On the right valve, before the inner cardinal tooth, there is a wide, deep groove, next to which there is another more elongated, but reduced cardinal tooth. The lateral blades are raised, curved upward and sharp. The impressions of the headrace muscles are well-marked and deep, like dimples inside the valves.

It inhabits streams and rivers, less frequently rivers, and is more common in hilly and upland waters than in lowland. It is a demanding species in terms of water quality conditions , requiring flowing, well-oxygenated waters and clean sediments; sandy or moderately muddy substrate (without excessive organic matter content), with salinity below 5‰.

In the project site there are small areas of favorable habitat for the species in the bank areas of the reservoirs where no concreting or bank hardening works have been carried out, but the presence of the species downstream of the Racovița dam is uncertain with bad prospects due to the fragmentation of the aquatic habitat. Recent studies carried out in the area have identified abandoned shells in the shoreline areas of Lake Racovița, but their provenance is

unclear, as they may have been transported from long distances, the lake being rather suitable for pond-dwelling species such as Sinanodonta woodiana or Anodonta anatina. The investigations for the report did not identify the presence of the species in the area, but it was certainly reported from the area of the Hartibače Podiș, where it presents favorable habitat.

Anisus vorticulus is a species of gastropod with a discoidal shell (amphracts spiral in the same plane), very flat-turtured, flat above, concave centrally below, brown in color, with 5-6 amphracts, obviously and equally rounded both above and below, separated by a deep suture. The last amphract is only 25% wider than the penultimate one, provided submedian with a slightly pronounced carina. The opening is oval-elliptical and obliquely positioned. The shell is approx. 0.5 - 0.8 mm high and up to 5-6 mm wide. The species is light grayish-brown in color.

It lives in stagnant waters, rich in vegetation, potholes, canals, ponds, swamps, marshes, deserted watercourses, but also in slowly flowing waters especially in lowland areas, rich in aquatic and marsh flora, attached to hard submerged parts of the flora or on different substrata (predominantly macrophytophilous). It prefers clear waters and is a bioindicator of high habitat quality. The species requirements for water quality refer to low turbidity, pH 7 to 7.5, calcium 40 to 400 mg/l, conductivity 200 to 1100 mS/m. A microphagous species, it also feeds on diatoms and other heliophilous algae. It tolerates frost and dry periods. Does not tolerate hypertrophic conditions.

The species has not been identified in the area either during the campaigns for the site management plan or during the current campaigns, its presence being uncertain, although there are favorable habitat sectors.

Photo 32 Favorable habitat *Unio crassus*

Photo 33 Favorable habitat *Anisus vorticulus*

Photo 34 Favorable habitat *Anisus vorticulus*

Photo 35 Favorable habitat *Anisus vorticulus*

POTENTIAL IMPACTS AND MANAGEMENT MEASURES

As far as invertebrate species are concerned, the works to be carried out on the investigated sites will have no impact on the majority of species or, in rare cases, will have a minimal impact on a small number of species, namely those that find favorable habitat in the bank areas of the water impoundments, areas that will be affected by the shifting of the water level and the reshaping of the bank line. In these situations, the impact will be minimal, consisting of the displacement of species populations in the new embankment area formed, with no effect on species populations, their conservation status or species viability.

As regards Natura 2000 species likely to occur in the area, the situation is as follows:

- in the case of *Unio crassus*, if the species will be identified in the area during the works, the management measures for the species are not to disturb the muddy and sandy banks with organic sediment, where the species finds shelter, and to keep trees or shrubs in the bank area, as the species is known to have an affinity for shaded areas.

- in the case of *Anisus vorticulus*, the management measures applicable where the species is identified are to maintain areas with standing water and rich aquatic vegetation (dead braches, pools, channels) and to avoid dredging or removal of aquatic vegetation.

C. ***Herpetofauna***

Material and methods

1.1. Project location

The deployment area for the inventory and assessment of amphibian and reptile species of Community interest is located in the enclosures of the 4 hydropower power plants, CHE Racovița, CHE Lotrioara, CHE Câineni and CHE Robești, included in the Cornetu - Avrig sector and a buffer zone of about 1 km around, an average dispersal distance of the targeted species and their habitats that may be affected. The 4 objectives are located within or close to the following protected areas of Community interest: ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu Sud-Vest, ROSAC0122 Făgăraș mountains, ROSAC0085 Frumoasa (figure below).

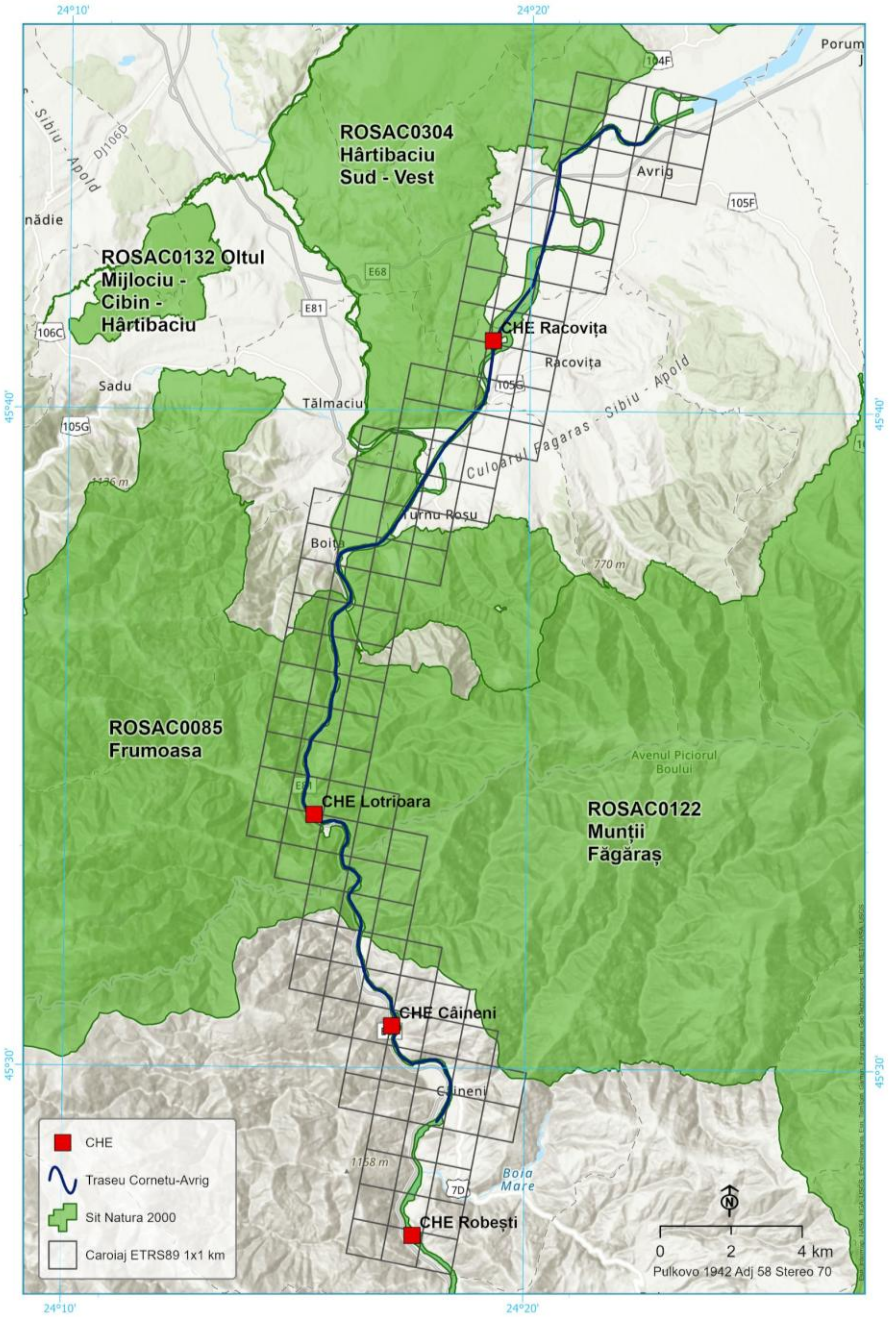


Figure 38 Location of the hydro-engineering works in the Cornetu-Avrig sector on the territory or in the vicinity of the Natura 2000 sites ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu South-West, ROSAC0122 Făgăraș Mountains, ROSAC0085 Frumoasa.

The study was conducted from December 2023 through May 2024 within the project perimeter and vicinity using primarily the diurnal line transect monitoring method.

1.2. Brief description of species of conservation concern

In the Natura 2000 standard forms of the sites ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu Sud-Vest, ROSAC0122 Făgăraș mountains, ROSAC0085 Frumoasa the species *Bombina variegata*, *Bombina bombina*, *Triturus cristatus*, *Triturus montandoni and Emys orbicularis* are mentioned in category 3.2. Species referred to in Article 4 of Directive 2009/147/EC, species listed in Annex IV to Directive 92/43/EEC and the site assessment for them.

Table 64 Species of amphibians or reptiles of conservation concern for which declared natural area

Natura 2000 Site	EUNIS code - Scientific name (vernacular name)	Legal conservation status*
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	*814 - Triturus cristatus (crested newt)*	Annex 3, 4A
	678 - Emys orbicularis (European freshwater turtle)	Annex 3, 4A
ROSAC0122 Făgăraș Mountains	*638 - Bombina variegata - (Yellow-bellied Toad)*	Annex 3, 4A
	814 - Triturus cristatus (crested newt)	Annex 3, 4A
	316346 - Triturus montandoni (Carpathian newt)	Annex 3, 4A
	17205 - Triturus vulgaris ampelensis (Transylvanian newt)	Annex 3, 4A
ROSAC0085 Frumoasa	*638 - Bombina variegata - (Yellow-bellied Toad)*	Annex 3, 4A
	814 - Triturus cristatus (crested newt)	Annex 3, 4A
ROSAC0304 South-West Hartibaciu	*638 - Bombina variegata - (Yellow-bellied Toad)*	Annex 3, 4A
	637 - Bombina bombina (Red-bellied Toad)	Annex 3, 4A
	814 - Triturus cristatus (crested newt)	Annex 3, 4A
	17205 - Triturus vulgaris ampelensis (Transylvanian newt)	Annex 3, 4A
	678 - Emys orbicularis (European freshwater turtle)	Annex 3, 4A

*Law no. 49/2011 approving the Government Emergency Ordinance no. 57/2007 on the regime of protected areas, conservation of natural habitats, wild flora and fauna:
Annex 3. Species (...) of animals whose conservation requires the designation of special areas of conservation (...)
Annex 4A. Species of Community interest. Animal species (...) requiring strict protection

Bombina bombina - the red-bellied puddlepuppy

It is a small frog, up to 5 cm long, with a stocky, flattened body. The head is relatively small, equal in length and width, and the snout is rounded. The eyes are very prominent with triangular pupils. The tympanum is not visible. The tongue is circular, adherent to the buccal plate and immobile. Dorsally, the integument is very warty, covered with numerous round or oval warts with a central black dot. The warts have no spines. Often the dorsal warts are grouped in two linear projections between the shoulders. The thigh and tibia are relatively smaller than in *B. variegata*. The tibio-tarsal joints of the hind legs, bent at right angles to the body axis, do not touch. The male has a shorter and narrower body than the female (more slender appearance); its forelimbs are thicker, and during mating it has dark nuptial callosities

on the inner arm during mating. It has two internal vocal sacs located subcutaneously (Fuhn, 1960).

Dorsally, there is a wide variation in color, from light gray - dark gray to olive-brown, with small black spots; sometimes there may be partially or even totally green individuals. Ventrally, black or shiny gray with small, orange-yellow to reddish spots predominate when feeding on certain species of cladocereans or other small crustaceans (e.g., genus *Daphnia*) that are rich in carotenoid pigments (Fuhn, 1960). The spots are not joined together - a species characteristic - and always occupy less than 50% of the total ventral surface. The bluish-black colored portions have small white spots surrounding the black wart. The ventral coloration is a warning that the species is toxic (Cogălniceanu et al., 2000).

There are spots and palmar spotting on the limbs, and the fingertips are dark in color, never yellowish-purple as in *B. variegata* (Stugren, 1980).

It is an aquatic animal, covering altitudinal altitudinal plains and hilly areas, living in steppe, forest-steppe, in a wide variety of aquatic habitats with clear, stagnant water and shallower depth: lakes, permanent or semi-permanent pools, ditches, canals, marshy areas with rich marsh vegetation.

It generally chooses cleaner water than *B. variegata*, but can also be found in polluted areas (www.iucnredlist.org). Often uses canals as a means of dispersal (Arnold and Burton, 1978; www.amphibiaweb.org).

Feeding: larvae are primary consumers, feeding mainly on algae. Necrophagy sometimes occurs. Adults are opportunists, consuming aquatic and terrestrial invertebrates (Coleoptera, Arahnidae, Copepods, Cladocere, Aphids, Orthoptera, Formicidae, respectively the larvae of some taxa such as Diptera-Nematocere, Lepidoptera), with a higher preponderance of aquatic invertebrates (Kovács and Török, 1997; Sas et al., 2004; Radu et al., 2007; www.amphibiaweb.org).

Breeding: starts from April-May and can last until August. Males swell their bodies and usually sing in chorus, especially in the evenings and at night, synchronizing. A single male can sing for several hours non-stop. They usually sing on the surface of the water, but can also sing underwater. Fertilization is external with a lumbar amplexus, with simultaneous egg and sperm elimination. A female may lay several eggs per year. The eggs (between 10-100 per clutch) are laid singly or in small clusters, usually attached to plants (Cogălniceanu et al., 2000). When the eggs are being ejected, the female grasps a vertical stem and, with the male attached to it, makes circular movements around it, so that the egg string will be wrapped around the stem. The larvae hatch after a week and metamorphosis takes about 90 days at an average temperature of 20°C. The larvae are about 5-6 mm at hatching, reaching 38 mm at maximum development (Fuhn, 1960). Dorsally, the larvae are brown; laterally, immediately after hatching, two yellowish longitudinal stripes appear, which later disappear; ventrally they are grayish-white. Sexual maturity is reached after 2-4 years (Rafinska, 1991).

Defense: there are glands in the thickness of the skin that secrete toxic polypeptides of the bombesin class (white, viscous, irritating-smelling liquid); these are released only when the animal is disturbed. The presence of the toxic glands is matched by the aposematic color of the abdomen. The attacked animal assumes a certain posture known as the "unken reflex": it turns with its abdomen up to expose the brightly colored ventral part of its body and remains

motionless for several seconds, its body is bent convexly, and its forelimbs cover its eyes or remain in the normal position, but it arches its abdomen strongly, raises its head, and curves its extremities so that the warning coloration is visible (Arnold and Burton, 1978; Bajger, 1980; www.amphibiaweb.org). Despite possessing these toxic secretions, there are vertebrates that regularly consume them (www.amphibiaweb.org). These secretions may also serve as a defense against fungi and bacteria (Simmaco et al., 2009).
It is an oriental, monotypic species; it is widespread in Sweden, Denmark, Germany, Poland, Latvia, Lithuania, Austria, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina, Serbia and Montenegro, Greece, Turkey, Bulgaria, Romania, Republic of Moldova, Ukraine, Belarus, Russia, Kazakhstan.

In Romania, it is found from sea level (the pools of the Danube Delta) to a maximum elevation of 400 m in the Transylvanian Plain (Fuhn, 1960; www.amphibiaweb.org). According to recent genetic studies, there are two groups delimited by allozyme studies: a northern one, occupying habitats in depressions north of the Carpathian Mountains, and a southern one, distributed along the Danube plains. These two groups probably intergrade east of the Carpathians. Populations in Romania belong to the southern genetic group of the species (Hofman et al., 2007).

Bombina variegata - Yellow-bellied Toad

The Yellow-bellied Oystercatcher is widespread in Romania between altitudes of 150 m and alpine hollows (up to 2000 m), usually not exceeding the upper limits of forests. On the dorsal side it has irregularly arranged warts, ending with a black horny spine at the tip, surrounded by many small horny spines, unlike Bombina bombina (the vicariant species for the lowland area), which has warts without horny spines. Dorsal coloration is light grayish-brown, grayish-brown, uniformly olive or mottled with black; usually with a pair of black spots between the shoulders and a spot in the middle of the back (Fuhn, 1960). Ventrally, Bombina variegata has gray or black spots on a light yellow background, with yellow predominating; white spots sometimes occur, especially within the dark marbling on the breast. The Bombina variegata secretes a toxic substance when threatened and exhibits a warning behavior (aposematic behavior, referred to in the literature as "Unken-reflex"): it arches dorsally to expose the light-colored ventral area of the gill, forelimbs and hindlimbs and to warn of toxicity of the integument.

Bombina variegata is an eurytopic, predominantly aquatic, social amphibian species, active both day and night. The species has a very good dispersal, being able to colonize any newly formed aquatic habitat or water body, and can tolerate polluted waters relatively well (Cogălniceanu et al., 2000). It is much less demanding in terms of spawning habitat than the vicariant *Bombina bombina*, the latter preferring larger pools in lowland areas, large river valleys or floodplains. The breeding strategy of Bombina variegata is to use as many water holes as possible, formed in road ruts or cattle tracks, temporary pools, small muddy springs, etc., to lay a few eggs, thus ensuring the continuity of the species and preventing some of the sites where it has laid eggs from drying up.

The species *Bombina variegata* is associated with small, temporary, sometimes even polluted pools, without vegetation, soil unevenness containing less than 1 liter of water, and is undemanding in terms of habitat requirements (Fuhn, 1960; Cogălniceanu et al., 2000).
The species' trophic spectrum consists of araneids, isopods, heteroptera, coleoptera (larvae and adults), heteroptera, hymenoptera (formicids, cynipids, ichneumonids) and diptera (culicids, brachyceans), colembola, lepidoptera, dermaptera and homoptera.

Breeding begins in late April - early May and lasts throughout the summer, with the female laying several eggs during this period. They hibernate between October and April.

Triturus cristatus - crested newt

It is the second largest newt species in Romania, up to 16 cm long. The body is robust and oval in cross-section, the head is broad, with a rounded snout, lacking longitudinal grooves. Well pronounced gular crest. Limbs long and strong, when stretched across the body - hind to fore - toes touching. Tail length less than or equal to the body and tapering to a pointed end. The integument is rough both dorsally and ventrally. Males are smaller than females, have longer limbs, and in the breeding season have a high, toothed dorsal crest that starts between the eyes, disappears at the cloaca and is continued by the caudal crest, which is equally well developed but less toothed; this is also developed on the ventral side of the tail. The male cloaca is swollen and dark. Females have a medio-dorsal groove in place of the height of the crown, and the caudal crests are very poorly developed (Fuhn, 1960; Cogălniceanu et al., 2000).

Breeding males have a background coloration, dorsally and laterally, dark brown with black to olive-brown spots, sometimes with reddish-brown shades; white dots appear laterally and laterally ventrally, which agglutinate on the head and on the goiter, and may form white vermicules. The gape is yellow to black, often with white spots; the ventral part is yellow or yellow-orange with irregular black spots; the cloaca is black. On the sides of the tail there is a broad, shiny, white stripe. The color pattern of the female is similar to that of the male, with slight differences: the cloaca and ventral edge of the tail are yellow or yellow-orange, and the sidephyle stripe on the tail is missing (Fuhn, 1960; Cogălniceanu et al., 2000).

It is a predominantly aquatic and nocturnal newt, but may also be diurnal; when environmental conditions become unsuitable, it retreats to land near the pool, being nocturnal only. It is generally found in the water from March to June and then on land near the water, hiding under stones, foliage, fallen logs, holes in the ground. Isolated individuals may remain in the water throughout the year. The migratory and colonization power covers distances up to 1 km. Despite their large size, they move quickly in both aquatic and terrestrial environments (Cogălniceanu et al., 2000).

Due to their large size they do not breed in small temporary pools, only in permanent ones. Reproduction takes place in March-April; nuptial games are carried out in the same way as in other newt species, fertilization is internal, without amplexus and is achieved by means of a spermatophore.

Sperm transfer takes place following a complex sexual parade during which the partners do not touch, stimulating the female and synchronizing their movements for successful sperm transfer through a series of visual, olfactory and mechanical signals. Females lay a single egg or groups of 2-3 eggs, which they attach to submerged vegetation, i.e. they are wrapped in plant leaves; in total 60-200 eggs are laid, these eggs are large, 2-4 mm in size and white in color,

but some do not develop due to chromosomal mutations. The larvae are large (8-10 mm at hatching) with a high dorsal ridge that is continued by a caudal filament up to 6 mm long and vary in color from dark brown to light gray with large, black spots. Embryogenesis lasts 12-20 days and larval development takes around 2.5-3 months; many larvae hibernate at this stage. After hatching, the larvae have a benthic mode of life (found on aquatic plants or substrate), and become pelagic after development of the caudal filament and digits. There are also cases of neoteny, sexual maturity being reached after the first 2-3 years of life in males, when body length reaches 12-13 cm; females take longer (Cogălniceanu et al., 2000).

If captured, they may make a high-pitched squeaking sound; the skin secretes a white toxic substance with a specific odor. Sometimes they may assume a specific defensive posture: they expose the aposematic colors of their abdomen by twisting their body and rolling their tail; the position is maintained with eyes closed and without breathing for several seconds.

It is widespread in wooded areas, meadows, parks, gardens; it prefers large and deep stagnant waters with submerged and marshy vegetation, in our country it is found from lowlands to 1000-1400 m altitude (Cogălniceanu et al., 2013). It is common in ponds and lakes, ditches, pools, artificial pools, even irrigation channels or smooth-flowing waters, especially if there is aquatic vegetation in which it can hide and fish are absent. It is not very fussy about water quality, but the larvae have higher water quality requirements; they have difficulty adapting to urban or suburban habitats.

Triturus montandoni - Carpathian newt

Females reach up to 11 cm, males are smaller. The marbled coloration is characteristic. The abdomen is orange-yellow, unguarded. The forehead has 3 longitudinal grooves. There are well-developed integumentary ridges on the sides of the back. Males have no crest. There is a yellowish, bluish-white stripe at the lower edge of the tail. In the aquatic period, the male's tail has a terminal filament and the cloaca is black, large and swollen. The female has a small, yellow cloaca. The female lays her eggs individually, sticking them to vegetation or objects in the water. She can lay over 100 eggs. Larvae hatch at 6-7 mm, metamorphose at 25-35 mm. Sexual maturity in 3-4 years. Easily observed when rising to the surface to breathe, but difficult to differentiate from Triturus vulgaris.

It also lives in the hills but is generally a mountain species (100-2000 m). Usually occurs in grasslands and deciduous or mixed forests. The species has a short aquatic period, corresponding to the breeding season. The rest of the year it is terrestrial.

In spring, choose a wide variety of usually shallow water types, from standing, permanent or temporary, to gently flowing. Those with vegetation are preferred.

In the terrestrial phase it becomes crepuscular-nocturnal. By day it takes refuge in microhabitats with dense vegetation and litter. It stays near wetlands near breeding sites. It feeds on invertebrates and amphibian larvae. Hibernates on land, rarely in water.

The Carpathian newt is endemic to the Carpathian Mountains, being widespread from the Iezer-Păpușa Mountains (Iftime et al., 2009, Iftime and Iftime, 2012), in the Cur Curved and Eastern Carpathians, up to at the Ukrainian border, then to the extreme west of Ukraine, the Tatra Mountains, southern Poland, eastern Czech and Slovakia (Cogălniceanu, et al., 2000).

Triturus vulgaris ampelensis - Transylvanian newt

Morphology: The adult is around 70 mm in size. The dorsal crest of the male in rut is generally short (2 - 4 mm), with a straight or slightly veined or scalloped edge; the height of the crown begins only in the occipital region and is streaked with black and yellow. The dorsal ridge usually increases gradually in height in an antero-posterior direction, reaching its maximum height above the cloaca. The lower edge of the caudal crest is straight and unbust. On the sides of the back, the integumentary ridges are well expressed. The tail usually terminates in a sharp filament with a tegumentary edge or with a black filament without edge. Usually, the hind toes of the male in rut have well-developed palpi on both sides of the phalanges. Females often have unguarded gills and abdomen, as in Triturus helveticus.

Coloring: In males, the background is generally yellowish, sometimes brownish, with very intense, round, very intense black spots on the back and flanks. The head has 7 black stripes: on the upper jaw, on the eyes, in the supraocular region, and a non-paired stripe between the supraocular stripes. On the abdomen there are round, black spots, usually with a bright orange-red median stripe (sometimes missing); longitudinal blue and red stripes are seen at the infra-facial edge; the flanks have golden reflections. Females are generally light yellow in coloration, with lateral edges on the back and a median dorsal border; small black dots appear on the back and flanks; sometimes with a dark toothed line along the back mucosae. On the head, between the upper jaw and the eyes, up to the parotoid, a yellow stripe is seen, sometimes extending to the cloaca, separating the flanks from the abdomen. The abdomen and gape are very often uniform, pale yellow or pale pinkish-yellow, unguarded.

Habitat: It occurs in hilly and mountainous areas, between 300 - 1200 m altitude, in and around pools or lakes with or without vegetation, even in calcareous waters and especially in limneocrene limneocrene clear pools (Fuhn, 1960; Cogălniceanu et al., 2000; Botnariuc and Tatole, 2005; www.amphibiaweb.org). In spring for breeding it chooses a wide variety of water types in different habitat types. It usually prefers shallow, well-sunlit, clean, vegetated waters, from permanent or temporary stagnant to gently flowing. They prefer fish-free waters. During the terrestrial period, great crested newts also have habitat preferences, needing shelter and feeding areas, so the presence of rocks, crevices and dead wood near breeding habitats is very important, especially as dispersal ability is low, being in the 1-1000 m range (Baker et al., 2011).

Activity: enters the water early spring (mid-February-early March) for spawning, after which adults quickly leave the aquatic environment; sometimes may remain aquatic throughout the active period. In the aquatic environment, it is present more in the water body, active both day and night, whereas in the terrestrial environment it is nocturnal (Cogălniceanu et al., 2000; www.amphibiaweb.org). Larvae are benthic and diurnal (Dolmen, 1983).

Feeding: opportunistic (and generalist), feeding on a wide variety of invertebrates (lumbricids, crustaceans, gastropods, spiders, mites, mites, beetles, coleoptera, dipterans or lepidoptera), eggs or small amphibian larvae (Cicort-Lucaciu et al., 2006). Freshly metamorphosed juveniles feed on land. Males and females sometimes have different capture strategies, the former in the aquatic environment being more adept at obtaining food due to their dorsal dorsal crest (David et al., 2009). Cannibalism is widespread in females that spend more time in the abundant vegetation near the shore to lay eggs; they are oophagous, sometimes even consuming their own eggs. Larvae initially feed on egg yolks, then on microcrustaceans;

as they develop, they consume larger prey, usually aquatic molluscs and insects (www.amphibiaweb.org).

Reproduction: mating takes place in spring from March and can last until later in June. The male courts the female, bringing her into a state of sexual receptivity through a specific nuptial dance, after which he deposits spermatophore on the bottom, which is immediately taken up by the female, who follows. Fertilization is internal (Green, 1991). The female will lay 60-300 eggs, one by one, on the leaves of aquatic plants: the egg is wrapped in a sticky substance and deposited on the leaf, after which the female folds the leaf around it with her hind limbs to protect it. The larvae emerge after 1-3 weeks, hatch in 6-7 mm, have a high dorsal crest and a light brown to yellow dorsal coloration with brown dots and silvery-white ventrally; metamorphosis usually occurs in the same year, rarely they may overwinter as larvae (www.amphibiaweb.org). Sexual maturity is reached after 2-3 years in males and slightly longer in females (up to 7 years) (Marnell, 1998).

Defense: if trapped, they may let out a low shriek and secrete toxic substances produced by the integumentary glands. In the aquatic phase, in case of danger, they take refuge in nearby aquatic vegetation (Duellman and Trueb, 1994).

Emys orbicularis - European freshwater turtle

Morphology: It is a tortoise with a sheeted carapace and the juveniles have a carapace with a keeled shell. It rarely reaches up to 30 cm, but only females, males reach up to 20 cm. It is greenish-black with yellow spots or striations. The limbs are flattened, the fingers have an interdigital membrane, which helps it to swim (Sos, 2011).

Habitat: Occurs from the lowlands to the hilly area between altitudes 0 - 800 m. In mountainous areas it can ascend in warm climate valleys. Year-round aquatic, leaves the water for breeding purposes or when aquatic habitats are damaged. It thrives in large, permanent, and calm water bodies, but often occurs in temporary waters.

Activity: In warm periods it is especially active in the early morning and evening, often at night. Choose microhabitats with dense vegetation. They are faithful to sunny places - fallen trees, rocks, spots on the shore without vegetation. Omnivorous, feeding on invertebrates, vertebrates (amphibians, fish) and plants. Generally hibernates in water. A shy, frightened species that takes refuge in the water (Sos, 2011).

Reproduction: Males often migrate between pools to find mates. Females are loyal to spawning sites, which are sloping, sunny areas with sandy, loamy soil. The number of eggs laid is between 2-20. Juveniles hatch 23-33 mm in size. Males reach sexual maturity at around 6 years, females at over 15 years.

The genus Emys is a member of the turtle family Emydidae, also known as the New World water turtles. Most members of this family are of American origin. Even the European water turtle is native to North America. The species migrated to the continent of Asia on the Bering 'strip' (today: Bering Strait) and later reached Europe (Sos, 2011).

From the sahelian to the mountainous area, in valleys with warm climate, between the altitudes 0 - 900 m (Cogălniceanu et al., 2000; Cogălniceanu et al. 2013a).

1.3. Methodology of inventory, mapping and assessment of herpetofauna species of conservation interest.

The inventory and mapping of the targeted species was carried out on the basis of the following complementary sub-activities (Table 65):

Table 65 Description of the steps in the methodology, expected results, logistics and material resources used and venue

Species	Description of the steps in the methodology	Results - interim and final	Logistics and material resources used	Venue
Bombina variegata, *Bombina bombina*, *Triturus cristatus*, *Triturus vulgaris ampelensis*, *Triturus montandoni*, *Emys orbicularis*	Inventorying, mapping and assessing the conservation status of **aquatic habitats in** use	Distribution, suitability of aquatic habitats (availability of standing water bodies, depth, water quality, presence of predators), availability of terrestrial habitats, pressures and threats, their intensity, conservation status	sock, GPS receiver, map, field sheet, camera, vehicle.	study area
Bombina variegata, *Bombina bombina*, *Triturus cristatus*, *Triturus vulgaris ampelensis*, *Triturus montandoni*, *Emys orbicularis*	Inventorying, mapping and assessing the conservation status of occupied **terrestrial habitats**	Distribution, habitat suitability (presence of specific structures and features), pressures and threats, their intensity, conservation status	GPS receiver, map, field sheet, camera, vehicle.	study area
Bombina variegata, *Bombina bombina*, *Triturus cristatus*, *Triturus vulgaris ampelensis*, *Triturus montandoni*,	Inventorying, mapping and assessing the conservation status of the **species during the breeding season**	Species distribution, estimated population size, pressures and threats, their intensity, conservation status. If possible: proportion of age classes and sex, population viability, etc.	sock, GPS receiver, map, field sheet, camera, vehicle.	study area

Species	Description of the steps in the methodology	Results - interim and final	Logistics and material resources used	Venue
Emys orbicularis				

Amphibians are a group of animals with a complex lifestyle. Their reproduction is closely linked to the presence and quality of water bodies. Some species, such as species of the genus *Bombina*, are closely linked to the presence of water bodies, such as small, temporary pools. These species spend their entire annual activity period in these aquatic habitats, where they breed and feed. Newts and most species of native frogs, such as the height of the crowned newts *Triturus sp.* and the brown frogs - Rana *sp*. have an annual aquatic and terrestrial cycle. They enter an aquatic phase in spring, which is also a morphological change, and breed only in aquatic habitats. The time spent in the aquatic habitat depends on the species, the weather, the physical characteristics of the water and the vegetation. After reproduction they leave the water and become terrestrial and generally nocturnal.

The larval development of all amphibian species takes place only in water, so the lack of aquatic habitats for reproduction leads to local extinction of amphibians. The preference and resistance of larvae to the physical, chemical and structural characteristics of aquatic habitats and threat factors differ, thus these characteristics and factors determine species composition structure and abundance.

In order to inventory and map the species of amphibians or reptiles with semi-aquatic lifestyles, as a first step, the aquatic habitats used were identified and inventoried. The localization was carried out by conducting field transects broken down by the different habitat types existing on the site and mainly in the area of the hydro-engineering sites targeted by the project and in their vicinity.

The transect method is a widely known and used method for inventorying species and their habitats. With this method we use well-defined units, e.g. the area covered by the transects, which are usually randomly arranged in the target area. Data obtained by observation along the transects result in datasets on the diversity, distribution and relative abundance of the target species, and the structure and quality of the habitats they occupy. These data can be used to compare the diversity, distribution and relative abundance of species in different habitat types, along an altitudinal gradient, or a distance from a negative factor. From the distributions obtained we can infer the relationship between the habitats occupied and the ecology of the target species. The repeatability of the inventory is a strength of the method. Inventory data taken at different times of the year or on an annual basis can reveal changes in the presence and structure of communities, so it is a method often used to monitor changes in community structure over time.

Field observations were supplemented with information from the literature for a more accurate assessment of the distribution of species of conservation interest in the project area. The data were georeferenced in GIS system where species distribution maps were produced.

Results

Following field surveys and the analysis of existing information for protected areas in the project area, one reptile species and two amphibian species of community interest present in the study area and potentially affected by the project were identified, namely: *Triturus cristatus, Bombina variegata and Emys orbicularis*

Critical analysis of representative bibliographical references of herpetofauna species of community interest in the study area.

No. crt.	Details bibliographical reference	Comments
1.	Fuhn I.E. (1960): Fauna of the Romanian People's Republic, Vol. XIV Amphibia, Editura Academiei Republicii Populare Române, Bucharest	The most extensive work on amphibian chorology for the second half of the second century. XX mentions the presence of the species *Bombina variegata* and *Triturus cristatus* in Turnu Roșu Pass.
2. 2.	Fuhn, I. E. & Vancea, Șt. 1961. Fauna of the Romanian People's Republic - Reptilia. Editura Academiei R.P.R., Bucharest, 1-352.	The most extensive work on reptile chorology for the second half of the second century. XX mentions the presence of the species *Emys orbicularis* at Avrig.
3.	Gyongyver M., Ghira I., Levente F. (1999) Preliminary report on herpetofauna of the upper and middle Olt river basin. Transsylv. Rev. Syst. Ecol. Res. 1:169-181	A work that synthesizes information from old literature such as Fuhn (1960), Fuhn and Vancea (1961) and Cogălniceanu (1991), complemented by observations from personal communications from Urlea M. and Graef P.R., as well as field research by the authors. *Bombina variegata*: Avrig, Sebeșul de Sus, Tălmaciu, Lotrioara. *Triturus cristatus*: Avrig, Turnu Roșu, Tălmaciu, Lotrioara. *Emys orbicularis*: Avrig, Bradu, Mârșa, Turnu Roșu, Boița, Tălmaciu, Lotrioara.
4.	Ghira I, Venczel M, Covaciu-Marcov SD, Mara G, Ghile P, Hartel T, Török Z, Farkas L, Rácz T, Farkas Z, Brad T (2002) Mapping of Transylvanian herpetofauna. Nymphaea Folia naturae Bihariae 29: 145-201	The most extensive work summarizing the distribution of amphibian and reptile species in Transylvania mentions the presence of species in the following ATUs: *Bombina variegata*: Avrig, Boița, Racovița, Tălmaciu; *Triturus cristatus*: Avrig, Boița, Tălmaciu; *Emys orbicularis*: Avrig, Boița, Tălmaciu.
5.	Bănăduc D (2004) The amphibian collection of the Sibiu Natural History Museum. Studies and Communications-Nature Sciences, Brukenthal Museum Sibiu 29: 215-219	A work that includes information on specimens preserved in museum collections of amphibian species from the collection of the Museum of Natural History Sibiu in which is mentioned the oldest presence of the species *Bombina variegata*, a specimen collected in 1884 in Turnu Roșu Pass.
6.	Krecsák L, Sike T, Sós T (2004) Distribution of the herpetofauna in the Lotrioara river basin, Sibiu district (Romania) Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 47: 285-295	*Bombina variegata*: Lotrioarei Valley
7.	Cogălniceanu D., Rozylowicz L., Székely P., Samoilă C., Stănescu F., Tudor M., Székely D., Iosif R., 2013a, Diversity and distribution of amphibians in Romania. ZooKeys, 296: 35.	The article includes most of the bibliographical citations from pre-2013 articles plus personal communications or field data of the team of herpetologists led by Prof. Dr. Dan Cogălniceanu from 1986-2012. Thus, the spatial references regarding the presence of *Bombina variegata* in the study area are in the TAUs: Turnu Roșu (V. Rândibou), Tălmaciu (V. Lotrioara) and Câineni.

No. crt.	Details bibliographical reference	Comments
		These references do not contain data on habitat type or other biotope or population data, but only the presence of the species within the localities or administrative-territorial units mentioned.

Triturus cristatus

Table 66 Species-specific data for Triturus cristatus at the protected natural area level.

No. crt.	Information/Attribute	Description
1	Species	814
2	Species-specific information	The species occupies permanent or temporary aquatic habitats with areas up to 100 square meters and depths up to 1 m, with aquatic vegetation necessary for reproduction, as well as terrestrial habitats such as meadows and forests in several localities in the study area. A number of 0-2 individuals were identified in 4 different habitats in the altitudinal range 350-390 m (outside the project site).
3	Presence status [temporary]	Resident
4	Presence status [spatial]	Widespread
5	Attendance status [management]	Native
6	Abundance	Rare
7	Field data collection period	December 2023 - May 2024
8	Species distribution [interpretation]	The species was also observed in 4 localities before 2000: Avrig, Tălmaciu, Turnu Roșu, Lotrioara.
9	Species distribution [distribution map]	IL
10	Other information on sources of information	D. Fuhn I.E. (1960): Fauna of the Romanian People's Republic, Vol. XIV Amphibia, Editura Academiei Republicii Populare Române, Bucharest E. Gyongyver M., Ghira I., Levente F. (1999) Preliminary report on herpetofauna of the upper and middle Olt river basin. Transsylv. Rev. Syst. Ecol. Res. 1:169-181 F. Ghira I, Venczel M, Covaciu-Marcov SD, Mara G, Ghile P, Hartel T, Török Z, Farkas L, Rácz T, Farkas Z, Brad T (2002) Mapping of Transylvanian herpetofauna. Nymphaea Folia naturae Bihariae 29: 145-201 G. Cogălniceanu D., Rozylowicz L., Székely P., Samoilă C., Stănescu F., Tudor M., Székely D., Iosif R., 2013a, Diversity and distribution of amphibians in Romania. ZooKeys, 296: 35.

Bombina variegata

Table 67 Species-specific data of Bombina variegata at the level of the protected natural area.

No. crt.	Information/Attribute	Description
1	Species	638
2	Species-specific information	It is less fussy in its choice of aquatic habitat, being found in temporary or permanent pools and puddles, with or without vegetation, swamps, marshes, smoother streams, streams, including in water collected in machine tracks. The population size in the study area is estimated in the range of 5-10 individuals and is distributed in more than 15 different aquatic habitats in the altitudinal range 350 - 700 m.
3	Presence status [temporary]	Resident
4	Presence status [spatial]	Widespread
5	Attendance status [management]	Native
6	Abundance	Common
7	Field data collection period	December 2023 - May 2024
8	Species distribution [interpretation]	The species has been reported in the following localities: Avrig, Boița, Câineni (V. Curpenului, V. Fetei, V. Satului), Lazaret (V. Fratelui, V. Rândibou, Fața Cetății), Lotrioara (V. Lotrioarei), Racovița, Râul Vadului, Tălmaciu (V. Cibin) and Turnu Roșu.
9	Species distribution [distribution map]	IL
10	Other information on sources of information	H. Fuhn I.E. (1960): Fauna of the Romanian People's Republic, Vol. XIV Amphibia, Editura Academiei Republicii Populare Române, Bucharest I. Gyongyver M., Ghira I., Levente F. (1999) Preliminary report on herpetofauna of the upper and middle Olt river basin. Transsylv. Rev. Syst. Ecol. Res. 1:169-181 J. Ghira I, Venczel M, Covaciu-Marcov SD, Mara G, Ghile P, Hartel T, Török Z, Farkas L, Rácz T, Farkas Z, Brad T (2002) Mapping of Transylvanian herpetofauna. Nymphaea Folia naturae Bihariae 29: 145-201 K. Bănăduc D (2004) The amphibian collection of the Sibiu Natural History Museum. Studies and Communications-Nature Sciences, Brukenthal Museum Sibiu 29: 215-219 L. Krecsák L, Sike T, Sós T (2004) Distribution of the herpetofauna in the Lotrioara river basin, Sibiu district (Romania) Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 47: 285-295 M. Cogălniceanu D., Rozylowicz L., Székely P., Samoilă C., Stănescu F., Tudor M., Székely D., Iosif R., 2013a, Diversity and distribution of amphibians in Romania. ZooKeys, 296: 35.

Emys orbicularis

Table 68 Species-specific data for Emys orbicularis at the protected natural area level.

No. crt.	Information/Attribute	Description
1	Species	678
2	Species-specific information	The species is common throughout the study area, constantly using a variety of aquatic habitats, such as oxbows, permanent pools, canals or river banks during periods of low flow. The population size in the study area is estimated in the range 0 - 5 individuals and is distributed in the altitudinal range 350 - 400 m.
3	Presence status [temporary]	Resident
4	Presence status [spatial]	Widespread
5	Attendance status [management]	Native
6	Abundance	Common
7	Field data collection period	December 2023 - May 2024
8	Species distribution [interpretation]	The species has been reported in the following localities: Avrig, Boița, Bradu, Lotrioara, Mârșa, Racovița, Tălmaciu and Turnu Roșu.
9	Species distribution [distribution map]	IL
10	Other information on sources of information	N. Fuhn, I. E. & Vancea, Șt. 1961. Fauna of the Romanian People's Republic - Reptilia. Editura Academiei R.P.R., Bucharest, 1-352. O. Gyongyver M., Ghira I., Levente F. (1999) Preliminary report on herpetofauna of the upper and middle Olt river basin. Transsylv. Rev. Syst. Ecol. Res. 1:169-181 P. Ghira I, Venczel M, Covaciu-Marcov SD, Mara G, Ghile P, Hartel T, Török Z, Farkas L, Rácz T, Farkas Z, Brad T (2002) Mapping of Transylvanian herpetofauna. Nymphaea Folia naturae Bihariae 29: 145-201 Q. Krecsák L, Sike T, Sós T (2004) Distribution of the herpetofauna in the Lotrioara river basin, Sibiu district (Romania) Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 47: 285-295 R. Cogălniceanu D., Rozylowicz L., Székely P., Samoilă C.,Stănescu F., Tudor M., Székely D., Iosif R., 2013a, Diversity and distribution of amphibians in Romania. ZooKeys, 296: 35.

Photo 36 Habitat characteristic of amphibian species in the project area

D. Birds

D.1. Location of study areas

The remaining works to be carried out at the Racovița development are very limited in scale, as this hydropower plant has been put into operation and cannot lead to the affectation of bird species present in these areas. These specific works can in the worst case induce only a slight spatial retreat, without resulting in population loss, loss of habitat areas specific to each bird species or affecting their current conservation status.

The sites analyzed in the bird species monitoring report are CHE Racovița, CHE Câineni and CHE Lotrioara. These sites are located in the administrative territorial units of the municipality of Câineni (CHE Câineni) and in the administrative territorial units of the municipalities of Boița and Turnu Roșu.

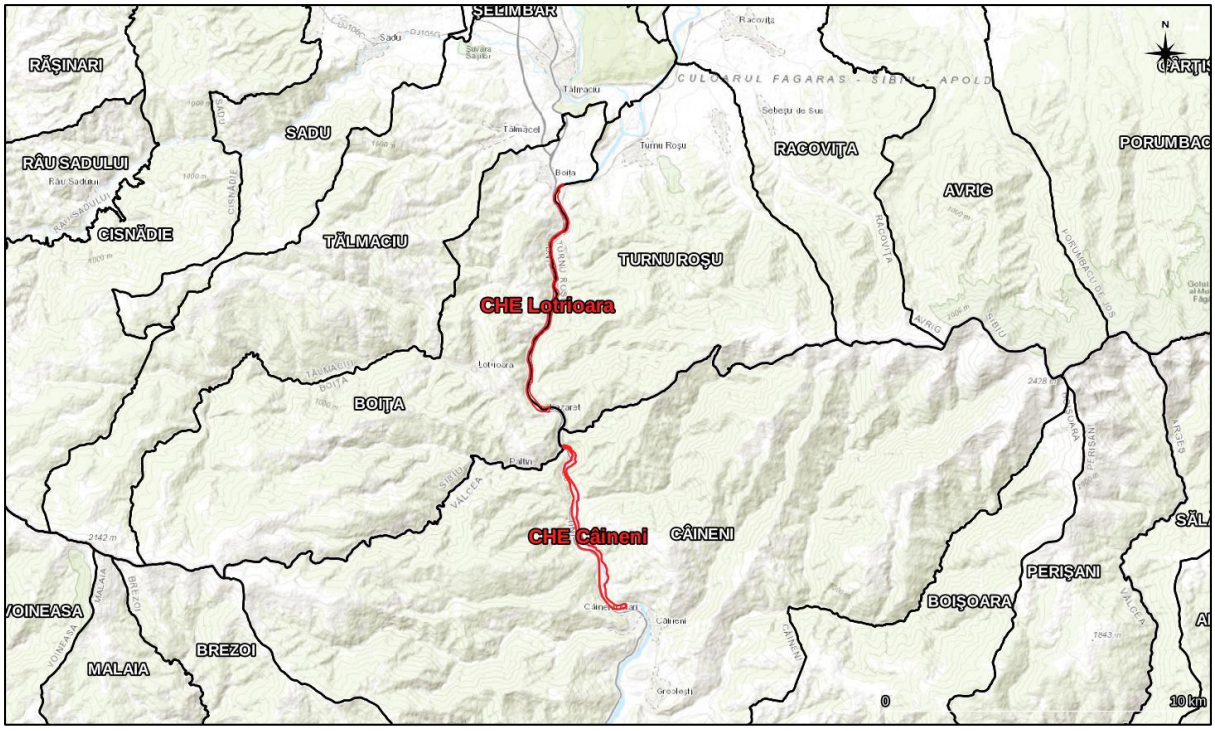


Figure 39 - Aspects regarding the territorial location of the sites concerned by the implementation of the project (red polygons) in relation to the administrative territorial boundaries in the analyzed area (black polygons)

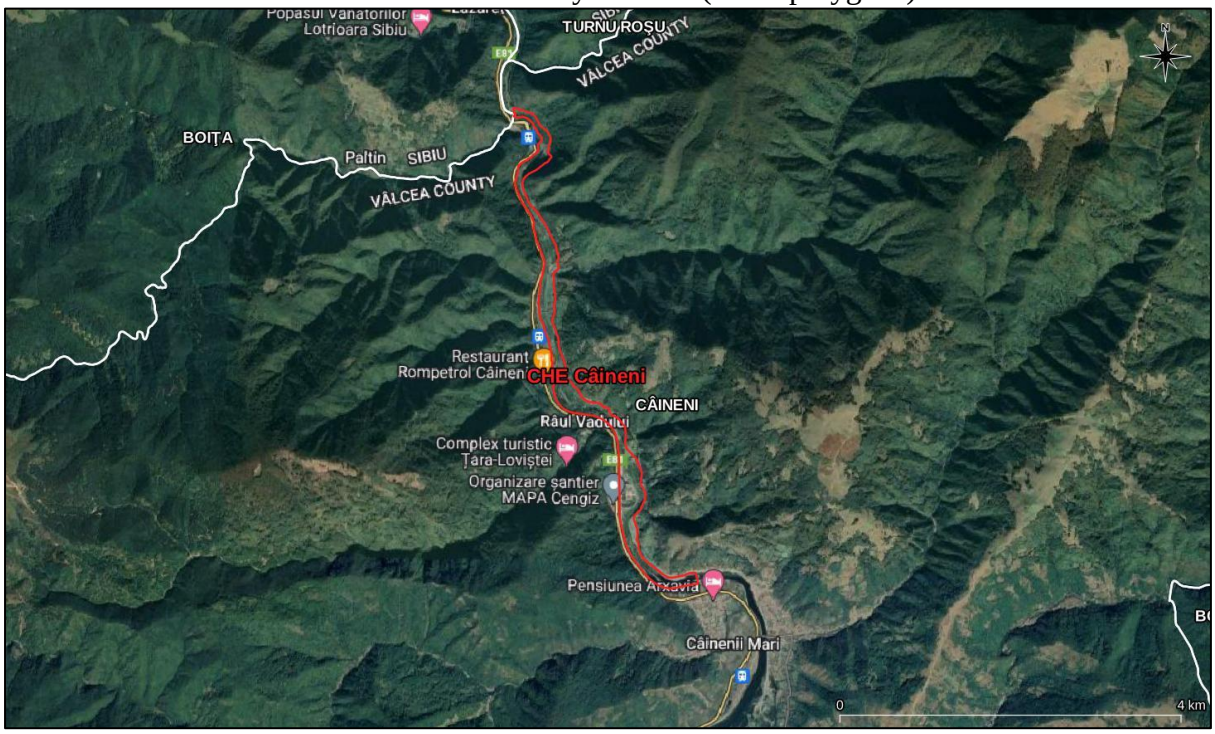


Figure 40 Detail of the location of the CHE Câineni site (red polygon) in relation to the administrative territorial limits of the municipality of Câineni (white polygons)

Figure 41 Detail of the territorial location of the CHE Lotrioara site (red polygon) in relation to the administrative territorial limits of Turnu Roșu and Boița communes (white polygons)

The relationship of the sites targeted by the project implementation (CHE Câineni and CHE Lotrioara) with the areas of special avifauna protection in the analyzed area

The following table shows the relationship between the sites targeted by the project implementation and the special protection areas for avifauna present in the analyzed area.

Table 69 Location of the project in relation to bird protection areas

home hydropower	Natura 2000 site in the area of influence	Natura 2000 site area	Natura 2000 site area crossed by the project (ha)	Intersection share of total Natura 2000 site area (%)
CHE Racovita	ROSPA0003	2.943,7	26,93	0,91
	ROSPA0098	71.201,70	0,09	0,0001
CHE Lotrioara	ROSPA0043	130.890,8	4,07	0,003

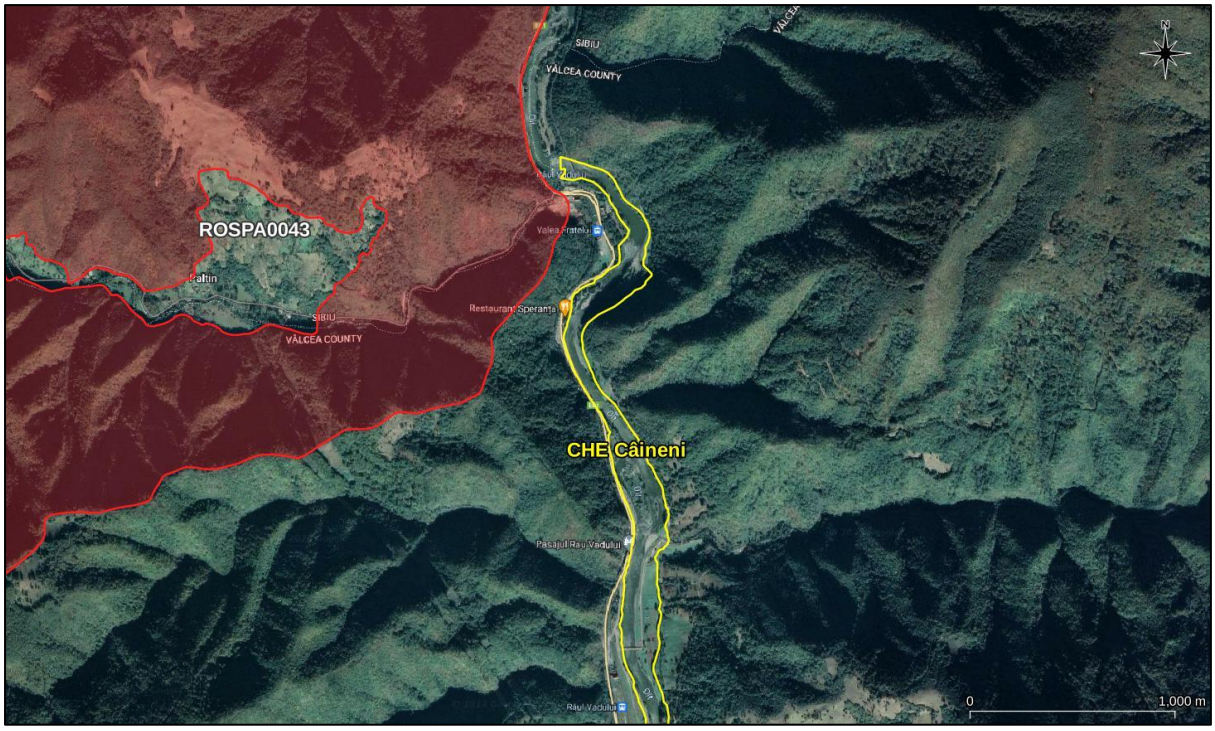


Figure 42 Aspect of the relationship between the Câineni accumulation (yellow polygon) and the special avifauna protection area ROSPA0043 Frumoasa (red polygons)

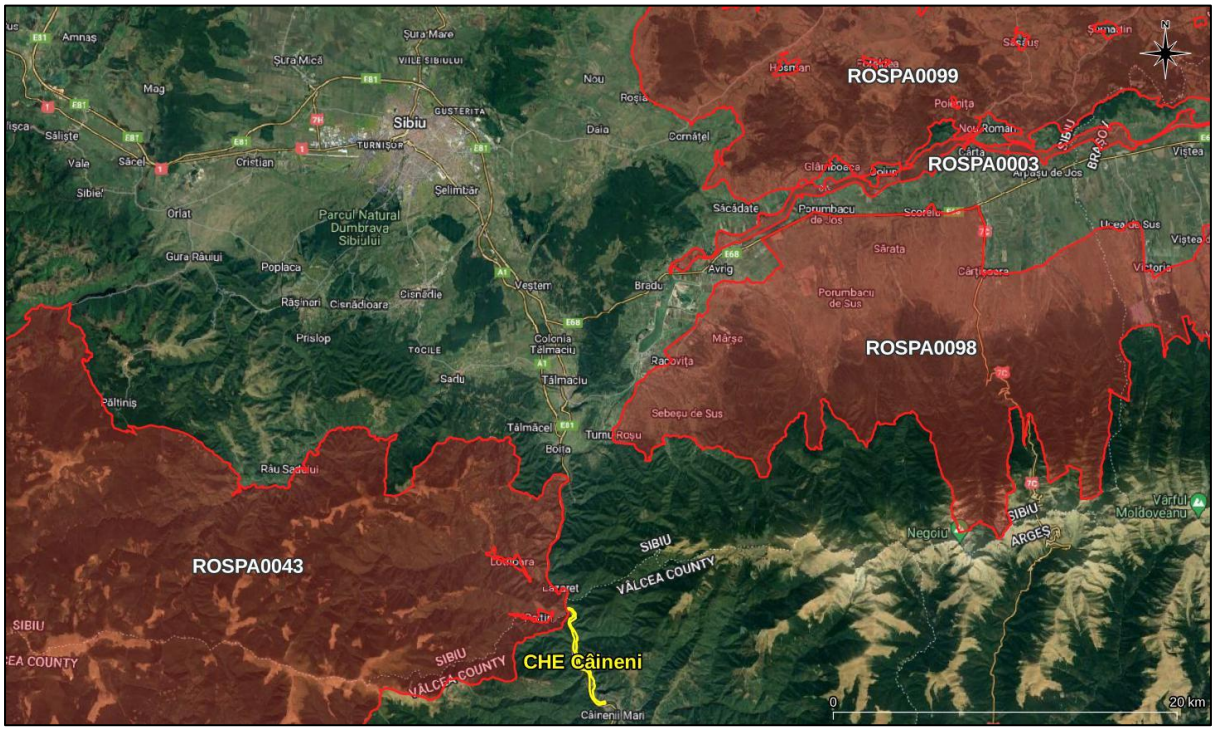


Figure 43 Aspect of the relationship between the Câineni accumulation (yellow polygon) and the special avifaunistic protection areas ROSPA0043 Frumoasa, ROSPA0098 Făgăraș Piedmont, located at least 9.6 km south-west, ROSPA0003 Avrig - Scorei - Făgăraș, located at least 20,2 km south - west and ROSPA0099 Podișul Hârtibaciului, located at least 25,5 km south - west, in relation to the boundaries of the protected areas (red polygons)

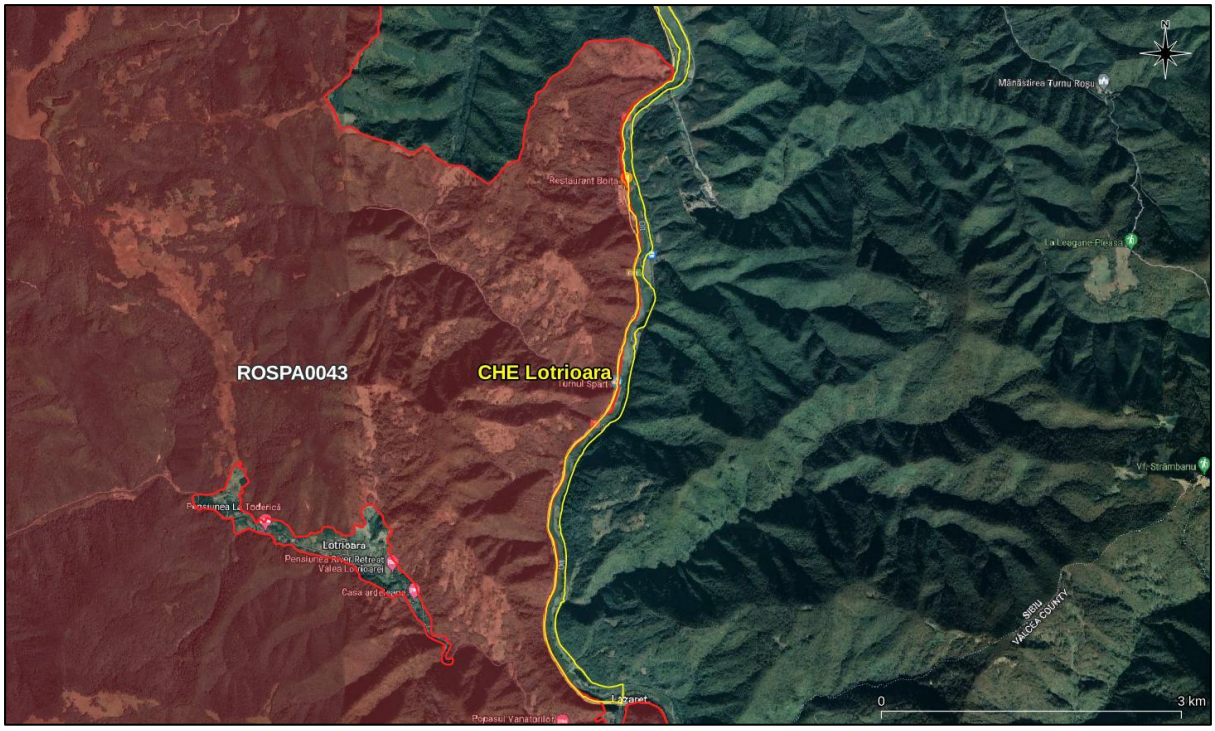


Figure 44 Aspect of the relationship between the Lotrioara Accumulation (yellow polygon) and the special avifauna protection area ROSPA0043 Frumoasa (red polygons)

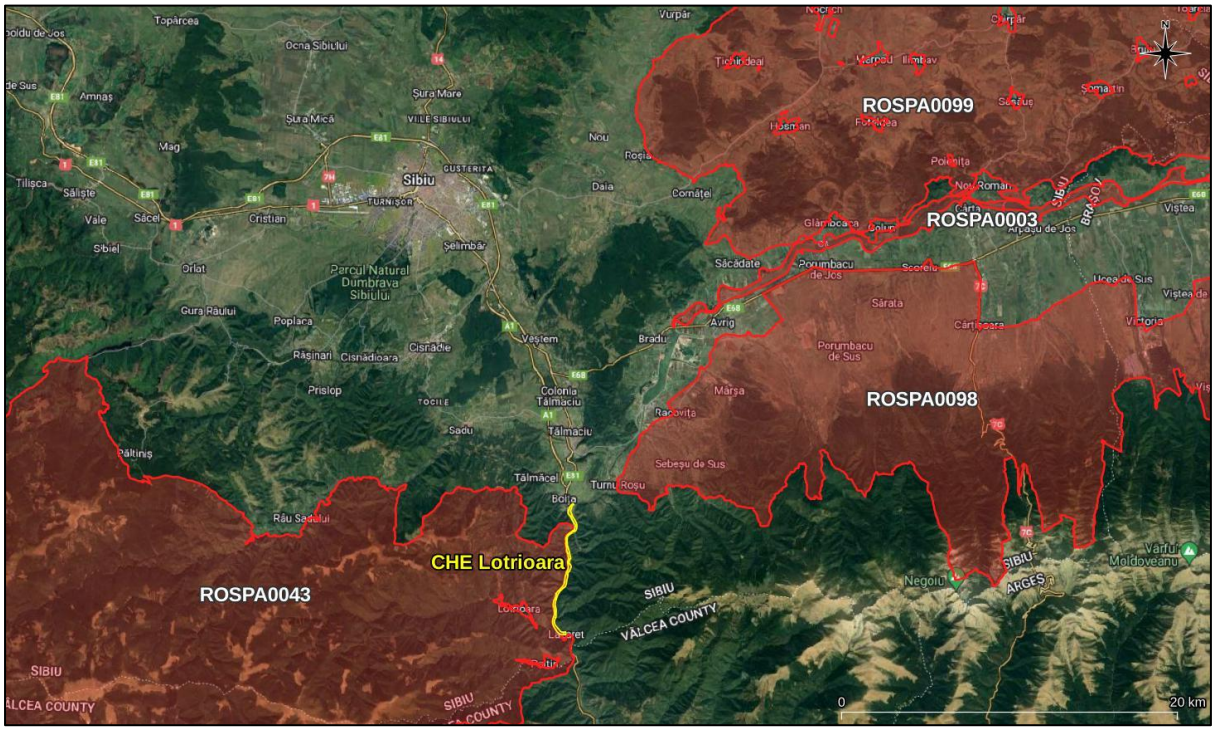


Figure 45 Aspect of the relationship between the Lotrioara accumulation (yellow colored polygon) and the special avifaunal protection areas: ROSPA0043 Frumoasa, located in the eastern vicinity of the protected natural area, with an area of about 4.07 ha, ROSPA0098 Făgăraș Piedmont, located at least 2.7 km to the west, ROSPA0003 Avrig - Scorei - Făgăraș,

located at least 12 km to the south-west and ROSPA0099 Podișul Hârtibaciului, located at least 17.3 km to the south-west

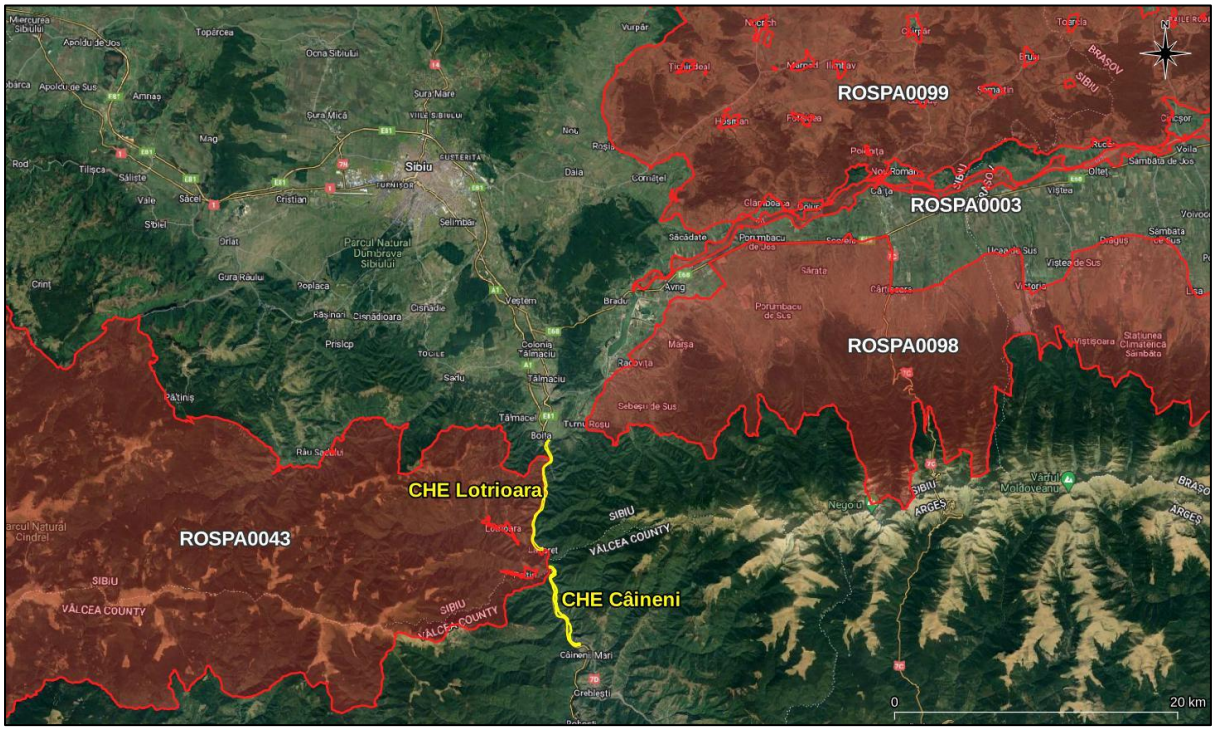


Figure 46 General aspect of the relationship of the Câineni and Lotrioara accumulations (yellow polygon) with the special protection areas ROSPA0043 Frumoasa, ROSPA0098 Făgăraș Piedmont, ROSPA0003 Avrig - Scorei - Făgăraș, and ROSPA0099 Podișul hârtibaciului (red polygons)

Monitoring methodology used

In order to identify the presence of bird species in the area of influence of the project, in the first phase, the information provided by the Management Plans of the Special Protection Areas for Birds in the study area was analyzed:

- Integrated Management Plan of the Natura 2000 sites ROSAC0085 Frumoasa and ROSPA0043 Frumoasa, approved by the Order of the Minister of Environment, Water and Forests no. 1.158/2016 on the approval of the Management Plan and Regulation of the Natura 2000 sites ROSCI0085 Frumoasa and ROSPA0043 Frumoasa;
- The Integrated Management Plan of the Natura 2000 sites ROSAC0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont, approved by the Order of the Minister of Environment, Water and Forests no. 1.156/2016 on the approval of the Management Plan and Regulation of the Natura 2000 sites ROSCI0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont;
- Management plan of the Natura 2000 site ROSPA0003 Avrig - Scorei - Făgăraș, approved by the Order of the Minister of Environment, Waters and Forests no. 1.291/2017 on the approval of the Management Plan and the Regulation of the Natura 2000 Site ROSPA0003 Avrig-Scorei-Făgăraș;

Following the analysis, the monitoring planning stage was carried out. A planning of the actions carried out, both in the field (data collection phase) and in the office (processing, analysis and final decision phase), was realized. The geographic coordinates of the project were entered into a sub-metric GPS device in order to accurately identify the areas concerned by the project implementation and of interest for this report.

The field data collection stage was one of the most important stages because the nature and accuracy of the data collected in the field depend on the results of the report and therefore on the achievement of the proposed objectives. In order to collect field data, all the areas concerned by the implementation of the project, as well as their neighboring area (Câineni and Lotrioara Reservoirs) were fully covered. The observations were carried out using the transect method, these samples being located within and in the vicinity of the sites concerned by the implementation of the project, as well as the fixed-point observation method.

The data obtained from the application of the methodologies were centralized in a CSV database and subsequently added to QGIS, being saved in a SHP file, in order to have a clear view on the distribution of bird species in relation to the sites targeted by the project (Câineni and Lotrioara Accumulations)

Baza de date Cornetu - Avrig — Features Total: 366, Filtered: 366, Selected: 0

	Specie	Sex	Nr. ex	Activitate	X	Y
1	Accipiter gentilis	M	1	NULL	445405.639	445129.261
2	Accipiter nisus	M+F	2	Pereche	444737.245	444732.828
3	Accipiter nisus	NULL	1	Hrănire	444216.341	445992.034
4	Accipiter nisus	NULL	1	Hrănire	443458.431	447933.275
5	Accipiter nisus	NULL	1	Hrănire	441703.897	451883.106
6	Accipiter nisus	NULL	1	Hrănire	450424.559	470789.953
7	Accipiter nisus	M	1	Hrănire	443871.061	446789.162
8	Acrocephalus arundinaceus	NULL	1	Indivizi cântători	450061.490	470899.920
9	Acrocephalus schoenobaenus	NULL	1	Indivizi cântători	444111.052	446647.959
10	Acrocephalus schoenobaenus	NULL	5	Indivizi cântători	448903.090	469875.068
11	Acrocephalus schoenobaenus	NULL	1	Indivizi cântători	450080.239	470906.431
12	Acrocephalus schoenobaenus	NULL	2	indivizi cântători	444214.316	446184.069
13	Actitis hypoleucos	NULL	2	Hrănire	444893.474	444897.582
14	Actitis hypoleucos	NULL	1	Hrănire	444213.784	446272.521
15	Actitis hypoleucos	NULL	1	Hrănire	443252.115	448182.430
16	Actitis hypoleucos	NULL	1	Hrănire	441972.874	451715.369
17	Actitis hypoleucos	NULL	2	Hrănire	449481.647	470467.478
18	Alauda arvensis	NULL	2	Indivizi cântătoriâ	442807.301	457535.680
19	Alauda arvensis	NULL	3	Indivizi cântători	444468.055	445189.152
20	Alauda arvensis	NULL	2	Indivizi cântători	444386.210	445565.976
21	Alauda arvensis	NULL	3	Indivizi cântători	442824.352	459008.874
22	Alauda arvensis	NULL	6	Indivizi cântători	450256.822	470970.053

Figure 47 - Aspect regarding the structure of the database obtained following the field application of the methodology for data collection on the sites targeted by the project implementation

Following the application of field methodologies, 72 bird species were observed in the project area of influence.

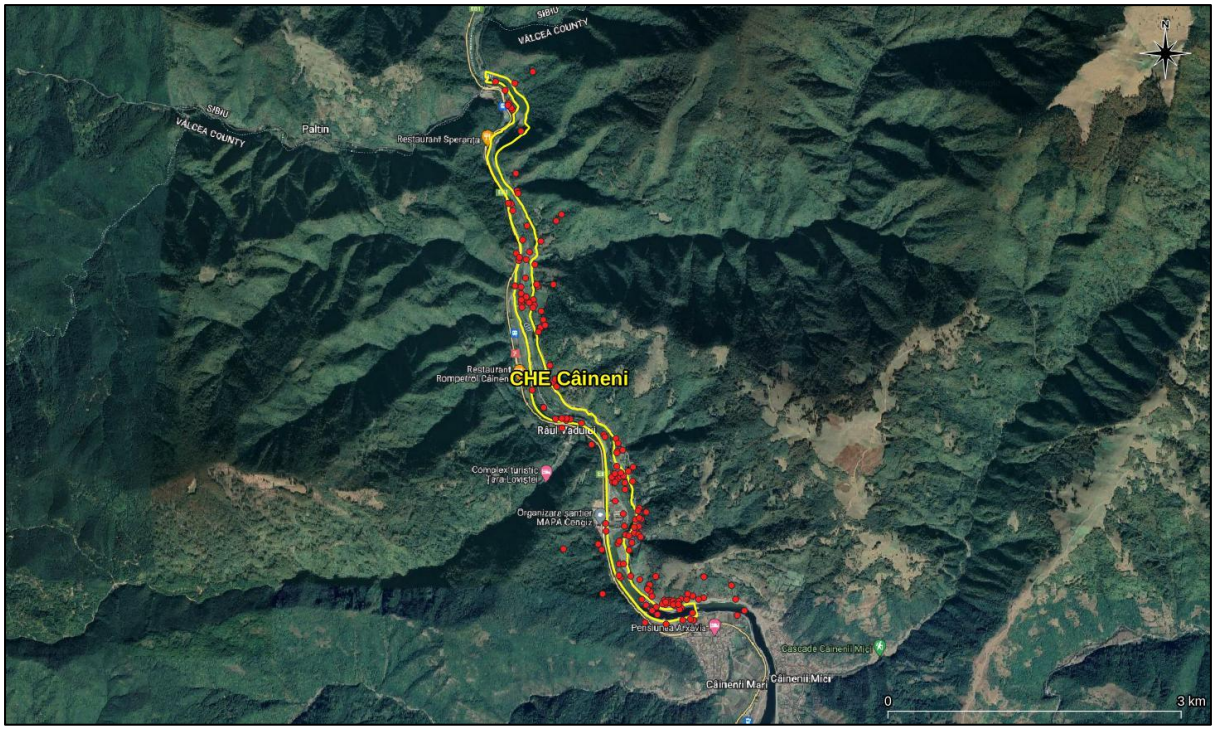


Figure 48 - Distribution of bird species sightings (red colored dots) in the area of influence of the project - CHE Câineni (yellow colored polygon)

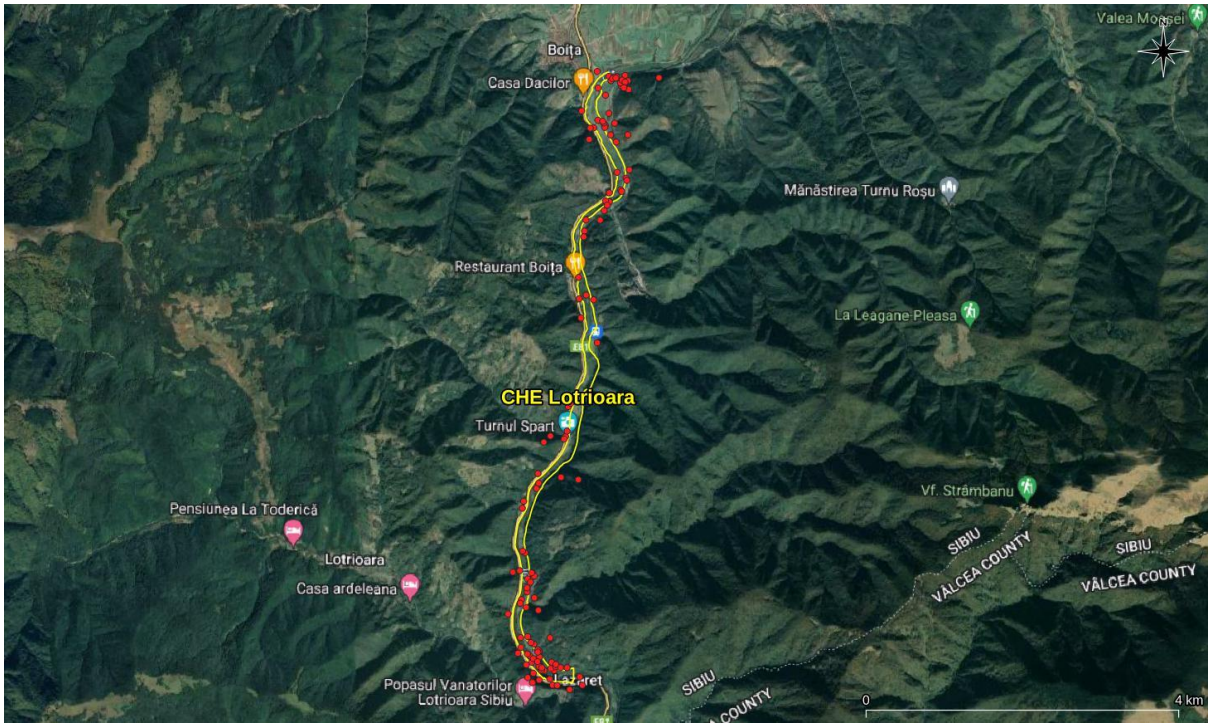


Figure 49 - Distribution of bird species sightings (red colored dots) in the area of influence of the project - CHE Lotrioara (yellow colored polygon)

D.3. Aspects regarding the presence of bird species in the areas of influence of the project , with emphasis on species of community interest targeted by the conservation management of Natura 2000 sites ROSPA0043 Frumoasa, ROSPA0098 Făgăraș Piedmont and ROSPA0003 Avrig - Scorei - Făgăraș

3.1. Special Protection Area for Birds ROSPA0043 Frumaosa

The Lotrioara reservoir overlaps on an area of about 4.07 ha with the special avifauna protection area ROSPA0043 Frumoasa. The Câineni reservoir is also located at a distance of at least 80 meters to the east of the boundaries of the protected natural area.

The special avifaunistic protection area ROSPA0043 Frumoasa, with an area of 130.890,80 ha, is under the administration of the National Agency for Protected areas and currently benefits, together with the special conservation area ROSAC0085 Frumoasa, from an Integrated Management Plan in force, approved by Order of the Minister of Environment, Water and Forests no. 1.158/2016.

The following table shows the list of species of community interest within ROSPA0043 Frumoasa and the evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Standard Form of ROSPA0043 Frumoasa of 17.02.2024.

The list of species of community interest within ROSPA0043 Frumoasa and the evaluation of criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the content of the Natura 2000 Standard Form and its completion manual, according to the Standard Form of ROSPA0043 Frumoasa of 17.02.2024

Species			Population			Sit			
No. crt.	Natura 2000 Code	Scientific name	Size (p-pairs, i-individends)		Categ.	Pop.	Conserv.	Isolation	Global
			Min.	Max.					
1.	A223	*Aegolius funereus*	300 p	350 p	C	B	B	C	B
2.	A104	*Bonasa bonasia*	500 p	600 p	P	B	B	C	B
3.	A224	*Caprimulgus europaeus*	50 p	60 p	P	C	B	C	B
4.	A239	*Dendrocopos leucotos*	150 p	230 p	P	C	B	C	B
5.	A236	*Dendrocopos martius*	300 p	400 p	P	C	B	C	B
6.	A321	*Ficedula albicollis*	7.000 p	12.000 p	C	C	B	C	B
7.	A320	*Ficedula parva*	1.200 p	2.000 p	C	C	B	C	B
8.	A217	*Glaucidium passerinum*	100 p	200 p	-	B	B	C	B
9.	A241	*Picoides tridactylus*	250 p	300 p	P	C	B	C	B
10.	A220	*Strix uralensis*	70 p	80 p	C	C	B	C	B
11.	A108	*Tetrao urogallus*	300 i	500 i	C	B	B	C	B

The analysis of the information provided in the Management Plan shows that all the species listed in the Standard Form of ROSPA0043 Frumoasa have been identified as present in the perimeter of the protected natural area, but it is noted that the numbers in the form have not been revised in accordance with the data in the Management Plan, in many cases the differences are significant.

Table 70 presents an analysis of the presence of species of common interest targeted by the conservation management of the special avifaunistic protection area ROSPA0043 Frumoasa in the area of Câineni and Lotrioara accumulations.

Table 70 Analysis of the presence of species of community interest targeted by the conservation management of the special avifaunistic protection area ROSPA0043 Frumoasa in the area of Câineni and Lotrioara accumulations.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
1.	*Aegolius funereus*	The species is characteristic of old coniferous forest habitats. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Taking into account the strict habitat preferences of the species (old coniferous forests), and the fact that the species inhabits much higher elevations, over 1,500 m, the distance between the specific habitats of the and the analyzed sites is much greater. The implementation of the project does not lead in any way to affect the population size of the species, to the loss of its specific habitats or to affect the current conservation status of the species within the perimeter of the special avifaunistic protection area ROSPA0043 Frumoasa.
2.	*Bonasa bonasia*	Found in coniferous and mixed conifer forests rich in berry-producing shrubs, but also in broad shrubby glades. It prefers south-facing, warm slopes near streams and streams with rich vegetation and as varied a plant mosaic as possible (e.g. in forests following clear-cutting, where successional processes have been triggered). Avoid uniform monocultures, intensively wooded forests or forests without understory. Open areas wider than 200-400 m or pure resinous forests are barriers to the spread of the species. It occurs at altitudes between 300 and 1800 m, most commonly between 800 and 1300 m. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 5.8 km westwards, respectively at a distance of at least 5.9 km westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. The sites targeted by the implementation of the project do not meet the minimum habitat conditions of the species.
3.	*Caprimulgus europaeus*	The blackthorn can be found in large, sparse meadows or pastures with ancient trees. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. For this species, the spatial distribution data are erroneous, as the species utilizes only extensive open habitats, while the distribution data indicate the presence of the species only in the forest floor within the perimeter of the protected natural area. The sites targeted by the implementation of the project do not meet the minimum habitat conditions of the species.
4.	*Dendrocopos leucotos*	In Romania it can be considered a species specialized on deciduous forests in hilly and mountainous regions. It prefers forests composed of beech (Fagus sp.), birch (Betula sp.), sp. pine (Acer sp.), ash (Fraxinus sp.), elm (Ulmus sp.), poplar (Populus sp.). It often occurs in mixed forests, sometimes also in coniferous forests. It often nests on the southern slopes of hills and mountains, but

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		also in tunnel forests along streams dominated by softwood tree species. Thus, the species can be found from low altitudes, from 400 m, where it nests in deciduous forests, to mountainous areas at 1800 m, where it nests in old beech or mixed forests. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Following the application of the monitoring methodology, the species was identified in only one location, in the eastern vicinity of the Câineni reservoir, at a distance of at least 60 m, outside the special avifaunistic protection area ROSPA0043 Frumoasa. The implementation of the project does not lead to the loss of specific habitats of white-backed woodpeckers, i.e. old ptarmigan in the perimeter of the special avifauna protection area ROSAC0043 Frumoasa or in the vicinity of the protected natural area. In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.
5.	*Dendrocopos martius*	It forages in montane forests, sometimes up to the tree line, and in the Alps it can reach heights of over 2,000 m. In the northern taiga it is mainly a lowland species. It prefers the tall, old trunks of forests at the climax of plant succession. Although it prefers sparser patches of forest, it may also be present in isolated forest patches relatively far from intact forest. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Following the application of the monitoring methodology, the species was identified in 8 locations, of which only 1 within the perimeter of the special avifauna protection area ROSPA0043 Frumoasa. It should be noted that the closest observation point of the species in relation to the areas targeted by the project implementation is at least 100 m, with significant altitudinal differences. The implementation of the project does not lead to the loss of specific black woodpecker habitats within the perimeter of the Special Protection Area ROSPA0043 Frumoasa or its vicinity. In the worst case, during the execution of the specific hydropower plant construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.
6.	*Ficedula albicollis*	The common common gular is characteristic of deciduous forests. It is not a frighly bird, and frequently nests in local parks, orchards and gardens. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Following the application of the monitoring methodology, the species was identified in only one location, in the eastern vicinity of the Lotrioara reservoir, at a distance of at least 60 m, outside the special avifaunistic protection area ROSPA0043 Frumoasa.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		The implementation of the project does not lead to the loss of specific habitats of the common nuthatch in the perimeter of the Special Protection Area ROSPA0043 Frumoasa or its vicinity, namely deciduous forest habitats. Even if the implementation of the project leads, following the filling of the reservoirs, to insignificant areas occupied by willows and reedbeds on the banks of the Olt River, this type of habitat is not used by the species. In the worst case, during the specific construction of hydropower plants, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.
7.	*Ficedula parva*	The little flycatcher prefers old forests over 100 years old that have a large amount of dead wood and a low shrub layer. The species avoids young forests less than 44 years old. In Romania it broods in the higher regions of the Carpathian Mountains, where it is found in deciduous or mixed forests in shady, slightly humid areas. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Following the application of the monitoring methodology, the species has not been identified in the forest habitats in the vicinity of the project sites The implementation of the project will in no way lead to the loss of habitats specific to the little flycatcher within the perimeter of the special avifaunistic protection area ROSPA0043 Frumoasa or its vicinity, namely old forest habitats, over 100 years old.
8.	*Glaucidium passerinum*	It is a characteristic species of coniferous woodlands and mature mixed and open mixed forests in mountain regions. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Taking into account the strict habitat preferences of the species (old coniferous forests), and the fact that the species inhabits much higher elevations, over 1,500 m, the distance between the habitats specific to the species and the sites analyzed is much greater. The implementation of the project does not lead in any way to affect the population size of the species, to the loss of its specific habitats or to affect the current conservation status of the species within the perimeter of the special avifaunistic protection area ROSPA0043 Frumoasa.
9.	*Picoides tridactylus*	In boreal regions it nests in taiga, often in the swampy areas of these forests. In temperate regions (as in Romania) it is a montane species, preferring old coniferous forests, but it can also be found in subalpine birch forests, the two habitat types being occupied by two distinct subspecies. The presence and abundance of the species depend on the amount of dead wood in the habitat and are therefore significantly influenced by silvicultural practices. It prefers forest areas with steep slopes. For nesting it chooses the more open parts of the forest, e.g. with windthrow or avalanches. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		least 5.8 km westwards, respectively at a distance of at least 5.9 km westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. The sites targeted by the implementation of the project do not meet the minimum habitat conditions of the species.
10.	*Strix uralensis*	The great opossum is a bird characteristic of deciduous and mixed forests with large open areas. In Romania it occurs up to an altitude of 1600 m. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 20 m westwards, respectively at a distance of at least 80 m westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. Following the application of the monitoring methodology, the species has not been identified in the area targeted by the project, i.e. Câineni and Lotrioara reservoirs. The implementation of the project does not lead to the loss of the great opossum specific habitats within the perimeter of the special avifaunal protection area ROSPA0043 Frumoasa or its vicinity, namely old, deciduous or mixed forest habitats. The species may occur only occasionally in the project's area of influence, utilizing open foraging habitats. Due to the high disturbance in the analyzed area, these habitats are totally suboptimal for the species. In the worst case, during the execution of the specific hydropower plant construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.
11.	*Tetrao urogallus*	The mountain grouse prefers mature but not very dense spruce stands with undergrowth and herbaceous cover, which are mainly made up of blueberry (Vaccinium mytrillus) and cranberry (Vaccinium vitis-idaea), located near water sources. The species occurs at altitudes of 800-1,800 m. It avoids pure deciduous forests. In winter, it prefers pure resinous stands, sheltered from the wind, with light. According to the spatial distribution data of the species, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 site ROSPA0043 Frumoasa, in relation to the Lotrioara accumulation, the species is present at a distance of at least 5.8 km westwards, respectively at a distance of at least 5.9 km westwards in relation to the Câineni accumulation, on the opposite side of the European road E81 connecting the cities of Sibiu and Râmnicu Vâlcea. The sites targeted by the implementation of the project in no way meet the minimum habitat conditions of the species.

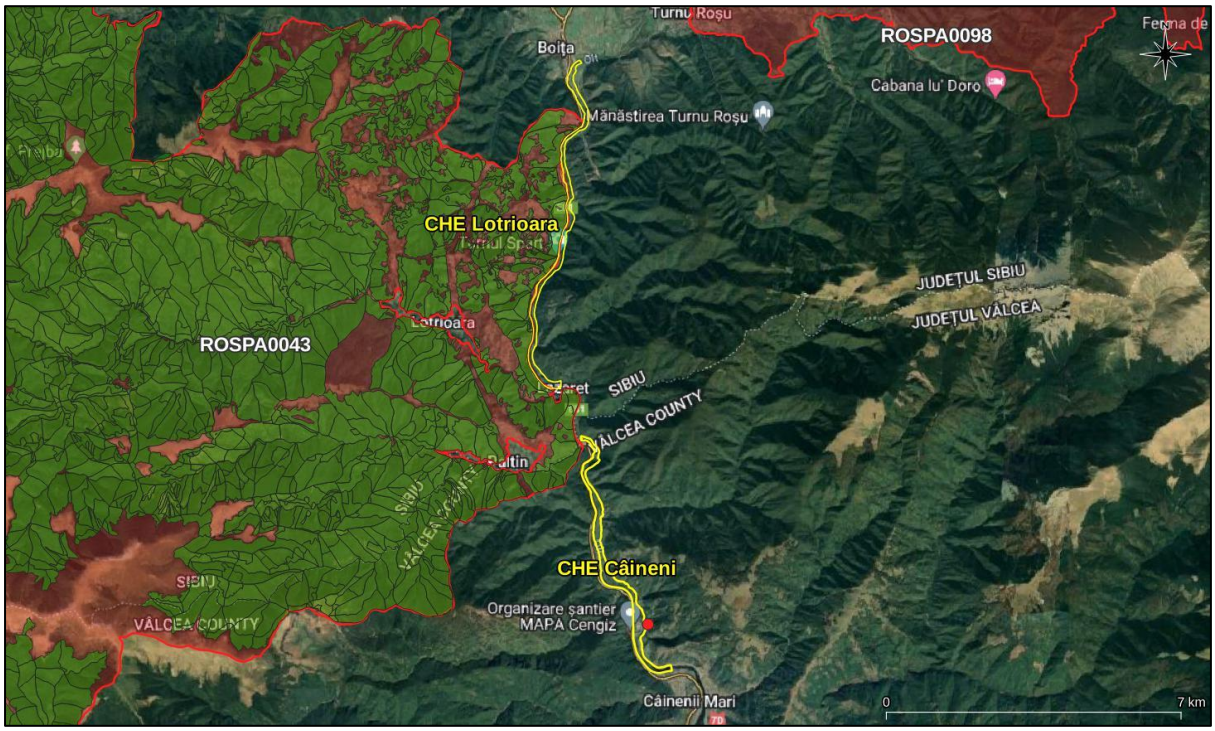


Figure 50 - Aspect of the observation point of the species *Dendrocopos leucotos* (observation point), as well as the distribution of the species in the perimeter of the special avifaunistic protection area ROSPA0043, based on spatial distribution data (green polygon), in relation to the analyzed sites (Câineni and Lotrioara accumulations)

Figure 51 - Aspect of the observation points of the species *Dryocopus martius* (red culling points), as well as the distribution of the species in the perimeter of the special avifaunistic protection area ROSPA0043, based on spatial distribution data (green polygon), in relation to the analyzed sites (Câineni and Lotrioara accumulations)

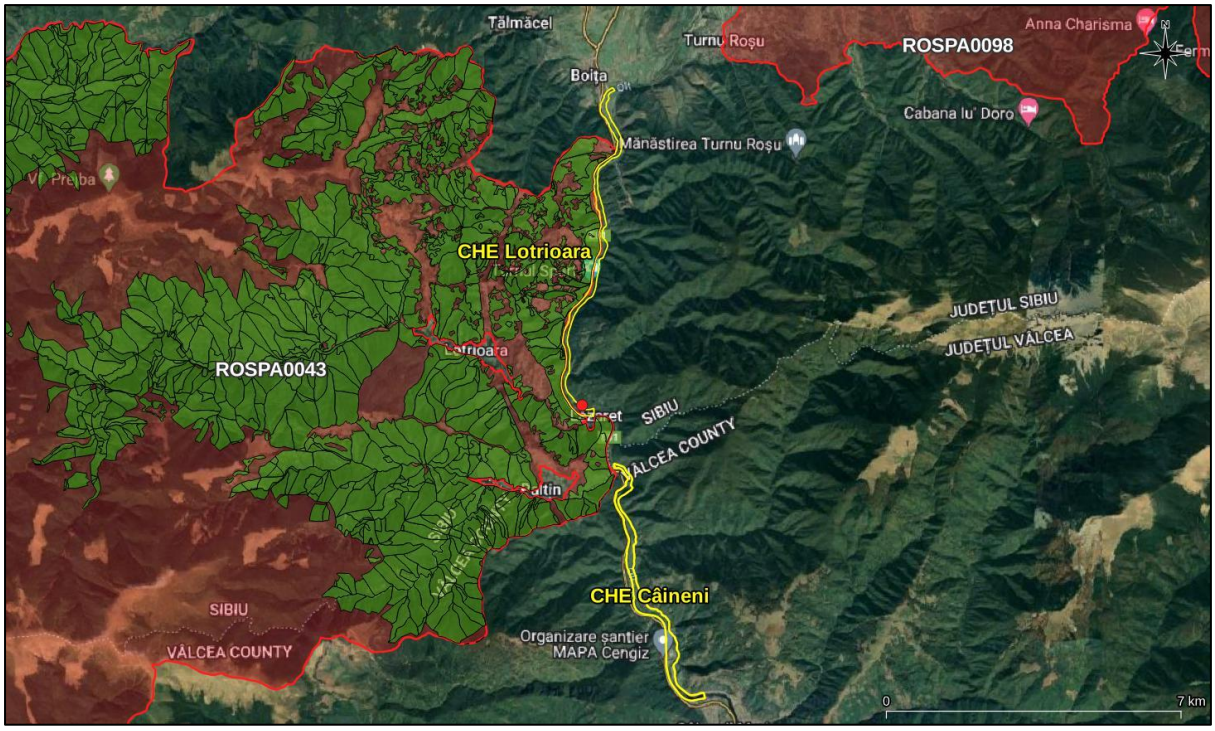


Figure 52 - Appearance of the observation point of *Ficedula albicollis* (red dot), as well as the distribution of the species in the perimeter of the special avifauna protection area ROSPA0043, based on spatial distribution data (green polygon), in relation to the analyzed sites (Câineni and Lotrioara accumulations)

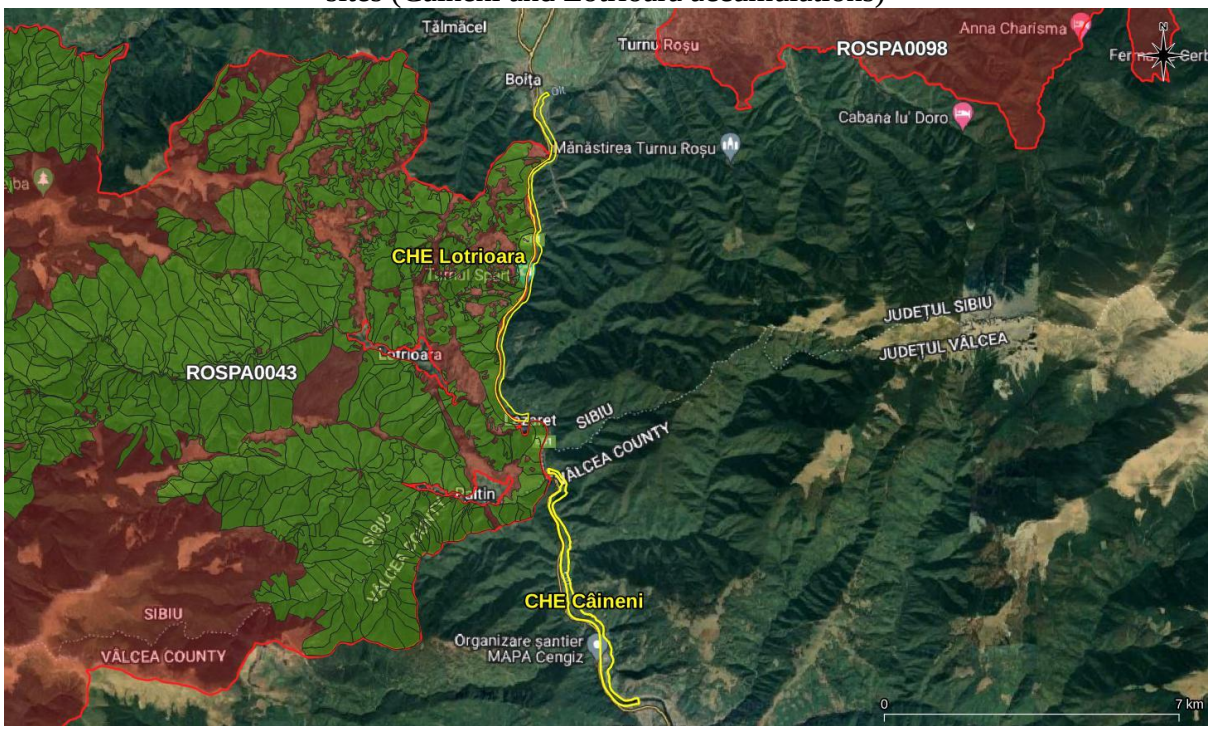


Figure 53 - Distribution aspect of *Ficedula parva* species in the perimeter of the special avifaunistic protection area ROSPA0043, based on spatial distribution data (green polygon), in relation to the analyzed sites (Câineni and Lotrioara accumulations)

Taking into account the information provided in Table no.71, it is found that the implementation of the analyzed project, namely the realization of the Câineni and Lotrioara CHEs, does not lead in any way to the impairment of the populations of species of community interest targeted by the conservation management of the special avifaunistic protection area ROSPA0043 Frumoasa, to the loss of their specific habitats within the perimeter of the protected natural area or in its vicinity or to the impairment of the current conservation status of these species.

3.2. Special Protection Area for Birds ROSPA0098 Făgăraș Piedmont

The project sites are located at a distance of at least 9.6 km south-west (CHE Câineni) and at least 2.7 km west (CHE Lotrioara) in relation to the boundaries of the special protection area ROSPA0098 Făgăraș Piedmont.

The special avifaunistic protection area ROSPA0098 Făgăraș Piedmont, covering an area of 71,201.7 ha, extends over the counties of Brasov and Sibiu and has been designated for the conservation of 25 species of wild birds of Community interest.

Currently, the special avifaunistic protection area ROSPA0098 Făgăraș Piedmont benefits from a Management Plan approved by the Order of the Minister of Environment, Water and Forests no. 1.156/2016. The Management Plan was developed by the Association Făgăraş mountains, in the framework of the project "Integrated management of the Natura 2000 sites Făgăraș mountains and Făgăraș Piedmont", financed by the Operational Program Sectorial Environment, project code: SMIS-CSNR 36867.

The conservation management of the special protection area ROSPA0098 Făgăraș Piedmont is currently ensured by the National Agency for Protected areas.

Following the specific activities of inventory, mapping and assessment of the conservation status of the species of community interest within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont, activities that were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the habitats and species of community interest were reassessed.

The following tables present the species of conservation interest for which the special protection area ROSPA0098 Făgăraș Piedmont has been designated, as well as the estimated populations and the evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its manual of completion. This information is in line with the assessments carried out for the preparation of the Integrated Management Plan for the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont and provides for the species of Community interest listed in the Natura 2000 Standard Form after the approval of the management plan.

The list of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0098 Făgăraș Piedmont has been designated and the assessment of the population numbers at the Natura 2000 site level, according to the information provided by the Integrated Management Plan of the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont.

No. crt.	Natura 2000 Code	Species name	Resident population	Breeding	Wintering	Passage
1.	A091	*Aquila chrysaetos*	-	0-1 p	-	3-5 i
2.	A089	*Pomarina eagle*	-	28-40 p	-	-
3.	A104	*Bonasa bonasia*	60-90 p	-	-	-
4.	A031	*Ciconia ciconia*	-	40-50 p	-	-
5.	A030	*Ciconia nigra*	-	6-9 p	-	-
6.	A080	*Circaetus gallicus*	-	4-6 p	-	-
7.	A081	*Circus aeruginosus*	-	0-2 p	-	-
8	A082	*Circus cyaneus*	-	-	10-30 i	-
9.	A122	*Crex crex*	-	150-200 p	-	-
10	A239	*Dendrocopos leucotos*	510-1040 p	-	-	-
11.	A238	*Dendrocopos medius*	66-110 p	-	-	-
12.	A429	*Dendrocopos syriacus*	20-40 p	-	-	-
13.	A236	*Dryocopus martius*	230-530 p	-	-	-
14.	A379	*Emberiza hortulana*	-	3-5 p	-	-
15.	A103	*Falco peregrinus*	-	1-1 p	-	1-3 i
16.	A321	*Ficedula albicollis*	-	6728-16268 p	-	-
17.	A320	*Ficedula parva*	-	2300-2600 p	-	-
18.	A338	*Lanius collurio*	-	9112-13174 p	-	-
19.	A339	*Lanius minor*	-	0-10 p	-	-
20.	A246	*Lullula arborea*	-	1200-1300 p	-	-
21.	A072	*Pernis apivorus*	-	43-65 p	-	-
22.	A234	*Picus canus*	465-1260 p	-	-	-
23.	A220	*Strix uralensis*	68-110 p	-	-	-
24.	A307	*Sylvia nisoria*	-	20-30 p	-	-
25.	A108	*Tetrao urogallus*	25-35 i	-	-	-
26.	A217	*Glaucidium passerinum*	10-20 p	-	-	-

List of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0098 Făgăraș Piedmont has been designated and the assessment of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its completion manual, according to the information provided by the Integrated Management Plan of the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont

No. crt.	Natura 2000 Code	Species name	Sit. Pop.	Conserv.	Isolation	Global
1.	A091	*Aquila chrysaetos*	C	B	C	B
2.	A089	*Pomarina eagle*	C	B	C	B
3.	A104	*Bonasa bonasia*	C	B	C	C
4.	A031	*Ciconia ciconia*	C	B	C	B
5.	A030	*Ciconia nigra*	C	B	C	B
6.	A080	*Circaetus gallicus*	C	B	C	B
7.	A081	*Circus aeruginosus*	D	-	-	-
8	A082	*Circus cyaneus*	C	B	C	B
9.	A122	*Crex crex*	C	B	C	B
10	A239	*Dendrocopos leucotos*	B	B	C	A
11.	A238	*Dendrocopos medius*	C	B	C	C
12.	A429	*Dendrocopos syriacus*	C	B	C	C
13.	A236	*Dryocopus martius*	C	B	C	B
14.	A379	*Emberiza hortulana*	D	-	-	-
15.	A103	*Falco peregrinus*	C	B	C	B

No. crt.	Natura 2000 Code	Species name	Sit. Pop.	Conserv.	Isolation	Global
16.	A321	*Ficedula albicollis*	C	B	C	B
17.	A320	*Ficedula parva*	C	B	C	B
18.	A338	*Lanius collurio*	C	B	C	B
19.	A339	*Lanius minor*	D	-	-	-
20.	A246	*Lullula arborea*	C	B	C	B
21.	A072	*Pernis apivorus*	C	B	C	B
22.	A234	*Picus canus*	C	B	C	B
23.	A220	*Strix uralensis*	C	B	C	B
24.	A307	*Sylvia nisoria*	D	-	-	-
25.	A108	*Tetrao urogallus*	C	B	C	B
26.	A217	*Glaucidium passerinum*	C	B	C	C

From the analysis of the information provided by the Natura 2000 standard form of the special avifauna protection area ROSPA0098 Făgăraș Piedmont(latest version dated 17.02.2024) it can be seen that the information provided has not been updated with the information obtained from the implementation of the project that had as main result the elaboration of the Integrated Management Plan of the Natura 2000 sites Făgăraș mountains and Făgăraș Piedmont. This is certainly due to the fact that the information provided by the Management Plan has not been entered into the IBIS database.

Given the above-mentioned context, it is obvious that the data provided by the Integrated Management Plan of the Natura 2000 sites Făgăraș Mountains and Făgăraș Piedmont, which was approved by ministerial order, should be taken into account when drafting environmental documents, and not the Natura 2000 standard form, which was based on the extraction of outdated data from the IBIS database.

Also, the latest version of the Natura 2000 standard form of the special avifauna protection area ROSPA0098 Făgăraș Piedmont includes a new species of Community interest (*Glaucidium passerinum*), a species which is not treated from any perspective in the Integrated Management Plan of the Natura 2000 sites Făgăraș mountains and Făgăraș Piedmont. However, the relationship of the analyzed plan with this species is also taken into account in this memorandum.

Table 71 presents an analysis of the presence of species of common interest targeted by the conservation management of the special protection area ROSPA0098 Făgăraș Piedmont in the area of Racovița, Câineni and Lotrioara accumulations.

Table 71 Analysis of the presence of species of common interest targeted by the conservation management of the special avifaunistic protection area ROSPA0098 Făgăraș Piedmont in the area of Racovița, Câineni and Lotrioara accumulations.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
1.	*Aquila chrysaetos*	Mountain eagles can be found in open or semi-open terrain, from sea level to 3,600 m, in a variety of habitats including tundra, scrublands, woodlands, deciduous or coniferous forests. However, most of the population is associated with mountain areas, avoiding inland waters and dense forests. In Romania it nests in small numbers only in the Carpathians. Taking into account the low numbers of the species in the perimeter of the special avifaunistic protection area ROSPA0098 Făgăraș Piedmont, as well as the habitat preferences of the species, nesting in forest habitats or on cliffs in quiet areas and using wide open habitats for foraging, it is found that the mountain eagle does not use the analyzed sites in any form. The implementation of the project does not lead in any way to affect the population of the species, the specific habitat or the current conservation status.
2.	*Pomarina eagle*	Lesser Spotted Eagle nests in lowland forests, lowland meadow forests, hilly and montane forests. It builds a large nest from twigs in old trees. Nests built on rocks or directly on the ground have rarely been recorded. An important factor in the choice of nest sites is the presence of nearby open feeding areas. The species forages in grassland, cropland and wet meadows. Lesser spotted eagle hunts in open or cultivated areas. A variety of open-field habitat types are very important to the species, although cultivated areas with tall crops such as corn or sunflowers impede access to prey. According to the spatial distribution data, which were the basis for the elaboration of the Integrated Management Plan for the Natura 2000 sites ROSCI0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont, the Lesser Spotted Eagle uses the forest habitats at the base of the Făgăraș Mountains for breeding and the open areas at the foot of the mountains for feeding. The species avoids open and semi-open habitats with small areas. Following the application of the monitoring methodology, the species was not identified in the project area. The Lesser Spotted Eagle does not use the habitats of the Valea Oltului area in any form.
3.	*Bonasa bonasia*	Found in coniferous and mixed conifer forests, rich in berry-producing shrubs, as well as in broad shrubby glades. It prefers south-facing, warm slopes near springs and streams with rich vegetation and as varied a plant mosaic as possible (e.g. in forests following clear-cutting, where successional processes have been triggered). Avoid uniform monocultures, intensively wooded forests or forests without understory. Open areas wider than 200-400 m or pure resinous forests are barriers to the spread of the species. Occurs at altitudes of 300-1,800 m, most commonly between 800 and 1,300 m. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species.
4.	*Ciconia ciconia*	The white stork is the only large bird species in Romania that lives almost exclusively near humans. The species nests almost exclusively in man-made areas, on low-voltage poles, on the roofs and chimneys of buildings, etc. The long-term survival of the species depends on maintaining the storks' preferred feeding areas (wetlands, meadows and pastures near nesting sites) in as natural a state as possible. Following the application of the inventory methodology, the species was not identified in the project area. The sites targeted by the implementation of the project do not meet the minimum habitat conditions of the species.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
5.	*Ciconia nigra*	A summer visitor, the black stork is more often seen during the passage periods, especially in the east of the country. Black storks prefer nesting in areas with extensive deciduous or mixed forests with old and tall trees, close to wetlands (flowing or standing), in areas where there is little or no anthropogenic impact. According to the spatial distribution data, which were the basis for the elaboration of the Integrated Management Plan of the Natura 2000 sites ROSCI0122 Făgăraș mountains and ROSPA0098 Făgăraș Piedmont, the black stork is present in the area targeted by the project, using this area for foraging. Following the application of the inventory methodology, the species was not identified in the project area. The sites targeted by the implementation of the project do not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status.
6.	*Circaetus gallicus*	The specific habitats of the serapus are found in xerophytic mountainous areas with cliffs and valleys and open spaces, wetlands or arid areas, where the serapus can provide its food, which is mainly reptiles. In Romania, the serpent can be found mainly in warmer mountain areas with forests and pastures. In the project area, Circaetus gallicus can be rarely observed, only in transition. The sites analyzed are totally suboptimal for the species. The implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status.
7.	*Circus aeruginosus*	The reed warbler's specific habitat is wetlands with extensive areas of reedbeds. Individuals settle near ponds, lakes, running water or marshes, where there is sufficient area covered with marsh vegetation and few trees. Wooded areas, mountainous regions and arid regions where there are no wetlands are not used by the species. It often also feeds on farmland and meadows around reedbeds where it nests. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
8	*Circus cyaneus*	Eretele vânăt cuibărește în nordul Europei, la noi fiind doar oaspete de iarnă. In Romania it winters in open areas, preferring rodent-rich habitats, especially farmland and meadows. The species avoids wooded areas, mountainous regions or wetlands covered with tall vegetation. It prefers a variety of open, low-vegetated habitats as well as wetlands, sandy habitats and steppes. It chooses habitat according to abundance of prey. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
9.	*Crex crex*	The field chrysanthemum is a species present in lowland, hilly areas and especially intra and extramontane depressions. The most significant populations are found in those areas where traditional extensive agriculture on undrained grassland still predominates. The

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		species does not nest in forests, scrublands, reedbeds or other dense vegetation taller than 50 cm, but prefers damp, cool places with grassy vegetation lower than its height. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
10	*Dendrocopos leucotos*	The White-backed Woodpecker can be seen in deciduous or coniferous forests with many dead and decaying trees. Specimens also climb in mountainous regions, but mostly in warmer, south-facing areas. The implementation of the project will not affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. The implementation of the project does not lead to loss of specific habitats of white-backed woodpeckers, i.e. old beech. In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.
11.	*Dendrocopos medius*	The oak woodpecker is highly specialized, being closely related to forests, parks or wooded pastures with rare specimens of oak or gorun (Quercus ssp.). The altitudes at which the oak woodpecker nests are determined by the existence of oak or gorun habitats, which are located at altitudes between 200 and 600 m. The species can even be found at lower altitudes in Dobrogea and the Western Plain. In Romania, the most significant nesting populations can be found in the hilly areas of the Transylvanian Plateau and in the gorges of Dobrogea. However, the species inhabits most areas where the habitats mentioned above are well represented. In winter it also occurs in anthropized areas (gardens, orchards). The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
12.	*Dendrocopos syriacus*	The Garden Woodpecker is the species that uses the most anthropized habitats, with the majority of the population nesting in gardens or near localities, in orchards, parks, wooded pastures, etc. It also uses the edges of mature deciduous forests and meadow forests as specific habitats. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
13.	*Dryocopus martius*	The black woodpecker is our largest woodpecker, about the size of a crow. A sedentary species, it lives mainly in coniferous and mixed woodlands, rarely occurring in the lowlands. The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. The implementation of the project does not lead to loss of specific black woodpecker habitats, i.e. old beech.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.
14.	*Emberiza hortulana*	The garden hemlock prefers cornfields and their neighbors. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
15.	*Falco peregrinus*	The Peregrine Falcon is a species characteristic of open, rocky tundra, tundra, grassland or steppe areas with forest and sea coasts. It can be found up to an altitude of 4,000 m. They leave their breeding grounds for wintering between August and November and return between March and May. During migrations they easily cross very large expanses of sea or ocean. Most birds travel singly or in pairs. The species may occur in the project area only occasionally for foraging. Bearing in mind that the species feeds by catching its prey in flight, it is noted that the implementation of the project may at worst generate only a local disturbance during the execution of specific hydropower construction works, resulting in only a slight retreat without any population loss. The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
16.	*Ficedula albicollis*	The common gilled flycatcher nests in sparse, deciduous forests of the high hills and mountains, in old trees with cavities in which they build their nests. The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. The implementation of the project does not lead to the loss of specific habitats of the common flycatcher, i.e. old beech. In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.
17.	*Ficedula parva*	Throughout most of its range, the little flycatcher prefers deciduous or mixed (deciduous - coniferous) forests, but in the north it also nests in coniferous forests. It can often be seen near running water. The little flycatcher also prefers forests with tall trees and well-developed undergrowth. The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. The implementation of the project does not lead to the loss of habitats specific to the little flycatcher, i.e. old beech. In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.
18.	*Lanius collurio*	The red-browed spruce nests in open areas, agricultural fields with thorn bushes (*Rosa ssp.*, *Prunus ssp.*, *Crataegus monogyna* etc.) and in glades. The specimens are evenly distributed in hilly areas with mosaic farmland with pastures and meadows in Transylvania

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		and Moldova. In Walla Wallachia the species is less well represented due to lack of suitable habitats. Grasslands and farmlands with natural vegetation are the ideal habitat for the redstart. The species selects areas for nesting where there are sufficiently large areas of hay meadows, pastures, wet meadows and agricultural areas so that food supply is assured The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. Following the application of the monitoring methodology, the species was identified in 4 locations in the project's area of influence, of which only 1 within the Câineni reservoir site. During the execution of specific hydropower construction works, the implementation of the project may generate only local disturbance, resulting in only a slight spatial retreat of the species. The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the CHE Lotrioara site and 7.5 ha on the CHE Câineni site. This area is considered to be insignificant and does not lead to population losses of the species or to affect the current conservation status.
19.	*Lanius minor*	The Black-crowned Shrike nests in open areas with isolated trees and bushes. Most often the species can be found in farmland and grassland, where it nests in trees clustered in small clumps, never in bushes. Specimens can often be seen on roadside poplars. The species is fond of a warmer microclimate. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
20.	*Lullula arborea*	The woodlark prefers open areas with scattered shrubs and trees, heaths, groves and groves. The species regularly occurs in areas with characteristic microrelief or warm microclimate. It particularly inhabits hilly areas and depressions, but is also present in lower and middle montane areas. The species is widespread in Romania, but local abundance differs significantly from one area of the country to another. The implementation of the project will not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status. Following the application of the monitoring methodology, the wood lark was not observed in the project area of influence.
21.	*Pernis apivorus*	The Wasps is a species that nests in temperate zones in a wide range of habitats, from lowlands to mountains, where conditions favor the development of Hymenoptera. The species can be found mainly in deciduous and coniferous forests, in areas with many clearings, or with favorable foraging areas nearby. The implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status. Following the application of the methodology, the species was observed in 2 locations in the project area, at significant distances, respectively, at a minimum of 140 m westwards from the Lotrioara reservoir and at a minimum of 247 m eastwards from the Câineni reservoir.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		The implementation of the project may generate in the worst case only a local disturbance during the execution of the specific construction works of the hydropower plants, resulting in only a slight spatial setback. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway. The implementation of the project does not lead to population losses of the species, loss of specific habitats or affect its current conservation status.
22.	*Picus canus*	The Southern Ghionoea is considered to specialize in deciduous forest habitats of the hilly and lower montane zone, inhabiting especially forests with a high proportion of beech or oak. It also nests successfully in lowland forests. Wooded grasslands are secondary habitats for the southern snowdrops. It is less common in urbanized areas than the green tree, but also occurs in orchards and parks, especially outside the breeding season. The implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status. Following the application of the monitoring methodology, the species was observed in 4 locations in the project area, at significant distances from the analyzed sites. The implementation of the project will in no way lead to loss of specific habitats of the southern gionoea (deciduous forest habitats) or to population losses of this species. In the worst case, during the execution of the specific hydropower plant construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.
23.	*Strix uralensis*	The Long-eared Owl is a resident, predominantly nocturnal owl species that uses quite diverse habitats, depending on the area in which it lives. In central and southern Europe it prefers deciduous forests, mainly beech, but also occurs in mixed forests. Some populations nest in pure coniferous forests and even in oak and hornbeam. It is a mountain-nesting bird, recently showing a tendency to descend into the hills. It rarely occurs in lowland areas, especially in winter. The implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status. The species may occur only occasionally in the project area of influence, utilizing open habitats for foraging. Due to the high disturbance in the analyzed area, these habitats are totally suboptimal to the Ural Owl. In the worst case, during the execution of the specific hydropower plant construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.
24.	*Sylvia nisoria*	The Silvia pigeon is a summer guest songbird that inhabits sparse woodlands and shrubby glades, thickets, and open areas with nesting shrubs similar to those favored by Lanius collurio. It avoids both arid and wet areas and is not a woodland species, but may inhabit narrow shelterbelts, plantations, clearings in mixed and broadleaved forests with much young growth, and areas in the early stages of regeneration of felled or burned trees. The species can also be found on shrubby hillsides, forest edges, pasture or meadow sites, roadsides, parks, orchards and waterside glades. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
25.	*Tetrao urogallus*	The mountain grouse prefers mature but not very dense spruce stands with undergrowth and herbaceous cover, which are mainly made up of blueberry (*Vaccinium mytrillus*) and cranberry (*Vaccinium vitis-idaea*), located near water sources. The species occurs at altitudes of 800-1,800 m. It avoids pure deciduous forests. In winter it prefers pure coniferous stands, sheltered from the wind, with light. It is a sedentary bird, descending to lower altitudes in the harsh winters, where it can find food. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or its conservation status.
26.	*Glaucidium passerinum*	It is a characteristic species of coniferous woodlands and mature mixed and open-space forests in mountain regions. It is active at dusk, morning and evening, and has the longest diurnal activity period of the owls. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the detriment of this species. Likewise, the implementation of the project does not lead to affect the population of the species within the perimeter of the special protection area ROSPA0098 Făgăraș Piedmont or to affect its conservation status.

Figure 54 - Appearance of *the Lanius colurio* species (red dots) in the area of the analyzed sites (Câineni and Lotrioara accumulations)

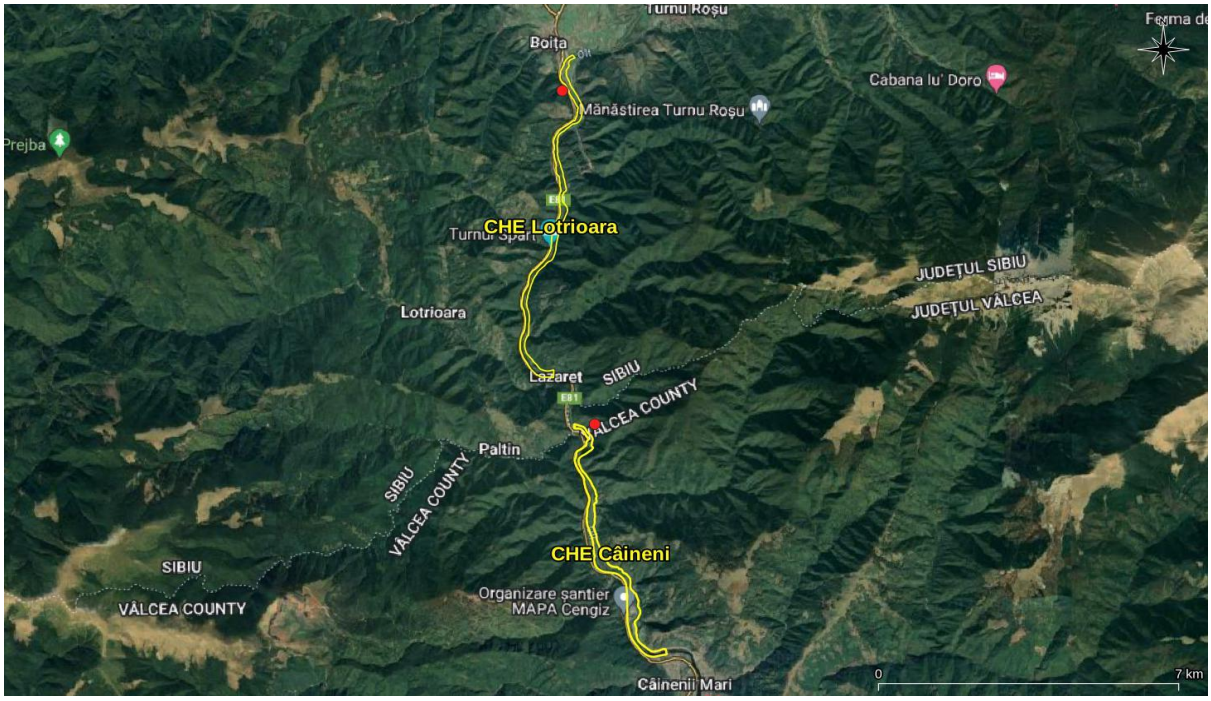


Figure 55 - Appearance of the *Pernis apivorus* species (red dots) in the area of the analyzed sites (Câineni and Lotrioara accumulations)

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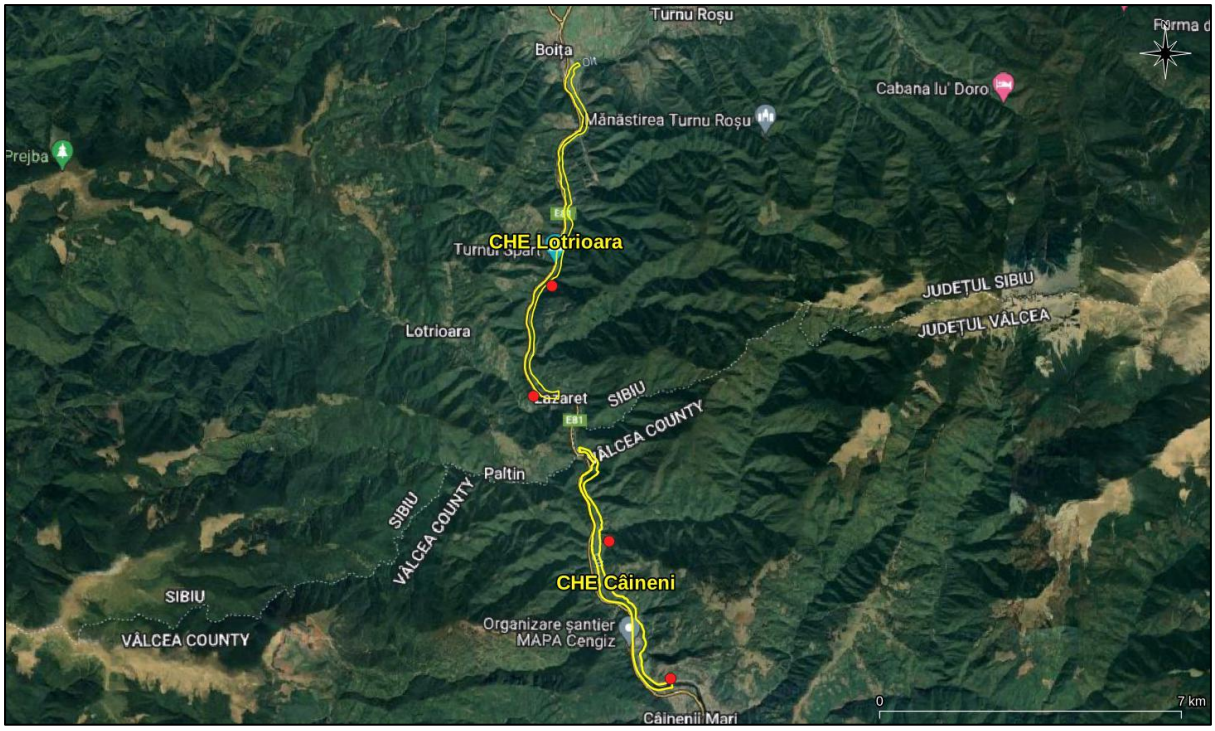


Figure 56 - Appearance of *the Picus canus* species (red dots) in the area of the analyzed sites (Câineni and Lotrioara accumulations)

Taking into account the information provided in Table 71, it can be seen that the implementation of the analyzed project, namely the realization of the Câineni and Lotrioara CHEs, does not lead in any way to the impairment of the populations of species of community interest targeted by the conservation management of the special avifaunal protection area ROSPA0098 Făgăraș Piedmont, to the loss of their specific habitats within the perimeter of the protected natural area or in its vicinity or to the impairment of the current conservation status of these species.

3.3. Birds Special Protection Area ROSPA0003 Avrig - Scorei - Făgăraș

The project sites are located at a distance of at least 12 km south - west (CHE Câineni), respectively at a distance of at least 20.1 km south - west (CHE Lotrioara) in relation to the boundaries of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș and overlaps on an area of 26.93 ha with the remaining works to be executed in CHE Racovița.

Special Protection Area for Birds ROSPA0003 Avrig - Scorei - Făgăraș , covering an area of 3,024 ha, extends over the counties of Brasov and Sibiu and has been designated for the conservation of 25 species of wild birds of Community interest.

Currently the special avifaunistic protection area ROSPA0003 Avrig - Scorei - Făgăraș benefits from a Management Plan in force, approved by the Order of the Minister of Environment, Water and Forests no. 1.291/2017 on the approval of the Management Plan and the Regulation of the Natura 2000 Site ROSPA0003 Avrig-Scorei-Făgăraș

The conservation management of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș is currently ensured by the National Agency for Protected areas.

The following tables present the species of conservation interest for which the special protection area ROSPA0003 Avrig-Scorei-Făgăraș has been designated, as well as the estimated population numbers and the evaluation of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its manual of completion, according to the Natura 2000 Standard Form revised on 17.02.2024

The list of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0003 Avrig-Scorei-Făgăraș has been designated and the assessment of the population numbers at the Natura 2000 site level and the manual for its completion, according to the Natura 2000 Standard Form revised on 17.02.2024.

No. crt.	Natura 2000 Code	Species name	Resident population	Breeding	Wintering	Passage
1.	A320	*Ficedula parva*	-	-	-	R
2.	A022	*Ixobrychus minutus*	-	40 p	-	-
3.	A339	*Lanius minor*	-	RC	-	-
4.	A246	*Lullula arborea*	-	RC	-	-
5.	A068	*Mergus albellus*	-	-	10-15 i	RC
6.	A094	*Pandion haliaetus*	-	-	-	10 i
7.	A151	*Philomachus pugnax*	-	-	-	RC
8.	A234	*Picus canus*	10-20 p	-	-	-
9.	A307	*Sylvia nisoria*	-	20-30 p	-	-
10.	A229	*Alcedo atthis*	40 p	-	-	-
11.	A255	*Anthus campestris*	-	-	-	R
12.	A091	*Aquila chrysaetos*	-	-	-	4 i
13.	A222	*Asio flammeus*	-	-	R	-
14.	A224	*Caprimulgus europaeus*	-	60 p	-	-
15.	A081	*Circus aeruginosus*	-	1-2 p	-	-
16.	A082	*Circus cyaneus*	-	-	-	40 i
17.	A122	*Crex crex*	-	80-160 p	-	-
18.	A238	*Dendrocopos medius*	10-12 p	-	-	-
19.	A429	*Dendrocopos syriacus*	10-20 p	-	-	-
20.	A236	*Dryocopus martius*	7-10 p	-	-	-
21.	A379	*Emberiza hortulana*	-	1-2 p	-	-
22.	A103	*Falco peregrinus*	-	-	-	2 i
23.	A097	*Falco vespertinus*	-	-	-	40 i
24.	A321	*Ficedula albicollis*	-	-	-	RC
25.	A031	*Ciconia ciconia*	-	120-140 p	-	-

The list of wild bird species listed in Annex I of Council Directive 2009/147/EC for which ROSPA0003 Avrig-Scorei-Făgăraș has been designated and the assessment of the criteria according to the Order of the Minister of Environment and Water Management no. 207/2006 on the approval of the contents of the Natura 2000 Standard Form and its completion manual, according to the Natura 2000 Standard Form revised on 17.02.2024

No. crt.	Natura 2000 Code	Species name	Sit. Pop.	Conserv.	Isolation	Global
1.	A320	*Ficedula parva*	D	-	-	-
2.	A022	*Ixobrychus minutus*	C	B	C	B
3.	A339	*Lanius minor*	D	-	-	-
4.	A246	*Lullula arborea*	D	-	-	-
5.	A068	*Mergus albellus*	C	B	C	C
6.	A094	*Pandion haliaetus*	C	B	C	C
7.	A151	*Philomachus pugnax*	D	-	-	-
8.	A234	*Picus canus*	D	-	-	-
9.	A307	*Sylvia nisoria*	C	B	C	C
10.	A229	*Alcedo atthis*	C	C	C	C
11.	A255	*Anthus campestris*	D	-	-	-
12.	A091	*Aquila chrysaetos*	D	-	-	-
13.	A222	*Asio flammeus*	D	-	-	-
14.	A224	*Caprimulgus europaeus*	C	B	C	B
15.	A081	*Circus aeruginosus*	D	-	-	-
16.	A082	*Circus cyaneus*	C	B	C	C
17.	A122	*Crex crex*	C	B	C	B
18.	A238	*Dendrocopos medius*	D	-	-	-
19.	A429	*Dendrocopos syriacus*	D	-	-	-
20.	A236	*Dryocopus martius*	D	-	-	-
21.	A379	*Emberiza hortulana*	D	-	-	-
22.	A103	*Falco peregrinus*	D	-	-	-
23.	A097	*Falco vespertinus*	D	-	-	-
24.	A321	*Ficedula albicollis*	D	-	-	-
25.	A031	*Ciconia ciconia*	C	A	B	B

Table no. 72 presents an analysis on the presence of species of common interest targeted by the conservation management of the special avifaunistic protection area ROSPA0003 Avrig - Scorei - Făgăraș, in the area of the Racovița, Câineni and Lotrioara accumulations.

Table 72 Analysis of the presence of species of common interest targeted by the conservation management of the special avifaunistic protection area ROSPA0003 Avrig - Scorei - Făgăraș, in the area of Racovița, Câineni and Lotrioara accumulations.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
1.	*Ficedula parva*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
2.	*Ixobrychus minutus*	A slender bird, the dwarf heron can be observed in specific wetland habitats with reed and water shrubs, and is predominantly found in areas with a lot of hygrophilous vegetation, such as reed, *Typha sp*., reed, Phragmites sp., or any other dense aquatic vegetation forming compact patches. They also occupy the margins of lakes, ponds, and the riparian edges of watercourses where woody vegetation predominates. In the project area (Câineni and Lotrioara reservoirs) there are no specific habitats of the dwarf heron. As a result of the field application of the monitoring methodology, the closest area where the species has been detected in relation to the Lotrioara reservoir is 11.4 km in the north-east direction. The implementation of the project will in no way lead to the species being affected. Also, the implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
3.	*Lanius minor*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
4.	*Lullula arborea*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
5.	*Mergus albellus*	It prefers wet, wooded, wooded areas with old trees and open areas of water without much aquatic vegetation (submerged or submerged) for nesting. Outside the nesting season, it can be found in a wide variety of wetlands, as the species has no strict ecological requirements during this period. In winter it remains in wetlands until they freeze completely. A moderately gregarious species most of the year. Outside the nesting season they form small to medium-sized groups. On migration they fly in groups, with individuals arranged in an oblique line or "V". During frost, they retreat to the seashore, where they form numerous flocks. In spring, their numbers increase with the emergence of wintering populations in south-eastern Europe. Within the special avifaunal protection area ROSPA0003, the Lesser Spotted Reed can be frequently observed in winter on the reservoirs within the protected natural area.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		In the project area (Câineni and Lotrioara reservoirs) there are no specific habitats of the small fen. The species may occur in this area only in migration, without using the Olt river. The implementation of the project will in no way lead to the species being affected. Also, the implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status. In the long term, after the reservoirs are filled, the implementation of the project may have a positive impact on the species.
6.	*Pandion haliaetus*	The common wigeon is a species characteristic of regions with permanent, standing or slow-flowing aquatic habitats with fresh, brackish or salt water. In the area of influence of the project, the species may occasionally occur in transition during the passage. Given the high degree of disturbance in the Valea Oltului, this section of the river is totally suboptimal for the species. The implementation of the project may generate in the worst case, during the execution of specific hydropower plant construction works, only a local disturbance, totally insignificant, without leading to population losses. The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status. In the long term, after the reservoirs have been filled, the implementation of the project may have a positive impact on the species, due to the increase in water surface area.
7.	*Philomachus pugnax*	The species nests in tundra habitats from the forest edge to the Arctic coast. It prefers arid hills and slopes with willow, *Salix spp*. and birch, *Betula sp.*, for breeding, and high scrub, and high scrub for nesting. It forages in littoral areas, deltas, salt marshes and lowland wetlands (such as small pools with edge vegetation and mounded marshes). Outside the breeding season, the species can be seen foraging in muddy banks of brackish, saline and alkaline pools, river banks, marshes and flooded areas, but also in meadows, pastures or agricultural fields (mainly wheat or rice fields). They migrate in large flocks of thousands, and form huge groups on wintering grounds. During the application of the monitoring methodology, the species was not observed on the sites targeted by the project implementation. Also, no specific habitats of the thrasher, i.e. muddy banks, were identified. The implementation of the project will in no way lead to the species being affected.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		Also, the implementation of the project does not lead in any way to affect the population of the species in the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
8.	*Picus canus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
9.	*Sylvia nisoria*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
10.	*Alcedo atthis*	The species nests in the western Palearctic in both upper and middle latitudes, and is widespread in continental and oceanic climates, in temperate, boreal and steppe regions, wherever it finds clear unfrozen water, preferably still or slow flowing, with small fish and sufficient staging sites. They prefer fresh water to salt or brackish water during spawning. Preferred nesting habitats are streams, small rivers and canals with ste steep, sandy banks in which they nest. Taking into account the ethology and ecology of the species, it is found that the implementation of the project does not lead in any way to affect the population of the Common Kingfisher in the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș. During the application of the monitoring methodology, the species was observed in 3 locations in the area of the analyzed sites, i.e. 2 locations in the perimeter of the Câineni reservoir and one in the perimeter of the Lotrioara reservoir. The nesting flock is evaluated at 2 - 3 pairs within the analyzed sites. Following the conservation measures provided in this report, the impact of the implementation of the project on the species is insignificant, with no population loss or impairment of the local conservation status of the species.
11.	*Anthus campestris*	The species prefers dry, but not arid, soils in mid-latitude areas from the shores of the Mediterranean Sea and steppes to temperate regions. It avoids steep and rocky terrain, high and low vegetation. Preferred habitats are more widespread in sunny continental lowland areas, but locally their habitat reaches up to altitudes of 2,600 m in Armenia. In Germany it breeds on sandy arable land and on sandy banks of rivers, lakes; similar habitats are occupied in other parts of western Europe. In north-west Africa it colonizes dry slopes and plateaus up to 2,400 m, and is an abundant species in the Atlas Mountains above the tree line up to 3,000 m. Other references include sand dunes in coastal regions, dry riverbeds, roadsides, vineyards and dry hillsides. Winter in Africa emphasizes a preference for arid soils; thus the species is common in coastal areas, steppes, Acacia thickets and in bare

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
		areas of the transition zone between dry savannas and desert, even on the desert edge; it is frequently associated with cattle herds. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the species being affected. Also, the implementation of the project does not affect the population of the species within the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or its conservation status.
12.	*Aquila chrysaetos*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
13.	*Asio flammeus*	nests on the ground in marshy or scrubland areas, on the edge of streams or in open boreal forests. In winter it gathers in groups in preferred areas in varied habitats from sea level to altitudes of 4,000 m. In Romania it is mainly found in agricultural areas, where it gathers from fall to spring in smaller or larger groups on fields with tall grass or in areas with reeds and stubble. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the species being affected. Also, the implementation of the project does not affect the population of the species within the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or its conservation status.
14.	*Caprimulgus europaeus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
15.	*Circus aeruginosus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
16.	*Circus cyaneus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
17.	*Crex crex*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
18.	*Dendrocopos medius*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
19.	*Dendrocopos syriacus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.

No. crt.	Species of Community interest	Aspects regarding the presence of the species in the area of influence of the analyzed project
20.	*Dryocopus martius*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
21.	*Emberiza hortulana*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
22.	*Falco peregrinus*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
23.	*Falco vespertinus*	a typical lowland species, preferring open areas alternating with alternating patches of trees in steppe and woodland habitats, but also not disliking patches of trees between arable land. During the period after the chicks have fledged, the birds roam; during the day they form small flocks and forage for food, and in the evening they gather in large numbers (up to several thousand) at traditional roosting sites (solitary trees, lines or fans), where they gather every year. They leave Europe in September-October, migrating across the Near East and Mediterranean region on broad fronts until they reach the savannas of southern Africa in November, where they remain until February. The area targeted by the implementation of the project does not meet the minimum habitat conditions of the species. The implementation of the project does not lead in any way to the species being affected. Also, the implementation of the project does not affect the population of the species within the perimeter of the special avifauna protection area ROSPA0003 Avrig - Scorei - Făgăraș or its conservation status.
24.	*Ficedula albicollis*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.
25.	*Ciconia ciconia*	The implementation of the project does not lead in any way to affect the population of the species within the perimeter of the special protection area ROSPA0003 Avrig - Scorei - Făgăraș or to affect its conservation status.

D.4. Aspects of the impact of the project implementation on the bird species identified in the study areas

Taking into account the information provided in the tables presented above, in the framework of the bird species monitoring study, in the following table a brief analysis of the project implementation on the bird species identified in the perimeter or immediate vicinity of the sites targeted by the project implementation (CHE Racovița, CHE Câineni and CHE Lotrioara).

Table 73 Summary analysis of the project implementation on the bird species identified in the perimeter or in the immediate vicinity of the sites targeted by the project implementation (CHE Câineni and CHE Lotrioara).

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Dendrocopos leucotos	Following the application of the monitoring methodology, the species was identified in only one location, in the eastern vicinity of the Câineni reservoir, at a distance of at least 60 m, outside the special avifaunistic protection area ROSPA0043 Frumoasa.	No impact The implementation of the project does not lead to the loss of specific habitats of white-backed woodpeckers, i.e. old woodcock in the perimeter of the Special Protection Area ROSPA0043 Frumoasa or in the vicinity of the protected natural area.	YES (Total not significant) In the worst case, during the construction period of the hydropower plant, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the E81 European highway and the Sibiu - Râmnicu Vâlcea highway construction works.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Dendrocopos martius	Following the application of the monitoring methodology, the species was identified in 8 locations, of which only 1 within the perimeter of the special avifaunistic protection area ROSPA0043 Frumoasa. We note that the closest observation point of the species in relation to the amphalos targeted by the implementation of the project is at least 100 m, with significant altitudinal differences.	No impact The implementation of the project does not lead to the loss of specific black woodpecker habitats in the perimeter of the Special Protection Area ROSPA0043 Frumoasa or its vicinity.	YES (Total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Ficedula albicollis	Following the application of the monitoring methodology, the species was identified in only one location, in the eastern vicinity of the Lotrioara reservoir, at a distance of at least 60 m, outside the special avifaunistic protection area ROSPA0043 Frumoasa.	No impact The implementation of the project does not lead to the loss of specific habitats of the common nuthatch in the perimeter of the Special Protection Area ROSPA0043 Frumoasa or its vicinity, namely deciduous forest habitats. Even if the implementation of the project leads, following the filling of the reservoirs, to insignificant areas occupied by willows and reedbeds on the banks of the Olt River, this type of habitat is not used by the species.	YES (Total not significant) In the worst case, during the specific hydropower construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Strix uralensis	Following the application of the monitoring methodology, the species has not been identified in the area targeted by the project, i.e. Câineni and Lotrioara reservoirs. The species may occur only occasionally in the project area of influence, utilizing open habitats for foraging. Due to the high disturbance in the analyzed area, these habitats are	No impact The implementation of the project does not lead to the loss of specific habitats of the common loon in the perimeter of the special avifaunal protection area ROSPA0043 Frumoasa or its vicinity, namely old forest, broadleaved or mixed forest habitats .	YES (Total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and by the Sibiu - Râmnicu Vâlcea highway works.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	totally suboptimal for the species.					
Circaetus gallicus	In the project area, *Circaetus gallicus* can be rarely observed, only in transition. The sites analyzed are totally suboptimal for the species.	No impact	No impact	No impact	No impact	No impact
Falco peregrinus	The species may occur in the project area only occasionally for foraging.	No impact The implementation of the project will in no way lead to loss of species-specific habitats.	YES (Total not significant) Bearing in mind that the species feeds by catching its prey in flight, it is noted that the implementation of the project may at worst generate only a local disturbance during the execution of specific hydropower construction works, resulting in only a slight retreat without any population loss.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Lanius collurio	Following the application of the monitoring methodology, the species was identified in 4 locations in the project's area of influence, of which only 1 within the Câineni reservoir site.	Yes (insignificant) The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the site of CHE Lotrioara and 7.5 ha on the site of CHE Câineni. This area is considered to be insignificant and does not lead to population losses of the species or to affect the current conservation status.	YES (total not significant) During the execution of specific hydropower construction works, the implementation of the project may generate only local disturbance, resulting in only a slight spatial retreat of the species.	No impact	No impact	Insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Picus canus	Following the application of the monitoring methodology, the species was observed in 4 locations in the project area, at significant distances from the analyzed sites.	No impact The implementation of the project will in no way lead to loss of specific habitats specific to the southern gionoea (deciduous forest habitats) or to population losses of this species.	YES (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Mergus albellus	In the project area (Câineni and Lotrioara reservoirs) there are no specific habitats of the small fen. The species may occur in this area only in migration, without using the Olt river.	No impact The implementation of the project does not lead to species-specific habitat loss.	No impact	Positive impact. Subsequent to the filling of the reservoirs, as a result of the increase in the surface area of the water surface, the impact of the project implementation is positive.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Pandion haliaetus	In the area of influence of the project, the species may occasionally occur in transition during the passage. Given the high degree of disturbance in the Valea Oltului, this section of the	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) The implementation of the project may generate in the worst case, during the execution of specific hydropower plant construction works, only a local disturbance, totally	Positive impact. Following the filling of the reservoirs, as a result of the increase in the surface area of the water surface, the	No impact	Totally insignificant, without leading to population losses or affecting the local conservation

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	river is totally suboptimal for the species.		insignificant, without leading to population losses.	impact of the project implementation is positive.		status of the species.
Alcedo atthis	During the application of the monitoring methodology, the species was observed in 3 locations in the area of the analyzed sites, i.e. 2 locations in the perimeter of the Câinei reservoir and one in the perimeter of the Lotrioara reservoir. The nesting flock is evaluated at 2 - 3 pairs within the analyzed sites.	YES, insignificant impact due to compliance with the conservation measure provided in this report.	Yes (total not significant) The implementation of the project may generate in the worst case, during the execution of specific hydropower plant construction works, only a local disturbance, totally insignificant, without leading to population losses.	Positive impact. Following the filling of reservoirs, the new banks will naturalize and will be beneficial for nesting.	No impact	Not significant
Aythya nyroca	In the area targeted by the project (Câineni and Lotrioara reservoirs) there are no specific habitats for the species, preferring lakes rich in marsh vegetation. In the analyzed area, the red duck may occasionally occur in the passage but without using the Olt river in this sector.	No impact	Yes (total not significant) The implementation of the project may generate at worst only a local disturbance during the execution of specific hydropower construction works, only if the species transits the area, without leading to population losses.	Positive impact. After the filling of the lakes of accumulation, as a result of the increase in the surface area of the water surface, the impact of the project implementation is positive.	No impact	No impact
Chlidonias hybridus	In the area targeted by the project (Câineni and Lotrioara accumulations) the species can be observed only during the passage period, transiting the area	No impact	Yes (total not significant) During the period of execution of specific works for the construction of the Câineni and Lotrioara hydropower plants, the	Positive impact Following the filling of the reservoirs of these 2 hydropower	No impact	Totally insignificant, without leading to population losses or affecting the

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	or occasionally using the Olt river for feeding, as suboptimal habitat.		implementation of the project may generate at worst only a local disturbance, resulting in an insignificant retreat of the species.	plants, the long-term effect of the project implementation is positive, due to the increase in the surface of the water surface.		local conservation status of the species.
Egretta alba	Following the application of the monitoring methodology, in the analyzed areas, the species was observed in 5 locations, totaling 11 individuals. In this sector of the Olt river, the great egret may occasionally use the river banks for feeding.	Yes (insignificant) During the period when the reservoirs are filled, the implementation of the project leads to the flooding of banks used by the species for feeding.	Yes (total not significant) Following the application of the monitoring methodology, in the analyzed areas, the species was observed in 5 locations, totaling 11 individuals. In this sector of the Olt river, the great egret may occasionally use the river banks for feeding.	Positive impact. After the reservoirs are filled in, the new banks will naturalize and will once again be optimal for feeding.	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.
Himantopus himantopus	In the area targeted by the project (Câineni and Lotrioara reservoirs) there are no specific habitats for this species, which prefers muddy areas with shallow water. In the analyzed area, the piciorong may occasionally occur in the passage but without using the Olt River in this sector.	No impact	Yes (total not significant) Implementation of the project may in the worst case generate only local disturbance during the specific hydropower construction works, but only if the species is transiting the area at the time of the works, without leading to population losses.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Nycticorax nycticorax	In the area targeted by the project (Câineni and Lotrioara reservoirs) there are no specific habitats for	No impact	Yes (total not significant) Implementation of the project may in the worst case generate only local	No impact	No impact	Totally insignificant, without leading to population

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	this species, which prefers muddy areas with shallow water. In the analyzed area the night sturgeon may occasionally occur in the passage but without using the Olt River water course in this sector.		disturbance during the specific hydropower construction works, but only if the species is transiting the area at the time of the works, without leading to population losses.			losses or affecting the local conservation status of the species.
Hirundo tern	In the area targeted by the project (Câineni and Lotrioara accumulations) the species can be observed only during the passage period, transiting the area or occasionally using the Olt river for feeding, as a totally suboptimal habitat.	No impact	Yes (total not significant) The implementation of the project may generate at worst only a local disturbance during the execution of the specific works for the construction of the hydropower plants, only if the species is transiting the area at the time of their execution, without leading to population losses.	In the long term, due to the increase in the surface area of the water surface, the impact is positive.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Accipiter gentilis	Following the application of the monitoring methodology, the ptarmigan was observed in only one location, in the area of the Câineni reservoir, at a distance of at least 440 m in the south-east direction from the analyzed site. The species may only occasionally use the survey area for foraging.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Accipiter nisus	Following the application of the monitoring methodology, the bird hawk was observed in 4 locations in the area of the Câineni site and in one location in the area of the Lotrioara reservoir. The species may only occasionally use the survey area for foraging.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the deterioration of its current conservation status .	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Actitis hypoleucos	As a result of field surveys, 4 specimens (3 locations) were observed on the banks of the Olt River in the Câineni reservoir and 1 specimen in the Lotrioara reservoir. The mountain pipit uses the analyzed area during the passage period for foraging.	Yes (insignificant and temporary) During the period when the reservoirs are filling up, the implementation of the project leads to a temporary loss of habitat until the new banks stabilize.	Yes (total not significant) During the specific hydropower construction works, the implementation of the project may generate only a local disturbance, resulting in a slight retreat of the species, without leading to population losses.	Positive impact. After the reservoirs are filled in, the new banks will naturalize and will once again be optimal for feeding.	No impact	The impact caused by the implementation of the project is insignificant and does not lead to population losses or affect the local conservation status of the species.
Alauda arvensis	As a result of field surveys, the species was observed only in the vicinity of the project sites in open grassland habitats.	Yes (insignificant) The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the CHE Lotrioara site and 7.5 ha on the CHE Câineni site. This area is considered to be totally insignificant and does not	Yes (total not significant) During the specific hydropower construction works, the implementation of the project may generate only a local disturbance, resulting in a slight retreat of the species, without leading to population losses.	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
		lead to population losses of the species or to an impairment of the current conservation status.				
Anas platyrhynchos	As a result of field surveys, the species was observed on both analyzed sites, respectively 2 nesting pairs on the Câineni accumulation, respectively 1 nesting pair and 4 solitary individuals on the Lotrioara accumulation.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) During the specific construction works of the hydropower plants, the implementation of the project may generate only a local disturbance, resulting in a slight retreat of the species, without leading to population losses.	Long-term positive Note that generally avoids strongly flowing rivers. In the medium and long term, following the filling of the reservoirs, the implementation of the project has a beneficial effect on the species, due to the increase in the surface area of the water surface.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Apus apus	As a result of field surveys, it was found that the species nests under the viaduct of the Vadului River Passage, located in the vicinity of the Câineni reservoir.	No impact	No impact	No impact	No impact	No impact
Ardea cinerea	Following the application of the monitoring methodology, in the analyzed areas, the species	Yes (insignificant) During the period when the reservoirs are filled, the implementation of the	Yes (total not significant) Following the application of the monitoring methodology, in the analyzed areas, the	Positive impact. After the reservoirs are filled in, the	No impact	Negligible, without leading to population losses or

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	was observed in 6 locations, totaling 9 individuals (7 on the banks of the Olt river in the CHE Câineni area, respectively 2 in the Lotrioara area). In this part of the Olt River, the grey heron may occasionally use the banks only for feeding.	project leads to the flooding of banks used by the species for feeding.	species was observed in 5 locations, totaling 11 individuals. In this sector of the Olt River, the grey heron may occasionally use the river banks for feeding.	new banks will naturalize and will once again be optimal for feeding.		affecting the local conservation status of the species.
Buteo buteo	Following the application of the monitoring methodology, the common redshank was observed in 5 locations, in the area of the analyzed accumulations, respectively 1 pair and 1 solitary specimen at a significant distance from the Lotrioara accumulation, and 2 pairs at a significant distance from the Câineni accumulation. The species may only occasionally use the study area for foraging as suboptimal habitat.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Carduelis carduelis	As a result of field surveys, the species was observed only in the area of the Câineni accumulation. Steltecs can use open and semi-open habitats for foraging.	No impact	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
			species, without causing population losses and without leading to the deterioration of its current conservation status .			status of the species.
Chroicocephalus ridibundus	As a result of the field surveys, several gulls have been observed feeding in the project area.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	Positive impact After filling the reservoirs of these 2 hydropower plants, the long-term effect of the project implementation is positive, due to the increase in the surface of the water surface.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Columba palumbus	The species is common in the project area, using nearby forest habitats for breeding. The species may also use open grassland for foraging.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Corvus corax	As a result of field surveys, several have been observed	No impact	No impact	No impact	No impact	No impact

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	in flight only, passing through the area.					
Cuculus canorus	Cuckoo is a common species in the analyzed area, being observed in 8 locations (more than 10 individuals), in the forest habitats in the vicinity of the analyzed sites.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Turkey warbler	Silvia mica is a common species in the analyzed area, being observed in 6 locations, respectively in the bush habitats in the immediate vicinity of the analyzed sites (Lotrioara and Câineni accumulations).	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to flooding of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the small forest will be insignificant, without leading to population losses or local conservation status.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.
Cyanistes caeruleus	The Blue Tit is a common species in the analyzed	Yes (insignificant)	Yes (total not significant)	No impact	No impact	Negligible, without leading

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	area, being observed in 9 locations (more than 10 individuals), in the bush habitats inside or in the immediate vicinity of the analyzed sites (Lotrioara and Câineni accumulations).	During the period of filling of reservoirs, the implementation of the project leads to inundation of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the blue tit will be insignificant, without leading to population losses or local conservation status.	In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.			to population losses or affecting the local conservation status of the species.
Delichon urbicum	As a result of field surveys, it was found that the species nests under the viaduct of the Vadului River overpass, located in the vicinity of the Câineni reservoir (more than 30 pairs). The Chamber Martin is also nesting on the buildings of the Lotrioara Recovery and Rehabilitation Center, in the vicinity of the CHE Lotrioara.	No impact	No impact	No impact	No impact	No impact
Dendrocopos major	As a result of field surveys, the species was observed in 9 locations (5 in the area of Câineni reservoir and 4 in	No The species may occasionally use the	Yes (total not significant) In the worst case, during the execution of specific hydropower construction	No impact	No impact	Totally insignificant, without leading to population

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	the area of Lotrioara reservoir), both nesting pairs and solitary individuals. I mention that most of the observations were made in forest habitats in the vicinity of the analyzed sites.	willows and reedbeds along the Olt stream. The impact of the project implementation is totally insignificant as it does not lead to loss of optimal habitats for the species and does not lead to population losses.	works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.			losses or affecting the local conservation status of the species.
Dryobates minor	As a result of field surveys, the species was observed in 3 locations (2 in the Câineni reservoir area and 1 in the Lotrioara reservoir area). I mention that most of the observations were made in the forest habitats in the vicinity of the analyzed sites.	No The species may occasionally use the willows and reedbeds along the Olt stream. The impact of the project implementation is totally insignificant as it does not lead to loss of optimal habitats for the species and does not lead to population losses.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Emberiza citrinella	As a result of field surveys, the species was observed in only 2 locations in the vicinity of the southern of the Câineni reservoir.	Yes (insignificant) The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the CHE Lotrioara site and 7.5 ha on the CHE Câineni site. This area is considered to be totally insignificant and does not lead to population losses of the species or to affect	Yes (total not significant) During the execution of specific hydropower construction works, the implementation of the project may generate only local disturbance, resulting in a slight retreat of the species, without leading to population losses.	No impact	No impact	Insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
		the current conservation status.				
Erithacus rubecula	The common tit is a common species in the analyzed area, being observed in 19 locations (more than 45 singing individuals), mostly in forest habitats in the vicinity of the analyzed sites. It should be noted that the species may also occasionally use the scrubland habitats in the areas targeted by the project.	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to flooding of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the common tit will be insignificant, without leading to population losses or affecting the local conservation status.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.
Falco tinnununculus	As a result of field surveys, the species has been observed in only one location, in the northern vicinity of the Lotrioara reservoir, near Boița. Red siskins may only occasionally use the survey area for foraging.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the specific construction works of hydropower plants, the implementation of the project may generate a local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Fringilla coelebs	Common species in forest habitats in the vicinity of the analyzed sites.	No impact	Yes, possible disturbance.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species
Fulica atra	As a result of the field surveys, the species was observed on both sites analyzed, i.e. 1 nesting pair and 2 solitary individuals on the Câineni site, and 1 solitary individual on the Lotrioara site.	No impact	Yes (total not significant) Implementation of the project may in the worst case generate only local disturbance during the specific hydropower construction works, but only if the species transits the area, without leading to population losses.	Positive impact. Following the filling of the reservoirs, as a result of the increase in the surface area of the water surface, the impact of the project implementation is positive.	No impact	No impact
Hirundo rustica	As a result of field surveys, it was found that the species uses the area only for foraging.	No impact	No impact	No impact	No impact	No impact
Jynx torquila	As a result of field surveys, the species was observed in only one location, in an orchard in the vicinity of the Câineni site.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
			species, without causing population losses and without leading to the impairment of its current conservation status.			status of the species.
Larus cachinnans/Caspian Gull	As a result of the field surveys, several yellow-legged gulls have been observed feeding in the project area.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	Positive impact Following the filling of the reservoirs of these 2 hydropower plants, the long-term effect of the project implementation is positive, due to the increase in the surface of the water surface.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Merops apiaster	Rare species in the area targeted by the implementation project, being observed in only 2 locations in the southern vicinity of the Câineni site. The prig may occasionally use open areas in the survey area for foraging only.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Motacilla alba	Common species in the project area, being	Yes (insignificant impact)	Yes (total not significant)	No impact	No impact	Negligible, without leading

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	observed in 10 different locations. White-tailed godwits may use areas with large stones for breeding.	During the period of filling of reservoirs, the implementation of the project leads to inundation of small areas of specific nesting habitat. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the able codobat will be insignificant, without leading to population losses or affecting the local conservation status.	In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.			to population losses or affecting the local conservation status of the species.
Oenanthe oenanthe	A rare species in the project area, being observed in only one location in the southern vicinity of the Câineni site, at a distance of at least 400 m.	No impact	No impact	No impact	No impact	No impact
Parus major	The Great Bittern is a common species in the analyzed area, being observed in 6 locations (more than 10 individuals), in the bush habitats inside or in the immediate vicinity of the analyzed sites (Lotrioara and Câineni accumulations).	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to flooding of small areas of scrub habitats. If the conservation measure provided in this memorandum for the	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
		species Alcedo atthis is complied with, the impact of the implementation of the project on the great spotted seabill will be insignificant, without leading to population losses or affecting the local conservation status.	leading to the impairment of its current conservation status.			
Phalacrocorax carbo	As a result of the field surveys, several individuals of great cormorants have been observed using the project area for feeding.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate a disturbance local, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	Positive impact Following the filling of the reservoirs of these 2 hydropower plants, in the long term, the effect of the project implementation is positive, due to the increase in the surface of the water surface.	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Phylloscopus collybita	Lesser Spotted Woodpecker is a common species in the analyzed area, being observed in 14 locations (more than 25 individuals), in the bush habitats inside or in the immediate vicinity of the analyzed sites (Lotrioara	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to inundation of small areas of scrub habitats. If the conservation measure provided in this memorandum for the	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	and Câineni accumulations).	species Alcedo atthis is complied with, the impact of the implementation of the project on the little bittern will be insignificant, without leading to population losses or affecting the local conservation status.	leading to the impairment of its current conservation status.			
Pica pica	Following the application of the monitoring methodology, the species was observed in only one location within the perimeter of the Câineni site, a nesting pair.	No impact	No impact	No impact	No impact	No impact
Picus viridis	Following the application of the monitoring methodology, the species was observed in 2 locations in the project area, at significant distances from the analyzed sites	No impact. The implementation of the project will in no way lead to the loss of specific green woodpecker habitats (deciduous forest habitats) or to population losses of this species.	YES (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate only a local disturbance resulting in a slight retreat of the species. This disturbance is significantly mitigated by the presence of the European road E81 and the Sibiu - Râmnicu Vâlcea highway.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Poecile palustris	The Southern Bittern is a rare species in the analyzed area being observed in only one location, in the vicinity of the Lotrioara site.	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to inundation	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate	No impact	No impact	Totally insignificant, without leading to population losses or affecting the

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
		of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the southern pipit will be insignificant, without leading to population losses or affecting the local conservation status.	local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.			local conservation status of the species.
Saxicola rubicola	As a result of field surveys, the species was observed only in the vicinity of the project sites in open grassland habitats.	Yes (insignificant) The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the CHE Lotrioara site and 7.5 ha on the CHE Câineni site. This area is considered to be insignificant and does not lead to population losses of the species or to affect the current conservation status.	YES (total not significant) During specific hydropower construction works, the implementation of the project may generate only local disturbance, resulting in only a slight spatial retreat of the species.	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.
Sitta europaea	Species common in beech forest habitats in the vicinity of the analyzed sites.	No impact The implementation of the project does not lead to species-specific habitat loss.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
			only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.			conservation status of the species.
Sylvia atricapilla	The black-headed Silvia is a common species in the analyzed area, being observed in 16 locations, totaling a number of more than 30 individuals, in forest and scrub habitats in the immediate vicinity of the analyzed sites (Lotrioara and Câineni accumulations).	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to inundation of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on black-headed black forest will be insignificant, without leading to population losses or affecting the local conservation status.	Yes (total not significant) In the worst case, during the specific construction works of hydropower plants, the implementation of the project may generate a local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Tringa ochropus	As a result of field surveys, 6 specimens (3 locations) were observed on the banks of the Olt River within the Câineni reservoir and 5 specimens within the Lotrioara reservoir. The Pied Flycatcher uses the analyzed area during	Yes (insignificant and temporary) During the period when the reservoirs are filled, the implementation of the project leads to a temporary loss of habitat until the new banks stabilize.	Yes (total not significant) During the specific hydropower construction works, the implementation of the project may generate only a local disturbance, resulting in a slight retreat of the species, without leading to population losses.	Positive impact. After the reservoirs are filled in, the new banks will naturalize and will once again be optimal for feeding.	No impact	The impact caused by the implementation of the project is insignificant and does not lead to population losses or affect the local conservation

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
	the passage period for feeding.					status of the species.
Troglodytes troglodytes	The common duck is a common species in the analyzed area, being observed in several locations, in forest and scrub habitats in the immediate vicinity of the analyzed sites (Lotrioara and Câineni accumulations).	Yes (insignificant) During the period of filling of reservoirs, the implementation of the project leads to inundation of small areas of scrub habitats. If the conservation measure provided in this memorandum for the species Alcedo atthis is complied with, the impact of the implementation of the project on the great crested duck will be insignificant, without leading to population losses or affecting the local conservation status.	Yes (total not significant) In the worst case, during the execution of the specific hydropower construction works, the implementation of the project may generate a disturbance local, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Turdus merula	All observations come from forest habitats in the vicinity of the Câineni and Lotrioara sites.	No impact The implementation of the project does not lead to loss of optimal habitats for Turdus merula.	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate local disturbance, causing only a slight retreat of the species, without causing population losses and without leading to the impairment of its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.

Species	Aspects concerning the presence of the species in the analyzed area	Construction period (short-term)		Operating period (long-term)		Global impact
		Habitat loss	Disturb	Habitat loss	Disturb	
Turdus philomelos	Common species in the project area, being observed in more than 20 locations, with a total of 33 individuals. All observations come from forest habitats in the vicinity of sites Câineni and Lotrioara.	No impact The implementation of the project does not lead to loss of optimal habitats for Turdus philomelos	Yes (total not significant) In the worst case, during the execution of specific hydropower construction works, the implementation of the project may generate a local disturbance, causing only a slight retreat of the species, without causing population losses and without affecting its current conservation status.	No impact	No impact	Totally insignificant, without leading to population losses or affecting the local conservation status of the species.
Upupa epops	The species was observed in 3 locations in the analyzed area, namely one location in the northern vicinity of the Lotrioara site and 2 locations in the perimeter of the Câineni site.	Yes (insignificant) The filling of reservoirs leads to a loss of habitat assessed as suboptimal for the species of 5.5 ha on the CHE Lotrioara site and 7.5 ha on the CHE Câineni site. This area is considered to be insignificant and does not lead to population losses of the species or to affect the current conservation status.	YES (total not significant) During the execution of specific hydropower construction works, the implementation of the project may generate only local disturbance, resulting in only a slight spatial retreat of the species.	No impact	No impact	Negligible, without leading to population losses or affecting the local conservation status of the species.

Note* - The species marked with bold in the above table are bird species of Community interest listed in Annex I of Directive 2009/147/EC of the European Parliament and of the Council of November 30, 2009 on the conservation of wild birds and are also listed in the standard forms of the Special Protection Areas ROSPA0043 Frumoasa, ROSPA0098 Făgăraș Piedmont, ROSPA0003 Avrig - Scorei - Făgăraș

E. Mammals

Following the analysis of existing information for protected areas in the project area, two semi-aquatic mammal species of conservation interest were identified, namely ***Lutra lutra*** (otter) and ***Castor fiber*** (beaver).

The activities were as follows:

- Analysis of the existing information for the protected areas of interest, related to the mammalian species covered by this contract;
- Conducting field observations to identify relevant elements of mammal species, conservation objectives set for protected areas of interest;
- Analysis of field data collected in order to assess the conservation status of the targeted mammal species;
- Activity reporting
- Identify measures to reduce or eliminate impacts on the mammal species concerned;

Materials and methods:

Stream bank transects (Standard Method) for mapping the range of *Lutra lutra and Castor fiber*

The survey technique used follows the guidelines of the standard method for otter surveys recommended by the IUCN/SSC Otter Specialist Group (Reuther *et al.* 2000). Thus the major watercourses were divided into segments of approximately 5 km representing, observation sites.

The first 600 m of each observation site were investigated for signs of presence; if signs of otter and beaver presence were identified they were recorded on the field form, the search continued, the site was declared positive and otherwise it would be negative. Sites where the presence of the species was certain were divided into two categories (permanent or incidental) according to the age of the presence signs (Reuther *et al.* 2000).

A standard form was completed in the field to help assess habitat quality, disturbance factors, conservation status assessment, assessment of anthropogenic impact activities and observation outcome.

In order to measure the relative abundance and to map the distribution of otter and beaver in the area of the project: hydropower development of the Olt river in the Avrig - Cornetu sector, 10 transects were randomly established along the Olt river course, so that the locations of the transects cover as large an area as possible in the study area.

Transects of 600 meters in length were walked on foot, and identified signs of presence were entered on the field form. The access to the transect was done by motorized transport if the regulation of the protected natural area and the transport network allowed it. The total length of the 600 m transects that were traveled within the observation sites is 6 km, but the access to the beginning of the transect should also be considered. An estimated 5 to 6 transects were completed per day, depending on motorized access, weather conditions and distance between transects.

At least one week before the start of the activities, the area to be covered was determined so that all transects could be covered within 2 days to avoid double measurements. Field equipment will also be prepared and existing information (already collected by game

managers, protected area managers, literature, public reports, etc.) will be analyzed in order to concentrate the effort in the areas of interest.

The implementation period of the field activities was as follows:

Ian.	Febr.	Tue.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

The results of the method depend on the following factors: standardization of the way of working, data recording and centralization, and data analysis.

Stages within each session:

Step 1. Preparing equipment and accessories, determining the means of transportation to be used;

Step 2. Scheduling the periods of each transect, carrying out the instruction on how to work.

Step 3. The actual transect work by the designated teams. Taking into account the ethology of the species, it is recommended that field activities start at dawn and end at sunset, as this will create the prerequisite for the possibility of visual identification of individuals.

In the field, the following were identified:

- otter and beaver tracks;
- beaver blush;
- beaver dams;
- Each identified track is measured and coordinates are recorded.
- otter droppings will be counted and their age noted;
- Any other marks identified in the field are recorded on the field form: beaver lodges, burrows, slides, anal jelly, amphibian and fish carcasses, tracks in the snow, tree, grass trails, drying and resting places, etc. These signs are also recorded with coordinates or landmarks (distance, orientation, etc.) are recorded according to the first sighting of the tracks or signs.

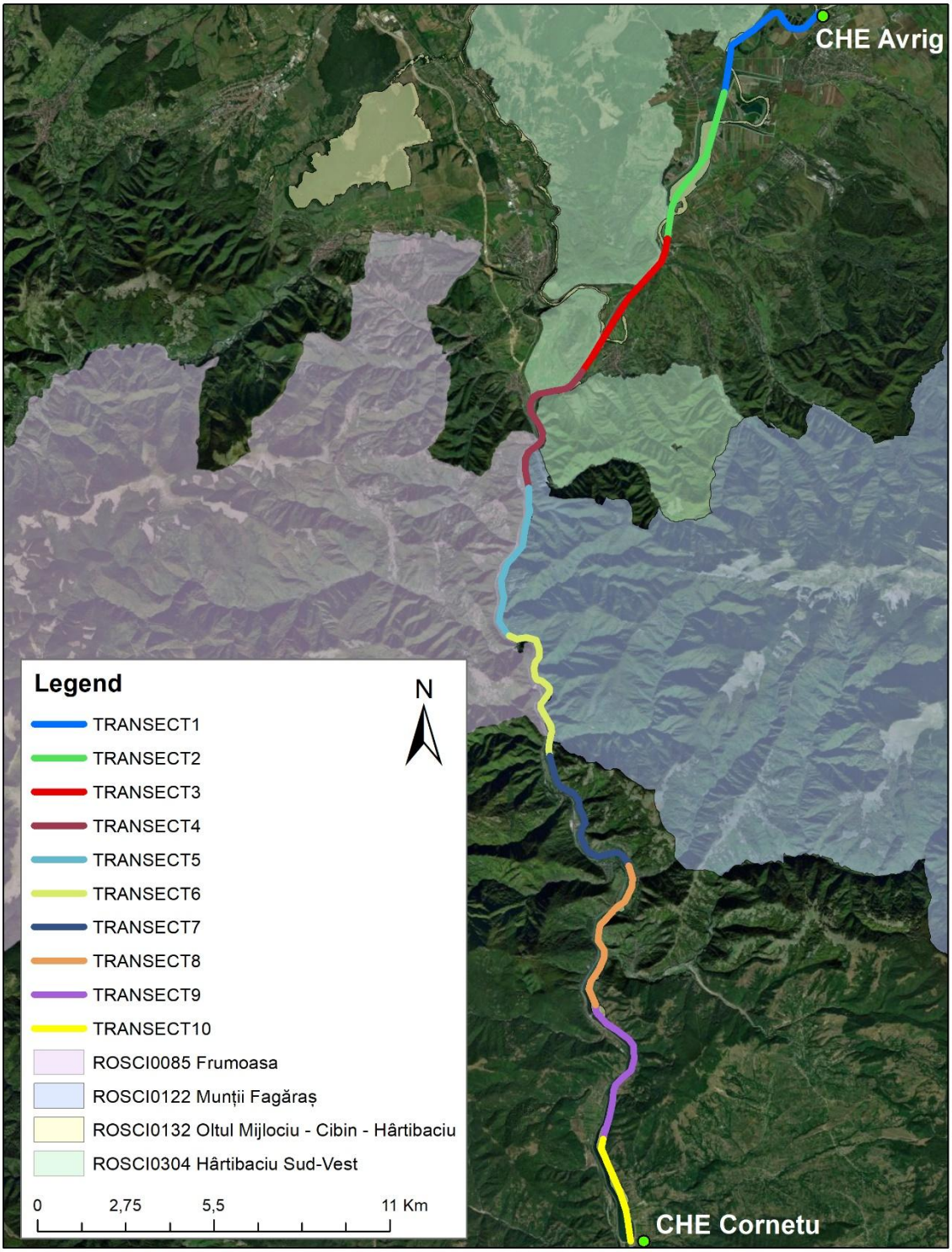


Figure 57 - Map of the distribution of the 5 km observation sites in the project area: hydropower development of the Olt river in the Avrig - Cornetu sector

Data storage and processing

At the end of the transect session, the data were stored in a GIS database, following the development of an attribute table for *Lutra lutra and Castor fiber*. The same operator ensured the mapping of the distribution of the recorded tracks using a computerized geographic data

processing system. Centralization of the data leads to the identification of possible gaps in the completion of the forms or to the appearance of some unclearness in the distribution of individuals.

Data interpretation and analysis

For this method, the data is analyzed statistically. Each 600 m transect of a stream is the equivalent of approximately 5 km of stream. Thus, if no signs of presence could be identified in the 600 meters of transect, the site is declared negative, as well as the whole sector of approximately 5 km. Field data were mapped together with the attributes of each record at the end of the data collection season. Utilizing spatial data analysis software, the distribution of otter and beaver species in the project area was first identified.

Results of field activities:

During the observations, the Olt river between CHE Avrig and CHE Cornetu was crossed on foot.

The use of the non-invasive method (transects) has provided us with important information on the distribution of the otter and beaver population, but a sustained effort is needed to be able to assess and monitor the target species which are characterized by high mobility and predominantly nocturnal activity. The proposed method, calibrated and applied repeatedly, provides reliable estimates of the distribution of the otter population in the sector of the Olt river located between CHE Avrig and CHE Cornetu.

Following the application of the standard method, signs of presence of *Lutra lutra* and *Castor fiber* species were identified: tracks, droppings, gnawing and slides.

A high density of signs of habitat use by the otter species were recorded all along the Olt riverbed surveyed. Signs of beaver presence were found all over the surveyed section of the Olt River, with a higher frequency in the area of the lakes in the Avrig area.

A high density of beaver presence signs (toboggans, burrows, burrows, gnaws and tracks) were identified on **transect 1.**

Photo 37 - Beaver slides between the Olt river and the fish farms in the Avrig area (left), beaver gnawed willows in the Avrig area (right) and beaver tracks (center - bottom)

Regarding *Lutra lutra* on transect no. 1, tracks and droppings were identified in the area Avrig - Bradu.

Photo 38 - Otter (*Lutra lutra*) tracks on the banks of the Olt river in the Avrig area

Transect no. 2 showed signs of otter (*Lutra lutra*) and beaver (*Castor fiber*) downstream of CHE Racoviță, on the Olt river. Tracks and droppings were identified.

Photo 39 - Otter spraints (*Lutra lutra*), on the bank of the Olt river, in the CHE Racovița area

The area that showed a higher density of signs of *Lutra lutra* and *fiber beaver* species on transect no. 3 was between the railway bridge and the road bridge on DJ105N in the Turnu Roșu area.

Photo 40 - Beaver tracks (left), otter tracks (right - top), beaver rosette (right - bottom) on the Olt river bank in the Turnu Roșu area

On transect no. 4, most signs of presence of otter and beaver were identified on the banks of the Olt river, in the area of Boița and Restaurant Boița.

Photo 41 - Otter spraints left and beaver gnawed willow (right) at Boița

On transect no. 5, signs of *Lutra lutra and Castor fiber* were identified in the area of the confluence of Pr. Megheș with the Olt river in the area of Turnul Spart.

IL

Photo 42 - Otter spraints (left) on the bank of Megheș stream and beaver gnawings on the bank of the Olt river, in the area of Turnul Spart

Transect no. 6 showed numerous signs of otter and beaver in the area of the confluence of the Olt river with the Lotrișoara stream and upstream to the road bridge.

Photo 43 - Signs of beaver gnawing on a tree on the banks of the Olt in the Lazaret area

Photo 44 - Latrine with otter droppings on the Lotrioara stream, at the confluence with the Olt river in the Lazaret area

On transect no. 7, signs of *Lutra lutra and Castor fiber* were identified on the Olt river, in the Râu Vadului area.

Photo 45 - Droppings of otters and beavers were found along the Olt riverbanks in the CHE Câineni area

Transect No. 8 showed numerous signs of otter and beaver in the area of Little Dogs.

Photo 46 - Beaver gnawed willow (right) and otter droppings (left) on the banks of the Olt at Câinenii Mici

Transect no. 9 showed signs of otter and beaver on the Olt river downstream of CHE Robești.

Photo 47 - Otter (*Lutra lutra*) excrement on the Olt river bank, at Robești

On **transect no. 10**, signs of otter and beaver presence were identified on the technical left bank of the reservoir on the Olt river, upstream of CHE Cornetu.

Photo 48 - Otter droppings (right) and beaver gnawings (left), on the banks of the Olt river, in the CHE Cornetu area

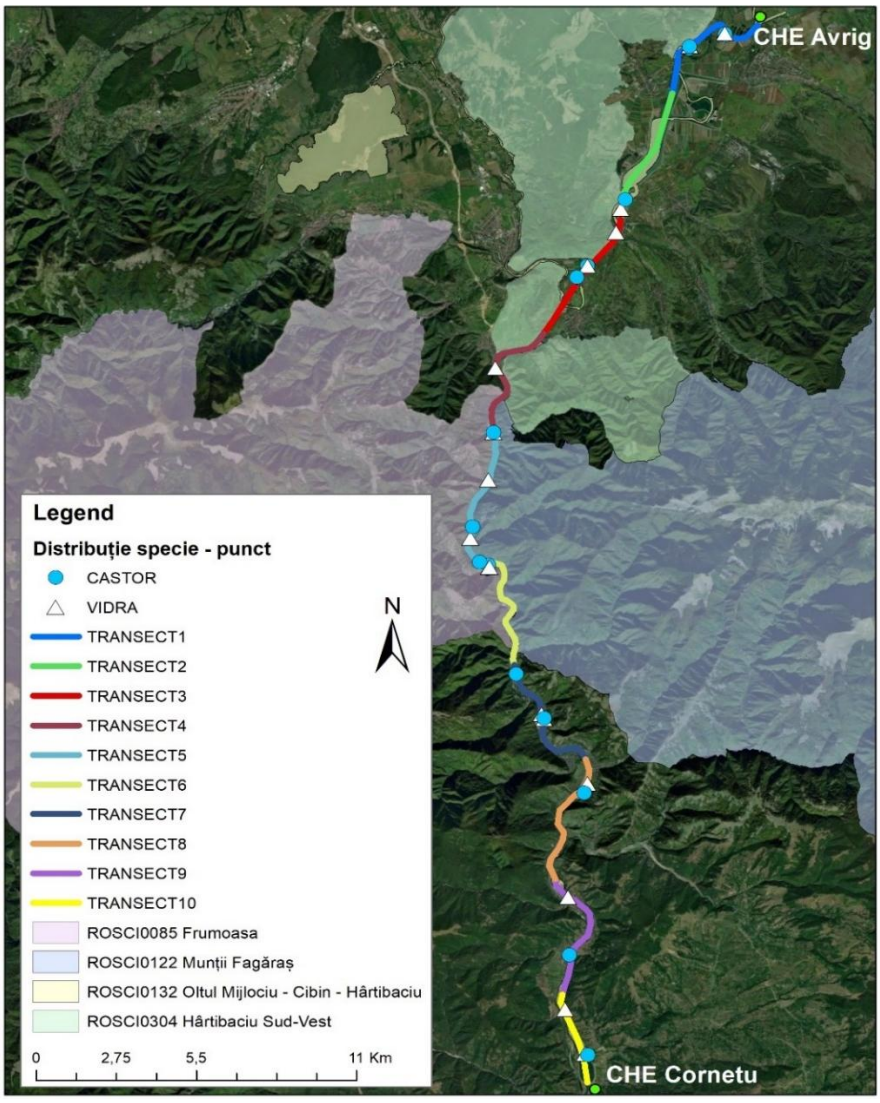


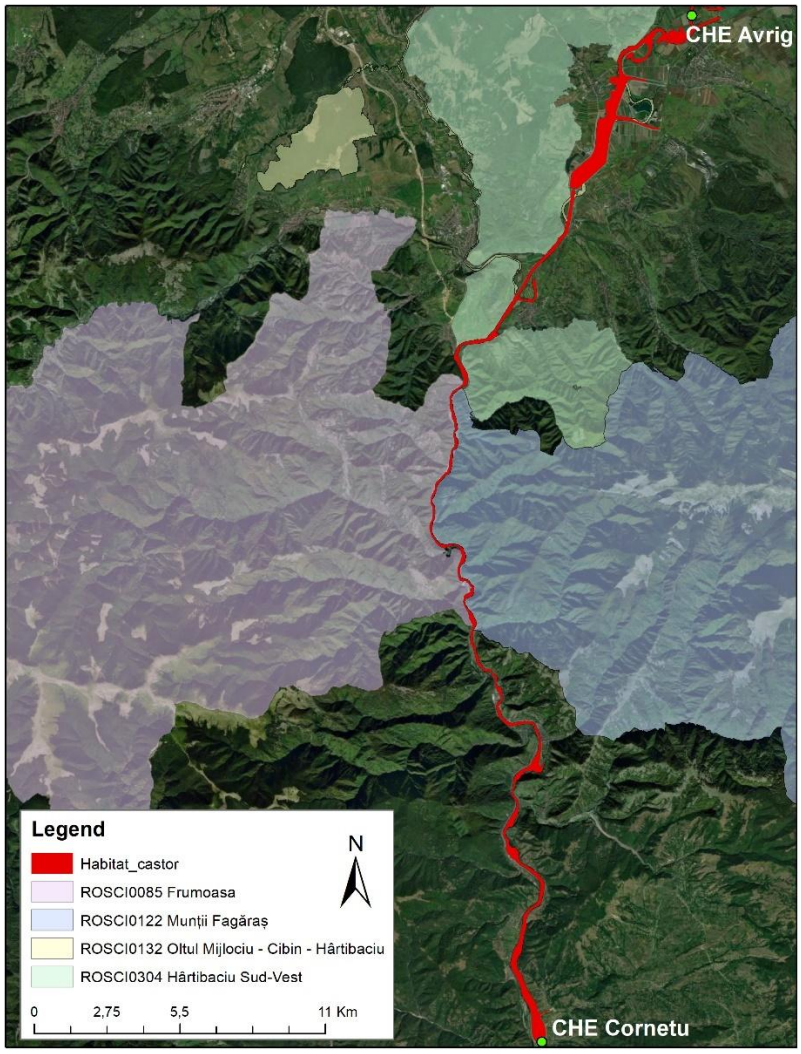
Figure 58 - Distribution map of *Lutra lutra* and *Castor fiber* - Standard Method

Habitat use:

The Eurasian beaver (***Castor fiber***) inhabits lakes and streams; it is strictly herbivorous, eating a large number of woody and herbaceous species. The contribution of herbaceous species to the beaver's diet varies according to the season and the region occupied. The beaver prefers soft woody species and in particular, poplar and willow of small size 2- 20 cm in diameter. From late summer, when the beaver's diet is based on tree bark, the beaver will take down large trees throughout the fall-winter period. Thinner branches and trunks are sectioned for easier transportation (Tallósi, 2007). Bark from thicker branches and trunks is sometimes consumed on the spot, but often these wood sorts are not used for feeding. Beavers usually feed in areas of shallow water or at the water's edge so that they can easily bring food into the water (Gurnell, 1998). A family has fixed feeding areas, which individuals use seemingly randomly.

The average population density has been given in the literature as approximately 0.2 colonies per km (Mitchell-Jones et al, 1999), 1.0 or 0.2 colonies per km - 0.25 colonies being per km at peak density in Sweden, 0.26 colonies per km in Germany, 0.29 colonies per km in Belarus-Poland, in Russia 1.5 colonies in habitats categorized as "very good" for beaver, 0.5 in habitats categorized as "good" and 0.1 colonies in habitats categorized as "mediocre" (Gurnell, 1998). The average size of a colony/family group averaged 3.7 individuals in Suwałki Lakeland, 4 in Lithuania, 4.4 in Belarus, 3.4 in Poland, 3.4-4.1 in Oka Nature Reserve (Zurowski and Kasperczyk, 1986).

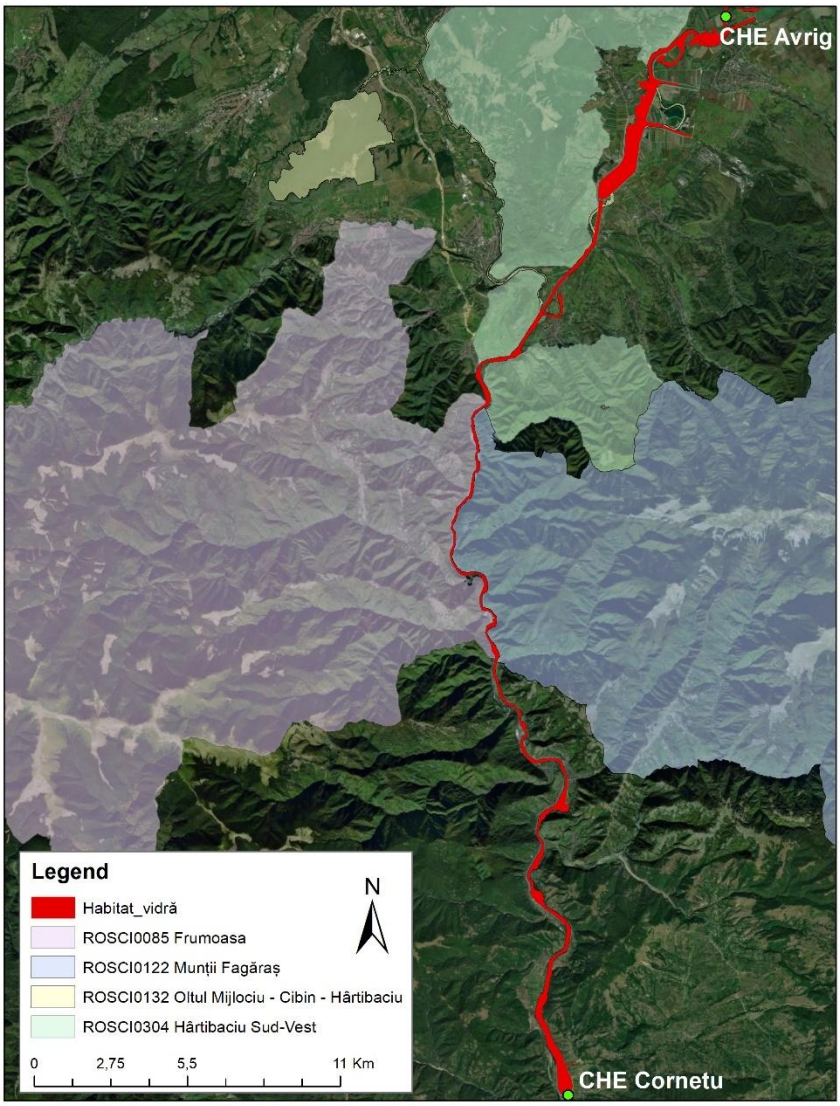
The beaver prefers the deeper, softer sections of watercourses with extensive vegetation composed of grasses and softwoods. The beaver is strictly herbivorous, eating a large number of woody species. Small tree species (2 - 20 cm in diameter): *Populus* sp., *Salix* sp., Other preferred species, but not only for food, are: *Ulmus, Qercus, Prunus, Prunus, Fraxinus, Betula, Alnus, Acer* (Juhász 2018). Beavers prefer more solid soils to be able to dig more easily and use a lot of woody material to make their roosts.

Code	Parameter	Description
A.1.	Species	**1337 - *Castor fiber***
A.2.	Population type of the species in the target area	Permanent population (sedentary/ resident)
A.3.	Localization of the species [geometry]	 Distribution map of the *fiber beaver* species in the Avrig - Cornetu sector of the Olt river
A.4.	Habitat area of the group of individuals	945 ha
A.5.	Location of species [description]	Following field trips in the period April - May 2024, it is observed that most signs of beaver presence can be identified in the area of the Olt River, but also its tributaries and in the area of neighboring ponds - particularly in the Avrig area. The presence of beaver was identified by the signs left by this species, so we noted and saved their locations on GPS. The most

		frequent signs of presence were feeding tracks left by this species, namely tree bark peeling or gnawing. Using the detailed inventory procedure we were able to identify the distribution of beaver in the targeted study area. The distribution of a family was easiest to observe by its feeding activity, as family members leave chew marks along the water bank. The frequency of fresh peeling marks on the trees (Czabán 2017, Juhász 2018) clearly shows the distribution range of a beaver family.
A.6.	Population size of the species at the site	23 - 25 families 60 - 75 individuals
A.7.	Quality of data on the population of the species at the site	mean - data estimated on the basis of extrapolation and/or modeling of data obtained from partial measurements;
A.8.	Species density class	High

The otter (*Lutra lutra*) lives in varied aquatic and semi-aquatic environments, it can be found from the seashore to high altitudes on mountain streams, even in the center of large cities, such as the Dâmbovița river in Bucharest. The presence of the otter in a given environment is strongly correlated with the existence of food resources. It can live both in fresh standing water (lakes, pools, ponds, reservoirs, marshes) and flowing water (rivers, streams, streams, rivers, man-made canals, sometimes even in ditches with only a few centimeters of water) as well as in brackish water: Seas and oceans; but in the case of the latter, there must be freshwater sources nearby in which the otter can wash its fur in order to maintain the fur's waterproofing and thermal insulating role by removing salt deposits. (Macdonald et al, 1998; Kruuk, 2006). However, there are different aquatic habitats preferred by otters over others, which are directly correlated with the availability of food, shelter and possible mates.

In Romania, otters inhabit the aquatic habitats of inland flowing and stagnant waters, with a very wide distribution range, from the shores of the Black Sea and the Danube Delta to altitudes of over 1500 m in the Carpathians. Regions at higher altitudes are less productive than those at lower altitudes, and the biomass of fish resources is directly correlated with altitude, hence otter population densities in most of Europe are lower in higher elevations and higher in lower elevations (Ruiz-Olmo, 1997; Prenda and Granado-Lorencio, 1996; Kruuk, 1993). Basically otters can be found in most aquatic habitats as long as there are sufficient food resources.

Code	Parameter	Description
A.1.	Species	**1355 - *Lutra lutra***
A.2.	Population type of the species in the protected natural area	Permanent population (sedentary/ resident)
A.3.	Localization of species [geometry]	 Distribution map of the *fiber beaver* species in the Avrig - Cornetu sector of the Olt river
A.4.	Habitat area of the group of individuals	945 ha
A.5.	Location of species [description]	The habitats used by the otter were identified on all sections of the Olt river in the study area, between Avrig and Cornetu.

A.6.	Population size of the species at the site	12 - 16 adult individuals
A.7.	Quality of data on the population of the species at the site	mean - data estimated on the basis of extrapolation and/or modeling of data obtained from partial measurements;
A.8.	Species density class	Raised;

Conservation status assessment

Parameters for assessing the conservation status of ***Lutra lutra*** from a population perspective

Nr.	Parameter	Description
A.1.	Species	**1355 *Lutra lutra*** - Vine Habitats Directive: Annexes II and IV It is listed in CITES Appendix I. Annex II of the Berne Convention Annex I of the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals (CMS), which recommends the highest level of protection. GEO 57/2007 - Annex 3 and 4A (Law 49/2011) - Species of plants and animals whose conservation requires the designation of special areas of conservation and special avifauna protection areas IUCN categories: NT Carpathian List of Endangered Species: VU
A.2	Temporal presence status of species	Permanent (sedentary) population
A.3	Population size of the species in the protected natural area	12 - 16 adult individuals
A.4	Quality of data on the population of the species in the protected natural area	mean - data estimated on the basis of extrapolation and/or modeling of data obtained by partial measurements;
A.5	Reference population size for the favorable status of the study area	15 - 20 individuals
A.6	Methodology to estimate the size of the reference population for the favorable status	The estimation of population size was based both on the size of tracks identified in the field and on a simple formula in which the habitat occupied by the otter is divided by the average size of the territory

		occupied by a female otter. Female territory size is chosen because females are known from the literature to maintain much more stable territories than males (Kruuk, 1995, 2006). Based on the studied works, for the Olt river area, the average territory size for otter is estimated as follows: juveniles 4-5 linear km, females 6 -7 linear km and males 10 - 15 linear km. Male and female territories may overlap. Male juveniles older than two years of age that become independent will seek their own territory, initially small (3 - 4 km²).
A.7	Ratio of the reference population size for the favorable status to the current population size	"≈" - approximately equal
A.8	Quality of data on the current trend in species population size	mean - data estimated on the basis of extrapolation and/or modeling of data obtained by partial measurements;
A.9	Population structure of the species	8 - 10 adult females, 4 - 6 adult males, 3 - 5 juveniles population age structure does not deviate from normal;
A.10	Population conservation status of the species	"FV" - favorable

Parameters for assessing the conservation status of the species ***Castor fiber*** from the population point of view

Nr.	Parameter	Description
A.1.	Species	***Castor fiber*** - Castor Habitats Directive: Annexes II and IV GEO 57/2007 - Annex 3 and 4A (Law 49/2011) - Species of plants and animals whose conservation requires the designation of special areas of conservation and special avifauna protection areas
A.2	Temporal presence status of species	Permanent (sedentary) population
A.3	Population size of the species in the protected natural area	60 - 75 adult individuals
A.4	Quality of data on the population of the species in the protected natural area	mean - data estimated on the basis of extrapolation and/or modeling of data obtained from partial measurements;
A.5	Reference population size for the favorable status of the study area	70 - 80

A.6	Methodology to estimate the size of the reference population for the favorable status	In order to estimate the beaver population in the study area, represented by the sector of the Olt river between Avrig and Cornetu, we have related the number of families to the average number of individuals in a family, according to the literature (Zurowski and Kasperczyk, 1986; Rosell and Thomsen 2006), on average, the size of a family was considered, under the environmental conditions of the study area, to be 3 individuals. The estimated number of individuals of the species *Castor fiber* in the study area is between 60 - 75 individuals, with 23 - 25 beaver colonies identified. The estimate was based primarily on active roosts and the frequency of rosetting, but also the density of other signs of presence such as dams and slides were taken into account, thus the number of individuals was assessed at each stream level.
A.7	Ratio of the reference population size for the favorable status to the current population size	"≈" - approximately equal
A.8	Quality of data on the current trend in species population size	mean - data estimated on the basis of extrapolation and/or modeling of data obtained from partial measurements;
A.9	Population structure of the species	32 adult females, 28 adult males, 15 juveniles population age structure does not deviate from normal;
A.10	Population conservation status of the species	"FV" - favorable

Conclusions

Mammal population inventory and mapping studies are crucial as they provide important information on species distribution, abundance and habitat, and their presence/absence can serve as potential indicators of the impact of hydropower development on the aquatic environment. In general, hydropower projects can cause irreversible habitat loss leading to the extinction of protected species such as otters (*Lutra lutra*) if not properly planned taking into account the needs of aquatic and semi-aquatic life.

Among the mammal species in the Olt river sector between Avrig and Cornetu, the most affected species by the changes generated by the hydro-technical infrastructure built here are the semi-aquatic species such as otter (*Lutra lutra*) and beaver (*Castor fiber), the* other carnivore, herbivore or bat species are affected to a lesser extent or not at all.

The construction and operation of hydropower plants can generate significant impacts on biodiversity when their siting and design are not based on respect for the ecological requirements of habitats and species. Unfortunately, this is the case for the vast majority of hydropower plants built or proposed to be built in Romania. The significant impacts can be felt

not only at local level but also at the level of aquatic ecological corridors, with the effects being felt even tens of kilometers away.

The mammal species potentially affected by the hydro-energetic infrastructure built on the Olt River sector are semi-aquatic species whose habitat is practically the course of the Olt River and its tributaries.

Among the species most affected by the construction is, on the one hand, the Eurasian otter (*Lutra lutra*), both by habitat degradation but especially by the decrease in food resources, consisting mainly of various species of fish and on the other hand, the beaver (*Castor fiber),* by reducing the trophic base on the banks of the Olt River.

F. Mammals other than otters and beavers

For mammalian species, the basic method was the presence/trace inventory method. The methods used for mammalian species were in accordance with the specialized guides, being adapted according to the recommendations of the Guide on monitoring protocols and uniform methodologies for monitoring the conservation status of species of Community interest in Romania, within the project "Completing the level of knowledge of biodiversity by implementing the system for monitoring the conservation status of species and habitats of Community interest in Romania and reporting under Article 17 of the Habitats Directive 92/43/EEC"

The track inventory method is based on the identification of tracks left by individuals in snow or soft substrate near water. Examples of the tracks investigated in the project are shown in the figure below. The method involves conducting transects in areas considered favorable habitat for terrestrial or aquatic mammal species. The transects were mainly conducted on existing forest roads in the project area and varied in length. The identified tracks were measured and their geographical position was recorded by GPS.

Following the application of the above-mentioned methodology, in conjunction with the placement of wildlife monitoring cameras in the area of favorable habitats for large carnivore species in the vicinity of the project sites, only traces of presence of *Ursus arctos* were identified, as well as specimens of prey species for *Canis lupus* and *Lynx lynx,* respectively *Cervus elaphus* and *Capreolus capreolus.*

Photo 49 *Cervus elaphus* (female) in the vicinity of the site (caught on camera)

Photo 50 *Capreolus capreolus* in the vicinity of the site (caught on camera)

Photo 51 *Ursus arctos* excrements on the land in the vicinity of the site

The presence of chiropteran species in the study area has been reported both through field surveys and literature. To extract information from the literature (Murariu et al. 2016; Valenciuc 1992; Valenciuc and Chachula 2002; Valenciuc, Ion, and Harea 1966), including data available from Natura 2000 networks in the site area.

To collect field data, a non-invasive observation method was used: ultrasound detection using a chiropteran detector (Anabat Walkabout - built-in GPS). Two monitoring campaigns were conducted, 14-17.05.2024 and 03-06.06.2024, totaling 10 nights of field work. Data were collected after sunset until 02:00 AM the following day. Data collected were analyzed using Anabat Inshight software and species determination guides (Pocora and Pocora 2012; Russ 2012). Some recordings could not be determined to species rank due to limitations of the methodology and strong similarity between certain species groups, such as *Pipistrellus nathusii* with *Pipistrellus kuhlii* or species in the genus *Myotis sp.* if recorded more than 7 m away from the microphone (Chaturvedi, Singh, and Tiwari 2018).

Following the field assessments, in the area of influence of the works (remaining to be executed), the following chiropteran species were identified: *Barbastella barbastellus, Myotis emarginatus, Rhinolophus hipposideros and Myotis dasycneme*, their distribution being shown in the figures below.

The Olt Corridor between the 4 Natura 2000 Sites, namely ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSAC0122 Făgăraș Mountains, ROSAC0085 Frumoasa, ROSAC0304 South-West Hârtibaciu, represent habitats for the identified bat species, the riparian vegetation on the banks of the Olt representing links between forest habitats (feeding habitats for bat species) on the two sides of the Valea Oltului. The realization of the project may affect the riparian vegetation on the banks of the river (R. Olt), leading to a reduction in the degree of connectivity between forest habitats on the two sides of the Valea Oltului.

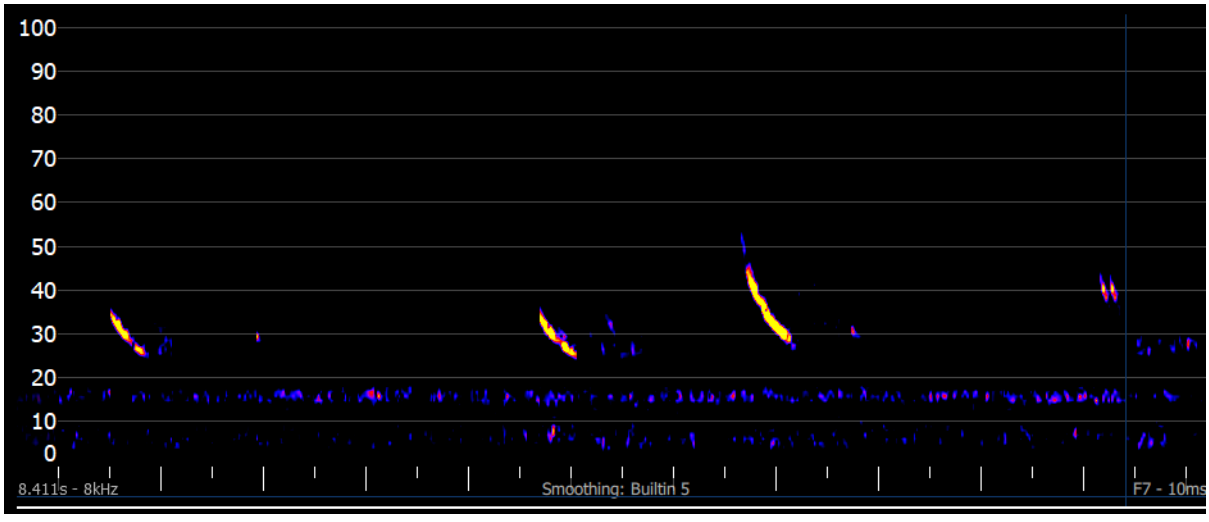


Figure 59 Example of ultrasound recording of chiropteran species

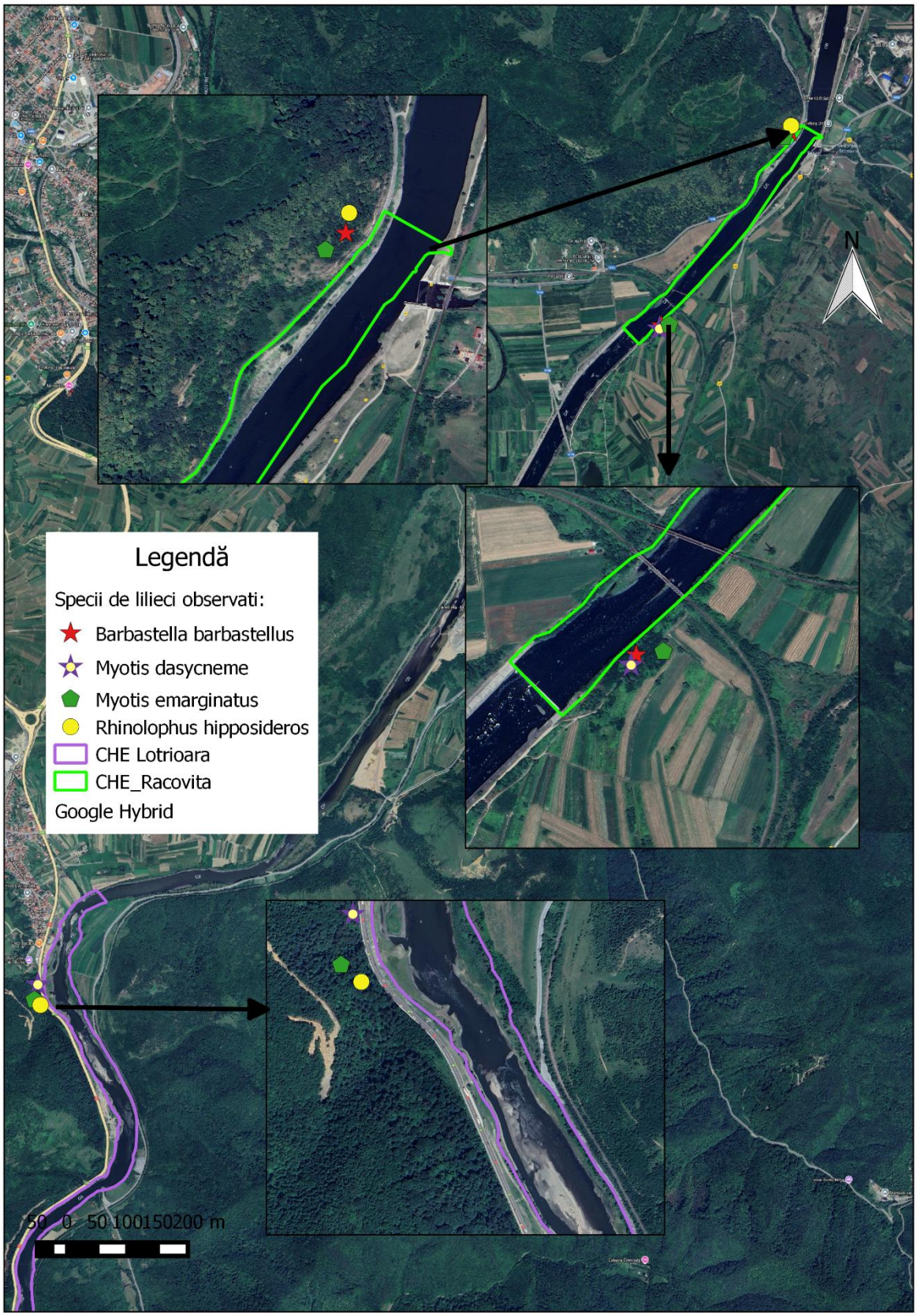


Figure 60 Map of observation points for chiropteran species

G. Ichthyofauna

G.1 Inventory, mapping and monitoring methodology of fish species in the project area

In order to be able to compare data collected from different ichthyofauna assessments, a standardized methodology and standardized equipment is necessary. Only with similar replication under similar conditions can comparable data be obtained.

For surveying and monitoring the fish fauna in the Olt River and tributaries of the Olt in the study area, we chose the electrofishing, which is recommended for all possible species present.

1.1.How to evaluate with the electron microscope (after Pricope et al. 2004)

In flowing waters the use of electronarcosis is recommended, which has the advantage that it does not kill the fish, and the evaluation is almost total at the working points. Although some studies demonstrate the negative effects of electronarcosis apparatus (Henry et al. 2003, Hollender and Carline 1994, Dalbey et al. 1996, Thompson et al. 1997), these effects usually do not affect fish survival in the long term (Dalbey et al. 1996). To mitigate these negative effects, the use of pulsed DC current is indicated (Dwyer and Erdahl 1995, Henry and Grizzle 2004).

Also to minimize negative effects, it is advisable to remove shocked fish as soon as possible from the range of the electronarcoding apparatus (Sharber et al. 1994). The European Standard CEN/TC 230 Water analysis establishes how to assess the specific composition, abundance and diversity of fish communities in rivers, lakes and coastal waters in order to qualify their ecological status. These standards standardize the methods of fish assessment so that the results obtained by different researchers are comparable. This document presents an electrofishing method that can be used to identify fish for the purpose of characterizing the species richness, composition, abundance and age structure of fish communities.

The main components of an electrofishing apparatus are the power supply, control panel, cables, safety switches and electrodes. Direct direct direct current (CCD) or pulsating direct current (PCC) can be used for electrofishing. Alternating current is very harmful to fish for this reason it is not used.

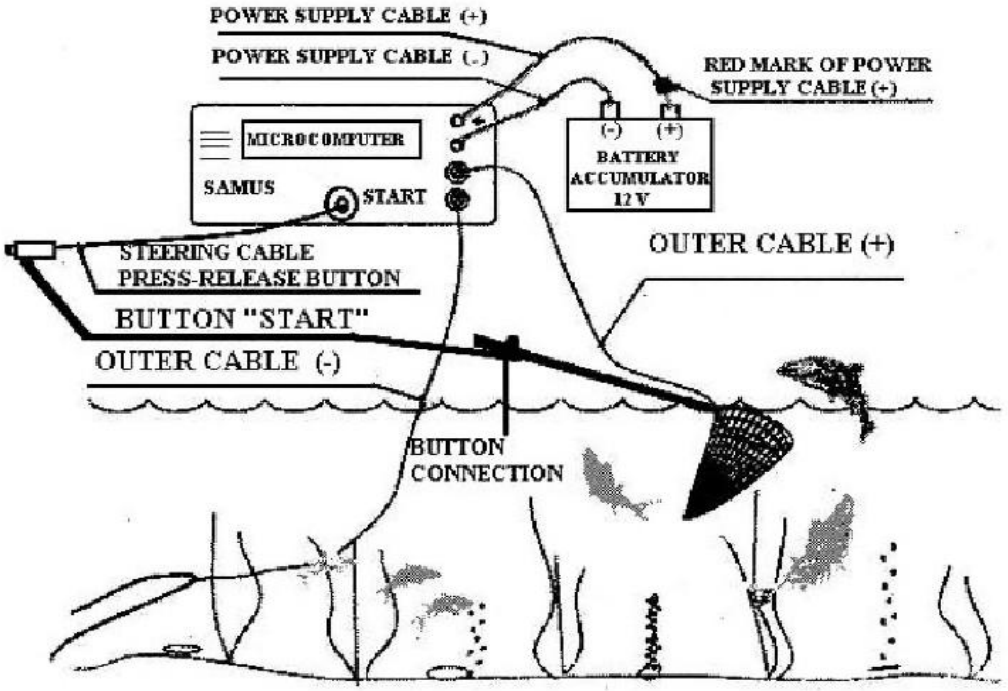


Figure 61 Operation of the electronarcosis apparatus

All fishing equipment generating electric current must comply with CENELEC and IEC standards and with the European legislation in force. These appliances must be capable of producing the desired voltage and amperage throughout their entire operating life.

For the inventory of fish species in the Olt River and its tributaries, we used a Samus electronarcotic device, which is a low-capacity pulsating DC current device, thus the negative effects on ichthyofauna will be minimal (Henry and Grizzle 2004) and which fulfills all the above mentioned requirements. Chest waders are used to move through the water, and the minnow is used to identify and count shocked fish.

1.2.How and where to inventory fish species

The fishing procedures and equipment used depend on the depth of water in the place where the fish species are inventoried. In the Olt and its tributaries being mountain rivers, portable fishing gears can be successfully used, as they allow greater mobility and the inventory is carried out from the bed. The sample size must be large enough to include the dominant species and to include the complete set of species characteristic of the river in question, in order to ensure representativeness of the respective fish community (Pricope et al. 2004). We note that during field trips we also check the catches of recreational anglers.

In the case of the Olt river and tributaries of the Olt, 29 inventory stations were proposed in the study area starting downstream of CHE Racovița and ending downstream of CHE Cornetu.

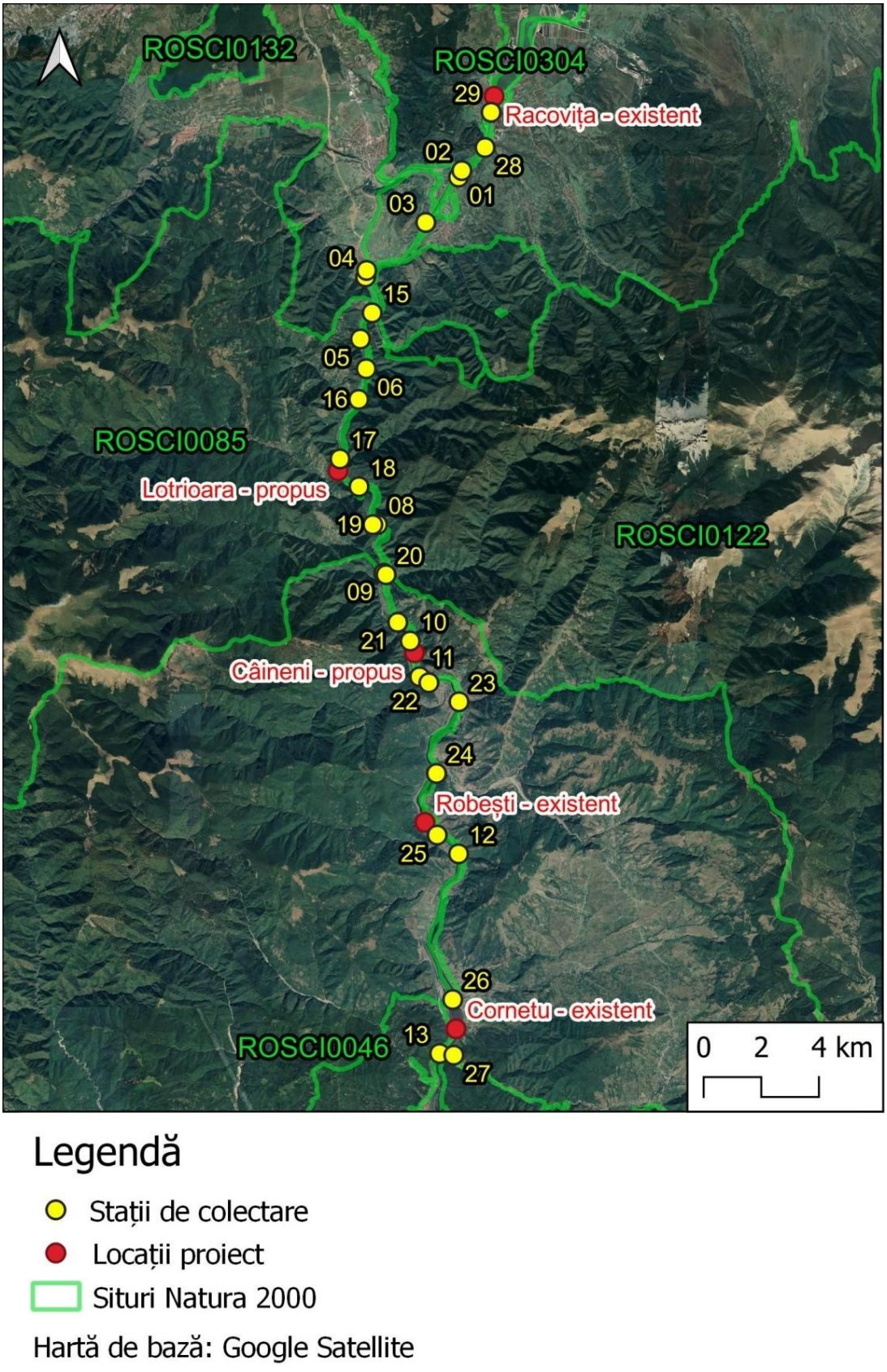


Figure 62 Proposed inventory stations

Inventorying fish species is done by a minimum of 2 people (Photo 48). The first person further upstream shocks the fish with the electronarcofish and the person(s) further downstream stops them with a minnow. Often the person who shocks the fish is able to identify the first shocked fish, and the person further downstream identifies the fish carried by the current. Shocked fish take 0.1-3 minutes (depending on the species and the distance they are at the time of the shock) to recover, and this is long enough to count, identify, etc.

The fish species inventories are standardized so that inventoried data from similar stations can be compared. Length of stations:

- on the Olt river: 150-300 m,
- on tributaries: 150 m.

On-site some stations were moved several hundred meters upstream or downstream, but these moves are not significant and can be tracked from the data attached to the ichthyofauna monitoring report (shown below). In the vast majority of cases, assessment stations were successfully completed where they were pre-established. For the remainder of this study, we will only use numbers for the names of the inventory stations.

Photo 52 Inventory: from the Olt river (left) and from a tributary of the Olt river (right).

The photos were taken by the person downstream with a minnow.

1.3.Constraints on the above method

One of the most important limitations of this method is the fact that the range of the electronarcoding device is quite small (1-1.5 m). If the range of action of the electron-arc is increased, some of the shocked fish will not survive. For this reason this range cannot be increased.

Another limitation of this method is its use in turbid waters. In this case shocked fish cannot be observed and inventoried by the assessors. For this reason, the assessment of ichthyofauna data will only be carried out if the water transparency is high enough to observe all shocked individuals.

1.4.Species identification and counting:

Fishes are identified and selected in different age categories based on the literature (Bănărescu 1964, Gyurkó 1972, Pintér 1989, Pintér 2002, Kottelat and Freyhof 2007).

1.5.Field sheet used to inventory fish species

Point name		Name end point									
Hydr.		Water body name		Date							
Team:		Now									
Station length (m)		Appliance type electronicarcosis	Samus								
Width: average-max (m)		Fishing type	From the boat		Kece		From the riverbed	X			
Surface evaluated (m2)		Structure riverbed	fine sediments (<0.1 cm)		sand (0.1-0.5 cm)		gravel (0.5-6 cm)				
Depth: average-max (cm)			stone (6-50 cm)		rock (> 50cm)		clay		concrete		
Coverage (%)		Land use	Wrong:								
Shading (%)			Left mal:								
Meandering number		Water level:	very low	low	normal	high	very high				
Shore vegetation (5 m from shore) (%)	wrong	herbaceous		woody		shrubland		stone		concrete	
	left pain	herbaceous		woody		shrubland		stone		concrete	
Water speed in %	fast	average	slow	free-standing	Transparency water (cm):	0 - 10	10 - 20	20 - 40	40 - 70	>70	
Nature:	almost natural	slightly modified	modified	heavily modified	Date modified (years):						
PH*		Conductivity* (µS)		TDS* (ppm)		Dissolved oxygen*	%	mg/l	°C*		
N2000 species:	Total	Stage		Other species	Total	Stage					
		Juv.	Ad.			Juv.	Ad.				

Fields marked with * are not mandatory.
Pressures/nature of change:
Threats:

G.2. Results: species identified, number of individuals, population sizes, sex ratio, juveniles/adults

Field trips for ichthyofauna inventory were carried out in the periods: 24.05.2024, 06-07.06.2024, 10- 11.06.2024, 24-25.06.2024 and 09-11, respectively 29-30.07.2024. During the outings, fish species were inventoried at 29 (39 with repeats) inventory stations (Figure 48) and 30 fish species were identified (Table No. 51).

Of these fish species 7 are of Community interest: *Barbus petenyi, Rhodeus amarus, Romanogobio kesslerii, Romanogobio vladykovi, Romanogobio vladykovi, Romanogobio uranoscopus, Sabanejewia balcanica and Aspius aspius*. We emphasize that the status of the genus *Romanogobio* is not fully clarified. The most recent studies (e.g. Schmid, 2023) indicate that an undescribed/unclarified species of the genus *Romanogobio* exists in the Olt River,

which requires further study. Genetically, this undescribed species is closely related to *R. kesslerii* and R. *carpathorossicus*, but also according to Schmid (2023) *R. carpathorossicus* has been identified in western rivers. Based on this information until further clarification we consider that *R. kesslerii* is present in the Olt River in our study area.

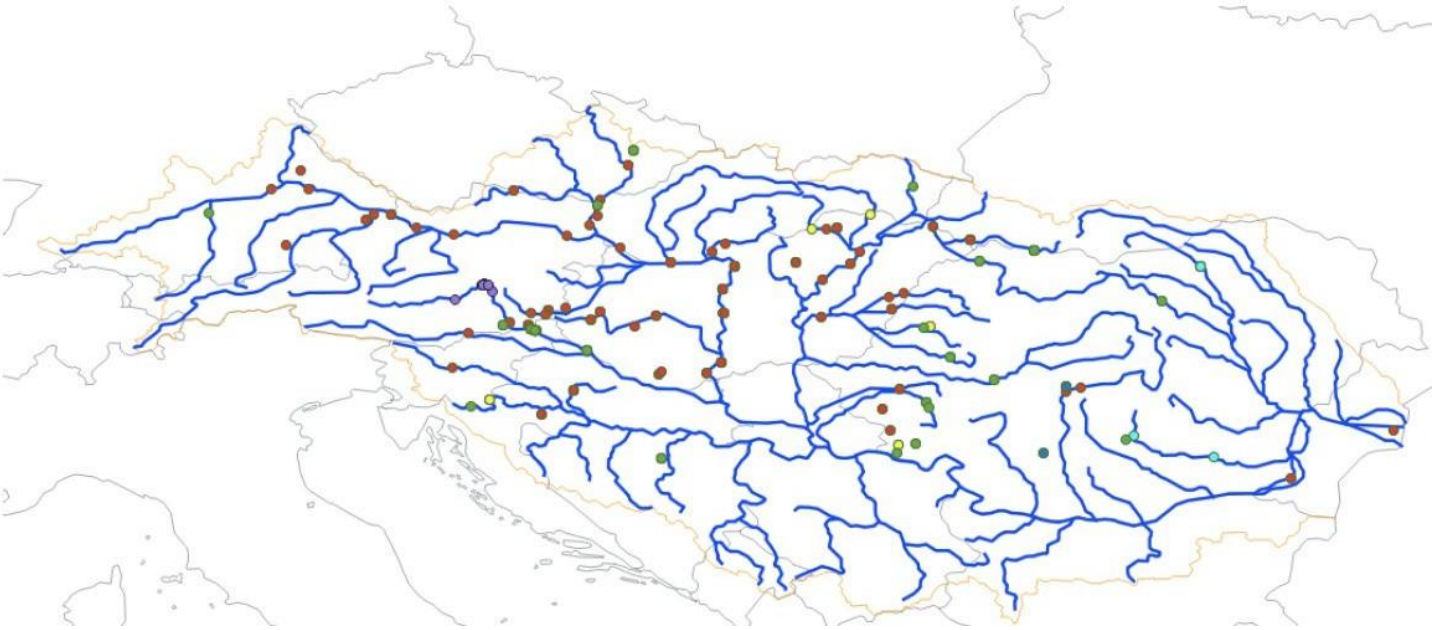


Figure 63 Distribution map of species of the genus Romanogobio after Schmid (2023): light blue: R. kesslerii, dark blue: Romanogobio sp. Olt, green: R. uranoscopus, yellow: R. carpathorossicus, red: R. vladykovi, purple: R. Skywalkeri

2.1. Number of specimens identified at inventory stations

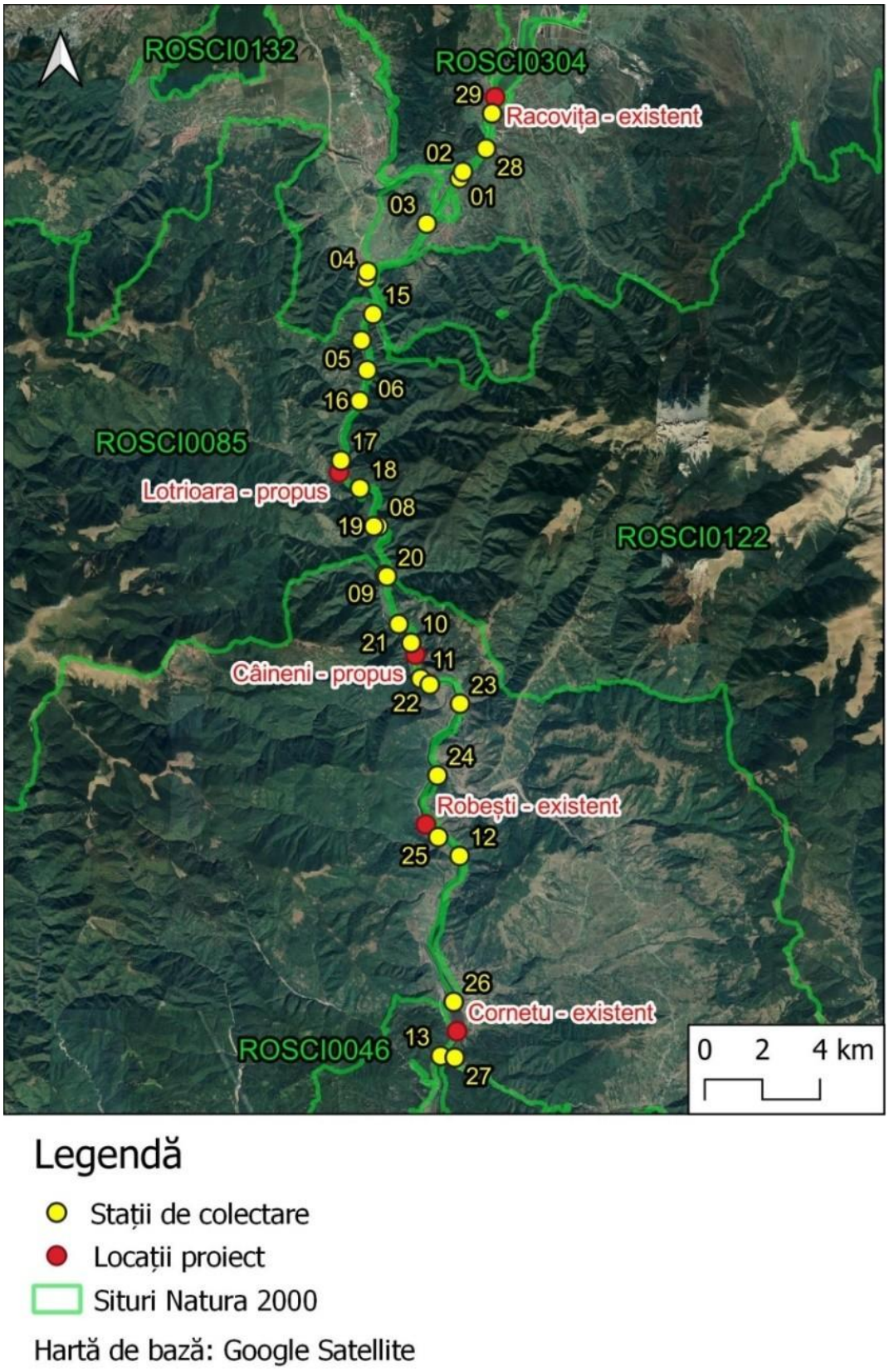


Figure 64 Inventory stations studied

Table no. 74 Fish species and their numbers identified at the stations surveyed (species of Community interest are bolded, stations marked with .01, .02, .03 are repeats)

Station name/ Species name*	01	01.2	02	02.2	03	03.2	03.3	04	04.1	05	06	07	07.1	08	08.1	09	09.1	10	10.1	11	11.1	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Salmo trutta														1											2	9	3	5	30	26	6	3	4		1				
Barbatula barbatula						1	2																										3				70	
Phoxinus phoxinus																																	7				45	
Barbus petenyi	**8**	**4**	**18**	**9**	**7**	**48**	**47**	**14**	**9**		**4**	**17**	**13**	**36**	**71**		**45**	**32**	**25**	**36**	**39**	**1**	**3**		**12**		**12**	**35**	**3**	**4**	**2**	**18**		**3**	**3**	**8**	**310**	**410**	
Rhodeus amarus			**7**		**1**						**26**				**2**					**1**		**1**																**8**
Perch fluviatilis			1																																			1
Lepomis gibbosus			2		5						2				3			4	5	1	3																	4
Pseudorasbora parva		3	1	6	7				2						2				2		5		9															1
Blicca bjoerkna			8	1																			68															
Scardinius erythrophthalmus			2																																			
Squalius cephalus		6	25	57	50	11	9	42	38	6	36	42	14	2	39	33	20	12	60	4	12	9	2										8		20	99	490	2
Leuciscus leuciscus									3		11																										1	
Chondrostoma nasus					36	35	7	4	44		22			22	4		18	31	6			13	60										95					
Alburnoides bipunctatus					12	8	15	43	2	2		60	4	280	236	63	25	74	11	3	32							2					3				25	
Alburnus alburnus					21	38	34	2	4	35	8	35	2	4		25	23	1	18		31	12	16										36		62			35
Romanogobio kesslerii												**8**																										
Romanogobio vladykovi						**2**	**1**					**2**				**1**	**2**		**1**																		**2**
Romanogobio uranoscopus							**2**													**3**	**10**																
Gobio gobio complex					4														1				1													45	
Babka gymnotrachelus	11	31		8	2	24	14	4	43		8	7	60	4	19	5	22	6	28	13	36	7	21											5			2
Sabanejewia balcanica							***1***									***1***	***1***																				
Sabanejewia romanica																																				38	3	
Carassius gibellio		47		96	20	7	3		14		143			11	83			19	101		43	58	74											54			59
Rutilus rutilus		1		4			2		5		30		7	6	7		20		10		7	66	3														8
Leucaspius delineatus																							3														
Aspius aspius				**1**							**2**						**1**	**1**				**4**															
Barbus barbus		X				X	X							X	X		X	X	X		X																
Silurus glanis				1									1		3			1																			
Tin Tin				2																																	
Cyprinus carpio											1																										
Sander pikeperch															1																						

*Bold indicates identified species of Community interest.

The inventory was carried out within the Natura 2000 site ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu with a few exceptions. Three stations were carried out at the site boundary on tributaries (22, 24, 26), in order to study species that might ascend from the Olt river, and two stations downstream of the site (13, 27), practically downstream of the existing Cornetu dam. The 5 stations were not positioned on the surface of another site.

It was considered very important to repeat the inventory at certain inventory stations of major interest for this project. The following stations have been repeated: 01, 02, 03, 04, 08, 09, 10, 11. The distance between repeats was at least 1 month, maximum 1.5 months. Thanks to the very short interval for the field period and the very high fluctuation of the water level during the day a repetition of an inventory station at a different time and at a different flow can yield new ichthyofaunal data.

Below you can follow the differences in the species identified and the number of individuals present in the 2/3 inventories. It should be noted that the presence of *Barbus barbus* was identified from the catches of recreational anglers or from the information of recreational anglers during the repetitions at the following inventory stations: 01.2, 03.2, 03.3, 09.2, 11.2. In the case of the other inventory stations the species was documented at the first inventory.

Table 75 First and second inventory data (for station 03 3 repetitions were performed)

Station name / Species name*	**01**	**01.2**	**02**	**02.2**	**03**	**03.2**	**03.3**	**0.4**	**04.1**	**07**	**07.1**	**08**	**08.1**	**09**	**09.1**	**10**	**10.1**	**11**	**11.1**
Salmo trutta												1							
Barbatula barbatula						1	2												
Barbus petenyi	**8**	**4**	**18**	**9**	**7**	**48**	**47**	**14**	**9**	**17**	**13**	**36**	**71**		**45**	**32**	**25**	**36**	**39**
Rhodeus amarus			**7**		**1**								**2**					**1**	
Perch fluviatilis			1																
Lepomis gibbosus			2		5								3			4	5	1	3
Pseudorasbora parva		3	1	6	7				2				2				2		5
Blicca bjoerkna			8	1															
Scardinius erythrophthalmus			2																
Squalius cephalus		6	25	57	50	11	9	42	38	42	14	2	39	33	20	12	60	4	12
Leuciscus leuciscus									3										
Chondrostoma nasus					36	35	7	4	44			22	4		18	31	6		
Alburnoides bipunctatus					12	8	15	43	2	60	4	280	236	63	25	74	11	3	32
Alburnus alburnus					21	38	34	2	4	35	2	4		25	23	1	18		31
Romanogobio kesslerii										**8**									
Romanogobio vladykovi						**2**	**1**			**2**				**1**	**2**		**1**		
Romanogobio uranoscopus							**2**											**3**	**10**
Gobio gobio complex					4												1		
Babka gymnotrachelus	11	31		8	2	24	14	4	43	7	60	4	19	5	22	6	28	13	36
Sabanejewia balcanica							**1**							**1**	**1**				
Sabanejewia romanica																			
Carassius gibellio		47		96	20	7	3		14			11	83			19	101		43
Rutilus rutilus		1		4			2		5		7	6	7		20		10		7
Leucaspius delineatus																			
Aspius aspius				**1**											**1**	**1**			
Silurus glanis				1							1		3			1			
Tin Tin				2															
Cyprinus carpio																			
Sander pikeperch													1						

* in bold the identified species of Community interest

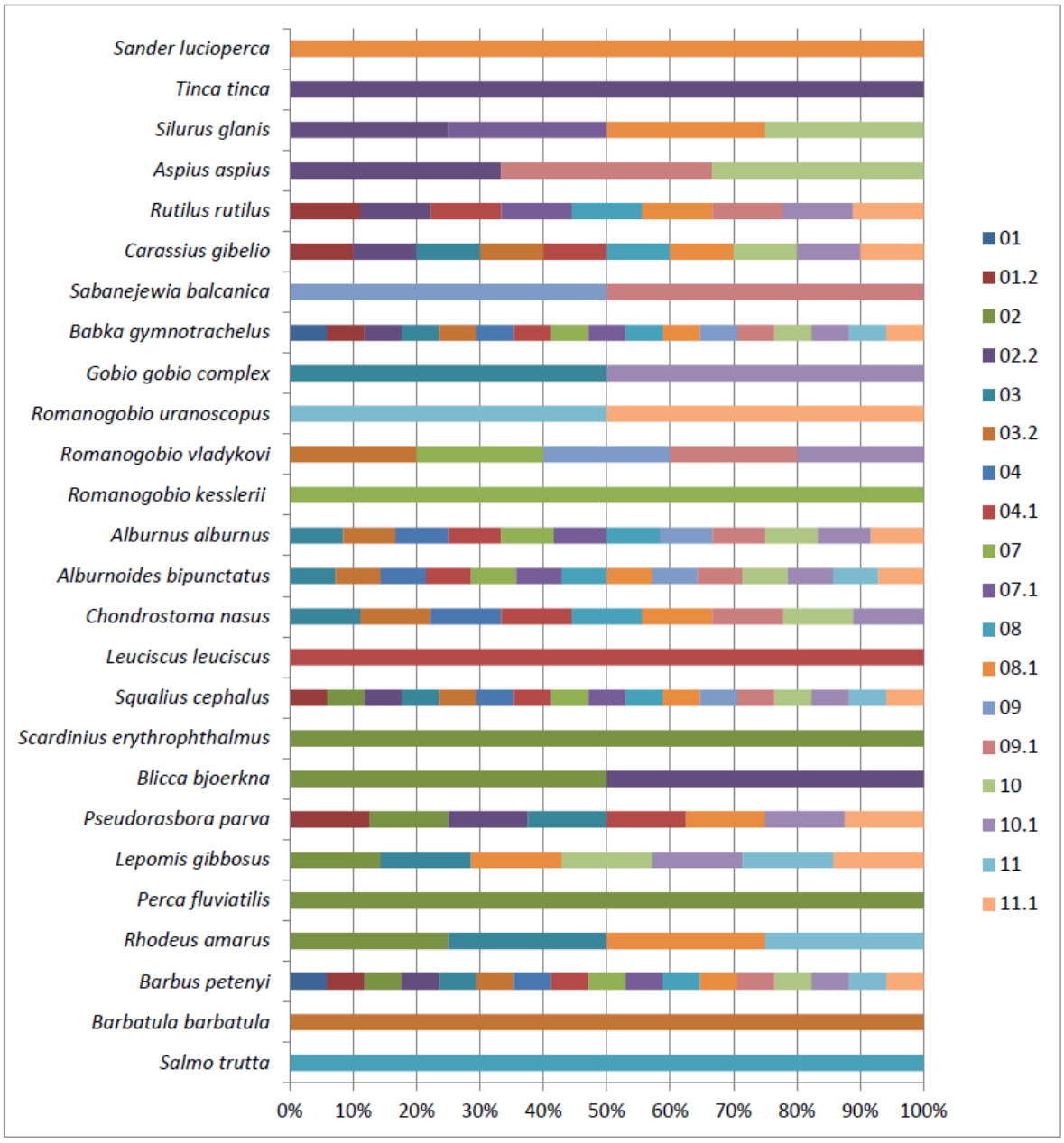


Figure 65 Frequency of fish species in repeated surveys

We can observe that 8 (the species that are visualized with a single color) of the 26 identified species were detected either in the first or in the second inventory (not counting the repetition with the 3rd one in the case of station 03. It should be added that 2 additional species of Community interest were identified during the repetition of the stations compared to the first inventory.

In the case of station 03 3 replicates were carried out, and below you can visualize the species frequencies for the 3 replicates. It can be seen that there are 3 species that were identified only in the first survey, no species were identified only in the second survey, and there are 3 species, including 2 species of community interest, that were identified only in the third survey.

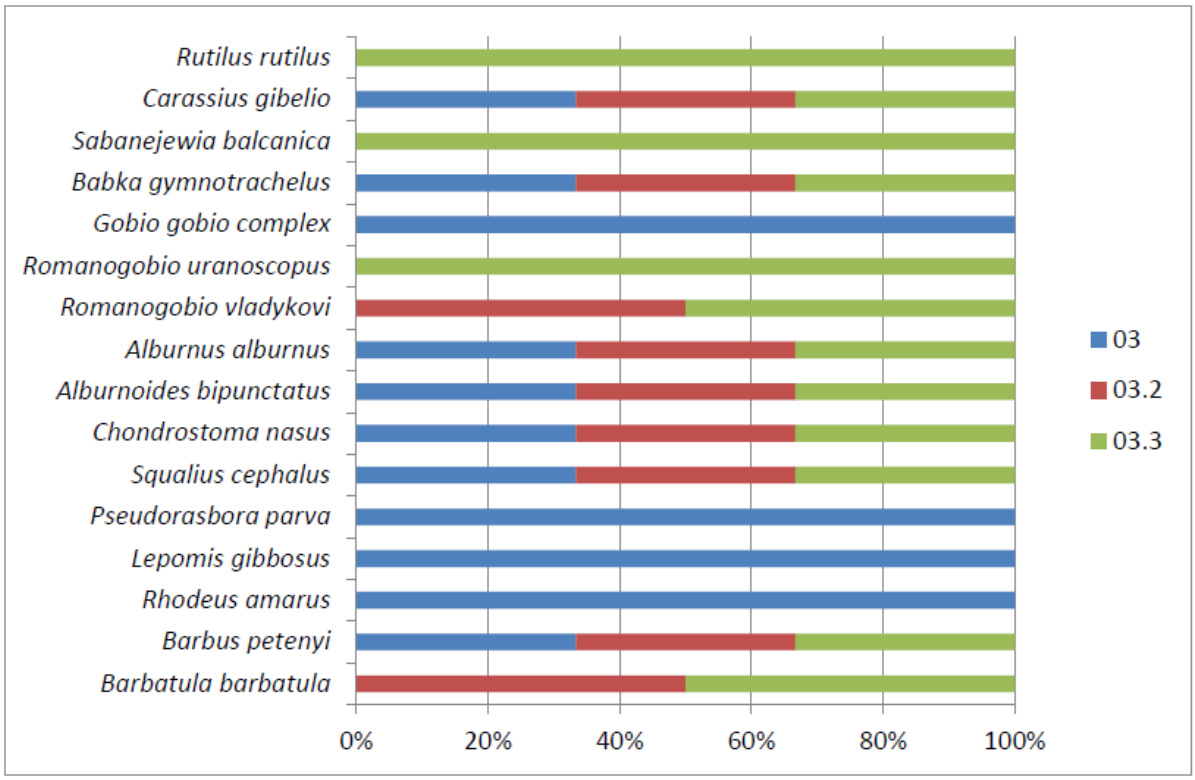


Figure 66 Frequency of fish species in repeated surveys at station 03

2.2. Age categories of species identified at the inventory stations

Table 76 Age categories at inventory stations (stations 01-15)

Station name	01			02			03			04			05			06			07			08			09			10			11			12			13			14			15		
Species name / No. specimens	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**
Salmo trutta																						1		1																		2	0	2
Barbatula barbatula																																											
Phoxinus phoxinus																																											
Barbus petenyi	**8**	**5**	**3**	**18**	**11**	**7**	**7**	**7**	**0**	**14**	**9**	**5**				**4**	**4**		**17**	**5**	**12**	**36**	**12**	**24**				**32**	**17**	**15**	**36**	**15**	**21**	**1**	**1**		**3**	**2**	**1**				**12**	**7**	**5**
Rhodeus amarus				**7**	**1**	**6**	**1**	**0**	**1**							**26**	**5**	**21**													**1**	**0**	**1**	**1**		**1**								
Perch fluviatilis				1	0	1																																					
Lepomis gibbosus				2	0	2	5	0	5							2		2										4		4	1	0	1											
Pseudorasbora parva				1	0	1	7	7	0							6		6																			9	5	4						
Blicca bjoerkna				8	0	8																															68	41	27						
Scardinius erythrophthalmus				2	2	0																																					
Squalius cephalus				25	7	18	50	24	26	42	11	31	6	5	1	36	26		42	27	15	2	1	1	33	30	3	12	7	5	4	4	0	9	4	5	2	1	1						
Leuciscus leuciscus																11	11																											
Chondrostoma nasus							36	27	9	4	2	2				22	22					22	22					31	27	4				13	13		60	60							
Alburnoides bipunctatus							12	5	7	43	24	19	2	0	2				60	10	50	280	67	213	63	0	63	74	44	30	3	0	3											
Alburnus alburnus							21	11	10	2	2	0	35	10	25	8	5	3	35	15	20	4	3	1	25	0	25	1		1				12		12	16	16						

Romanogobio kesslerii																			**8**	**0**	**8**																								
Romanogobio vladykovi																			**2**	**0**	**2**				**1**	**0**	**1**																		
Romanogobio uranoscopus																															**3**	**0**	**3**												
Gobio gobio complex							4	0	4																												1		1						
Babka gymnotrachelus	11	6	5				2	2	0	4	0	4				8		8	7		7	4	3	1	5	0	5	6	5	1	13	3	10	7	4	3	21	21							
Sabanejewia balcanica																									**1**	**0**	**1**																		
Sabanejewia romanica																																													
Carassius gibellio							20	20	0							143	16	137				11	11					19	14	5				58	56	2	74	69	5						
Rutilus rutilus																30	27	3				6	6											66	66		3	3							
Leucaspius delineatus																																					3	3							
Aspius aspius																**2**	**2**											**1**	**1**					**4**	**4**										
Silurus glanis																												1	1																
Tin Tin																																													
Cyprinus carpio																1	1																												
Sander pikeperch																																													

Table 77 Age categories at the inventory stations (stations 16-29)

Station name	16			17			18			19			20			21			22			23			24			25			26			27			28			29		
Species name / No. specimens	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**
Salmo trutta	9	2	7	3	1	2	5	0	5	30	16	14	26	4	22	6	6	0	3	0	3	4	4	0				1	1	0												
Barbatula barbatula																									3	1	2										70	20	50			
Phoxinus phoxinus																									7	5	2										45	20	25			
Barbus petenyi				**12**	**7**	**5**	**35**	**0**	**35**	**3**	**0**	**3**	**4**	**0**	**4**	**2**	**0**	**2**	**18**	**4**	**14**				**3**	**2**	**1**	**3**	**2**	**1**	**8**	**7**	**1**	**310**	**265**	**45**	**410**	**130**	**280**			
Rhodeus amarus																																							**8**	**3**	**5**
Perch fluviatilis																																							1		1
Lepomis gibbosus																																							4		4
Pseudorasbora parva																																							1		1
Blicca bjoerkna																																									
Scardinius erythrophthalmus																																									
Squalius cephalus																									8	3	5				20	20	0	99	72	27	490	280	210	2	2	
Leuciscus leuciscus																																					1	1	0			
Chondrostoma nasus																									95	94	1															
Alburnoides bipunctatus							2	1	1																3	2	1										25	10	15			
Alburnus alburnus																									36	3	33				62	0	62							37		37
Romanogobio kesslerii																																									
Romanogobio vladykovi																																							**2**		**2**
Romanogobio uranoscopus																																									
Gobio gobio complex																																					45	15	30			
Babka gymnotrachelus																															5	4	1							2		2
Sabanejewia balcanica																																									
Sabanejewia romanica																																		38	12	26	3	1	2			
Carassius gibellio																															54	54	0							59	59	
Rutilus rutilus																																								8	7	1
Leucaspius delineatus																																									
Aspius aspius																																									
Silurus glanis																																									
Tinca tinca																																									
Cyprinus carpio																																									
Sander lucioperca																																									

Table 78 Comparison of age categories at stations where the inventory was repeated at least once

Station name	01.2			02.2			03.2			03.3			04.1			07.1			08.1			09.1			10.1			11.1		
Species name / No. specimens	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**	**Total**	**Juv.**	**Ad.**
Barbatula barbatula							1	1		2		2																		
Barbus petenyi	**4**	**1**	**3**	**9**	**6**	**3**	**48**	**48**		**47**	**21**	**26**	**9**	**9**		**13**	**13**		**71**	**58**	**13**	**45**	**32**	**13**	**25**	**12**	**13**	**39**	**34**	**5**
Rhodeus amarus																			**2**		**2**									
Lepomis gibbosus																			3		3				5		5	3		3
Pseudorasbora parva	3	3		6	6								2		2				2		2				2		2	5		5
Blicca bjoerkna				1	1																									
Squalius cephalus	6	6		57	49	8	11	1	10	9	2	7	38	37	1	14	14		39	32	7	20	20		60	35	25	12	12	
Leuciscus leuciscus													3	3																
Chondrostoma nasus							35	35		7	3	4	44	44					4	4		18	18		6	5	1			
Alburnoides bipunctatus							8	8		15	12	3	2		2	4		4	236	31	205	25		25	11	5	6	32	5	27
Alburnus alburnus							38	25	13	34	9	25	4		4	2	2					23	4	19	18	15	3	31	8	23
Romanogobio kesslerii																														
Romanogobio vladykovi							**2**		**2**	**1**		**1**										**2**		**2**	**1**		**1**			
Romanogobio uranoscopus										**2**		**2**																**10**		**10**
Gobio gobio complex																									1		1			
Babka gymnotrachelus	31	13	18	8	5	3	24	21	3	14	10	4	43	7	36	60	17	43	19	4	15	22	3	19	28	9	19	36	9	27
Sabanejewia balcanica										**1**		**1**										**1**		**1**						
Carassius gibellio	47	41	6	96	60	36	7	7		3	1	2	14	3	11				83	11	72				101	14	87	43	6	37
Rutilus rutilus	1	1		4	3	1				2	2		5	5		7	7		7	7		20	15	5	10	10		7	7	
Aspius aspius				**1**	**1**																	**1**	**1**							
Silurus glanis				1		1										1	1		3		3									
Tin Tin				2		2																								
Sander pikeperch																			1	1										

2.3. Density of species identified at the inventory stations

Table 79 Density of species at the inventory stations in the first assessment card (please note that in the first version of the study the densities were wrongly calculated, please take into account only the densities presented below)

Station name / Species name	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
Salmo trutta								0.1							0.7	3	1.2	1.4	8.6	7.4	3	1	1.3		0.4				
Barbatula barbatula																								0.7				16	
Phoxinus phoxinus																								1.6				10	
Barbus petenyi	**1**	**2.6**	**1.3**	**3.1**		**0.5**	**2.1**	**4.5**		**5.3**	**4.5**	**0.2**	**0.6**	**0**	**4**	**0**	**4.8**	**10**	**0.9**	**1.1**	**1**	**6**		**0.7**	**1.2**	**3.2**	**89**	**91**	
Rhodeus amarus		**1**	**0.2**			**3.3**					**0.1**	**0.2**																	**4**
Perch fluviatilis		0.1																											0.5
Lepomis gibbosus		0.3	0.9			0.3				0.7	0.1																		2
Pseudorasbora parva		0.1	1.3			0.8							1.8																0.5
Blicca bjoerkna		1.1											14																
Scardinius erythrophthalmus		0.3											0																
Squalius cephalus		3.6	9.1	9.3	1	4.5	5.3	0.3	4.1	2	0.5	1.8	0.4											1.8		8	28	109	1
Leuciscus leuciscus						1.4																						0.2	
Chondrostoma nasus			6.5	0.9	0	2.8	0	2.8	0	5.2	0	2.6	12											21					
Alburnoides bipunctatus			2.2	9.6	0.3	0	7.5	35	7.9	12	0.4							0.6						0.7				5.6	
Alburnus alburnus			3.8	0.4	5.8	1	4.4	0.5	3.1	0.2		2.4	3.2											8		25			19
Romanogobio kesslerii							**1**																						
Romanogobio vladykovi							**0.3**		**0.1**																				**1**
Romanogobio uranoscopus											**0.4**																		
Gobio gobio complex			0.7										0.2															10	
Babka gymnotrachelus	1.4		0.4	0.9		1	0.9	0.5	0.6	1	1.6	1.4	4.2													2			1
Sabanejewia balcanica									**0.1**																				
Sabanejewia romanica																											11	0.7	
Carassius gibellio			3.6			18		1.4		3.2		12	15													22			30
Rutilus rutilus						3.8		0.8				13	0.6																4
Leucaspius delineatus													0.6																
Aspius aspius						**0.3**				**0.2**		**0.8**																	
Silurus glanis										0.2																			
Tin Tin Tin																													
Cyprinus carpio						0.1																							

Table 80 Species density at those inventory stations that were repeated

Station name / Species name	**01.2**	**02.2**	**03.2**	**03.3**	**04.2**	**07.2**	**08.2**	**09.2**	**10.2**	**11.2**
Barbatula barbatula			0.1							
Phoxinus phoxinus			0							
Barbus petenyi	0.5	1.5	6.9	2	1.8	2.4	14	6.4	3.6	6
Rhodeus amarus				**0.3**			**0.4**			
Lepomis gibbosus				1.4			0.6		0.7	0.5
Pseudorasbora parva	0.4	1		2	0.4		0.4		0.3	0.8
Blicca bjoerkna		0.2								
Squalius cephalus	0.8	9.5	1.6	14	7.6	2.5	7.8	2.9	8.6	1.8
Leuciscus leuciscus					0.6					
Chondrostoma nasus			5	10	8.8		0.8	2.6	0.9	
Alburnoides bipunctatus			1.1	3.4	0.4	0.7	47	3.6	1.6	4.9
Alburnus alburnus			5.4	6	0.8	0.4		3.3	2.6	4.8
Romanogobio vladykovi			***0.3***					***0.3***	***0.1***	
Romanogobio uranoscopus										***1.5***
Gobio gobio complex				1.1					0.1	
Babka gymnotrachelus	3.9	1.3	3.4	0.6	8.6	11	3.8	3.1	4	5.5
Sabanejewia balcanica								**0.1**		
Carassius gibellio	5.9	16	1	5.7	2.8		17		14	6.6
Rutilus rutilus	0.1	0.7			1	1.3	1.4	2.9	1.4	1.1
Aspius aspius		**0.2**						**0.1**		
Silurus glanis		0.2				0.2	0.6			
Tin Tin Tin		0.3								
Sander pikeperch							0.2			

2.4. Inventory stations overlapping with expropriation corridors

Overlapping inventory stations with these expropriated areas for the 3 dams.

1. CHE Racovița:

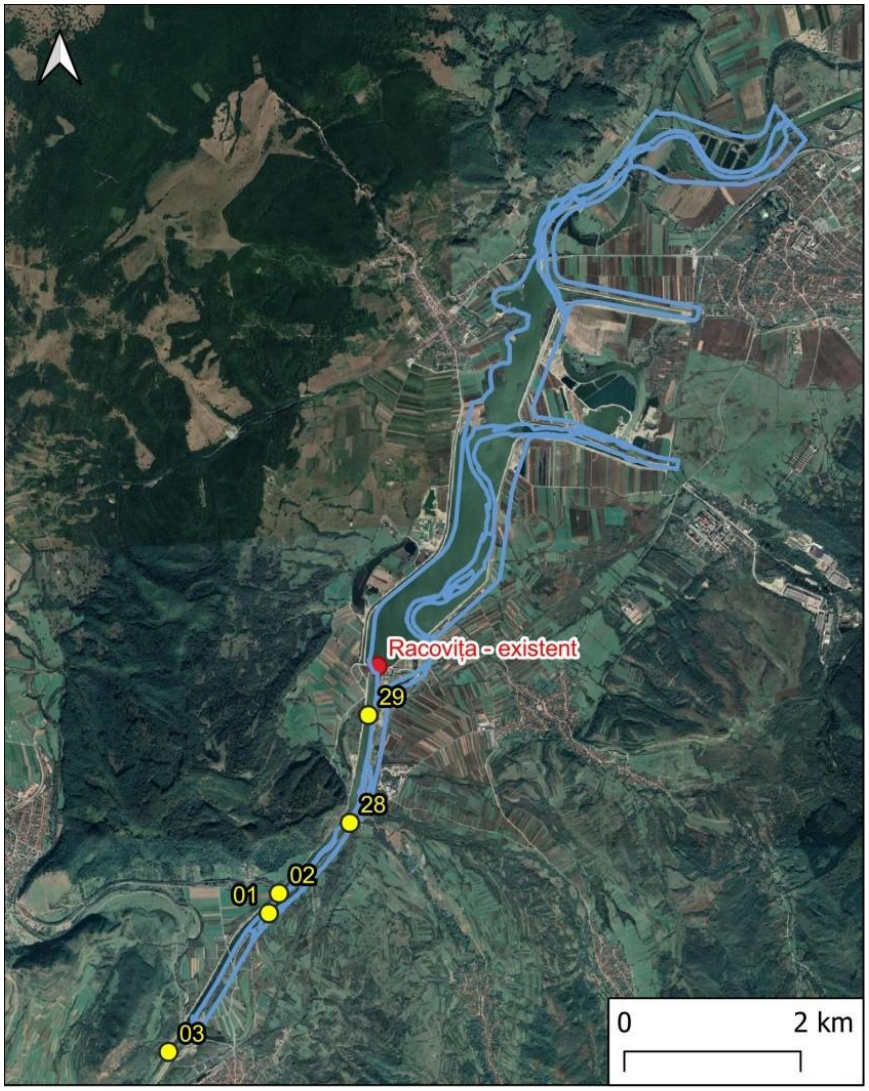


Figure 67 Stations located on the expropriation corridor CHE Racovița

Stations carried out: 01, 01.2, 02, 02.2, 03, 03.2, 03.2, 03.2, 28 and 29 immediately downstream of this area. It should be noted that in this case we had activity only downstream of CHE Racoviță. Station No. 03 is also important, because it is immediately downstream and the effects of the dam reach this station, and species that prefer faster water sections at certain times of the year can move upstream towards the Sebeș River, respectively they can use the fish ladder that is located at the confluence of the Olt River with the Sebeș River. Station no. 03 was surveyed 3 times, in total we surveyed 9 stations to inventory fish species.

Species of Community interest identified at stations: 01, 01.2, 02, 02.2, 03, 03.2, 03.2, 28 and 29: *Barbus petenyi, Rhodeus amarus, Romanogobio vladykovi, Romanogobio uranoscopus, Sabanejewia balcanica, Aspius aspius.*

2. CHE Lotrioara:

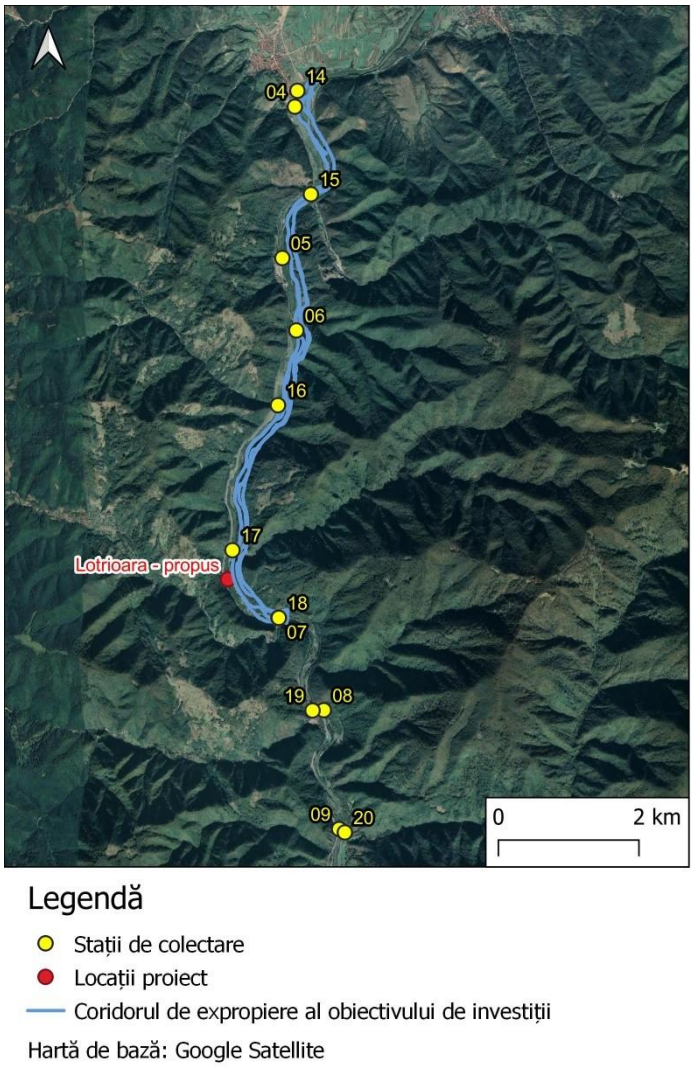


Figure 68 Stations located on the expropriation corridor CHE Lotrioara

Stations made: 04, 04.2, 05, 06, 07, 07.2, 08, 08.2, 09, 09.2, 14, 15, 16, 17, 18 19, 20.

We emphasize that the area expropriated for the Racovița CHE ends about 3 km upstream of this area, so theoretically species that prefer faster flowing water sections will only have habitat for a very short section. Similarly, the expropriated area for the CHE Câineni downstream of this area already starts about 1.7 km. We believe that a large part of the aquatic fauna will suffer from this and invasive species will be very successful in spreading.

Species of Community interest identified at stations 04, 04.2, 05, 06, 07, 07.2,08, 08.2, 09, 09.2, 14, 15, 16, 17, 18 19, 20: *Barbus petenyi, Rhodeus amarus, Romanogobio kesslerii, Romanogobio vladykovi, Sabanejewia balcanica, Aspius aspius.*

3. CHE Câineni:

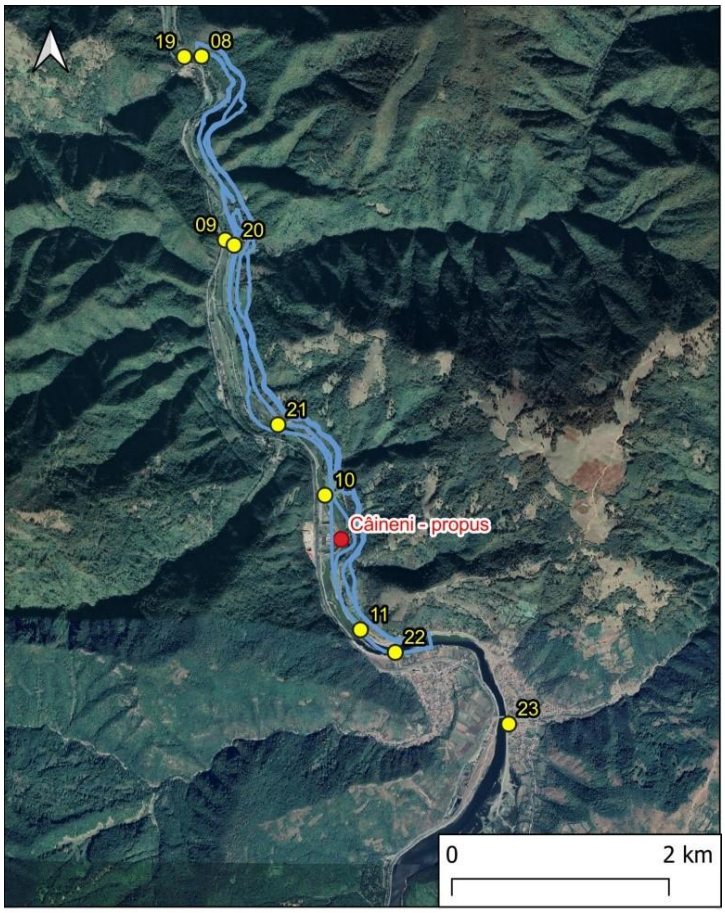


Figure 69 Stations located on the expropriation corridor CHE Câineni

Stations made: 08, 08.2, 09, 09.2, 10, 10.2, 11, 11.2, 19, 20, 21, 22. Immediately downstream of this area begins the lentic section of the Robești dam, and downstream of CHE Robești begins the lentic section of the Cornetu dam. Perhaps a few hundred meters of lotic section will remain downstream of CHE Câineni. What is certain is that downstream of the proposed Câineni reservoir, a very long section will no longer be present downstream of the proposed CHE Câineni, where fish species that prefer faster-flowing water will no longer be present.

Species of Community Interest identified at stations 08, 08.2, 09, 09.2, 10, 10.2, 11, 11.2, 19, 20, 21, 22: *Barbus petenyi, Rhodeus amarus, Romanogobio vladykovi, Romanogobio uranoscopus, Aspius aspius, Sabanejewia balcanica.*

Table 81 Summary table on the presence of species of community interest on the expropriation corridors of the investment objectives, with the mention that in the case of CHE Racovița the inventory was carried out only downstream of the dam:

Species	CHE Racovița	CHE Lotrioara	CHE Caineni
Barbus petenyi			
Rhodeus amarus			
Romanogobio kesslerii			
Romanogobio vladykovi			
Romanogobio uranoscopus			
Sabanejewia balcanica			
Aspius aspius			

2.5. Presentation of fish species of Community interest with a description of the habitats of the species in the project area

- ***Barbus petenyi - common moorhen***

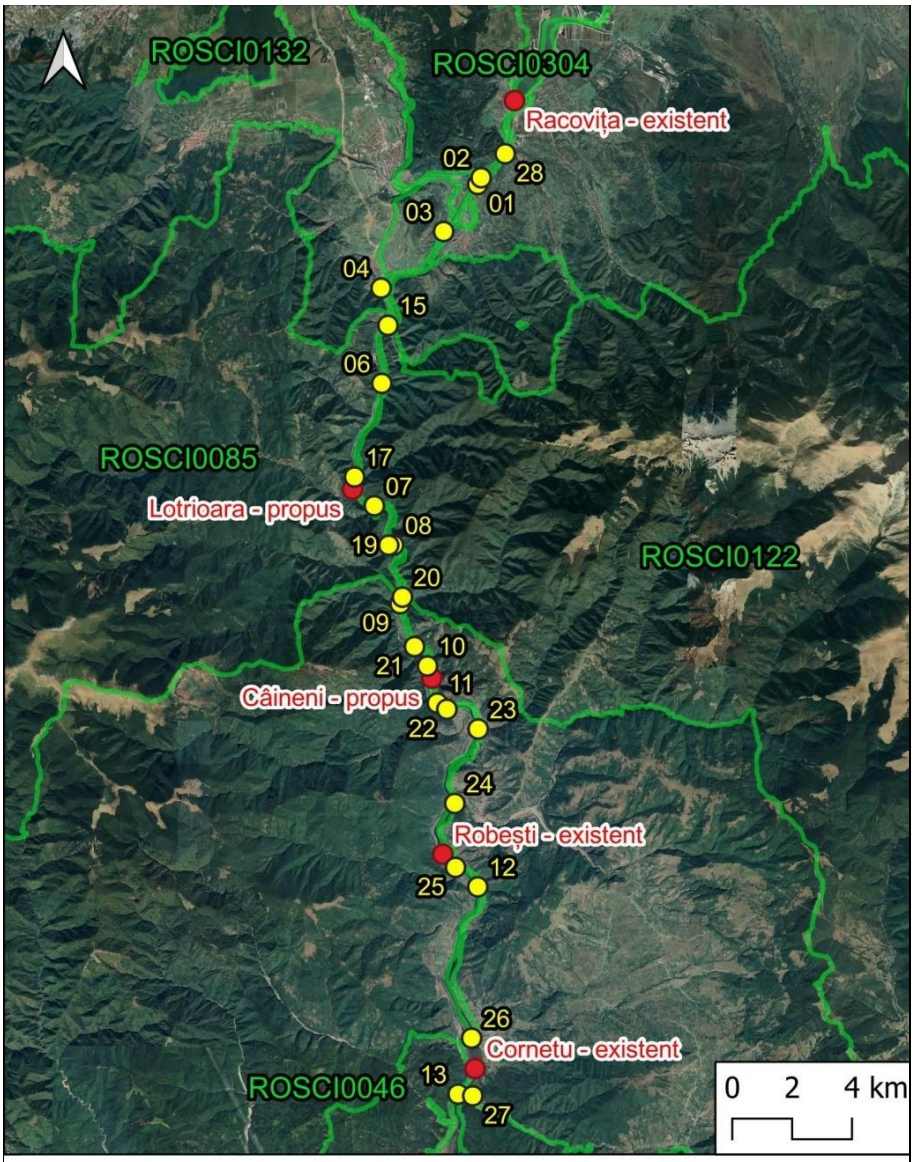
No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 12559, Natura 2000 code - 5266
2	Scientific name	Barbus petenyi (Heckel, 1852) 50 years ago the species was treated as a subspecies (Barbus meridionalis petenyi), the species being Barbus meridionalis Risso, 1826 (Bănărescu 1964). Some literature sources have treated the species as a subspecies (Barbus peloponessius petenyi) of Barbus peloponnesius Valenciennes, 1842 (Karakousis et al. 1993, 1995). In recent years the species has been definitively described as Barbus petenyi, in fact redescribed by its original name given by Heckel in 1852 (Tsigenopoulos et al. 1999, Tsigenopoulos and Berrebi 2000, Machordom and Doadrio 2001, Kotlík P. et al. 2002).

No	Information/Attribute	Description
3	Popular name	English: mreană vânătă, moioagă, breană de râu (Severin), brană de vale (Făgăraș), cârcușă (along the Prigor stream), cheștealcă (Putna), crăcușa (Orșova), jamlă (Sibiu), jamnă (Argeș, Olt), jeamna (Sibiu), jemnugă (Strei), jiblă/jimblă (Făgăraș and Buzău), jimugă and jimură (Jil), jumugă (Jil), mireană porcească (Bihor), moioacă (Cerna, Eșelnița and Prigor), moiță (Cerna, Timiș), mreană and mreană de Ilfov (Dâmbovița), mreană neagră and mreană răpănoasă (Siret), porcini (Moldavia), roasted mash (Suceava), sand trout (Pecineașca Herculane), and chard (Uz, Trotuș, Doftana). Hungarian: Petényi márna, zsemle, zsemlemárna, bartafiú, semlehal, zsemlénk, zsemling, zsömehal English: Spotted barbel, Romanian barbel, Petenyi's barbell (Bănărescu 1964, Gyurkó 1973, Pintér 2002, Kottelat 2007)
6	Critical periods	Breeding takes place in spring, sometimes lasting until late summer (Bănărescu 1964).
7	Habitat requirements	The species lives exclusively in rivers and streams in the mountain and upper hilly region. In most rivers flowing from the uplands or hills, it is absent even in their upper reaches, which are rapid. It inhabits both stony, fast and cold rivers and some muddier streams, which warm strongly in summer, but only in the mountains. It shows a particular preference for stretches with strong currents and stony bottoms. The bruised moray eel is also found in the scobar area (Chondrostoma nasus), where seasonal temperature fluctuations are greater than in the bruised moray eel and lipan (upstream of the scobar area) and the oxygen content is more moderate (Bănărescu 1964). Habitat of the species in the study area: the most widespread species, it was present at 24 out of 29 inventory stations (with 39 replicates). Most lotic habitats are suitable for the species in our study area. Given that the species requires stony bottoms and strong current, we consider that the alteration of lotic habitats to lentic habitats in the study area will impact the species. The habitat area of the species can be determined based on the water area delineated by the inventory stations.

No	Information/Attribute	Description
8	Photos	Photo 53 Adult specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	Barbus petenyi (Heckel, 1852) Eunis code - 12559, Natura 2000 code - 5266
2	Specific information species	In the study area the species was identified at the following stations: 01, 01.2, 02, 02.2, 03, 03.2, 03.3, 04, 04.3, 07, 07.2, 08, 08.2, 09.2, 10, 10.2, 11, 11.2, 12, 13, 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28
3	Attendance status [temporary]	resident,
4	Attendance status [space]	widespread
5	Attendance status [management]	native,
6	Abundance	common,
7	Collection period field data	05-07.2024.
8	Species distribution [interpretation]	The species is present in almost all lotic habitats on the Olt River in the confluence area in tributaries. It rarely occurs also in slow areas, but it does not favor them. It is important that the species is able to move freely between lotic sections of the river and also move along the lower reaches of tributaries.

9	Species distribution [distribution map]	 Figure 70 Distribution map of the species (yellow: stations where species has been identified - see attached shape-file)

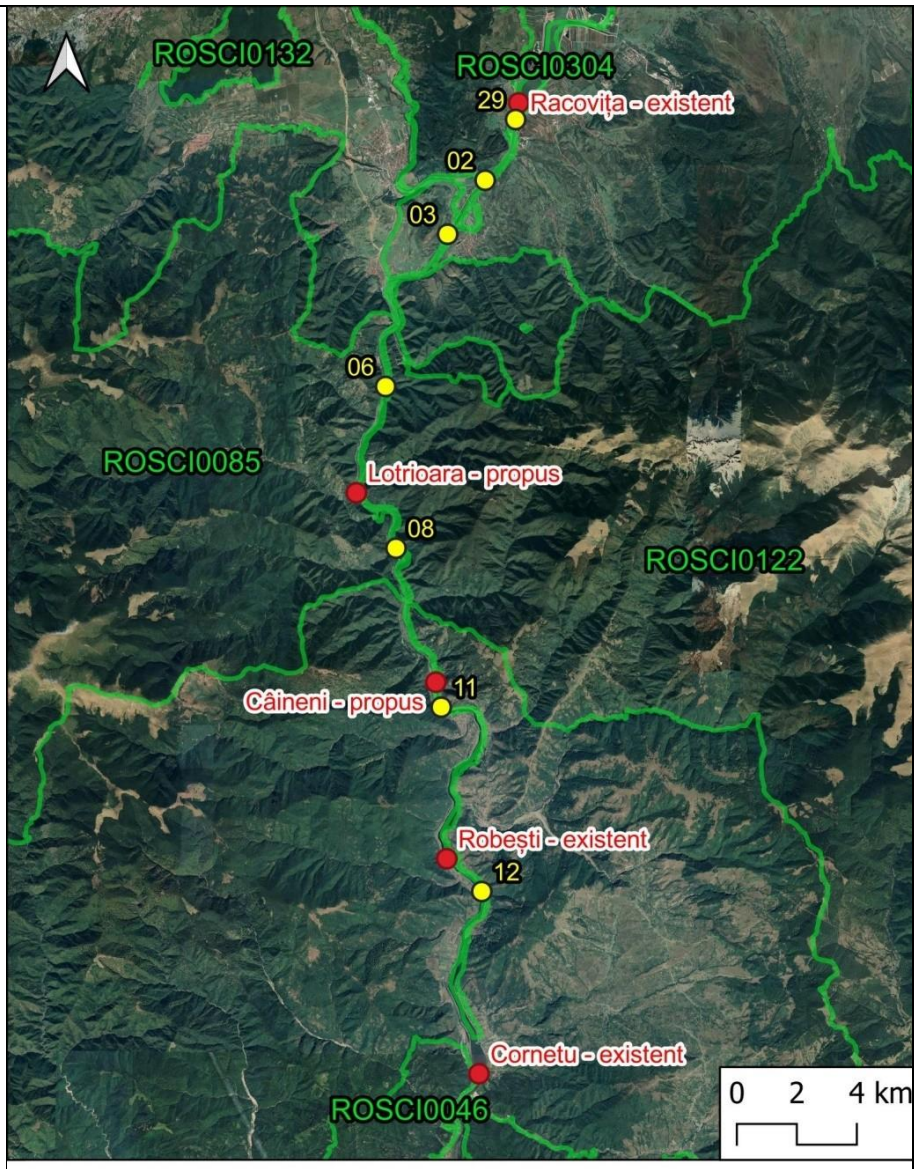
- ***<u>Rhodeus amarus</u>***

No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 581, Natura 2000 code - 5339
2	Scientific name	*Rhodeus amarus* (Bloch, 1782) Most of our authors (Bănărescu 1964, Nalbant 1995, Harka and Bănărescu 1999) used the name Rhodeus sericeus amarus (Bloch, 1782). More recently (Kottelat and Freyhof 2007) it is indicated to use the term Rhodeus amarus (Bloch, 1782).
3	Popular name	English: boarță, belghiță (Tecuci), beltiță, beschiță (Ilfov), blehariță (Bârlad), boarchiță (Snagov), borț, burticuță (Romanați), borțică (Vlașca), burta verde (Oltenia, Călărași, Filipoiu-Brăila, Snagov), burtică (Brăila), cărășoaică (Mehedinți), chișoagă (Ialomița, Vaslui), chizdorungă (Pașcani), chitic lat (Vaslui), chizdurcă (Jijia and Prut), halan (Sibiu), lătana, lătanca and lăteana (Tecuci), lătiță (Lugoș), mioarță (Teleorman), ocheană-săracă or pește-sărac (Bacău), țigăncii (Obilești, Ilfov), preuteasă (Ilfov, Gorj), proscheraș, proschiraș (Tighina), rânchiță (Snagov), roșioară (Dolj), sfei (Vaslui). Hungarian: szivárványos ökle English: European Bitterling (Bănărescu 1964, Gyurkó 1973, Kottelat and Freyhof 2007)
5	Species description	Widespread in Romania. Telcean & Bănărescu (2002) categorize it as a species that has maintained its range and abundance in recent years. External morphology: The body is tall and strongly compressed laterally. The dorsal and ventral profile is convex. The mouth is small, subterminal, semilunar, the opening reaching below the nostrils. The lips are thin and entire. The peduncle is short and laterally compressed. The dorsal edge is slightly convex. Pectoral short, rounded at the tip. Scales large, much higher than long, persistent. Short lateral line. Usually reaches between 30-60 mm long without tail and 38-72 mm total length. Maximum height is 78 mm. Color: The dorsal part of the body is grayish-yellowish, sometimes beating greenish, the flanks white, without metallic sheen, the dorsal and caudal grayish, the other fins beating red. Along the posterior half of the body and caudal peduncle a very conspicuous greenish stripe (Bănărescu 1964).
6	Critical periods	Breeding begins in late April and lasts until August. Spawning takes place in batches, with each female spawning several times during a season. The eggs are deposited in the gill cavity of lamellibranches of the genera Unio and Anodonta with the help of the ovipositor (Bănărescu 1964) or in other lamellibranched species.

No	Information/Attribute	Description
7	Habitat requirements	It prefers still or slow flowing water, that is why in rivers it is mostly found in the side branches, but it is also quite common in full current, up to near the mountainous part of the rivers, especially in Transylvania. It feeds on filamentous and unicellular algae, detritus and detritus of higher plants; incidentally it also ingests animal organisms (Bănărescu 1964). Its spread is related to the presence of Unio or Anodonta lamellibranches. Reproduction begins in late April and lasts until August. Breeding takes place in spawning clutches, with each female spawning several times during a season. The eggs are deposited in the gill cavity of Unio and Anodonta lamellibranches or other lamellibranch species by ovipositor. Other important habitat requirements: Presence of sections with still or slow flowing water Without the exploitation of mineral aggregates (sand, gravel, ballast, etc.) from minor albi No major sources of pollution No invasive species. Presence of lamellibranhiata (Unio or Anodonta) There should be no artificial obstructions, the river water should not be captured
8	Photos	 Photo nr. 54 Adult specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	Rhodeus amarus (Bloch, 1782) Eunis code - 581, Natura 2000 code - 5339
2	Specific information species	In the study area the species was identified at the following stations: 02, 03, 06, 08.2, 11, 12, 29.
3	Attendance status [temporary]	resident,
4	Attendance status [space]	isolated,
5	Attendance status [management]	native,
6	Abundance	rare (in habitats of major importance for this study)
7	Period of field data collection	05-07.2024.
8	Species distribution [interpretation]	The species has been identified at 7 stations on the Olt River, downstream of CHE Racovița and immediately downstream of the proposed CHE Lotrioara investments and CHE Câineni.

9	Species distribution [distribution map]	 Figure 71 Distribution map of the species (yellow: stations at which species has been identified - see attached shape-file)

- ***Romanogobio kesslerii - petroc***

No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis Code - 314274, Natura 2000 Code - 6143
2	Scientific name	Romanogobio kesslerii (Dybowski, 1862) (Eunis Code - 314274, Natura 2000 Code - 6143) For this species the names Gobio kessleri (Dybowski, 1862) and Gobio kessleri kessleri (Dybowski, 1862) have been used in particular (Harka and Bănărescu 1999, Nalbant 1995, Bănărescu et al. 1999). More recently, Kottelat and Freyhof (2007) consider the term Romanogobio kesslerii (Dybowski, 1862).
3	Popular name	Romanian: porcușor de nisip Hungarian: homoki küllő English: Sand gudgeon (Bănărescu 1964, Kottelat and Freyhof 2007)
5	Species description	The species is fairly widespread in Romania. In recent years it has disappeared from Arieș and probably from Milcov, and in Târnava Mare, Mureș, Argeș and Suceava it has greatly reduced its numbers (Bănărescu 2005). Telcean & Bănărescu (2002) categorize it as a species that has reduced its range in recent years or has shown a decline in numbers. External morphology: Body short and thick, relatively tall and weakly laterally compressed. Caudal peduncle thick and cylindrical, its thickness generally greater than the minimum height. Dorsal slice slightly concave. The caudal deeply hollowed (Bănărescu 1964). Coloring: Upper body greenish grayish or yellowish, head grayish gray with darker spots and streaks. On the flanks 7-9 (rarely 6- 6- 11) dark grayish spots with silvery sheen, which are generally short. On the lateral line scales are two small black spots, more conspicuous than in other species of the genus. On the dors dorsal and caudal radii there are 2 rows each of small, very pale, black spots (Bănărescu 1964). Sexual dimorphism is weakly marked. It can be confused with the other three species of the same family (G. albipinnatus, G. uranoscopus, G. gobio).
6	Critical periods	Breeds in June (Bănărescu 1964).
7	Habitat requirements	It lives in the middle reaches of large rivers from the lower part of the scobar to the carp zone. In some small lowland rivers it lives in the clean zone. The presence of the species is related to a water velocity of 45-65, rarely up to 90 cm/s. This velocity is characteristic of lowland rivers, i.e. their shallow, sandy-bottomed stretches. In these stretches the species is very abundant, living in large herds of several hundred individuals. Isolated individuals are much rarer. Juveniles form large schools, which stay in slower water. Towards the upper reaches of rivers this velocity is found in stretches where the river is relatively deeper and slower. In these reaches the species is rarer and almost only adults occur. The food consists mainly of diatoms and small psamophilic invertebrates (Bănărescu 1964). Habitat of the species in the study area: The species was only present at one inventory station downstream of CHE Lotrioara (proposed investment). The species requires high velocity stony bottom water. We consider that the lotic streams are suitable for the species,

No	Information/Attribute	Description
		but in particular this species is very rare,. The habitat area of the species is very small.
8	Photos	
		Photo 55 Adult specimen

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	*Romanogobio kesslerii* (Dybowski, 1862). Eunis Code - 314274, Natura 2000 Code - 6143
2	Specific information species	In the study area the species has been identified at the following stations: 07
3	Attendance status [temporary]	resident,
4	Attendance status [space]	marginal,
5	Attendance status [management]	native,
6	Abundance	very rare
7	Collection period field data	05-07.2024.
8	Species distribution [interpretation]	The species was present at only one station downstream of CHE Lotrioara (proposed investment).

9	Species distribution [distribution map]	 Figure 72 Distribution map of the species (yellow: stations where the species has been identified - see attached shape-file)

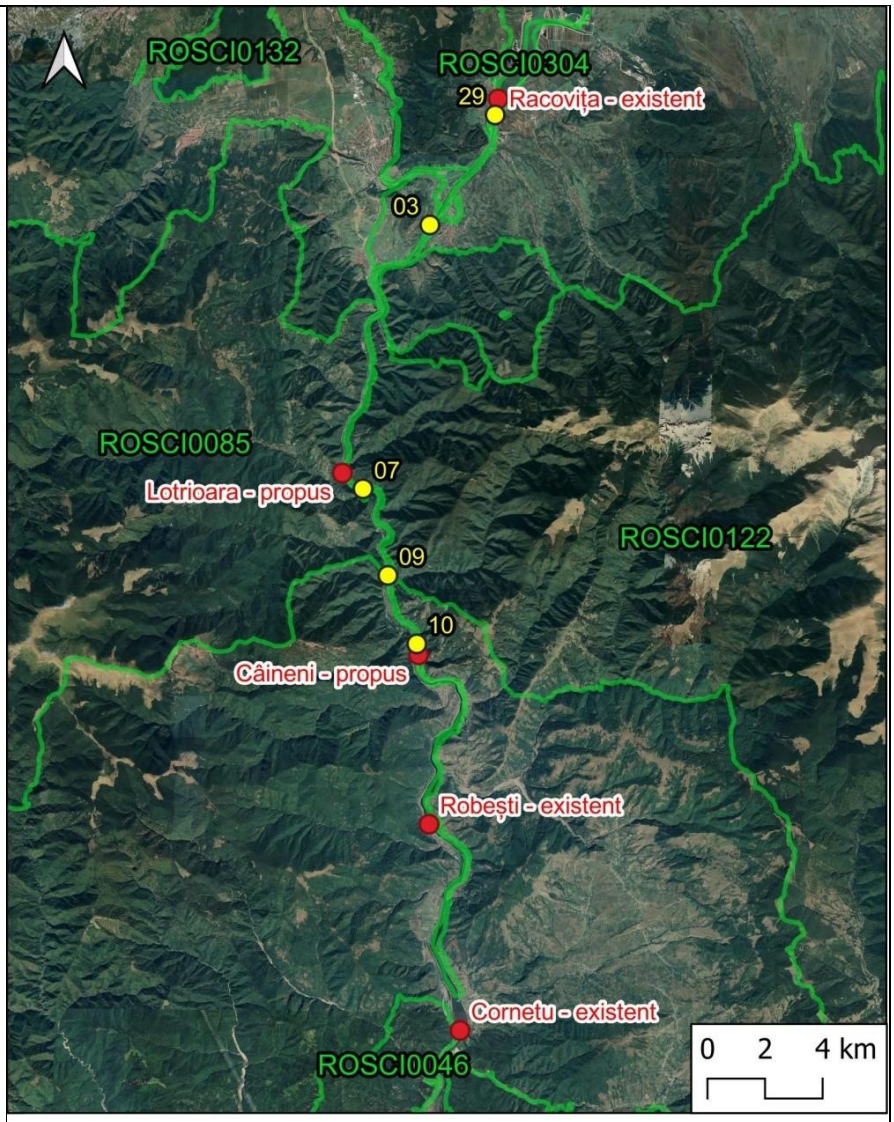
- ***Romanogobio vladykovi - the little plains pig***

No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 314279, Natura 2000 code - 5329
2	Scientific name	*Romanogobio vladykovi (Fang, 1943)* For this species the names Gobio albipinnatus (Lukasch, 1933) and Gobio albipinnatus vladykovi (Fang, 1943) have been used in particular (Harka and Bănărescu 1999, Nalbant 1995, Bănărescu et al. 1999). Due to new molecular research (Naseka 2001) Kottelat and Freyhof (2007) consider the name Romanogobio vladykovi to be valid (Fang, 1943).
3	Popular name	Română: porcușșor de șes Hungarian: halványfoltú küllő English: white-finned gudgeon, Danube whitefin gudgeon (Bănărescu 1964, Kottelat and Freyhof 2007)
5	Species description	A widespread species in Romania, it is the most common of the three Gobio/Romanogobio species of community importance. Telcean & Bănărescu (2002) categorize it to species that have expanded their range or become more abundant in recent years. Description and identification: Body and caudal peduncle relatively high and laterally compressed. 7, exceptionally 8 dorsally divided radii. Whiskers generally reaching to posterior margin of eye. Caudal peduncle slightly laterally compressed, minimum height slightly greater than (rarely equal to) peduncle thickness at posterior end of anal anal. The caeca deeply hollow, its upper lobe longer than the lower. Usually up to 10 cm. Coloring: Upper face light grayish yellowish, dorsal face of head darker grayish, with darker spots and streaks. On sides 7-8, rarely 6 or up to 12 round spots, smaller than in other species of the genus. The lateral line scales have two very weakly pronounced black spots. On the dorsal and caudal radii, two rows of very pale black spots. Sexual dimorphism is weakly marked. Lives mostly solitary, sometimes in small herds. It consumes bottom fauna, especially diatoms, small ephemerid larvae and other sand animals. It is a sedentary species, not undertaking long periodic migrations. Its natural enemies are predatory species (pike, pike-perch, red pike, red snapper, catfish or perch). Among mammals: otter. Some specimens may also be eaten by the Common Kingfisher (Alcedo atthis). It should be noted that these natural enemies do not jeopardize the survival of populations of this species. Much more dangerous is the presence of invasive species and habitat degradation. These invasive

No	Information/Attribute	Description
		species are in competition with the marsh porcupine for food or breeding sites (carps, dwarf catfish, willet, sun perch) (Bănărescu 1964).
6	Critical periods	Breeding takes place in May and June (Bănărescu, 1964).
7	Habitat requirements	Lives in the lower reaches of sandy or clay-bottomed rivers. Localizes in places with slightly deeper water and weak current. Avoids places with faster flowing water. The threatening factors that contribute to the degradation of the species' habitat are: exploitation of mineral aggregates (sand, ballast, etc.) in the minor riverbeds, pollution of watercourses, decrease in river flow by abstraction. Some specimens may be used as live nads by local fishermen (Bănărescu 1964). Habitat of the species in the study area: The species prefers shallower and deeper water. It has been identified at 5 stations (7 with repeats): downstream of CHE Racovița (03.2, 03.3, 29) and between the proposed CHE Lotrioara and CHE Câineni investments (07, 09, 09.2, 10.02). We consider the species to be rare, or so far it has been identified at few stations with suitable habitat. The habitat area of the species can be determined based on the water area delimited by the inventory stations.
8	Photos	 Photo nr. 56 Adult specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	Romanogobio vladykovi (Fang, 1943) Eunis code - 314279, Natura 2000 code - 5329
2	Specific information species	In the study area the species was identified at the following stations: 03.2, 03.3, 29, 07, 09, 09.2, 10.02.
3	Attendance status [temporary]	resident,
4	Attendance status [space]	marginal,
5	Attendance status [management]	native,
6	Abundance	rare
7	Collection period field data	05-07.2024.
8	Species distribution [interpretation]	It has been identified at 5 stations (7 with repetitions): downstream of CHE Racovița (03.2, 03.3, 29) and between the proposed CHE investments Lotrioara and CHE Câineni (07, 09, 09.2, 10.02).

9	Species distribution [distribution map]	 Figure 73 Distribution map of the species (yellow: stations where the species has been identified - see attached shape-file)

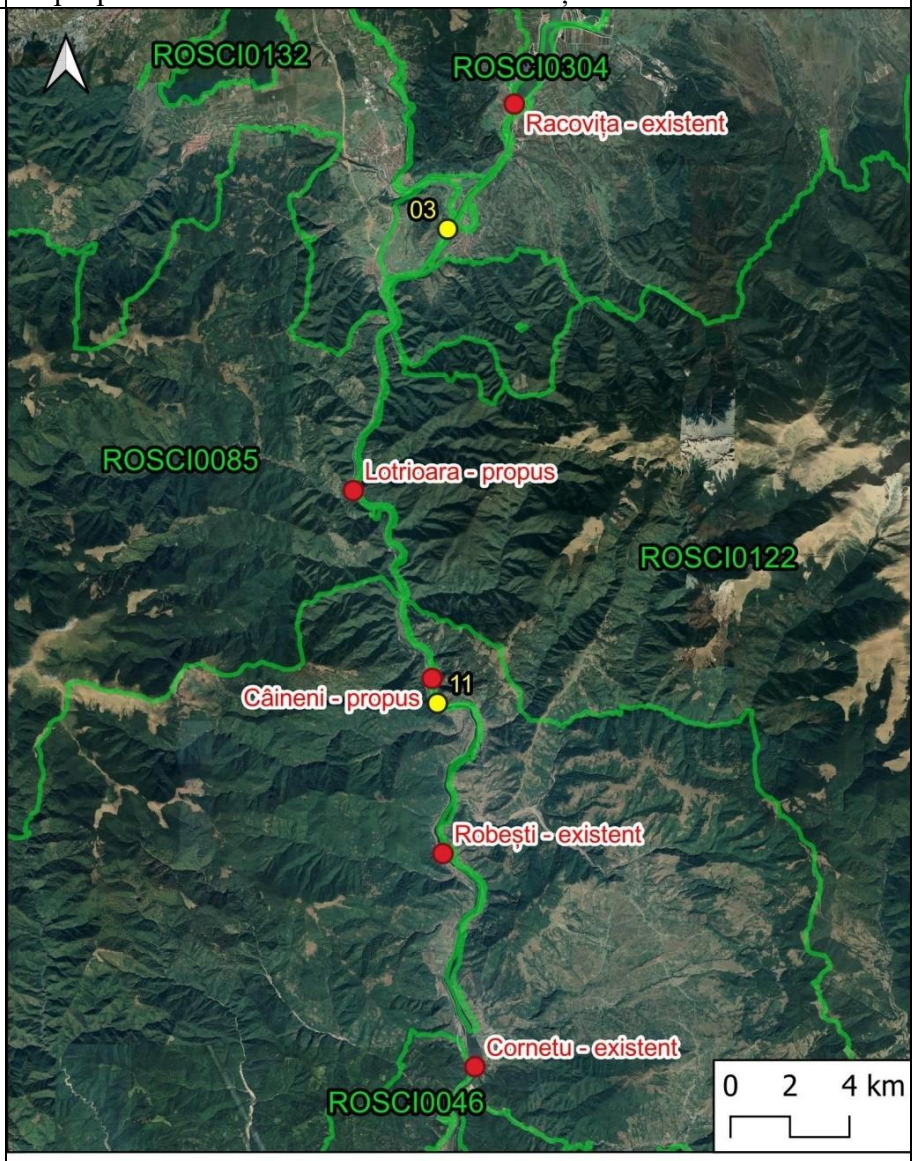
- ***Romanogobio uranoscopus - wading pig***

No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 314278, Natura 2000 code - 6145
2	Name scientific	Romanogobio uranoscopus (Agassiz, 1828)
3	Popular name	Romanian: porcușor de vad, chetrar, chetrar, cui, morcoci, morcoci, pește pistriț, pistriț, petrișor, petros, petroasă, petroc, petroșel. Hungarian: felpillantó küllő, gobhal English: Danube gudgeon, Danubian longbarbel gudgeon and the stone gudgeon. (Bănărescu 1964, Gyurkó 1973, Kottelat and Freyhof 2007)
5	Species description	Description and identification: Body elongate, thick, cylindrical, laterally uncompressed. Thickness slightly less than height. Dorsal profile weakly convex, ventral profile horizontal. Muzzle pointed, almost always longer than the postorbital space. Eyes more upward looking. Whiskers much more developed than in other species of the genus. The ventral insertion is just below the dorsal insertion or slightly behind. The tip of the pectorals sometimes exceeds the ventral insertion, sometimes not even touching it. The caudus deeply hollowed, its lobes rounded, equal, or the lower lobe slightly longer. Dorsal margin slightly hollowed. Anus closer to anus than ventrally. Chest and isthmus completely covered with scales. Coloring: Dorsal face grayish-greenish or reddish-brown; dorsal scales with black border. Behind the dorsal 2-3 large, very conspicuous blackish spots giving a barred appearance. On the sides of the body 7-10 large round, rarely elongated spots. Yellowish-white ventral face. At base of caudal fin two very conspicuous white spots. On the lateral lateral line scales two small, faint black dots. On the dorsal and caudal fin radii (rarely other fins) there are two rows of black spots, weaker than in Gobio gobio. Dimensions: Up to 10.5 cm without tail, 12.3 cm total length. Variability: Coloration varies widely even within the same population. Food consists of bioderma and small rheophilic invertebrates (Bănărescu, 1964).
6	Critical periods	It breeds between May and September (usually May-June), depending on climatic conditions during the year. (Bănărescu, 1964)
7	Habitat requirements	It lives in mountain and hilly rivers, localized in fords and steeps, where the water velocity is 70-115 cm/s and the bottom is rocky. Sometimes it also reaches the shallows, but only in the steeps. Juveniles stay in slower water, sometimes on sandy bottom. Although many individuals

No	Information/Attribute	Description
		are encountered in some slips, they never form true schools (Bănărescu, 1964). Habitat of the species in the study area: The species prefers habitats with high water velocity and bouldery bottom, as it is also at station no. 11 and 03 (identified at the third repetition 03.3), downstream of the proposed investment at CHE Racovița and CHE Câineni. We consider that despite being able to identify such habitats in the study area the species is very rare
8	Photos	 Photo 57 Adult specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	Romanogobio (Gobio) uranoscopus (Agassiz, 1828) Eunis code - 314278, Natura 2000 code - 6145
2	Specific information species	In the study area the species was identified at the following stations: 03, 11.
3	Attendance status [temporary]	resident,
4	Attendance status [space]	isolated
5	Attendance status [management]	native,
6	Abundance	very rare
7	Collection period field data	05-07.2024.

8	Species distribution [interpretation]	The species was present at stations 03 and 11, downstream of the proposed investment from CHE Racovița and CHE Câineni.
9	Species distribution [distribution map]	 Figure 74 Distribution map of the species (yellow: stations where the species has been identified - see attached shape-file)

- ***Sabanejewia balcanica - capercaillie***

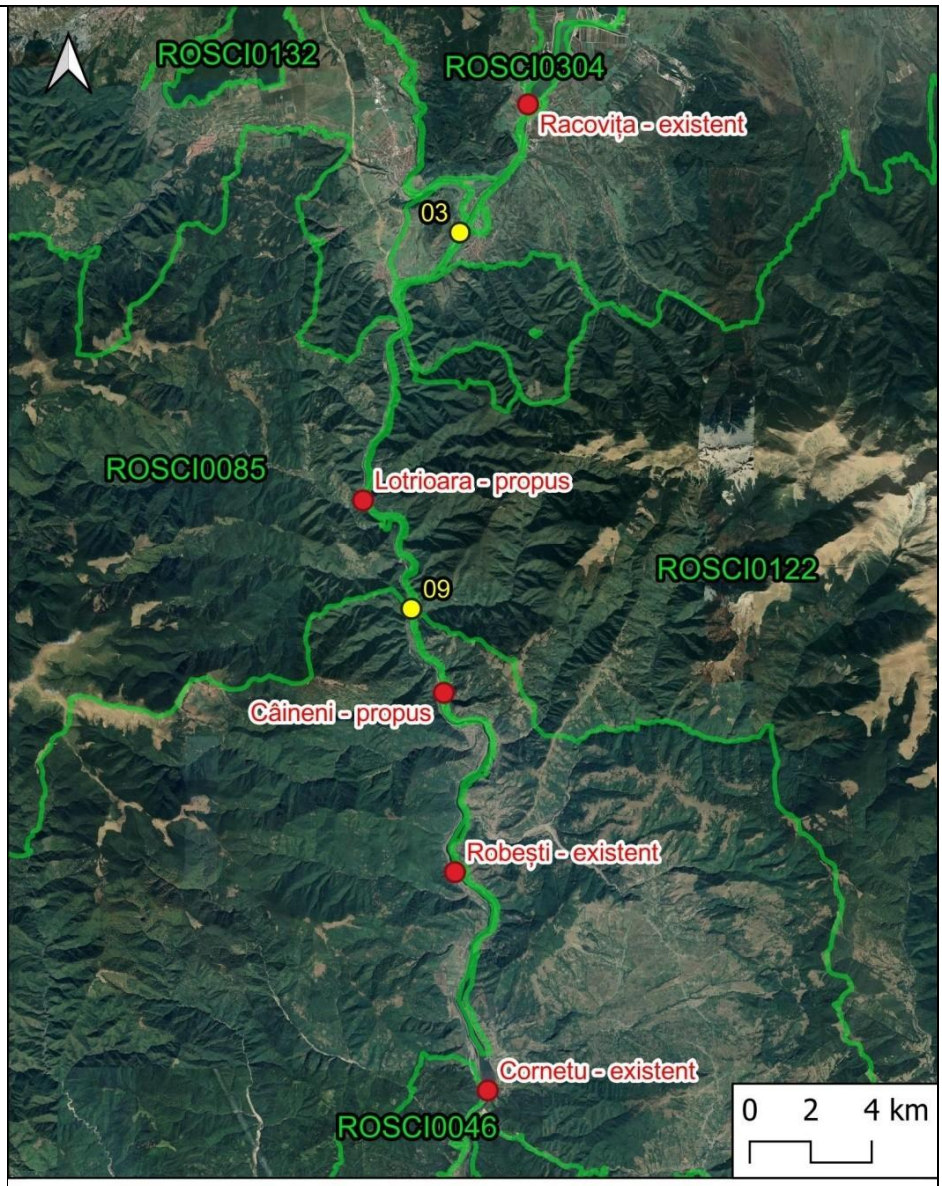
No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 594, Natura 2000 code - 5197
2	Scientific name	*Sabanejewia balcanica* (Karaman, 1922) Bănărescu (1964) still uses the name *Cobitis aurata*, with the genus Sabanejewia in parenthesis. In recent decades most authors use the name *Sabanejewia aurata* (Bănărescu 1964, Bănărescu et al. 1972, Nalbant 1995, Bănărescu et al. 1999, Harka and Bănărescu 1999). Until recently, four subspecies of Sabanejewia aurata were known: balcanica, in the lower reaches of rivers in Ardeal, Crișana, Banat and some rivers in Muntenia, Oltenia and Moldova, bulgarica, in the Tisa and Danube up to the Delta, radnensis in the upper reaches of the Mures, vallahica in three rivers in the south-eastern part of the country. A gradual intergradation between balcanica and bulgarica has also been observed in the western rivers (especially Timiș and Someș). Recent molecular research (Perdices et all. 2003) shows that our populations can no longer be attributed to Sabanejewia aurata. Accordingly, the valid name for the western populations, previously attributed to Balcanica, is *Sabanejewia montana* (Vladykov, 1925). Kottelat and Freyhof (2007) recommend the use of the name *Sabanejewia balcanica* (Karaman, 1922). It is proposed to use the name *Sabanejewia balcanica* (Karaman, 1922).
3	Popular name	Romanian: câră/fâță Hungarian: kőfúró csík, törpe csík, balkáni csík, bolgár csík, kőfúró, kőharapó English: Balkan golden loach (Bănărescu 1964, Pintér 2002, Kottelat & Freyhof 2007)
5	Species description	Species with a fairly wide distribution in Romania. Telcean & Bănărescu (2002) categorize it as a species that has maintained its range and abundance in recent years. External morphology: Body of variable height, moderately laterally compressed. Suborbital spine strong, the two branches divergent, the large branch strongly curved. Eyes close together; interorbital space flat, equal, slightly larger or smaller than eye. Anterior nostril prolonged in the shape of a tube. Caudal peduncle with an adipose ridge, more developed in the reproductive period; the anterior limit of this ridge coincides with the tip of the dorsal dorsum (when this fin is lying down). Without ventral adipose crest. Ventral insertion situated a short distance behind the anterior edge of the dorsal base. Caudella slightly truncate. Pectorals and ventrals rounded, dorsal and anal margin straight.

No	Information/Attribute	Description
		Color: Yellowish-white background, sometimes beating golden. Dorsally 10-14 (rarely 8-9 or 15-16) spots; these are longer than broad, their length greater than or equal to the distance between them. Lateral spots 10-13 (rarely 8-9 or 14); their shape is varied. Between the dorsal and lateral spots there is abundant pigmentation, consisting of small, irregular patches, more or less anastomosed in a network. This pigmentation extends to the caudal. At the base of the caudal one dorsal and one ventral grayish spot each, which are generally small and spaced apart. Variability is very pronounced. The male body has two lateral thickenings before the dorsum. Male sexual dimorphism is more pronounced during the breeding season (Bănărescu 1964). It may be confused with *Cobitis elongatoides*, but the latter has a small, vertical black spot at the base of the tail.
6	Critical periods	Breeding takes place in spring, often by mid-summer. (Bănărescu, 1964).
7	Habitat requirements	It lives in rivers from the mountains to the plateaus; it prefers sandy, sandy, sandy bottoms, but is also commonly found in exclusively sandy stretches of rivers. In sandy rivers most of the time it buries itself in sand. It is absent in muddy rivers (Bănărescu 1964). Other important habitat requirements: Presence of sections with gravel, gravel and sand bottom. Without the exploitation of mineral aggregates (sand, gravel, ballast, etc.) from minor albi No major sources of pollution No hydro-technical works (bed re-profiling/re-grading) No artificial obstructions, and no major water abstractions Habitat of the species in the study area: The species was present at station no. 03 (at the third repetition 03.3), downstream of CHE Racovița and 09, between the proposed CHE Lotrioara and CHE Câineni. Although there are many ideal habitats for this species, it is very rare in the study area. It prefers sandy bottom.

No	Information/Attribute	Description
8	Photos	 Photo 58 Adult specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	*Sabanejewia balcanica* (Karaman, 1922) Eunis code - 594, Natura 2000 code - 5197
2	Specific information species	In the study area the species has been identified at the following stations: 03, 09
3	Attendance status [temporary]	resident,
4	Attendance status [space]	isolated
5	Attendance status [management]	native,
6	Abundance	very rare
7	Data collection period in the field	05-07.2024.
8	Species distribution [interpretation]	The species was present at station no. 03 (at the third repetition 03.3), downstream of CHE Racovița and 09, between the proposed CHE Lotrioara and CHE Caineni.

9	Species distribution [distribution map]	 Figure 75 Distribution map of the species (yellow: stations where the species has been identified - see attached shape-file)

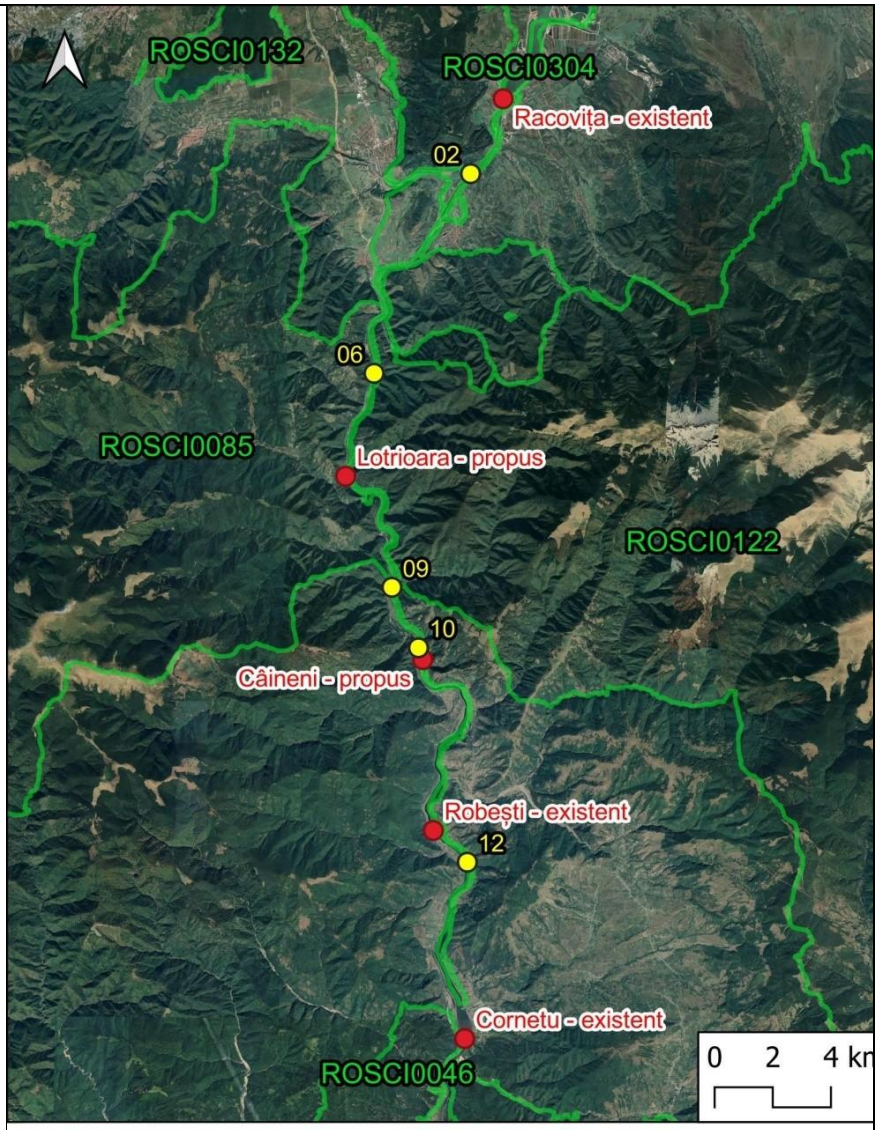
- ***Aspius aspius - avat***

No	Information/Attribute	Description
1	Species Code - EUNIS	Eunis code - 432, Natura 2000 code - 1130
2	Scientific name	*Aspius aspius* (Linnaeus, 1758) For the last 50 years, only the name *Aspius aspius* has been used for the avat, some authors (Nalbant 1995) also used *Aspius aspius aspius* (Linnaeus, 1758) showing that the avat in our country is a subspecies of *Aspius aspius*. We still propose to use the name Aspius aspius (Linnaeus, 1758).
3	Popular name	Romanian: avat, arvat (Fetești), aun (Ardeal), belizna (among the Lipovans), bușoiu (Mehedinți), bușon (along the Danube), fat (Dolj), haut (along the Prut and Seret), guran (Mehedinți), hăut (along the Siret), hauț (Ocna Mureș), lup-de-pește (Neajlov), pește-lup (Giurgiu, Greek), pește-țigănesc, pește-cu-seven-name, țigan (Greek), vânător (Luduș), vângău (Geaca), vrespere (Geaca), vulcan (Neajlov). Hungarian: balin, ragadozó őn, baing, baksa, bálind, balinkeszeg, ballin, boin, bucó, csabak, cserеőn, fenekeszeg, jászkeszeg, nagy szélhal, őn, őnhal, őnkeszeg, ragadozó küsz, táncos őn, vadászkeszeg, vezérhal English: Asp (Bănărescu 1964, Gyurkó 1973, Kottelat and Freyhof 2007)
5	Species description	A species with a fairly wide distribution in Romania, Telcean & Bănărescu (2002) categorize it as a species that has maintained its range and abundance in recent years. Description and identification: The body is elongate, slightly compressed laterally. The dorsal profile of the head ascends smoothly, but immediately behind the head the profile rises sharply, forming a sort of hump. The anal margin is strongly concave. The caul is deeply hollow, with approximately equal lobes. The scales are thin but well attached, with obvious striations, they cover the isthmus entirely. Usually reaches 30-40 cm, but can reach up to 80 cm. Coloring: Back dark olive dorsum, somewhat lower bruised, flanks silvery, ventral face white. Dorsal and caudal grayish, ventral and anal colorless or pale reddish, pectorals colorless. Lips whitish.
7	Habitat requirements	It lives both in rivers from the lowland to the hilly area and in large pools and fresh or brackish lakes, less frequently in the sweet parts of the sea. In rivers they rise upstream during spawning. The young feed initially on plankton; older juveniles and adults feed almost exclusively on fish (Bănărescu, 1964). Habitat of the species in the study area: The species prefers both large rivers and stillwaters, so the presence of the existing dams most likely does not have a large impact on the species and the proposed dams will not have a large impact on the species. However, the fact that there is no longitudinal continuity at

No	Information/Attribute	Description
		Robești and Cornetu dams means a very high pressure on the existing populations and in the long term a significant impact will result. This is why it is essential to implement the proposed solutions to ensure longitudinal connectivity at the level of the Lotrioara and Câineni CHEs respectively. The species was identified downstream of CHE Racovița, upstream of CHE Câineni (proposed) and downstream of CHE Robești, at 5 stations. The area of habitat of the species can be determined based on the area of water delineated by the inventory stations.
8	Photos	 Photo 59 Juvenile specimen identified in the study area

Species-specific data for the study area

No	Information/Attribute	Description
1	Species	*Aspius aspius (Linnaeus, 1758)* Eunis code - 432, Natura 2000 code - 1130
2	Specific information species	In the study area the species has been identified in the following stations: 02, 06, 09, 10, 12.
3	Attendance status [temporary]	resident,
4	Attendance status [space]	widespread
5	Attendance status [management]	native,
6	Abundance	rare
7	Collection period field data	05-07.2024.
8	Species distribution [interpretation]	The species was identified downstream of CHE Racovița, upstream of CHE Câineni (proposed) and downstream of CHE Robești, at 5 stations.

9	Species distribution [distribution map]	 Figure 76 Distribution map of the species (yellow: stations where the species has been identified - see attached shape-file)

2.6. Conservation status for species of interest

Analysis of the information contained in the Integrated Management Plan (Management Plan of the protected areas ROSPA0099 Podișul Hârtibaciului, ROSCI0227Sighișoara Târnava Mare, ROSCI0144 Forest of gorun and oak on the Purcărețului Hill, ROSCI0143 Forest of gorun and oak at Dosul Fânațului, ROSCI0132 Middle Oltul Cibin Hârtibaciu, ROSCI0303 Hârtibaciu Sud Est, ROSCI0304 Hârtibaciu Sud Vest, Nature Reserve "The Dry Oak Trees of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The Downy Oak Reserve",

Order 1166/2016) respectively in the Site Specific Conservation Objectives for ROSCI0132 Middle Oltul Mijlociu - Cibin - Hârtibaciu (Decision no. 522 of 18.10.2021)

The conservation status of the species of communicated interest must be assessed according to the provisions of Order 901 of April 6, 2023 on the approval of the Guidelines for the elaboration of Management Plans for Protected areas.

According to Article 2.2. of the Habitats Directive 92/43 EEC, conservation measures must lead to the maintenance or improvement of the conservation status so as to ensure favorable conservation status for natural habitat types and species of wild flora and fauna of Community importance.

Simply put, favorable conservation status can be described as a situation in which a habitat type or species is thriving (both in terms of area and population size, and in terms of population quality, including reproductive capacity, age structure, mortality) and there are prospects for it to continue to do so in the future without significant changes in existing policies and management. The fact that a habitat type or species is not threatened (e.g. there is no direct risk of it becoming extinct) does not mean that it is in a favorable conservation status. The Directive's objective is defined in positive terms, oriented towards a favorable status to be defined, achieved and/or maintained. The objective of the Habitats Directive is therefore more than the avoidance of the extinction of habitat types or species.

The unfavorable conservation status is divided into two classes:

- "unfavorable-inadequate" for situations where a change in policy or management is needed to bring the habitat type or species to a favorable conservation status, but there is no danger of extinction in the foreseeable future (e.g., 50-100 years);
- "unfavorable-bad" for situations where the habitat type or species is in danger of becoming extinct in the foreseeable future (e.g. 50-100 years).

For all situations where there is insufficient information to make a proper assessment, the conservation status is considered 'unknown'.

Status of species of Community interest identified in the survey

Figure 77 Map of the stations from the Final Report on the inventory and assessment of the conservation status of aquatic species and riparian habitats of Community interest in the reference area of the PH+ Pro Management Natura 2000 project and the elaboration of management measures/recommendations

- ***<u>Barbus petenyi - common moorhen</u>***

The Management Plan presents data at the level of the whole complex of Hârtibaciu sites (seven overlapping sites of which two important sites for fish species: ROSAC0132 and ROSAC0227). The conservation status of the species according to the Management Plan is satisfactory. Based on available information, this rating correlates with the unfavorable-inadequate category.

According to the Management Plan, the population size of the species at the Hârtibaciu site complex is more than 10,000 individuals. According to the baseline study, the population status of *Barbus petenyi* (in the Management Plan the species is referred to as *B. meridionalis*, but the correct name is *B. petenyi* - see species presentation) in the Olt River ranges from very good in sector 328 to poor in sectors 326, 324 and 322. The lotic habitats of the sectors of the Olt river where individuals of the species were found are in average condition.

<u>The following situation was found in the study area:</u>

The most widespread species was present at 24 out of 29 inventory stations (with 39 replicates). We consider most lotic habitats suitable for the species in our study area. Considering that the species requires stony bottom and strong current, we consider that the alteration of lotic habitats to lentic habitats in the study area will have an impact on the species.

The area of habitat of the species can be determined based on the area of water delineated by the inventory stations.

Rhodeus amarus

According to the Management Plan the conservation status of the species according to the Management Plan is satisfactory. Based on the available information, this rating correlates with the unfavorable-inadequate category.

According to the management plan, the population size of the species within the site is at least 2,000 individuals. The population status of the Olt river (in sectors 328, 327, 326, 325, 324, 323) is very good (A) in accordance with: population size (C), balanced distribution of individuals by age classes, size of the distribution area and with the high weight of individuals of the species of interest in the fish community structure. The exception is sector 322 where the population of *Rhodeus amarus* shows a poor status (C). In the Olt River, the sectors where the species was identified, the characteristic habitats are in an average status, except for sector 322 where the habitat is in a poor status.

In our study area we found the following situation:

The species has been identified at 7 stations on the Olt River, downstream of CHE Racovița and immediately downstream of the proposed CHE Lotrioara and CHE Câineni investments. It prefers stagnant waters, so it avoids lotic sections but even if dams themselves through stagnant water could become suitable habitat for this species, we consider that fragmentation could result in a negative impact in the long term, especially due to the fact that the species is closely linked to the presence of lamelibranids (*Unior* or *Anodonta*), which in turn need longitudinal connectivity. We consider that the species may have sizable populations in Robești and Cornetu dams, but the near stagnant water in these dams were not important target areas for this study. The habitat area of the species can be determined based on the area of water delineated by the inventory stations.

Romanogobio kesslerii - petroc

The conservation status of the species according to the Management Plan is satisfactory. Based on the available information, this rating correlates with the unfavorable-inadequate category.

According to the management plan, the population size of the species within the site is at least 1,000 individuals. The estimated population is greater than 5,000 individuals. According to the baseline study, the population status of the Olt River (in sectors 328, 326, 324 and 322) is poor (C) in accordance with: population size (V), unbalanced distribution of individuals by age classes and the low weight of individuals of the species of interest in the fish community structure. The lotic habitats characteristic of the species, in the two sectors of the Olt River where individuals of the species Romanogobio kessleri were found, are in a medium/poor state.

In our study area we found the following situation:

The species was only present at one inventory station downstream of CHE Lotrioara (proposed investment). The species requires high velocity stony bottom water. We consider that lotic streams are suitable for the species, but in particular this species is very rare, most likely due to the already existing fragmentation and significant flow fluctuation due to the Racovița CHE. The habitat area of the species is very small.

(d) Romanogobio vladykovi - Barrow porcupine

The species is not listed in the Standard Site Form but according to recent research by Nagy et al. (2023) the species is present within the site. In the Management Plan the species is not mentioned, so there is no information about its status within the site.

In our study area we found the following situation:

The species prefers shallower and deeper water. It has been identified at 5 stations (7 with repeats): downstream of CHE Racovița (03.2, 03.3, 29) and between the proposed CHE Lotrioara and CHE Câineni investments (07, 09, 09.2, 10.02). We consider the species to be rare, or so far it has been identified at few stations with suitable habitat. It most probably does not tolerate the level fluctuations caused by the Racovița CHE. The habitat area of the species can be determined according to the water surface delimited by the inventory stations.

- ***Romanogobio uranoscopus - wading pig***

According to the Management Plan the species has not been identified within the site during the assessments carried out for the preparation of the baseline study for the Management Plan so its conservation status is unknown.

In our study area we found the following situation:

The species prefers habitats with high water velocity and bouldery bottom, as it is also at station no. 11 and 03 (identified at the third repetition 03.3), downstream of the proposed CHE Racovița and CHE Câineni investment. We consider that despite the fact that such habitats can be identified in the study area, the species is very rare. It is very likely that fragmentation has already had an impact on this species. The habitat areas of the species are very small, most likely living in stretches of a few hundred meters.

- ***Sabanejewia balcanica - capercaillie***

The conservation status of the species according to the Management Plan is satisfactory. Based on the available information, this rating correlates with unfavorable - inadequate.

According to the management plan, the population size of the species within the site is at least 10,000 individuals. According to the baseline study, the population status in the Olt River ranges from very good in sectors 328, 326, 325, 324 and 322 to poor in sectors 327 and 323. The lotic habitats of the sectors of the Olt River where individuals of *Sabanejewia aurata* have been found are in average condition.

In our study area we found the following situation:

The species was present at station no. 03 (at the third repetition 03.3), downstream of CHE Racovița and 09, between the proposed CHE Lotrioara and CHE Câineni. Although there are many ideal habitats for this species, it is very rare in the study area. It prefers sandy bottom.

Aspius aspius - avat

According to the Management Plan the species has not been identified within the site during the assessments carried out for the preparation of the baseline study for the Management Plan so its conservation status is unknown.

In our study area we found the following situation:

The species prefers both large rivers and stillwaters, so the presence of the existing dams most likely does not have a large impact on the species and the proposed dams will not have a large impact on the species either. However, the fact that there is no longitudinal continuity at Robești and Cornetu dams means a very high pressure on the existing populations and in the long term a significant impact will result. This is why it is essential to implement the proposed solutions to ensure longitudinal connectivity at the level of the Lotrioara and Câineni CHEs respectively.

The species was identified downstream of CHE Racovița, upstream of CHE Câineni (proposed) and downstream of CHE Robești, at 5 stations.

Table 82 Summary table of the presence of species of community interest in the Management Plan, respectively conservation objectives and their presence in the study

Community species name	PM +OC +OC ROSCI0132	Current study
Barbus petenyi	from	from
Rhodeus amarus	from	from
Romanogobio kesslerii	from	from
Romanogobio vladykovi	no	from
Romanogobio uranoscopus	no	from
Sabanejewia balcanica	from	from
Aspius aspius	no	from
Cobitis elongatoides	from	no
Zingel zingel	from	no
Zingel streber	no	no
Pelecus cultratus	from	no

Out of the 7 species of Community interest mentioned in the Management Plan/Conservation Objectives for the Natura 2000 site ROSAC0132, 4 species have been identified and at the same time 3 species of Community interest have been identified.

The only species for which neither at the PM+OC level nor in our study so far there is any information is *Zingel streber*, a species that is still on the ROSAC0132 Standard Form.

Status of species of Community interest not identified in the survey but listed in the Management Plan/Conservation Objectives/SFs

a) Cobitis elongatoides - Cobbler

The conservation status of the species according to the Management Plan is satisfactory. Based on available information, this rating correlates with the unfavorable category - inadequate. According to the Management Plan, the population size of the species within the site is greater than 5,000 individuals.

According to the baseline study, the status of *Cobitis elongatoides* populations in the Olt river (sectors 328ms, 326ms, 325ms, 324ms, 323ms, 322) is poor (C) in accordance with: population size (V), the size of the distribution area, the unbalanced distribution of individuals by age classes and the low weight of individuals of the species of interest in the structure of fish communities. The lotic habitats of the sectors of the Olt River where individuals of the species *Cobitis elongatoides* were found, are in an average condition.

In our study area we found the following situation: the species was not identified, although many habitats were suitable for it in the studied areas.

b) Zingel zingel - stone

According to the Management Plan, the species has been identified in Olt on a section upstream of Făgăraș and at Turnu Roșu. The conservation status of the species according to the Management Plan is unsatisfactory. Based on the available information, this qualifier correlates with the unfavorable category.

According to the management plan, the population size of the species within the site is less than 100 individuals. The species has been identified in the Olt on a section upstream of Făgăraș and at Turnu Roșu, i.e. upstream and downstream of the section of the river transformed and fragmented by dams. In order to improve the conservation status, it is necessary to re-establish the connectivity of the river and to provide deep lotic systems. The status of *Zingel zingel* populations (on the Olt River in sectors 322 and 328) is poor (C) in accordance with: population size (V), unbalanced distribution of individuals by age classes, small size of the distribution range and low weight of individuals of the species of interest in the fish community structure.

In our study area we have found the following situation: we emphasize that we have preselected a station in Turnu Roșu and we have inventoried the station three times (03, 03.2, 03.3), but the species was not identified.

c) Zingel streber - small spindle

According to the Management Plan the species has not been identified within the site during the assessments carried out for the preparation of the Management Plan so its conservation status is unknown.

In our study area we found the following situation: we were not able to identify the species, although most probably there are very short habitats suitable for this species.

d) Pelecus cultratus - sabre

The conservation status of the species according to the Management Plan is unsatisfactory.

Based on the available information, this rating correlates with the unfavorable-area category.

According to the management plan, the population size of the species within the site is less than 100 individuals. According to the baseline study, the status of the populations in the Olt river (sectors 322 and 328) is poor (C) in accordance with: population size (V), unbalanced distribution of individuals by age classes, small size of the distribution area and low weight of individuals of the species of interest in the fish community structure. The lotic habitats of the two sectors of the Olt River where individuals of the species *Pelecus cultratus* were found, are in average condition.

In our study area we have found the following situation: we have not been able to identify the species, if it is present it may be in the existing dams, but the stretch not yet affected by dams we consider that it is not a suitable habitat for this species.

2.7. Presence of invasive species in the study area

Invasive/alochthonous species represent competition for food, habitat and competition for spawning areas. Four invasive fish species can be observed in the study area, which were present at almost all stations on the Olt River. At most stations the species *Babka gymnotrachelus* (mudpuppy, mudpuppy) was present, which although a native species in the Valea Oltului region, is recorded as an invasive species throughout Europe due to its very rapid spread in rivers in the last decades. Bănărescu in 1964 mentions the presence of the species in the waters flowing into the Black Sea and the Black Sea shores.

We consider that the high frequency of the species represents a pressure on the ichthyofauna of the Olt River. In the case of the 15 assessment stations located on tributaries at the confluence with the Olt River, we identified the invasive species (silver carachus, *Carassius gibelio*) at only one assessment station.

Table 83 Presence of invasive fish species at station level (only those stations where we have identified at least one invasive species are shown)

Station name/ Species name	**01**	**02**	**03**	**04**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**26**	**29**
Lepomis gibbosus														
Pseudorasbora parva														
Babka gymnotrachelus														
Carassius gibellio														

Table 84 Presence of invasive fish species at the stations that have been repeated

Station name/ Species name	**01.2**	**02.2**	**03.2**	**03.3**	**04.2**	**07.2**	**08.2**	**09.2**	**10.2**	**11.2**
Lepomis gibbosus										
Pseudorasbora parva										
Babka gymnotrachelus										
Carassius gibellio										

It can be seen that at the first 2 stations during the repetition (01.2, 02.2) we managed to identify 2 more invasive species at both stations. At station 3 we identified 2 less, at station 10 2 more. We consider that at all the inventory stations the situation is similar.

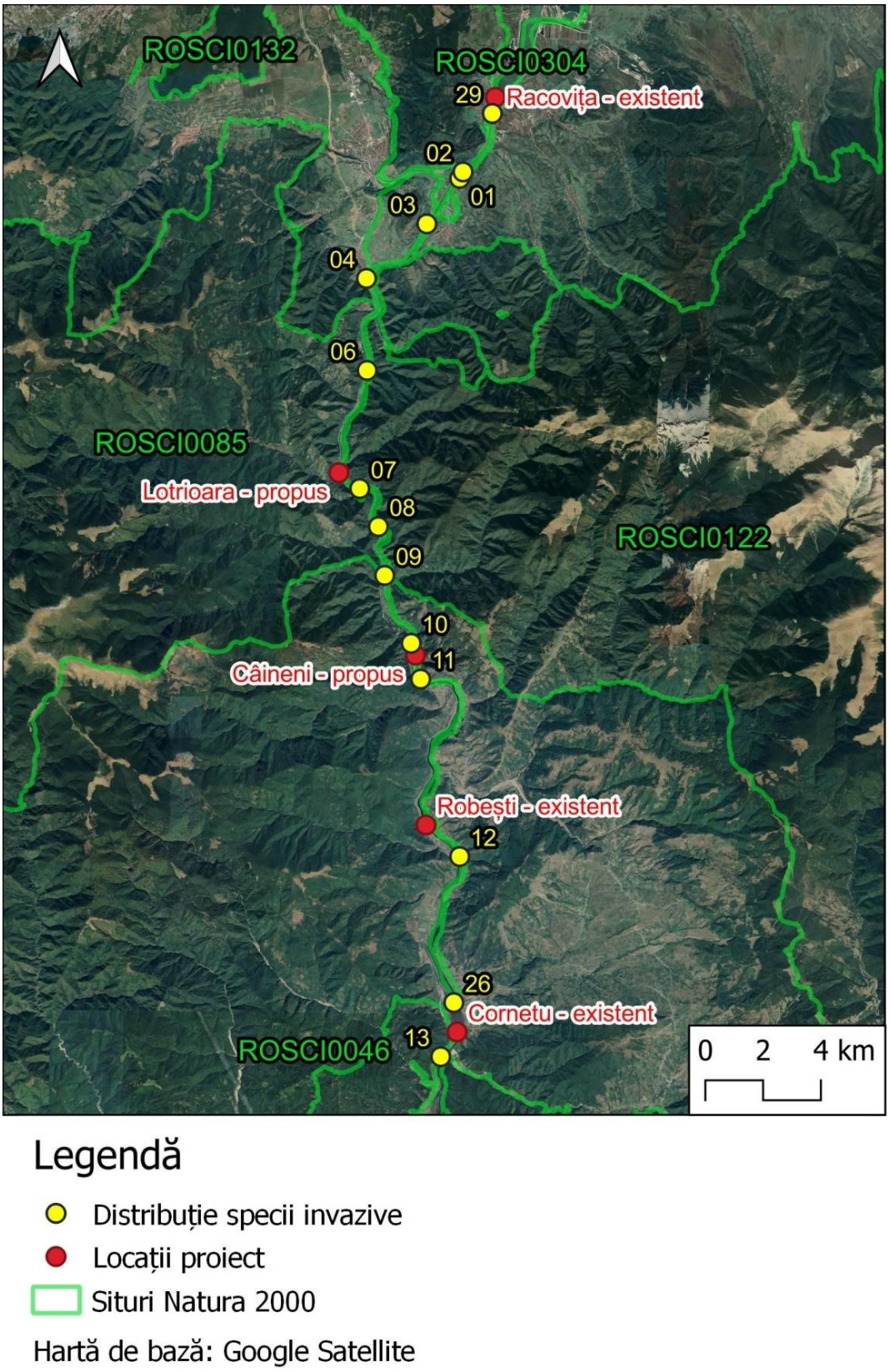


Figure 78 Distribution of invasive fish species in the studycu area

G.3 Conclusions and Recommendations (Measures)

3.1. Fragmentation

To achieve the objectives of the Habitats Directive (92/43/EEC) and the Water Framework Directive (2000/60/EEC) the mitigation of anthropogenic hydro-morphological changes affecting river ecosystems must be addressed. Therefore, endemic and threatened fish species should be targets for habitat enhancement and river restoration actions (Hayer et al. 2008; Acreman and Ferguson 2010). Hydropower plants impact nature, and most impacts already occur during the construction phase. Habitat degradation associated with tree felling, excavation, areas filled with excavated material, road construction, blasting, construction of water storage systems, construction of supply canals, digging, loss of riparian zone and wetland destruction is a primary environmental concern for hydropower plants under construction (Bashkaya et al. 2011).

Longitudinal connectivity becomes a central issue when focusing on fish migration. The term "migration" is often applied to adaptive, long-distance movements that occur predictably in the life cycle of a species (Smith, 1985). The term 'movement' or 'restricted movement' describes habitat shifts within normally used areas, i.e. territories and domains (Gerking, 1958; Peter, 1998). The negative impact of artificial barriers on fish species migration is well described in the literature (Peter, 1998; Waidbacher & Haidvogl, 1998; Williams, 1998), but habitat fragmentation can also have dramatic effects on local fish faunas (Peter, 1998). The success of fish species in flowing waters depends on their flexibility to adapt to migrations/movements at different stages of their life cycle, and their ability to respond appropriately to changes in their habitat.

Therefore, stagnophilic fish must undergo restricted movements and depend on barrier-free flows to maintain their viability. For various small fish species with reduced ability to jump or swim, reductions in local populations have been documented as an effect of migratory barriers (Barandun, 1990; Bless, 1990; Roth & Utzinger, 1993; Stahlberg- Meinhardt, 1994). Populations fragmented by dams are often characterized by lower genetic diversity, greater morphological asymmetry and smaller population size compared to populations downstream of dams (Morita & Yokota, 2002).

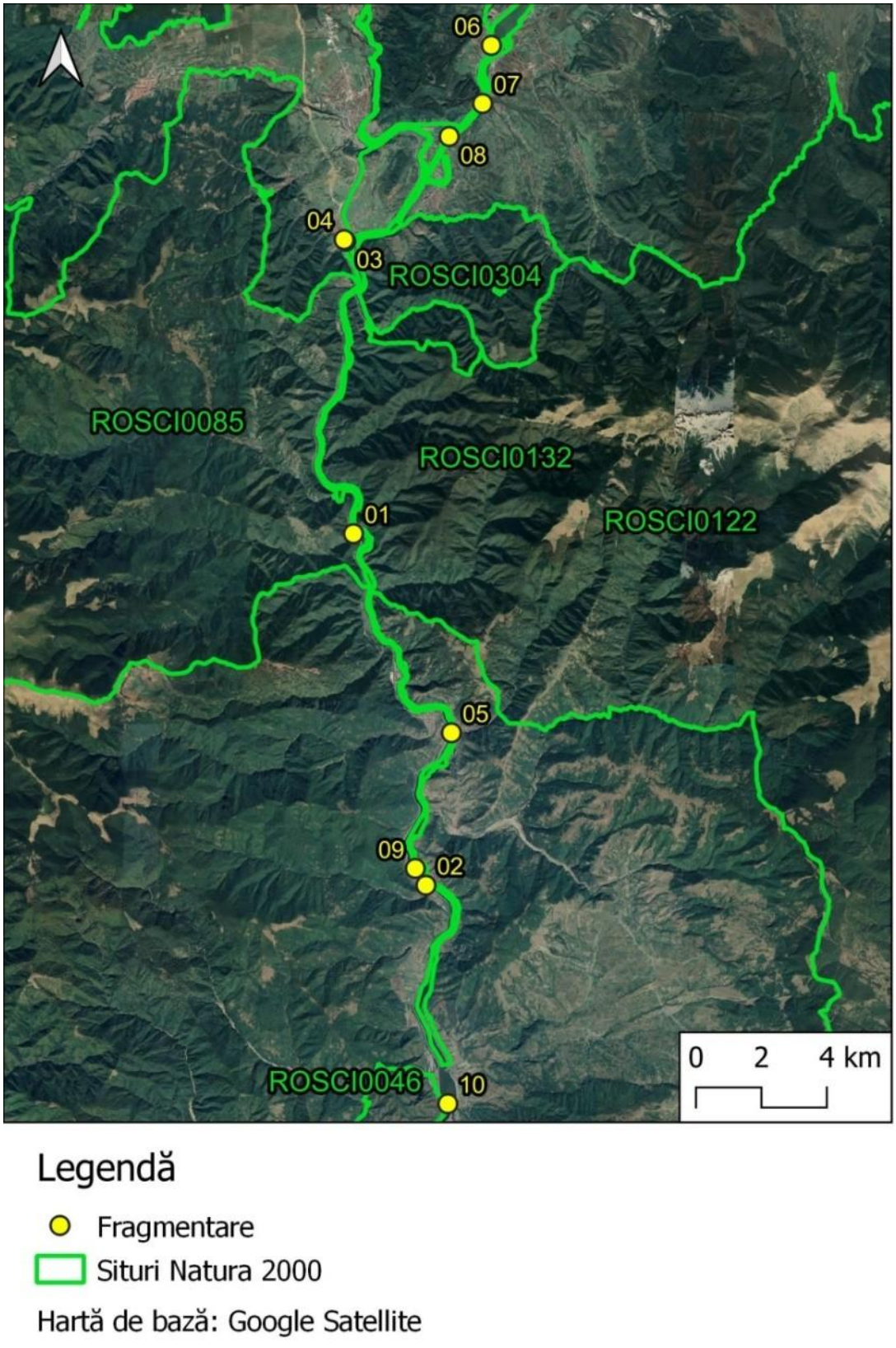


Figure 79 Location of fragmentation elements in the study area

3.2. Flow fluctuation:

During the inventory we identified that there is a very large fluctuation of flow in the study area. A very high flow with a level difference of about 1 m starts from the Racovița dam usually at 12 o'clock, but there are occasions when even at 5 o'clock and practically the water spreads into the bank areas that were dry. The high water is even more turbid and the flow returns to a low one by the next day, leaving the banks dry again. We believe that this is seriously affecting the fish fauna by leaving no spawning or rearing space for larvae and juveniles.

The bank zone is a very important habitat for fish species, and this oscillation has most likely already had an impact on fish populations. In general we can state that the fish fauna of the Olt River in the study area is poor. It should also be mentioned that this instability affects the macronevertebrate fauna, the main food source of fish species. Dewson et al. (2007) reviewed several scientific articles on the effect of flow reduction and found that flow reduction affects both the density and diversity of macronevertebrates, the main food source of fish species.

Nistorescu et al. (2016) in "Good practice guidelines for planning and implementation of investments in the micro-hydropower sector" recommend that "the ecological flow should take into account the seasonal dynamics of water flows as well as the quantifiable effects of climate change. The ecological flow should ensure habitat conditions for protected species also in low water situations (summer and winter periods). The ecological flow should have a minimum of 2 values (ideally 4): one higher for high water periods (generally spring and early summer) and one for drier periods (summer and winter) to best mimic the natural flow of the river. In each case, however, the ecological flow must be at least 25% of the multiannual average flow."

Photo 60 Inventory Station 10. The left bank, the boulder area is dry, but when the water level rises over a width of 2-3 the bank will be under water

The already existing fragmentation and flow fluctuations already result in a cumulative impact, which will intensify with the construction of the two dams.

3.3. Proposed measures

a) Introduction: fish migration

The documented research of fishes in the present-day territory of Romania begins with the observations of Marsigli, who landed around 1690 in Ada-Kaleh and who left in his work Danubius pannonicus-mysicus of 1726 valuable information about the ichthyological fauna of those places, including five species of sturgeons (Bănărescu, 1964). Grigore Antipa (1909), also known as the founder of the Romanian school of hydrobiology and ichthyology, made a particular contribution to research and knowledge of aquatic ecosystems. Through his efforts as head of the commercial fisheries authorities, he laid the foundations for modern and sustainable fisheries. His papers and work show a deep understanding of the dependency between fish as individuals and the river as an ecosystem, including flood plains and phenomena, which we often call calamities (Antipa, 1910; Antipa, 1911; Antipa, 1913). In his works, Antipa addresses the longitudinal continuity of the river through the migration of sturgeons from the Black Sea to the Danube (Antipa, 1905), but he also deals with the phenomenon of lateral connectivity of the river with its floodplain, proposing a submersible dyking system to exploit the ecological potential of the floodplain. The industrial revolution and the change in mentality brought about by this cultural and social upheaval meant that Antipa's ideas were abandoned and a definitive, 'unsubmersible' river embankment was adopted, so that fishing became an almost negligible branch of the country's economy. Grigore Antipa's research work in biology has been carried on by many biologists, but Bănărescu's Fauna of the Romanian People's Republic (1964) is still the reference work in Romania. It is desirable that in the current process of designating and monitoring protected areas and implementing European directives, scientific research should be carried out in order to update the information left by all these scientists.

Aquatic organisms in rivers make journeys that can sometimes cover impressive distances. These migrations are not by chance, but are a consequence of the biological needs of this fauna (MUNLV, 2005). Fish make movements to find feeding, wintering and spawning habitats, which often differ from each other. Of course, fish also migrate for dispersal or to repopulate habitats following plagues or catastrophes.

The acceptance, that fish migration passages should only be constructed for migratory species present in the area, is still present in the design of crossbars. The classic distinction between 'migratory' and 'non-migratory' fish is challenged with scientific evidence, especially following the development of telemetry technology (IfÖ, 2013). This has made it possible to record the movements of 'strictly sedentary', 'territorial' species making (upstream) migrations of hundreds of kilometers. The Water Framework Directive, as well as ICPDR (2013) follows this direction, considering all fish species as migratory and requiring river continuity for all aquatic organisms.

The importance of these migrations was described in Romania as early as 1905 by Grigore Antipa, showing that limiting feeding migrations of economically valuable species leads to reduced fish populations (Antipa, 1905), but became evident in the collapse of sturgeon

populations after the spawning migration route was interrupted by the construction of the Iron Gates I and II dams (Lenhardt et al., 2006).

Bănărescu (1964) stated that some of the fish of marine origin migrate beyond Romania: the red mullet (*Acipenser güldenstaedtii*), the common bream (*Acipenser stellatus*), the morun (*Huso huso*) and the sculpin (*Alosa pontica*), and among the duck or brackish water species the common bream, the common guvid (*Gobius kessleri*), the porcupine (*Gobius fluviatilis*) (up to Cazane). Sturgeon species inhabited the Danube and its tributaries as far as present-day Germany (EC, 2005), starting their migration from the Black Sea, except for the common dogfish (*Acipenser ruthenus*).

Migratory behavior of aquatic organisms

Fish species rely on migrations to meet their biotop structure requirements during different life stages. Migrations are performed by both fish and less mobile benthic invertebrates. Migrations can be longitudinal in the main channel, or lateral between the main channel and lateral waters. Where rivers repeatedly form pools along their course, there is a need for the interconnection of these different ecosystems to allow organisms to migrate in such a way as to satisfy their migration and habitat requirements. Longitudinal connectivity of rivers must therefore play a particularly important role both with respect to reproduction, as well as to the spread of populations and recolonization of depopulated river sections.

b) Moving between different habitats

Some fish species make intra-annual migrations between their feeding and resting habitats, or populate during their life cycle different areas of a river that provide specific conditions to meet their requirements at different stages of development.

Migration for reproduction

Spawning migrations are a special type of migration between different parts of a habitat. They are carried out by most native fish species within the river system in which they live. If spawning migrations are blocked by impassable obstacles, fish species may spawn in parts of the river where conditions are less favorable (emergency spawning). This leads to lower spawning rates or

total reproductive failure with subsequent extinction of species in the habitat.

In terms of breeding migrations, according to MUNLV (2005), they can be categorized as: potamodromous migrations, which take place exclusively in freshwaters, and diadromous migrations, which involve a switch between marine and freshwater environments. In turn, diadromous migrations can be anadromous, where species that migrate diadromously breed in freshwater but spend most of their lives in saline environments (e.g. the morun *Huso huso*) or catadromous, where breeding takes place in saline environments. Here it should be noted that some sources use the term diadromous species for species that switch from marine to freshwater and vice versa for purposes other than breeding.

d) Exchange of populations

Equalization of different population densities in neighboring river reaches occurs through upstream or downstream migration and leads to genetic exchange between populations.

<u>Downstream migration</u>

Downstream migration, in addition to its importance for reproductive migration, plays an important role for example when environmental catastrophes, such as severe floods or pollutant spills, occur, aquatic organisms may drift downstream (the 'drift-catastrophic' phenomenon). In all cases, whether migrations are actively carried out (i.e. escaping) or passively supported, aquatic organisms depend on adequate longitudinal connectivity. The mobility of aquatic organisms plays a critical role in the recolonization of whole water bodies and watercourses, or portions thereof, that have been depopulated during a single catastrophic event.

The EU Biodiversity Strategy calls for the restoration of the natural functions of rivers. Thus, the strategy sets the objective of restoring connectivity on at least 25,000 km of rivers by 2030 by removing barriers and restoring floodplains (Kampa 2022). This is also foreseen in the new Nature Restoration Law.

e) Context of the proposed measures

1. Racovița CHE development (based on existing documentation)

According to the approval decree, the Racovița CHE included: Racovița reservoir, NNR = 373,50 mdMB; Volume in the lake: ca. 14.2 million m3.

As mandatory recommendations with implications for the safety management of the works, the Owner will pay particular attention to: Protective measures for the culvert and piers of the two CF bridges and the adoption of appropriate structural foundation measures for the piers, in the event that the two bridges are not decommissioned.

Variant A

The location of the hydrotechnical node is situated in the lower terrace area on the right bank of the Olt at approx. 1.8 km upstream of the Sebeș-Olt railway station. In the retention front, the center is located to the left of the spillway dam. On both banks, the lake is delimited by protective dykes which follow the river bed as far as possible. The embankment on the left bank turns and follows the regularized riverbeds of the Avrig and Mirșa streams with embankment embankments, finally closing into the railway embankment immediately downstream of the outlet of the Avrig HEP run-off channel. The right bank embankment is continuous and closes into the slope in the Bradu area. The access to the canopy is realized from both banks through branches from the county roads. Access to the power plant is from the left bank. Upstream of Bradu, the lake is crossed by the DN 1, the left bank embankment was foreseen in the initial project to be closed in the embankment of the bridge over the Olt river. Also in this area, according to the initial project, a pipeline for the transportation of petroleum products was planned.

Variant B

- completion of the remaining works to be carried out according to the submitted projects both for the embankment dams in the tail of the reservoir and for the Racovița CHE tailrace channel;
- protection works for the railroad bridges on the Racovița CHE run-off channel in variants B1 and B2. Racovița 2 variant does not consider the realization of protections for the railroad bridges, which makes the Racovița CHE to operate with downstream level restrictions.

Situation of the Racovița CHE storage

The regularization of the Sebeș stream and its outflow into the tailrace has been completed. Approximately 2.75 km downstream of the hydro-technical junction, the runoff channel is crossed by 2 railroad bridges: Brașov-Podu Olt and Piatra Olt-Podu Olt.

The realization of the escape channel at the final elevations of the project, the route of which is inscribed between the railway bridge culverts, by excavating 3.00 - 4.00 m below the current elevation of the Olt River in this section, results in an embedment of their piers of about 1.00 m, which is unacceptable for the safety and stability of the bridges. In order to put into operation the Racovița CHE, at the project parameters, it is necessary to execute the channel of escape and high waters at the project elevations. To this end, it is mandatory to carry out works to make the railroad bridges infrastructure safe, either by reinforcing them or by building a new infrastructure.

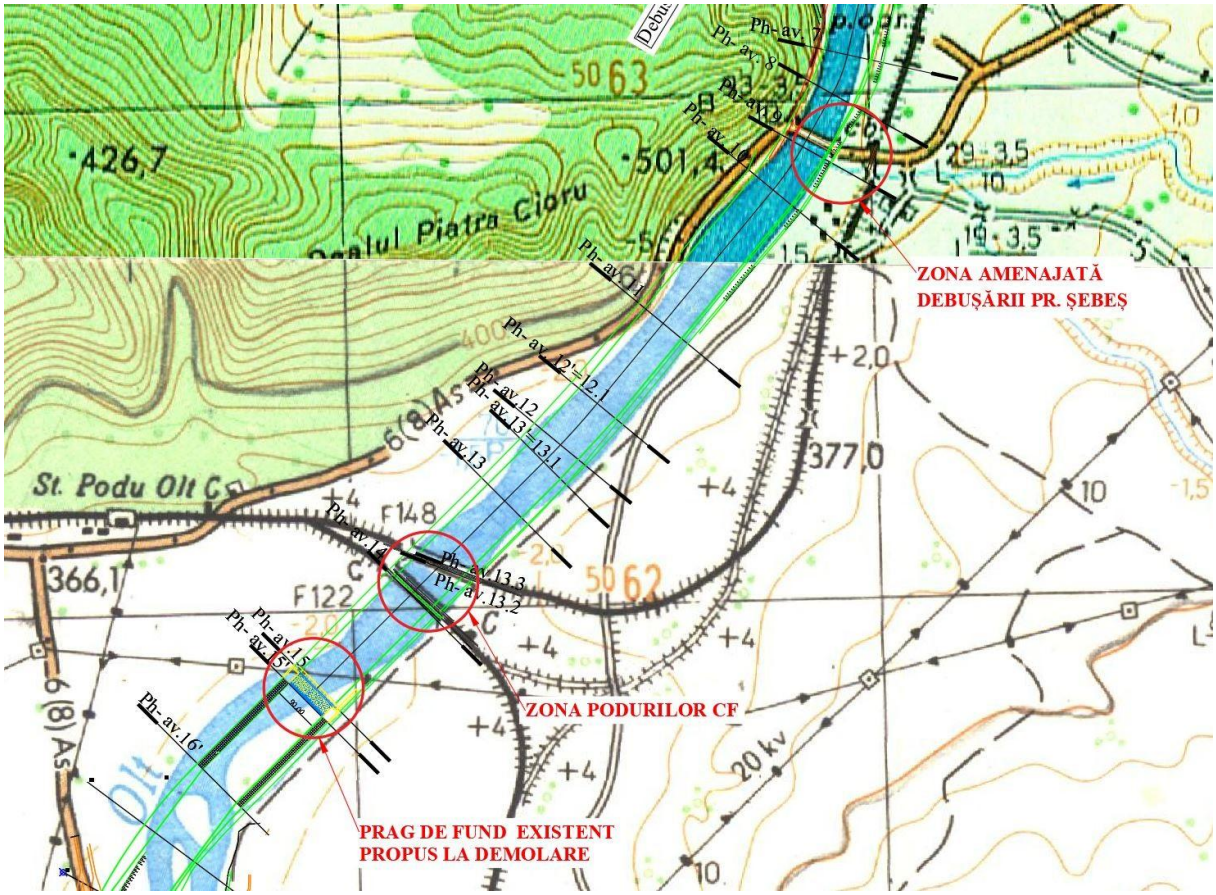


Figure 80 Runoff channel downstream of CHE Racovița

The construction of the outlet of the Sebeș stream into the CHE Racoviță tailrace was executed before the downstream CF bridges were made safe. As the difference in level between the slope of the Olt river and the slope of the Sebeș stream (left tributary) is significant, the connection of the stream to the river outlet channel was realized by a concrete spillway, equipped with a fish ladder on the left bank of the stream.

Photo 61 Development of the Șebeș river outlet

Due to the current channel section upstream of the spillway, the stream flow is fairly evenly distributed over the width of the channel. In order to ensure the highest possible flow towards the left bank, where the fish ladder is located, it is recommended to raise the elevation of the coronament elevation at the spillway and to reprofile the bed in the area of the development by lowering the slope of the slope, ensuring a funnel-shaped slope from the right bank to the left bank. During periods of low water levels the majority of the flows will concentrate towards the passage thus ensuring connectivity, but more significant quantities of water will flow on the opposite side only during periods of medium or high water.

Photo 62 Overflow spillway confluence of pr. Șebeș with Olt river

Following the projected dewatering of the outlet channel, the elevation of the embankment will be lowered below the current elevation of the downstream position of the passage. In order to further ensure the connectivity of the Șebeș stream with the Olt River, it is recommended to extend the fish ladder, avoiding as far as possible its penetration towards the middle of the escape channel, by introducing an additional section or (if necessary) additional sections with a serpentine route. The downstream end of the ladder shall be positioned below the shallow water level up to the talveg level of the escape channel.

The downstream end of the regularization of the Sebeș stream and its outlet into the channel is protected with a bottom sill whose crest elevation must respect the descent of the talveg slope in order to prevent fish ladder blockage.

Photo 63 Spillway at the mouth of the Șebeș pr.

The directing (entrainment) of the aquatic fauna downstream towards the Sebeș stream will be realized by the execution of a spur made of rough stone. If the flow velocity of the water does not allow the construction of the rock-cast construction, a sub-mountable dike of gabions or concrete can also be built with a maximum crest height at mid-water level. This construction will be curved in the form of a curve in the outlet area on the right bank of the Șebeș stream, with a radius large enough to include the downstream end of the fish ladder.

Photo 64 Existing fish ladder

It is recommended to follow the existing infrastructure of the outlet during the execution of the outlet channel clearance in order to exclude the possibility of damage to the outlet channel after the sudden lowering of the slope.

The work of lowering the slope and demolishing the bottom sill on the Olt River will be carried out outside the spawning period of the fish species and the period immediately after spawning, when the newly hatched fry are highly susceptible to any kind of negative change.

The ideal time to carry out bed clearance work is during the low-water period, when temporary access ramps into the bed can be made without significant difficulties. The existence of these ramps contributes to increasing the accessibility of the excavation machinery to the work area, and to reducing excess movements in the bed.

During this period the vulnerability of the ichthyofauna is quite high. It is therefore proposed that the clearing be carried out alternately along the two banks, so that the water flow is diverted towards the bank where the bed has been cleared, followed by clearing the opposite bank. In order to protect ichthyofauna (water clearing), a break of at least one day should be taken after every two days of work.

Photo 65 Bottom sill proposed for demolition

2. *Lotrioara CHE development*

According to the approval decree, the Lotrioara CHE included: Lotrioara reservoir, NNR = 360,00 mdMB; Volume in the lake: ca. 5,3 mil. m3; Optimization according to Opinion No. 116/2009 on the Lotrioara development:

- NNR in the reservoir reduced by 2 m compared to the approved version, respectively at 358,00 mdMB, compared to 360,00 mdMB according to the Decree;
- works for the protection of the railway on the length of 5140,00 m;
- DN7 protection on a length of 8400 m;

Variant A

The dam-power station is located in the minor bed of the Olt river at about. 600 m upstream the Lotrioara stream. The power station is located to the right of the spillway dam. The reservoir develops in a steep gorge area, on the left bank it has the CF embankment, and on the right bank the DN platform, which is about. 2 m below the level of the CF. The lake being thus cut off on both banks, the initial project envisaged works to raise the DN and defend the CF.

Variant B

NNR in the reservoir is reduced from elevation 360,00 according to the Decree to elevation 357,00 mdMB. The elevation of 357.00 mdMB was imposed by the National Roads Administration Brasov, to be one meter below the DN7 elevation in the dam section;

Photo 66 Location CHE Lotrioara, left bank

Photo 67 Location CHE Lotrioara, right bank

Situation of CHE Lotrioara storage

All of the weirs realized are currently below water level. To be a functional fish ladder, the fish ladder should be sized to meet the following construction requirements: as shallow as possible slope, significant width, built on a serpentine vertical slot pattern, no large sills (depending on the fish species present). A fish ladder will be constructed both downstream to upstream and upstream to downstream. The ladder inside the dam will ensure that fish species living near the bottom can find the entrance to the ladder to move downstream.

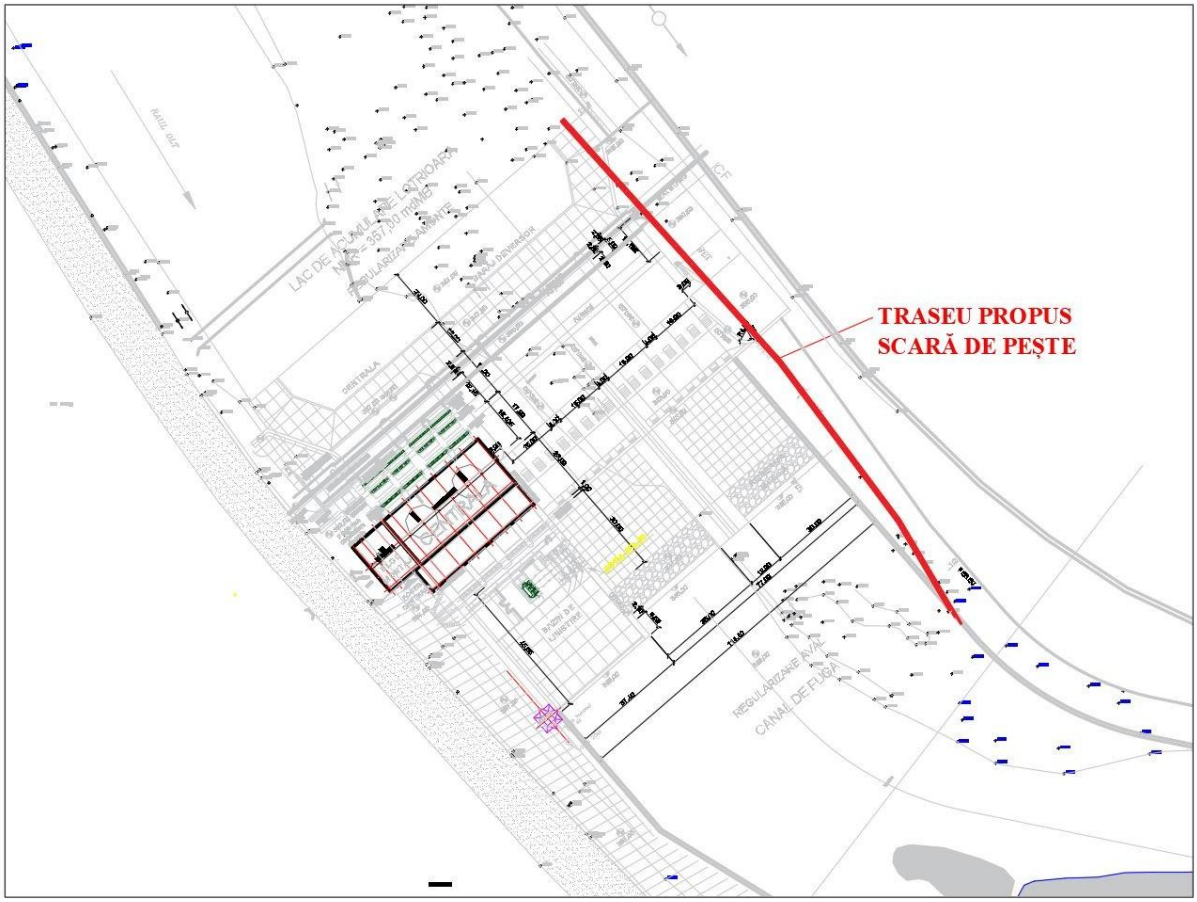


Figure 81 Proposed fish ladder route in the CHE area

The fish ladder (or fish passage) of any type of construction shall consist of an entrance area acting as an attractor (to attract fish), a passage area consisting of pools with generous surface areas appropriate to the size of the fish, and an exit area, and if necessary a fish guiding spur shall be placed upstream and/or downstream.

The entrance area must exert the necessary attraction to guide the fish transit. An ecological flow must therefore be provided by means of fish ladders, possibly supplemented by an auxiliary volume of water by means of motor pumps.

The crossing area should be arranged in such a way that the bottom of the enclosure in principle should be as close as possible to the roughness and composition characteristics of the natural ones. The bottom substrate in the interior shall run continuously over the entire surface of the fish ladder. The material used for the bottom layer shall have an average grain diameter of at least d 50-60 mm. The minimum thickness of the bottom layer shall be approximately 0,2 m. It is advisable to incorporate several large stones with the pouring of the underside of the staircase so that the concrete will set these stone blocks which in turn provide increased stability of the smaller aggregate sizes. This substrate acts to favor access for benthic fauna, as well as to reduce the velocity of the water current, creating the possibility for small or resting fish to advance. Water depth in the fish ladder should be a minimum of 0.5 m above the substrate.

Noonan et al. (2012) analyzed data from 122 scientific papers and found that the effectiveness of fish ladders that were constructed to provide upstream connectivity was only

41.7%, we must also consider this, namely that even a well-designed and constructed fish ladder will only partially resolve connectivity. In addition, some fish, even if they could get over these weirs (using the fish ladders or the constructed fish ramp), will not do so, as they will not exert additional effort, switching to sedentary life, as published by Branco et al. (2017), thus using unsuitable but more easily accessible habitats for survival.

3. CHE Câineni

According to the decree of approval, the CHE Câineni development included: Câineni reservoir, NNR = 348,00 mdMB; Volume in the lake: ca. 5,8 mil. m^3; Optimization according to the Opinion No. 116/2009 on the Câineni development:

- NNR in the reservoir minus 1,00 m, i.e. 347,00 mdMB, compared to 348,00 mdMB (according to the Decree);
- realization of a right bank breakwater for the defense of the CF having the height of the crown elevation at 349,00 mdMB, with a length of 2850 m;
- access to the junction is realized by bridge over DN7, downstream of the junction;
- defense works on DN7 on a length of 1125 m;

Variant A

The Câineni reservoir develops practically between the two slopes with the CF and DN on the right bank. From the point of view of the defense works of the CF and DN, the situation is similar to that of the Robești reservoir. In the retention front the center is located to the right of the dam. At the Câineni dam, adjacent to the left bank basin, a float spillway was provided to evacuate and transit the floats. This spillway was of the vat type and had a flap valve and mechanism chamber, and the opening of the discharge front was 16.00 m. The reception of the floats discharged by dumping over the flap was through a catch basin. This channel would be converted into a bypass channel to connect the dam with the downstream Oltul.

Variant B

- NNR in the reservoir = 347,00 mdMB, compared to 348,00 mdMB (according to the Decree);
- realization of the right embankment embankment for the defense of the CF (it is not necessary to raise it) located between the right embankment of the power plant and the viaduct crossing DN7 (the area where the CF crosses the right slope of the gorge) - with a length of approx. 2800 m;
- DN7 remains in its current position for the entire length of the Câineni reservoir, with no need to raise it. There will be areas where national road protection will be built;
- The connection of the hydrotechnical junction with the right bank and the right bank embankment will be an integral part of the protection of the railroad;
- the float spillway will be dispensed with as experience has shown that it is not necessary. Findings on the float inflow to the Cornetu reservoir have led to the idea of abandoning this opening. The opening will be incorporated in the left bank platform which continues with the left bank embankment;

- The starting elevation of the invert of the outlet channel at the connection with the rhizberma was changed, with the lowering of the NNR in the Câineni reservoir from 334.00 to 333.50 mdMB. As the stilling basin of the power plant (and its wall) is already built at 334.00 mdMB, the change to 333.50 mdMB will be made by means of a prism of rock fillings in front of the stilling basin;
- with the abandonment of the floating spillway, the design concept of the upstream left bank wall is modified, adopting a wall section with a variable crest elevation from 350.50 mdMB to 337.00 mdMB (upper left bank breakwater seal elevation);

Photo 68 Existing buildings CHE Câineni

Situation of the CHE Câineni reservoir:

According to the project, a longitudinal channel will be built on the right bank in order to collect meteorological waters from the right slope where the existing communication routes (Railroad, National Road) are located. This will also ensure the longitudinal continuity of the aquatic fauna, connected upstream to the NNR elevation, and downstream to the downstream elevation foreseen in the project.

The geometric characteristics of this channel are determined in relation to the year-round ecological flow, which will complement the sanitary flow downstream of the CHE, i.e. the stormwater flow and the longitudinal slope of the passage.

This channel will be a semi-natural channel, with stones/boulders placed on the concrete embankment and a crushed stone protection on the sides of the channel, and consists of an entrance area acting as an attractor (to attract fish), a through area and an exit area.

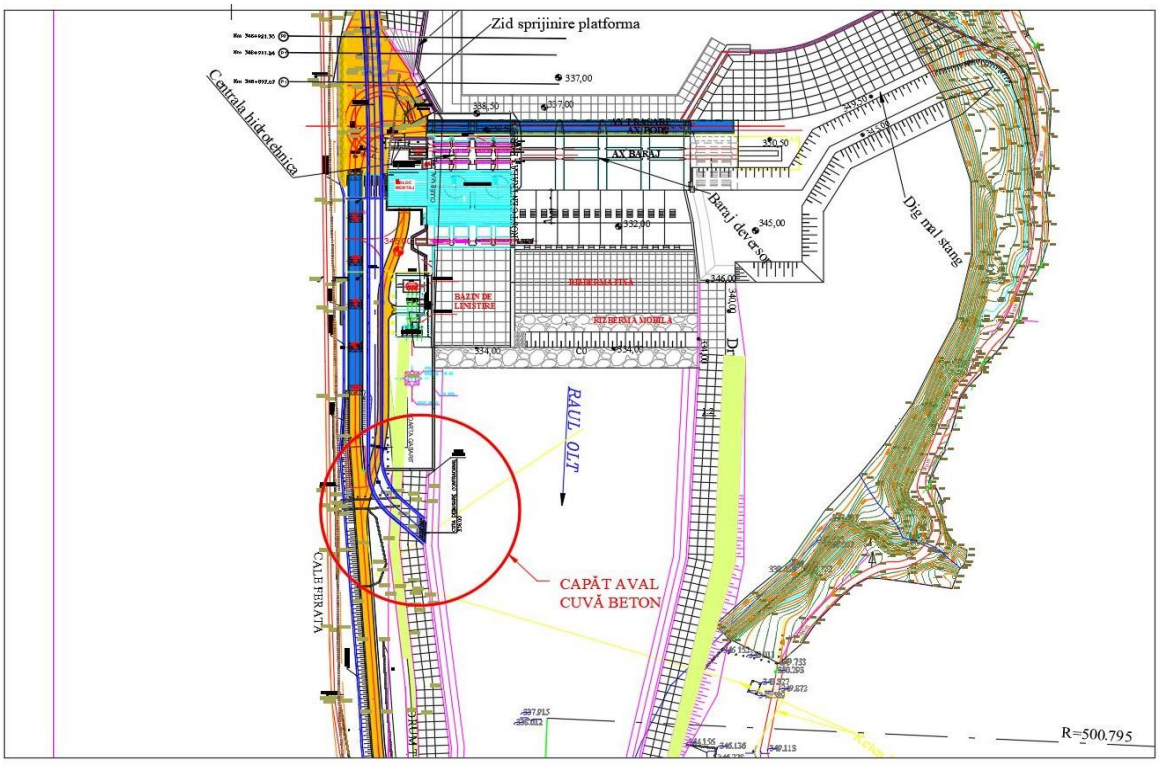


Figure 82 Connection of the passage to the run-off channel downstream of the CHE

Photo 69 Existing concrete tank section

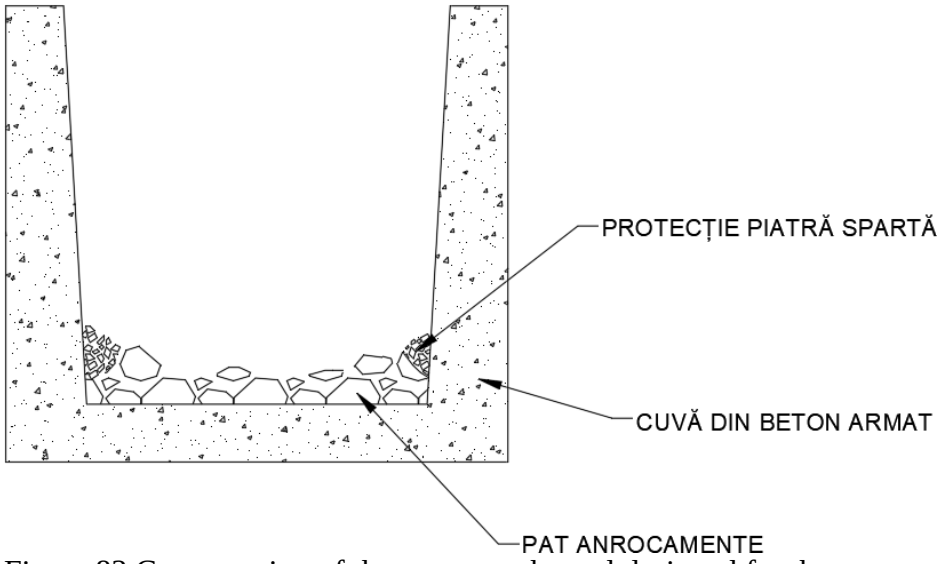


Figure 83 Cross-section of the concrete channel designed for the passage

At the upstream entrance of the channel it is recommended that at the entrance (attraction) zone the flow velocity vector of the water should be perpendicular to the entrance section so that the flow does not swirl and the minimum depth at the entrance is recommended to be 0.3 m.

At the downstream outlet of the channel it is recommended that for the maximum water velocity at the outlet to be
between 0.05 m/s and 0.3 m/s depending on the size of the migrating fish.

The channel will be connected to the slope of the Olt river and a spur (spur) will be built at both ends to train/direct fish species towards the entrance of the channel.

Noonan et al. (2012) analyzed data from 122 scientific papers and found that the effectiveness of fish ladders that were constructed to provide upstream connectivity was only 41.7%, we must also consider this, namely that even a well-designed and constructed fish ladder will only partially address connectivity. In addition, some fish, even if they could get over these weirs (using the fish ladders or the constructed fish ramp), will not do so, because they will not exert additional effort, switching to sedentary life, according to data published by Branco et al. (2017), thus using unsuitable but more easily accessible habitats for survival.

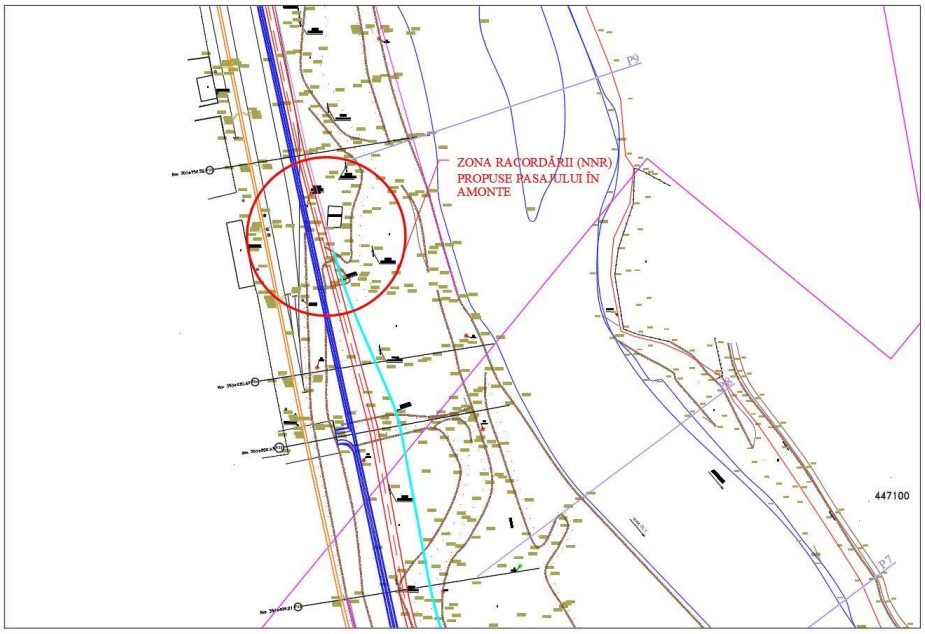


Figure 84 Connection of the passage upstream of the CHE

f) General provisions

Fish ladders should be located where fish moving upstream or downstream can quickly identify its entrance. In general, the entrance should be located immediately downstream of the barrier and adjacent to the dominant source of water (attraction flow). In other cases, the location of the fish ladder entrance may be downstream or lateral of a highly turbulent area or near another source that may play the necessary attraction role.

The maintenance of the construction and possible installations is a very important activity that requires appropriate equipment and trained personnel. Subsequent changes in the water flow regime, the mobility of the bed in the constructed stretch, the development of riparian vegetation may affect the proper functioning of the fish ladder. The implementation of a program to control the efficient functioning of the fish ladders is necessary in order to keep the fish ladder functioning at its best parameters over time. As a result, it should be constructed in such a way that it has a low tendency to clogging and is reliable in operation, requiring low maintenance efforts.

The size of a fish ladder obviously depends on the difference in level in the cross-section of the obstacle and the size of the ladder enclosure. But making a linear ladder with the entrance far downstream leads to inefficiency.

Another important aspect is the movement of fish downstream of cross barriers on rivers. Fish may encounter man-made structures such as dams, which may pose a risk to their survival or cause physical damage (e.g. turbines installed in hydropower plants, weirs or weirs). Ensuring the safe downstream movement of fish is usually implemented by diverting the route as far as possible away from hydropower intakes or weirs. This approach requires fish flows to be diverted to a route protected by a solid or impermeable structure.

Ecological flow:

According to the Good Practice Guide for the planning and implementation of investments in the micro-hydropower sector (Nistorescu et al. 2016): 'the ecological flow must take into account the seasonal dynamics of water flows as well as the quantifiable effects of climate change. The ecological flow must ensure habitat conditions for protected species also in low water situations (summer and winter periods). The ecological flow should have a minimum of 2 values (ideally 4): one higher for high water periods (generally spring and early summer) and one for drier periods (summer and winter), to best mimic the natural flow of the river. In all cases, however, the ecological flow must be at least 25% of the multiannual average flow. Since fish ladders ideally function only at a certain flow, the ecological flow has to be provided in 2 ways (sections): one part on the fish ladder (in dry periods all the ecological flow has to be provided only on the fish ladder) and the other part somewhere near the fish ladder (the excess flow during periods of higher flows).

"The ecological flow shall be accompanied by provisions for water flow velocity ranges and minimum water column height such that the habitat requirements of each aquatic species of conservation concern are provided."

"It is advisable not to use ultrasound-based solutions for flow monitoring activities, which can limit fish transit, but solutions based on pressure transducers."

These provisions, even if formulated for micro-hydropower plants, we consider that they are also appropriate for plants in the study area.

Parameters for Lotrioara fish ladder and Câineni bypass:

Taking into account the fact that the largest fish in the two intervention areas is the catfish (*Silurus glanis*), we consider that the size of the ladder and the bypass should correspond to the requirements of the species in question, so they will be adequate for the other species present.

Zonarea: Epipotamal, Specia după care se defineşte mărimea: somn (*Silurus glanis*)	Lungime (cm):	120
Disiparea de energie (W/m^3): 100	Lăţime (cm):	18

Dimensiuni pentru stabilirea tipului pasajului pentru peşti

Tip pasaj pentru peşti	Diferenţă de nivel (cm)	Cădere maximă (%)	Lungimea minimă a bazinului (cm)	Lăţime minimă (cm)	Adâncime minimă-maximă a bazinului/ cavitate (cm)	Volum bazin (m3)	Dotaţie (l/s)	Adâncime minimă-maximă a fantei/vad	Lăţime minimă cădere/vad (cm)	Lăţime minimă a fantei (cm)
Pasaj cu bazine (pool and weir ladder)	10-13		530	320	120	9,9	780	79		75
Pasaj de tip bypass		0,5			120		930	45	370	
Pasaj cu fantă verticală (vertical slot)	10-13		370	250	120	11,6	910			50
Rampă treptată pentru peşti	10-13	*)	*)	*)	130	*)	*)	87	*)	75

In the absence of a guideline for the dimensions of fish passages in Romania, we propose for guidance the data from the Austrian Guidelines for the Construction of Fish Passages (BMLFUW (2012):

*) The minimum depth of the pools should be 10 cm deeper than the pool and weir ladder because of sediment transport. In the case of high sediment input it is recommended that the pools be 20 cm deeper.

g) Ichthyofauna monitoring

Given that the effects of the proposed project will be long-term, it is necessary to monitor the ichthyofauna in this way:

- twice a year before and during construction works;
- twice a year for the first 5 years after putting the investment into operation;
- monitoring sites: a. general monitoring at project level before and after the realization of the investment, b. fish ladder at the confluence Sebeș-Olt, fish ladder at Lotrioara and the bypass channel at Câineni after the realization of the investment.

Monitoring will be based on 2 methodologies:

Inventory with the electronrose machine: the inventory will be carried out at the same assessment stations as in the current study (the 29 stations).

Telemetry based on PIT tags (fish ladder at the confluence of the Sebeș-Olt river, fish ladder at the CHE Lotrioara and bypass at the CHE Câineni): If a fish ladder or fish ramp is installed, it must be monitored in order to document its functionality or non-functionality. The fish ladder/fish ramp shall be equipped with automatic telemetry monitoring system based on PIT tags. This monitoring system shall be included in the design phase. Two readers need to be installed: one at the entrance of the fish ladder (downstream side) and one at the exit of the fish ladder (upstream side), the same as for the fish ramp, thus making it possible to track whether fish have managed to enter the fish ladder, the time spent by the fish in the fish ladder

and whether the fish have managed to pass over the fish ladder or have returned. If it is found that the fish ladder needs to be changed, this should be done as soon as possible. Monitoring of fish ladders/fish ladders shall be carried out over a period of at least 10 years by specialized personnel.

h) Comments/conclusions and final provisions

The difficulty of fish movement downstream of existing transverse hydro-engineering works on rivers needs to be carefully considered as fish may encounter obstacles or water inflows that may pose a direct risk to their survival or indirectly through the damage to natural habitats of fish fauna. By considering and practicing these issues such as minimal delays in movement or the lowest possible rate of stress, fish injury and mortality can be reduced. Ensuring the safe downstream movement of fish is usually implemented by diverting the route as far as possible away from hydropower intakes or impoundments, usually by means of bypass channels or spillways. This approach requires fish flows to be diverted to a protected and close-to-nature pathway to safe routes.

In order to prevent these difficulties downstream of the hydropower facilities, it is also necessary to restore the riverbed to its natural state, preserving the meanders, without removing small and medium-sized obstacles in the riverbed that do not jeopardize the integrity of the banks or possible bank defenses. For the run-off channel, which is the stretch of artificial bed immediately downstream of the hydropower plant, where large flows generally run off and carry with them considerable quantities of silt, it is preferable to create a series of vertical baffles, which are attached laterally, in order not to obstruct the transit section, thus creating, regardless of the water level, shelter and countercurrents to help fish to move through the stretch. These baffles can be fixed to the channel wall perpendicularly or at an angle of 30-90°, as well as vertically inclined, allowing the transit of floats and avoiding blockage of the channel. Depending on how they are fixed, they can also be adjusted under different angles or spacing.

The present study recommended the way and nature of ensuring the continuity of the three hydropower schemes, such as the extension of the fish ladder at the outlet of the Șebeș stream and the execution of the Olt river clearance downstream of the Racovița CHE, the provision of the right bank embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of the Câineni CHE or the introduction of a fish ladder after completing the existing weirs at the Lotrioara CHE.

e) Climate and climate change

General information

In the context of the increasing importance given to climate change issues, taking into account the requirements on climate impact analysis in the Law No. 292/2018 on the assessment of the environmental impact of certain public and private projects, in order to have a uniform approach at national level on the measures to be taken to avoid duplication of assessments and taking into account the European Commission's guidelines on climate-proofing of infrastructure projects, the objective of this assessment is the analysis of the project to climate change and the formulation of adaptation measures. The climate change assessment and management for the present project was based on the "National Strategy on Adaptation to Climate Change for the period 2022-2030 with the perspective 2050" (SNASC) and the "National Action Plan for its implementation" (PNASC), available climate data and European Commission documents (e.g. Technical guidance on the climate proofing of infrastructure in the period 2021-2027).

The priority objective of the assessment took into account the fact that climate change and the associated risks are driving major changes in the interactions between socio-economic systems and the natural environment. Adaptation and capitalizing on new opportunities are a priority for increasing the resilience of society, the economy and the natural environment to the impacts of climate change, and at the same time constitute the enhancement of adaptive capacity and increasing the resilience of socio-economic and natural systems to the impacts of climate change, across different areas and time scales. Ex-ante assessment of vulnerability to climate change is an important step in the process of determining appropriate adaptation measures to climate change. This Ex-ante vulnerability analysis is divided into three modules comprising climate change sensitivity analysis, assessment of exposure to current and future climate variables, and the combination of the two for climate change vulnerability analysis.

The Ex-Ante Vulnerability Analysis for the analyzed project is based on the European Commission's Directorate General for Climate Action - Guidelines for Project Managers, its requirements being applied according to relevance and data available. According to these guidelines, the following steps have been followed in the climate change vulnerability analysis:

- Identify the climate sensitivity of the area;
- Assessment of project exposure to current and future climatic factors (climate variables);
- Vulnerability analysis;
- Risk assessment;
- Identifying adaptation options;
- Assessment of adaptation options;
- Mainstreaming adaptation.

Infrastructure is usually long-lived and may be exposed for many years to a changing climate with extreme weather events and increasingly frequent and adverse climatic impacts. Under the supervision and control of the public authorities concerned, climate vulnerability and risk assessment contributes to the identification of significant climate risks. The assessment

is the basis for the identification, consideration and implementation of specific adaptation measures. This will help to reduce the residual risk to an acceptable level.

Climate change adaptation measures for infrastructure projects focus on ensuring an adequate level of resilience to the impacts of climate change, which includes extreme events such as more intense floods, cloudbursts, droughts, heat waves, forest fires, storms and landslides and hurricanes, as well as slow-onset events such as projected sea level rise and changes in average precipitation, soil moisture and air humidity. In addition to taking into account the climate resilience of the project, measures must be in place to ensure that the project does not increase the vulnerability of neighboring economic and social structures.

Analyzing the vulnerability of a project to climate change is an important step in identifying appropriate adaptation measures to be taken. The analysis is divided into three steps, comprising a sensitivity analysis, an assessment of current and future exposure, and then a combination of the two for the vulnerability assessment. The purpose of the vulnerability analysis is to identify the climatic hazards relevant to the specific type of project at the planned site. The vulnerability of a project is a combination of two aspects: how sensitive the project components are to climate hazards in general (sensitivity) and the likelihood of these hazards occurring at the project site now and in the future (exposure). These two aspects can be assessed separately or together.

Climate change mitigation

According to Romania's Energy Strategy 2016-2030, with the perspective of 2050, climate and environmental policies, focused on reducing GHG emissions and changing social attitudes in favor of "clean energies" are a second determining factor shaping investment behavior and consumption patterns in the energy sector.

In the long term, renewable energy sources (RES) will make up a substantial part of the energy mix, with management systems and mechanisms to facilitate their integration. Global warming will force the transformation of the global economy towards a sustainable model, both in terms of emissions and consumption of raw materials. The 2015 Paris Agreement and European policies to prevent climate change contribute to a sustainable energy system. Commitments made at COP21 are boosting the development of low $CO_{(2)}$ technologies and fuels. According to the International Energy Agency, CO_2 emissions from the global energy sector stagnated in 2015, with a 1.8% reduction in energy intensity and an increase in the share of RES. In the central scenario of the International Energy Agency, in 2040 most RES will be competitive without dedicated support schemes; photovoltaics will have an average cost decrease of 40-70% by 2040 and offshore wind will have average costs at least 10-25% lower. Among fossil fuels, natural gas is seen as the favorite, due to its relatively low GHG emissions and the flexibility of combustion plants using it. Coal has increased its share in the global energy mix from 23% in 2000 to 29% today, but this growth wave has come to an end

Project exposure to climate change

According to the MMAP Circular no. DGEICPSC/108047/08.08.2023 on the degree of importance given to climate change aspects in the approval of applications for financing from European funds, in order to use the recommendations of the Communication COM having no. 2021/C372/01 - Technical Guidelines on Climate Change Impact Assessment for the period 2021-2027, for the Cornetu Avrig AHE project, analyses were carried out on the main risks identified: the risk of flooding, the risk of exposure to minimum-maximum temperatures in a time horizon, as well as the risk of exposure to potential landslides.

One of the main objectives of the National Climate Change Strategy 2022-2030 is the implementation of strategic measures to directly and indirectly reduce greenhouse gas emissions.

Climate change is a comprehensive element that can be analyzed through the prism of several determining factors. The impact of climate change on hydropower projects is one that is analyzed at international level from the perspective of the multiple effects it can have both at operational and project development/modernization level.

The project sensitivity analysis considered the following climate variables:

- average annual temperatures;
- extreme high temperatures;
- mean annual precipitation;
- extreme heavy precipitation;
- average wind speeds;
- extreme wind speeds;
- humidity;
- snow;
- frost;
- solar radiation,
- storms (tornadoes);
- flooding;
- landslides/soil erosion;
- drought;
- wildfires.

Table 85 Key climate variables and associated hazards identified

No. crt.	Climate factors	Climate-related side effects/hazards
1.	Air temperature (rising air temperature, extreme temperatures, heat waves, sudden drops in air temperature)	Storms (heavy rain, snow, blizzard, blizzard, dust storms), threats to biodiversity for some bird species, mammalian species
2.	Changes in precipitation, extreme precipitation	Floods, landslides

3.	Wind (change in wind speed and/or direction)	Reduced visibility, wildfires, landslides
4.	Drought	Wildfires, soil erosion, land use change, damage to ecosystem services in agriculture, forestry, fisheries
5.	Humidity	Threats to biodiversity for certain types of animal and plant species facing changes in their life cycle
6.	Solar radiation	Threats to biodiversity, specific species and habitat types

Table 86 Degree of sensitivity to climatic factors

No. crt.	Climate sensitivity	Description
1.	High	Climatic factors (climate variables/associated hazards) may have a significant impact on the proposed project
2.	Average	Climatic factors (climate variables) may have a moderate impact on the proposed project
3.	Small	Climatic factors (climate variables) do not have an associated impact on the proposed project.

As a result of the above analysis, the project sensitivity assessment revealed the following climate variables with an average sensitivity across project components:

- extreme high temperatures;
- extreme heavy precipitation;
- extreme wind speeds;
- frost;
- storms (tornadoes);
- flooding;
- landslides/soil erosion;
- wildfires.

After climate sensitivity assessment, the next step is exposure assessment (to current and future climate variables). The project exposure assessment should be carried out in relation to current as well as future climate conditions.

Table 87 Climatic exposure levels

No. Crt.	Exposure to climatic factors	Description
1.	High	Exposure to climatic factors can have a significant impact on assets and processes inputs, outputs.
2.	Average	Exposure to climatic factors can have a moderate impact on assets and processes inputs, outputs.
3.	Small	Exposure to climatic factors has no associated impact on it.

The role of the energy sector in climate change mitigation and adaptation

The energy sector, including the combustion of heating and motor fuels in internal combustion engines, is the main contributor to GHG emissions. For this reason, the power sector plays a central role in mitigating global warming and GHG emissions need to be reduced gradually but drastically. Reducing GHG emissions in the power segment can be achieved through a gradual transition from fossil fuels to GHG-free fossil fuels - RES and nuclear power, with the intermediate step of replacing coal by natural gas. Coal and natural gas can maintain their place in the electricity mix by adopting the most efficient and clean technologies - including, in the long term, the installation of CO_2 capture equipment, with CO_2 transport and geological storage (CCS). CCS (the process of capturing, transporting and geologically storing CO_2 emissions) is in its infancy and is costly. In transport, the reduction of GHG emissions occurs primarily by increasing vehicle efficiency. However, the reduction in specific fuel consumption is offset by increased mobility, so that total emissions are still slightly increasing. Sustainable, large-scale biomass recovery is important for Romania. The use of electricity-based heat pumps from RES is also expected to expand, while natural gas will continue to play an important role for heating. The most important contribution to reducing GHG emissions in the heating sector will, however, come from decreasing demand by increasing the energy efficiency of buildings. In the short term, measures to insulate chambers with high quality standards are needed; in the long term, energy efficiency standards for new buildings, including passive and active chambers, will have an effect. Romania has commitments at EU level for 2020 on the share of RES in final energy consumption and in the transport sector, i.e. targets to reduce GHG emissions and increase energy efficiency. The national targets for 2030 will be subject to an iterative and multilateral quantification process at European level through the National Integrated Energy and Climate Plan (NIICP), part of the new approach to Energy Union governance. They will be submitted by January 1, 2019. Romania will make a fair contribution to the EU's common GHG emission reduction target. Romania will increasingly face extreme weather events such as heat waves, droughts, floods and hail storms . The energy sector also plays a key role in climate change adaptation. Most important in this context will be sound forest management, sustainable development of energy crops and hydro-energy

development of watercourses. In all these areas, ongoing activities must take into account the resilience of ecosystems to climate change as anticipated in the most recent detailed studies. Equally important is that the related investment projects contribute constructively to the process of ecosystem adaptation to climate change, in a timely manner and at the scale needed to avoid further ecosystem degradation and biodiversity loss. Examples of such investments are in making dams and dykes safer; effective monitoring of forest health, avoiding monocultures, etc.

The effects of climate change are increasingly visible in Romania and internationally, whether it is intense heat waves, droughts destroying agricultural production, floods or threats to biodiversity caused by wildfires. Climate change is one of the biggest challenges facing mankind and, implicitly, Romania, at a time of climate emergency.

For example, the National Strategy on Adaptation to Climate Change 2022 - 2030 identified the following challenges in the energy sector in Romania:

- a decrease in electricity demand for heating in winter as a result of rising average global temperatures;
- increased electricity consumption to run air conditioners and cooling devices on hot days;
- seasonal changes in electricity demand, which will be lower in winter and higher in summer;
- reduction of hydropower due to decreasing water resources (decreasing water resources also affect the operation of cooling systems of nuclear power plants).

The risks identified by the International Energy Agency in the energy sector due to climate change impacts are extreme weather events (storms, forest fires, landslides, floods, extreme temperatures), which affect energy production and distribution infrastructure, cause supply disruptions and damage infrastructure that depends on energy supply. The risk to energy infrastructure increases with the frequency and intensity of certain types of extreme weather events.

Changes in water availability will exacerbate existing challenges for energy production. Reduced water availability and increased demand for water by the population will create constraints in hydropower, bioenergy (in particular biogas production), solar energy systems, and the operation of thermal power plants (fossil and nuclear fuels), which require water for cooling. On the other hand, too much water (flooding, extreme precipitation, storms) poses challenges for energy infrastructure.

Unusual seasonal temperatures can change energy demand patterns. For example, higher summer temperatures increase electricity demand for cooling, and corresponding peak loads may require additional generation capacity, while warmer winters will reduce heat demand.

Sea level rise will affect energy infrastructure in coastal and offshore areas. The biggest concern is storm surges due to higher amounts of water being transported by winds, tides, waves.

f) Noise

At present, the site area is characterized by low noise and vibration due to the absence of industry and other major sources of auditory discomfort in the main localities adjacent to the project. The main source of noise and vibration is road traffic on the main arterial roads in the towns. The frequency of traffic is higher during periods of increased tourist numbers. The noise levels generated are within the limit values for the protection of the population.

In order to determine the background noise in the project area, specific determinations were carried out in November 2023 with Integrating Sound Level Meter on A, C type 2250 Light BRUEL & KJAER A, C type 2250 Light weighting networks.

- **Principle of the method**

For ambient noise measurements there are two main strategies:

- a single measurement is made under favorable weather conditions, while closely monitoring the source operating conditions
- a long-term measurement or several point measurements, dispersed over time, with monitoring of meteorological conditions.

Both types of measurement require further processing of the measured data. Each result will have some uncertainty, which needs to be determined.

The principle of the method is the determination of the A-weighted equivalent continuous sound pressure level (LAeqT) using a class 1 integrating-averaging sound level meter.

Determination of LAeqT can be performed:

- by continuous measurement over the time interval T;
- by measuring the A-weighted equivalent continuous sound pressure levels over time subintervals of T in which the noise is stationary, LAeqT being obtained by calculation from the results of these measurements;
- by measuring the sound exposure levels of the individual events occurring over the time interval T, LAeqT being calculated from the results of these measurements;
- by combining the above methods.

The acoustic sources contributing to the total field exposure may or may not be distinct. Measurements shall be performed in the field, the determinations may be supplemented by computational steps, including the use of specific validated software.

- **Equipment**

- Integrating sound level meter on A,C weighting grids, class 1- Bruel&Kjaer 2250 Light, series 3011282

Technical specifications

- class 1 precision integrating sound level meter
- Measurement range 16.4 dB - 140 dB(A)
- Frequency range 5 Hz - 18 kHz
- frequency analysis module, provides real-time 1/1 and 1/3 octave analysis
- frequency weightings A, B, C, Z
- automatic/manual measurement mode

- touchscreen
- illuminated keyboard
- USB interface, PC software

– Class 1 acoustic calibrator type 4231 - Bruel&Kjaer

Technical specifications

- According to SR ISO 6926:2003
- Sound pressure level 94± 0,2 dB or 114± 0,2 dB
- Frequency 1000 Hz
- Tripod sound level meter - Bruel&Kjaer

Determinations were carried out in the 4 project areas as follows:

- Zone 1 - DJ104F - Lake Racovița dam;
- Zone 2 - On the Racovița Dam;
- Zone 3 - Lotrioara dam;
- Zone 4 - At Câineni dam.

The values obtained are assessed in relation to:

➢ A-weighted equivalent continuous A-weighted sound pressure level, L_{AeqT} provided in SR 10009/2017 "Acoustics. Permissible limits of ambient environmental noise level", item 4.1 "Permissible limits of noise level at the boundary of functional spaces", Table 1, item 4, which states:

Table 88 Sound pressure level limits

No. crt.	Functional spaces	A-weighted equivalent continuous A-weighted sound pressure level, L_{AeqT} (dB)
1	Spaces for recreation and relaxation, medical treatment and balneotherapy	45
2	School, nursery or kindergarten premises and children's playgrounds	75
3	Stadiums, open-air cinemas and theaters, open-air cultural, sporting and entertainment events[1)]	90[2)]
4	**Industrial premises and premises treated as industrial premises[3)]**	**65**
5	Markets, shopping areas, open-air restaurants[4)]	65
6	Parking[5)]	70
Note 1 - The boundary of such premises shall be deemed to be the space exclusively arranged for the specific activity and not the boundary of the property to which the premises belong, which may be wider Note 2 - The period of time to be taken into account for the application of the permissible limit is the actual period corresponding to the length of service Note 3 - Any space that has commercial manufacturing or maintenance activities (such as car service, car washes, etc.) and that is not located in an industrial zone established by the PUG. The boundary of the functional space is the property boundary of this space according to the cadastral plan (including land)		

Note 4 - The boundary of such premises shall be deemed to be the boundary of the space for the specific activity and not the boundary of the property to which the premises belong, which may be wider

Note 5 - The boundary of this space shall be deemed to be the boundary of the space exclusively designated as a parking space and not the boundary of the property to which the space belongs, which may be wider, and the permissible limit shall apply only to parking spaces serving large economic objectives (shopping complexes, office buildings, etc.) or which are similar to parking spaces serving such objectives and shall not apply to parking spaces along arterial roads.

Table 89 Measured values of A-weighted equivalent continuous sound pressure level, L_{AeqT}

Sample code	Test method	UM	Value obtained	Permissible limit values
Zone 1	SR 6161-1/2022; SR ISO 1996-1:2016; SR ISO 1996-2:2018; PSL 28	dB(A)	**49,5**	**65**
Zone 2			**51,3**	
Zone 3			**59,4**	
Zone 4			**60,3**	

As can be seen from the table above, the noise values in the monitored area are currently below the maximum permissible thresholds.

As can be seen from the table above, at present, the ambient noise levels in the monitored area are below the maximum permissible thresholds.

Sources of vibration and noise during construction

During the construction works, noise sources will be temporary in nature, generating local effects for a limited time. The physical pollution associated with the project at this stage is caused by noise and vibration generated by construction activities (vehicle and machinery engines, material handling, operation of earthmoving equipment used for site development, etc.).

The noise level regulated by STAS 10009/2017, "Urban acoustics, permissible noise level limits" is 65 dB(A) at the site boundary. According to the Order of the Ministry of Health No. 119/2014 for the approval of the Hygiene and Public Health Norms on the living environment of the population, the continuous equivalent weighted sound pressure level (AeqT), measured outside the dwelling according to the SR ISO 1996/2-08 standard, at 1.5 m height from the ground, shall not exceed 55 dB and the noise curve Cz 50. During the night (hours 23:00 - 7:00), the continuous equivalent sound pressure level shall not exceed 45 dB and the noise curve Cz 40.

In order to assess the level of impact generated by the proposed project, a noise source modeling was performed using the Sound Plan Essential 2.0 software application. A scenario considered as very likely, i.e. one in which several noise sources operate simultaneously during the execution of the works, was taken into account, considering the following noise levels:

- 1 bulldozer 110 dB(A);
- 1 truck 105 dB(A);
- 1 compactor 100 dB(A);
- 1 crane 104 dB(A);

The sources of noise will be of temporary character, being represented by:

- ✓ construction operations loading/unloading/loading materials and equipment;
- ✓ operation of equipment and vehicles involved in construction/erection works;
- ✓ vehicular traffic necessary for carrying out the works.

Normally construction work will take place during the day between 08:00 - 18:00. There are, however, operations that need to be carried out continuously, such as pouring concrete for foundations, which may also require night work.

The results of the modeling carried out with the SoundPLAN software show that, during the construction phase, the noise level generated by the project will not have a significant impact on the quality of living in the neighboring villages at the level of the nearest receptors, the operation of the equipment used in the modeling generating a maximum noise level of about 39 dB. The noise generated by the construction activities is not able to change the current noise level induced mainly by the motor traffic in the area.

At the level of protected areas, the noise generated by construction activities may lead to an increase in the equivalent noise level of up to 100 dB(A) over a distance of maximum 50 m, which could lead to a disturbance of species (especially birds) during the works, but given the site area in a forested area this increase will be significantly reduced in the immediate vicinity of the project.

Taking into account that the works carried out in the analyzed project will have a low contribution to the noise level generated in inhabited areas, we consider that no measures are necessary to reduce the noise level in relation to the settlements.

Sources of vibration and noise during operation

There will be no additional sources of noise and vibration during the operation of the project compared to the current road traffic.

g) <u>Inhabited areas - population</u>

1.) Location of the project in relation to inhabited areas

The location of the project overlaps with 2 Counties and 6 administrative-territorial units, as follows:

- CHE Racovița works overlap with u.a.t.s: Avrig, Racovița, Tălmaciu and Turnu Roșu (Sibiu County);
- CHE Lotrioara works overlap with u.a.t.s: Boița and Turnu Roșu (Sibiu County) and Câineni (Valcea County);
- The CHE Câineni works overlap with the Câineni u.a.t. (Valcea county).

2.) Description of inhabited areas in the project area

❖ ***<u>U.A.T. Avrig</u>***

Avrig is located in the foothills of the Făgăraș Mountains, on the Valea Oltului, at an altitude of about 400 meters. It is crossed by national road no. 1 and is located about 26 kilometers from Sibiu. Situated in a true natural amphitheater, where the relief rises and falls

from 2500 to 350 meters, Avrigul is characterized by a varied physical and geographical complex, both in terms of geological structure and morphological aspect

The southern side is crossed by the Făgăraș Mountains, called by the French geographer Em. de Martonne "Transylvanian Alps", the peaks of Suru (2281m), Budislavu (2345m), Ciortea (2426m) and Scara (2213m).

To the north it has as neighbors the communes of Rosia and Nocrich, delimited by Muchia Chirmovului, Dealul Nucului and Magura. To the east Avrigul is bordered by Porumbacu de Jos, the Racovicioara stream on the left side of the Olt and the Colunului Valley on the right side of the river. The western neighbors are the communes of Racovița, Tălmaciu and Șelimbăr.

Avrig ranks fourth in the county in terms of stable population. Taking into consideration the data provided by the Tempo online portal, accessible at https://sibiu.insse.ro/, we can observe that the population of Avrig has been on a slightly downward trend since 2015, in relation to the number of inhabitants. It has a population of 14,259 inhabitants and was documented in 1346, being declared a city in 1989.

A general feature of Avrig's current economic profile is the diversity of the fields of activity that local entrepreneurs are involved in. Avrig is currently in the process of shaping a new socio-economic identity, and it has to create a line of force that distinguishes it from similar urban structures and particularizes it.

From a historical perspective, however, Avrigul was a favorable place for trade, due to its location near the "border" with Walla Wallachia, Transylvania and Făgărașului, and the skills and abilities acquired over time are still expressly evidenced today.

At the moment, the city is showing development in industry on the one hand, and in agriculture and animal husbandry on the other. Locally developed branches of industry:

- light industry;
- machinery manufacturing industry;
- construction;
- wood industry.

The most significant share in its economic profile is given by the trade of consumer goods (furniture, food, textiles, etc.), timber, agricultural products, animal products. Being a transit area (practically linking Sibiu and Brasov on one of the major traffic arteries in southern Transylvania), commercial companies with transport as their field of activity have also been favored. The sustainable development strategy of Avrig aims at: industrial development, capitalizing on unconventional energies and scientific and technical resources to ensure the competitiveness and attractiveness of the location (Avrig) for investors.

One such initiative is the integration of Avrig in European projects, which promote the development and implementation of financial and technological scenarios as an integrated system, in order to increase the standard of living in local communities, improve energy efficiency and unconventional energy production, in order to achieve energy independence locally.

❖ ***U.A.T. Racovița***

The commune of Racovița is located at the foot of Suru Peak (2281m), on the contact zone between the submontane hills of the Făgăraș Mountains and the low alluvial terrace on the left bank of the Olt, at an altitude 385 meters.

The town is bordered to the north and northeast by the boundary of Avrig, a boundary that stretches from the confluence of the Mârșa Valley with the Oltul up to the Sorliței Peak, a boundary drawn after 1200 and marked as such with boundary signs called 'morminți'.

According to the 2011 census, Racovița Commune had a population of 2,760 inhabitants. However, over the last 10 years, the population has decreased by 154 people, representing a decrease of 5.58% compared to the 2011 census figures. Therefore, according to the information obtained in 2022, the population of Racovita Commune is estimated at 2,606 inhabitants. In Racovița Commune, the total population is 2,606 inhabitants. Of these, the age group with the largest population is between 40 - 49 years of age, in which there are 428 people, which is approximately 16.42% of the total population.

On the other hand, the age group with the fewest residents is the 80+ age group, with 120 people, i.e. 4.60% of the entire population of Racovița commune.

❖ ***U.A.T. Tălmaciu***

Tălmaciu is a town in Sibiu county, Transylvania, Romania, consisting of the component locality Tălmaciu (the residence), and the villages Colonia Tălmaciu and Tălmăcel.The town, with a population of 6,905 inhabitants, is located at a distance of 18 kilometers from the municipality Sibiu in the direction of Râmnicu Vâlcea on the national road 7 and on the railway line connecting Transylvania and Oltenia. The town is crossed by the Cibin River (tributary of the Olt) and the Sadu River.According to the 2011 census, the population of Tălmaciu is 6,905 inhabitants, down from 7,147 in the previous census in 2002. The majority of the inhabitants are Romanian (89.78%), with a minority of Roma (3.1%). From the confessional point of view, the majority of the inhabitants are Orthodox (90.3%), with a minority of Christians according to the Gospel (1.94%). 5.88% of the population does not know their confessional affiliation.

As the main administrative center of the area, Tălmaciu attracts the population from Tălmăcel and Boița, which have no possibility of development, and therefore no possibility of job creation.

In the town of Tălmaciu, the active population is mainly engaged in textile industry, clothing, wood industry, trade, manufacturing industry and in the surrounding villages mainly in agriculture and animal husbandry but also in other complementary activities (wood exploitation, timber, charcoal, coal, woodworking).

Since 1990, in the town of TĂLMACIU, 597 companies have been registered at the Trade Register.

The administrative territory totals 28.556 ha and is divided into two areas: an area on the right bank of the Olt, which includes the localities of Tălmaciu and Tălmacel and a mountainous area in the Lotrului Mountains, which includes forests and pastures with sheepfolds, climbing up to heights of 2135 m (Negovanu Mare peak). In the first area of the

administrative territory, at the confluence of the rivers Sadu and Cibin, is located the town of Tălmaciu - the administrative center of the area.

The village of Tălmăcel is located 3 km to the west, on the valley of Tălmăcel, at 528 m above sea level, with an area of 44.23 ha and is the second largest village (by area).

- The boundary between Tălmaciu-Veștem-Șelimbăr is represented by the Balta Neagră Pasture - Tălmaciu II Forest - Râura.
- The border between Tălmaciu- Racovița is represented by the arable land called Carpone.
- The border between Tălmaciu-Turnu-Roșu is established by the Valea Oltului.

The main communication routes are:

- ✓ national road DN7 which is also European road E81, which crosses the locality of Tălmaciu on a length of 3.20 km, with the name of Unirii Street, category III road;
- ✓ county road DJ105G - paved road with the name of Gh. Lazăr, category III-a road;
- ✓ communal road DC61 with the name of Băii and Tălmăcelului streets, both streets are asphalted, category III roads.

Other category III roads are also part of the main road network, their total length being 17.8 km, of which 9.47 km are asphalt concrete, 1.1 km are cement surfaced and 3.1 km are dirt or with existing hardening.

Rail:

Through the center of Tălmaciu passes the railway that connects Sibiu with the cities of Râmnicu Vâlcea and Brasov, here is also an important railway junction. In the central part of the city there is a passenger railway station, and in the northern part there is a C.F.R. area with maneuvering and storage areas.

❖ ***U.A.T. Turnu Roşu***

The commune Turnu Roşu is situated at the foot of the Fagaraş Mountains, in Transylvania, on the left bank of the Olt, at the confluence with the Cibinul, near the entrance to the gorge, about 25 km from Sibiu. The locality, situated close to the Olt bank, occupies that part where the river changes direction, heading south, after having crossed the Făgăraş Depression from east to west.

According to the 2011 census, the population of Turnu Roșu commune is 2415 inhabitants. The gender structure of the total population is 1178 males and 1237 females. In 2013, the population of the commune increased compared to 2011 to 2653 persons, of which 1233 persons are male and 1420 persons are female. According to the 2011 census, the situation of the inhabitants of the constituent localities of Turnu Roșu commune is as follows:

- in Turnu Roșu, the stable population is 1827 inhabitants;
- in Sebeșu de Jos, the stable population is 588 inhabitants.

The economic potential of the commune supports the following activities:

- Agriculture, mainly corn and potatoes;
- Forestry, logging, forest fruit and game exploitation;

- Tourism and agro-tourism activities, valorization of the natural environment and of the historical, religious and traditional architectural monuments of the commune;
- Small-scale industry and transportation - service establishments, repair establishments, establishments providing services to the public, etc.

In terms of employed population, industrial activities account for the largest share of the economy, followed by the service sector and then the agro-forestry sector. The workforce is skilled in heavy industry - mechanical engineering and textiles.

❖ ***U.A.T. Boița***

Boița Commune is located in the southern part of Sibiu County, at the entrance of Olt in the gorge, on the national (European) road DN7 - E81, 22 km from Sibiu - the county seat. Boița Commune has in its administrative territorial composition the villages:

- Boița - residence of the commune
- Lazaret - on DN7, 8 km from the residence, at the southern limit of the county, on the Valea Oltului;
- Lotrioara - on the DC73, 4Km South of Boița, on the Valea Oltului;
- Paltin - 8 Km South, accessed from DN7, via the logging road.

Situated in an area considered strategic since Roman times, Boița commune has predominant relations with the neighboring localities: Tălmaciu, Turnu Roșu and Câineni (in Valcea county), but also with Sibiu, only 22 km away.

Transportation in the Boița commune area is concentrated on the Sibiu - Rm. Vâlcea (E81), serving a whole range of economic activities, both local and county, national and international.

The village of Boița is located 22 km south of the county seat - Sibiu, which determines an increased efficiency of transportation of goods and people, locally, in a relatively short time.

On the territory of the commune, the transportation links between the villages of Boița and Lazaret are relatively easy, these two villages being connected by important traffic arteries: the national road 7 (DN7) and the European road E81 on the same route, ensuring in good conditions the connection of the villages with the neighboring localities.

A more difficult connection is established with the village of Paltin, through the national road DN7 and an unmodernized exploitation road - 8 km away from the village.

The connection with the village of Lotrioara, 4 km south, is made on the national road DN7, which connects with the communal road DC73, which crosses the territory of this village.

According to the census carried out in 2021, the population of Boița commune amounts to 1,410 inhabitants, down from 1,613 inhabitants in the previous census in 2011

Transportation in the Boita commune area is concentrated on the Sibiu - Rm. Valcea DN7 (E81), serving a whole range of economic activities, both local and county, national and international. Thus, the following major activities can be identified, which contribute to the economic and social development of the area, largely through the roads in the area (DN7 - E81):

- Commercial activities of valorization of local products - to Sibiu and Rm. Valcea - agri-food products, meat products and semi-prepared meat products, honey, wool, handicraft products, timber, etc..;

- Commercial and transportation activities - from Sibiu and Rm. Valcea - industrial consumer products, household products, passenger transportation, goods transportation, etc.; - Commercial and transportation activities - which do not directly influence the economic and social activities of the commune - goods and people transportation through the commune's territory on the Sebes - Sibiu - Rm. Valcea, E81 - DN7;
- Specific transportation activities: transportation of stone from the stone quarry Lotrioara (DC73) - rough stone, polished stone, building stone, etc.; transportation of wood in rough (logs) and semi-finished (timber).

On the territory of the commune, the transportation links between the villages Boita and Lazaret are relatively easy, these two villages being connected by important traffic arteries: the national road DN7 and the European road E81 on the same route, ensuring in good conditions the connection of the villages with the neighboring localities.

❖ ***U.A.T. Câineni***

Câineni Commune is located in the north-north-eastern part of Loviștei and Valcea County, respectively in the extreme north-eastern part of Oltenia and approximately in the central-southern part of Romania 20. The geographical coordinates of the municipality are 45º29' (southern limit) - 45º35'05 (northern limit) north latitude and 24º19' (western limit) - 24º29'15 (eastern limit) east longitude, respectively, and it is crossed by the Olt river from north to south, over a distance of 14 km. Câineni consists of the villages of Câinenii Mari, Câinenii Mici (residence), Greblești, Priloage, Râu Vadului and Robești.

According to the census carried out in 2021, the population of the commune of Câineni amounted to 2,484 inhabitants, down from the previous census in 2011, when 2,500 inhabitants were registered, generally engaged in livestock breeding, agriculture, various crafts and wood exploitation.

h) Material goods

ARCHAEOLOGY

The site area is identified as being quite rich in historical, cultural and archaeological elements including those of cultural heritage, so a detailed assessment of these elements in the project area was necessary in the impact assessment, the conclusions of this assessment are presented below.

Research methodology

We started by checking information on archaeological finds from several categories of sources.

1. The archaeological repertory of Southern Transylvania and Northern Oltenia;
2. National Archaeological Record (RAN);
3. List of Historical Monuments (LMI, Sibiu, Valcea county)
4. Articles and books;
5. Other databases.

methodology involved several stages of documentation, organized as follows:

1. Prior documentation of known and documented archaeological sites in the area.
2. drafting the text for this report, image processing.

Based on the information on the location of the necessary facilities for the Cornetu-Avrig hydropower plant, the report presents the archaeological findings in the area targeted by the hydropower plant.

Archaeological discoveries in the area of Bradu, Racovița, Turnu Roșu, Boița, Câineni, Câinenii Mari, Câinenii Mici, Greblești, Robești, Priloage, Racovița and Copăceni.

a) BRADU

The National Archaeological Register (RAN) records 5 sites in Bradu.

1. The Roman settlement of Bradu

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	144072.07
Name	The Roman settlement of Bradu
County	Sibiu
Administrative unit	Town of Avrig
Locality	Bradu
Reference point	The archaeological site is located on the right bank of the Olt, towards Săcădate.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	terrace
Category	Habitation
Type	settlement
Date of Last Record Update	02.02.2022

This point is also recorded in the work of S. A. Luca, Z. K. Pinter, A. Georgescu, Repertoriul arheologicul al județul Sibiu (Repertoriu Sibiu 2003 (ulbsibiu.ro)), with the following description: "4. On the right bank of the Olt, towards Săcădate, there are traces of a small Roman settlement. Fragments of Roman vessels and weapons are found here. Traces of a Roman road can still be seen on the surface. The Daco-Roman necropolis of Cașolț is about half an hour's walk from this site. *Bibliography*: *Ackner 1856*, p. 28; *Bielz 1899*, p. 31; *Popa 2000*, p. 164; *2002*, p. 43."

Information on this point also appears in D. Popa, Villae, vici, pagi. Asezările rurale din Dacia romană intracarpatică, Ed. Economică, 2002, villae, vici, pagi, Așezările rurale in Dacia romana (ulbsibiu.ro). It states that: '**106. BRADU**, jud. Sibiu *(11th century).* Ancient literature mentions a Roman settlement located between Bradu and Săcădate, on the right bank of the Olt, from which metal vessels and weapons are said to have come. A surface search carried out in this area led to the discovery of a rural Roman settlement located on a raised terrace on the right bank of the river. The collected material consists only of pottery and fragments of chirpic. We do not know whether the two settlements are identical. M. J. Ackner, *MCC*, 1, 1856, p. 28; *TIR, L* 35, p. 28."

The point is also mentioned in the most recent work cataloging the discoveries in Roman Dacia: M. Bărbulescu, F.-Gh. Fodorean, L. Nedelea (eds.), Tabula Imperii romani - Forma Orbis Romani. Dacia, Ed. Academiei Române, București, 2022, p. 119, s.v. Bradu: "Traces of a small Roman settlement were found on the right bank of the Olt river, towards Săcădate. A Roman road, pottery and weapons were identified here as well. Not far from this point one can reach the Dacian-Roman necropolis from Cașolț (*RepSb*, 63, no. 35/4)".

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

2. Archaeological site of Bradu - Atzenau

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	144072.06
Name	Archaeological site of Bradu - Atzenau
County	Sibiu
Administrative unit	Town of Avrig
Locality	Bradu
Point	Atzenau
Reference point	The archaeological site is located towards the Dolman forest, between Bradu and Săcădate, in the direction of the three mounds, east of Cașaloț.
Category	Habitation
Type	settlement
Date of Last Record Update	02.02.2022

This point is also recorded in the work of S. A. Luca, Z. K. Pinter, A. Georgescu, Repertoriul arqueheologicul al județul Sibiu (Repertoriu Sibiu 2003 (ulbsibiu.ro)), with the following description: "1. At the place called *Atzenau*, towards the *Dolman* forest, between

Bradu and Săcădate, in the direction of the three mounds, E of Cașolț, red-colored ceramic fragments, probably Neolithic, were discovered. *Bibliography*: *Neigebaur 1851*, p. 273; *Ackner 1851*, p. 35; *Gooss 1876*, p. 23; *Roska 1942*, p. 93, no. 92."

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

3. The Neolithic settlement of Bradu - Poiana cu șopruri

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	144072.01
LMI Code (List of Historic Monuments)	SB-I-s-A-11948
Name	The Neolithic settlement of Bradu - Poiana cu șopruri
County	Sibiu
Administrative unit	Town of Avrig
Locality	Bradu
Point	The meadow at the slopes
Reference point	The settlement was identified on the Coșolțului slope, between Bradului and Dracului Hills.
Relief shape	depression
Category	Habitation
Type	settlement
Date of Last Record Update	02.02.2022

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro).

4. Noa Settlement of Bradu

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	144072.05
LMI Code (List of Historic Monuments)	SB-I-s-A-11948
Name	The Noa settlement of Bradu
County	Sibiu
Administrative unit	Town of Avrig
Locality	Bradu
Reference point	The settlement lies in the eastern part of the village of Bradu, towards Avrig, to the right of the Sibiu-Făgăraș national highway, in the garden behind the chamber of Dumitru Vasile.
Relief shape	depression
Category	Habitation
Type	settlement
Date of Last Record Update	02.02.2022

Details on this point appear in the study by **M. Macrea, E. Dobroiu, N. Lupu, Șantierul arheologic Cașolț-Calbor (r. Sibiu and Făgăraș, reg. Stalin), in Materiale și cercetări arheologice 5, 1959, p. 413:** "4. Settlement belonging to the Noa culture in the village of Bradu. This settlement was discovered at the eastern end of the village of Bradu, towards Avrig, on the right side of the national highway Sibiu-Făgăraş, in the garden behind the chamber of the inhabitant Dumitru Vasile, during the digging of a pit from which earth was being dug for bricks. The traces of the settlement appeared at a depth of 1.80 meters and consist of pottery, charcoal and animal bones. The pottery is all handmade. Some of it is made of coarser, reddish-brown, brownish, slightly fired paste. Some fragments are ornamented with raised stripes or ridges under the simple, straight lip, with finger- or ridge-printed recesses, and oblique rims. Others are made of black paste, also coarse, ornamented with striations executed with a broom. Characteristic for the Noa culture are the fragments of finer black paste, part of the so-called cups, bitronconical in shape, ornamented with grooves and provided with raised torces, with ridges and knobs. The settlement is located on the first terrace of the Valea Oltului, on the right bank of the river, about 4 km from the contemporary necropolis, to which it does not seem to have any connection. It adds to the few settlements belonging to the Noa culture, from the end of the Bronze Age and the beginning of the Iron Age, known so far in Transylvania."

The authors of the archaeological research have also published some ceramic materials.

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro).

5. Bronze Age settlement at Bradu

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	144072.02
LMI code (List of Historic Monuments)	IL SB-I-s-B-11949
Name	Bronze Age settlement at Bradu
County	Sibiu
Administrative unit	Town of Avrig
Locality	Bradu
Reference point	The settlement is located in the countryside, on an old terrace of the Olt.
Category	Habitation
Type	settlement
Date of Last Record Update	20.08.2012

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro).

6. Eneolithic stone axe

Details of this discovery appear in the study by M. Macrea, E. Dobroiu, N. Lupu, Șantierul archeologic Cașolț-Calbor (r. Sibiu and Făgăraș, reg. Stalin), in Materiale și cercetări arheologice 5, 1959, p. 413: "It was discovered by chance, by the inhabitant Aurel Paștiu, NE of the village of Bradu, on the valley of the Buhoi river, 30-40 m from its confluence with the Bradului valley. It is whole and well preserved. The execution is neat. Length is 8.7 cm, maximum width 5.7 cm, thickness 4.4 cm. It is amygdaloid in shape with a rounded edge, wider in the middle, with a straight edge and a 2 cm diameter handing hole in the middle of the body. The stone is an andezite. It dates back to the Eneolithic period and seems to be related to the Coțofeni settlement at Pepinieră, only 2 km away from where the axe was found."

The discovery can also be linked to other finds of stone axes. Information also appears in S. A. Luca, Z. K. Pinter, A. Georgescu, Repertoriul arheologicul al județului Sibiu (Repertoriu Sibiu 2003 (ulbsibiu.ro)), with the following description:"2. Several stone axes

(one of which, Eneolithic, Coțofeni culture, found somewhere *on the banks of the Olt*) are reported from the village territory, without further details (MNB). *Bibliography*: *Neigebaur 1851*, p. 292; *Ackner 1851*, p. 35; *Gooss 1876*, p. 23; *Koch 1876*, p. 130; *Tocilescu 1880*, p. 780; *Marțian 1920*, p. 96; *Roska 1941*, p. 58, 96; *1942*, p. 93, no. 92; *Berciu 1942*, p. 29."

b) **RACOVIȚA**

The National Archaeological Register (RAN) records 3 sites in Racovița.

1. Archaeological site of Racovița - Bâlea area

The information in the RAN site file is as follows (Repertoriul Arhetoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	145364.01
Name	Racovița archaeological site - Bâlea area
County	Sibiu
Administrative unit	Racovița
Locality	Racovița
Point	Bâlea area
Reference point	The site was identified in the central area of the Făgăraș Mountains.
Relief shape	mountain
Category	Habitation
Type	settlement
Date of Last Record Update	23.01.2013

The site is described by S. A. Luca, Cronica cercetărilor arheologice din România. Campania 2005, CIMEC-Institut de Memorie Culturală, București, 2006, https://cronica.cimec.ro/detaliu.asp?k=3446: "A brief survey was carried out between the 10th and 14th of August in the central area of the Făgăraș Mountains. Although three high altitude lakes were accurately surveyed, they demonstrated that the region is unsuitable to prehistorical occupation for a number of reasons. The approach that was used to survey the Făgăraș is the same already experimented during more than 30 years of surveys along the south Alpine arc, and, during the last four years in the Pindus Range of Western Macedonia. According to this experience, which led to the discovery of dozens of sites from the Final Palaeolithic up to the Middle Ages, it is well known that glacial lakes and water pits are ideal places for temporary settling by prehistorical and protohistorical populations moving from one side to the other of

any mountain chain. This is the case for both the Southern Alps and the Pindus. The previously undertaken research strategy also demonstrates that prehistorical populations preferred to settle in sheltered areas, although always along places rich in water supplies. The idea is that alpine pastures were ideal for seasonal hunting, because of a better visibility and for the possibility of getting old wood branches, from the lower woods, for making a fire. Furthermore both the Alps and the Pindus, in the areas where they were inhabited by prehistorical peoples, present an easy access and gentle slopes which make the transit between one valley to another very easy. Unfortunately, this is not the case for the Făgăraș Mountains of the Carpathians, where access is difficult, the slopes very steep, and the transit between one valley to another very problematic. This point is also demonstrated by the fact that alpine huts or animal sheds are systematically absent in the area and that the alpine pastures are difficult to reach. This is undoubtedly the reason why the Făgăraș were not inhabited (as they are not nowadays and were not in historical times) during prehistory. Difficult access, steep slopes, and furthermore the absence of transitable watered pastures rendered the prehistorical (and also later) occupation of these landscapes unnecessary. The picture is complete by the long distance from raw material sources for making hunting and processing tools."

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

2. Flint topiary at Racovița - Cărțăoaia's Garden

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	145364.02
Name	Flint topiary at Racovița - Cărțăoaia's Garden
County	Sibiu
Administrative unit	Racovița
Locality	Racovița
Point	The Garden of the Daisy
Reference point	The toporașș was discovered at the place called Cărțăoaia's Garden, located on one of the upper terraces of the Olt, at the confluence of the Valea Lupului and the Church Creek.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Category	isolated discovery

Type artifact
Date of discovery 1972
Date of Last Record Update 23.01.2013

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

3. Roman archaeological site of Racovița - Praetorium II (Fortress)

The information in the RAN site file is as follows (National Archaeological Record (cimec.ro))

Location Show on map of Romania *
RAN Code 172518.01
LMI Code (List of Historic Monuments) VL-I-s-A-09564
Name Roman archaeological site of Racovița - Praetorium II (Fortress)
County Vâlcea
Administrative unit Racovița
Locality Racovița
Point Praetorium II
Reference point The site is located south of Racoviță locality and Valea Satului, about 210 meters east of the Olt River, 150 meters west of the DC8 communal road, 85 meters north of the county road DJ 703P and about 92 meters northwest of the town hall of Copăceni.
Hydrographic Reference - Name Olt
Hydrographic Reference - Type river
Relief shape depression
Land use agriculture
Category housing; installation
Type settlement; military settlement; hydraulic engineering
Description The site was not overlain by other constructions. Part of the walls of the surge tank have been excavated, the rest being covered by vegetation. The public data of the road infrastructure project of the A1 highway (Pitești-Sibiu) show that it will partially affect the west side (outer walls) of the surge tank. The highway will be built very close to the auxiliary fort and will affect visibility from the south and west, significantly altering the archaeological landscape. At the same time, agriculture was practiced in the area of the former Roman civil settlement.

Comments The surge tank was part of the north-eastern limes of the Roman Empire, that is to say of the defensive system built and organized for the defense of the province of Dacia.
Site surface 2.592 ha
State of conservation very good / 28.07.2022
Natural risks Floods: 4 / 19.05.2022
Anthropogenic risks Intensive agriculture: 4 / 19.05.2022
Ownership private
Date of Last Record Update 28.03.2023

The archaeological site is also included in the list of sites on the Limes that will become UNESCO World Heritage Sites Archaeological sites (limesromania.ro)():

6.8.1	Racovița - Praetorium II / Cetate	auxiliary fort, civil settlement	25.10	2.60	Racoviț a	Vâlcea	Google Map	RAN Map	RAN
6.8.2	Racovița - Praetorium II / Cetate	aqueduct	25.10	0.74	Racoviț a	Vâlcea	Google Map	RAN Map	RAN
6.9	Copăceni - Praetorium I / Cetate	fortlet	18.00	0.59	Racoviț a	Vâlcea	Google Map	RAN Map	RAN
6.1	Copăceni – Sub Pietre	auxiliary fort, civilian settlement	5.12	0.19	Racoviț a	Vâlcea	Google Map	RAN Map	RAN
6.1	Copăceni – Sub Pietre	roman road	5.12	0.19	Racoviț a	Vâlcea	Google Map	RAN Map	RAN

Source: Archaeological sites (limesromania.ro)

The description of the stone fortress is as follows: 'The auxiliary fort of Racovița was built on a plateau, southwest of the modern settlement, on the Olt river, at the mouth of the

Clocotici stream. A rectangular enclosure is clearly visible on the ground surface. After the excavations were completed, the ruins were covered and thus preserved. On the basis of the 1976 and 1979 excavation a single fort with a stone enclosure was noted. It is rectangular in shape, with rounded corners, measuring 106 x 118 m. The main gate was positioned on the east side. The trapezoidal shaped corner towers are slightly projected inward.The gates are provided with square towers which are slightly visible above the ground. The command building (principia) was in the center of the fort, as usual, and a granary was in the latus dex-trum. The fort's enclosure and the buildings inside were not altered in any way.According to some scholars, the fort was built in the time of Hadrianus (117-138 AD) or after the fort at Copaceni (500 meters to the south) was abandoned.The circumstance indicates that, apart from the principia, the rest of the fort's buildings were made of wood and were not observed during archaeological research.The fort has an area of 1,336 ha."

The LMI code for the surge tank is VL-I-m-A-A-09564.01.

It is also attested here a civil settlement, dated between sec. II-IV AD, with LMI code VL-I-m-A-A-09525.02.

The traces of an aqueduct are also recorded here, with the following description in the RAN: "On a hill about 360 meters high and located 600 meters southeast of the fort, a system of aqueducts was found. Three plates with the dimensions 96x88x4/93x88x4 cm were preserved from the distribution tanks. The interconnected clay pipes formed the structure of the conduits. A total of twenty-three sections, covering a distance of about 195 meters, were excavated during the archaeological research. It was discovered that the route of the aqueduct followed the natural contours of the land, descending in a series of steps as it made its way towards the auxiliary fort. The path of the aqueduct lies mostly in a wooded area; however, it also crosses private property, thus there is a risk that some modern buildings could affect the site. The aqueduct was preserved after the excavations were completed, but is now covered by earth. Archaeological excavations revealed that the segment of the aqueduct pipe was complete. Once the excavations were completed, the sections were backfilled to ensure the preservation of the pipes. According to the data, the ceramic pipes have stood the test of time quite well, the same cannot be said for the distribution tanks."

In **Felix Marcu, Organizarea internă a castrelor din Dacia / The internal planning of Roman forts in Dacia, Ed. Mega, Cuj-Napoca, 2009,** the author refers to the topography of the Racovița fort (p.): "The fort of about 118.00 × 106.00 m at Racovița is located 500 m north the fortification at Copăceni (pl. 35). The only buildings about which we have information are from latus, identified as principia and storechamber, without having any

indication on the fort construction periods. Some researchers considered the first half of the 2nd century as construction date of the fortification, since the gate towers are rectangular and slightly project outwards alike in other fortifications on Olt line. The towers shape is however not a decisive dating criterion, therefore the beginning of the stone fort remains uncertain. I mention that the towers of the fort at Bumbesti, also rectangular and without an outward projection, date with certainty in AD 201. Other researchers assumed that the fortification was the fort garrison of the troop numerus Burgariorum et Veredariorum (see supra), as the fort at Copăceni had become too worn. This difficult to prove since, as we have seen, the fort at Copăceni still functioned by the end of the 2nd century. In addition, noticeably Racovița fort sizes were almost double than the fortification at Copăceni. Therefore, it is impossible it has been built by and for the same garrison troop. Moreover, it would have been against the Roman's construction logic to build, in case a fort was obsolete, another one at 500 m distance from the first. The decision to build a fort in a particular position was obviously not accidental. Therefore, the construction of the forts at Copăceni and Racovița would have been by necessity, even though they were not contemporary. Outside the enclosure, attached to it, were found small platforms with brick-made extremities. These are placed two on each side, between the corner towers and gates. Their sizes seem strange, some of them being long and very narrow, for instance 6.10 × 0.15 m or 3.95 × 0.17. The length of the other falls within the limits of the two mentioned, and the widths are slightly over 20 cm. The fort gates have rectangular towers very slightly projected outwards, each having c. 5.00 m span, similar to those at Copăceni, but corner towers and the enclosure itself are different from those in the mentioned fort. Unlike other forts on Olt line, at Racovița was not necessary to add buttresses to strengthen the enclosure wall. I therefore ask if this does not prove that the fortification was built either before the forts at Copăceni, Rădăcinesti, Titesti and Arutela or after their construction.". The building of principia is also described (p. 210-211): "The structure is slightly asymmetrical oriented compared to the fortification sides, fact that indicates a layout change. As construction technique, the building walls are similarly built with those of the enclosure made of quarry stone bound with mortar, the west wall being reinforced with bricks in the corner, as the case of the corner towers or the mentioned platforms. The walls are 0.80-0.85 m thick and are built 'directly on battered clay'. Therefore it is possible that principia was built directly of stone. An earlier timber phase is not excluded, but I assume that the exacavators would have observed an occupation layer previous the one corresponding to the stone phase. The area occupied by the headquarters building is almost 600 m2, occupying 4% of the fort total area. The entrance into the headquarters building is impressive, measuring over 6.00 m, given that the area of all gates

measured each c. 5.00 m. However, in Britannia forts the sizes of the entrance into principia are generally of 2.50 to 3.50 m, irrespective the entrance type, either of pillars, timner posts or simple opening in the wall. Courtyard. The front part of the headquarters building generically called 'courtyard' was identified as a yard surrounded by a wall, which had in the plan a single opening, although another one was definitely necessary for access to the basilica. The existence of an 1.80 m wide area paved with bricks on the west side, from the basilica made the excavators assume here of a connecting portion with the basilica. It is possible that this space was actually a corridor or peristyle that usually appears between the basilica and the front courtyard of the headquarters building, this interval being usually narrower than the portico normally surrounding the courtyard. The lack of rooms on courtyard sides is not necessarily unusual, but at RacoviEa not even a portico is reported, which is rather curious. The dimensions of this open space are 20.50 × 10.15, being quite narrow, with a ratio of 2.01. Only in the case of this building part the archaeologists decided that the walls seem to be abutted, therefore, the courtyard construction would belong to a third construction phase of the headquarters building. Unfortunately, nowhere is stated what the exacavators understood by construction phases of the headquarters building, however it is obvious that the courtyard and back rooms arrangement was contemporary with the basilica construction, since they are part of a unitary construction. Clearly, the construction stages did not perfectly coincide, which explains the small differences in terms of construction techniques. Moreover, such differences can be assigned to revetments made during the use of the building. Basilica. The dimensions of this part of the headquarters building are normal, 19.50 × 9.50 m. It is very interesting, however, that on the short axis of the basilica, in extension the so-called entrance to it from the courtyard, were found on a relatively small area portions covered with tiles and bricks fragments, thus reaching the conclusion that on both sides of this supposed central corridor two rooms must have been. The excavators could be right, analogies of this kind being met in some forts dated in the 3rd century AD. It is possible that the tribunal was not identified precisely because subsequent changes in the basilica area, especially since tribunal walls are usually of poor quality. It is curious that the areas occupied by the inner courtyard and the basilica are almost similar, the first occupying 33% of the headquarters building total surface, while the basilica only 30%. Normally, the courtyard sizes should have been greater compared with those of the basilica, but considering the total area that the building occupied, differences may be normal. Back rooms. There is one room on both sides of the aedes, each sized c. 6.00 × 6.00. In this area, walls are only 0.70 to 0.75 m thick, hence entrances from the basilica could not be identified. The aedes is 6.10 × 5.75 × 6.35 × 5.85 m, being approximately 35 m2, area relatively large compared with fort

sizes. Typically, the strongroom covers an area of 25 m2. The excavators presume that the walls of the back rooms are not organically linked with the main northern and southern walls of the headquarters building, thus proving a 'second construction phase'. Differences observed by the excavators in the back rooms area are explained by construction stages of any building. In the case of the headquarters building, construction starts with the aedes as clearly established in the forts from South Shields or Brecon Gaer. Moreover, the aedes may remain occasionallyy an independent structure, without being directly linked to the outer walls of the headquarters building." The horreum is also presented: "At about 13.00 m north the headquarters building is a horreum, with an area of c. 477 m2, thus occupying 3.8% of the fort total area. The opposite sides of the store chamber are not perfectly equal, with c. 1.00 m differences between them, thus resulting an asymmetrical layout, alike the headquarters building one. The walls are made of stone and mortar and are rather thick, of 1.14 to 1.40 m. Therefore buttresses were no longer required. The area between principia and horreum remained probably free, since the entrance into the store chamber-7 m wide-is on the long southern side from the headquarters building. Entrances on the long side are extremely rare. A similar situation was identified in Britannia only in the fort at Wallsend. At Racovița, the explanation for the location of the entrance on this fort side would be that the goods handling area was much larger. Inside, in the north-west of the structure, an area of c. 8.30 × 10.00 × 8.10 × 9.80 m was discovered, covered with cobbles placed fairly regularly, which could have marked a room, from where towards the entrance started a 0.90 m wide corridor, with same characteristics. It is strange that within the horreum, in its north-east side, were found nails, harness appliques, pilum heads, an arrowhead, a pugio and a marking iron tool1515, which are not common horrea finds. Primarily by its location, the building north the principia might be a horreum. However, inside the building were not identified pillars or supporting walls of floor, usually heightened. Cases when floors are laid directly on the ground are relatively rare, and where the floor existed, it was waterproof, made of concrete or large stone slabs1516. D. J. A. Taylor believes that these constructions without heightened floor cannot be considered proper granaries. Usually, access was made on the short sides, or here it is on the long southern side. Moreover, granaries strech over 1.5-2% of the forts total surface, with several exceptions, such as the granaries from the fort at Strageath during the Flavian stage, occupying 3.7% of the fort, but they are related to military campaigns, especially with that of Agricola. Granary dimensions are generally small, surfaced between 15-45 × 6.9 m and having a length and width ratio of 1: 2. Or, the width of the storechamber at RacoviEa is quite large, with a 1.53 length/width ratio. Another issue of its function as a horreum is the lack of buttresses on the outer walls. It is true that the walls are rather thick, but

the building is impressively wide for a horreum, therefore one would have expected such buttresses, necessary not only for roof support, but also for carrying the walls under extreme stress due to the large quantity of stored goods. The only explanation for the lack of buttresses is a shingle roofing instead of tiles."

A study describing the archaeological objectives of the Valea Oltului, including the Racovița surge tank and the Roman road in the area, is the article signed by colleagues **Ovidiu Țentea, Florian-Matei Popescu, Vlad Călina, Limes Alutanus: the road and the surge tanks in the gorge area, in M.-M. Ștefan, Al. Popa, D. Ștefan, Archaeology of the transition from the Late Iron Age to the Roman Age in Dacia. Contacte și conflicte în secolele I-II p. Chr., Ed. Cetatea de Scaun, Târgoviște-Sf. Gheorghe, 2022, p. 233-278**.

Another interesting study, which documents the Racovița area very well, in detail, with all the necessary information, is the article published by colleagues **Ovidiu Țentea, Vlad Călina and Ioana Manea, Road and Roman fortress of Copăceni (com. Racovița, Vâlcea county). Recent re-evaluation of some forgotten monuments, in Cercetări arheologice 29.2, 2022, p. 557-572**.

The castrum, which is located in the immediate vicinity of the Cornetu dam, is presented first (p. 558-559): "**The Racovița castrum** (frequently associated with the ancient name Praetorium II) is the largest castrum in the mountainous area of the Alutanian line. It stands out visibly in the central area of the present village on the area of six private properties. The partially restored fortification enclosure can be seen along most of the perimeter, especially along the boundaries of the present-day properties, although it is most frequently covered by vegetation. Both the northwest and southeast towers are well preserved. In the interior, abundant vegetation outlines the command building (principia), which is clearly visible in aerial photographs. Information on the civilian settlement is sporadic and of little relevance to provide clear indications of its delimitation. Public data from the A1 highway infrastructure project (Pitești - Sibiu) show that it will partially affect the civil settlement parallel to the west side of the fortification. An interesting element was the signaling of the aqueduct that tapped a spring located at a distance of about 600 meters from the castrum, in a south-easterly direction. Research in the 1980s was able to archaeologically document this aqueduct, consisting of tubules, over a distance of about 195 m. The Roman fortification of Copăceni, to which we will refer in more detail below, was located about 500 m SSE of the aforementioned Racovița castrum. Due to a graphical error or the desire to name the lower terrace after the old course of the Olt River, it was considered that the fortification was destroyed by the Olt River. Most of the more recently known data come from the reports made during the rescue excavations

carried out during the extensive development of the Olt watercourse. In these publications, the plan of the preserved thirteenth section of the Copăceni castrum, located on the active riverbed, began to appear. The information provided by C. M. Vlădescu and Gh. Poenaru-Bordea leaves the impression that the data in the plan published by Gr. Tocilescu, are no longer up to date. As it results from the joining of the two plans and from the digital terrain model realized after the field identification of the fortification, the wrong information was later taken up in numerous publications, the Copăceni castrum being considered destroyed. Although the fortification was surveyed, the confusion persisted in some publications, where it continued to be listed as destroyed. By silting up the terrace on which the fortress was built, two thirds of its site was destroyed. About one half of the remaining third was affected by the construction of chambers and their outbuildings. During the archaeological evaluation we superficially and partially uncovered the southern tower of the porta praetoria for a length of 2.2 m (north side) and 1.4 m (south side) and the eastern part of the enclosure (for a length of 4.3 m). The northeast tower was partially uncovered for a length of 2.8 m in the southwest direction. A semicircular-shaped protrusion of the tower was captured on the exterior, approximately 40 cm wide. The enclosure was constructed of dressed stone, mortared in the opus incertum technique. As a result of these interventions we were able to make detailed measurements on the basis of which we have based our proposals for the reconstruction of the fortification enclosure. According to research by Gr. Tocilescu and P. Polonic, two stones with inscriptions and a military pillar reused in the reconstruction of the gate were discovered in the right side of the eastern gate. It was possible to distinguish a slight hollow, up to 20 m wide, marked as a fortification ditch to the east of the praetoria gate. Geophysical measurements did not yield any relevant results on this section. At about 50 m northeast of the eastern side of the fortification, we discovered traces of old excavations in the balneum area, considered by Gr. Tocilescu and P. Polonic as the "commander's chamber". Through geophysical prospecting we were able to identify irregular building structures and brick agglomerations. In order to determine the planimetry and orientation of the baths so that they can be correlated with the plan realized by P. Polonic, it is necessary to extend the non-invasive investigations and to carry out control surveys. On the basis of the data collected from the fortification we were able to carry out a comparative analysis in parallel with the typological details of the closest analogs of the Roman fortifications around the Cozia massif. The closest analogies of the Copăceni fortification are the fortifications of Arutela and Racovița. The dimensions appear to be similar to those of the Arutela fortification (east side 60.8 m), while the east side of Copăceni appears to be 64 m. At Rădăcinești and Titești, the porta praetoria was on the east side, apparently as at all the

fortifications in this area. The towers of the gates are rectangular in shape, with projections on the outside, similar to those at Racovița and Arutela. Porta praetoria seems to be, as at Arutela, located on the eastern side, next to the road. Epigraphic information indicated the construction of the surge tank in the year 138 by numerus burgariorum et veredariorum Daciae inferioris sub / Fl(avio) Constante proc(uratore) Aug(usti), with another phase of rebuilding in the year 14013 castra n(umerus) burg(ariorum) et vered(ariorum), quod anguste tenderet, duplicato valli pede et inpositis turribus ampliavit per Aquilam Fidum, procuratorem Augusti. To this extent we can say that the archaeologically documented phase belongs to the second phase. The Roman road in the area of the Copăceni castrum was repaired in 236 BC. The text of an inscription on a bronze piece indicated the possible presence of beneficiarii consularis. Although two thirds of the area of the Copăceni surge tank has been destroyed, we can make a proposal for a hypothetical reconstruction of the plan based on analogies. Part of the eastern side, between the gate and the northeast cannon, remains intact. The gate was provided with projections on the outside and flanked by two towers measuring approximately 4 × 5 m. These have entrances placed on their north-west corners with openings of 0.80 m. The enclosure wall was built of river stones, bound with white mortar, using the opus incertum technique. On the basis of the available evidence and by comparison with analogous situations, we can assume that the gate is located in the middle of the eastern side. The distance between the axis of the gate and the north wall (measured on the inside) is about 30.5 m. Gr. Tocilescu stated that the entire length of the surrounding wall on the east side is 64 m, although P. Polonic's plan does not show this fact. M. Vlădescu, when the author mentioned that the eastern side could be fully surveyed for a distance of 41.50 m. In the 2022 assessment, we could only trace the eastern side for a distance of 37 m due to the extension of the household. Using the closest analogy, Arutela, it appears that the east side of the Copăceni fortification is most likely 64 m long, and the gate was in the middle of this side. It is most likely that this gate was the main gate of the fortress. The most analogies for the construction technique of the enclosure are also in the Arutela surge tank. As in the case of the aforementioned castrum, the wall has a 0.25 m high plinth, but, unlike at Rădăcinești and Titești, projections on the outside of the towers."

Even the location of the thermal baths was established, thanks to the use of non-invasive methods (GPR measurements) (p. 559): "GPR measurements were carried out inside the fortification, as well as in the eastern area and in the civil settlement. On this occasion we were able to establish the precise location of the baths, 50 m east of the fortification, a position that corresponds to Gr. Tocilescu".

The most interesting data are those related to the Roman road, which was observed in the field, cut in the rock, just near the Cornetu Dam, on the eastern side of the Olt river. It is an exceptional discovery (Sat Copăceni, com. Racovița, jud. Vâlcea, point "Sub Pietre" - Dealul Prislopului (RAN: 172554.03)) (p. 559-560): "The most spectacular part of this documentation is the portion of the Roman road dug into the rock at Copăceni. About 530 meters southwest of the Copăceni fortification and about 200 meters southeast of the Cornetu Dam, on Barajului Street, we documented an alignment of nine rock-cut openings, about 45-50 m long. These holes are square in shape, with slightly rounded corners, with sides approximately 25 × 20 cm. They were dug into the rock to an average depth of 50 - 70 cm, narrowing very slightly inwards. There are chisel marks all along the alignment, the result of careful landscaping of the slope. At a height of about 5 m, between openings 7 and 8, we found a cave-like chamber cut into the rock. This cave of Copăceni - Racovița is located under the Dealul Târgului, on the place called "Sub Pietre". D. Tudor mentioned a number of nine holes, a system similar to those at Cazane, and concluded that these rooms were arranged by the Roman stonemasons as dwellings and storage places for tools20. A series of steps cut into the rock, which probably served as access to the rooms, can be seen even though there is overgrown vegetation in places. The mention of this road and the room can be documented from the 18th century onwards: in the letter of Fr. Schwantz to Count Stainville of January 23, 1717: [....] The ancients of the time of Trajan had a road from Cozia to Cornet on the east bank of the Olt, where large marks and half-ways are still to be found in the stone cliffs in various places, but so ruined [...] In addition there is a gate near Cozia, through which one passes, so still in completely good condition, almost like a gate of honor, so through a high cliff (over which one cannot pass) and still every sign of the stonemason can be seen, worked smooth as a wall and down uniform as a table. As I asked about it, the builders say it was made by Caesar Trajan. From this rock you can see the Cornet [...] around the rock you can see up to 18 holes in which the frames of the podium were placed as at Dobra (Golubac) made of wood, because you cannot see any feature of a wall. Michael Schendos de Van Der Beck (1691?-1736), a physician sent by Field Marshal Stainville, administrator of Oltenia and Transylvania on behalf of Austria, noted the presence of these rooms when he and Fr. Schwantz's map of Oltenia.22 This monument carved into the rock is proof of the existence of a Roman road that followed the eastern course of the Olt River in Antiquity in the area mentioned above. The preserved portion corresponds to a gorge where the course of the Olt was different from the present one, regularized by the dam. The construction of the road in this stretch required an exceptional design and logistical effort. On this stretch the road was suspended above the course of the

river for at least 50 meters, as far as we know today the road overpass built on wooden beams. There were no portions dug deep into the rock, as has been documented in the development of the road in the Iron Gates area on the right bank of the Danube23. The holes dug in the rock to fix the wooden beams are preserved in remarkable conditions and are unique in Romania. The above-mentioned appearance and characteristics were part of the arguments for the proposal for inclusion on the UNESCO Frontiers of the Roman Empire list."

c) TURNU ROȘU

1. Isolated discovery. The Eneolithic stone from Turnu Roşu

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	145943.01
Name	The Eneolithic stone from Turnu Roşu
County	Sibiu
Administrative unit	Turnu Roșu
Locality	Turnu Roșu
Reference point	The discovery was made on the left bank of the Olt, at the southern edge of the village, towards Boița.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Category	isolated discovery
Type	artifact
Comments	Ceramic fragments dating back to the Early Bronze Age (perieghează I. Paul), probably dating back to the Schneckenberg culture, were also found here.
Date of Last Record Update	28.03.2013

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

Together with this discovery, the archaeological repository of Sibiu County (Repertoriu Sibiu 2003 (ulbsibiu.ro)) also records a series of other discoveries, some of which, unfortunately, could not be precisely localized following field research: "1. On the left side of the Olt, at the southern edge of the village, towards Boița, ceramic fragments dating from the beginning of the Bronze Age (perieghează I. Paul) were discovered, probably dating from the Schneckenberg culture. A stone axe (MNB) and a stone mace probably also come from here. Bibliography: Miller 1887, p. 120; Schroller 1933, p. 65, 76; Roska 1942, p. 231; Kalmar 1999,

p. 190. 2. The following artifacts come from the gorge, without knowing the location of the finds: a) A tool-sharpening quill and metal weapons. Bibliography: Koch 1876, p. 132. b) A bronze three-edged arrow of Scythian type (Ackner collection).
Bibliography: Neigebaur 1851, p. 273, no. 1; Ackner 1851, p. 22; Gooss 1876, p. 46; Tocilescu 1880, p. 801; Roska 1937a, p. 19; 1942, p. 231, no. 71; Popescu 1944, p. 209; Vasiliev 1980, pp. 148, 151, 181.
3. This is the Roman road to Apulum. Bibliography: Gooss 1876, p. 104-105; Christescu 1929, p. 101; 1937, p. 108; Albescu 1966, p. 20-21. 4. Traces of mining, from where two Roman coins and an opaiț were discovered in 1717, can be found just in front of the Cozia monastery, on the left bank of the Olt. In Roman times, there was a stone quarry here (Nișului or Cioroiului hill), as well as a copper mine. Bibliography: Gooss 1876, p. 104, no. 4; Wollmann 1996, p. 150, 263; Popa 2002, p. 201. 5. A hoard of Dyrrhachium coins mixed with Roman imperial coins (Gordian III and Philip II) was discovered in the gorge. Bibliography: Jung 1894, p. 145, no. 3; 189; TIR, L35, p. 75; Popa 2002, p. 201. 6. In an unspecified place, fragments of a grayish headdress ornamented with wavy lines, from the Roman period (MNB) were discovered. Bibliography: Popa 2000, p. 182; 2002, p. 201. 9. The Lotrioara Fortress (Lotorvaio, Lauterbeng) is located in the Turnu-Roșu pass, at the Lotrioara's mouth into the Olt, on the right bank of the Olt, and dates back to the medieval period. Traces of walls and ditches are preserved, although their route is unknown. The first document relating to this fortress dates from 1407. *Bibliography*: *Neigebaur 1851*, p. 273, no. 2; *Ackner 1856*, pp. 25-26; *Gooss 1876*, p. 4, nos. 2-3; *Horedt 1941a*, p. 594; *Albescu 1966*, pp. 20-22. 10. To the N of the fortress, at the entrance to the pass from Sibiu, on the right bank of the Olt, is the half-destroyed *Turnu-Roșu* tower, dating from the medieval period (15th century AD). *Bibliography*: *Jung 1894*, p. 145, no. 3; 189; *TIR*, L35, p. 75. 11. On the left bank of the Olt, between the citadel of Lotrioara and Turnu-Roșu, there is another tower, the *Stricat Tower* or *Turnul Spart* (*Halbesturn*), also dating from the medieval period. All three monuments, also known as the *Trajan's Gate* and the *Roman Gate*, were wrongly considered Roman monuments. For the *Landeskrone* fortress, see Tălmaciu. *Bibliography*: *Jung 1894*, p. 145, no. 3; 189; *TIR*, L35, p. 75. 12. The Orthodox monastery was founded on the site *on the Caselor Valley in Curechiuri*. The hermitage was re-established in 1994 with the feast of *the Assumption*. *Bibliography*: *Rusu et al. 2000*, p. 272."

d) CÂINENII MARI

1. Archaeological site of Câinenii Mari - Arxavia

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania *
RAN Code	169137.01
LMI Code (List of Historic Monuments)	VL-I-s-B-09522
Name	Archaeological site of Câinenii Mari - Arxavia
County	Vâlcea
Administrative unit	Caineni
Locality	Câinenii Mari
Point	Arxavia
Reference point	The site is located on the right bank of the Olt, north-west of the bridge over the Olt that connects the localities of Câinenii Mari and Câinenii Mici, on either side of the DN7 road and the railroad between Câineni and Radu Vadului, in the outskirts of Câinenii Mari, to the east.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	hill
Land use	pasture
Category	Habitation
Type	settlement
Description	The site includes the ruins of the Austrian fortress of Arxavia, which overlies a Roman settlement.
Natural risks	Floods: 5 / 05.04.2022
Anthropogenic risks	Partial affectation: 4 / 05.04.2022; Intensive agriculture: 4 / 05.04.2022
Date of Last Record Update	05.04.2022

The RAN states the following information. "The fortress of Arxavia or Strassbourg was a fortification built by the Habsburgs on a plateau to the right of the Olt, on the last slope of the Făgăraș Mountains. It was built after the peace of Passarowitz when the Austrians took control of Oltenia and was destroyed by the Ottomans in 1739, after the peace of Belgrade. It was a stone fortress with rectangular towers, an access gate and a moat, which can still be seen both on the ground and on satellite images."

The point is precisely located in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

Bibliography:

1. List of Historical Monuments, MO no. 646 bis/16/07/2004, Order of the Minister of Culture and Religious Affairs no. 2.314/2004, vol. III, Bucharest, 2004, p. 2297-2298, poz. 35-37.

2. Fragments of the Austrian Via Carolina

The information in the RAN site file is as follows (Repertoriul Arhetoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	169137.03
LMI Code (List of Historic Monuments)	VL-II-m-B-B-09707
Name	Fragments of the Austrian Via Carolina
County	Vâlcea
Administrative unit	Caineni
Locality	Câinenii Mari
Reference point	400 m N, on D.N.7
Category	communication route
Type	road
Date of Last Record Update	08.01.2009

Data about this road appear in several works ((99+) VIA CAROLINA | Dan T O M A Dulciu - Academia.edu): "After the Peace of Passarowitz (1718), following the conquest of Belgrade by Prince Eugene of Savoy, Banat, with its capital Timișoara, and Oltenia came under the administration of the Habsburg Empire, so that in the following year - 1719 - work began on the construction of a communication route between Transylvania and the new territories that came under Habsburg rule (Wallachia Mica - Oltenia - made up of 5 counties). The road was named VIA CAROLINA, in honor of Emperor Charles VI (Alba Iulia - during the Habsburg Empire was called Karlsburg Fortress, in honor of the same emperor) and started from Turnu Roșu (the border between Transylvania and Lesser Wallachia, where an inscription was carved in the stone), going as far as Bogdănești, a town located about halfway between Călimănești and Râmnicu Vâlcea. There are two inscriptions. The first, written during the life of the Count of Stainville, has the wrong milesimal: MDCCVII (1707), corrected on the second inscription, written later, after the death of the founder of this work, by adding an X, also wrong (resulting 1717), which is impossible, because at that time the fighting between the Austrians and the Turks was in full swing and nobody was going to stop writing commemorative stones.

Near the village of Câineni (called Strassburg in Austrian maps, a premonitory name!), high up in the mountains, there was another inscription in Latin on a large white marble slab at the end of the 19th century. During the reign of Stirbey-Vod, the road was diverted in that place, so that the inscription was no longer visible to passers-by. The second inscription recalls the Habsburg Emperor Charles VI, the battles led by Prince Eugene de Savoia, the commanding general Count Stephanne de Stainville, Governor of Transylvania, both of French origin, under whose direct supervision the military fortification engineer Captain Friedrich Schwanz von Springfels, but also a good surveyor, began the construction work on this road of great strategic, commercial value, but also of great difficulty."

About the road on the Valea Oltului we have also noted some essential aspects in Florin Fodorean, Drumurile din Dacia romană, Cluj-Napoca, 2006, p. 302-303: "From Sânbotin the Roman road goes on the left side of the Olt until Câineni, where it crosses again on the right side, also with the help of a bridge that we only assume. The Roman road passes through the village of Dăești and reaches Jiblea, where the road forks. One branch of it continues along the left bank of the Olt and heads north to Copăceni, and the second bypasses the Cozia massif to the east, in a north-easterly direction, passing through the localities: Sălătrucel, Berislăvești, Rădăcinești (surge tank), Poiana, Pripoarele (surge tank), Perișani (surge tank), Titești (surge tank), Racovița and Copăceni. This branch seems to be older than the Olt gorge branch and was used by the Romans during the conquest of Dacia. On this section, about 30 km long, the ancient road overlaps the modern one. The Olt branch of this road was destroyed in the course of time between Jiblea and Copăceni-Racovița by the works carried out on the embankment of the railroad built at the beginning of the last century. Dumitru Tudor states that Polonic noticed the Roman road cut into the rock from the Coasta Pietrei cliff in front of Călimănești, to the Pleșui stream, in the village of Păușa (at the Grunișor point), over the Păușa stream and to Bivolari, where the ancient *Arutela* was located. From this point to the mouth of the river Lotru the Roman road enters the gorge. Traces of this road could still be seen only where the road was not covered by the railroad embankment. In this sector it was excavated in several places in the rock. D. Tudor's research in 1944 resulted in the field identification of the Roman road at several points. In the place called "Trajan's Table", near the Turnu railway station, two thresholds dug in the rock could be observed, with holes in them, hollowed out horizontally to fix the beams of the bridge, in order to realize a suspended road similar to the one at Cazane, which we have discussed in the previous chapter. From "Trajan's Table" to the point "The Plain between the Tunnels", the Roman road was observed in the field by Polonic at the Tower Cave and the Usturoiul cliffs, near the Puturoasa stream, where the road was dug into the rock at a height of 5 m. D. Tudor states that

at the end of the hill called "Plaiul dintre tunlele" the road is still dug into the rock up to a height of 4 m, but it is covered with gravel and boulders that have fallen from the coast, so that it is no longer possible to drive on it. The same historian points out that the Roman road between the Clopot brook and the Alunului brook, near the 'Cârlige' tunnel, was destroyed in 1944 by quarrying work. At this point, at Cârlige, due to the fact that the Olt river makes a strong bend, the Roman road remained intact on the water bank, thanks to the construction of the railroad through a tunnel dug in the rock. The Roman road was observed at a height of 1-2 m above the Olt River, in the forest near the Alunului stream. Here the Roman road is 5 m wide. Further on, the road passes through Văratec, Lotru railway station and follows the left bank of the Olt as far as Copăceni, while the railroad and the modern road pass on the right bank. Further on, between Lotru railway station and Copăceni (*Praetorium* castrum), the Roman road was observed by D. Tudor at the following points: Podișor hill, Știubeilor stream, Dosul Drăgăneștilor hill, Drăgănești village, Călinești hill, Lotrișorului valley, Poiana Mlaștinilor, Băiașilor stream, Târgului hill (in front of the Cornet monastery) and Copăceni village. At this point it joined the road that bypassed the Cozia massif to the east. The Jiblea - Gura Lotrului - Copăceni sector of the Alutan road was built rather slowly after the conquest of Dacia, perhaps during Hadrian's time, and in many places rock excavations had to be made to build it. The road was guarded and maintained by the *numerus burgariorum et veredariorum Daciae Inferioris* and was in use until the 18th century, when the Austrians, through the engineer Fr. Schwantz-Hauptmann, built, as is known, the *via Carolina*.

The last section of this road is from Copăceni up to Turnu Roșu, where the Roman road also runs on the left side of the Olt. Quoting Polonic, D. Tudor states that the road was observed in the field by Tocilescu's assistant at the Clocotiș stream and at the Bisericii stream, both within the boundaries of the commune of Racovița, and then further on the Priboi hill, cut into the rock near the villages of Sărăcinești, Robești and Griblești, after which it reaches Turnu Roșu (*Pons Vetus*), where it is also cut into the rock. The toponym *Pons Vetus* again leads us to believe that there was a bridge in this area in Roman times.

Finally, between Câineni and Boița the Roman road was destroyed due to railroad works, but Polonic observed it at Palma Jidovului, Jugastrului Hill, Carpenilor Valley, Râul Vadului village and Boița. The Olt road was used in the Middle Ages for commercial purposes. It connected Sibiu with the one coming from northern Transylvania. From here it descended to Turnu Roșu, where merchants were awaited by customs officers, crossed the mountainous corridor until it reached the customs of the Romanian lands at Genune-Câineni and from here it went to Râmnicu Vâlcea, then south to Slatina. From here the road reached the Danube, at

Turnu Măgurele or Nicopolul Mic, where Nicopolul Mare was located on the right bank of the river. The route of this medieval road is that of the Roman road, which was used until modern times. In 1717, the Austrian administration in Transylvania took steps to develop this trade route. General Stainville, the commander of the Habsburg army in Transylvania, "digging into the mountain an inscription rivaling those left by Trajan", named the road *Via Carolina*, after the then Emperor Charles VI. From an account by another traveler, named Frederic Murhard, we learn that Câineni had a customs chamber in modern times, on the former Roman road in the Valea Oltului, and that a mail system operated, with vehicles and carters to move travelers.

The French Count Auguste de Lagarde traveled from Moscow to Vienna between 1812 and 1821 and published a book in French about this journey (*Voyage de Moscou à Vienne, par Kiev, Odessa, Constantinopole et Hermanstadt ou lettres adressées à Jules Griffith*, Paris, 1924). The main information on this journey is as follows: 'The entrance is via the Red Tower, which is described in detail, as is the *Via Carolina*, built under Charles VI, and the Olt. The traveler has to spend a number of days in quarantine, where one usually sleeps on straw and eats very badly. The mail wagon, which had to sledge him twice, waited outside, with its four horses and haystack; the surugi whinnies and the carriage started. At the border of Loviștii, whose name is supposed to mean "ditch with fishes", is the mountain plaice. From Câineni, where you can see the composition of the post chamber, with the captain, the logofătul, the logofătul, the ceaușșul and the rotarul, you pass through the woods, to the Dealul Turcilor, the Poarta Romanilor - the names are given in Romanian - to Pripoare, to Sălătruc, on a road lined with beech planks. The rest stops are clay cottages, covered with straw and with greased paper in the windows instead of glass."

The opening of the Via Carolina road in 1719 is also marked on the map of Oltenia by fr. Schwantz von Springfels (source: Opening_of_the_Via_Carolina_road_1719_page_154.jpeg (4000×3429) (bjc.ro)).

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

Bibliography:

1. List of Historical Monuments, MO no. 646 bis/16/07/2004, Order of the Minister of Culture and Religious Affairs no. 2.314/2004, vol. III, Bucharest, 2004, p. 2324, poz. 378.

(e) CÂINENII MICI

1. The Roman Tower of Câinenii Mici - Pons Vetus / La Turnuleţe

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania *
RAN Code	169128.03
Name	The Roman Tower of Câinenii Mici - Pons Vetus / The Small Towers
County	Vâlcea
Administrative unit	Caineni
Locality	Câinenii Mici
Point	Pons Vetus / La Turnuleţe
Reference point	The site is located in the village of Câinenii Mici, in the north-eastern part, about 300 meters north-east of the left bank of the Olt, about 0.33 km north of DN7D, at the foot of Mount Pleașa.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	mountain
Land use	Habitation
Category	Habitation
Type	defensive system
Anthropogenic risks	Partial affectation: 4 / 05.04.2022
Ownership	private
Date of Last Record Update	05.04.2022

The point is precisely located in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

Bibliography:

1. Marcu, Felix, Site Sheet: Câineni Mici - Pons Vetus/La Turnulețe, Project "Limes. Frontiers of the Roman Empire", Cluj- Napoca, 2022.

f) GREBLEȘTI

1. The Roman settlement of Greblești

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania
RAN Code	169146.01

LMI Code (List of Historic Monuments) VL-I-s-B-09539
Name The Roman settlement of Greblești
County Vâlcea
Administrative unit Caineni
Locality Greblești
Reference point V of the village, up to the Olt riverbed
Hydrographic Reference - Name Olt
Category Habitation
Type settlement
Date of Last Record Update 08.01.2009

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

g) ROBEȘTI

1. The archaeological site of Robești

The information in the RAN site file is as follows (Repertoriul Arheologic Național (cimec.ro)):

Location Show on map of Romania
RAN Code 169173.01
LMI Code (List of Historic Monuments) VL-I-s-B-09569
Name Archaeological site of Robești
County Vâlcea
Administrative unit Caineni
Locality Robești
Reference point in the heart of the village
Category Habitation
Type settlement
Date of Last Record Update 08.01.2009

The point is not precisely localized in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

h) COPĂCENI

1. Roman archaeological site of Copăceni - The mill

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location Show on map of Romania *
RAN Code 172554.01

LMI Code (List of Historic Monuments)	VL-I-s-A-09525
Name	Roman archaeological site of Copăceni - The mill
County	Vâlcea
Administrative unit	Racovița
Locality	Copăceni
Point	At the mill
Other point names	Fortress; Selels
other languages	Praetorium I
Reference point	The site is located on the left bank of the Olt, on a high terrace, north of the Cornetu Hydropower Plant, on either side of the DJ703P road, east of Copăceni, on the locality's islet.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	terrace
Land use	pasture
Category	Habitation
Type	settlement
Description	The site consists of the castrum, the civil settlement and the baths of the Praetorium I castrum, also mentioned in the Tabula Peutingeriana.
Comments	Part of the site was flooded by the Olt. The surge tank was part of the north-eastern limes of the Roman Empire, i.e. of the defensive system built and organized for the defense of the province of Dacia.
Site surface	0.518 ha
State of conservation	precarious / 05.04.2022
Natural risks	Floods: 5 / 05.04.2022; Excess water in soil: 5 / 05.04.2022
Anthropogenic risks	Partial affectation: 4 / 05.04.2022; Intensive agriculture: 4 / 05.04.2022
Ownership	private
Date of Last Record Update	29.03.2023

About the fortress, RAN states: "The fortress was built in the oppus incertum technique, having a supposedly square plan with a 64-meter side, however, only part of (41.60 m) of its eastern side is preserved. The trapezoidal corner towers were slightly projecting outwards, similar to those of the gate on the east side, the only one preserved. Epigraphic information indicates that the surge tank was built in the year 138 by the numerus burgariorum et veredariorum Daciae inferioris (CIL III 13795 = ILS 8909 = IDR II 587), and was enlarged in the year 140 (CIL III 13796 = ILS 8910 = IDR II 588 = Piso 2013, 149, no. 6: castra n(umerus) burg(ariorum) et vered(ariorum), quod anguste tenderet, duplicato valli pede et inpositis turribus ampliavit per Aquilam Fidum, procuratorem Augusti). It can thus be seen that what

was the only archaeologically documented phase is in fact a second phase. The road along the Olt in the area of the Copăceni surge tank was repaired in 236 B.C. (CIL III 1421619 = IDR II 589). A reading of an inscription on a bronze piece indicated the possible presence of some beneficiarii consularis (CIL III 13797 = IDR II 591).On the basis of epigraphic evidence found around the main (eastern) gate (porta praetoria), the fortress represents one of the few well-documented construction phases of a Roman fortification on the Olt bank. The Cozia Massif (1668 meters) was bypassed to the east (Rădăcinești, Titești fortifications) and to the west by a secondary access road which was a fast communication route for those heading north towards the province of Dacia**."**

The point is correctly mapped in RAN (Cartographic Server for the National Cultural Heritage (cimec.ro)**), source** National Archaeological Repertory (cimec.ro)**).**

2. The Roman Burg of Copăceni

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania *
RAN Code	172554.02
Name	The Roman Burg of Copăceni
County	Vâlcea
Administrative unit	Racovița
Locality	Copăceni
Reference point	The fortification is located east of Copăceni, north of the stream Cordoaia Mică.
Hydrographic Reference - Name	Cordoaia Mica
Hydrographic Reference - Type	brook
Relief shape	hill
Land use	pasture
Category	Habitation
Type	military settlement
Anthropogenic risks	Partial affectation: 4 / 19.05.2022
Date of Last Record Update	19.05.2022

The point is correctly mapped in RAN (Cartographic Server for National Cultural Heritage (cimec.ro)).

3. The Roman road from Copăceni - The Cart Road

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania *
RAN Code	172554.03
Name	The Roman road from Copăceni - The Chariot Road (Carriage Road)
County	Vâlcea
Administrative unit	Racovița
Locality	Copăceni
Point	Sub Pietre
Other point names	Prislopului Peak, Târgului Hill
Reference point	The road runs parallel to the east bank of the Olt, southwest of Copăceni.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	hill
Land use	pasture
Category	communication route
Type	road
Description	This monument, carved into the rock, is proof of the existence of a Roman road that followed the eastern course of the Olt River in antiquity, in the area mentioned above. It is one of the few roads carved in stone that have survived to the present day, most of which have been destroyed by the modern development of the country. This road is unique for Dacia, its structure being similar to that of the rock-cut road at the Iron Gates, depicted on Trajan's Column (the gate located in Serbia, on the territory of the former province of Upper Moesia).
Comments	The road obviously had wooden elements, but these have not been preserved. The original road design does not appear to have been affected by modern interventions and the route is still visible on the surface. Holes cut into the rock testify to the special construction technique and character of this road.
Date of discovery	1909
Site surface	0.1912 ha
State of conservation	good / 01.11.2022
Anthropogenic risks	Partial affectation: 3 / 01.11.2022
Ownership	private
Date of Last Record Update	29.03.2023

The road is described in the RAN **(**Repertoriul Arheologicul Național (cimec.ro)**):** "Located at a distance of about 800 m south of the Copăceni fortress, this Roman road was rediscovered because its exact location could not be established by researchers. The Copăceni Roman road

"Under the Stones" is still visible today. "It is marked by holes of various shapes and sizes cut into the native rock. The road was cut into the rock and then extended across the water on wooden supports. Nine holes were identified to support wooden beams over a distance of approximately 50 m. Information about the road dates back to the 18th century. The first information we have is from the letter that Father Schwantz sent to Count Stainville on January 23, 1717, in which he indicated that on the road from Cozia to Cornet on the east bank of the Olt, the ruins of the Roman road could be observed. This information was included in the letter. D. Tudor referred to a number of nine rectangular holes, as opposed to eighteen (Pr. Schwantz), which is a system quite similar to those at Cazane (Dobra - Golubac - Serbia). Several cave-like rooms are also mentioned in the literature, interpreted by D. Tudor as spaces used by Roman stonemasons as dwellings and places for storing tools. Michael Schendos de Van Der Beck (1691-1736), a physician sent by Field Marshal Stainville, who was the administrator of Oltenia and Transylvania on behalf of Austria, noted the presence of these rooms when drawing up the map of Oltenia together with Fr. Schwantz."

The point is correctly mapped in RAN (Cartographic Server for the National Cultural Heritage (cimec.ro))**, source** National Archaeological Repertory (cimec.ro), National Archaeological Repertory (cimec.ro)**).**

i) BOIȚA

1. Roman archaeological site of Boița - Ruda

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania *
RAN Code	145845.01
LMI Code (List of Historic Monuments)	SB-I-s-A-11946
Name	Roman archaeological site of Boița - Ruda
County	Sibiu
Administrative unit	Boița
Locality	Boița
Point	Ruda
Other point names	In Rude
Reference point	The site is located about 2 km east of the village, near the curvature of the Olt, on the right bank of the Olt, beyond the Old Tile Factory, 700 m east of the village, on the second terrace of the river.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river

Relief shape	depression
Land use	agriculture
Category	Habitation
Type	military settlement; civilian settlement
Description	On the high terrace to the right of the Olt, partial traces of the Roman fortification are visible, especially the soil resulting from archaeological excavations, without any visible ruins. In the field, as a result of agricultural work, numerous traces of Roman remains can easily be identified, especially at the edge of the high terrace, south-east of the fortification. The site has not been overlain by modern constructions.
Comments	This surge tank is believed to be Caput Stenarum. The surge tank was part of the northeastern limes of the Roman Empire, that is to say of the defensive system built and organized for the defense of the province of Dacia. This site is a reference site for the limes Alutanus, being located at the bend of the Olt river, near the first gorge, at Turnu Roșu. There was an important port nearby. In this area is the branch of the Roman roads leading to the provincial capital, Apulum and the eastern border of Dacia. The point was valuable in Roman times both militarily and especially commercially. The scenery is remarkable because from this area you can see the entrance to the mountain gorge of the Olt River, the height of the crown of the Făgăraș Mountains, the Parâng Mountains, the landscape of the Transylvanian hills and the Olt stream.
Site surface	1 298 ha
State of conservation	good / 28.03.2023
Anthropogenic risks	Intensive farming: 4 / 07.06.2022
Ownership	public; private
Date of Last Record Update	28.03.2023

The archaeological features here are the castrum, its civil settlement and a *statio*.

About the surge tank, the RAN states: "The fortification has rounded corners, 45 m by 50 m, a double wall 1.50 m thick, surrounded by a double defense ditch; on the west side a gate has been partially identified. An early Roman building detachment in Dacia (Bauvexillation?) was suggested by the discovery of a stamp bearing the name Legion XIII Gemina, perhaps together with cohort I Tyriorum sag and cohort I (Flavia) Commagenorum sag."

About the civil settlement, RAN notes: "Around the fortification, where the vicus was presumed to have stood, pottery fragments and the ruins of a building with a stone foundation and a wooden structure have been reported. A monetary hoard was discovered here, probably buried in the context of the Carpathian invasion of 247 BC. A Roman road connects the civil and military settlements."

About the statio, the same database states: "A massive building (20 x 50 m) was discovered 80 m south of the citadel. The heating and bathing facilities may be part of a larger complex or garrison fortress.

Nearby were discovered the remains of a building (11×10.5 m), interpreted by N. Lupu as a statio or tabularium portorii."

The point is correctly located in RAN **(**Cartographic Server for National Cultural Heritage (cimec.ro)**).**

2. The Roman road from Boița

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania
RAN Code	145845.03
Name	The Roman road from Boița
County	Sibiu
Administrative unit	Boița
Locality	Boița
Reference point	The Roman road can be seen 4 km south of the village and north of the Roman fort at Ruda.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Category	communication route
Type	road
Description	The road is called Trajan's Road by the locals and ran from Olt, probably as far as Apulum.
Date of Last Record Update	02.02.2022

The point is not precisely localized in the RAN **(**Cartographic Server for National Cultural Heritage (cimec.ro)**).**

3. The medieval tower of Boița - Turnul Spart

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania *
RAN Code	145845.02
LMI Code (List of Historic Monuments)	SB-I-s-A-11947
Name	The medieval tower of Boița - Turnul Spart
County	Sibiu
Administrative unit	Boița
Locality	Boița
Point	Turnu Spart
Other point names	Moghișului Tower; Medveș
Reference point	The archaeological site of Turnul Spart is located on the territory of the village of Boița, south of it, in the Olt gorge. Today the site is located on a narrow stretch of embankment between the Olt and the national road DN 7, between kilometers 245 + 430.000 and 245 + 520.000 of the latter.
Hydrographic Reference - Name	Olt, Meghiș
Hydrographic Reference - Type	river, stream
Relief shape	parade
Land use	riverbed
Category	Habitation
Type	defensive system
Description	In 1991, an archaeological survey was initiated in the area of the Broken Gun, whose report was published in 1999, which shed some light on the stratigraphy of the site and the buildings after the tower (the contemporary chamber). According to period documents and images, the fortification, of which only the ruin of the tower remains today, was built in the 15th-16th centuries and was intended to guard the border crossing between Transylvania and Wallachia, between the localities of Câineni and Boița. The ensemble also contained a wall, which started from the mountainside and stretched up to the Olt riverbed, at the level of the old road (below the current DN 7) there was a vaulted passage. A substantial section of this wall still remains to the west of today's DN 7, continuing up the mountainside.
State of conservation	precarious / 03.01.2017
Anthropogenic risks	Partial affectation: 4 / 03.01.2017
Date of Last Record Update	13.07.2022

The point is precisely located in the RAN (Cartographic Server for the National Cultural Heritage (cimec.ro)**) source** Repertoriul Arhetoriul Arheologic Național (cimec.ro)**).**

4. Turnu Roșu Fortress from Boița

The information in the RAN is as follows (National Archaeological Directory (cimec.ro)):

Location	Show on map of Romania *
RAN Code	145845.04
LMI code (List of Historic Monuments)	IL SB-II-m-A-12337
Name	Turnu Roșu Fortress from Boița
County	Sibiu
Administrative unit	Boița
Locality	Boița
Other point names	Red Tower
Reference point	The tower is located north of the Lotrioara Fortress, at the entrance to the pass from Sibiu, on the right bank of the Olt.
Hydrographic Reference - Name	Olt
Hydrographic Reference - Type	river
Relief shape	hill
Category	Habitation
Type	civil settlement
Description	In Turnu-Roșu there is a group of buildings which can be divided into three distinct units, built on three historic floors.
Ownership	state
Owner	Sibiu County Council, Foster Care Center no.
Date of Last Record Update	14.07.2022

The point is precisely located in the RAN (Cartographic Server for National Cultural Heritage (cimec.ro)**).**

5. The information in the RAN is as follows (Repertoriul Arhetoriul Arheologic Național (cimec.ro)):

Location	Show on map of Romania *
RAN Code	145845.05
Name	Lotrioara Fortress at Boița
County	Sibiu
Administrative unit	Boița
Locality	Boița
Other point names	Lotorvaio Fortress (Lauterbeng)
Reference point	The Lotrioara Fortress is located in the Turnu-Roșu pass, at the Lotrioara's spill into the Olt, on the right bank of the Olt, 9 km south of Turnul Roșu.

Hydrographic Reference - Name Olt
Hydrographic Reference - Type river
Relief shape hill
Land use forest
Category Habitation
Type civil settlement
State of conservation seriously affected / 13.07.2022
Natural risks Earthquake: 5 / 13.07.2022; Floods: 5 / 13.07.2022
Ownership public
Owner Romanian state
Date of Last Record Update 13.07.2022

The point is precisely located in the RAN (Cartographic Server for National Cultural Heritage (cimec.ro)**).**

Conclusions and recommendations

Government Ordinance no. 43/2000, approved with amendments and additions by Law no. 378/2001, republished in the Official Journal of Romania, Part I, no. 352 of April 26, 2005, states:

Chapter I

General provisions

Article 1

This Ordinance regulates the general legal regime of archaeological discoveries and research, as well as the protection of archaeological heritage, part of the national cultural heritage.

Article 2

(1) Within the meaning of this Ordinance:

[...]

b) the archaeological heritage is the set of archaeological assets consisting of:

1. archaeological sites inscribed in the National Archaeological Repertory, except those destroyed or disappeared, and sites classified in the List of Historical Monuments, located above, underground or underwater, containing archaeological remains: settlements, necropolis, structures, buildings, groups of buildings, as well as land with archaeological potential, defined by law;

[...]

e) preventive archaeological research is:

1. construction, alteration, extension or repair works relating to roads, technical and public utilities, including underground and underwater works, excavations, quarrying, construction of trunk mains, land improvement works, telecommunications networks, the installation of telecommunications relays and aerials, land research and prospecting works - drilling and excavation - required for geotechnical studies, the siting of ballast pits and oil and gas wells, and any other works affecting the surface and subsoil in areas with archaeological heritage, whether they are carried out within or outside the boundaries of the locality and irrespective of the form of ownership of the land;

[...]

j) an area with archaeological heritage is the land delimited by law, where archaeological research is to be carried out on the basis of information or scientific studies that prove the existence underground or underwater of archaeological heritage assets, likely to be part of the national cultural heritage; until the completion of archaeological research and taking appropriate measures for the protection and enhancement of archaeological discoveries, the areas of protection of archaeological or historical sites, established by law, are also areas with archaeological potential;

k) area with archaeological potential revealed by chance means the land where the existence of archaeological heritage assets has been revealed, in an unforeseen way, as a result of: 1. human actions, other than documented archaeological research, such as: construction works, geological prospecting works, including remote sensing, agricultural works, and other types of works and research carried out underground or underwater;2. actions of natural factors, such as earthquakes, landslides, floods, soil erosion and others, and where archaeological research is necessary for their recording and scientific valorization.

[...]

(7) Diagnostic, excavation or archaeological survey stages may be necessary in the following cases:

a) implementing a systematic archaeological research project;

b) as part of an environmental impact assessment, under the conditions laid down in environmental protection legislation;

c) as a result of a planned intervention on the ground, which may pose a threat to the archaeological potential of a demarcated area or an archaeological site;

d) as part of the phases of realization and approval of urban planning documents, within the legal framework established by national, regional, local urban planning documents and/or at the stage of their elaboration;

e) as a result of natural processes that bring archaeological heritage assets to light;

f) as a result of human actions, other than archaeological research, and the works referred to in Article 6;

g) for the elaboration of investment and development plans initiated at private, local, regional, national or international level.

[...]

(9) Preliminary archaeological research is mandatory in all cases of issuing environmental agreements for areas with archaeological heritage, constituting the only way to identify, describe and assess the direct and indirect effects of investment projects on the archaeological heritage.

[...]

(12) The evaluation of the results of the archaeological research, as materialized in the archaeological report drawn up in accordance with the standards in force, is the basis for determining the legal status of protection of archaeological finds or, where appropriate, the discharge of the archaeological burden of the area.

After analyzing the documentation related to the archaeological sites in the areas that will be affected by the project "Increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the hydropower development of the Olt river defileu on the Cornetu Avrig sector", the following was found:

Where the investment will affect large areas of land, according to the legislation, intrusive diagnostics will have to be carried out to check the archaeological burden. This concerns the area that will be affected by the development of the reservoir at Avrig, between Racovița and Bradu/Avrig.

In the case of the site BOIȚA - medieval tower, RAN code 145845.02, LMI code SB-I-s-A-11947, located on the territory of the village of Boița, south of it, in the Olt gorge, on a narrow stretch of bank between the Olt and the national road DN 7, between km 245 + 430.000 and 245 + 520.000 of the latter, if the development of the reservoir will require an extension to the west, the archaeological objective could be affected by the development of the reservoir Lotrioara. If the archaeological objective will be affected, preventive archaeological research is recommended. If there will be no such extension, then the archaeological objective will not be affected.

Table 89 *Archaeological sites discussed in the study on the* hydropower development of the Olt river gorge on the Cornetu - Avrig sector.

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Recommendations
BRADU				
1.	**Bradu, Roman settlement, RAN code 144072.07.**	Between Bradu and Săcădate, on the right bank of the Olt. The point cannot be precisely localized.	The point cannot be precisely localized.	Where the investment will affect large areas of land, according to the legislation, intrusive diagnostics will have to be carried out to check for archaeological loading. This is the area that will be affected by the development of the reservoir at Avrig, between Racovița and Bradu/Avrig.
2.	**Bradu-Atzenau, RAN code 144072.06.**	Towards the Dolman forest, between Bradu and Săcădate. The point cannot be precisely localized.	The point cannot be precisely localized.	
3.	**Bradu - Poiana cu șopruri, RAN code 144072.01, LMI code SB-I-s-A-11948.**	On the Coșolțului slope, between Bradului Hill and Dracului Hill. The point cannot be precisely localized.	The point cannot be precisely localized.	
4.	**Bradu - settlement Noa, RAN code 144072.05, LMI code SB-I-s-A-11948.**	On the east side of the village of Bradu, towards Avrig, to the right of the national highway Sibiu-Făgăraș. The point cannot be precisely localized.	The point cannot be precisely localized.	
5.	**Bradu, Bronze Age settlement, RAN code 144072.02**	In the country, on an old Olt terrace. The point cannot be precisely localized.	The point cannot be precisely localized.	
6.	**Isolated discovery. Stone axe.**	NE of the village of Bradu, on the Buhoi river valley, 30-40 m from its confluence with the Bradului valley.	The point cannot be precisely localized.	
RACOVIȚA				
1.	**Racovița - Bâlea area, RAN code 145364.01.**	In the central area of the Făgăraș Mountains. The point cannot be precisely localized.	The point cannot be precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
2.	**Isolated discovery. Racovița - Cărțăoaia's Garden, RAN code 145364.02.**	At the place called Cărțăoaia's Garden, located on one of the upper terraces of the Olt, at the confluence of the Valea Lupului and the Church Creek.	The point cannot be precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
TURNU RED				
1.	**A Eneolithic stone from Turnu Roșu. RAN Code 145943.01.**	To the left of Olt, at the southern edge of the village, towards Boița.	The point cannot be precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
THE CÂINENII MARI				
1.	**Archaeological site of Câinenii Mari - Arxavia.**	On the right bank of the Olt, north-west of the bridge over the Olt connecting Câinenii Mari and Câinenii Mici, on	The point is precisely localized. The archaeological objective will not be	This is not the case.

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Recommendations
	RAN Code 169137.01. LMI Code VL-I-s-B-09522.	either side of the DN7 road and the railroad between Câineni and Radu Vadului, in the outskirts of Câinenii Mari, to the east.	affected by the project.	
2.	**Fragments of the Austrian Via Carolina, RAN code 169137.03. LMI code VL-II-m-B-B-09707.**	400 m N, on D.N.7.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
CÂINENII MICI				
1.	**Roman Tower of Câinenii Mici - Pons Vetus / La Turnulețe, RAN code 169128.03.**	In the village of Câinenii Mici, in the northeastern part, about 300 meters northeast of the left bank of Olt, about 0.33 km north of DN7D, at the foot of Mount Pleașa.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
GREBLEȘTI				
1.	**Greblești - Roman settlement, RAN code 169146.01, LMI code VL-I-s-B-09539.**	V from the village, up to the Olt riverbed.	The point cannot be precisely localized.	If the investment does not exceed the width of the Olt riverbed, the archaeological site will not be affected.
ROBEȘTI				
1.	**Robești - archaeological site, RAN code 169173.01, LMI code VL-I-s-B-09569.**	In the heart of the village.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
RACOVIȚA (Vâlcea) - Praetorium II				
1.	**Racovița (Praetorium) II, Cetate, RAN code 17252518.01, LMI code VL-I-s-A-09564.**	The site is located south of Racoviță locality and Valea Satului, about 210 meters east of the Olt River, 150 meters west of the DC8 communal road, 85 meters north of the county road DJ 703P and about 92 meters northwest of the town hall of Copăceni.	The surge tank and the Roman road are located in the immediate vicinity of the Olt stream and the Cornetu dam. The archaeological objective will not be affected by the project.	This is not the case.
COPĂCENI				
1.	**Copăceni - At the mill. RAN code 172554.01, LMI code VL-I-s-A-09525.**	The site is located on the left bank of the Olt, on a high terrace, north of the Cornetu Hydropower Plant, on either side of the DJ703P road, east of Copăceni, on the locality's islet.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Recommendations
2.	**Copăceni-burgus Roman, RAN code 172554.02.**	The fortification is located east of Copăceni, north of the stream Cordoaia Mică.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
3.	**Copăceni, Roman road, RAN code 172554.03.**	The road runs parallel to the east bank of the Olt, southwest of Copăceni.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
BOIȚA				
1.	**Boița - Ruda, RAN code 145845.01, LMI code SB-I-s-A-11946.**	The site is located about 2 km east of the village, near the curvature of the Olt, on the right bank of the Olt, beyond the Old Tile Factory, 700 m east of the village, on the second terrace of the river.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
2.	**Roman road, RAN code 145845.03.**	The Roman road can be seen 4 km south of the village and north of the Roman fort at Ruda.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
3.	**Medieval tower, RAN code 145845.02, LMI code SB-I-s-A-11947.**	The archaeological site of Turnul Spart is located on the territory of the village of Boița, south of it, in the Olt gorge. Today the site is located on a narrow stretch of embankment between the Olt and the national road DN 7, between km 245 + 430.000 and 245 + 520.000 of the latter.	**The archaeological objective could be affected by the development of the Lotrioara reservoir.**	**If the archaeological objective will be affected, preventive archaeological research is recommended.**
4.	**Turnu Roșu Fortress, RAN code 145845.04, LMI code SB-II-m-A-A-12337.**	The tower is located north of the Lotrioara Fortress, at the entrance to the pass from Sibiu, on the right bank of the Olt.	The point is precisely localized. The archaeological objective will not be affected by the project.	This is not the case.
5.	**Lotrioara Fortress of Boița, RAN code 145845.05.**	The Lotrioara Fortress is located in the Turnu-Roșu pass, at the Lotrioara's spill into the Olt, on the right bank of the Olt, 9 km south of Turnul Roșu.	The point is precisely localized. The archaeological target will not be affected by project.	This is not the case.

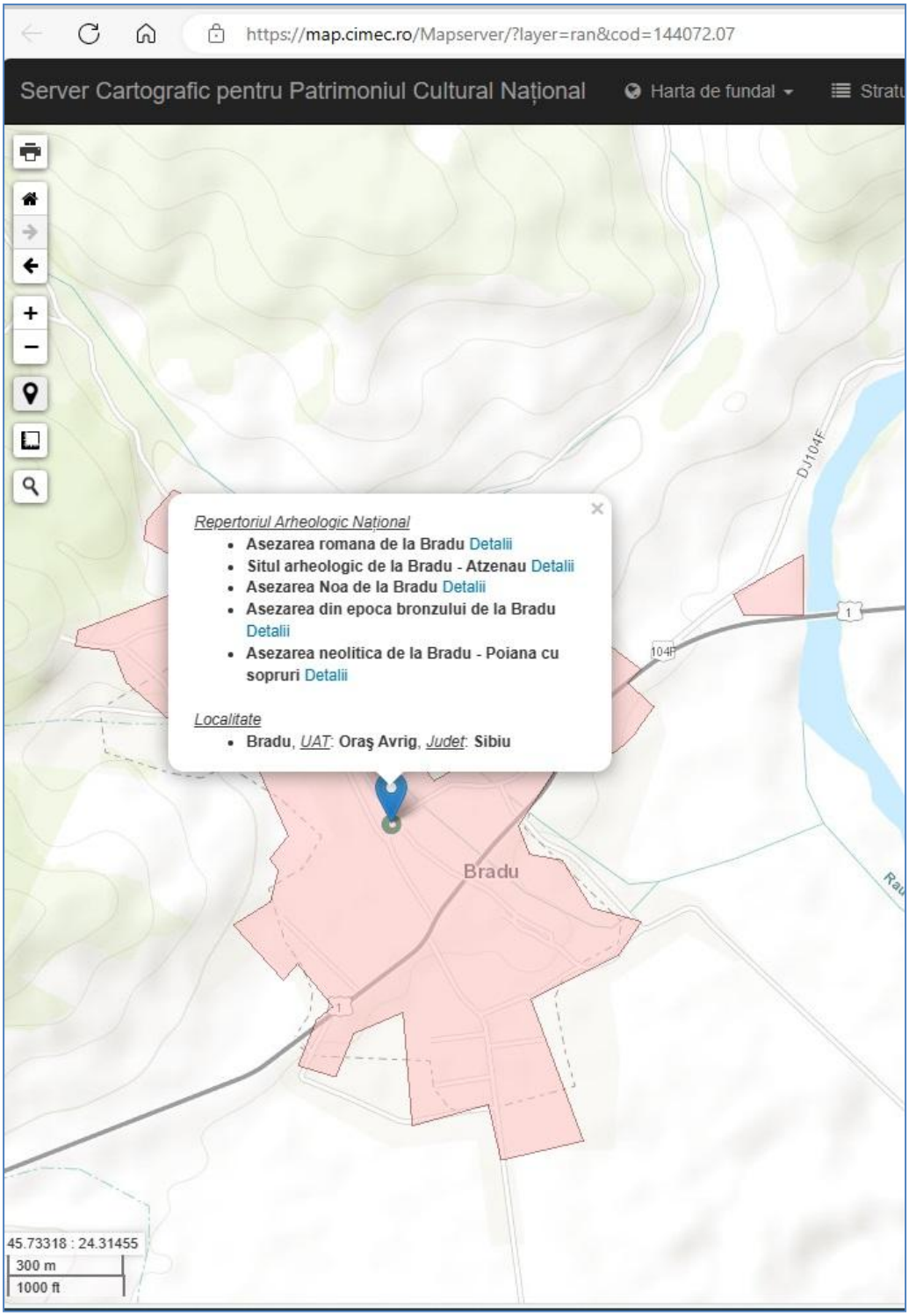


Figure 85 Roman settlement of Bradu, Archaeological site of Bradu, Noa settlement of Bradu, Bronze Age settlement of Bradu, Neolithic settlement of Bradu - Poiana cu sopruri

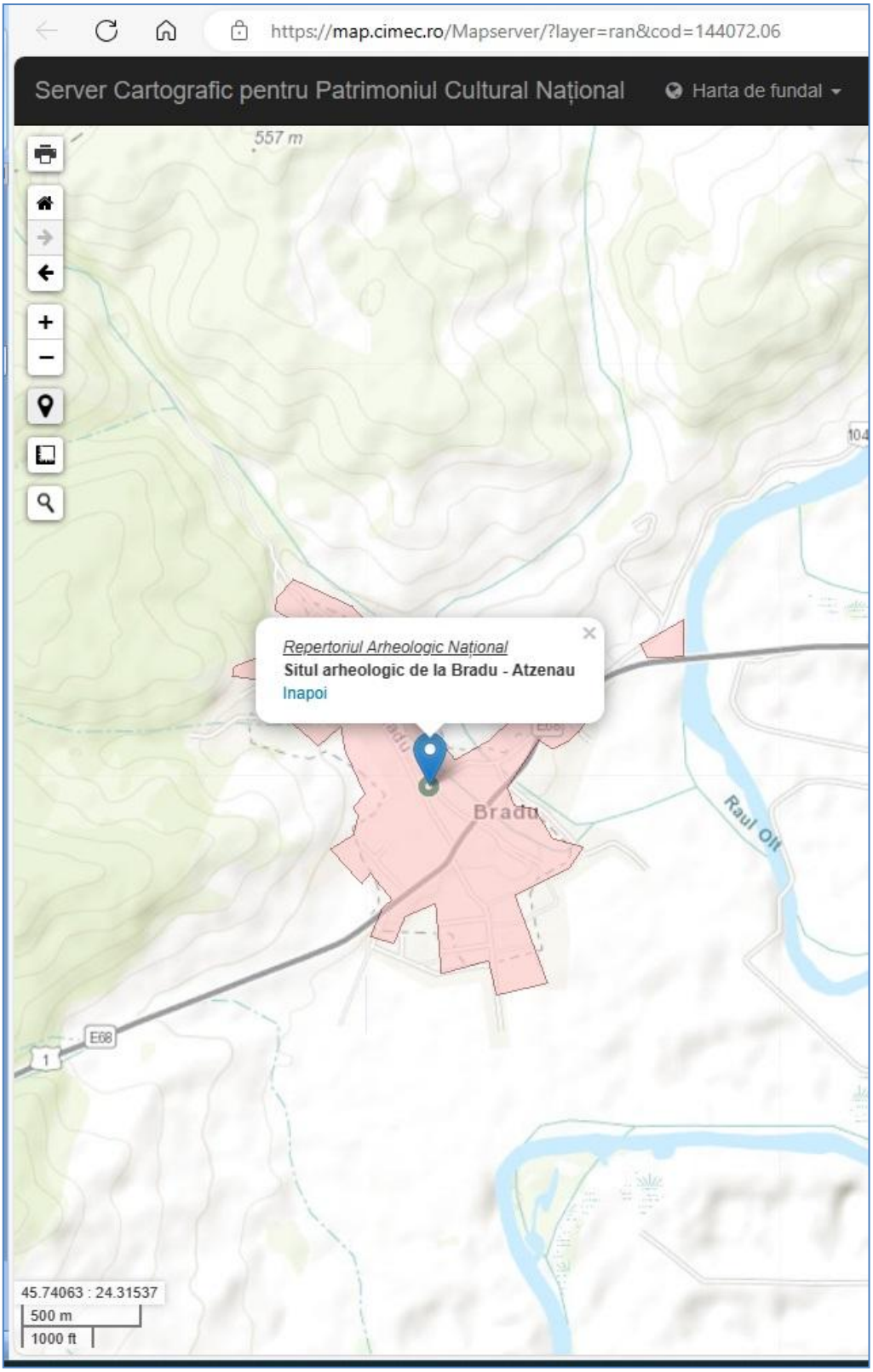


Figure 86 Archaeological site of Bradu - Atzenau

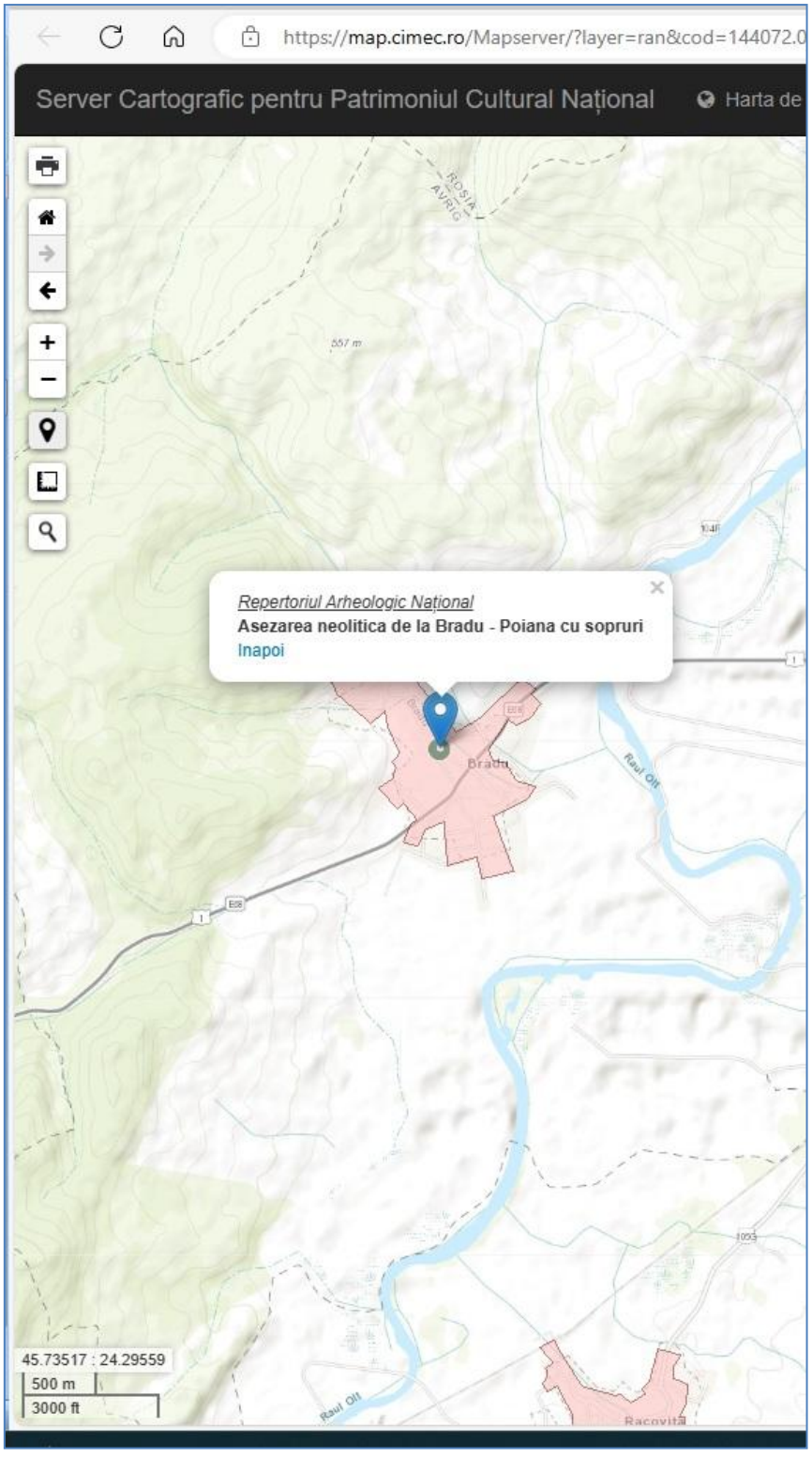


Figure 87 Neolithic settlement of Bradu - Poiana cu sopruri

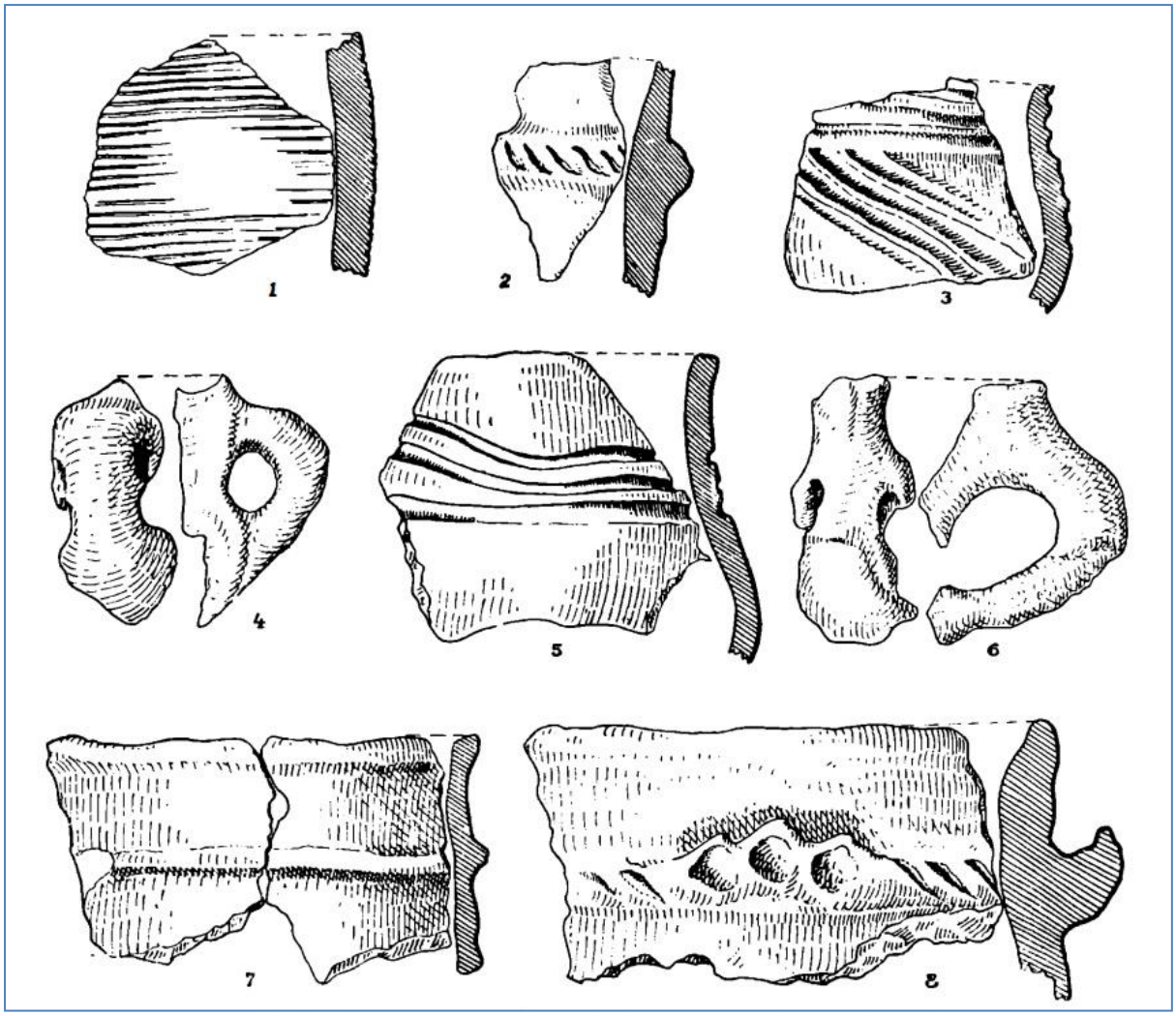


Figure 88 Bradu - Pottery from the settlement belonging to the Noa culture

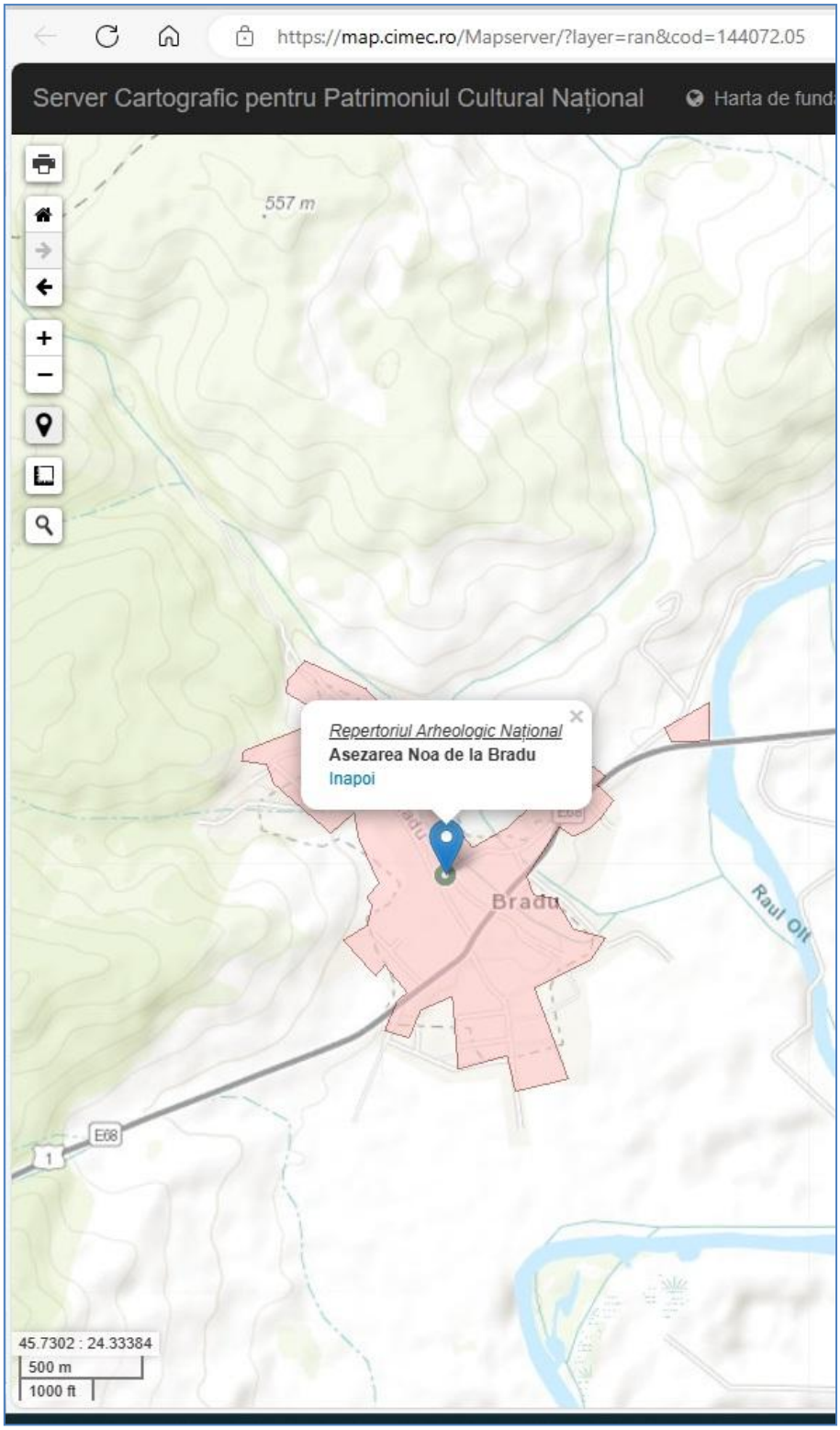


Figure 89 Noa Settlement of Bradu

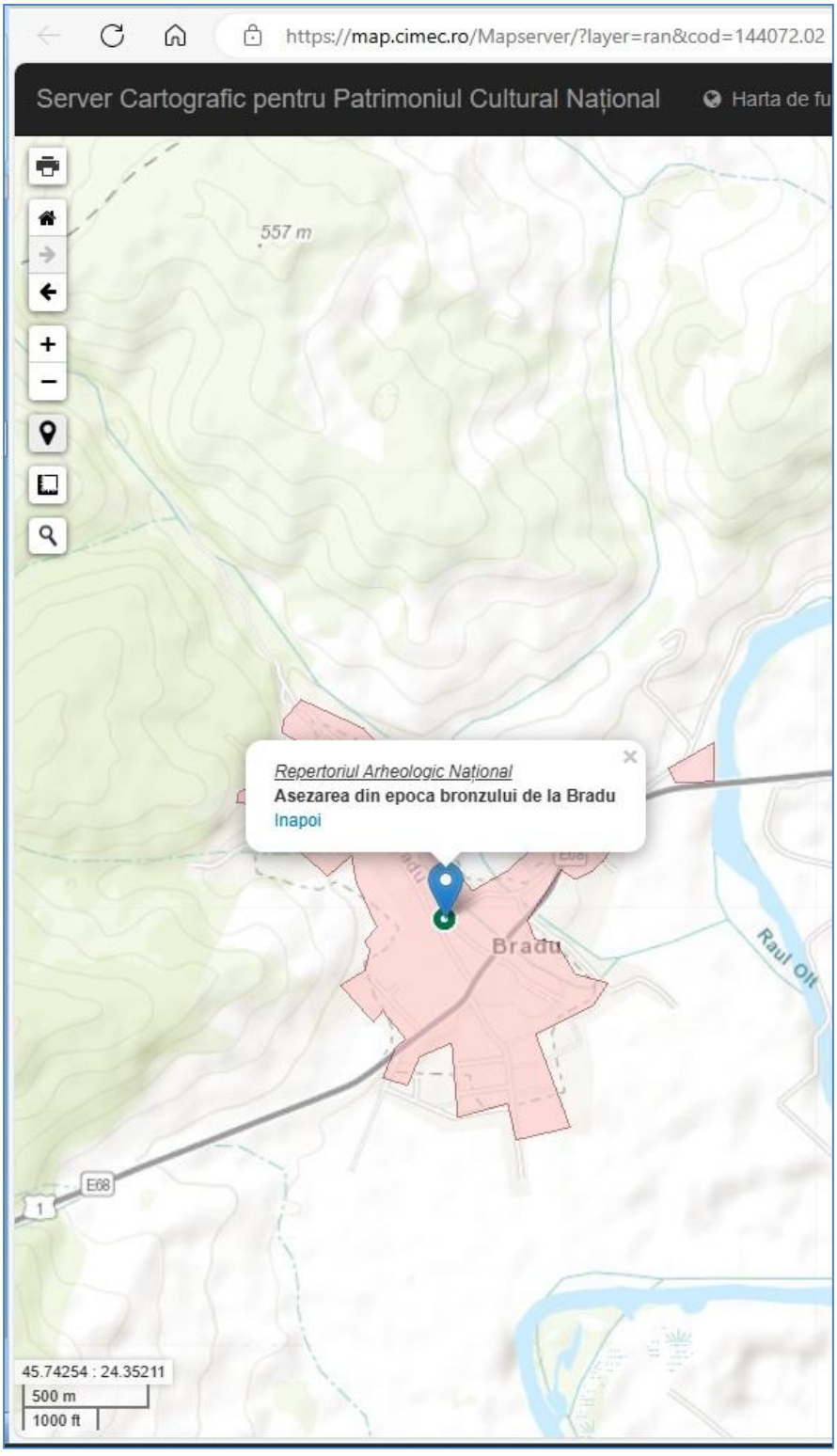


Figure 90 Bronze Age settlement at Bradu

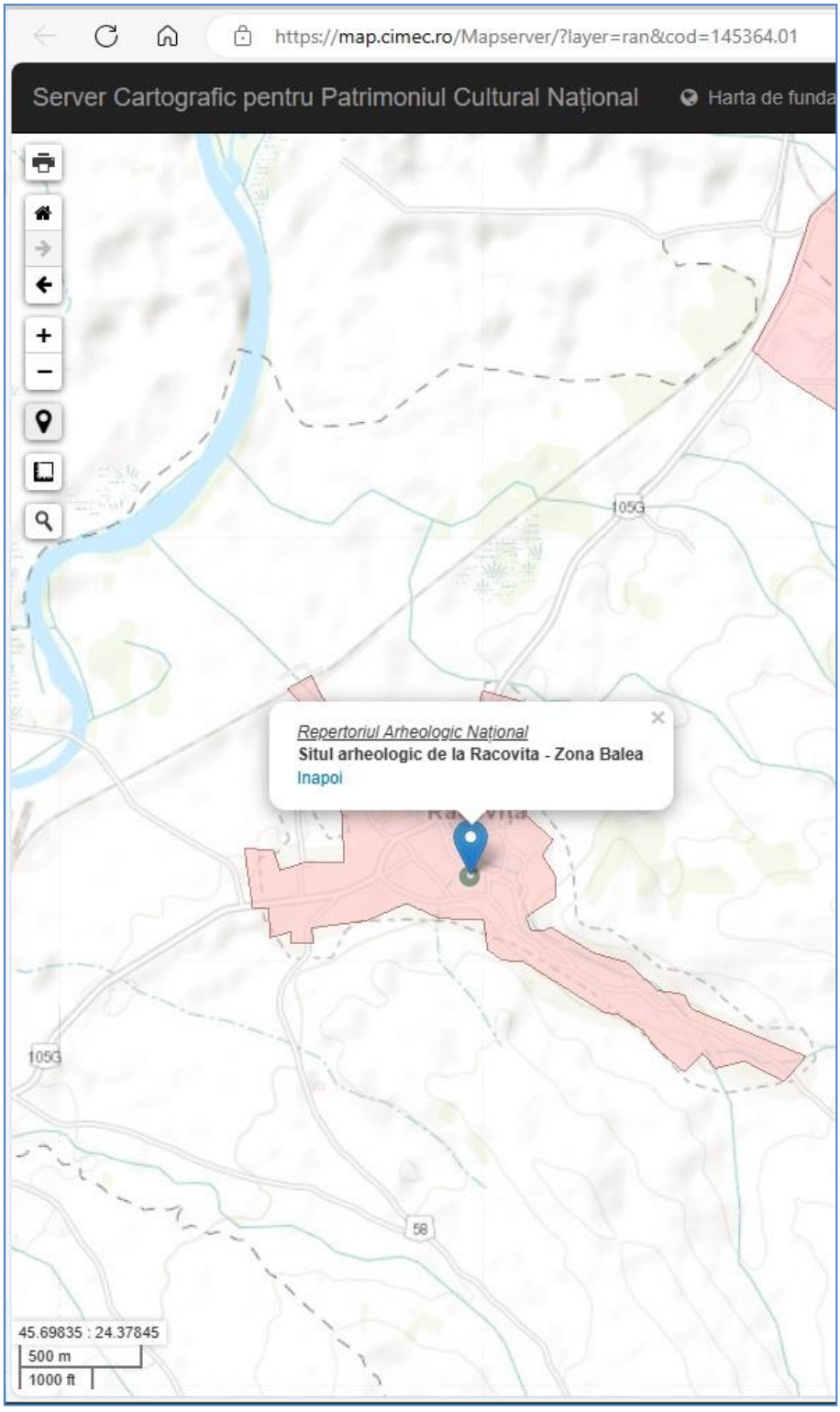


Figure 91 Racovița archaeological site - Balea area

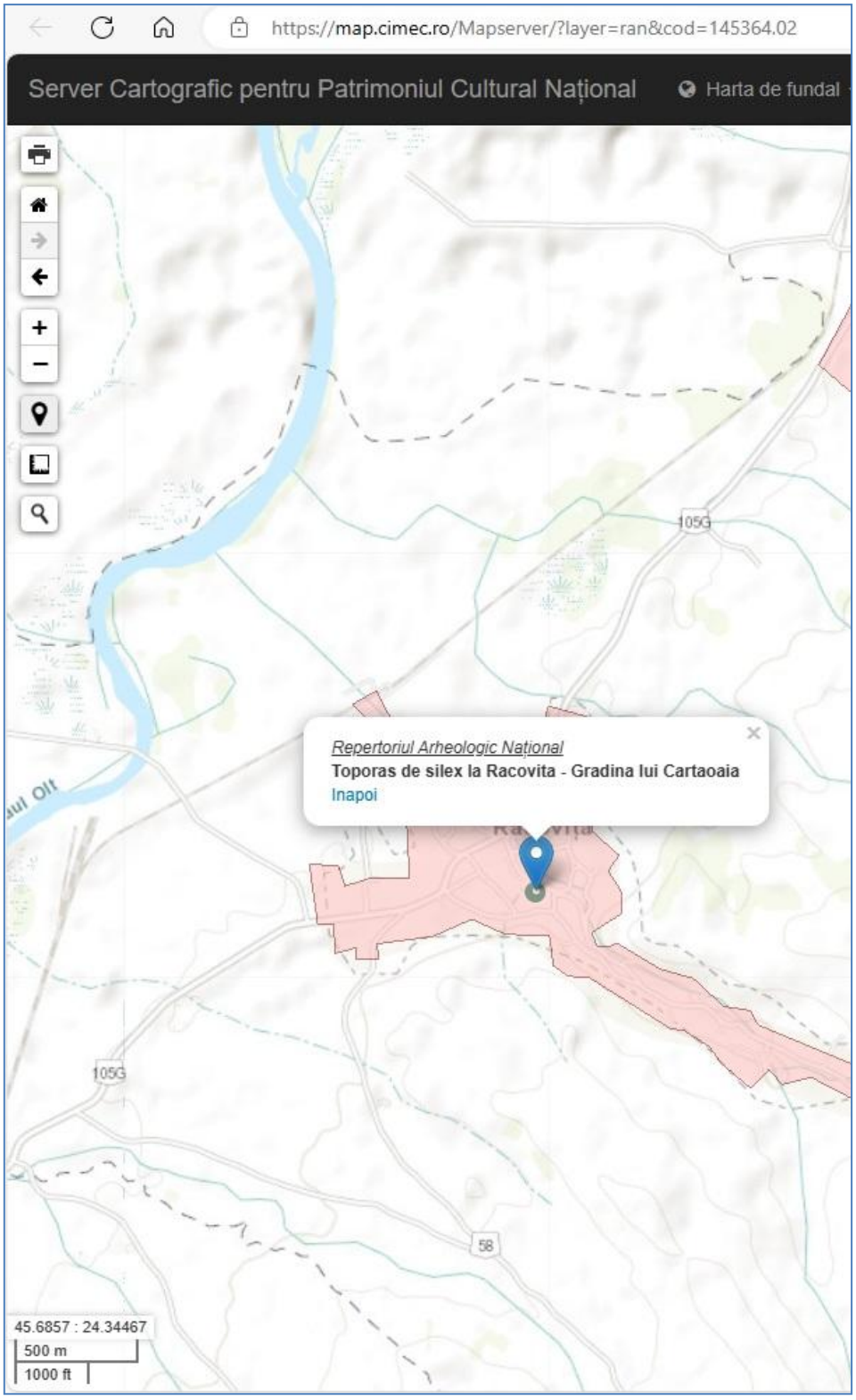


Figure 92 Flint topora at Racovița - Cartaoaia's Garden

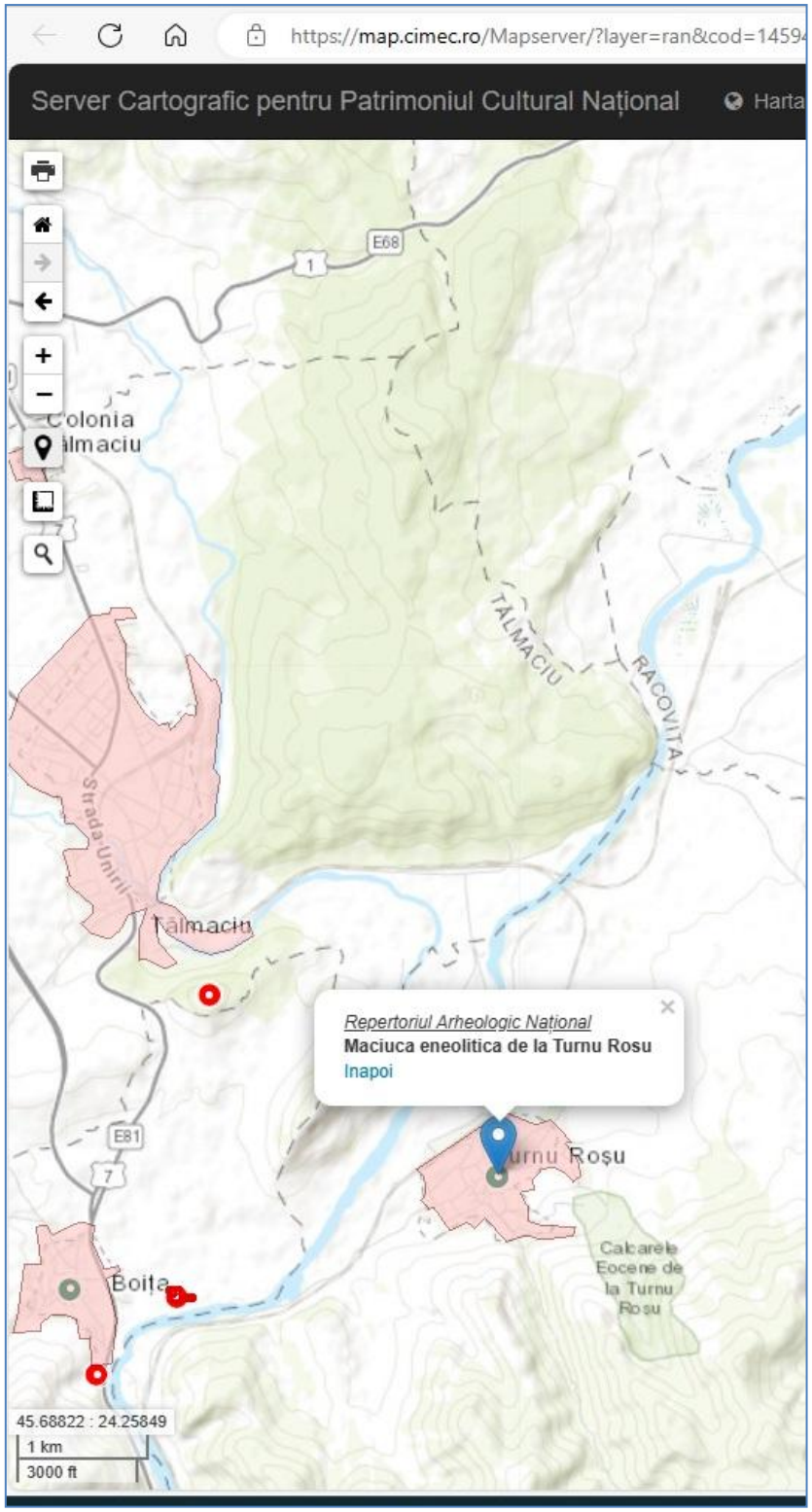


Figure 93 Eneolithic measures from Turnu Roșu

Figure 94 Archaeological site of Câinenii Mari - Arxavia

Figure 95 Opening of the Via Carolina road (1719). Detail from the map of Oltenia by Fr. Schwantz von Springfels

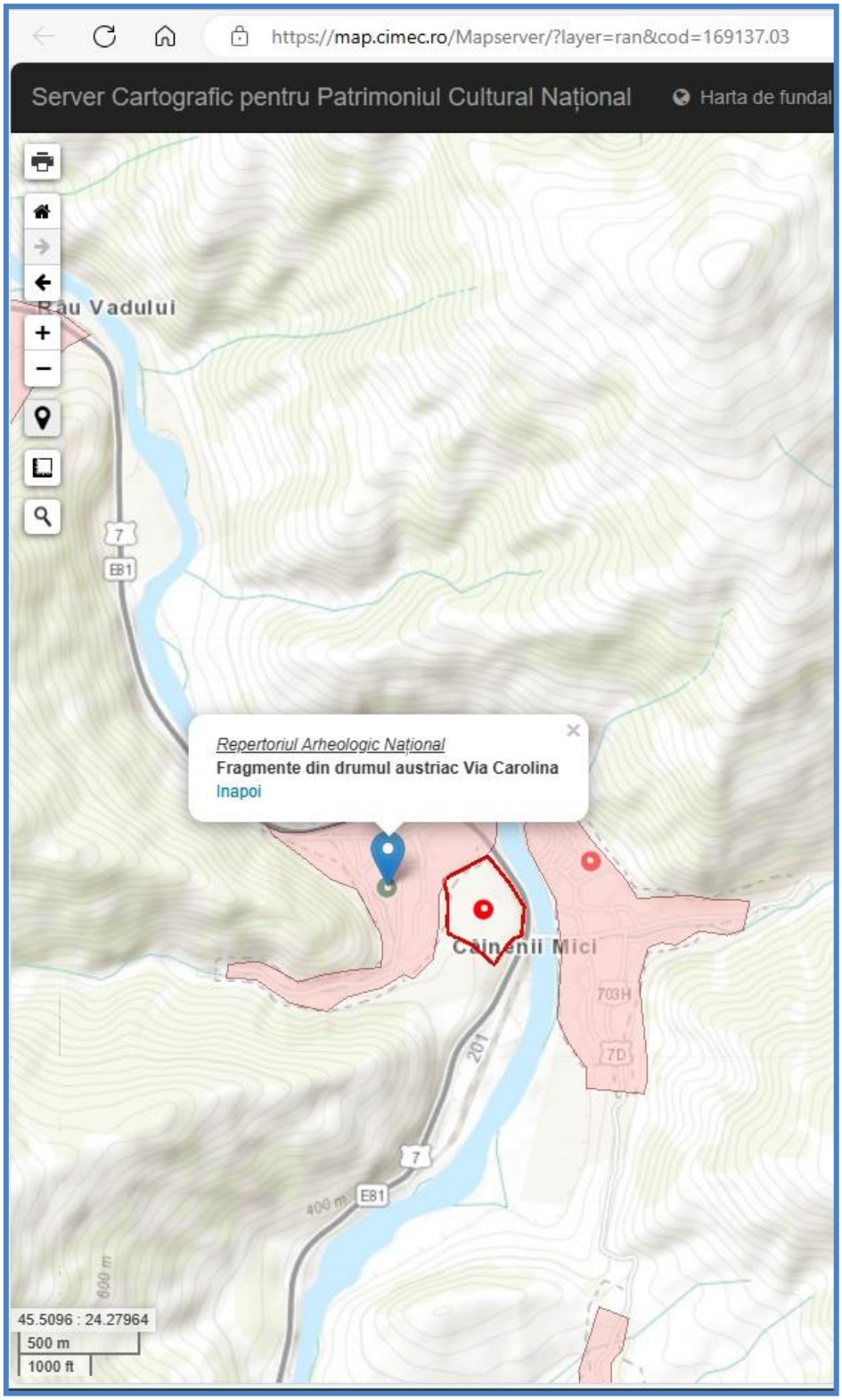


Figure 96 Parts of the Austrian road via Carolina

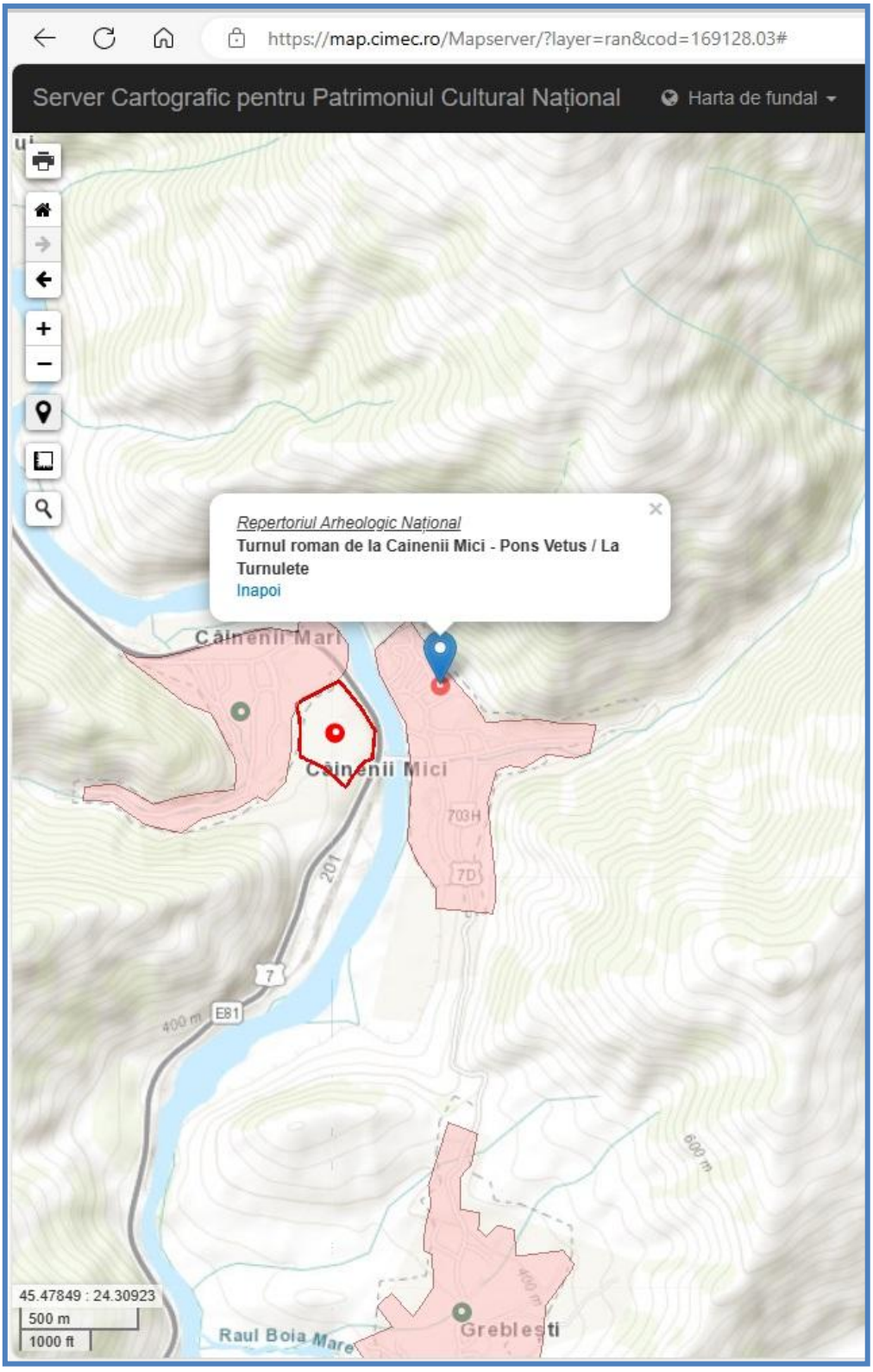


Figure 97 The Roman Tower of Câinenii Mici - Pons Vetus/ La Turnulețe

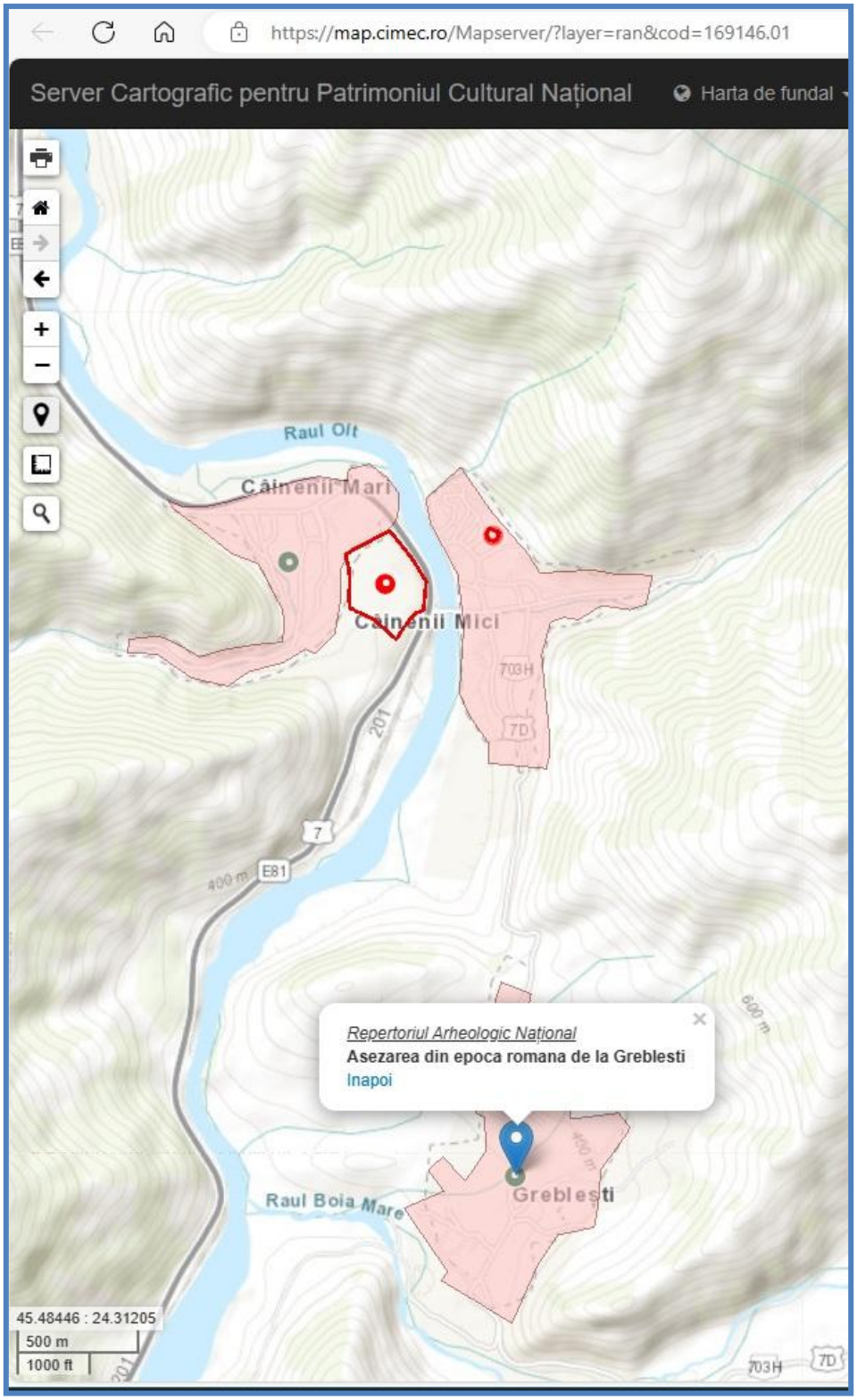


Figure 98 The Roman settlement of Greblești

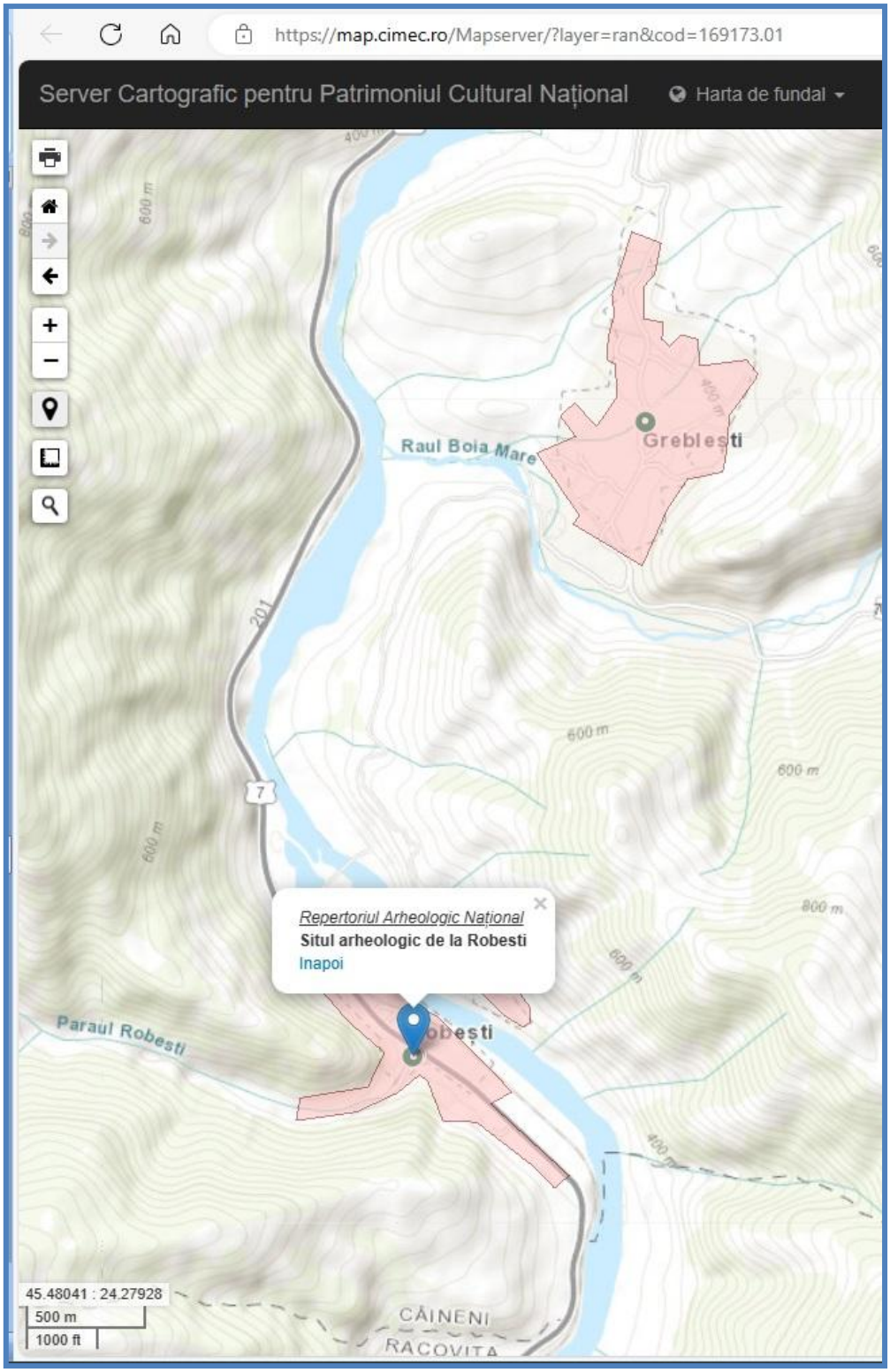


Figure 99 Archaeological site of Robești

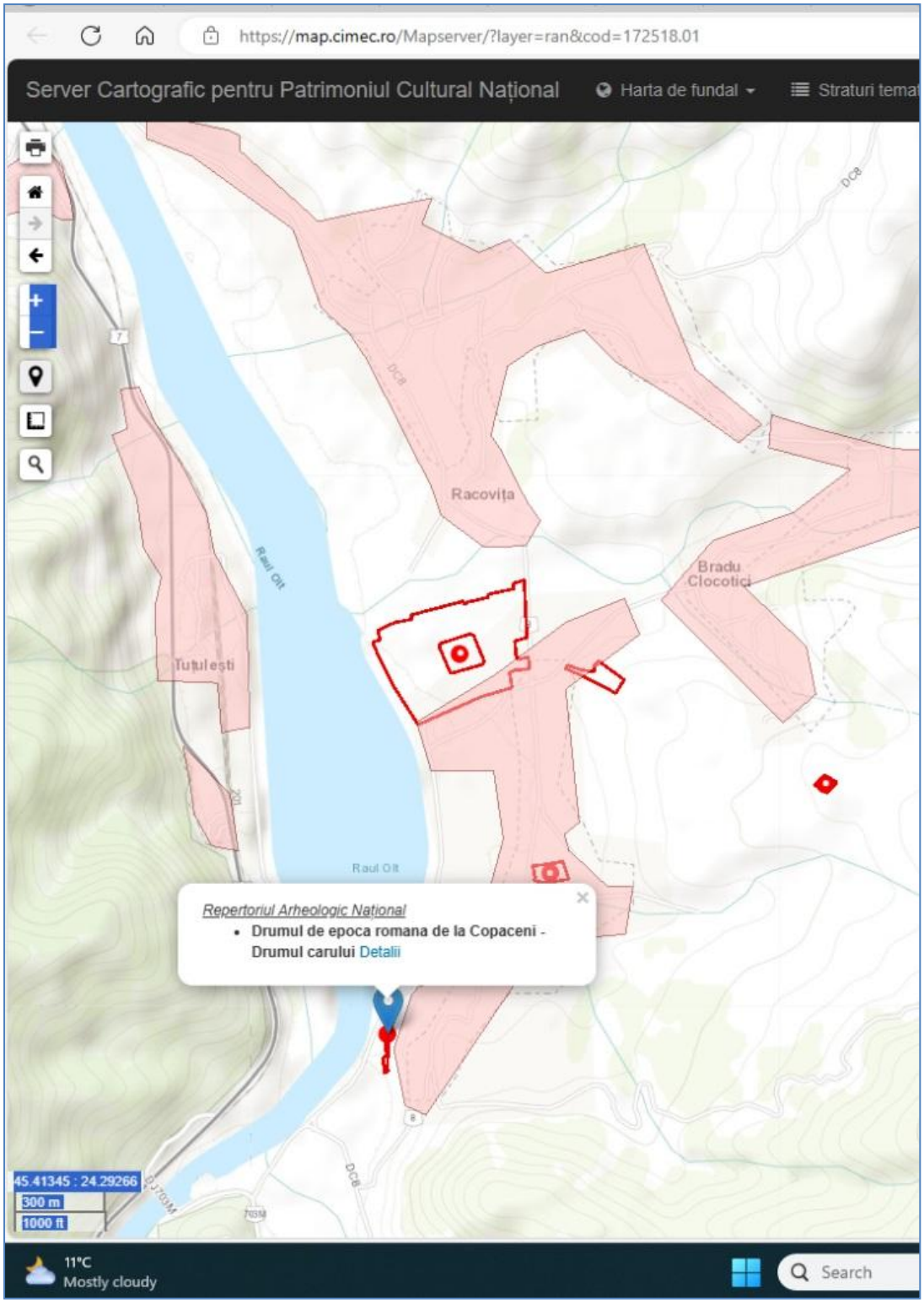


Figure 100 The Roman road from Copăceni - The Cart Road

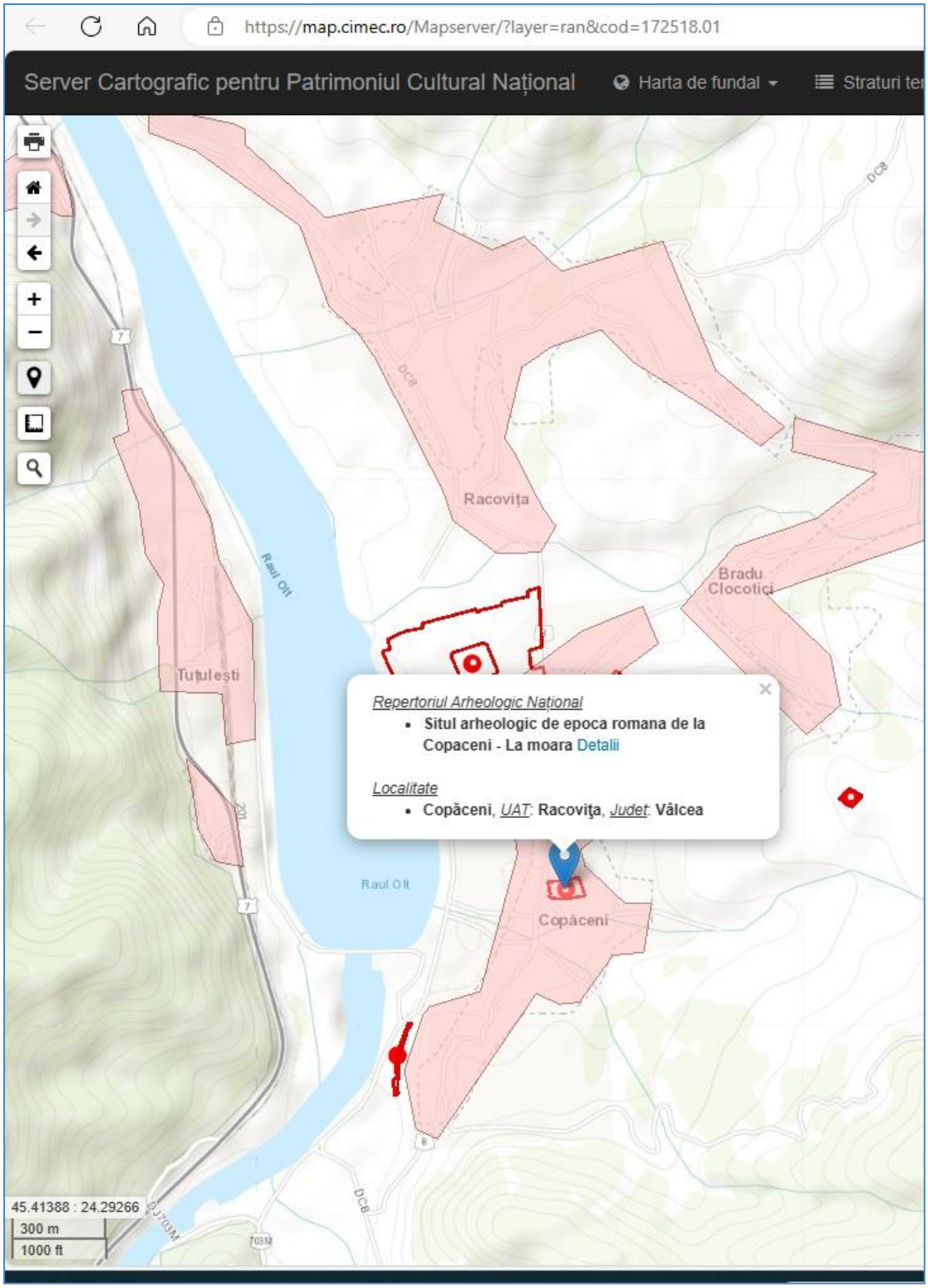


Figure 101 The Roman archaeological site of Copăceni - The mill

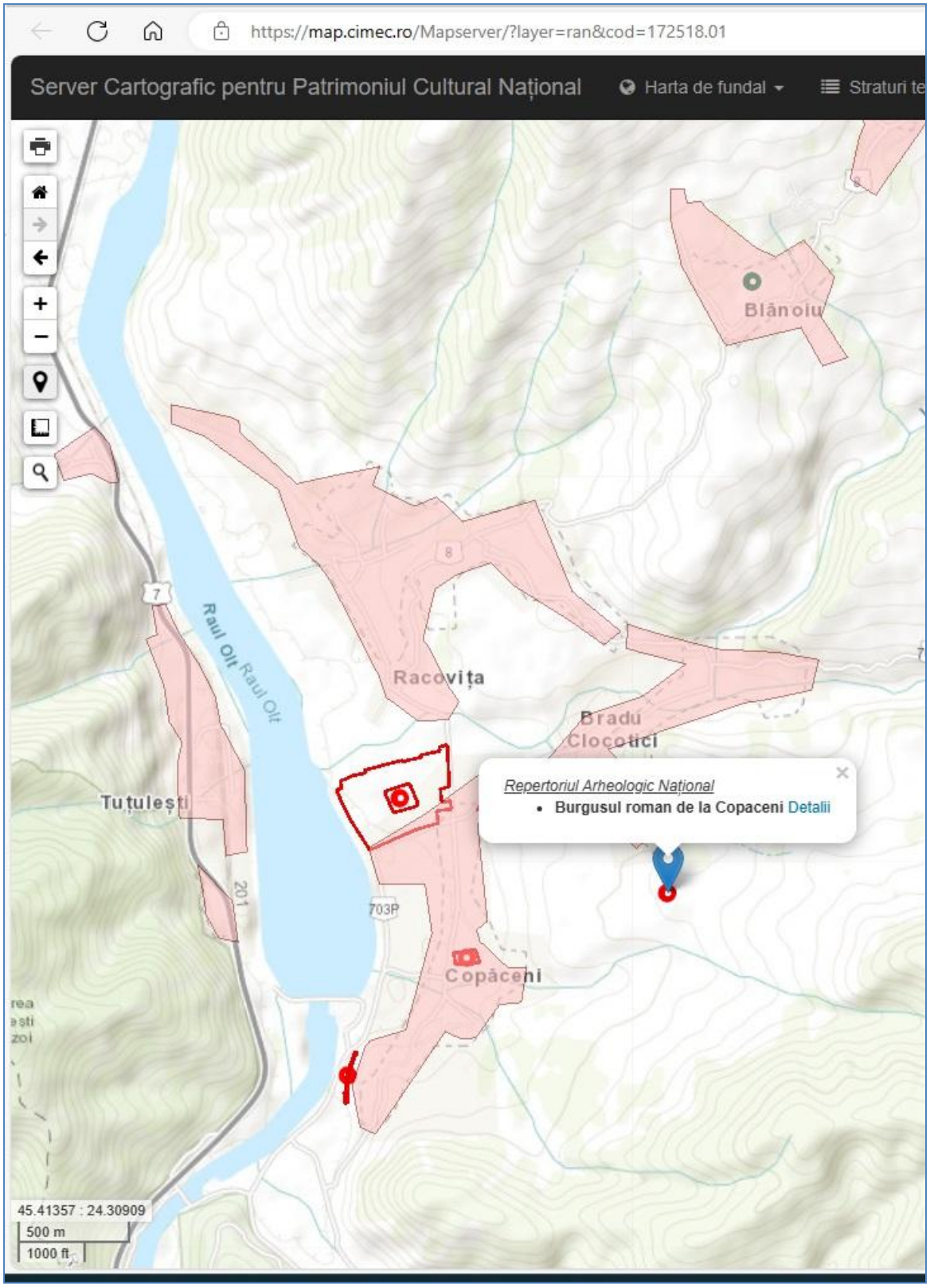


Figure 102 The Roman Burg of Copăceni

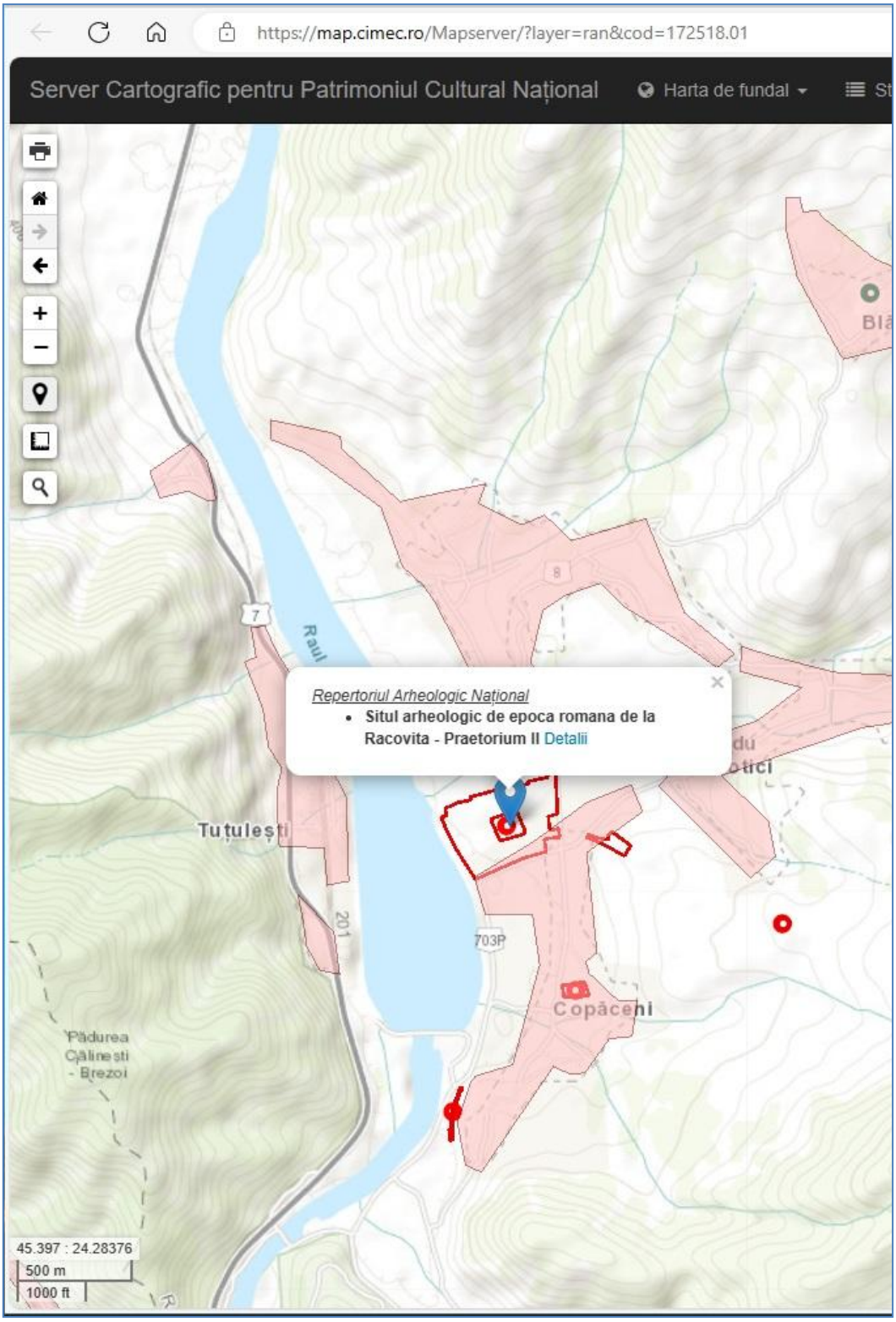


Figure 103 Roman archaeological site of Racovița - Praetorium II

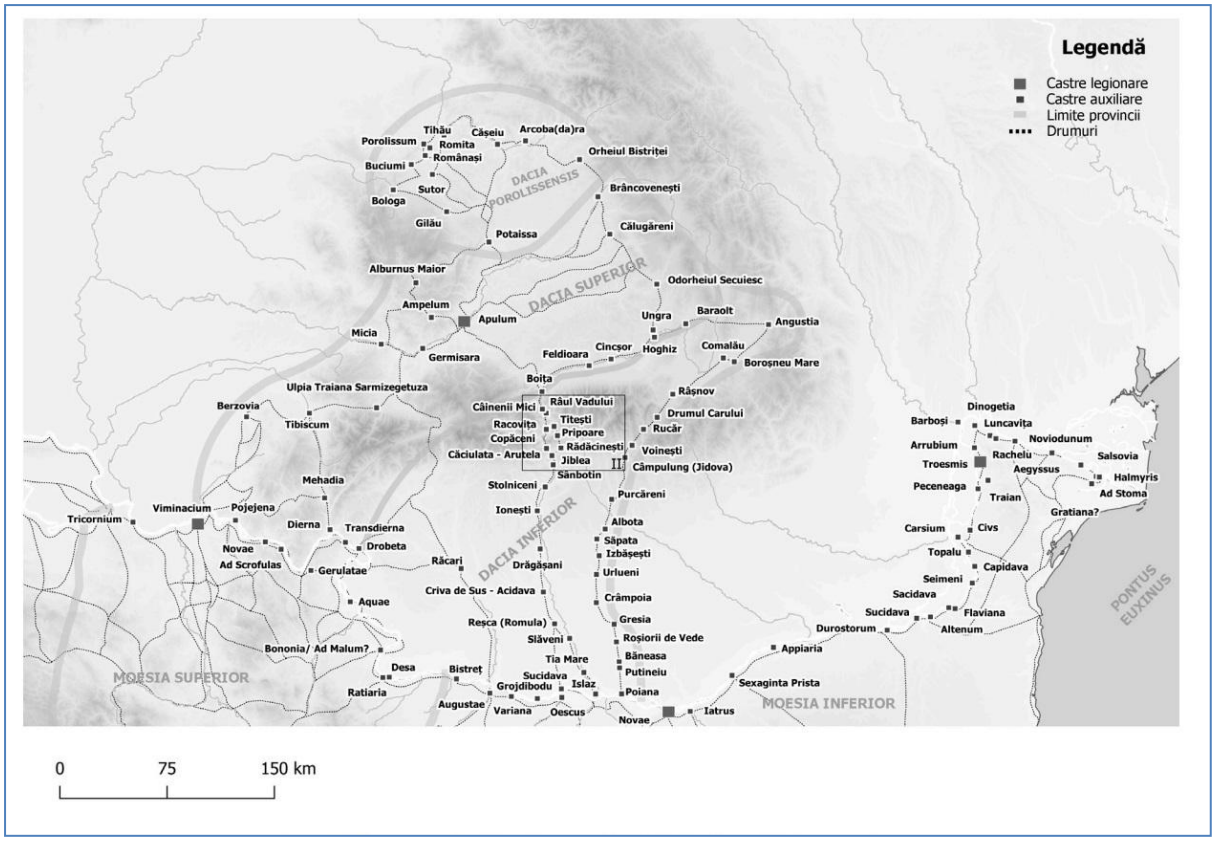


Figure 104 Map of the provinces of Dacia, Moesia Superior and Moesia Inferior

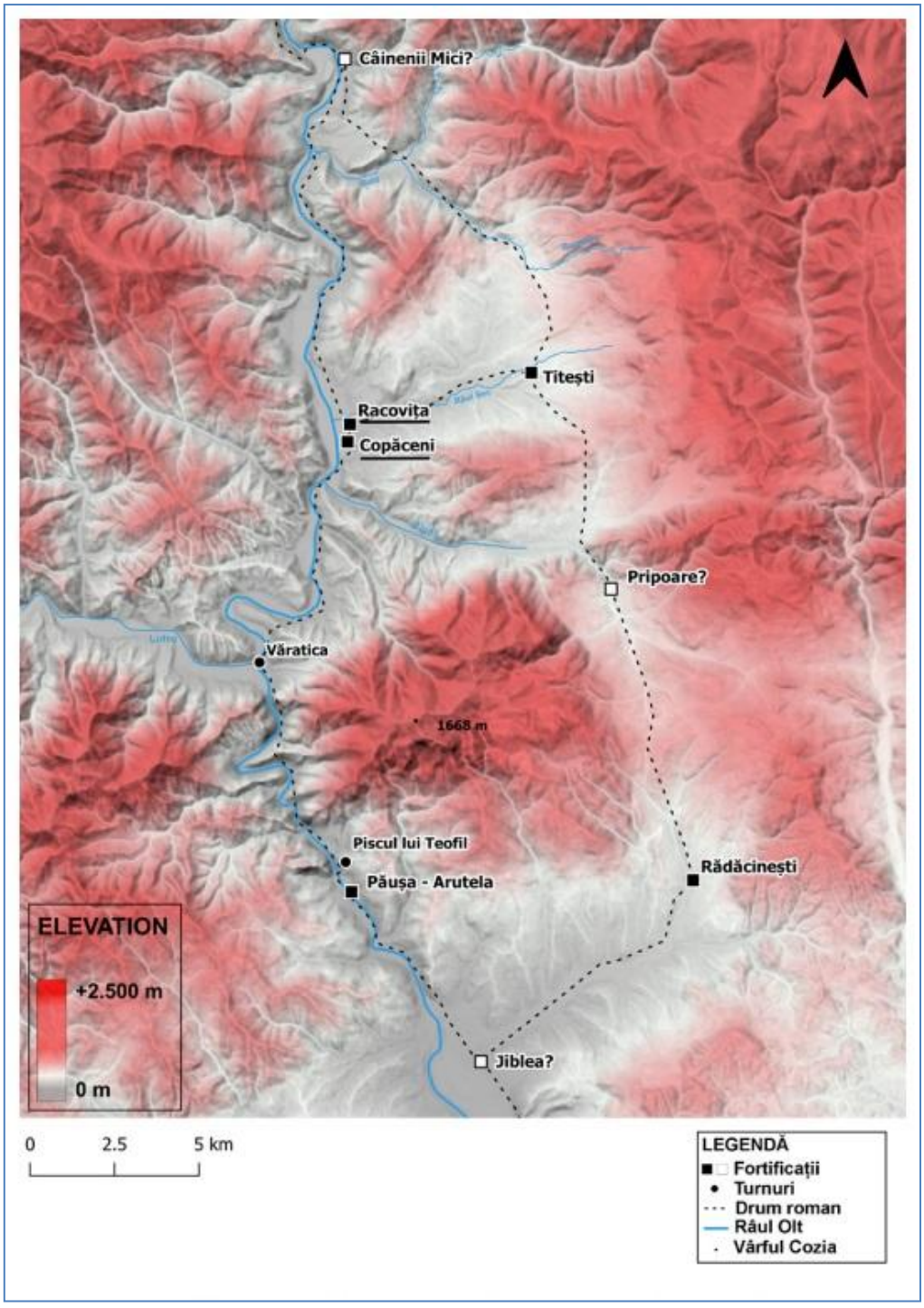


Figure 105 Roman fortifications in the Cozia Massif area

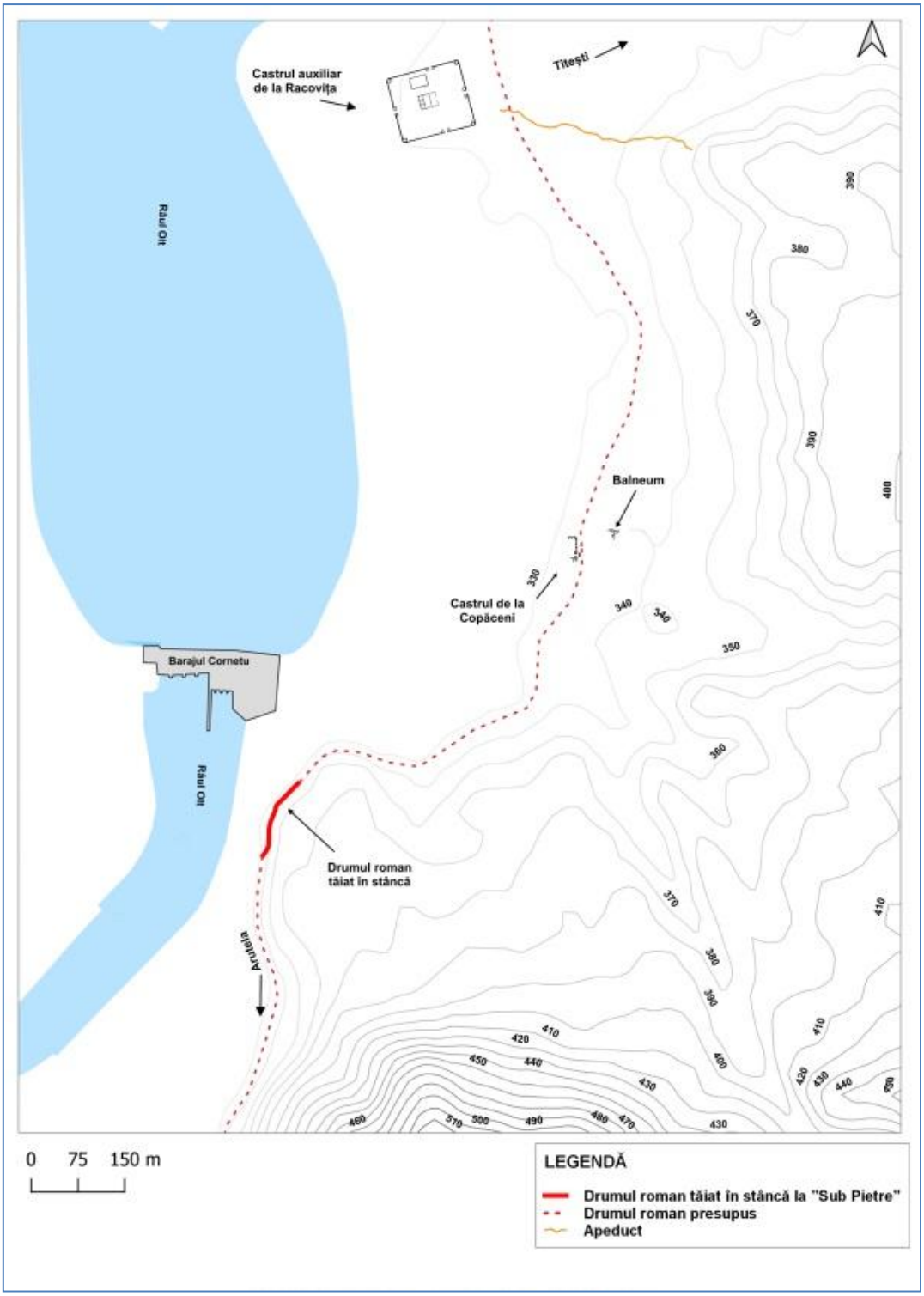


Figure 106 Roman fortifications at Racovița and Copăceni

Figure 107 Racovița Auxiliary Castrum, oblique drone photo, view from the north-west (2022)

Figure 108 Reconstruction of the plan of the Racovița surge tank (a); Overlay of the plan processed after P. Polonic over the orthophotoplan (2002)

Figure 109 Copăceni and Racovița surge tanks, oblique drone photo, view from the southeast (2022)

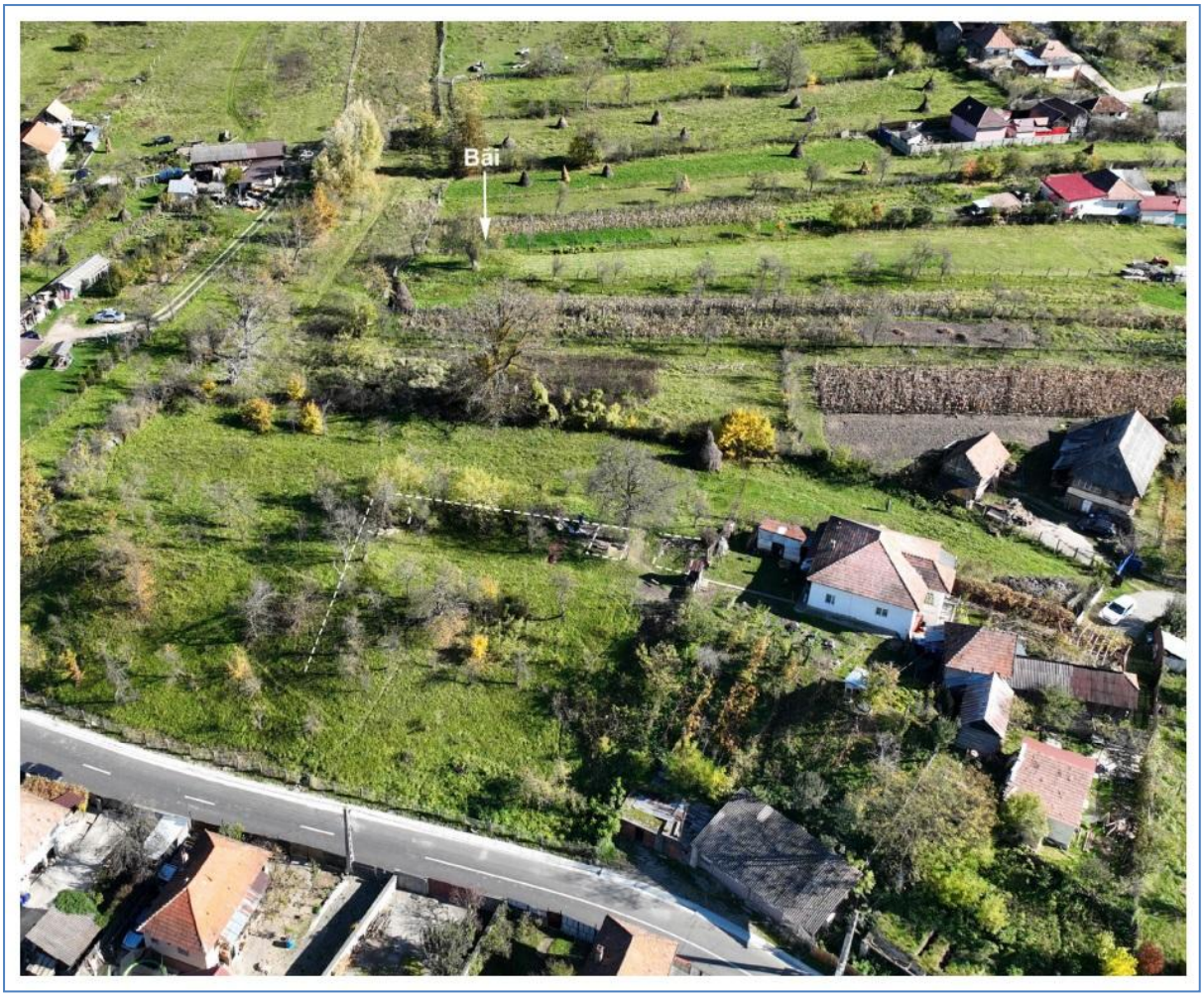


Figure 110 Copăceni Castropolis and location of the baths, oblique drone photo, view from the south-west (2022)

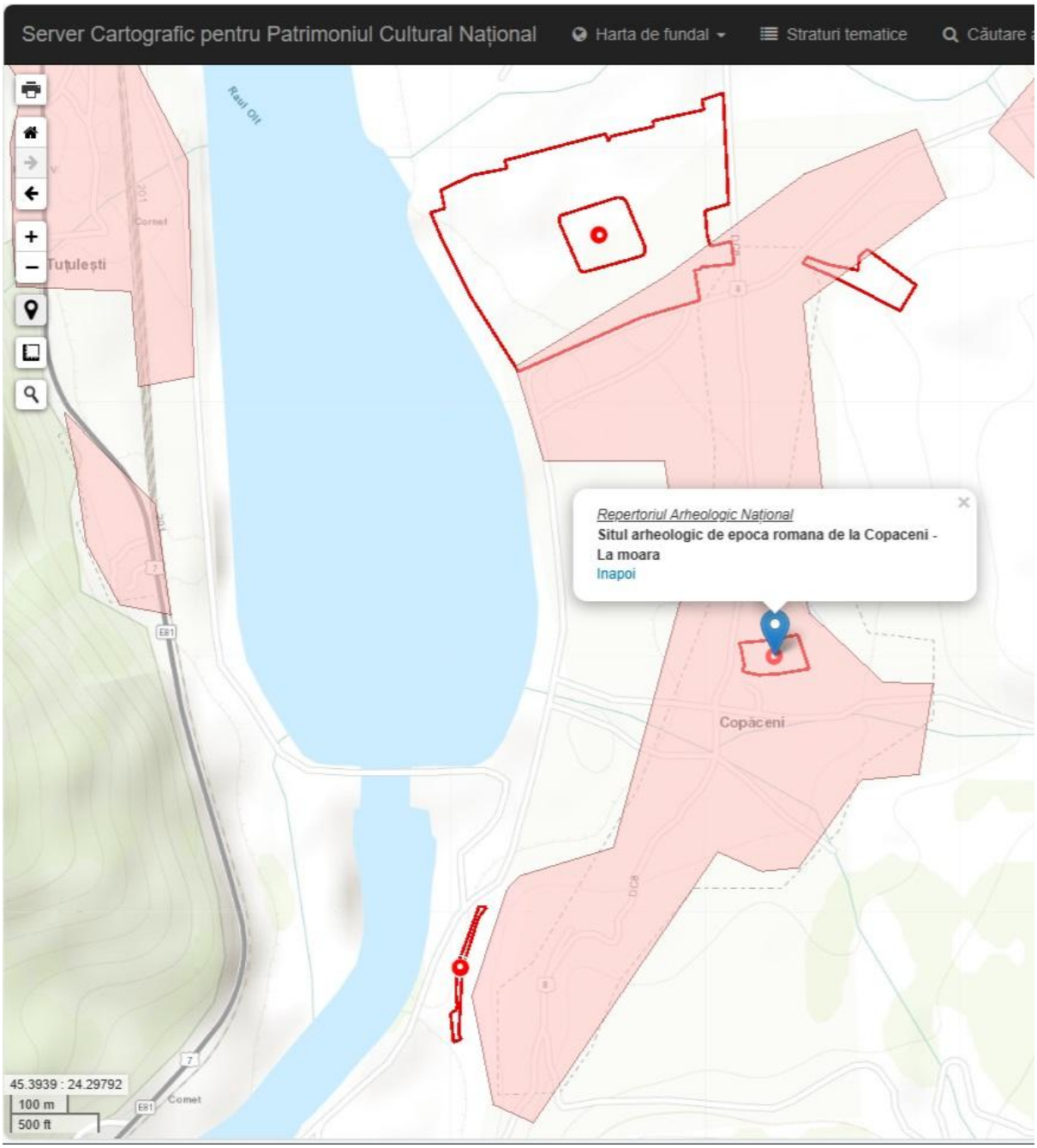


Figure 111 Roman archaeological site of Copăceni - The mill

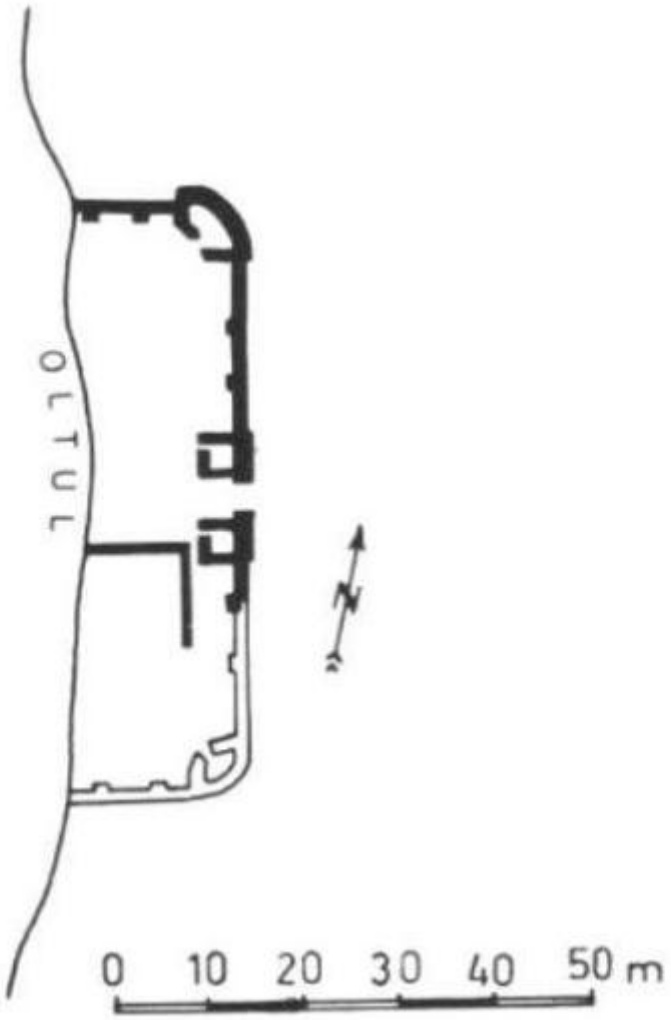


Figure 112 Copăceni, plan of the surge tank (Gudea, 1997)

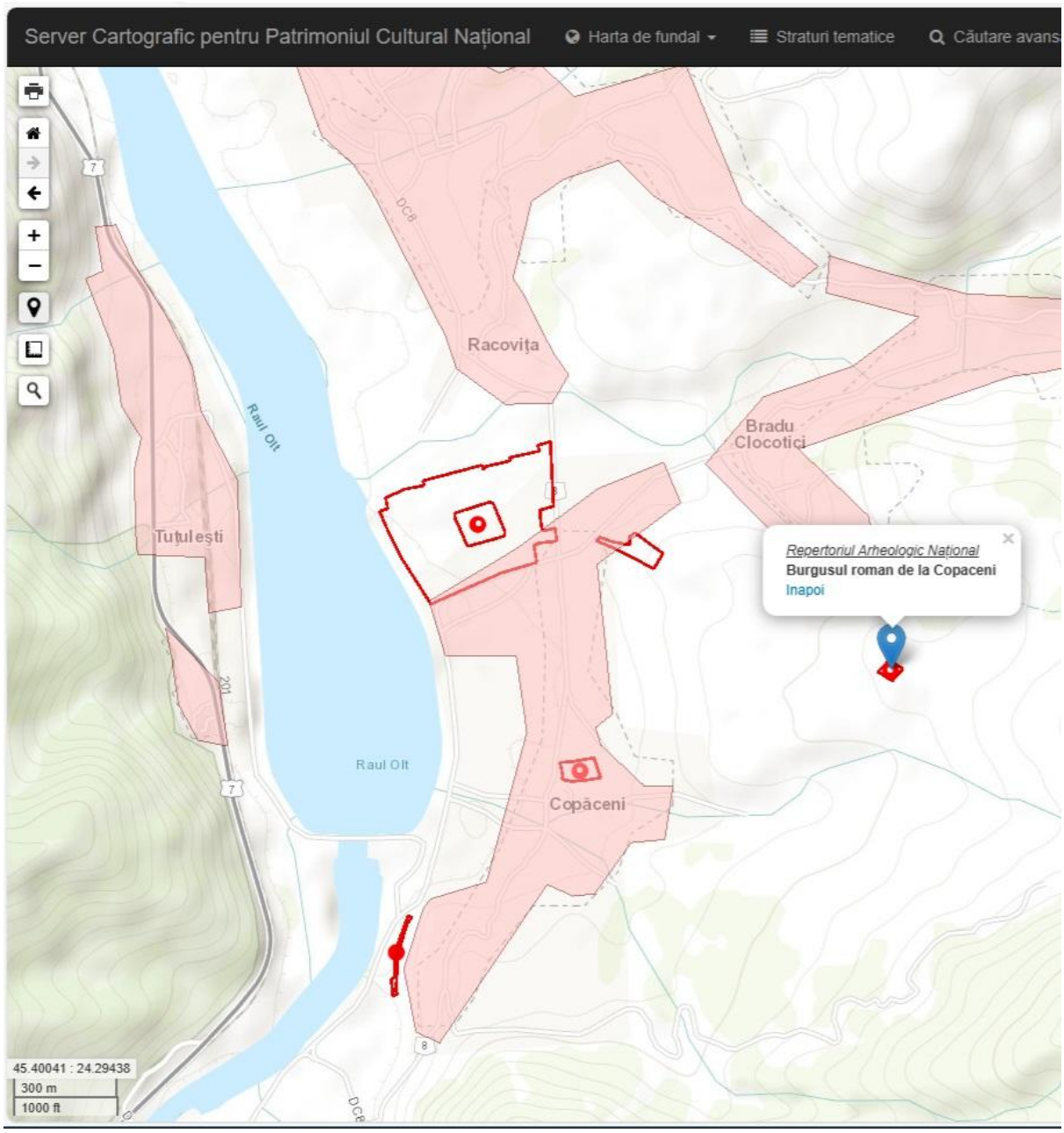


Figure 113 The Roman Burg of Copăceni

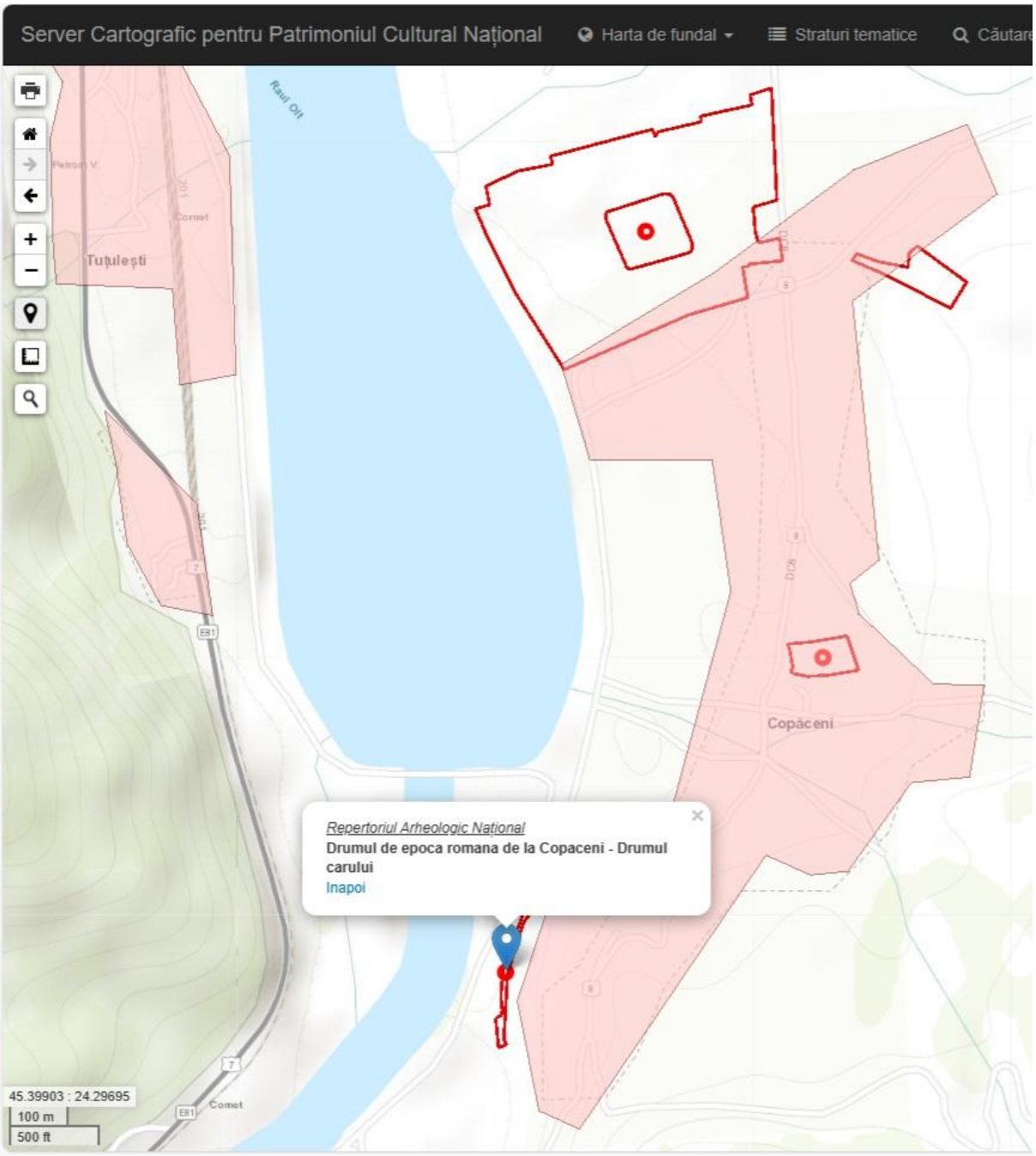


Figure 114 The Roman road from Copăceni - Drumul carului

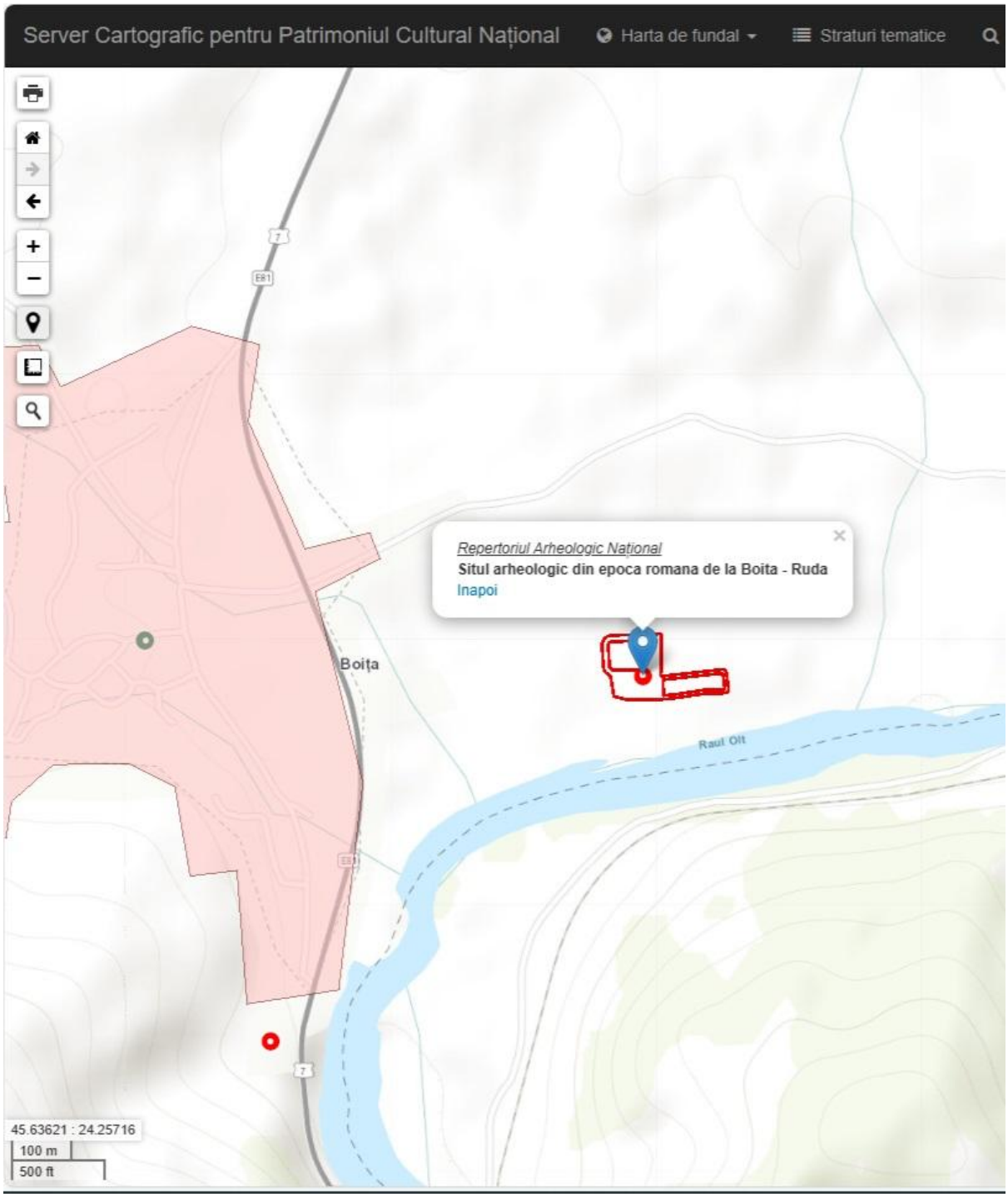


Figure 115 The Roman archaeological site of Boița - Ruda

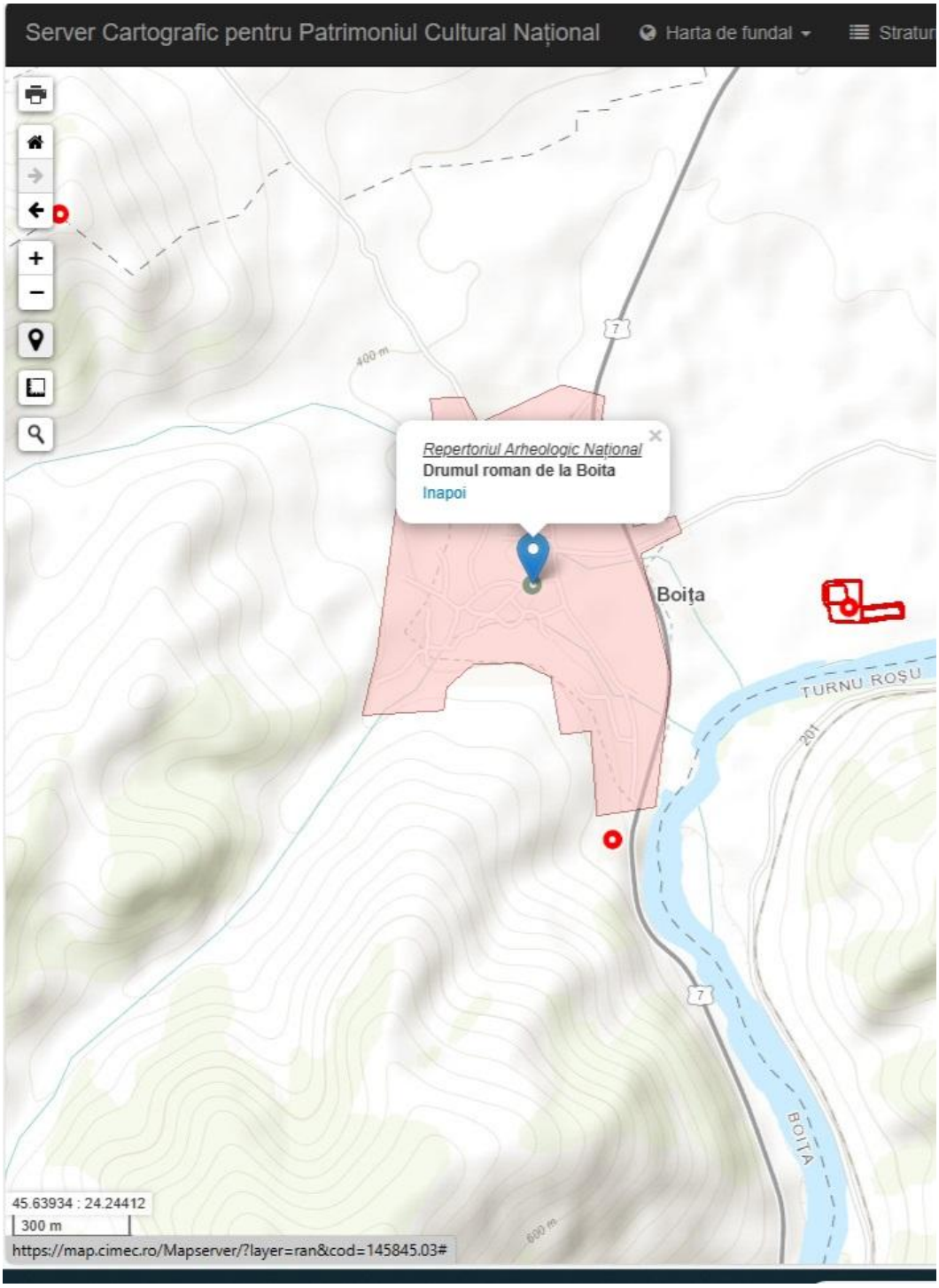


Figure 116 The Roman road from Boița

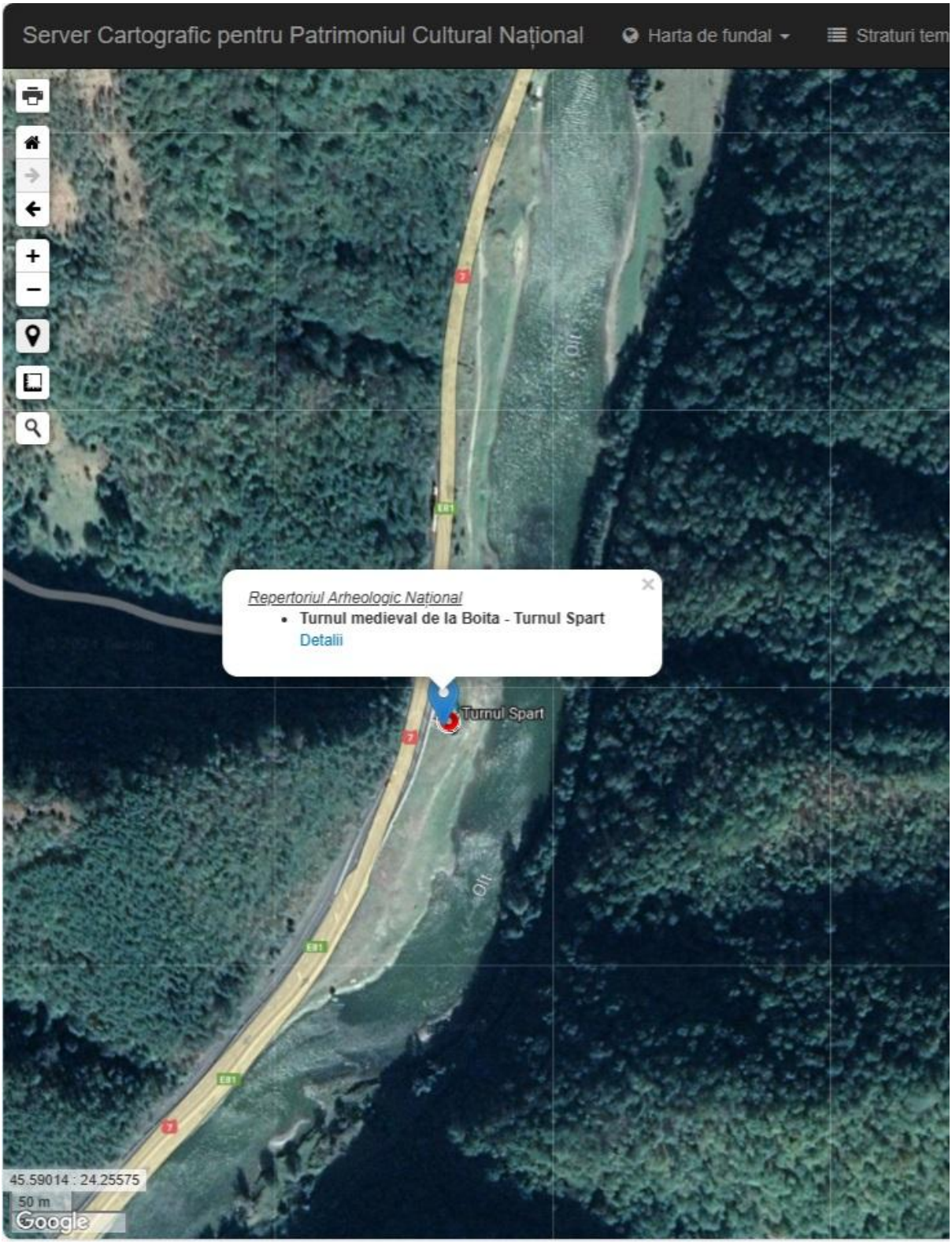


Figure 117 The medieval tower of Boița - Turnul Spart

Figure 118 Turnu Roșu Fortress from Boița

Figure 119 Lotrioara Fortress of Boița

The archaeological analysis shows that in the project implementation area, namely in the area of the Lotrioara reservoir, there is an archaeological site, namely the Medieval Tower, RAN code 145845.02, LMI code SB-I-s-A-11947, which could be affected by the implementation of the works.

The impact generated during the works on the elements of the archaeological heritage will be ***insignificant negative for the archaeological objectives outside the project site (with the exception of the Medieval Tower)*** and due in particular to the sensitivity of the monument buildings to vibrations generated by the traffic of machinery and trucks during the works. It is worth mentioning that the impact will be limited, reversible, reduced in intensity and limited

in time only during the works, during the operation phase there will be no impact on archaeological elements.

j) The landscape

Visual perception of the landscape is subjective, which makes it difficult to assess the impact on this environmental factor. It is important to emphasize that landscape is a result of the interrelation of the other environmental factors, so that the impact generated on the environmental factors water, air, soil/soil, biodiversity and social-economic and cultural environment will be reflected in the quality of the landscape, especially in protected areas.

During the works, the landscape may be affected in terms of aesthetic effect:

- ✓ containers for the storage of waste generated by workers;
- ✓ by the trucks involved in the work;
- ✓ by raising the dam's canopy to the designed level;
- ✓ dust from machinery and particulate matter from the transportation to the site of raw materials for the remaining work

During the execution period of the works foreseen by the project, waste is collected in special containers and temporarily stored at the site organizations, and then recovered/disposed of by an authorized economic operator. There will also be areas for temporary storage of construction materials on the site of the site organization.

None of the site organizations are located in intact forest landscape areas are located in man-made areas, in areas with agricultural land (pasture, arable land) or in built-up areas.

At the same time, site organizations are located in remote areas, at considerable distances from inhabited areas.

An insignificant negative impact on the landscape may occur during the remaining works to be carried out on the entire Cornetu Avrig hydropower plant due to the temporary storage of waste and reusable materials on the temporary storage platform and also as a result of the actual works on the site.

The damage to the landscape has occurred with the start of the works and the non-completion of the works may have an impact on the landscape in this area through landslides, erosion, slope runoff.

4. DESCRIPTION OF THE ENVIRONMENTAL FACTORS LIKELY TO BE AFFECTED BY THE INVESTMENT OBJECTIVE

a) Environmental factor water

a.1.) Assessment of project impacts on water bodies and protected areas

Article 4 (7) of the Water Framework Directive, transposed by Art. 27 of the Water Law No. 107/1996, with subsequent additions and amendments, sets out the conditions for exemption following new changes to the physical characteristics of a surface water body as a result of new human activities for sustainable development.

Water Law No. 107/1996, transposes Directive 2000/60/EC of the European Parliament and of the Council of October 23, 2000 establishing a framework for Community action in the field of water policy and Article 27 is Article 4(7) of this Directive:

Art. 27 - (1) The objectives set out in Art. 21 para. (1) and (2) shall not be deemed not to have been achieved when:

(a) failure to achieve good groundwater status, good ecological status or, where relevant, good ecological potential or failure to prevent deterioration in the status of a body of surface water or groundwater is the result of new modifications to the physical characteristics of a surface water body or changes in the level of bodies of groundwater;

(2) The provisions of para. (1) shall apply only when the following conditions are cumulatively met:

(a) all measures are taken to minimize adverse impacts on the status of water bodies;

b) the reasons for such modifications or alterations are specifically set out and explained in the management plan and the objectives are reviewed every 6 years;

c) the reasons for such modifications or alterations are of overriding public interest and/or the benefits to the environment or to society of achieving the objectives set out in Article 21, paragraphs. (1) and (2) are outweighed by the benefits of the new modifications or alterations for human health, the maintenance of public safety or sustainable development;

(d) the servicing of the beneficial uses, which has led to those modifications or alterations of water bodies, cannot, for reasons of technical feasibility or disproportionate cost, be achieved by other means which are a significantly better option from the point of view of environmental protection."

New physical modifications, new human activities for sustainable development, or changes in them that could cause damage, are frequently linked to the achievement of the objectives of other EU policies, such as **energy**, transport, flood protection, coastal zone protection, water supply and waste water treatment, etc., in addition to relevant national policies. Therefore, the integration of the WFD and its links with the implementation of these policies requires a coordinated approach and more coherence of permitting processes in relation to Article 4 (7).

As achieving these objectives may require **changes to the hydromorphological conditions of water bodies**, **hydropower infrastructure projects** may cause deterioration or non-achievement of good status/good potential and therefore may trigger testing against the application of Article 4(7) to assess whether a project can be authorized under the WFD.

Following the application of the collaborative framework, i.e. the Common Implementation Strategy of the Water Framework Directive (2000/60/EC), **the CIS Guide No. 36 Exemptions from environmental objectives under Article 4(7) New changes in the physical characteristics of surface water bodies, changes in groundwater levels or new human activities for sustainable development, the Joint Implementation Strategy of the Water Framework Directive (2000/60/EC),** intended to facilitate the implementation of the provisions of the Directive, provisions that were also transposed into national legislation, in the Water Law No. 107/1996, with subsequent additions and amendments.

From this perspective, the **CIS Guide No 36**, which is a set of **guidelines and best practices, can support project evaluation by facilitating**:

- **Article 4(7) applicability assessment**" - assessment of whether the project may lead to deterioration or affect the ability of the water body to achieve good status/potential;
- **"Article 4(7) Testing"** - applicable where it has been determined that as a result of the "Article 4(7) Applicability Assessment" that the "Article 4(7) Applicability Assessment" is expected to result in damage or compromise the ability of the water body to achieve the good status/potential objective.

*"If, "**due to the application of mitigation measures,** a project is NOT likely to **cause deterioration or compromise the achievement of good status/good potential** then an Article 4(7) Test is not required"*

In line with the CIS Guidance No. 36 - Exceptions from environmental objectives under Article 4(7), Annex No. 3 of the **M.A.P. Order No. 828/04.07.2019** states that "*the analysis is carried out only if the assessments under Point D show that the project proposed for implementation or cumulated with the projects authorized/ under authorization/ under approval/ under approval/ under approval/ planned on the water bodies identified in Point C1 lead to deterioration of the status of the water body".*

From the analysis made within Point D of the present Study, it resulted that the expected effects on the water body as a result of the implementation of the project will lead to a decrease in the quality of the OLT water body - downstream Racoviță reservoir - upstream Robești reservoir (RORW8.1_B8) through the quality elements: Hydrological regime. Flow quantity and dynamics, Longitudinal connectivity, Lateral river continuity, Morphological conditions: river depth and width, Morphological conditions: bed structure and substrate, Morphological conditions: riparian zone structure, Thermal conditions, Oxygenation conditions, Nutrient conditions. All these pressures will be felt on the biological diversity and will have a significant effect on biological quality elements: phytobenthos, macrophytes, benthic invertebrate fauna, fish fauna

Taking into account these considerations and the fact that the measures for pollution prevention and/or mitigation have been taken into account during the project design phase and that the analysis has shown that the project **is likely to cause damage or compromise the achievement of the good potential,** it is necessary to carry out an analysis of the application of Article 2^7 of the Water Law no. 107/1996 with subsequent amendments and additions.

According to Art. (2) of the Water Law no. 107/1996, "A surface water body is designated as artificial or heavily modified when:

"(2) A body of surface water is designated as artificial or heavily modified when:

***a) changes to the hydromorphological characteristics of** this water body, necessary for achieving good ecological status, could have significant adverse effects on the environment in general, on navigation, including the development of port or recreational facilities, on **activities for which water is stored**, such as water supply, **power generation** or irrigation, water flow regulation, flood protection, land drainage and other activities of equal importance to those envisaged for sustainable development;*

***(b) the artificial or modified characteristics of the water body,** imposed by the beneficial uses, **cannot reasonably be achieved, for reasons of technical feasibility** or **disproportionate cost**, by other means which are significantly better options from the point of view of environmental protection.*

(3) The designation of artificial or heavily modified water bodies, including the reasons for designation, shall be presented in the management plans which shall be a qualitative management component of the river basin planning and management master plans, hereinafter referred to as master plans, and subsequently reviewed every 6 years in accordance with the provisions of Article 43."

The two passes of Câineni and Lotrioara are provided as exceptions from the fulfillment of the environmental objectives in the Olt River Basin Management Plan, updated 2021, they are part of the Olt water body, downstream Racoviță reservoir, upstream Robești reservoir (page 9, Chapter 10 - Exceptions from the environmental objectives).

a.2.) Drawing conclusions - (taken from SEICA)

The SEICA aimed to analyze the potential effects on the ecological status/ecological potential and chemical status of surface water bodies (rivers), the quantitative and qualitative status of groundwater bodies, and the status of protected areas as a result of the project implementation. The study was prepared in accordance with Annex 3 of Order 828/2019 - Framework Content of the Impact Assessment Study on Water Bodies. The study also took into account the methodological and legislative instruments used in the field of water resources management (Water Framework Directive 2000/60/EC, Law 107/1996 with subsequent amendments and additions European guidelines, methodologies).

Out of the 10 water bodies potentially affected by the project, the works related to the Cornetu Avrig H.H.E. are designed on 5 water bodies.

The main quality elements affected by the completion and commissioning of the Câineni and Lotrioara drop steps are the hydrological regime and bed morphology (depth and width of the bed, substrate) on the water sector associated with the creation of the Lotrioara-Câineni biflow.

The change in the category of the watercourse sector related to the completion of the two waterfalls (Lotrioara and Câineni) leads to the delimitation of the related water body (RORW8-1_B8) as a lake-type water body and implicitly to its designation as a heavily modified water body. Thus, the creation of the conjugate forebay generates effects on the flow dynamics given both by the reduction of the flow velocity, but also of the flow variation relative to the natural flow regime. An effect in terms of the depth and width of the bed is estimated for the bypassed sector, taking into account the retention times in this sector. In terms of bed structure and substrate, the estimated effect is small due to the pre-existing sediment stabilization exerted by the upstream reaches.

Concerning the ecological flow, the Caineni, Lotrioara falls are part of the planning scheme related to the Olt Defileu Hydro-energetic Plan, the Avrig- Cornetu sector, the scheme including five falls in the Racovita, Lotrioara, Caineni, Robesti and Cornetu areas, developed on a 55 km length of the Olt river. The connection between the fall stages is ensured by conjugated forebays, with variable lengths, in the case of the Lotrioara Cornetu forebay, this being 12 km.

Taking into account the provisions of HG 148/2020, Art.6, point b, namely "in the case of developments with conjugate forebays, the ecological flow is implicitly ensured by the operating regime, its determination being made downstream of the last section of the dam, thus not being necessary to calculate and measures to ensure it.

On longitudinal connectivity

The documentation for obtaining the water management permit, SEICA analysis provides for the construction of two fish ladders:

- fish ladder at the outlet of the Sebeș stream into the tailrace (the fish ladder has been realized, it will only be connected to the elevation of the projected invert of the tailrace section II once the works in the tailrace have been carried out)
- fish ladder step Lotrioara.

It should be noted that according to the provisions of the updated Olt River Basin Management Plan, approved by HG 392/2023, for 4 water bodies (ROLW8-1_B7 - OLT -am. Ac. Voila, Vistea, Arpas, Scorei Avrig and downstream ac. Racovita; ROLW8-1_B9- OLT -am.ac.Robesti, Cornet, Gura Lotrului, Turnu, Calimanesti, Daesti, Rm Valcea, Raureni, Govora and downstream ac.Babeni;

ROLW8- 1_B10- OLT -ac.Ionesti, Zavideni, Dragasani, Strejesti, Arcesti, Slatina, Ipotesti, Draganesti-Olt and downstream ac.Frunzaru; ROLW8-1_B11- OLT -accumulation Rusanesti and Izbiceni), water bodies that concern practically all hydropower developments on the Upper Oltul, Oltul gorge, Lower Oltul, less severe environmental objectives have been identified. According to the provisions of Art. 4.5. "on the achievement of less stringent environmental objectives for certain water bodies, if they are affected by human activity" of the WFD these water bodies were included in the category of water bodies that do not reach, in terms of ecological status, the objective of good status.

The justification for the exceptions, presented in the River Basin Management Plan approved by HG 80/2011, is based on the disproportionate costs related to the realization of fish ladders at each existing fall stage, costs caused by the significant adverse effect on the use of electricity generation. Thus the realization of fish ladders at the two steps located between water bodies for which the environmental objectives have been defined as less severe, according to Art 5 of the WFD is ecologically unfeasible, the ecological impact on ichthyofauna being reduced in the context of an environment already anthropically affected.

b) Environmental factor air

The negative impact thus generated will be spatially limited and ***insignificant***.

The contractor will be required to keep his own machinery/means of transport in good working order and to maintain (spraying, leveling) the technological/access roads in good repair.

The cleaning/sandblasting operations of the various elements of the equipment that have already been purchased and require work to restore the anti-corrosion protection (armor, watertight gate, penstock sections, expansion compensator, etc.) will generate local air pollution, which will require work protection measures for the execution personnel.

In these circumstances, the negative impact thus generated will be a negative impact that will manifest itself throughout the entire period of the works, but which will be within acceptable limits and must be accepted.

Once the works are completed and this drop step is in operation, there will be no more sources of air pollution.

Emissions

The main sources of pollution in the project area are air emissions from:

- Excavation, excavation and landscaping activities.
- Moving activities in the site organization of the materials used.
- Transportation activities
-

Emissions from non-road mobile sources

Execution stage

In the execution phase, non-road mobile sources will be represented by the machinery and equipment involved in the construction works (bulldozer; excavator; crane; compactor; front-end loader). The emissions from the operation of these sources have been estimated using the *EMEP/EEA* calculation

methodology - *1.A.4 Non road mobile machinery, Tier1*, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

Operating stage

At this stage, the non-road mobile sources will be electric generators. It should be noted that these sources will operate occasionally, only in the event of power grid failures. The pollutant emissions from these sources have been estimated using the calculation methodology EMEP/EEA - 1.A.4 Non road mobile machinery, TIER1, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

The results of the emission calculations are shown in the following table:

Table 90 Emissions from non-road mobile sources in the implementation phase

Source name	Pollutant	Mass flow			Emission concentration (mg/m^3)*
		kg/h	g/h	g/s	
Mobile crane	Particulates	0,015	14,09	0,004	132,19
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5
Excavator/Front Loader	Particulates	0,02	24,51	0,01	132,5
	SO_2	0,003	2,91	0,001	15,7
	NO_x	0,38	380,06	0,11	2054,4
	CO	0,13	125,50	0,03	678,4
Bulldozer	Particulates	0,02	21,01	0,01	133,0
	SO_2	0,002	2,50	0,001	15,8
	NO_x	0,33	325,77	0,09	2061,8
	CO	0,11	107,57	0,03	680,8
Compactor	Particulates	0,01	14,00	0,004	132,1
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5

*Due to the fact that the estimated mass flow rates for the calculated pollutants are below the limit value of Order no. 462/1993 - Annex 1, the maximum permissible values of pollutant concentrations of the above mentioned Order do not apply to the analyzed sources.

Emissions from unabated stationary sources

Execution stage

The uncontrolled stationary sources of air pollution during the execution period of the works proposed for the realization of the objective are represented by the earth moving activities (stripping, digging, filling, levelling, loading - unloading, transport) for the site development. These operations will mainly be sources of dust emissions into the atmosphere.

An additional source of dust is wind erosion, which accompanies construction works. This phenomenon occurs when, for a certain period of time, uncovered areas of land are exposed to wind

action. Wind erosion can, however, be controlled by appropriate measures to reduce the spatial and temporal extent of unvegetated land areas.

Dust generated by material handling and wind erosion is mainly of natural origin (soil particles, mineral dust).

The cutting and welding operations of the metal elements that will make up the constructions will generate emissions of: fine particles containing mainly metal oxides (iron oxide, manganese oxide, nickel oxide, etc.), carbon monoxide resulting from the decomposition of atmospheric carbon dioxide in the electric arc zone, nitrogen dioxide resulting from the oxidation of atmospheric nitrogen due to the high temperature in the electric arc zone, ozone. These sources, however, will not generate significant amounts of pollutants in the atmosphere and have not been included in the calculation of atmospheric emissions.

Emission concentrations cannot be associated with the sources characteristic of the activities during the execution phase of the works, as they are free, open, undirected sources. For the same reason, they cannot be evaluated in relation to the provisions of Order 462/1993 and other emission regulations.

Operating stage

There will be no directed/directed stationary emission sources in the operation phase

Emissions from mobile sources

Execution stage

During the execution of the works, the mobile sources will be the heavy goods vehicles for the transportation of construction materials and the vehicles of the employees involved in the construction works. All these sources will not operate simultaneously on the site, and their actual operating time will be short, sufficient for moving around the site and parking them in specially designated areas.

The estimation of pollutant emissions from mobile sources was carried out using the EMEP/EEA calculation methodology - 1.A.3.b.b.i-iv Road transport 2016, Tier 1, which takes into account the type of vehicle, fuel type, fuel consumption used and emission factors corresponding to the characteristic pollutants. For this purpose we have considered an average number of 10 heavy-duty vehicles per day running on diesel, 10 light-duty vehicles per day running on diesel and 5 light-duty vehicles per day running on gasoline.

Operating stage

During the operation phase of the objective, the mobile sources will be the employees' vehicles, i.e. 10 vehicles per day (estimated)

We specify that the sources of emissions from employee vehicles will not operate simultaneously on the site, with the busiest period of a day being at the start of the shift. In addition, the duration of a vehicle's operation on the site will be as short as necessary for the time needed to drive to the parking place and to perform parking maneuvers.

Tab. 93 Mobile source emissions

Types of mobile sources	Fuel type	Pollutants	Emissions (g/h)	Run-time emissions (g/h)	Emissions during operation (g/h)
Employee vehicles	Diesel	CO	8,45	66,55	679,19
		NO_x	33,36	259,14	2641,58
		Particulates	2,94	22,08	225,09
		SO_2	0,07	0,39	3,34
Employee vehicles	Petrol	CO	211,36	420,96	4293,78
		NO_x	22,19	43,98	443,66
		Particulates	0,08	0,17	1,68
		SO_2	0,29	0,53	4,19

Order No 462/1993 does not set limits for mobile sources. The Ordinance indicates that pollutant emissions from road motor vehicles are limited as a preventive measure by the technical conditions laid down in the technical inspections carried out periodically throughout the period of use of road motor vehicles registered in the country.

Preventive limitation of emissions from motor vehicles is achieved through the technical conditions imposed at type-approval for registration for entry into service and throughout their service life through mandatory periodic roadworthiness tests.

c) Soil/subsoil environmental factor

During the execution of the works, the only possibility of soil pollution would be caused any accidental loss of fuels and/or lubricants from the contractor's machinery/transport equipment.

In order to intervene in the event of such accidental soil pollution, the contractor will be required to have a minimum of absorbent materials (handkerchiefs, pillows, biodegradable absorbent, etc.).

The Contractor shall pay particular attention to the refueling operations (from mobile tankers) of the equipment required for the works. It should be noted that no additional land will be taken up for the remaining works.

Provided that the contractor keeps his own machinery/transport equipment in good working order, coupled with rapid and efficient intervention, the negative impact on the soil will be limited in space and ***insignificant***.

Once the works have been completed, the operation of this fall will not generate sources of soil pollution.

d) Biodiversity

d.1.) Analysis of pressures and threats to species and habitats

The management plans present a number of pressures and threats identified on the surface of the natural areas with applicability to various areas, so from their analysis those relevant to the project analyzed in this appropriate assessment study are listed in the table below:

Table 91 Analysis of pressures/threats in management plans and other PPs

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
ROSAC0085 Frumoasa	*Bombina variegata*	Species distribution Population size Habitat area	E.03.01 Disposal of household/leisure site waste	Low	Project implementation	The Appropriate Assessment Study proposed measures for the collection of waste generated by the implementation of the project as well as the monitoring of the fulfillment of these tasks, both during the construction and the operation period.
	Bombina variegata	Species distribution Population size Habitat area	H.01.05 Pollution diffused water area, caused by agricultural and forestry activities	Average	Project implementation	The Appropriate Assessment Study proposed measures to avoid water pollution during the realization of the project as well as the monitoring of the fulfillment of these tasks, both during the construction and during the operation.
	Bombina variegata	Species distribution Population size Habitat area	J.03.01 Reduction or loss of	Average	Project implementation	Measures to monitor habitats and species of

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
			specific characteristics de habitat			Community interest during both construction and operation are proposed as part of the Appropriate Assessment Study .
ROSAC0122 Făgăraș Mountains	*Barbus petenyi*	Length of the network of flowing water suitable for the species, Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	H01.08 - diffuse surface water pollution from domestic sewage and wastewater	Low	Project implementation	The project is subject to an appropriate environmental assessment, which assessed the impact on the species. Measures have also been proposed to maintain its conservation status. Measures for the monitoring of habitats and species of Community interest during both construction and operation are proposed in the Appropriate Assessment.
			J02.05.05 - small hydropower stations, dams	High	Project implementation	
			J02.06.06 - abstraction of surface water for hydropower power stations	High	Project implementation	
			J03.01 - reduction or loss of specific habitat features	High	Project implementation	
	Bombina variegata	Population size, Habitat area,	H01 - surface water pollution	Average	Project implementation	The Appropriate Assessment Study proposed measures to avoid water
			J02.06 - Surface water abstraction	Average	Project implementation	

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
		Natural vegetation near breeding habitats	K01.02 - sealing	Average	Project implementation	pollution during the realization of the project as well as the monitoring of the fulfillment of these tasks, both during the construction and during the operation.
			K01.03 - drying	Average	Project implementation	
	Canis lupus, Ursus arctos, Lynx lynx	Predator population density	H06.01.01 - noise pollution caused by an irregular source	Low	Project implementation	During the implementation of the project, the disturbance to wildlife species will be insignificant, given the location of the project, at the western boundary of the Natura 2000 site, on a small area, in an already anthropized area.
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu, ROSAC0304 South-West Hartibaciu	*Bat species*	Species distribution in the site	Renovation, reconstruction or demolition of old buildings	Average	Project implementation	For the elaboration of the adequate assessment study, field trips of specialists and monitoring of all biodiversity elements on the surface of the protected areas

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
						were carried out. Monitoring of these elements will also be carried out throughout the construction period and after its completion during operation, and if specific situations are found, measures will be taken to reduce and avoid any negative effects on habitats and species of Community interest.
	Castor fiber, Lutra lutra	Natural hydromorphology	Building energy dams	Average	Project implementation	Measures to ensure longitudinal connectivity are proposed in the appropriate assessment study.
	Bombina variegata, Bat species, Castor fiber, Lutra lutra	Population size, Habitat size, Habitat surface area, Natural vegetation in the vicinity of breeding habitats (for *Bombina variegata)*	Removal of tree and shrub nodes along roads - during modernization or for other reasons - hedgerows, hedgerows, ditches - for example during	Average	Project implementation	The Appropriate Assessment Study shall include measures to restore as far as possible the riparian vegetation where it is affected by the project.

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
		Length of linear vegetation, providing connectivity between shelter and foraging habitats, Species distribution at the site (for bat species), Riparian vegetation, Riparian vegetation with an average width of at least 3m on both banks of the stream, (for *fiber beaver*, *Lutra lutra*)	regularization works - combined with the lack of landscaped crossing areas or structures to divert the routes used between shelter and feeding areas			
	Bombina variegata, *Fish species*, *Bat species*, *Castor fiber*, *Lutra lutra*, *Emys orbicularis*	Population size, Habitat size, (for *Bombina variegata*), Ecological status of water bodies based on chemical and physico-chemical elements, Ecological status of water bodies based on ecological indicators (for fish species)	Illegal dumping of waste deposited by floods and wastes carried by water and	Average	Project implementation	The Appropriate Assessment Study proposed measures for the collection of waste generated by the implementation of the project as well as the monitoring of the fulfillment of these tasks, both during the construction and the operation period.

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
		Species distribution at the site (for bat species), Species distribution in the site (for *Castor fiber*), Ecological status of water bodies based on chemical and physico-chemical elements, Ecological status of water bodies based on ecological indicators, Species distribution in the site (for *Lutra lutra*), Population size, Habitat surface, Ecological status of water bodies based on chemical and physico-chemical elements, Ecological status of water bodies based on ecological indicators, (for *Emys orbicularis*)				
ROSPA0003 Avrig-Scorei-Făgăraș	*Bird species*	The area of woody vegetation along the banks,	Reed burning	High	Project implementation	In accordance with national legislation, measures to avoid

ANPIC	Species/ habitat	Parameter/target affected	Pressure/threat according to ANPIC PM/FS	Pressure/threat level according to ANPIC PM/FS	PP contributing to pressure/ threat	Comments
		Habitat surface area, The reedbed area, Distribution pattern				fires will be taken into account and complied with when carrying out the works.
		Habitat surface area, Distribution pattern	The garbage	Average	Project implementation	The Appropriate Assessment Study proposed measures for the collection of waste generated by the implementation of the project as well as the monitoring of the fulfillment of these tasks, both during the construction and during the operation.
		Habitat surface area, Distribution pattern	Noise pollution	Average	Project implementation	Measures to keep noise pollution as low as possible are foreseen in the appropriate assessment study. Also, given the small area of the project, disturbance to bird species will be insignificant.

d.2.) Impact assessment

The assessment of the impacts on ANPIC was based on their conservation objectives, established by the MMAP and ANANP, and approved by:

- Decision no. 522/18.10.2021 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Water and Forests no. 1166/2016 on the approval of the Management Plan of the protected areas ROSPA0099 Podișul Hârtibaciului, ROSCI0227 Sighișoara-Târnava Mare, ROSCI0144 Gorun and oak forest on the Purcărețului Hill, ROSCI0143 Gorun and oak forest at Dosul Fânațului, ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu South-East, ROSCI0304 Hârtibaciu South-West, Nature Reserve "The dry oak trees of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The shag oak reserve" - Criș village, for the site ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu (Annex 1);
- Decision no. 522/18.10.2021 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Water and Forests no. 1166/2016 on the approval of the Management Plan for the protected areas ROSPA0099 Podișul Hârtibaciului, ROSCI0227 Sighișoara-Târnava Mare, ROSCI0144 Gorun and oak forest on Purcărețului Hill, ROSCI0143 Gorun and oak forest at Dosul Fânațului, ROSCI0132 Oltul Mijlociu-Cibin-Hârtibaciu, ROSCI0303 Hârtibaciu Sud-Est, ROSCI0304 Hârtibaciu Sud-Vest, Nature Reserve "The dry oak trees of Breite municipality of Sighișoara", Reserve "Mihăileni Canyon", "The shagbark oak reserve" - Criș village, for the site ROSAC0304 Hârtibaciu Sud-Vest (Annex 2);
- Decision no. 547/27.10.2021 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Waters and Forests no. 1156/2016 on the approval of the Management Plan and Regulation of the Natura 2000 sites ROSCI0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont, for the site ROSAC0122 Făgăraș Mountains;
- Decision no. 217/04.07.2024 on the approval of the Methodological Norms regarding the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Waters and Forests no. 1156/2016 on the approval of the Management Plan and Regulation of the Natura 2000 sites ROSCI0122 Făgăraș Mountains and ROSPA0098 Făgăraș Piedmont, for the site ROSPA0098 Făgăraș Piedmont;
- Decision no. 263/27.04.2023 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Water and Forests no. 1158/2016 on the approval of the Management Plan and Regulation of the Natura 2000 sites ROSCI0085 Frumoasa and ROSPA0043 Frumoasa, for the ROSAC0085 Frumoasa site;

- Decision no. 218/04.07.2024 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Water and Forests no. 1158/2016 on the approval of the Management Plan and the Regulation of the Natura 2000 sites ROSCI0085 Frumoasa and ROSPA0043 Frumoasa, for the site ROSPA0043 Frumoasa;
- Decision no. 579/03.11.2021 on the approval of the Methodological Norms on the implementation of the conservation objectives set out in the Annex to the Order of the Minister of Environment, Waters and Forests no. 1291/2017 on the approval of the Management Plan and the Regulation of the Natura 2000 Site ROSPA0003 Avrig-Scorei-Făgăraș, for the ROSPA0003 Avrig-Scorei-Făgăraș site;

Aquatic organisms in rivers make journeys that can sometimes cover impressive distances. These migrations are not by chance, but are a consequence of the biological needs of this fauna (MUNLV, 2005). Fish make movements to find feeding, wintering and spawning habitats, which often differ from each other. Of course, fish also migrate for dispersal or to repopulate habitats following plagues or catastrophes.

The acceptance, that fish migration passages should only be constructed for migratory species present in the area, is still present in the design of crossbars. The classic distinction between 'migratory' and 'non-migratory' fish is challenged with scientific evidence, especially following the development of telemetry technology (IfÖ, 2013). This has made it possible to record the movements of 'strictly sedentary', 'territorial' species making (upstream) migrations of hundreds of kilometers. The Water Framework Directive, as well as ICPDR (2013) follows this direction, considering all fish species as migratory and requiring river continuity for all aquatic organisms.

The importance of these migrations was described in Romania as early as 1905 by Grigore Antipa, showing that limiting feeding migrations of economically valuable species leads to reduced fish populations (Antipa, 1905), but became evident in the collapse of sturgeon populations after the spawning migration route was interrupted by the construction of the Iron Gates I and II dams (Lenhardt et al., 2006).

Bănărescu (1964) stated that some of the fish of marine origin migrate beyond Romania: The nisetre (*Acipenser güldenstaedtii*), the păstruga (*Acipenser stellatus*), the morun (*Huso huso*) and the scrumbia (*Alosa pontica*), and among the ones of ducicolous or brackish water the moaca of the barnacle, the puddle oyster (*Gobius kessleri*), the porcupine (*Gobius fluviatilis*) (up to Cazane). Sturgeon species inhabited the Danube and its tributaries as far as today's Germany (EC, 2005), starting their migration from the Black Sea, except for the common dogfish (*Acipenser ruthenus*). Of course, the situation changed dramatically after the construction of the Iron Gates hydropower system.

Migratory behavior of aquatic organisms

Fish species rely on migrations to meet their biotope structure requirements during different life stages. Migrations are performed by both fish and less mobile benthic invertebrates. Migrations can be longitudinal in the main channel, or lateral between the main channel and lateral waters. Where rivers repeatedly form pools along their course, there is a need for the interconnection of these different ecosystems to allow organisms to migrate in

such a way as to satisfy their migration and habitat requirements. The longitudinal connectivity of rivers must therefore play a particularly important role both with regard to reproduction, as well as the spread of populations and the recolonization of depopulated river sections.

Moving between different habitats

Some fish species make intra-annual migrations between their feeding and resting habitats, or populate during their life cycle different areas of a river that provide specific conditions to meet their requirements at different stages of development.

Migration for reproduction

Spawning migrations are a special type of migration between different parts of a habitat. They are carried out by most native fish species within the river system in which they live. If spawning migrations are blocked by impassable obstacles, fish species may spawn in parts of the river where conditions are less favorable (emergency spawning). This leads to reduced spawning rates or complete reproductive failure with subsequent extinction of the species in that habitat.

In terms of breeding migrations, according to MUNLV (2005), they can be categorized as: potamodromous migrations, which take place exclusively in freshwaters, and diadromous migrations, which involve a switch between marine and freshwater environments. In turn, diadromous migrations can be anadromous, where species that migrate anadromously breed in freshwater but spend most of their lives in saline environments (e.g. the morun *Huso huso*) or catadromous, where breeding takes place in saline environments. Here it should be noted that some sources use the term *diadromous species* for species that switch from marine to freshwater and vice versa for purposes other than breeding.

Changing populations

Equalization of different population densities in neighboring river reaches occurs through upstream or downstream migration and leads to genetic exchange between populations.

Downstream migration

Downstream migration, in addition to its importance for reproductive migration, has an important role for example when environmental catastrophes, such as severe floods or pollutant spills, occur, aquatic organisms may drift downstream (the 'drift-catastrophic' phenomenon). In all cases, whether migrations are actively carried out (i.e. escaping) or passively supported, aquatic organisms depend on adequate longitudinal connectivity. The mobility of aquatic organisms plays a critical role in the recolonization of whole water bodies and watercourses, or portions thereof, that have been depopulated during a single catastrophic event.

The following table presents the identification and quantification of the impacts resulting from the implementation of the project on the species and habitats of community interest identified in the area of influence of the project, according to the structure of Table no. 18 (Identification and quantification of impacts) of Annex no. 5A of the Annex to the Order MMAP no. 1.682/2023 for the approval of the Methodological Guide on the appropriate assessment of the potential effects of plans or projects on protected areas of community interest.

Table 92 Identification and quantification of impacts

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
CONSTRUCTION	Loss of Natura 2000 habitat and Potential spread of invasive/potentially invasive tree/shrub species	Habitat degradation by increasing the proportion of non-characteristic species	Habitat degradation for some species dependent on riparian habitats	-	Habitat degradation due to possible highway works	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	Not significant	In the areas where works have already been carried out (for example in the vicinity of the channel, *Salix caparea*, *Populus tremula*, *Betula pendula*, etc. (species not characteristic of this type of habitat) have been observed (species not part of the forest, but spontaneously installed in the area of the works), there is a possibility that their shoots/branches may reach the surface of the habitats, while given the degree of dispersion of these species (quite low and punctual) it was estimated that the impact on this parameter is insignificant.	Analysis of the degree of dispersal of non-characteristic species and the possibility of their spread by dwarfing/leaching, including sample areas for determining the extent of non-characteristic/invasive species cover
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)	Not significant	Invasive species (e.g. acacia) have been observed adjacent to the site, as there will be excavations on the site there is a minor risk of spread of these species (including shoots/ saplings).	
		Reducing habitat area	-	-	Habitat area reduction due to the construction of the Sibiu-Pitești highway	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	Not significant	In the implementation of the project will be affected an area estimated at a maximum of 0.5 ha, areas of land occupied by this habitat outside the forest, for example islands formed on the course of the Olt River where the tree and shrub vegetation characteristic of this type of habitat has been installed, namely specimens of *Populus alba*, *Salix alba*, etc. Given that, most likely these habitat fragments were not quantified when estimating the area of habitat in the site, it is estimated that the area of habitat inventoried within the site will not be modified	GIS measurements of habitat area
	Loss of individuals of species with reduced mobility (amphibians) and loss of habitats characteristic of these species (amphibians and invertebrates)	Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Species distribution	Not significant	The distribution of the species in the protected area is quite wide (most probably not all the locations of the species have been inventoried in the management plan), but the locations of the species on the surface of the site are marginal in the protected natural area and reduced to only 2 pools (possibly temporary).Considering the very large number of locations of the species, as well as the small area and the small number of them that will be affected as a result of the project, it was estimated that its implementation will negatively - insignificantly affect this parameter.	Field inventories on the presence of amphibian, invertebrate and reptile species (transects, monitoring in characteristic habitats)
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSCA0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Species distribution	Not significant	The distribution of the species in the protected area is quite wide, (most probably not all the locations of the species have been inventoried in the management plan), but the locations of the species on the site are marginal in the protected natural area and reduced to only 3 (possibly temporary) pools. Taking into account the very high number of locations of the species' presence, the preum and the small area and number of locations that will be affected as a result of the project, it was estimated that the project implementation will negatively - insignificantly affect this parameter.	Field inventories on the presence of habitats characteristic of these species (GPS measurements of the species' habitat areas)
		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	-	Reduction in the number of individuals of the species	Short-term impact during the works	ROSCA0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Population size	Not significant	Given the small area on which the works will be carried out (15.43 ha overlapping with this Natura 2000 Site), as well as the location of the project adjacent to the protected natural area, combined with a low number of habitats favorable to the species (it was observed in 3 locations of presence), it was estimated that the impact on this parameter will be insignificant.	Field inventories on the presence of amphibian, invertebrate and reptile species (transects, monitoring in characteristic habitats)
		Reduction of the number of individuals of the species in	Reduced species occupancy of	-	Reduction in the number of individuals of the species	Short-term impact during the works	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Population size	Not significant	Considering the small area on which the works will be carried out (4.07 ha overlapping with this Natura 2000 Site), as well as the location of the adjacent project in the protected natural area, in	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		the protected natural area	favorable habitats									conjunction with a low number of favorable habitats for the species (it was observed in 2 locations of presence, with temporary pools), it was estimated that the impact on this parameter will be insignificant.	
		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	-	Reduction in the number of individuals of the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Population size	Not significant	Species identified in 4 locations in the project site area. Given the long length of the water network on the site and the large number of habitats characteristic of the species (implicitly also a significant population) the impact on this parameter is estimated to be insignificant.	
		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	-	Reduction in the number of individuals of the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Population size	Not significant	Given that no individuals of the species were observed in the habitats identified in the area of the site and that their presence is rather unlikely, the impact on this parameter is estimated to be insignificant.	
		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	-	Reduction in the number of individuals of the species	Short-term impact during the works	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Population size	Not significant	Species identified in one specific habitat in the project site area. Given the very small area of the project site overlap area and the very small number of habitats characteristic of the species on the site (only one pond observed characteristic of the species) it is estimated that the impact on this parameter will be insignificant	
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Habitat size	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size	Not significant	The surface area of the habitat of the species observed in the area of the project site measures a maximum of 100 square meters and is represented by a temporary pond. Given the very small area of the project in this Natura 2000 Site (0.31 ha), as well as its bordering nature, it is estimated that the impact of the works (remaining to be carried out) will be insignificant on this parameter.	Field inventories on the presence of habitats characteristic of these species (GPS measurements of the species' habitat areas)
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Habitat area	Not significant	The surface area of the 3 habitats where the species was observed is a maximum of 500 square meters, which represents 0.002% of the surface area of the species habitat in the protected natural area, so the impact on this parameter will be insignificant.	
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Habitat area	Not significant	The surface area of the 4 habitats where the species was observed is of maximum 800 square meters, so taking into account the very large area of aquatic habitats in this Natura 2000 Site (over 130 km long) it was estimated that the impact on this parameter is insignificant.	
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Habitat area	Not significant	The area of habitat of the species in the site area is very small and potential, so the impact of the project is insignificant.	
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Habitat area	Not significant	The surface area of the 2 habitats where the species was observed is a maximum of 300 square meters, which represents 0.002% of the surface area of the habitat of the species at the level of the protected natural area, so the impact of this parameter on the protected area will be insignificant.	
		Reducing the number of habitats	Decrease in species population size	-	Reduction in the number of habitats	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in	Not significant	Given the low number of habitats for the species in the project site area and the low number of such microhabitats, the impact on this parameter is expected to be insignificant negative.	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		favorable to the species			favorable to the species					the littoral zone of habitats			
		Reducing the number of habitats favorable to the species	Decrease in species population size	-	Reduction in the number of habitats favorable to the species	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	Not significant	Given the low number of habitats for the species in the project site area and the low number of such microhabitats, the impact on this parameter is expected to be insignificant negative.	
	Affectation of riparian vegetation in the river bed area (construction of dams, dykes, embankment protection, counterchannels), including punctual modifications of the natural hydromorphology of the watercourse	Modification of the natural structure of the Olt riverbed on the Racovița-Câineni sector	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact during the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	GIS analysis, using satellite imagery, of the meandering degree of the Olt River in the Natura 2000 Sites in the area of influence of the project
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (using satellite imagery), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (using satellite imagery), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (using satellite imagery), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Natural hydromorphology	Not significant	In this Natura 2000 Site more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	
	Reducing the areas of species habitats by converting the river course into standing water and by occupying clay/prairie habitats and turning them into lakes	Changing the structure of the aquatic habitat into a lake ecosystem	Degradation of aquatic habitat quality (eutrophication, etc)	-	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	Area/length of river converted from flowing water to lakes
			Degradation of aquatic habitat quality (eutrophication, etc)	-	-	Long-term, especially after the filling of the dams Lotrioara and Câineni	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	
			Degradation of aquatic habitat quality (eutrophication, etc)	-	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	
			Degradation of aquatic habitat quality (eutrophication, etc)	-	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	
			Degradation of aquatic habitat quality (eutrophication, etc)	-	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of the network of flowing water suitable for the species	Not significant	According to the management plan the species has been mapped on several rivers and streams (R. Argeș - downstream of Vidraru dam, R. Doamnei, R. Vâlsan, R. Boia Mare, V. Rîndibou), their length measuring 59 km, the project occupies a length of 70 m, which represents 0.1% of the length of the hydrographical network characteristic of the species in the Sit.	
	Changes in the sediment structure of the R. Olt in the areas with works	Degradation of the habitat quality of the species, including spawning habitat by changes in the sedimentary structure of the bed of the riverbed in the area of section 2 of the Racovita CHE tailrace channel	-	Species population reduction on the river section included in the project	-	During the works	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works at the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	Surfaces on which the works are carried out in the bed, analysis of the method of carrying out the works
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works at the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, considering the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
										have changed the character of these sectors		River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works on the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works on the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works at the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	
							ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of sectors affected by anthropogenic interventions that have changed the	Not significant	According to the management plan the species was mapped on several rivers and streams (R. Argeș - downstream of Vidraru dam, R. Doamnei, R. Vâlsan, R. Boia Mare, V. Rîndibou), their length measuring 59 km, the project occupies a length of 70 m, which represents 0.1% of the length of the	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
										character of these sectors		hydrographical network characteristic of the species in the Sit.	
CONSTRUCTION AND OPERATION	CONSTRUCTION: - Increased turbidity in the sectors concerned by the works in the Olt riverbed, including reduction of the quality of the aquatic habitat due to accidental pollution AND OPERATION: - Decrease in the natural flow (including changes in water composition and quality) of the Olt river between Racovița dam and Câineni dam	Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	Estimation of water quality change (including estimation of pollutant dispersion in water) in the project areas taking into account the technical and construction details of the project
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on physico-chemical indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	-	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, thus that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality		-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the course of the river) and the impact	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant, taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force.	
		Degradation of aquatic habitat quality	-	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												the operation phase was estimated as insignificant taking into account the ecological flow that is necessary to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the course of the river) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation stage was estimated as insignificant taking into account the ecological flow that is required to be respected, imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	
		Degradation of aquatic habitat quality	-	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in	Short-term impact, strictly during the period	ROSAC0132 Middle Oltul -	5339	*Rhodeus (sericeus) amarus*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
					order to reduce its flow	of works in the river bed	Cibin - Hârtibaciu					located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
		Degradation of aquatic habitat quality	Declining populations of the species	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	
CONSTRUCTION	Affectation of riparian vegetation in the river bed area (construction of dams, dykes, embankment protection, counterchannels), including punctual modifications of the natural hydromorphology of the watercourse	Reduced resting/feeding habitat for the species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba* and *Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	GIS measurements for the length of riparian vegetation, estimation of the degree of shading of aquatic habitats correlated with the length of the sections of river bank affected by the works
		Reduced resting/feeding habitat for the species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba* and *Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reduced resting/feeding habitat for the species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reduced resting/feeding	-	Reduced use by the species of	-	Short-term impact, strictly	ROSAC0132 Middle Oltul -	1303	*Rhinolophus hipposideros*	Length of linear vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km,	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		habitat for the species		certain favorable habitats in the site area		during the period of works in the river bed	Cibin - Hârtibaciu			providing connectivity between shelter and foraging habitats		Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees *randomly scattered on the banks of the Olt, at a distance from* each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reduced nesting, roosting or refuge areas for species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the site's watercourse. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reduced nesting, roosting or refuge areas for species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the site's watercourse. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reduced nesting, roosting or refuge areas for species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reduced nesting, roosting or refuge areas for species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reduced nesting, roosting, refuge or	-	Reduced use by species of certain favorable	-	Short-term impact, strictly for the period of realization of the	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, predominantly on the banks of the stream in the site there is riparian vegetation. The construction	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		nesting areas for species		habitats in the site area		works in the river bed						of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reduced nesting, roosting or refuge areas for species	-	Reduced species use of certain favorable habitats in the site area	-	Short-term impact, strictly during the period of works in the river bed	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of woody vegetation along the banks	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Natural vegetation near breeding habitats	Not significant	The surface area of the 3 habitats where the species was observed is a maximum of 500 square meters, which represents 0.002% of the surface area of the species habitat at the level of the protected natural area, at the same time it was observed that in the area of these habitats the vegetation was quite poor, the degree of shading was around 40-50%, so that the impact generated on this parameter will be insignificant.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Riparian vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reduced foraging habitat for the species		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	
		Reducing shading of aquatic habitats (including characteristic habitats of amphibian species)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Natural vegetation near breeding habitats	Not significant	The surface area of the 4 habitats where the species was observed is maximum 800 sq.m, at the same time it was observed that in the area of these habitats the vegetation was quite poor, the degree of shading was around 30-50%, so the impact generated on this parameter will be insignificant.	
		Reducing shading of aquatic		Reduced species use of certain favorable	Loss of riparian vegetation	Short-term impact, strictly during the period	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata* -	Natural terrestrial vegetation around breeding habitats	Not significant	The habitat uprature of the species observed in the area of the project site measures a maximum of 100 square meters and is represented by a	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		habitats (including amphibian habitats)		habitats in the site area		of works in the river bed			*Yellow-bellied Toad*	(meadows, shrubs, forest)		temporary pond where it was observed that the vegetation was quite poor, the degree of shading was around 20-30%, so that the impact generated on this parameter will be insignificant.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Cover of natural terrestrial habitats (grasslands, shrublands and forests) around breeding habitats	Not significant	The surface area of the two habitats where the species was observed is a maximum of 300 square meters, which represents 0.002% of the surface area of the species habitat at the level of the protected natural area, at the same time it was observed that the vegetation in the area of these habitats was quite poor, the degree of shading was around 50-60%, so that the impact generated on this parameter will be insignificant.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Riparian vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could generate significant impact on this parameter.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could generate significant impact on this parameter.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so taking into account the precautionary principle it was estimated that the project could generate significant impact on this parameter.	
		Reducing shading of aquatic habitats		Reduced species use of certain favorable	Loss of riparian vegetation	Short-term impact, strictly during the period	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection,	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
		(including amphibian habitats)		habitats in the site area		of works in the river bed						counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could generate significant impact on this parameter.	
		Reducing shading of aquatic habitats (including amphibian habitats)		Reduced species use of certain favorable habitats in the site area	Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could generate significant impact on this parameter.	
	Reducing the areas of species habitats by converting the river course into standing water and by occupying clay/prairie habitats and turning them into lakes	Loss of habitat characteristic of the species	Species retreat to quieter areas	-	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Rospa0043 Frumoasa	A253	Delichon urbicum	Area of habitats	insignificant	The area where the works will be carried out represents 0.04% of the habitat of the species, at the same time they will be implemented in fairly anthropized areas (the meadow area of the Olt River between DN 7 and the Sibiu-Rm. Vâlcea railway), so the impact on this parameter is insignificant.	GIS measurements of species habitat occupancy by project works (GIS intersect between species habitats and works site)
		Loss of habitat characteristic of the species	-	-	-	In the short term, while the work is being carried out	Rospa0043 Frumoasa	A262	Motacilla alba	Area of habitats	insignificant	The area where the works will be carried out represents 0.04% of the habitat of the species, at the same time they will be implemented in fairly anthropized areas (the meadow area of the Olt River between DN 7 and the Sibiu-Rm. Vâlcea railway), so the impact on this parameter is insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Habitat area	Not significant	The area with works in this Natura 2000 site is 26,93 ha (including the extension of the Racovița reservoir surface) by raising the restricted level of 372,50 mdMB to the NNR level of 373,50 mdMB. Although the project will occupy an area of 1.4 ha (0.3% of the habitat area of the species), as a result of the above-mentioned extension of the water surface, the area of the characteristic habitat of the species will also be extended by 15-20 ha, depending on the water level in the lake.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
						Lotrioara and Câineni dams						was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Habitat surface - wet meadows	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Area of nesting and foraging habitat	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Foraging habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Foraging habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Foraging habitat area	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Reed area	Not significant	The area with works in this Natura 2000 site is 26,93 ha (including the extension of the Racovița reservoir surface) by raising the restricted level of 372,50 mdMB to the NNR level of 373,50 mdMB. Although the project will occupy an area of 1.4 ha (0.3% of the habitat area of the species), as a result of the extension of the above-mentioned water surface, the area of the characteristic habitat of the species will also be extended by 15-20 ha, depending on the water level in the lake.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Area of reedbeds	Not significant	The area with works in this Natura 2000 site is 26,93 ha (including the extension of the Racovița reservoir surface) by raising the restricted level of 372,50 mdMB to the NNR level of 373,50 mdMB. Although the project will occupy an area of 1.4 ha (0.3% of the habitat area of the species), as a result of the above-mentioned extension of the water surface, the area of the characteristic habitat of the species will also be extended by 15-20 ha, depending on the water level in the lake.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Area of reedbeds	Not significant	The area with works in this Natura 2000 site is 26,93 ha (including the extension of the Racovița reservoir surface) by raising the restricted level of 372,50 mdMB to the NNR level of 373,50 mdMB. Although the project will occupy an area of 1.4 ha (0.3% of the habitat area of the species), as a result	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												of the above-mentioned extension of the water surface, the area of the characteristic habitat of the species will also be extended by 15-20 ha, depending on the water level in the lake.	
		Loss of habitat characteristic of the species	Species retreat to quieter areas		Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of reedbeds	Not significant	The area with works in this Natura 2000 site is 26,93 ha (including the extension of the Racovița reservoir surface) by raising the restricted level of 372,50 mdMB to the NNR level of 373,50 mdMB. Although the project will occupy an area of 1.4 ha (0.3% of the habitat area of the species), as a result of the above-mentioned extension of the water surface, the area of the characteristic habitat of the species will also be extended by 15-20 ha, depending on the water level in the lake.	
	Increased noise and emissions in the project area	Disruption of species activity	-	Reduced use by the species of certain favorable habitats in the site area	Disturbance of the species in locations with favorable habitats	Short-term impact during the works	ROSPA0003 Avrig-Scorei-Făgăraș	A081	*Circus aeruginosus - Reed cattail*	Distribution pattern	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas with continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	Analysis/modeling of noise level, analysis of the proposed works, their timeframe
							ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Distribution pattern	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas with continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A122	*Crex crex - Field Cricket*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas with continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus - Uligan fish*	Distribution pattern	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A229	*Alcedo atthis - Common Kingfisher*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A031	*Ciconia ciconia - White Stork*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A068	*Mergus albellus - Smew*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Distribution pattern	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A338	*Lanius collurio*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A168	*Actitis hypoleucos*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A165	*Tringa ochropus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, also, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A086	*Accipiter nisus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A247	*Alauda arvensis*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A207	*Columba oenas*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A208	*Columba palumbus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A113	*Coturnix coturnix*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A212	*Cuculus canorus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A253	*Delichon urbica*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A269	*Erithacus rubecula*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A359	*Fringilla coelebs*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A315	*Phylloscopus collybita*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A275	*Saxicola rubetra*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A210	*Streptopelia turtur*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A311	*Sylvia atricapilla*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, also, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A308	*Sylvia Curruca*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A283	*Turdus merula*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A285	*Turdus philomelos*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A284	*Turdus pilaris*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A364	*Carduelis carduelis*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Distribution pattern	Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	
							Rospa0043 Frumoasa	A239	*Dendrocopos leucotos (White-backed Woodpecker)*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A236	*Dryocopus martius (Black Woodpecker)*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A321	*Ficedula albicollis (Gularate Muscar)*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A338	Lanius collurio (Red-backed Shrike)	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												no characteristic habitats in the area of the site (in the area of overlap with the Natura 2000 site), and the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A072	Pernis apivorus (Viespar)	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A234	Picus canus (Southern Snowdrop)	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A220	*Strix uralensis (Ural Owl)*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A086	*Accipiter nisus*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A247	Alauda arvensis	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A087	Buteo buteo	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A208	Columba palumbus	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A350	Corvus corax	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A212	Cuculus canorus	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A237	Dendrocopos major	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A269	Erithacus rubecula	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A359	Fringilla coelebs	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A330	Parus major	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A325	Poecile palustris	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A315	Phylloscopus collybita	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha,	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A235	Picus viridis	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A332	Sitta europaea	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A311	Sylvia atricapilla	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A308	Sylvia Curruca	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A265	Troglodytes troglodytes	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A283	Turdus merula	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A285	Turdus philomelos	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A253	Delichon urbicum	Distribution pattern	insignificant	The total area on which the works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species have significant populations on the Natura 2000 site area, as well as the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A262	Motacilla alba	Distribution pattern	insignificant	The total area on which the works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species have significant populations on the Natura 2000 site area, as well as the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A168	*Actitis hypoleucos*	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A053	Anas platyrhynchos	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A028	Ardea cinerea	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A604	Larus cachinnans / Caspian Gull	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	
							Rospa0043 Frumoasa	A017	Phalacrocorax carbo	Distribution pattern	insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
							ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the foraging habitat of the species, as well as the degree of anthropization and noise already generated in the area of the project site, in correlation with the reduced possibility of use by the species of the site area, it was estimated that the impact generated on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A234	*Picus canus (Southern Snowdrop)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0005% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSPA0098 Făgăraș Piedmont	A220	*Strix uralensis (Ural Owl)*	Distribution pattern	Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	
							ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1352*	Canis lupus	Prey population density	Not significant	The implementation of the project (works remaining to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the project will have a negligible impact on this parameter.	
							ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1354*	Ursus arctos	Prey population density	Not significant	The implementation of the project (remaining works to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the project will have a negligible impact on this parameter.	
							ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1361	Lynx lynx	Prey population density	Not significant	The implementation of the project (remaining works to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
												project will have a negligible impact on this parameter.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area	Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced to below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has reduced activity.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Species distribution in the site	Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Species distribution in the site	Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Species distribution in the site	Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	
							ROSAC0304 South-West Hartibaciu	1308	*Barbastella barbastellus (Barbastella barbastellus)*	Species distribution in the site	Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	
							ROSAC0304 South-West Hartibaciu	1321	*Myotis emarginatus (Geoffroy's Bat)*	Species distribution in the site	Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative-negligible. At the same time, the project works will only be carried out during the day, when this species has low activity.	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
							ROSAC0304 South-West Hartibaciu	1303	*Rhinolophus hipposideros (Little horseshoe bat)*	Species distribution in the site	Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Species distribution	Not significant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being characteristic otter habitat . At present, there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) on the Olt river (in the protected natural area) upstream of Lotrioara and Câineni and two dams downstream of these, namely Robești and Cornetu. Given the very long length of the river network in this Natura 2000 site (which represents otter habitat) and the fact that the works are being carried out over a relatively short period of time, it is estimated that the impact generated for these parameters will be insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Species distribution	Not significant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic beaver habitat. There are currently 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) on the Olt river (in the protected natural area) upstream of Lotrioara and Câineni and two dams downstream of these, Robești and Cornetu. Given the very long length of the river network in this Natura 2000 site (which represents beaver habitat) and the fact that the works are being carried out over a relatively short period of time, it is estimated that the impact generated for these parameters will be insignificant.	
CONSTRUCTION AND OPERATION	Longitudinal stream fragmentation	Disruption of aquatic habitat connectivity	Changes in the sediment structure in the bed of the Olt river bed	Reducing current river flow	-	Long-term impact through changes in water composition and quality, including sediment structure	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within and outside the site boundaries)	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for otters and the species of the characteristic trophic base (ichthyofauna). At present on the Olt River (in the area of the protected natural area) there are 6 dams (respectively: Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, respectively Robești and Cornetu, except for the dams Racovița and Robești the rest were all built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	Constructive details of the number of fragmentation elements in the project (works remaining to be executed)
							ROSAC0132 Middle Oltul -	5266	*Barbus petenyi*	Lateral fragmentation	Not significant	Fairly common species, identified in most of the monitoring stations carried out within the specific	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
							Cibin - Hârtibaciu					study in the project area, also present in the two streams (Rândibou and Lotrioara Valley). Considering the very long length of the specific habitat in this Natura 2000 site as well as its characteristic habitats in the neighboring sites, the overall impact of the project works on this parameter was estimated to be insignificant.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Longitudinal fragmentation	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present on the Olt River (in the area of the protected natural area) there are 6 dams (respectively: Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, respectively Robești and Cornetu, except for the dams Racovița and Robești the rest were all built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. Currently on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, all the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	

Intervention	Impact	Direct impacts	Indirect impacts	Secondary impacts	Cumulative impacts	Short- and long-term impacts	Species/habitat			Parameter/target affected	Quantifying the impact	Quantifying the impact	How to quantify
							ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*		Potential impact	Reasons for the estimated impact	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	
							ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (the middle part of its), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. Currently on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for the dams Racovița and Robești the rest were all built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	

d.3.) Assessing the significance of impacts

The appropriate assessment study identified and assessed all forms of impact of the project that could significantly affect ANPIC, as follows:

1. direct, indirect, secondary;

2. cumulative.

The cumulative impact analysis has been carried out from two points of view, on the one hand from the point of view of the works already realized within the project, and on the other hand from the point of view of the projects/activities in the area of implementation of the works.

The impact analysis took into account the construction and operation phase (the objectives will operate for a very long period of time - more than 50 years, and their subsequent use will also be as a dam/hydropower development). At the same time, the impact quantification took into account habitat degradation/alteration for species of conservation interest possibly affected by the project.

The assessment of the significance of the impacts of the implementation of the project is dealt with in Annex no. 1 (*Tables for the assessment of the impact induced by the implementation of the Project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu-Avrig hydropower scheme on habitats and species of community interest assessed as present or potentially present in the area of influence of project*) to the present Adequate Assessment Study (according to the table in Annex no. 3C of the Methodological Guide on the appropriate assessment of the potential effects of plans or projects on protected areas of Community interest, approved by Order of the Minister of the Environment, Water and Forests No 1.682/2023).

Table 93 Measures to prevent (P), avoid (E) and reduce (R) impacts

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
M1. In order to avoid the risk of introduction or spread of allochthonous, non-native, ruderal or nitrophilous species (e.g. *Robinia pseudacacia, Salix capraea, Betula pendula, Populus tremula*) into the area of habitat 92A0, specimens of these species will be removed during construction works	E	Habitat degradation by increasing the proportion of non-characteristic species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	Permanent, under construction	In all construction areas, especially at CHE Lotrioara	-
M2. Throughout the construction period, non-native, non-habitat type, ruderal or nitrophilous tree and shrub species identified on the project site will be carefully monitored to prevent their spread. If necessary, their removal will be accomplished, including removal of shoots/roots from their roots.	E		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)	Permanent, under construction	In all construction areas, especially at CHE Lotrioara	-
M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and approval procedures	R	Reducing habitat area	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	Permanent, under construction	In all construction zones	In case additional land occupation is necessary for the implementation of the project, its use will be subject to regulation by the environmental protection authority
M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. If additional areas need to be occupied, they will be subject to regulatory and approval procedures	R	Reducing the number of habitats favorable to the species	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Species distribution	Permanent, under construction	In all construction zones	The measure aims to limit the impact on habitats favorable to species of Community interest (amphibians and reptiles, birds, mammals, etc.) at the project site boundary
		Reducing the number of habitats favorable to the species	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Species distribution			
M4. Prior to the start of construction works, all areas within the project site will be inspected (with emphasis on the CHE Lotrioara area) in order to identify specimens of *Bombina variegata or Emy orbicularis* and in case individuals of these species are observed, all necessary measures will be taken to relocate them to other favorable habitats.	R	Reduction in the number of individuals of the species in the protected natural area	ROSAC0122 MUNȚII FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Population size	Before the construction period	In all areas with works	Considering that specimens of the species *Bombina variegata* have been observed in areas with favorable habitats, as well as habitats for *Emys orbicularis* in the area of the site (in particular CHE Lotrioara and CHE Racovița), all sites will be inspected and if specimens of these species are identified, they will be relocated (after obtaining legal approvals) in characteristic habitats on the surface of the protected areas, so that those individuals will not be affected.
		Reduction in the number of individuals of the species in the protected natural area	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Population size			
		Reduction in the number of individuals of the species in the protected natural area	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Population size			
		Reducing the number of individuals of the species in the protected natural area	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Population size			
		Reducing the number of individuals of the species in the protected natural area	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Population size			
M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these	R	Reducing the number of habitats favorable to the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Habitat size	Permanent, under construction	In all construction zones	The measure aims to limit the impact on habitats favorable to species of Community interest (amphibians and reptiles, birds, mammals,
		Reducing the number of habitats favorable to the species	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
will be subject to regulatory and approval procedures		Reducing the number of habitats favorable to the species	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 MUNTII FĂGĂRAȘ)	1193	Bombina variegata	Habitat area			etc.) at the project site boundary
		Reducing the number of habitats favorable to the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Habitat area			
		Reducing the number of habitats favorable to the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Habitat area			
		Reducing the number of habitats favorable to the species	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Habitat area			
		Reducing the number of habitats favorable to the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats			
		Reducing the number of habitats favorable to the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats			
M5. Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara	R	Modification of the natural structure of the Olt riverbed on the Racovița-Câineni sector	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Natural hydromorphology	During the construction period	The CHE Lotrioara	Taking into account the fact that the largest inhabiting fish species in the Olt River sector in the area of influence of the CHE Lotrioara is the catfish (*Silurus glanis*), it is proposed that the design and realization of the fish ladder should take into account the passability requirements of this species, in this situation longitudinal connectivity is guaranteed for the remaining fish species in the area. As there is no national guideline for the dimensions of constructed fish passages, the ichthyologists involved in the preparation of the environmental documentation recommend the Austrian Guidelines for the Construction of Fish Passages (BMLFUW, 2012).
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Natural hydromorphology			
M6. Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Natural hydromorphology	During the construction period	At CHE Câineni	Taking into account the fact that the largest inhabiting fish species in the Olt River sector in the area of influence of CHE Câineni is the catfish (*Silurus glanis*), it is proposed that the design and construction of the bypass should take into account the passage requirements of this species, thus ensuring longitudinal connectivity for
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
									the remaining fish species in the area. As there is no national guideline for the dimensions of fish passages constructed for fish, the ichthyologists involved in the preparation of the environmental documentation recommend the Austrian Guidelines for the Construction of Fish Passages (BMLFUW, 2012).
M7. With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend the fish ladder at the outlet of the Șebeș stream into the Olt River	R	Changing the structure of the aquatic habitat into a lake ecosystem	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology	During the construction period	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	The construction of the outlet of the Sebeș stream into the CHE Racovița tailrace was carried out before the downstream CF bridges were made safe. As the difference in level between the slope of the Olt river and the slope of the Sebeș stream (left tributary) is significant, the connection of the stream to the river outlet channel was realized by a concrete spillway, equipped with a fish ladder on the left bank of the stream. It is recommended to extend the fish ladder, avoiding as far as possible its penetration towards the middle of the escapement channel, by introducing an additional section or (where appropriate) additional sections with a serpentine (serpentine) route. The downstream end of the ladder shall be positioned below the shallow water level up to the talveg level of the tailrace.
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Natural hydromorphology			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species			
M8 Connectivity will be ensured between the Olt River and the Rîndibou Valley	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species	During both construction and operation	At CHE Lotrioara at the confluence of R. Olt with Vl. Rîndibou	Considering that the Rîndibou Valley is a habitat for fish species (Barbus petenyi), as well as the fact that this species has been identified in the Olt river, it is necessary to ensure connectivity between these two favorable habitats, in the sense that to ensure connectivity between the Lotrioara dam and this valley, and in the case of protection of the CF bridge over this valley to ensure that connectivity will not be interrupted/blocked (no thresholds/barriers will be built).
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
M9. Raising the elevation of the crest at the spillway related to the Sebeș stream outflow and reprofiling the bed	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species	During the construction period	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	The Sebeș stream outlet in the CHE Racovița tailrace was constructed before the downstream CF bridges were made safe. Due to the current section of the bed upstream of the spillway, the flow of the Sebeș brook is fairly evenly distributed over the width of the bed. In order to ensure the highest possible flow towards the left bank, where the fish ladder is located, it is recommended to raise the elevation of the coran at the spillway and to reprofile the bed in the area of the development by lowering the slope of the slope, ensuring a funnel-shaped slope from the right bank to the left bank. During periods of low water levels the majority of the flows will concentrate towards the passage thus ensuring connectivity, but more significant quantities of water will flow on the opposite side only during periods of medium or high water. The directing (entrainment) of the aquatic fauna downstream towards the Sebeș stream will be realized by the execution of a spur made of rough stone. If the flow velocity of the water does not allow the construction of the rock-cast construction, a sub-mountable dike of gabions or concrete can also be built with a maximum crest height at mid-water level. This construction will be curved in the form of a curve in the outlet area on the right bank of the Șebeș stream, with a radius large enough to include the downstream end of the fish ladder. The work will be carried out outside the spawning period

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				of the fish species and the period immediately after spawning, when newly hatched juveniles are highly susceptible to any kind of negative change. In order to protect the ichthyofauna (clear the water), a break of at least one day should be taken after every 2 days .
M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	R		ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of the network of flowing water suitable for the species	Permanent, during construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	In order to ensure the ecological flow necessary to maintain viable populations of ichthyofauna species, the provisions and methods of calculation of the ecological flow set out in Government Decision no. 148/2020 on the approval of the method of determining and calculating the ecological flow, as amended and supplemented. "It is advisable not to use ultrasound-based solutions for flow monitoring activities, which can limit fish transit, but solutions based on pressure transducers." "The monitoring of the easement flow (and by implication the ecological flow) must be carried out throughout the MHC's operational life. Monitoring should be conducted at frequencies of less than ½ h, and data should be posted in real time on an unrestricted-access web page."
M11. The water diversion works (including those for lowering the embankment in the area of section 2 of the Racovița CHE tailrace) will be carried out outside the fish prohibition period and only during low-flow periods, preferably in August-October	R	Degradation of the habitat quality of the species, including spawning habitat by changes in the sedimentary structure of the bed of the riverbed in the area of section 2 of the Racovita CHE tailrace channel	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	Permanently, during the construction phase, with particular attention during the period when work is being carried out on the Racovița CHE escape channel	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	The measure leads to the protection of fish species during their most sensitive periods, i.e. during prohibition periods
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
			ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors			
M11. The water diversion works (including those for lowering the embankment in the area of section 2 of the Racovița CHE tailrace) will be carried out outside the closed season for fish species and only during low-flow periods, preferably in August-October	R	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on ecological indicators	Permanently, during the construction phase, with particular attention during the period when work is being carried out on the Racovița CHE escape channel	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	The measure leads to the protection of fish species during their most sensitive periods, i.e. during prohibition periods
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on physico-chemical indicators			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on chemical and physico-chemical elements			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical and physico-chemical elements			
M12. In works to be carried out on the watercourse involving various substances/materials (e.g. concrete, oils, paints, primers), particular attention will be paid to their handling in order to minimize the risk of accidental pollution.	P	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements	Permanent, during construction	In all areas with works in the minor bed of the Olt river	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements			
M13. ing of machinery in riverbeds is prohibited, subject to the other measures related to water bodies indicated in the SEICA. For work in the riverbed, only tested machinery that does not leak oil/fuel will be used.	P	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements	Permanent, during construction	In all areas with works in the minor bed of the Olt river	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on ecological indicators			
M14. An accidental pollution prevention and response plan shall be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or onto land.	P	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	Permanent, during construction	In all areas with works in the minor bed of the Olt river	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators			
M15. Quiet machinery and means of transport will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. The machines will also be checked periodically in order to avoid spills of oils and fuels on the surface of habitats or near watercourses.	P	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	Permanent, during construction	In all areas with works in the minor bed of the Olt river	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators			
M16. Proper waste management shall be practiced; selective collection, recovery and regular disposal of waste shall be carried out in order to avoid attracting	P	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Water turbidity	Permanent, during construction	In all areas with works	The measure maintains the quality of the aquatic habitat and prevents accidental pollution

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animals, making them ill or causing them injury.		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Water turbidity			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Water turbidity			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Water turbidity			
		Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Water turbidity			
M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	R	Degradation of aquatic habitat quality	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	Permanent, during construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	To ensure the ecological flow necessary to maintain viable populations of ichthyofauna species, the provisions and methods of calculation of the ecological flow provided for in the Government Decision no. 148/2020 on the approval of the method of determining and calculating the ecological flow, with subsequent amendments and additions, shall be . "It is advisable not to use ultrasound-based solutions for flow monitoring activities, which can limit fish transit, but solutions based on pressure transducers." "The monitoring of the easement flow (and by implication the ecological flow) must be carried out throughout the MHC's operational life. Monitoring should be conducted at frequencies of less than ½ h, and data should be posted in real time on an unrestricted-access web page."
M17 Particular attention will be paid to sediment management so that sediment is returned to the river bed as efficiently as possible	E						Permanent, in operation	All 3 CHE (Racovita, Lotrioara and Câineni)	To prevent erosion phenomena and to ensure the presence of the natural substrate in the riverbed, it is necessary to release the sediments resulting from the cleaning of settling basins and the desilting of the reservoir into the river during pre-established periods, at flow rates that can ensure their dilution. These works must be carried out during high flows, outside the fish reproduction periods and the immediately following period (such works must be avoided during April-July). It is necessary to ensure the transport of sediments deposited upstream of the dam to areas downstream of the dam.

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									According to Nistorescu et al. (2016), to reduce the impact on aquatic ecosystems, the flushing of desanding basins must be carried out exclusively during periods of high water, preferably for short durations (e.g., a maximum of 15 minutes), or continuously through partial opening of the desanding basin's scour valve, resulting in lower velocities on the fish ladder.
M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and approval procedures	R	Reduced resting/feeding habitat for the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	Permanent, under construction	In all construction zones	The measure aims to limit the impact on habitats favorable to species of Community interest (amphibians and reptiles, birds, mammals, etc.) at the project site boundary
		Reduced resting/feeding habitat for the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats			
		Reduced resting/feeding habitat for the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats			
		Reduced resting/feeding habitat for the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Length of linear vegetation providing connectivity between shelter and foraging habitats			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Area of woody vegetation along the banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Area of woody vegetation along the banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Area of woody vegetation along the banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks			
		Reduced nesting, roosting or refuge areas for species	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of woody vegetation along the banks			
M18 Upon completion of the project works on both banks of the reservoirs related to CHE Lotrioara and CHE Câineni (where the terrain allows), white poplar (*Populus alba*), black poplar (*Populus nigra*), anin (*Alnus* sp.) and willow (*Salix* sp.) trees will be planted and maintained in order to restore the affected riparian vegetation (they will be planted in rows, parallel to the direction of flow of the Olt River, so that they will look like forest cords).	R	Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Natural vegetation near breeding habitats	At the end of the construction period	Racovița, Lotrioara and Câineni reservoirs	The species used to implement the activity will only be native and characteristic of the resort. The activity will be carried out under the guidance of a biologist or forest engineer.
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Riparian vegetation			
		Reduced foraging habitat for the species	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse			
		Reducing shading of aquatic habitats	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Natural vegetation near breeding habitats			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
		(including amphibian habitats)							
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Natural terrestrial vegetation around breeding habitats (meadows, shrubs, forest)			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Cover of natural terrestrial habitats (grasslands, shrublands and forests) around breeding habitats			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Riparian vegetation			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation			
		Reducing shading of aquatic habitats (including amphibian habitats)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long			
M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and approval procedures	R	Loss of habitat characteristic of the species	Rospa0043 Frumoasa	A253	Delichon urbicum	Area of habitats	Permanent, under construction	In all construction zones	The measure aims to limit the impact on habitats favorable to species of Community interest (amphibians and reptiles, birds, mammals, etc.) at the project site boundary
		Loss of habitat characteristic of the species	Rospa0043 Frumoasa	A262	Motacilla alba	Area of habitats			
		Loss of habitat characteristic of the species	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Habitat area			
M14. An accidental pollution prevention and response plan shall be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or onto land.	P	Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Habitat area	Permanent, during construction	In all areas with works in the minor bed of the Olt river	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Habitat area			
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Habitat area			
M16. Proper waste management shall be practiced; selective collection, recovery and regular disposal of waste shall be carried out in order to avoid attracting animals, making them ill or causing them injury.	P	Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Habitat area	Permanent, during construction	In all areas with works	The measure maintains the quality of the aquatic habitat and prevents accidental pollution
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Habitat area			
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Habitat surface - wet meadows			
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Area of nesting and foraging habitat			
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Foraging habitat area			

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Foraging habitat area			
M19 Once the works are finalized and the 3 dams are filled to the projected levels (Racovița, Lotrioara and Câineni), the water level will be maintained as constant as possible in order to favor the establishment (in the shoreline/coastal areas) of reed and papyrus vegetation	R	Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	In operation	In the area of the 3 dams (Racovița, Lotrioara and Câineni), in the shallow water areas of these dams	The measure aims to encourage the installation of reedbeds in the area of the 2 new dams, as well as in the area of the Racovița dam (after it will be filled to the designed level), in order to increase the areas of feeding/nesting habitats for species dependent on such habitats, including species that may occasionally use such habitats (e.g. white codobat)
		Loss of habitat characteristic of the species	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Foraging habitat area			
		Loss of habitat characteristic of the species	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Reed area			
		Loss of habitat characteristic of the species	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Area of reedbeds			
		Loss of habitat characteristic of the species	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Area of reedbeds			
		Loss of habitat characteristic of the species	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of reedbeds			
M20. The project works will be carried out exclusively during the day, between 07:00-20:00	E	Disruption of species activity	ROSPA0003 Avrig-Scorei-Făgăraș	A081	*Circus aeruginosus - Reed cattail*	Distribution pattern	Permanent, under construction	On all sites concerned by the execution of the remaining works	-
			ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A122	*Crex crex - Field Cricket*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus - Uligan fish*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus - Uligan fish*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A229	*Alcedo atthis - Common Kingfisher*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A031	*Ciconia ciconia - White Stork*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A068	*Mergus albellus - Smew*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A338	*Lanius collurio*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Distribution pattern			
M15. Quiet machinery and means of transport will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. The machines will also be checked periodically in order to avoid spills of oils and fuels on the surface of habitats or near watercourses.	P		ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Distribution pattern	Permanent, during construction	In all areas with works	The measure leads to reduced disturbance in project areas
			ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A168	*Actitis hypoleucos*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A165	*Tringa ochropus*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A086	*Accipiter nisus*	Distribution pattern			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
			ROSPA0003 Avrig-Scorei-Făgăraș	A247	*Alauda arvensis*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A207	*Columba oenas*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A208	*Columba palumbus*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A113	*Coturnix coturnix*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A212	*Cuculus canorus*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A253	*Delichon urbica*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A269	*Erithacus rubecula*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A359	*Fringilla coelebs*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A315	*Phylloscopus collybita*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A275	*Saxicola rubetra*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A210	*Streptopelia turtur*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A311	*Sylvia atricapilla*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A308	*Sylvia Curruca*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A283	*Turdus merula*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A285	*Turdus philomelos*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A284	*Turdus pilaris*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A364	*Carduelis carduelis*	Distribution pattern			
			ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Distribution pattern			
M21 In all the sites in the area of the dams/ spillways of CHE Câineni and CHE Lotrioara where works will be carried out, mobile sound absorbing panels will be used to fence the areas	E		Rospa0043 Frumoasa	A239	*Dendrocopos leucotos (White-backed Woodpecker)*	Distribution pattern	Permanent, under construction	In all areas with works on the dams of CHE Lotrioara and CHE Câineni	The measure leads to noise reduction in the site area
			Rospa0043 Frumoasa	A236	*Dryocopus martius (Black Woodpecker)*	Distribution pattern			
			Rospa0043 Frumoasa	A321	*Ficedula albicollis (Gularate Muscar)*	Distribution pattern			
			Rospa0043 Frumoasa	A338	Lanius collurio (Red-backed Shrike)	Distribution pattern			
			Rospa0043 Frumoasa	A072	Pernis apivorus (Viespar)	Distribution pattern			
			Rospa0043 Frumoasa	A234	Picus canus (Southern Snowdrop)	Distribution pattern			
			Rospa0043 Frumoasa	A220	*Strix uralensis (Ural Owl)*	Distribution pattern			
			Rospa0043 Frumoasa	A086	*Accipiter nisus*	Distribution pattern			
			Rospa0043 Frumoasa	A247	Alauda arvensis	Distribution pattern			
			Rospa0043 Frumoasa	A087	Buteo buteo	Distribution pattern			
			Rospa0043 Frumoasa	A208	Columba palumbus	Distribution pattern			
			Rospa0043 Frumoasa	A350	Corvus corax	Distribution pattern			
			Rospa0043 Frumoasa	A212	Cuculus canorus	Distribution pattern			
			Rospa0043 Frumoasa	A237	Dendrocopos major	Distribution pattern			
			Rospa0043 Frumoasa	A269	Erithacus rubecula	Distribution pattern			
			Rospa0043 Frumoasa	A359	Fringilla coelebs	Distribution pattern			
			Rospa0043 Frumoasa	A330	Parus major	Distribution pattern			
			Rospa0043 Frumoasa	A325	Poecile palustris	Distribution pattern			
			Rospa0043 Frumoasa	A315	Phylloscopus collybita	Distribution pattern			

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			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
			Rospa0043 Frumoasa	A235	Picus viridis	Distribution pattern			
			Rospa0043 Frumoasa	A332	Sitta europaea	Distribution pattern			
			Rospa0043 Frumoasa	A311	Sylvia atricapilla	Distribution pattern			
			Rospa0043 Frumoasa	A308	Sylvia Curruca	Distribution pattern			
			Rospa0043 Frumoasa	A265	Troglodytes troglodytes	Distribution pattern			
			Rospa0043 Frumoasa	A283	Turdus merula	Distribution pattern			
			Rospa0043 Frumoasa	A285	Turdus philomelos	Distribution pattern			
			Rospa0043 Frumoasa	A253	Delichon urbicum	Distribution pattern			
			Rospa0043 Frumoasa	A262	Motacilla alba	Distribution pattern			
			Rospa0043 Frumoasa	A168	*Actitis hypoleucos*	Distribution pattern			
			Rospa0043 Frumoasa	A053	Anas platyrhynchos	Distribution pattern			
			Rospa0043 Frumoasa	A028	Ardea cinerea	Distribution pattern			
			Rospa0043 Frumoasa	A604	Larus cachinnans / Caspian Gull	Distribution pattern			
			Rospa0043 Frumoasa	A017	Phalacrocorax carbo	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A234	*Picus canus (Southern Snowdrop)*	Distribution pattern			
			ROSPA0098 Făgăraș Piedmont	A220	*Strix uralensis (Ural Owl)*	Distribution pattern			
			ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1352*	Canis lupus	Prey population density			
			ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1354*	Ursus arctos	Prey population density			
			ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1361	Lynx lynx	Prey population density			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area			

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Species distribution in the site			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Species distribution in the site			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Species distribution in the site			
			ROSAC0304 South-West Hartibaciu	1308	*Barbastella barbastellus (Barbastella barbastellus)*	Species distribution in the site			
			ROSAC0304 South-West Hartibaciu	1321	*Myotis emarginatus (Geoffroy's Bat)*	Species distribution in the site			
			ROSAC0304 South-West Hartibaciu	1303	*Rhinolophus hipposideros (Little horseshoe bat)*	Species distribution in the site			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Species distribution			
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Species distribution			
M5. Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara	R	Disruption of aquatic habitat connectivity	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within and outside the site boundaries)	During operation (fish ladder maintenance)	CHE Racovița	Taking into account the fact that the largest inhabiting fish species in the Olt River sector in the area of influence of the CHE Lotrioara is the catfish (*Silurus glanis*), it is proposed that the design and realization of the fish ladder should take into account the passability requirements of this species, in this situation longitudinal connectivity is guaranteed for the remaining fish species in the area. As there is no national guideline for the dimensions of constructed fish passages, the ichthyologists involved in the preparation of the environmental documentation recommend the Austrian Guidelines for the Construction of Fish Passages (BMLFUW, 2012).
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Lateral fragmentation			
M6. Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Longitudinal fragmentation	During operation (maintenance of the bypass calal)	At CHE Câineni	Taking into account the fact that the largest inhabiting fish species in the Olt River sector in the area of influence of CHE Câineni is the catfish (*Silurus glanis*), it is proposed that the design and construction of the bypass should take into account the passage requirements of this species, thus ensuring longitudinal connectivity for

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
									the remaining fish species in the area. As there is no national guideline for the dimensions of constructed fish passages, the ichthyologists involved in the preparation of the environmental documentation recommend the Austrian Guidelines for the Construction of Fish Passages (BMLFUW, 2012).
M7. With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend the fish ladder at the outlet of the Șebeș stream into the Olt River	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation	During operation (fish ladder maintenance)	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	The construction of the outlet of the Sebeș stream into the CHE Racovița tailrace was carried out before the downstream CF bridges were made safe. As the difference in level between the slope of the Olt river and the slope of the Sebeș stream (left tributary) is significant, the connection of the stream to the river outlet channel was realized by a concrete spillway, equipped with a fish ladder on the left bank of the stream. It is recommended to extend the fish ladder, avoiding as far as possible its penetration towards the middle of the escapement channel, by introducing an additional section or (where appropriate) additional sections with a serpentine (serpentine) route. The downstream end of the ladder shall be positioned below the shallow water level up to the talveg level of the escape channel.
			ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation			
M8. Connectivity will be ensured between the Olt River and the Rîndibou Valley	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation	During both construction and operation	At CHE Lotrioara at the confluence of R. Olt with Vl. Rîndibou	Considering that the Rîndibou Valley is a habitat for fish species (Barbus petenyi), as well as the fact that this species has been identified in the Olt r., it is necessary to ensure connectivity between these two favorable habitats.
M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	R		ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)	During both construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	In order to ensure the ecological flow necessary to maintain viable populations of ichthyofauna species, the provisions and methods of calculation of the ecological flow set out in Government Decision no. 148/2020 on the approval of the method of

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
									determining and calculating the ecological flow, as amended and supplemented. "It is advisable not to use ultrasound-based solutions for flow monitoring activities, which can limit fish transit, but solutions based on pressure transducers." "The monitoring of the easement flow (and by implication the ecological flow) must be carried out throughout the MHC's operational life. Monitoring should be conducted at frequencies of less than ½ h, and data should be posted in real time on an unrestricted-access web page."
M22. There shall be no harvesting, capture, killing, destruction or harming of specimens of nationally and/or internationally protected wild flora and fauna species in their natural environment, at any stage of their life cycle, that could accidentally end up in the area of the work perimeter; in this regard, the training program for the personnel involved shall also include specific information on protection and management of situations in which employees interact with flora and fauna species within protected areas.	E	-	All protected areas in the project's area of influence	-	All species of Community interest assessed as present or potentially present in the area of influence of the project	-	Permanent, during construction and operation	In all areas with works	-
M23 All elements of biodiversity (amphibian, reptile, mammal, bird and fish species) in the project area will be monitored throughout the construction period and for a minimum of 3 years (except for ichthyofauna which is recommended to be a minimum of 5 years) during the operational period. In order to be able to compare presence/absence data we recommend that monitoring should be carried out at the same locations as presented in the Appropriate Assessment Study.	E	-	All protected areas in the project's area of influence	-	All species of Community interest assessed as present or potentially present in the area of influence of the project	-	Permanent (recommended monthly) during the construction phase and the first 3 years during the operational phase for all habitats and species except for ichthyofauna, which are recommended for a minimum of 5 years	In all project areas	Detailed ichthyofauna monitoring: Given that the effects of the proposed project will be long-term, it is necessary to monitor the ichthyofauna in this way: - twice a year before and during construction works; - twice a year for the first 5 years after putting the investment into operation; - monitoring locations: a. general monitoring at project level before and after project implementation the investment, b. the fish ladder at the Sebeș-Olt confluence, the fish ladder at Lotrioara and Câineni after the investment. Inventory with the electronrose machine: the inventory will be carried out at the same assessment

Measure-description	Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
			ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
									stations as in the current study (the 29 stations).
M24 Monitoring fish ladders/passages	E		All protected areas in the project's area of influence	-	All fish species of Community interest assessed as present or potentially present in the project area of influence	-	For a minimum period of 5 years	CHE Lotrioara, CHE Câineni, improvement of the Sebeș stream outlet downstream of CHE Racovița	If a fish ladder or fish ramp is installed, it shall be monitored in order to document its functionality or non-functionality. The fish ladder/fish ramp shall be equipped with automatic telemetry monitoring system based on PIT tags. This monitoring system shall be included in the design phase. Two readers should be placed: one at the entrance of the fish ladder (downstream side) and one at the exit of the fish ladder (upstream side), the same for the fish ramp, thus making it possible to track whether fish have managed to enter the fish ladder, the time they spent in the fish ladder and whether the fish have managed to pass over the fish ladder or have returned. If the fish ladder is found to require changes, these shall be made as soon as possible. The monitoring of fish ladders/fish ladders shall be carried out over a period of at least 5 years by specialized personnel.

CENTRALIZER OF PREVENTION/AVOIDANCE/REDUCTION MEASURES

MEASURE CODE	MEASURE NAME
M1	In order to avoid the risk of introduction or spread of non-native, non-characteristic of habitat types, ruderal or nitrophilous species (e.g. *Robinia pseudacacia, Salix capraea, Betula pendula, Populus tremula*) into the area of habitat 92A0, specimens of these species will be removed during construction works
M2	Throughout the construction period, non-native, non-habitat type, ruderal or nitrophilous tree and shrub species identified on the project site will be carefully monitored to prevent their spread. If necessary, their removal will be accomplished, including removal of shoots/roots from their roots.
M3	The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. If it is necessary to occupy additional areas, these will be subject to regulatory and approval procedures
M4	Prior to the start of construction works, all areas within the project site will be inspected (with emphasis on the CHE Lotrioara area) in order to identify specimens of *Bombina variegata* or *Emy orbicularis* and in case individuals of these species are observed, all necessary measures will be taken to relocate them to other favorable habitats.
M5	Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara
M6	Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni
M7	With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend the fish ladder at the outlet of the Șebeș stream into the Olt River
M8	Connectivity will be ensured between the Olt River and the Rîndibou Valley
M9	Raising of the crest elevation at the spillway related to the development of the Sebeș stream outlet and reprofiling of the bed

Measure-description		Type of measure (P/E/R)	Target impact	Affected species/habitat			Parameter addressed by the measure	Period of implementation of the measure	Location of implementation of the measure	Comments (detail of the measure)
				ANPIC code and name	Natura 2000 Code	*Scientific name habitat/species*				
M10	Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig									
M11	Water diversion works (including those for the lowering of the slope in the area of section 2 of the Racovița CHE tailrace channel) will be carried out outside the fish species prohibition period and only during low-flow periods, preferably in August-October									
M12	In works to be carried out on the watercourse involving various substances/materials (e.g. concrete, oils, paints, primers), special attention will be paid to their handling in order to minimize the risk of accidental pollution.									
M13	Washing of machinery in riverbeds is prohibited, subject to other measures related to the water bodies indicated in the SEICA. For work in the riverbed, only tested machinery that does not leak oil/fuel will be used.									
M14	An accidental pollution prevention and response plan will be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or on land.									
M15	Quiet machinery and means of transport will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. At the same time, machinery will be checked periodically to avoid oil and fuel spills on the surface of habitats or near watercourses.									
M16	Proper waste management shall be practiced; selective collection, recovery and regular disposal of waste shall be carried out in order to avoid attracting animals, making them ill or causing them to injure themselves.									
M17	Particular attention will be paid to sediment management so that sediment is returned to the river bed as efficiently as possible									
M18	Upon completion of the project works on both banks of the reservoirs related to CHE Lotrioara and CHE Câineni (where the terrain allows) will be planted and maintained white poplar *(Populus alba), black poplar (Populus nigra), anin (Alnus sp.) and willow (Salix sp.)* so as to restore the affected riparian vegetation (they will be planted in rows, parallel to the direction of flow of the Olt River, so that they have the appearance of forest cords).									
M19	Once the works are completed and the 3 dams are filled to the projected levels (Racovița, Lotrioara and Câineni), the water level will be maintained as constant as possible in order to favor the establishment (in the shoreline/coastal areas) of reed and papyrus vegetation									
M20	Project work will be carried out exclusively during the day, between 07:00-20:00									
M21	In all the sites in the area of the dams / spillways of CHE Câineni and CHE Lotrioara where works will be carried out, mobile sound absorbing panels will be used to fence off the areas									
M22	There shall be no harvesting, capture, killing, destruction or harming of specimens of wild flora and fauna species protected at national and/or international level, in their natural environment, at any stage of their life cycle and that could accidentally end up in the area of the work perimeter; in this regard, the training program for the personnel involved shall also include specific information on protection and management of situations in which employees interact with fauna and flora species within protected areas.									
M23	All elements of biodiversity (amphibian, reptile, mammal, bird and fish species) in the project area will be monitored throughout the construction period and for a minimum of 3 years (except for ichthyofauna, which is recommended to be a minimum of 5 years) during the operational period. In order to be able to compare presence/absence data we recommend that monitoring should be carried out at the same locations as presented in the Appropriate Assessment Study.									
M24	Monitoring fish ladders/passages									

d.4.) Residual impact assessment

The residual impact associated with the implementation of the project during the construction and operation phase will be insignificant for all habitats and species of community interest assessed as present or potentially present in the project's area of influence.

Table 94 Residual impact assessment

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	CONSTRUCTION	Habitat degradation by increasing the proportion of non-characteristic species	Habitat degradation for some riparian habitat-dependent species	Habitat degradation due to possible highway works	Short-term impact during the works	Not significant	In the areas where works have already been carried out (for example in the vicinity of the channel, *Salix caparea*, *Populus tremula*, *Betula pendula*, etc. (species not characteristic of this type of habitat) have been observed (species not part of the forest, but spontaneously installed in the area of the works), there is a possibility that their shoots/branches may reach the surface of the habitats, while given the degree of dispersion of these species (quite low and punctual) it was estimated that the impact on this parameter is insignificant.	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	M1, M2	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Invasive species (e.g. acacia) have been observed at the site boundary, as there will be excavation on the site there is a minor risk of spread of these species (including shoots/ saplings).	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)	M1, M2	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing habitat area	-	Habitat area reduction due to the construction of the Sibiu-Pitești highway	Short-term impact during the works	Not significant	In the implementation of the project will be affected an estimated area of maximum 0.5 ha, areas of land occupied by this habitat outside the forest, for example islands formed on the course of the Olt River where the tree and shrub vegetation characteristic of this type of habitat has been installed, namely specimens of Populus alba, Salix alba, etc. Given that, most likely, these habitat fragments were not quantified when estimating the area of habitat in the site, the habitat loss will be less than 2% of the habitat area at the site.	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	M3	Not significant
ROSAC0085 Frumoasa		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The distribution of the species in the protected area is quite wide, (most probably not all the locations of the species have been inventoried in the management plan), the locations of the species on the site are marginal in the protected natural area and reduced to only 2 (possibly temporary) pools. Taking into account the very high number of locations of the species' presence, as well as the small area and the small number of them that will be affected as a result of the project, it is estimated that its implementation will negatively - insignificantly affect this parameter.	1193	*Bombina variegata*	Species distribution	M3	Not significant
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The distribution of the species in the protected area is quite wide, (most probably not all the locations of the species have been inventoried in the management plan), the locations of the species on the site are marginal in the protected natural area and reduced to only 3 (possibly temporary) pools. Taking into account the very high number of locations of the species' presence, as well as the small area and the small number of them that will be affected as a result of the project, it was estimated that its implementation will negatively - insignificantly affect this parameter.	1193	Bombina variegata	Species distribution	M3	Not significant
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)		Reduction in the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	Reduction in the number of individuals of the species	Short-term impact during the works	Not significant	Given the small area on which the works will be carried out (15.43 ha overlapping with this Natura 2000 Site), as well as the location adjacent to the protected natural area, combined with a low number of habitats favorable to the species (it was observed in 3 locations of presence), it was estimated that the impact on this parameter will be insignificant.	1193	Bombina variegata	Population size	M4	Not significant
ROSAC0085 Frumoasa		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	Reduction in the number of individuals of the species	Short-term impact during the works	Not significant	Given the small area on which the works will be carried out (4.07 ha overlapping with this Natura 2000 Site), as well as the location adjacent to the protected natural area, combined with a low number of habitats favorable to the species (it was observed in 2 locations of presence, with temporary pools), it was estimated that the impact on this parameter will be insignificant.	1193	*Bombina variegata*	Population size	M4	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	Reduction in the number of individuals of the species	Short-term impact during the works	Not significant	Species identified in 4 locations in the project site area. Given the long length of the water network on the site and the large number of habitats characteristic of the species (implicitly also a significant population) the impact on this parameter is estimated to be insignificant.	1193	*Bombina variegata*	Population size	M4	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of individuals of the species in	Reduced species occupancy of favorable habitats	Reduction in the number of individuals of the species	Short-term impact during the works	Not significant	Given that no individuals of the species were observed in the habitats identified in the area of the site and that their presence is rather unlikely, the impact on this parameter is estimated to be insignificant.	1220	*Emys orbicularis*	Population size	M4	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
		the protected natural area										
ROSAC0304 South-West Hartibaciu		Reducing the number of individuals of the species in the protected natural area	Reduced species occupancy of favorable habitats	Reduction in the number of individuals of the species	Short-term impact during the works	Not significant	Species identified in one specific habitat in the project site area. Given the very small area of the project site overlap area and the very small number of habitats characteristic of the species on the site (only one pond observed characteristic of the species) it is estimated that the impact on this parameter will be insignificant	1193	*Bombina variegata - Yellow-bellied Toad*	Population size	M4	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	1032	*Unio crassus*	Habitat size	M4	Not significant
ROSAC0304 South-West Hartibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The surface area of the habitat of the species observed in the area of the project site measures a maximum of 100 square meters and is represented by a temporary pond. Given the very small area of the project in this Natura 2000 Site (0.31 ha), as well as its bordering nature, it is estimated that the impact of the works (remaining to be carried out) will be insignificant on this parameter.	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size	M4	Not significant
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The surface area of the 3 habitats where the species was observed is a maximum of 500 square meters, which represents 0.002% of the surface area of the habitat of the species at the level of the protected natural area, so the impact of this parameter on the protected natural area will be insignificant.	1193	Bombina variegata	Habitat area	M3	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The surface area of the 4 habitats where the species was observed is of maximum 800 square meters, so taking into account the very large area of aquatic habitats in this Natura 2000 Site (over 130 km long) it was estimated that the impact on this parameter is insignificant.	1193	*Bombina variegata*	Habitat area	M3	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The area of habitat of the species in the site area is very small and potential, so the impact of the project is insignificant.	1220	*Emys orbicularis*	Habitat area	M3	Not significant
ROSAC0085 Frumoasa		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	The surface area of the 2 habitats where the species was observed is a maximum of 300 square meters, which represents 0.002% of the surface area of the habitat of the species at the level of the protected natural area, so the impact of this parameter on the protected area will be insignificant.	1193	*Bombina variegata*	Habitat area	M3	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	Given the low number of habitats for the species in the project site area and the low number of such microhabitats, the impact on this parameter is expected to be insignificant negative.	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	M3	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing the number of habitats favorable to the species	Decrease in species population size	Reduction in the number of habitats favorable to the species	Short-term impact during the works	Not significant	Given the low number of habitats for the species in the project site area and the low number of such microhabitats, the impact on this parameter is expected to be insignificant negative.	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	M3	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Modification of the natural structure of the Olt riverbed on the Racovița-Câineni sector	-	-	Short-term impact during the works	Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	1337	*Castor fiber*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	5266	*Barbus petenyi*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite imagery), by the construction of dykes or other works will be affected a maximum of 4 meanders, so that the impact of the project implementation on this parameter was assessed as insignificant.	6143	*Romanogobio kesslerii*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	In this Natura 2000 Site, more than 100 meanders have been assessed (with the help of satellite images), by the construction of dykes or other works will be affected a maximum of 4 meanders, so the impact of the project implementation on this parameter was assessed as insignificant.	1032	*Unio crassus*	Natural hydromorphology	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu			Degradation of aquatic habitat quality (eutrophication, etc)	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu			Degradation of aquatic habitat quality (eutrophication, etc)	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Changing the structure of the aquatic habitat into a lake ecosystem	Degradation of aquatic habitat quality (eutrophication, etc)	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu			Degradation of aquatic habitat quality (eutrophication, etc)	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Two new dams will be built as part of the project, namely the Lotrioara dam and the Câineni dam, both about 600 m long. The length of the flowing water network in the site is over 130 km (mainly consisting of the R. Olt and R. Hârtibaciu), through the project this will be modified in 2 sectors, for a maximum length of 600 m (representing maximum 0.5%), so the impact has been estimated as insignificant.	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0122 FĂGĂRAŞ MOUNTAINS (ROSCI0122 FĂGĂRAŞ MOUNTAINS)			Degradation of aquatic habitat quality (eutrophication, etc)	-	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	According to the management plan the species has been mapped on several rivers and streams (R. Argeș - downstream of Vidraru dam, R. Doamnei, R. Vâlsan, R. Boia Mare, V. Rîndibou), their length measuring 59 km, the project occupies a length of 70 m, which represents 0.1% of the length of the hydrographical network characteristic of the species in the Sit.	1138	Barbus petenyi	Length of the network of flowing water suitable for the species	M5, M6, M7, M8, M9, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of the habitat quality of the species, including spawning habitat by changes in the sedimentary structure of the bed of the riverbed in the area of section 2 of the Racovita CHE tailrace channel	-	-	During the works	insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works on the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	M11	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have	M11	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works at the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.			changed the character of these sectors		
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works at the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	M11	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works on the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	M11	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						insignificant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Excavation works on the runoff channel section 2 (from CHE Racovița) will be carried out on a length of 1.5 km, representing 1.2% of the total length of the hydrographic network of the Site. Thus, given the very long length of the river network and the small area where the works will be carried out, it is estimated that the impact on this parameter will be insignificant.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	M11	Not significant
ROSCA0122 MUNTII FĂGĂRAȘ (ROSCI0122						Not significant	According to the management plan the species was mapped on several rivers and streams (R. Argeș - downstream of Vidraru dam, R. Doamnei, R. Vâlsan, R. Boia Mare, V. Rîndibou), their length measuring 59 km, the project occupies a length of 70 m,	1138	Barbus petenyi	Length of sectors affected by anthropogenic interventions that have	M11	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
MUNTII FĂGĂRAȘ)							which represents 0.1% of the length of the hydrographical network characteristic of the species in the Sit.			changed the character of these sectors		
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	1032	*Unio crassus*	Water quality based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	1032	*Unio crassus*	Water quality based on physico-chemical indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	**CONSTRUCTION AND OPERATION**	Degradation of aquatic habitat quality	Declining populations of the species	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	-	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	1355	*Lutra lutra*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality		Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Changing the current flow of the Olt river, in	Short-term impact, strictly during the period	insignificant	The quantification of the impact on this parameter was based on the very long length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations set out in HG 148/2020 on	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements	M10, M11, M12, M13, M14, M15, M16, M17	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
				order to reduce its flow	of works in the river bed		the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	1355	*Lutra lutra*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Changing the current flow of the Olt river, in	Short-term impact, strictly during the period	insignificant	The quantification of the impact on this parameter was based on the very long length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
				order to reduce its flow	of works in the river bed		on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modification of the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	insignificant	The quantification of the impact on this parameter was based on the very large length of the river network favorable to fish species (over 130 km on the Olt and Olt R. Hârtibaciu) as well as from the obligations and regulations laid down in HG 148/2020 on the approval of the method for determining and calculating the ecological flow, with subsequent amendments and additions, so that the impact during the construction phase will be insignificant, punctual and reversible due to the chosen execution technology (the works in the riverbed will be carried out by temporarily diverting the river course) and the impact during the operation phase was estimated as insignificant taking into account the ecological flow that is required to be respected imposed by the legislation in force, which is sufficient to maintain the benthic elements in the structure of the river course.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	-	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	1355	*Lutra lutra*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	5266	*Barbus petenyi*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	6143	*Romanogobio kesslerii*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	5339	*Rhodeus (sericeus) amarus*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the R. Olt, in order to reduce its flow	Short-term impact, strictly for the period of realization of the works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, and the fact that downstream of the project site (about 3.5 km from CHE Câineni) is the Robești dam, it was estimated that the impact on this parameter will be insignificant.	5197	*Sabanejewia (aurata) balcanica*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Degradation of aquatic habitat quality	Declining populations of the species	Modifying the current flow of the Olt river in order to reduce its flow	Short-term impact, strictly during the period of works in the river bed	Not significant	Taking into account that the works will be carried out only temporarily and punctually in the Olt riverbed, as well as the fact that the Robești dam is located downstream of the project site (about 3.5 km from CHE Câineni), it was estimated that the impact on this parameter will be insignificant.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	M10, M11, M12, M13, M14, M15, M16, M17	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reduced resting/feeding habitat for the species	-	-	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reduced resting/feeding habitat for the species	-	-	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	**CONSTRUCTION**	Reduced resting/feeding habitat for the species	-	-	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reduced resting/feeding habitat for the species	-	-	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1303	*Rhinolophus hipposideros*	Length of linear vegetation providing connectivity between shelter and foraging habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of about 18.4 km (Racovța area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks	M3, M18	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							that the project could have a significant impact on this parameter.					
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A005	*Podiceps cristatus*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A125	*Fulica atra*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A459	*Larus cachinnans*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Reduced nesting, roosting or refuge areas for species	-	-	Short-term impact, strictly during the period of works in the river bed	Not significant	The length of the stretch of the Olt river course in the protected natural area measures 53 km, mainly riparian vegetation is found on the banks of the stream in the site. The construction of the dam will affect a length of riparian vegetation of approx. 2.2 km, representing 4.2% of the length of riparian vegetation at the site, so this parameter will be insignificantly affected at the site.	A123	*Gallinula chloropus*	Area of woody vegetation along the banks	M3, M18	Not significant
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Not significant	The surface area of the 3 habitats where the species was observed is a maximum of 500 square meters, which represents 0.002% of the surface area of the species habitat at the level of the protected natural area, at the same time it was observed that in the area of these habitats the vegetation was quite poor, the degree of shading was around 40-50%, so that the impact generated on this parameter will be insignificant.	1193	Bombina variegata	Natural vegetation near breeding habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly for the period of realization of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by dikes and bank protections, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1355	*Lutra lutra*	Riparian vegetation	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reduced foraging habitat for the species		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	**Significant**	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse	M3, M18	Not significant

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							parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Not significant	The surface area of the 4 habitats where the species was observed is maximum 800 sq.m, at the same time it was observed that in the area of these habitats the vegetation was quite poor, the degree of shading was around 30-50%, so the impact generated on this parameter will be insignificant.	1193	*Bombina variegata*	Natural vegetation near breeding habitats	M3, M18	Not significant
ROSAC0304 South-West Hartibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Not significant	The habitat uprature of the species observed in the area of the project site measures a maximum of 100 square meters and is represented by a temporary pond where it was observed that the vegetation was quite poor, the degree of shading was around 20-30%, so that the impact generated on this parameter will be insignificant.	1193	*Bombina variegata - Yellow-bellied Toad*	Natural terrestrial vegetation around breeding habitats (meadows, shrubs, forest)	M3, M18	Not significant
ROSAC0085 Frumoasa		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Not significant	The surface area of the two habitats where the species was observed is a maximum of 300 square meters, which represents 0.002% of the surface area of the species habitat at the level of the protected natural area, at the same time it was observed that the vegetation in the area of these habitats was quite poor, the degree of shading was around 50-60%, so that the impact generated on this parameter will be insignificant.	1193	*Bombina variegata*	Cover of natural terrestrial habitats (grasslands, shrublands and forests) around breeding habitats	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Significant	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	6143	*Romanogobio kesslerii*	Riparian vegetation	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Significant	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Significant	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with Salix alba and Populus alba trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation	M3, M18	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including		Loss of riparian vegetation	Short-term impact, strictly during the period	Significant	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation	M3, M18	Not significant

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		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
		amphibian habitats)			of works in the river bed		the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with *Salix alba and Populus alba* trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu		Reducing shading of aquatic habitats (including amphibian habitats)		Loss of riparian vegetation	Short-term impact, strictly during the period of works in the river bed	Significant	The project works are carried out on a length of approximately 18.4 km (Racovița area - 3.6 km, Lotrioara area - 10.5 km, Câineni area - 4.3 km), represented by embankments and bank protection, counterchannels, etc., in some areas being affected the linear vegetation (riparian) on the banks of the Olt River. It should be noted that the riparian vegetation on the banks of the Olt is discontinuous, with Salix alba and Populus alba trees randomly scattered on the banks of the Olt, at a distance from each other, so that the length of continuous vegetation is impossible to quantify. When estimating the impact on this parameter, the maximum length of the project site was taken into account, so, taking into account the precautionary principle, it was estimated that the project could have a significant impact on this parameter.	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long	M3, M18	Not significant
Rospa0043 Frumoasa		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	insignificant	The area where the works will be carried out represents 0.04% of the habitat of the species, at the same time they will be implemented in fairly anthropized areas (the meadow area of the Olt River between DN 7 and the Sibiu-Rm. Vâlcea railway), so the impact on this parameter is insignificant.	A253	*Delichon urbicum*	Area of habitats	M3, M14, M16, M19	Not significant
Rospa0043 Frumoasa		Loss of habitat characteristic of the species	-	-	In the short term, while the work is being carried out	insignificant	The area where the works will be carried out represents 0.04% of the habitat of the species, at the same time they will be implemented in fairly anthropized areas (the meadow area of the Olt River between DN 7 and the Sibiu-Rm. Vâlcea railway), so the impact on this parameter is insignificant.	A262	*Motacilla alba*	Area of habitats	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	The area with works in this Natura 2000 site is 26.93 ha (including the Racovița dam). Although the project will occupy an area of 1.4 ha (0.3% of the species' habitat area), as a result of the increase in the water surface (by raising the Racovița dam), the area of the species' characteristic habitat will be extended by 15-20 ha, depending on the water level in the lake.	A022	*Ixobrychus minutus - Little Bittern*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A031	*Ciconia ciconia (White Stork)*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A082	*Circus cyaneus (Black-headed Erytra)*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A338	*Lanius collurio (Red-backed Shrike)*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A088	*Aquila chrysaetos (Mountain Eagle)*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A081	*Circus aeruginosus (Reed cattail)*	Habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A122	*Crex crex (Field Cricket)*	Habitat surface - wet meadows	M3, M14, M16, M19	Not significant

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					Lotrioara and Câineni dams							
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A103	*Falco peregrinus (Peregrine Falcon)*	Area of nesting and foraging habitat	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A089	*Pomarina eagle*	Foraging habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A030	*Ciconia nigra (Black Stork)*	Foraging habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	M3, M14, M16, M19	Not significant
ROSPA0098 Făgăraș Piedmont		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	Considering the very small area of the project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, it was estimated that the impact generated by the implementation of the works will be insignificant.	A072	*Pernis apivorus (Viespar)*	Foraging habitat area	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	The area with works in this Natura 2000 site is 26.93 ha (including the Racovița dam). Although the project will occupy an area of 1.4 ha (0.3% of the species' habitat area), as a result of the increase in the water surface (by raising the Racovița dam), the area of the species' characteristic habitat will be extended by 15-20 ha, depending on the water level in the lake.	A027	*Egretta alba*	Reed area	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	The area with works in this Natura 2000 site is 26.93 ha (including the Racovița dam raising). Although the project will occupy an area of 1.4 ha (0.3% of the species' habitat area), as a result of the increase in the water surface (by expanding the Racovița reservoir), the area of the species' characteristic habitat will also be extended by 15-20 ha, depending on the water level in the lake.	A298	*Acrocephalus arundinaceus*	Area of reedbeds	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	The area with works in this Natura 2000 site is 26.93 ha (including the Racovița dam raising). Although the project will occupy an area of 1.4 ha (0.3% of the species' habitat area), as a result of the increase in the water surface (by expanding the Racovița reservoir), the area of the species' characteristic habitat will also be extended by 15-20 ha, depending on the water level in the lake.	A295	*Acrocephalus schoenebaenus*	Area of reedbeds	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Loss of habitat characteristic of the species	Species retreat to quieter areas	Disruption of species activity	Long-term, especially after the filling of the Lotrioara and Câineni dams	Not significant	The area with works in this Natura 2000 site is 26.93 ha (including the Racovița dam raising). Although the project will occupy an area of 1.4 ha (0.3% of the species' habitat area), as a result of the increase in the water surface (by expanding the Racovița reservoir), the area of the species' characteristic habitat will also be extended by 15-20 ha, depending on the water level in the lake.	A123	*Gallinula chloropus*	Area of reedbeds	M3, M14, M16, M19	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș		Disruption of species activity	-	Disturbance of the species in locations with favorable habitats	Short-term impact during the works	Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	A081	*Circus aeruginosus - Reed cattail*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of	A022	*Ixobrychus minutus - Little Bittern*	Distribution pattern	M15, M20, M21	Not significant

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		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.					
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A122	*Crex crex - Field Cricket*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of expansion of the Racovița reservoir (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A229	*Alcedo atthis* - Common Kingfisher	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A031	*Ciconia ciconia* - White Stork	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A068	*Mergus albellus* - Smew	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be executed that overlap with this Natura 2000 Site on an area of 26.93 ha, being works to finalize the DMS section III, in this area is also included the area of the Racovița reservoir extension (flooding of land between the dam and the Olt River), basically increasing the surface of aquatic habitats. At the same time, taking into account the rather small area on which the works will be carried out, as well as the fact that their sites are located in areas of continuous disturbance (DN1 area), it was estimated that the impact of the project on this parameter will be insignificant.	A027	*Egretta alba*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of	A338	*Lanius collurio*	Distribution pattern	M15, M20, M21	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.					
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A017	*Phalacrocorax carbo*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A005	*Podiceps cristatus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A125	*Fulica atra*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A459	*Larus cachinnans*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A053	*Anas platyrhnchos*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A168	*Actitis hypoleucos*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A165	*Tringa ochropus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A298	*Acrocephalus arundinaceus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A295	*Acrocephalus schoenebaenus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will	A086	*Accipiter nisus*	Distribution pattern	M15, M20, M21	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.					
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A247	*Alauda arvensis*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A207	*Columba oenas*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, while taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A208	*Columba palumbus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A113	*Coturnix coturnix*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A212	*Cuculus canorus*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A253	*Delichon urbica*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A269	*Erithacus rubecula*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A359	*Fringilla coelebs*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A315	*Phylloscopus collybita*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time,	A275	*Saxicola rubetra*	Distribution pattern	M15, M20, M21	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
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							taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.					
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A210	*Streptopelia turtur*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A311	*Sylvia atricapilla*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, while, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A308	*Sylvia Curruca*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A283	*Turdus merula*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A285	*Turdus philomelos*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A284	*Turdus pilaris*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A364	*Carduelis carduelis*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0003 Avrig-Scorei-Făgăraș						Not significant	The areas with remaining works to be carried out that overlap with this Natura 2000 Site on the area of 26.93 ha, being works for the completion of the DMS section III, at the same time, taking into account the rather small area on which the works will be carried out, and the fact that their sites are located in areas of continuous disturbance (DN1 area) it was estimated that the impact of the project on this parameter will be insignificant.	A123	*Gallinula chloropus*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A239	*Dendrocopos leucotos (White-backed Woodpecker)*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the	A236	*Dryocopus martius* (Black Woodpecker)	Distribution pattern	M15, M20, M21	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
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							fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.					
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A321	*Ficedula albicollis* (Gularate Muscar)	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site (in the area of overlap with the Natura 2000 site), and the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A338	*Lanius collurio* (Red-backed Shrike)	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A072	*Pernis apivorus* (Viespar)	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A234	*Picus canus* (Southern Snowdrop)	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that this species has no characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A086	*Accipiter nisus*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A247	*Alauda arvensis*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A087	*Buteo buteo*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A208	*Columba palumbus*	Distribution pattern	M15, M20, M21	Not significant

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		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A350	*Corvus corax*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the area of the site, as well as the fact that the works within the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A212	*Cuculus canorus*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A237	*Dendrocopos major*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A269	*Erithacus rubecula*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A359	*Fringilla coelebs*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A330	*Parus major*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A325	*Poecile palustris*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A315	*Phylloscopus collybita*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A235	*Picus viridis*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad,	A332	*Sitta europaea*	Distribution pattern	M15, M20, M21	Not significant

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							construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.					
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A311	*Sylvia atricapilla*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A308	*Sylvia Curruca*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A265	*Troglodytes troglodytes*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A283	*Turdus merula*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A285	*Turdus philomelos*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which the works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species have significant populations on the Natura 2000 site area, as well as the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A253	*Delichon urbicum*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which the works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species have significant populations on the Natura 2000 site area, as well as the fact that the works of the project are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A262	*Motacilla alba*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A168	*Actitis hypoleucos*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A053	*Anas platyrhynchos*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the	A028	*Ardea cinerea*	Distribution pattern	M15, M20, M21	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
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							fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.					
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A604	*Larus cachinnans / Caspian Gull*	Distribution pattern	M15, M20, M21	Not significant
Rospa0043 Frumoasa						insignificant	The total area on which works will be carried out overlapping with this Natura 2000 site is 4.07 ha, so taking into account the fact that these species do not have characteristic habitats in the site area, as well as the fact that the project works are carried out in an area of continuous disturbance (from DN7, railroad, construction of the Sibiu-Pitești highway), the impact of the project on this parameter was assessed as insignificant.	A017	*Phalacrocorax carbo*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A088	*Aquila chrysaetos* (Mountain Eagle)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A089	*Pomarina eagle*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A031	*Ciconia ciconia* (White Stork)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A030	*Ciconia nigra* (Black Stork)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A081	*Circus aeruginosus* (Reed cattail)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A082	*Circus cyaneus* (Black-headed Erytra)	Distribution pattern	M15, M20, M21	Not significant

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ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A122	*Crex crex* (Field Cricket)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A103	*Falco peregrinus* (*Peregrine* Falcon)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A338	*Lanius collurio* (Red-backed Shrike)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A072	*Pernis apivorus* (Viespar)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0005% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A234	*Picus canus* (Southern Snowdrop)	Distribution pattern	M15, M20, M21	Not significant
ROSPA0098 Făgăraș Piedmont						Not significant	Taking into account the very small area of project implementation (0.09 ha), which represents 0.0003% of the feeding habitat of the species, as well as the degree of anthropization and noise already generated in the project site area, correlated with the reduced possibility of use by the species of the site area, it was estimated that the impact on this parameter is insignificant.	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	M15, M20, M21	Not significant
ROSCA0122 MUNTII FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)						Not significant	The implementation of the project (remaining works to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the project will have a negligible impact on this parameter.	1352*	*Canis lupus*	Predator population density	M15, M20, M21	Not significant
ROSCA0122 MUNTII FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)						Not significant	The implementation of the project (remaining works to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the project will have a negligible impact on this parameter.	1354*	*Ursus arctos*	Predator population density	M15, M20, M21	Not significant
ROSCA0122 MUNTII FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)						Not significant	The implementation of the project (works remaining to be executed) overlaps with this Natura 2000 Site on an area of 15.43 ha, on a linear structure along the Olt River, the works being realized in different points on this area. Given the small area on which the works will be carried out, in relation to the area of habitat favorable to these species (over 190,000 ha), and the marginal location of these works, it is estimated that the project will have a negligible impact on this parameter.	1361	Lynx lynx	Predator population density	M15, M20, M21	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area	M15, M20, M21	Not significant

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							will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	1308	*Barbastella barbastellus*	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	1318	*Myotis dasycneme*	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Taking into account that the site has a linear structure, being spread over a length of more than 130 km, mainly on the surface of the Olt and Hârtibaciu watercourses and the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be executed) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	1321	*Myotis emarginatus*	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0304 South-West Hartibaciu						Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	1308	*Barbastella barbastellus (Barbastella barbastellus*)	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0304 South-West Hartibaciu						Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative-negligible. At the same time, the project works will only be carried out during the day, when this species has low activity.	1321	*Myotis emarginatus* (Scarlet bat)	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0304 South-West Hartibaciu						Not significant	Considering the very small area on which the works will be carried out in the protected natural area (0.31 ha), as well as the fact that the noise will be reduced below 50dB at an average distance of 100 m from the site, it was estimated that the overall impact of the works (remaining to be carried out) will be negative - insignificant. At the same time, the project works will only be carried out during the day, when this species has low activity.	1303	*Rhinolophus hipposideros* (Little horseshoe bat)	Species distribution in the site	M15, M20, M21	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being characteristic habitat for otters. There are currently 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) on the Olt river (in the protected natural area) upstream of Lotrioara and Câineni and two dams downstream of these, Robești and Cornetu. Given the very long length of the hydrographic network in this Natura 2000 site (which represents otter habitat) and the fact that the works are being carried out over a relatively short period of time, it was estimated that the impact generated for these parameters will be insignificant.	1355	*Lutra lutra*	Species distribution	M15, M20, M21	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the	1337	*Castor fiber*	Species distribution	M15, M20, M21	Not significant

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							Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic beaver habitat. There are currently 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) on the Olt river (in the protected natural area) upstream of Lotrioara and Câineni and two dams downstream of these, Robești and Cornetu. Given the very long length of the river network in this Natura 2000 site (which represents beaver habitat) and the fact that the works are being carried out over a relatively short period of time, it is estimated that the impact generated for these parameters will be insignificant.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	**CONSTRUCTION AND OPERATION**	Disruption of aquatic habitat connectivity	Changes in the sediment structure in the bed of the Olt river bed	-	Long-term impact through changes in water composition and quality, including sediment structure	**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for otters and the species of the characteristic trophic base (ichthyofauna). At present on the Olt River (in the area of the protected natural area) there are 6 dams (respectively: Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, respectively Robești and Cornetu, except for the dams Racovița and Robești the rest were all built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within and outside the site boundaries)	M5, M6, M8, , M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						Not significant	Fairly common species, identified in most of the monitoring stations carried out within the specific study in the project area, also present in the two streams (Rândibou and Lotrioara Valley). Considering the very long length of the specific habitat in this Natura 2000 site as well as its characteristic habitats in the neighboring sites, the overall impact of the project works on this parameter was estimated to be insignificant.	5266	*Barbus petenyi*	Lateral fragmentation	M5, M6, M8, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	6143	*Romanogobio kesslerii*	Longitudinal fragmentation	M5, M6, M8, M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation	M5, M6, M8, , M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being mainly represented by the course of the Olt River (its middle zone), the course of the	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation	M5, M6, M8, , M10	Not significant

Name ANPIC	Stage	Impact						Species/habitat		Parameter/target affected	Prevention, avoidance, reduction measure	Residual impact
		Direct impacts	Indirect impacts	Cumulative impacts	Short- and long-term impacts	Potential impact	Reasons for the estimated impact	Natura 2000 Code	*Scientific name habitat/species*			
							Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.					
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation	M5, M6, M8, , M10	Not significant
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu						**Significant**	The length of the hydrographical network in this Natura 2000 Site measures over 130 km, being represented mainly by the course of the Olt River (its middle zone), the course of the Hârtibaciu River (including the Cibinul) and their tributaries, the entire length being a characteristic habitat for fish species. At present, on the Olt River (in the area of the protected natural area) there are 6 dams (Voila, Vișlea, Arpaș, Scoreiu, Avrig and Racovița) upstream of Lotrioara and Câineni and two dams downstream of them, Robești and Cornetu, except for Racovița and Robești dams, the rest were built before the designation of the Natura 2000 site. Although the Olt sector of this Natura 2000 site is highly fragmented, with the 8 dams mentioned above and countless sills/fragmentation (including the sill downstream of CHE Racovița) the introduction of the two fragmentation (without mitigation measures) could generate a significant impact.	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)	M5, M6, M8, M10	Not significant

d.4.) Appropriate evaluation conclusions

"*The project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu-Avrig hydropower project - continuation of the works to be executed at the Cornetu-Avrig AHE*" - continuation of the works to be executed at the Cornetu-Avrig AHE will be implemented almost entirely within the perimeter of the Natura 2000 ecological network.

In order to correctly base the measures to prevent, avoid and reduce the impact of the project on the elements of conservation interest in the protected natural area, specific studies were carried out on each group of species/habitat, the results of which are presented in the previous chapters, with emphasis on the assessment of the impact of the project on each species/habitat of conservation interest.

The present study paid special attention to the connectivity of the aquatic habitat present on the surface of the protected natural area ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, in order to maintain its connectivity.

The residual impact after project implementation has been estimated to be insignificant, provided that the prevention, avoidance and mitigation measures proposed in this environmental study are complied with. At the same time, both during the construction and later during the operation phase, monitoring of biodiversity elements is necessary in order to accurately calculate the generated impacts and possibly recalibrate the mitigation measures.

Table 95 Findings of the adequate assessment

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
CONSTRUCTION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	Not significant	M1, M2	Not significant	Completing the remaining work	Established by CSAT Decision no. 169 on improving Romania's energy resilience in order to ensure security in the field by operational adaptation and development of new energy production capacities, in the context of the war in Ukraine and by Emergency Ordinance no. 175/2022 on establishing measures on investment objectives for the realization of hydropower facilities under implementation, as well as other projects of major public interest using renewable energy, and amending and supplementing	Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)	Not significant	M1, M2	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Species distribution	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Species distribution	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul -	1220	*Emys orbicularis*	Population size	Not significant	M4	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Cibin - Hârtibaciu							remaining work	some normative acts		
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Habitat size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in	Not significant	M3	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				the littoral zone of habitats							
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Nesemnifcativ	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	*Barbus petenyi*	Length of the network of flowing water suitable for the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ	1138	Barbus petenyi	Length of sectors affected by	Not significant	M11	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)			anthropogenic interventions that have changed the character of these sectors				remaining work			
CONSTRUCTION AND OPERATION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on physico-chemical indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul -	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical	insignificant	M10, M11, M12,	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Cibin - Hârtibaciu			and physico-chemical elements		M13, M14, M15, M16, M17		remaining work			
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on	insignificant	M10, M11, M12, M13,	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				ecological indicators		M14, M15, M16, M17					
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14,	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
						M15, M16, M17					
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	Not significant	M10, M11, M12, M13, M14,	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
						M15, M16, M17					
CONSTRUCTION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Length of linear vegetation, providing connectivity between shelter and feeding habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Natural vegetation near breeding habitats	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Natural vegetation near breeding habitats	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Natural terrestrial vegetation around breeding habitats (meadows, shrubs, forest)	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Cover of natural terrestrial habitats	Not significant	M3, M18	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				(grasslands, shrublands and forests) around breeding habitats				remaining work			
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A253	Delichon urbicum	Area of habitats	insignificant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A262	Motacilla alba	Area of habitats	insignificant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia* (White Stork)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus* (Black-headed Erytra)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio* (Red-backed Shrike)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos* (Mountain Eagle)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus* (Reed cattail)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex* (Field Cricket)	Habitat surface - wet meadows	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus* (*Peregrine* Falcon)	Area of nesting and foraging habitat	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra* (Black Stork)	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus* (Viespar)	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Reed area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A081	*Circus aeruginosus* - Reed cattail	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus* - Little Bittern	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A122	*Crex crex* - Field Cricket	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A229	*Alcedo atthis* - Common Kingfisher	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A031	*Ciconia ciconia* - White Stork	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A068	*Mergus albellus* - Smew	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A338	*Lanius collurio*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A168	*Actitis hypoleucos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A165	*Tringa ochropus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A086	*Accipiter nisus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A247	*Alauda arvensis*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A207	*Columba oenas*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A208	*Columba palumbus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A113	*Coturnix coturnix*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A212	*Cuculus canorus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A253	*Delichon urbica*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A269	*Erithacus rubecula*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A359	*Fringilla coelebs*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A315	*Phylloscopus collybita*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A275	*Saxicola rubetra*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A210	*Streptopelia turtur*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A311	*Sylvia atricapilla*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A308	*Sylvia Curruca*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A283	*Turdus merula*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A285	*Turdus philomelos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A284	*Turdus pilaris*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

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		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A364	*Carduelis carduelis*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A239	*Dendrocopos leucotos* (White-backed Woodpecker)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A236	*Dryocopus martius* (Black Woodpecker)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A321	*Ficedula albicollis* (Gularate Muscar)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A338	Lanius collurio (Red-backed Shrike)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A072	Pernis apivorus (Viespar)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A234	Picus canus (Southern Snowdrop)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A086	*Accipiter nisus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A247	*Alauda arvensis*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
								remaining work			
	Rospa0043 Frumoasa	A087	*Buteo buteo*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A208	*Columba palumbus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A350	*Corvus corax*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A212	*Cuculus canorus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A237	*Dendrocopos major*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A269	*Erithacus rubecula*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A359	*Fringilla coelebs*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A330	*Parus major*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A325	*Poecile palustris*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A315	*Phylloscopus collybita*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Rospa0043 Frumoasa	A235	*Picus viridis*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A332	*Sitta europaea*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A311	*Sylvia atricapilla*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A308	*Sylvia Curruca*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A265	*Troglodytes troglodytes*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A283	*Turdus merula*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A285	*Turdus philomelos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A253	*Delichon urbicum*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A262	*Motacilla alba*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A168	*Actitis hypoleucos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A053	*Anas platyrhynchos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the		Not the case	-

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		Natura 2000 Code	*Scientific name habitat/species*								
								remaining work			
	Rospa0043 Frumoasa	A028	*Ardea cinerea*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A604	*Larus cachinnans / Caspian Gull*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A017	*Phalacrocorax carbo*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos* (Mountain Eagle)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia* (White Stork)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (*Black Stork)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus* (Reed cattail)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus* (Black-headed Erytra)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex* (Field Cricket)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus* (*Peregrine* Falcon)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio* (Red-backed Shrike)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus* (Viespar)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A234	*Picus canus (Southern Snowdrop)*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1352*	*Canis lupus*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1354*	*Ursus arctos*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1361	*Lynx lynx*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1308	*Barbastella barbastellus (Barbastella barbastellus)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1321	*Myotis emarginatus (Geoffroy's Bat)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1303	*Rhinolophus hipposideros (Little horseshoe bat)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Species distribution	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Species distribution	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
CONSTRUCTION AND OPERATION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				and outside the site boundaries)							
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Lateral fragmentation	Not significant	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-

e) Climate and climate change

e.1.) Vulnerability of the project to climate change

The climate in the project area is typically continental, with moderate winters and partly cool summers, rich in precipitation. The hilly relief, however, has a strong imprint on the climate features, imprinting regional and local nuances of the dominant climatic type, which is defined as a temperate continental climate, with oceanic influences, of the lowland and high hills, the Transylvanian Depression, the forest district, the complex topoclimate of the Târnavelor Plateau.

The average rainfall is 681 mm per year, with the wettest months being May, June and July. In spring, after the sprouting period, cold air masses coming from the Făgăraș Mountains cause repeated, sudden frosts, sometimes causing significant agricultural damage. The lowest amounts of precipitation are in the winter months, with a minimum in February and an average of 25.72 millimeters/m2 .

The highest amount of precipitation is recorded in June - 95.91 millimeters/m2 . This increase is due to both cyclonic activities of Atlantic origin and thermal convection of air masses penetrating over the Carpathian chain.

Altitude conditions the mean annual precipitation amounts, ranging from about 600 millimeters in the extreme north-western and south-eastern parts to over 650 millimeters in the central part of the site. In the area of the Hârtibaciu-Târnava Mare-Olt region, the following wind directions are formed: east, south-east, south, south-west, west.

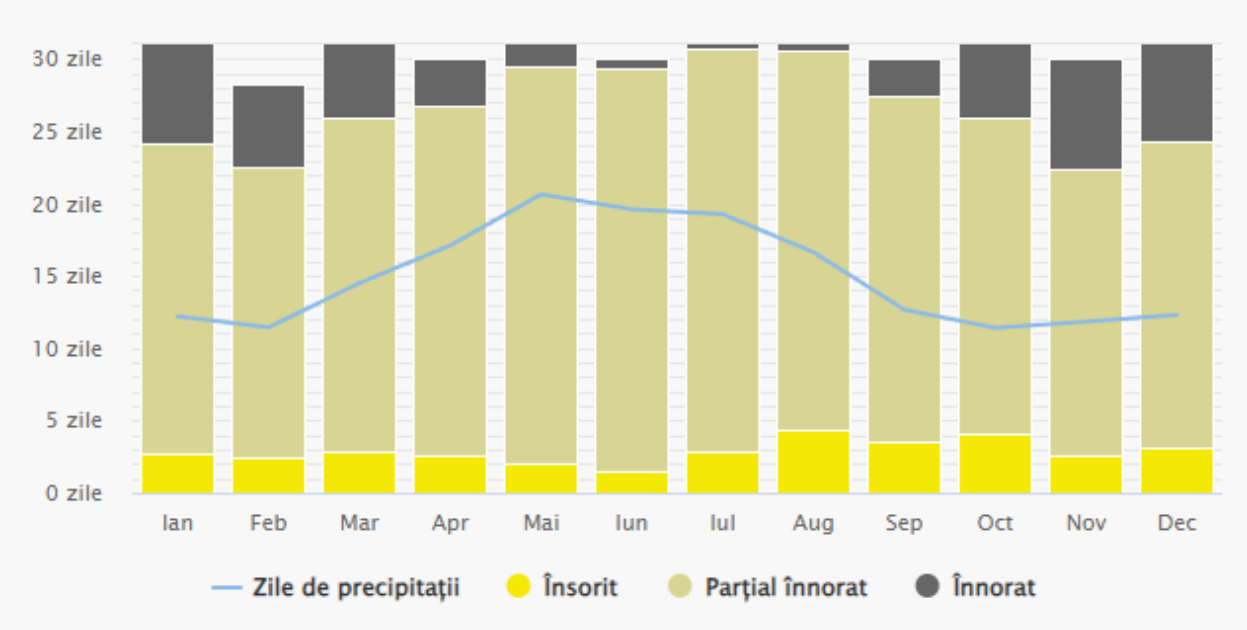

Figure 120 Cloud cover, sunshine and precipitation days in Câineni, source: Meteoblue

The graph shows the monthly number of sunny, partly cloudy, cloudy and rainy days. Days with less than 20% cloud cover are considered sunny, those with 20-80% cloud cover as partly cloudy and those with more than 80% cloudy.

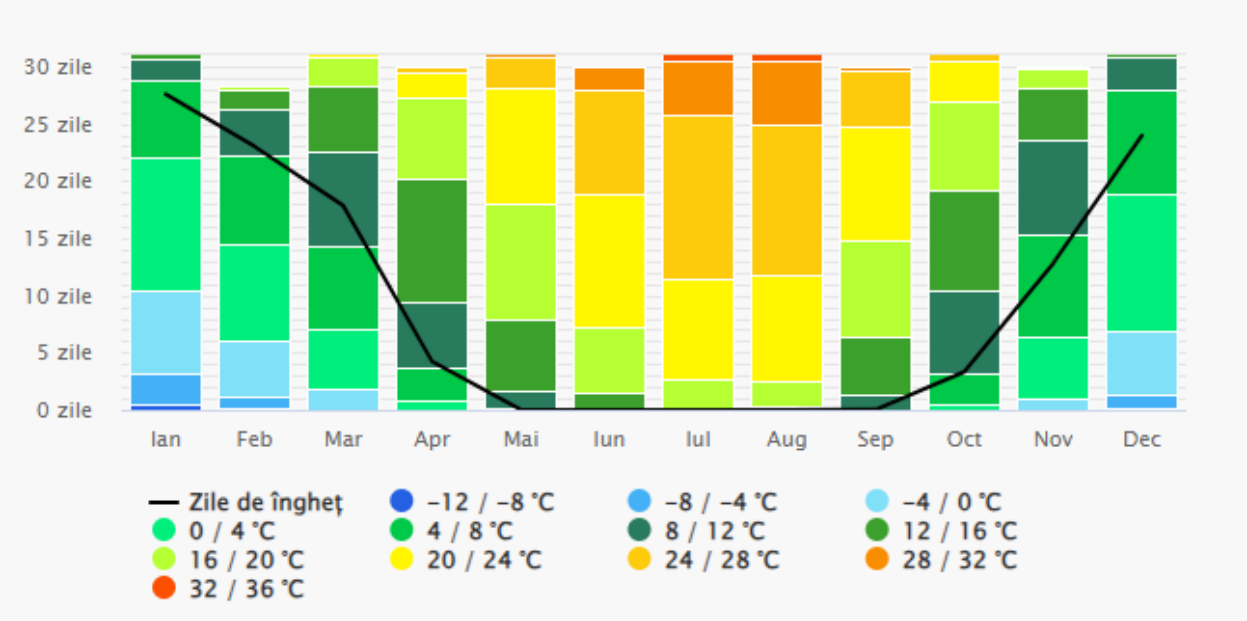

Figure 121 Maximum temperatures, Câineni, source: Meteoblue

The maximum temperature diagram for Câinenii Mari displays how many days per month reach certain temperatures.

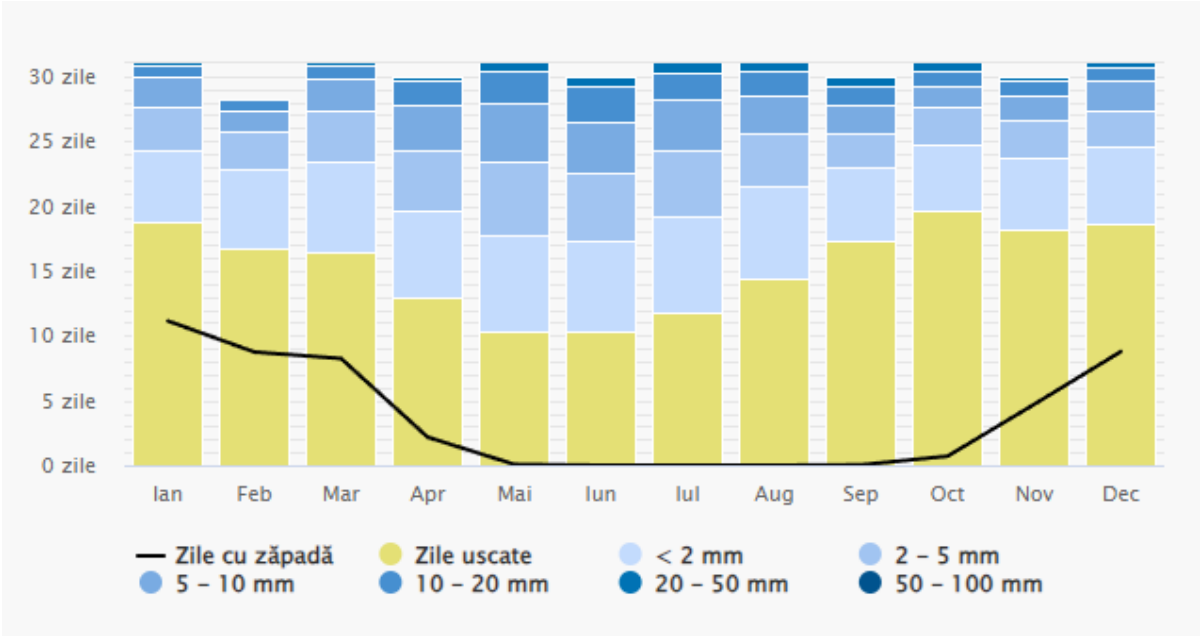

Figure 122 Rainfall, Câineni, source: Meteoblue

The precipitation diagram for Câinenii Mari shows on how many days per month a certain precipitation amount is reached. In tropical and monsoon climates these amounts may be underestimated.

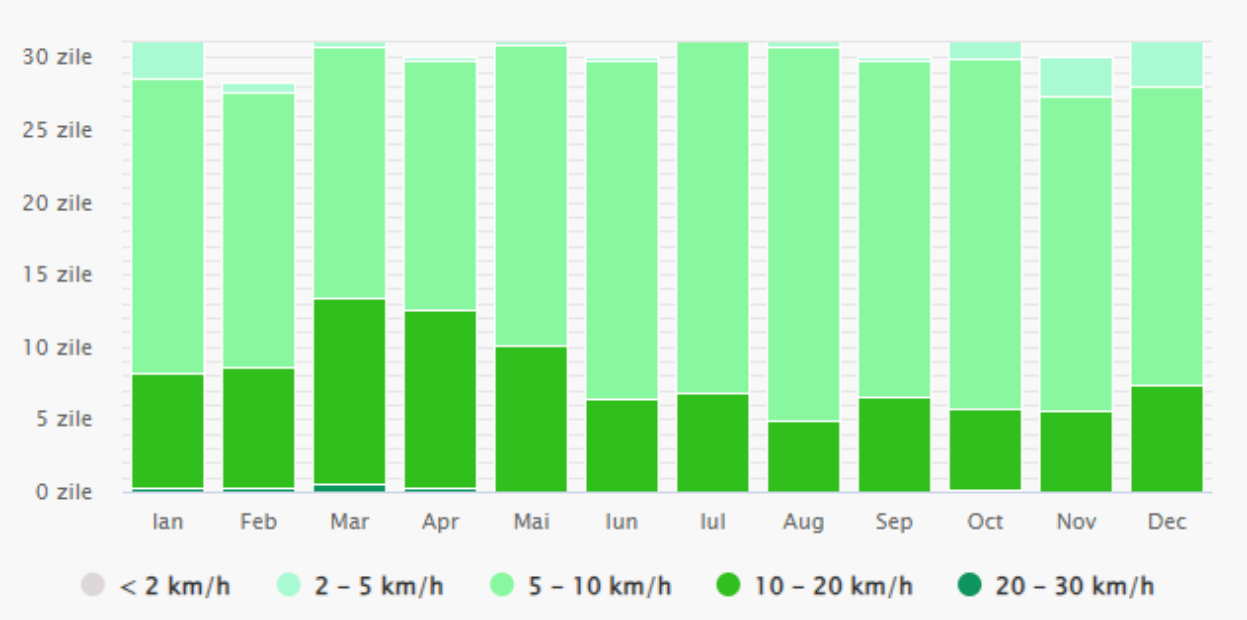

Figure 123 Wind speed, Câineni, source: Meteoblue

The Câinenii Mari diagram shows on which days of the month the wind reaches a certain speed.

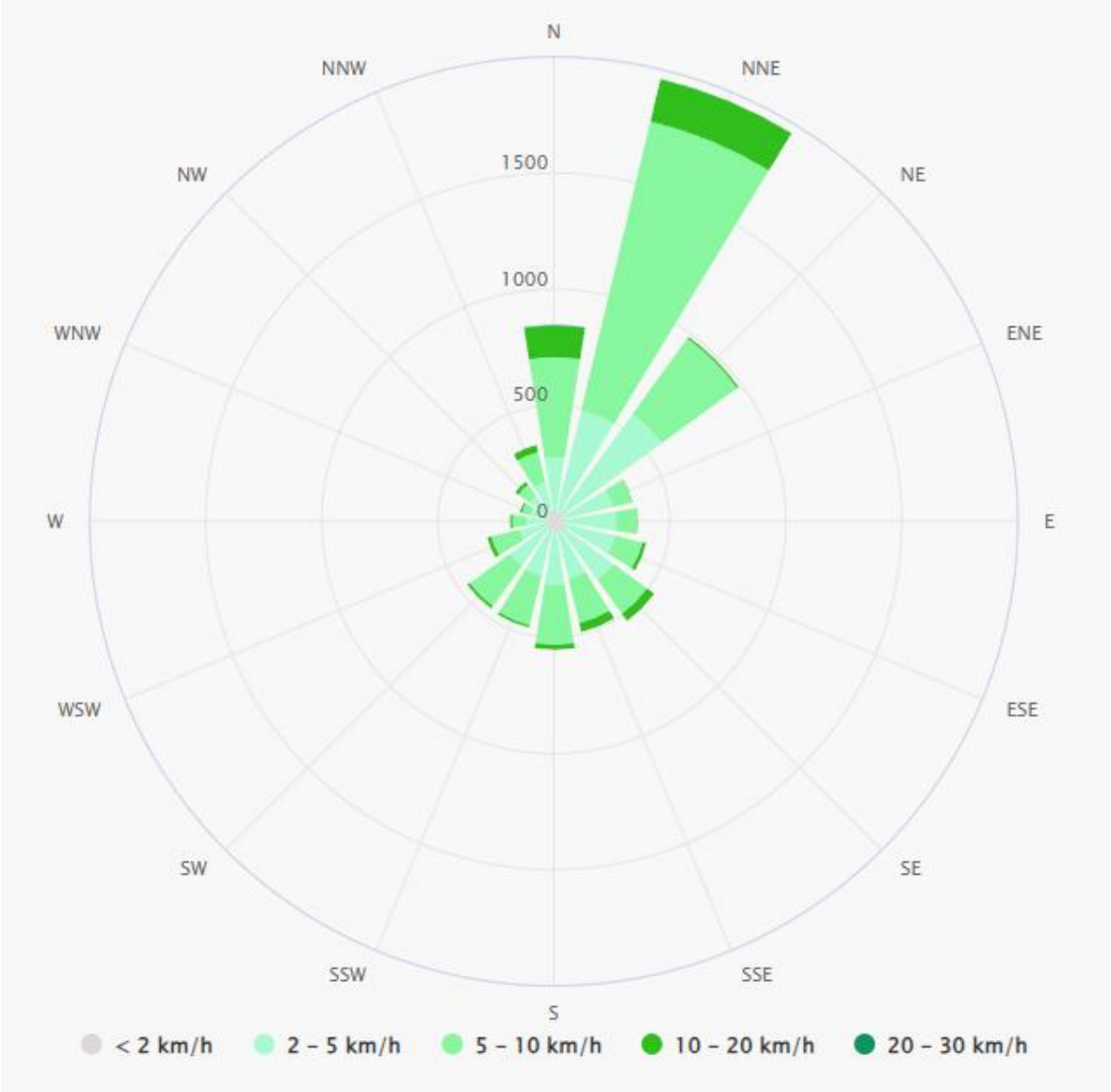

Figure 124 Wind chill, Câineni, source: Meteoblue

The wind rose for Câinenii Mari shows how many hours per year the wind blows from the indicated direction. Example SV: The wind blows from the south-west (SV) to the north-east (NE).

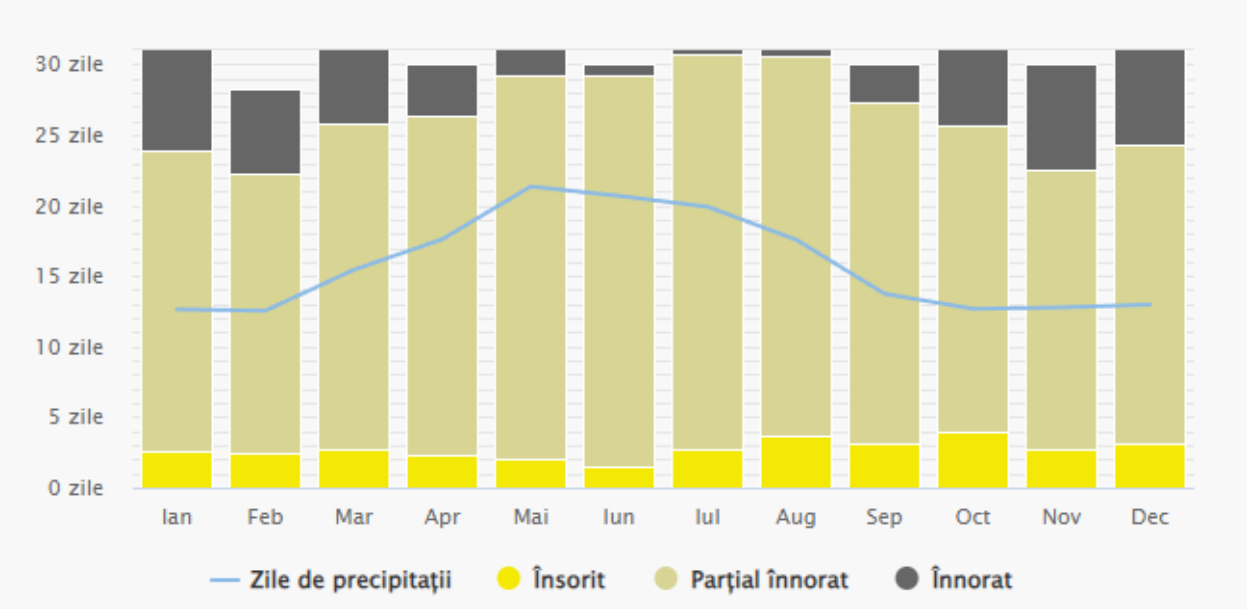

Figure 125 Cloud cover, sunshine and precipitation days, Lotrioara, source: Meteoblue

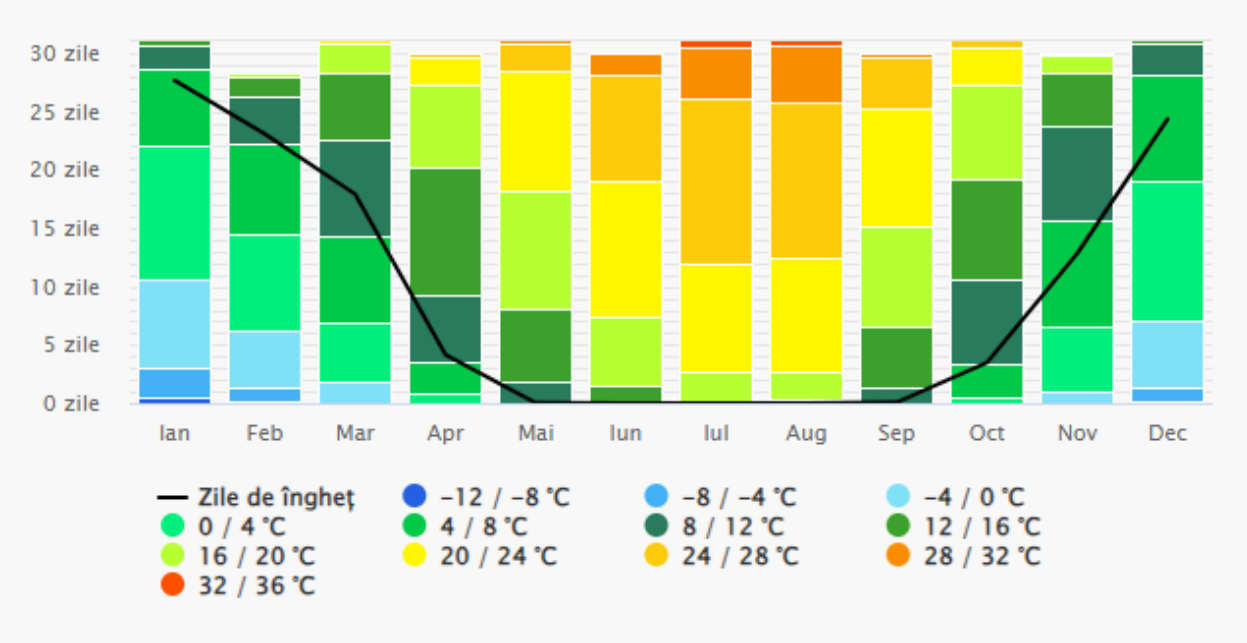

Figure 126 Maximum temperatures, Lotrioara, source: Meteoblue

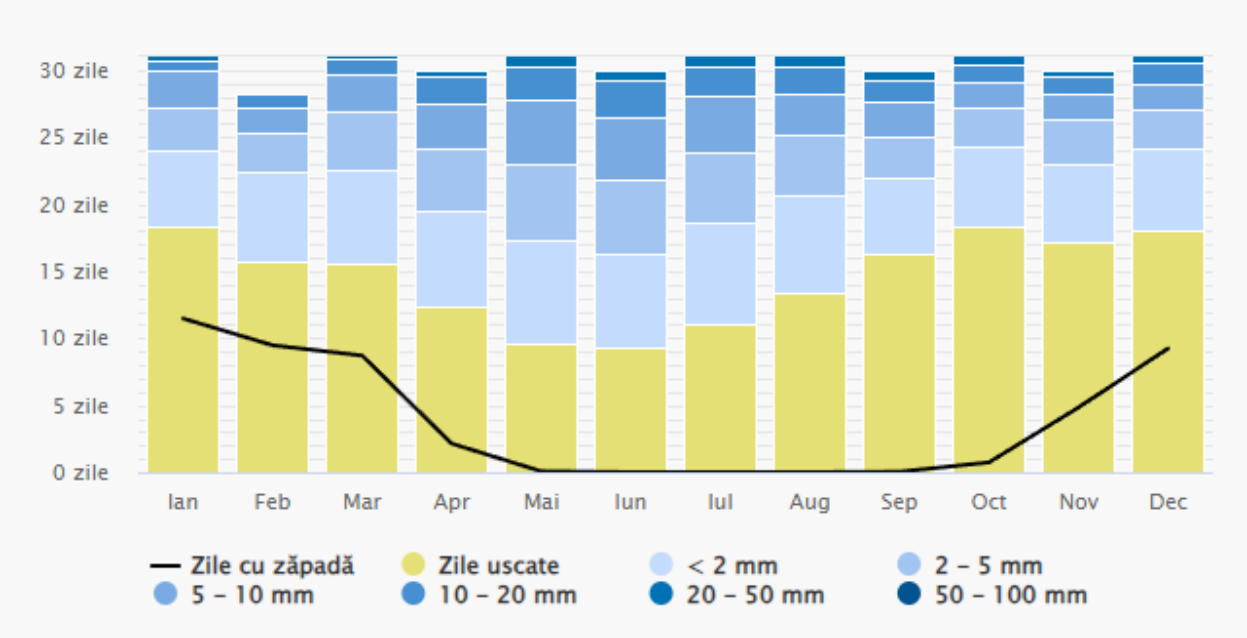

Figure 127 Rainfall, Lotrioara, source: Meteoblue

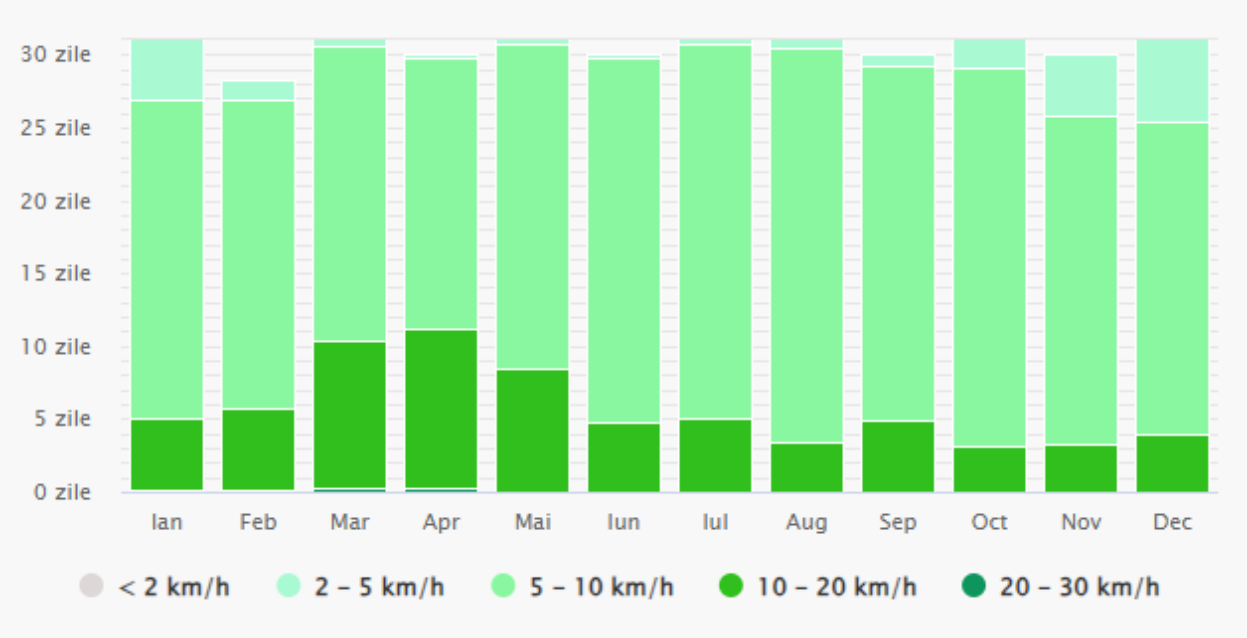

Figure 128 Wind speed, Lotrioara, source: Meteoblue

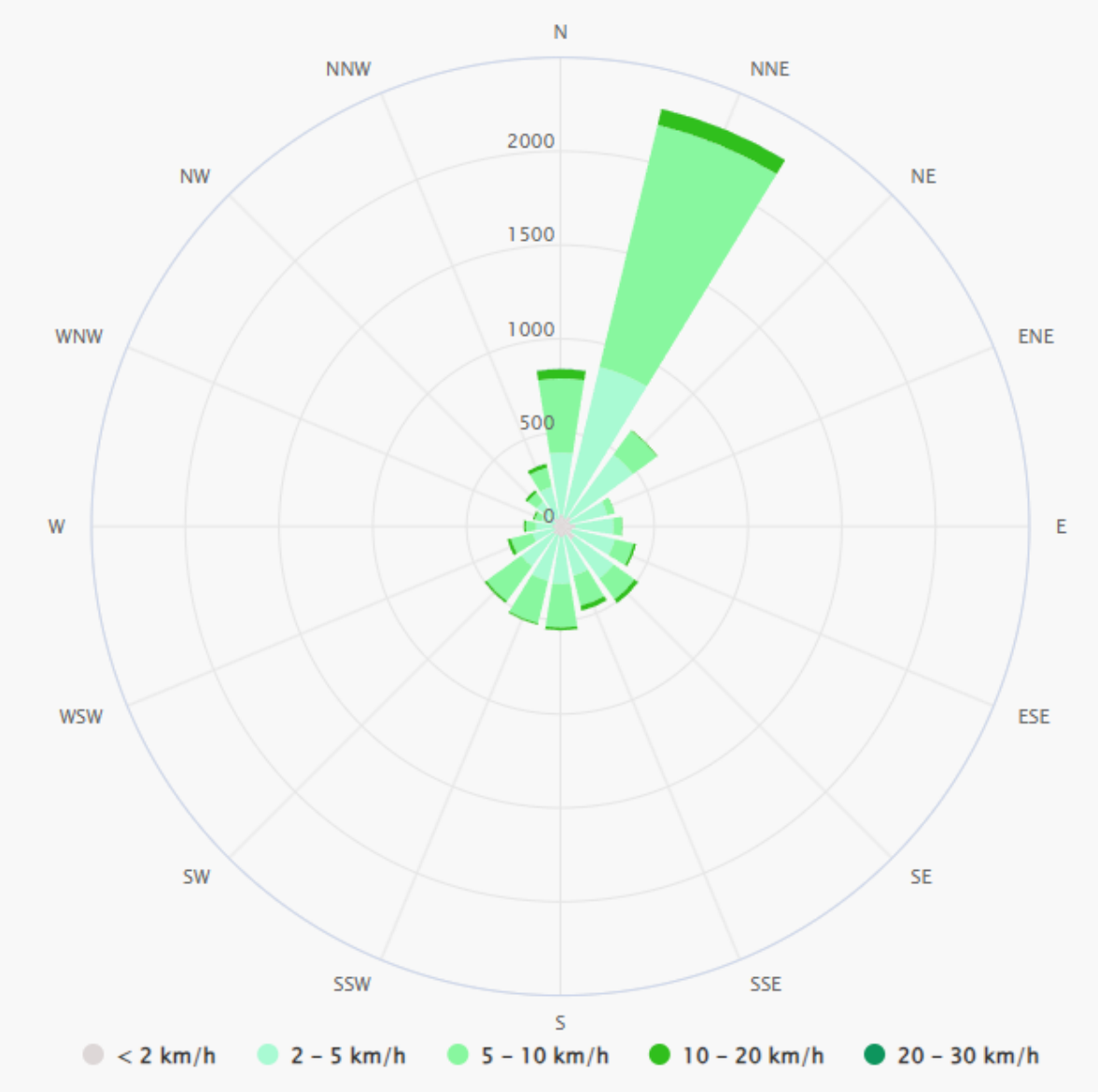

Figure 129 Wind chill, Lotrioara, source: Meteoblue

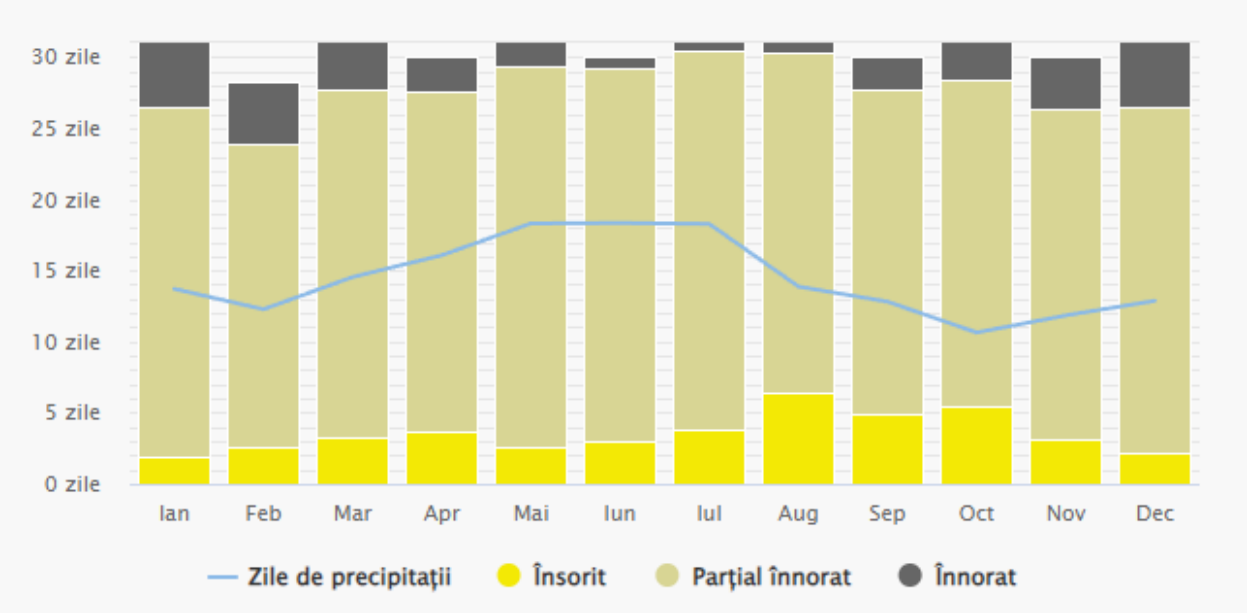

Figure 130 Cloud cover, sunshine and precipitation days, Racovița, source: Meteoblue

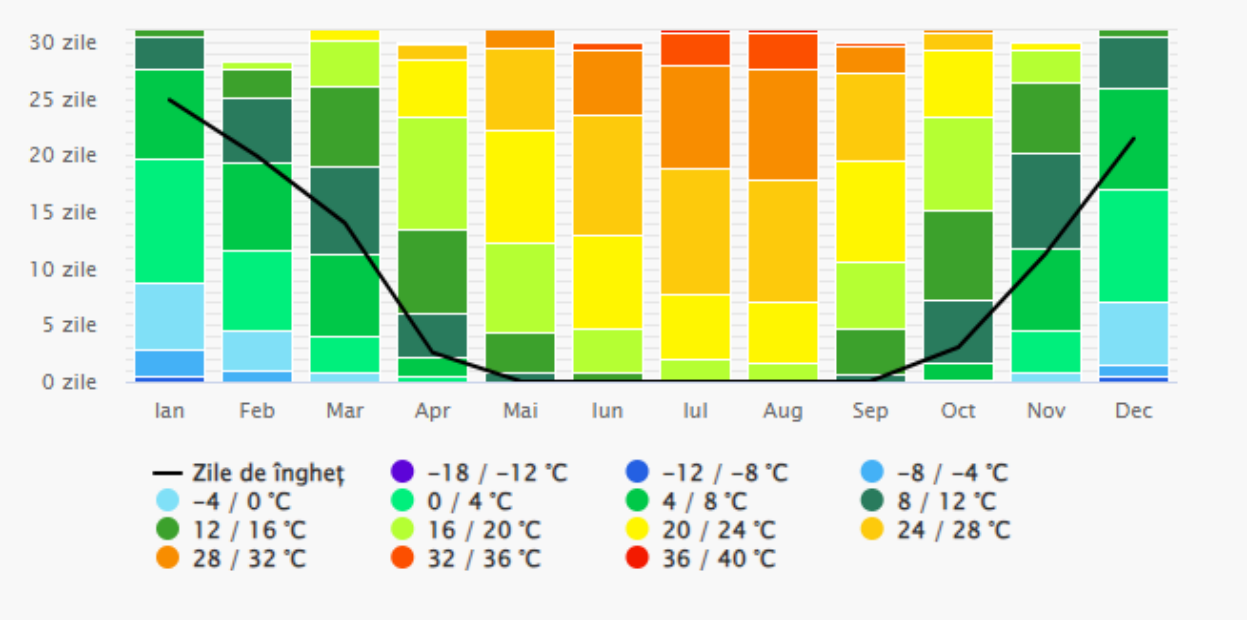

Figure 131 Maximum temperatures, Racovita, source: Meteoblue

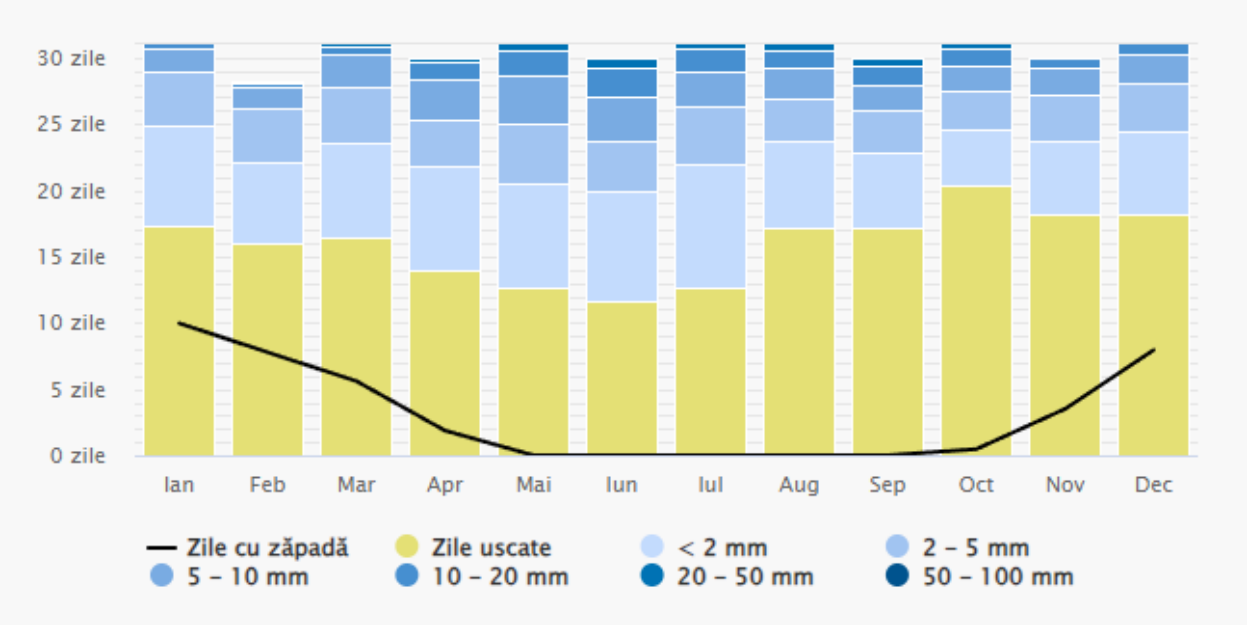

Figure 132 Rainfall, Racovita, source: Meteoblue

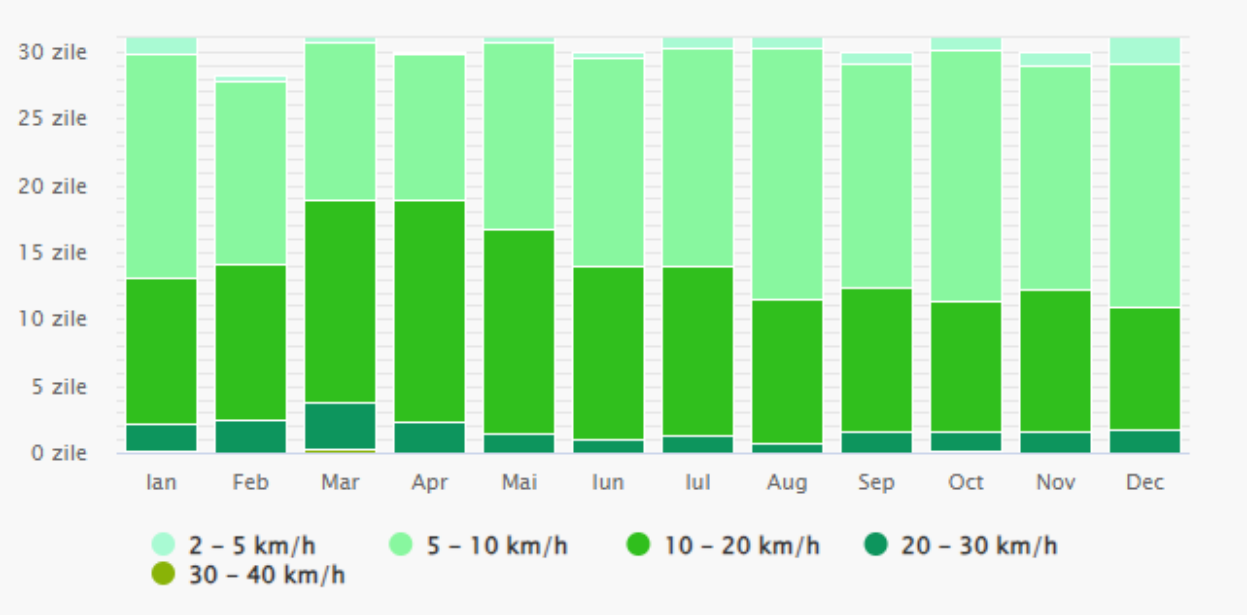

Figure 133 Wind speed, Racovița, source: Meteoblue

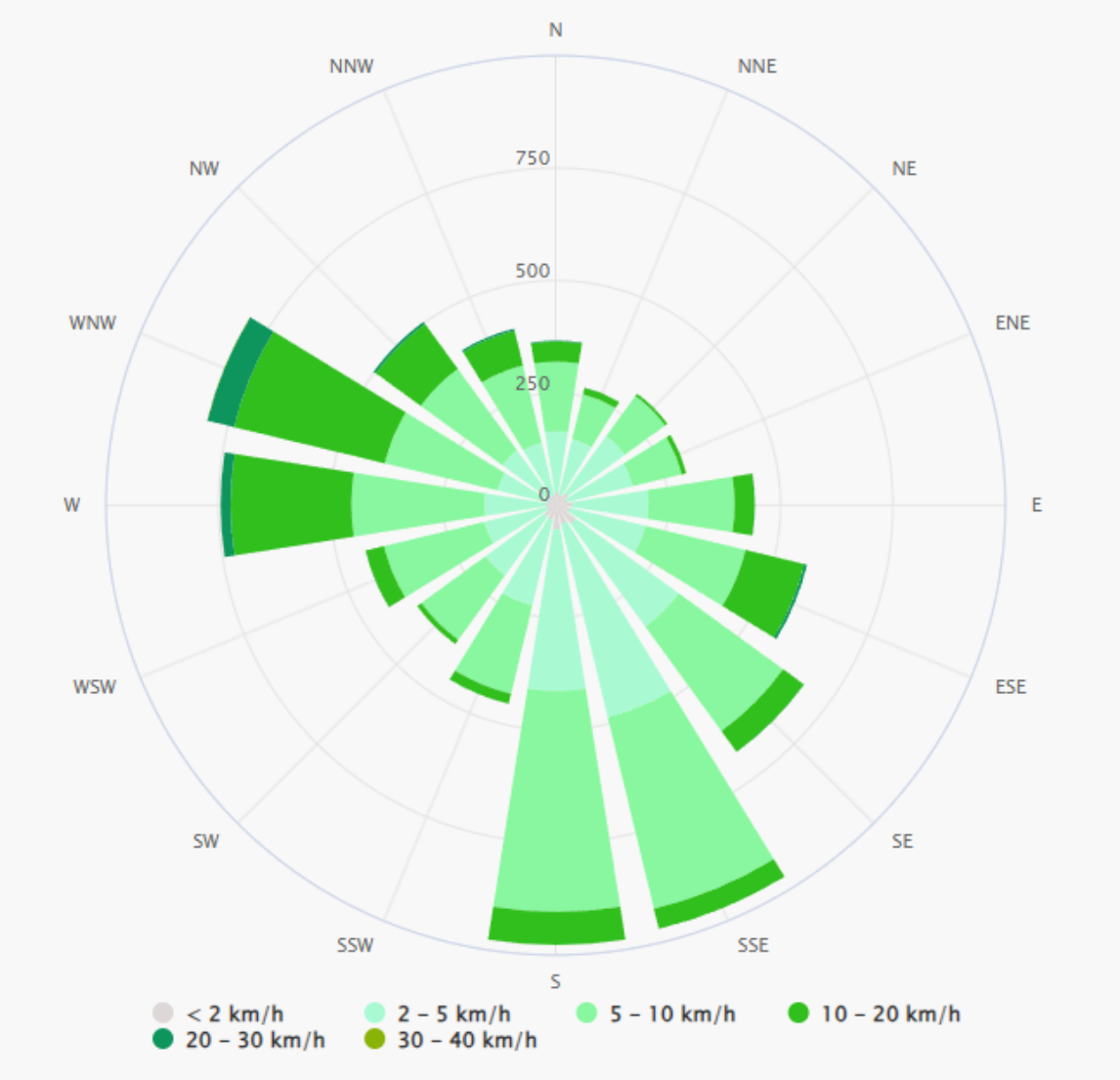

Figure 134 Wind rose, Racovița, source: Meteoblue

Table 96 Risks, vulnerabilities and opportunities identified

Risks/vulnerabilities	Opportunities / actions
Rising costs for heating homes as the centralized heating system is dismantled and natural gas-fired heating plants are installed	Re-establishment, rehabilitation and modernization of the infrastructure of the centralized system of production and distribution of thermal energy
High share of dwellings that are not thermally rehabilitated (also generating CO_2 emissions)	Harnessing renewable energy resources by setting up solar and wind farms

and are made of energy inefficient building materials, with pitched roofs	
Increased electricity and natural gas consumption of public buildings and low share of public buildings that have benefited from energy efficiency works	To improve energy efficiency and reduce the costs of powering homes, public buildings, industrial facilities, public lighting, public transport
Rising costs of electricity consumed by the public lighting system, due to its reduced energy efficiency - Rising energy prices in dry years, as the share of hydropower decreases at the expense of (more expensive) thermal energy	**Setting up hydropower**

The reduction in electricity demand for heating in winter as a result of rising average global temperatures does not offset the increase in electricity needed to run air conditioners and coolers on hot days. Climate change will change seasonal electricity demand to be lower in winter and higher in summer. Climate change may also cause a reduction in hydropower production by reducing water resources. Reduced water resources also affect the cooling systems of nuclear power plants.

Energy sector risk assessment

Romania's electricity needs are covered by an energy mix in which hydro energy covers around 17% in a normal hydrological year. Due to the occurrence of prolonged summer droughts (2003, 2007), the shortage of electricity in the system was covered by the energy produced by burning coal, which created particular pressure on coal production, but also on the price of electricity, given that hydro energy is the cheapest. One threat is linked to the fact that the use of coal is jeopardizing the fulfilment of Romania's commitments on SO_2, NO_x and dust emissions from thermo-electric power plants. A further pressure will be exerted on the cost of electricity by exceeding the amount of greenhouse gas emission allowances allocated to thermal power plants through the National Allocation Plan. Another danger is due to the increased need for air conditioning in the summer, with peak electricity consumption in summer approaching winter peaks. This will put pressure on the entire energy sector, as cogeneration plants operate in winter and are much less used in summer.

The hazards to energy infrastructure are extreme weather events; there have been many, many cases where thousands of homes have been left without electricity due to severe storms. Hazards include: Collapse of transmission and distribution lines, destruction of electrical transformers due to lightning strikes, prolonged interruption of power supply to consumers due to very rapid increase in demand for air conditioning during the summer, for which the electrical distribution networks are not prepared to cover, the clogging of dams due to flooding of rivers, the impossibility of meeting the cooling needs of large power generation plants, which would lead to their shutdown (in 2003, Unit 1 of the Cernavodă CNE had to be shut down due to lack of water in the Danube).

Achieving the objective of the Cornetu Avrig AHE will lead to increased investment in the use of renewable energy sources, in order to utilize the economic and technical potential that Romania has. This will be all the more important as world fossil fuel prices are rising at an alarming rate, but also in order to meet EU commitments.

The risk assessment and prioritization was carried out by estimating the impact of climate change on each risk and considering the likelihood of a particular change occurring, using a scale of 1 to 5 and constructing a matrix (where 1 represents very low impact-very low likelihood and 5 very high impact-very high likelihood-risk)

In AHE Cornetu Avrig the matrix for risks identified in the Energy and Telecommunications sector is:

Table 97 Matrix for risks identified in the Energy and Telecommunications sector

Hazard	Vulnerabilities	Risks	Impact	Probability	Impact	Total score
Rising temperatures	Unrehabilitated housing	More air conditioners	Increased costs; Increased energy consumption	5	2	10
Extreme temperatures (frost)	Increasing the number of individual heating plants	Decrease in gas pressure	Declining quality of life	1	2	2
Climate change	Old network segments; Low energy consumption	Unprofitability in certain segments/networks	Price increases; Hardship for those who can't afford it	5	2	10
Drought	Fall in hydro production	Energy basket change (price increase)	Industrial and household consumers affected	5	2	10
Blizzard / freezing rain	High percentage of overhead distribution cables; High energy dependency	Cable collapse	Interruption of energy supply; Interruption of street lighting	5	3	19

Vulnerability analysis is the identification of climate variables or hazards that could have an impact on the proposed project based on sensitivity and exposure for both current and future climate conditions.

Vulnerability (V) is calculated as V=S x E, where S is the degree of sensitivity to a given climatic factor and E is the degree of exposure to a given climatic factor.

Table 98 Project vulnerability analysis

No. crt.	Climate variables	Exposure to current conditions	Exposure to future conditions
DIRECT EFFECTS			
1.	Average annual temperatures	The annual average temperature trend for the project area, in the period 1960-2023, is increasing at a rate of ca. 0,09°C	In the project area, the mean annual temperature increase could be between 1.20°C and 1.29°C
2.	Extreme high temperatures, drought	In Sibiu county, more scorching days (with temperatures ≥35˚C) were recorded in 2023, the temperature record, in force since 1949, namely 37.6 degrees, was broken on 25.08.2012, reaching 38.9 degrees	The future trend for temperatures is rising
3.	Extreme heavy rain, floods	Increases in annual precipitation extremes have been recorded in the study project area	The average number of days per year with more precipitation increases in Sibiu county by between 0.35 and 0.85 compared to the 1970-2000 reference period
4.	Extreme wind speeds	Slight increase in frequency of occurrence of strong winds	Slight increase in frequency of occurrence of strong winds
5.	Humidity	Between 1960-2023, in the project area, the recorded values indicate incipient drought.	Multi-annual mean values for the coming period indicate significant reductions compared to the current climate for snow depth in the cold season
6.	Frost	The current risk of freezing rain is on a slightly increasing trend.	Slightly increasing trends in the risk of freezing rain weather event

No. crt.	Climate variables	Exposure to current conditions	Exposure to future conditions
7.	Solar radiation	There has been an increasing trend in solar radiation in the range 1960 - 2023	Increases in solar radiation values are expected

Immunizing the project to climate change in the context of its vulnerability

Risk assessment based on vulnerability analysis

Risk assessment is based on vulnerability analysis and focuses on identifying risks and opportunities associated with high or medium vulnerabilities. It consists of assessing the likelihood and magnitude of the consequences of the impacts associated with the identified climate hazards, as well as assessing the significance of the risk for the proposed projects.

Table 99 Project vulnerability to climate variables

No. crt.	Climate variables	Sensitivity		Exposure to current conditions	Vulnerability to current conditions	
		Entries	Out		Entries	Out
1.	Average annual temperatures	0	0	1	0	0
2.	Extreme high temperatures, drought	1	1	2	2	2
3.	Extreme heavy rain, floods	1	1	2	2	2
4.	Extreme wind speeds	1	1	2	2	2
5.	Humidity	0	0	1	0	0
6.	Frost	1	1	2	2	2
7.	Solar radiation	0	0	1	0	0

Legend

Vulnerability	small (score 0 -1)	medium (score 2 -3)	high (score 4 -6)

The analysis of project vulnerability to climate change took into account the following climate variables:

- extreme high temperatures;
- extreme heavy precipitation;
- extreme wind speeds;

- frost;
- storms (tornadoes);
- flooding;
- landslides/soil erosion;
- wildfires.

The analysis established an average vulnerability level for 4 climate variables: extreme high temperatures; extreme heavy precipitation; extreme wind speeds and frost.

Climate change mitigation (climate neutrality), adaptation measures

Climate change mitigation involves decarbonization, energy efficiency, energy savings and the use of renewable forms of energy. It involves taking action to reduce GHG emissions or increase GHG sequestration and is guided by EU policy on emission reduction targets for 2030 and 2050. In addition, a large proportion of the infrastructure projects to be supported in the period 2021-2027 will have a life span extending beyond 2050.

In these guidelines, the carbon footprint method is used not only to estimate greenhouse gas emissions for a project when it is ready to be implemented, but more importantly to support the analysis and integration of low-carbon solutions in the planning and design stages. It is therefore essential that climate proofing is integrated into project cycle management from the outset.

Effective measures to reduce greenhouse gas emissions must be taken in the energy sector, mainly at the planning level. Carbon footprint methodologies can be extended to provide an immediate assessment of the extent to which the plan is producing the expected positive effects on GHG emissions. This could be one of the main key performance indicators for such plans.

For the analysis of climate neutrality issues, specific studies have been carried out, based on the Commission Communication Technical Guidelines for the climate-proofing of infrastructure for the period 2021-2027, (2021/C 373/01).

The process of preparing for climate change adaptation has taken into account:

- assessing and specifying the project context, boundaries and interactions between projects;
- selection of the assessment methodology, including key parameters for vulnerability and risk assessment;
- Compilation of key reference documents, such as the applicable National Energy and Climate Plan (NECP) and relevant adaptation strategies and plans, including, for example, national and local disaster risk reduction strategies;
- ensuring compliance with applicable laws, rules and regulations.

Climate proofing is a process that integrates climate change mitigation and adaptation measures into project development.

This allows institutional and private investors in Europe to make informed decisions on projects deemed compatible with the Paris Agreement.

The process comprises two pillars (mitigation, adaptation) and two steps (screening, detailed analysis). Detailed analysis depends on the outcome of the screening step, which contributes to reducing the administrative burden.

For the assessment of CO_2e emissions, the methodologies referred to in the Communication from the Commission - Technical Guidelines on climate-proofing of infrastructure for the period 2021-2027, (2021/C 373/01) have been used,

In accordance with the applicable guidelines and methodologies, the specific studies were conducted following the specific process steps outlined below:

I. Mitigation (climate neutrality)

- Phase 1: Screening with assessment of project impacts on GHG emissions
- Phase 2: Detailed analysis, presenting the principles of energy efficiency and GHG emission reduction in the conception and design of the investment, including calculation of GHG emissions generated by the project and comparison with the existing situation and the situation without the project (baseline scenario) - only if the project generates emissions of more than 20,000 tons CO_2/year.

II. Adaptation (climate resilience):

- Step 1: Examination with the following steps:
  1. Sensitivity analysis of the project to climate variables;
  2. Assessment of the exposure to risks generated by climatic variables in the project area;
  3. Vulnerability analysis;
  4. Risk assessment.
- Step 2: Adaptation solutions with the following steps:
  1. Identifying adaptation options;
  2. Assessment of adaptation options ;

We summarize these expert studies below:

The proposed project will emit carbon dioxide (CO_2) during construction 51.46 tons of CO_2e over the entire 60-month construction period.

In line with the European Commission's Communication on Technical Guidelines on climate-proofing infrastructure, the project does not require a detailed carbon footprint assessment.

The project will not increase GHG emissions in the area

The conclusion of the climate proofing analysis after the stage 1 screening was that the project does not require a detailed carbon footprint assessment, given that the project development and operation generates less than 20,000 tons of CO_2e/year and the project type is included in the list of projects for which a detailed carbon footprint assessment is not required.

The project has no additional impact on emissions and cannot negatively influence climate variables, on the contrary its realization will support the climate mitigation process.

The project does not involve activities that may increase GHG emissions in the area, will not significantly influence energy demand and includes solutions for the use of renewable energy sources.

The project will not lead to a significant increase in personal travel or freight.

The objective has considered all relevant aspects of GHG emission reduction, mitigation and adaptation to climate change. Thus the objective does not present a significant vulnerability to climate change, taking into account that all measures and technical works to address climate risks

identified in the implementation have been included and do not require any additional works for climate change protection and adaptation.

The project also has no potential to significantly influence the level of GHG emissions in the project area.

In operation, it will provide an alternative to conventional energy sources by providing renewable energy, thus supporting the reduction of national GHG emissions.

f) Population

Labor needed for the project

- *work to complete the investment*

The table below gives an estimate of the workforce required to complete the investment, by professional qualification and by the trades specific to this type of construction work; it should be noted that not all of these posts may be filled simultaneously during the period of the investment.

Table 100 Labor required during the investment period

Specific professional qualification/specialization	No. persons
- Site Manager	1
- Civil Engineer	4
- Electro-Mechanical Engineer	3
- TESA staff	4
- Foreman	4
- Surveyor	3
- Concrete Plant Operator	4
- Concrete Laboratory Operator	4
- General Transportation Vehicle Driver	4
- Dump Truck Driver (on-site)	8
- Construction Equipment Operator	4
- Powder man	4
- Carpenter	3
- Reinforcement Steel Worker	5
- Concrete Worker	5
- Injection Operator	4
- Unskilled Worker	18

g) Safety and human health

Risks to human health and safety, cultural heritage or the environment from accidents, armed attack or disasters

These risks have been highlighted:

- floods caused by natural overflows of watercourses, ice jams, landslides ; floods caused by incidents, accidents or building damage;
- dangerous weather phenomena: heavy rain, heavy snow, thunderstorms and blizzards, ice, frost, ice, ice, ice, ice, frost, early or late frost, heat, hail and drought, tornadoes, avalanches;
- Armed attacks, fires, explosions, accidental pollution of watercourses, soil, accidental polluting emissions into the atmosphere, earthquakes, damage to or destruction of installations, equipment and hydro-technical constructions, floods, morphological and geological changes in the slopes of reservoirs and other serious natural disasters.

For all these situations, there are measures included in the beneficiary's action plan, drawn up with the county prevention and defense committees. In this case, warning-alarm measures are applied to save people and property; the H.A. is shut down; the quick valve is closed; the dispatcher and the Emergency Situations Cell are notified; the level in the lake is monitored and if there is a danger of flooding the power station, all the CHE installations are de-energized and the CHE is left.

The characteristic defense measures defined in case of floods are:

a) For the dyked areas of watercourses:
   - Phase I defense - when the water level reaches the foot of the outer embankment of the embankment for one third of its length;
   - Phase II defense - when the water level reaches halfway between the elevation of Phase I and Phase III defense;
   - Phase III of defense - when the water level reaches 0.2 m - 1.5 m below the level of the known maximum water levels or below the maximum level for which the dike was sized or when a critical point is exceeded.

b) For the un-dammed areas of watercourses in hydrometric station sections:
   - flood level - I.C. - the level at which significant overflows occur that may lead to flooding of the first objective;
   - hazard level - H.P. - the level at which special measures may be necessary to evacuate people and goods, restrictions on the use of bridges and roads, as well as special measures to be taken in the operation of hydro-technical constructions.

For reservoirs, the phases I, II and III of defense are established according to the water level in the lake and the tributary flow and are calculated by the designer/expert in the range between the Normal Retention Level (N.N.R.) and the Maximum Level of Exploitation (N.M.E.) established by the operating regulations.

For the behavior of dams, the critical thresholds are set by the designer for each objective according to:

- the water level in the lake when it exceeds the Normal Retention Level (N.N.R.);
- reaching certain limit values in the behavior of the construction. The limit values in construction behavior are:
- threshold of attention - the values of some of the parameters approach or even exceed the range considered normal, without the general state of stability of the construction being altered;
- alert threshold - dangerous changes in behavioral parameters with evolution towards incipient failure phenomena;
- hazard threshold - the dam undergoes changes that may lead to serious damage or failure.

In the case of flood hazard due to ice agglomeration and overflow, the following characteristic magnitudes are determined:

- Phase I - when the ice is breaking up and the ice flows down the watercourse and small ice piles appear;
- Phase II - when the ice-slides become congested and levels rise upstream;
- Phase III - when the landslides have become stuck in a slush, leading to damage by upstream overflow or downstream flow of the landslides due to slush failure.

The following characteristic magnitudes shall be established for flood hazards on agricultural land caused by rising groundwater table (inland floods):

- threshold of attention - the occurrence of waterlogging on an area of at least 30% of the total area of land potentially affected;
- warning threshold - water stands still in the flooded area for up to 72 hours
- warning/danger threshold - water stagnates in the flooded area for more than 72 hours

h) Landscape

Visual perception of the landscape is subjective, which makes it difficult to assess the impact on this environmental factor. It is important to emphasize that landscape is a result of the interrelation of the other environmental factors, so that the impact on the environmental factors water, air, soil/soil, biodiversity and social-economic and cultural environment will be reflected in the quality of the landscape, especially in protected areas.

During the works, the landscape may be affected in terms of aesthetic effect:

- containers for the storage of waste generated by workers;
- by the trucks involved in the work;
- by raising the dam's canopy to the designed level;
- dust from machinery and particulate matter from the transportation to the site of raw materials for the remaining work;

During the execution period of the works foreseen by the project, waste is collected in special containers and temporarily stored at the site organizations, and then recovered/disposed of by an authorized economic operator. There will also be areas for temporary storage of construction materials on the site of the site organization.

None of the site organizations are located in intact forest landscape areas are located in man-made areas, in areas with agricultural land (pasture, arable land) or in built-up areas.

At the same time, site organizations are located in remote areas, at considerable distances from inhabited areas.

An insignificant negative impact on the landscape may occur during the remaining works to be carried out on the entire Cornetu Avrig hydropower plant due to the temporary storage of waste and reusable materials on the temporary storage platform and also as a result of the actual works on the site.

The damage to the landscape has occurred with the start of the works and the non-completion of the works may have an impact on the landscape in this area through landslides, erosion, slope runoff.

Summarizing the above, it can be assessed that the estimated impact on the landscape during the execution of the works is insignificant negative, reducing to neutral (no impact) once the works are completed.

5. DESCRIPTION OF THE SIGNIFICANT EFFECTS THAT THE INVESTMENT OBJECTIVE MAY HAVE ON THE ENVIRONMENT

5.1. Use of resources for the realization of the project (works remaining to be executed)

This project falls within the context of the fair and rational use of available resources, addressing issues related to the growth and development of renewable electricity generation and the rational use of available energy potential.

In addition to achieving the main objective - electricity generation - other objectives will be pursued in the implementation of the project, such as:

- land development in order to locate the project's facilities, construction of access roads and roads for access and operation;
- development of the transmission infrastructure for the electricity produced;
- creating new jobs during the development;
- contribute to increasing the share of electricity produced from renewable energy sources.

The main natural resources used to realize the project are water, soil and mineral aggregates (natural stone, ballast, sand). The mineral aggregates will be sourced from existing quarries/ballast pits also used for the realized elements included in the initial project.

The transportation of aggregates from the quarries and/or ballast pits to the project site area will be carried out by specific means of transport on national and/or local roads, as appropriate. Front loaders will also be used for transportation as part of the site/works organization.

Procurement of materials will be done gradually, in stages of construction, so that they can be put into operation and to avoid long-term stockpiling of raw materials.

Also, the supply of the necessary natural resources will be made only from authorized companies located as close as possible to the project site.

As regards the source of supply of material resources to be used for the realization of the planned works, they will be purchased from authorized firms specialized in this respect, which will provide the materials ready to be put into operation on the project site, taking into account its specificity.

Taking into account the specific nature of the works as well as the progress of the project, we present below the quantities for the elements already completed within the project and the remaining quantities to be executed.

Supplies will be made only from authorized companies, taking into account the optimal distance from the objective. It should be noted that the realization of the project (works still to be carried out) will not lead to additional land occupation.

5.2. Effects of PP interventions

a) description of project effects

The project interventions (works still to be executed) can be divided into 3 main areas:

- It is partially implemented in ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu Sud-Vest, ROSPA0003 Avrig-Scorei-Făgăraș and ROSPA0098 Făgăraș Piedmont.
- Zone 2 CHE Lotrioara - It is partially implemented in ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu, ROSAC0304 Hârtibaciu South-West, ROSAC0122 Făgăraș mountains, ROSAC0085 Frumoasa and ROSPA0043 Frumosa;
- Zone 3 CHE Câineni - It is partially implemented in ROSAC0132 Middle Oltul - Cibin - Hârtibaciu.

The following is the summary of the effects generated by the implementation of the project, according to the structure of (Summary of the effects generated by the implementation of the project) in Annex no. 5A to the Annex to the Order MMAP no. 1.682/2023 for the approval of the Methodological Guide on the appropriate assessment of the potential effects of plans or projects on protected areas of community interest.

Table 101 - Summary of effects generated by the project implementation

Stage	Impact	Type(s) of intervention generating the effect	Method of quantification	Quantifying the effects	Distance to the effects	ANPIC potentially affected	Other additional information
Construction	Loss of individuals of species with reduced mobility (amphibians and reptiles) and loss of habitats characteristic of these species (amphibians and reptiles/ invertebrates)	CHE Câineni - Dam-type power plant located in front, aligned with the spillway dam, remaining 50% to be executed. CHE Câineni - Overflow dam CHE Câineni - Runaway canal CHE Câineni - Câineni reservoir dikes CHE Câineni - Water diversion CHE Câineni - Access road to the hydrotechnical node CHE Lotrioara - Spillway dam CHE Lotrioara - Upstream regularization (channel) CHE Lotrioara - Reservoir CHE Lotrioara - The Runaway and High Waters Canal CHE Lotrioara - Roads, bridges, accesses and protections DN7 and CF CHE Lotrioara - Water diversion CHE Racovița - remaining to be executed	Estimating the number of individuals and characteristic habitat areas	In order to quantify the effects, field trips/monitoring were carried out to assess the number of specimens of species with reduced mobility (e.g. *Bombina variegata*) and to estimate the area of habitats of these species in the area of the works	Only in the area where the work is carried out	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu, ROSAC0122 Făgăraș Mountains, ROSAC0085 Frumoasa, ROSAC0304 South-West Hartibaciu	Individuals of the species *Bombina variegata* and its characteristic habitats have been identified on the project site

Stage	Impact	Type(s) of intervention generating the effect	Method of quantification	Quantifying the effects	Distance to the effects	ANPIC potentially affected	Other additional information
	Increased noise and emissions in the project area	CHE Câineni - Dam-type power plant located in front, aligned with the spillway dam, remaining 50% to be executed. CHE Câineni - Overflow dam CHE Câineni - Runaway canal CHE Câineni - Câineni reservoir dikes CHE Câineni - Water diversion CHE Câineni - Access road to the hydrotechnical node CHE Lotrioara - Spillway dam CHE Lotrioara - Upstream regularization (channel) CHE Lotrioara - Reservoir CHE Lotrioara - The Runaway and High Waters Canal CHE Lotrioara - Roads, bridges, accesses and protections DN7 and CF CHE Lotrioara - Water diversion CHE Racovița - remaining to be executed	Calculations+ noise dispersion modeling	In order to assess the noise level generated by the execution of the project, a worst case situation was considered, i.e. the operation of all equipment and machinery involved in the construction activities, in a working front as long as possible	Taking into account the fact that there is a forest forest adjacent to the project site, which has the capacity to absorb the noise level, it was calculated that at a distance of 100 m from the works area, the noise will be reduced to acceptable parameters (below 50dB)	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu, ROSAC0122 Făgăraș Mountains, ROSPA0043 Frumoasa, ROSPA0003 Avrig-Scorei-Făgăraș and ROSPA0098 Făgăraș Piedmont	The works within the project are works - remaining to be executed within the Project on increasing the share of electricity production from renewable energy sources through hydropower Cornetu - Avrig, so that taking into account the relatively small quantities of works remaining to be executed, the small areas where these works are to be completed, as well as their concentration in anthropized areas, it can be said that the noise generated during the works will be reduced in relation to the areas of protected areas.
	Increased turbidity in the sectors affected by works in the Olt river bed,	CHE Câineni - Dam-type power plant located in front, aligned with the	Information on the characteristics of the project	Work will be carried out in the short term. By following a work schedule, the effects will	Variable distance depending on existing flows	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu, ROSAC0122 Făgăraș	The project may cause accidental pollution phenomena that could affect the quality of surface

Stage	Impact	Type(s) of intervention generating the effect	Method of quantification	Quantifying the effects	Distance to the effects	ANPIC potentially affected	Other additional information
	including the reduction of the quality of the aquatic habitat due to accidental pollution	spillway dam, remaining 50% to be executed. CHE Câineni - Overflow dam CHE Câineni - Runaway canal CHE Câineni - Câineni reservoir dikes CHE Câineni - Water diversion CHE Câineni - Access road to the hydrotechnical node CHE Lotrioara, 99% to be executed CHE Lotrioara - Spillway dam CHE Lotrioara - Upstream regularization (channel) CHE Lotrioara - Reservoir CHE Lotrioara - The Runaway and High Waters Canal CHE Lotrioara - Roads, bridges, accesses and protections DN7 and CF CHE Lotrioara - Water diversion CHE Racovița - remaining to be executed	(length/built areas, land areas, construction techniques)	be discontinuous and less intense.		Mountains, ROSPA0003 Avrig-Scorei-Făgăraș and ROSPA0098 Făgăraș Piedmont	water. At the same time, the areas occupied by the future lakes (Lotrioara and Câineni) will change the structure of the current aquatic habitat in this area.
	Affectation of riparian vegetation in the river bed area (construction of dams, dykes, embankment protection, counterchannels), including punctual modifications of the natural hydromorphology of the watercourse				Strictly on the project site, in areas where construction works are being carried out (e.g.: breakwaters, floodgates, etc.)		
	Changes in the sediment structure of the R. Olt in the areas with works				Locally, in areas where works are being carried out in the minor riverbed (e.g. in the area of the Racovița CHE tailrace)		
	Reducing the areas of species habitats by converting the river course into standing water and by occupying clay/prairie habitats and turning them into lakes				Locally, in the areas where the Lotrioara and Câineni dams and the extension of the Racovița dam will be built		

Stage	Impact	Type(s) of intervention generating the effect	Method of quantification	Quantifying the effects	Distance to the effects	ANPIC potentially affected	Other additional information
	Loss of Natura 2000 habitat and Potential spread of invasive/potentially invasive tree/shrub species	CHE Lotrioara Spillway dam: Excavation of walls upstream right and left bank and downstream left bank - Preparing wall foundations - Fillings - Concrete - Finishing: plastering, flooring - Metal confections	Extent of invasive species	Habitat 92A0 has been identified on the project site, and in the area where the works have already been carried out (e.g. *Salix caparea, Populus tremula, Betula pendula, Robinia pseudocacia, etc.* (species not characteristic for this type of habitat) have been observed in the vicinity of the channel, there is a possibility that once they have been cut (they are not part of the forest, but have spontaneously settled in the area of the works), their shoots/branches may reach the surface of the habitats.	Given the degree of enclosure of the stands/shrublands in the project area and the dispersal potential of these species, as well as the fact that the works are being carried out in a rather isolated and punctiform manner, non-characteristic/native species may extend up to 50 m into the habitat.	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	*Salix caparea, Populus tremula, Betula pendula* are known as "pioneer" species having a great adaptability for installation (even prefer) on anthropized lands, where works of any kind have been carried out. It is also known for its great ability to spread, as it has excellent seedling and suckering capacity.
Construction and Operation	Longitudinal stream fragmentation	Damming the Olt watercourse at Lotrioara and Câineni	Operation of CHE Lotrioara and CHE Câineni	Presence of fish species of Community interest, otter and beaver upstream and downstream of the dams CHE Lotrioara and CHE Câineni	Up to the CHE Lotrioara dam in the case of CHE Câineni and up to the CHE Racovița dam in the case of CHE Lotrioara	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	Affecting the migration of fish species of Community interest. Affecting the otter and beaver ecological corridor.
	Decrease in the natural flow (including changes in water composition and quality) of the Olt	Operation of the 3 hydropower plants (Racovita, Lotrioara and Câineni)	Calculations set by the authorities on the ecological flow assurance	Reducing the natural flow of the Olt in the section between Racovița dam and Câineni dam	Sector between Racovița dam and Câineni dam	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	-

Stage	Impact	Type(s) of intervention generating the effect	Method of quantification	Quantifying the effects	Distance to the effects	ANPIC potentially affected	Other additional information
	river between Racovița dam and Câineni dam						

b) emissions

The main sources of pollution in the project area are air emissions from:

- Excavation, excavation and landscaping activities.
- Moving activities in the site organization of the materials used.
- Transportation activities

Emissions from non-road mobile sources

Execution stage

In the execution phase, non-road mobile sources will be represented by the machinery and equipment involved in the construction works (bulldozer; excavator; crane; compactor; front-end loader). The emissions from the operation of these sources have been estimated using the calculation methodology *EMEP/EEA - 1.A.4 Non road mobile machinery, Tier1*, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

Operating stage

At this stage, the non-road mobile sources will be electric generators. It should be noted that these sources will operate occasionally, only in the event of power grid failures. The pollutant emissions from these sources have been estimated using the calculation methodology EMEP/EEA - 1.A.4 Non road mobile machinery, TIER1, which takes into account the type and consumption of fuel used and the corresponding emission factors for the characteristic pollutants.

The results of the emission calculations are shown in the following table.

Table 102 Emissions from non-road mobile sources in the implementation phase

Source name	**Pollutant**	**Mass flow**			**Emission concentration (mg/m^3)***
		kg/h	**g/h**	**g/s**	
Mobile crane	Particulates	0,015	14,09	0,004	132,19
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5
Excavator/ Front loader	Particulates	0,02	24,51	0,01	132,5
	SO_2	0,003	2,91	0,001	15,7
	NO_x	0,38	380,06	0,11	2054,4
	CO	0,13	125,50	0,03	678,4
Bulldozer	Particulates	0,02	21,01	0,01	133,0
	SO_2	0,002	2,50	0,001	15,8
	NO_x	0,33	325,77	0,09	2061,8
	CO	0,11	107,57	0,03	680,8
Compactor	Particulates	0,01	14,00	0,004	132,1
	SO_2	0,002	1,66	0,0005	15,7
	NO_x	0,22	217,18	0,06	2048,9
	CO	0,07	71,71	0,02	676,5

* Due to the estimated mass flow rates for the calculated pollutants being below the limit value of Order no. 462/1993 - Annex 1, the maximum permissible values of pollutant concentrations of the above mentioned Order do not apply to the analyzed sources.

Emissions from unabated stationary sources

Execution stage

The uncontrolled stationary sources of air pollution during the execution period of the works proposed for the realization of the objective are represented by the earth moving activities (stripping, digging, filling, levelling, loading - unloading, transport) for the site development. These operations will mainly be sources of dust emissions into the atmosphere.

An additional source of dust is wind erosion, which accompanies construction works. This phenomenon occurs when, for a certain period of time, uncovered areas of land are exposed to wind action. Wind erosion can, however, be controlled by appropriate measures to reduce the spatial and temporal extent of unvegetated land areas.

Dust generated by material handling and wind erosion is mainly of natural origin (soil particles, mineral dust).

The cutting and welding operations of the metal elements that will make up the constructions will generate emissions of: fine particles containing mainly metal oxides (iron oxide, manganese oxide, nickel oxide, etc.), carbon monoxide resulting from the decomposition of atmospheric carbon dioxide in the electric arc zone, nitrogen dioxide resulting from the oxidation of atmospheric nitrogen due to the high temperature in the electric arc zone, ozone. These sources, however, will not generate significant amounts of pollutants in the atmosphere and have not been included in the calculation of atmospheric emissions.

Emission concentrations cannot be associated with the sources characteristic of the activities during the execution phase of the works, as they are free, open, undirected sources. For the same reason, they cannot be evaluated in relation to the provisions of Order 462/1993 and other emission regulations.

Operating stage

There will be no uncontrolled stationary emission sources during operation

Emissions from mobile sources

Execution stage

During the execution of the works, the mobile sources will be the heavy goods vehicles for the transportation of construction materials and the vehicles of the employees involved in the construction works. All these sources will not operate simultaneously on the site, and their actual operating time will be short, sufficient for moving around the site and parking them in specially designated areas.

The estimation of pollutant emissions from mobile sources was carried out using the EMEP/EEA calculation methodology - 1.A.3.b.b.i-iv Road transport 2016, Tier 1, which takes into account the type of vehicle, fuel type, fuel consumption used and emission factors for the characteristic pollutants.

Operating stage

During the operation phase of the objective, the mobile sources will be the employees' vehicles, i.e. 10 vehicles per day (estimated).

We specify that the sources of emissions from employee vehicles will not operate simultaneously on the site, with the busiest period of a day being at the start of the shift. In addition, the duration of a vehicle's operation on the site will be as short as necessary for the time needed to drive to the parking place and to perform parking maneuvers.

Table 103 Mobile source emissions

Types of mobile sources	Fuel type	Pollutants	Emissions (g/h)	Run-time emissions (g/h)	Emissions during operation (g/h)
Employee vehicles	Diesel	CO	8,45	66,55	679,19
		NO_x	33,36	259,14	2641,58
		Particulates	2,94	22,08	225,09
		SO_2	0,07	0,39	3,34
Employee vehicles	Petrol	CO	211,36	420,96	4293,78
		NO_x	22,19	43,98	443,66
		Particulates	0,08	0,17	1,68
		SO_2	0,29	0,53	4,19

Order No 462/1993 does not set limits for mobile sources. The Ordinance indicates that pollutant emissions from road motor vehicles are limited as a preventive measure by the technical conditions laid down in the technical inspections carried out periodically throughout the period of use of road motor vehicles registered in the country.

Preventive limitation of emissions from motor vehicles is achieved through the technical conditions imposed at type-approval for registration for entry into service and throughout their service life through mandatory periodic roadworthiness tests.

c) Greenhouse gases

Greenhouse gas emissions from Romania's energy sector are on a downward trend, as the share of fossil-fuel electricity decreases and the share of renewables increases. Hydropower is a low-carbon renewable energy source and a reliable and cost-effective alternative to fossil-fuel power generation.

Using hydropower instead of fossil fuels to generate electricity has helped to avoid more than 100 billion tons of carbon dioxide in the last 50 years alone. All energy sources, even renewable ones, produce carbon emissions during their life cycle due to emissions caused by their manufacture, construction or operation. Hydropower assets have a very long lifetime, which means that construction emissions can be amortized over a much longer time compared to technologies with shorter lifetimes. Secondary effects related to GHG emissions occur during construction, installation and commissioning or decommissioning and termination of the project.

The effects are identified by considering whether the project activity will require any practices, processes, consumption or production of energy or materials during its establishment and cessation that will result in a change in GHG emissions unrelated to the primary effect.

For some types of projects, large impacts may occur during construction through transportation of equipment. During the decommissioning phase, effects to be considered may be associated with off-site waste disposal and dismantling of equipment.

Effects can also occur for some land use projects. For example, reforestation and afforestation projects often require clearing vegetation to prepare land for planting. This results in GHG emissions from the machinery used to clear the land, as well as through the release of carbon stored in the cleared vegetation and soil.

Reducing GHG emissions or increasing GHG sequestration is key to climate change mitigation. According to the "Communication from the Commission - Technical Guidelines on Climate Mainstreaming in Infrastructure for the period 2021-2027", climate neutrality aims at the following steps:

Project analysis

- ✓ Describing GHG emissions and comparing them with thresholds for absolute and relative emissions;
- ✓ Description of the project's consistency with relevant EU and national energy and climate plans, the EU's objective to reduce emissions by 2030 and achieve climate neutrality by 2050;
- ✓ Provide other relevant information e.g. on the baseline carbon footprint scenario as follows:

Table 104 Thresholds for EIB carbon footprint methodology

Absolute emissions greater than 20000 tons CO_{2e}/year (positive or negative)
Relative emissions greater than 20000 tons CO_{2e}/year (positive or negative)

The greenhouse gases included in the EIB Carbon Footprint Methodology include the seven gases listed in the Kyoto Protocol to the United Nations Framework Convention on Climate Change, namely: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulphur hexafluoride (SF_6); and nitrogen trifluoride (NF_3). The process of quantifying greenhouse gas emissions converts all emissions to tons of carbon dioxide called CO_{2e} (equivalent) using the global warming potential (GWP).

Infrastructure projects with absolute and/or relative emissions above 20,000 tons CO_{2e}/year (positive or negative) must be subject to both screening and detailed analysis of the climate change immunization process for climate change mitigation.If, for the Cornetu Avrig AHE project, the notional carbon cost exceeds the threshold level of emissions above 20,000 tons CO_2/year, GHG emissions will be monetized.

d) Waste

The waste quantities were estimated on the basis of the information and quantities of materials used provided by the beneficiary:

Table 105 Estimation of waste quantities

Nr. crt	Type of waste	Estimated quantity	Management mode
1.	***sterile*** (code 17.05.04)	18.788 mc	Depending on the area in the development where the excavated material will be excavated, it will be transported and deposited on one of the four existing stockpiles in the area of the fall steps.
2.	***waste concrete*** (code 17.01.01)	3.432 mc	Being inert wastes, we consider that they could be deposited at the same landfills; obviously, an eventual crushing of these wastes would be a positive factor in their integration into the landfills. An alternative solution would be the transportation of this waste to an ecological landfill that will be operational in the area at the time of the works. Clearly, this solution will involve additional costs, which would be borne by the owner of the investment; it is also necessary to obtain the prior agreement of the operator of the landfill to accept this asphalt waste. It should also be mentioned the possibility of identifying at that time local authorities/economic operators interested in using (e.g. road works/regularization etc.) such concrete waste.
3.	***waste material - non-hazardous*** (code (assimilation): code 17.01.01)	22.4 mc	As it is mainly mortar, it will be deposited on the tailings piles.
4.	***waste material - hazardous*** (code (assimilation): code 17.06.05*)	31 440 kg	This waste consists of asbestos-cement sheets from buildings (1048 pieces, 2m long and 1m wide). This category of waste will only be removed from the site by companies authorized to do so.
5.	***Wood waste*** (code (assimilation): 03.03.01)	997 mc	The wood material resulting from the removal of woody vegetation (trees, shrubs, branches) will be returned to the City Hall (if it will express its interest) as representative of the Romanian State. The remaining waste (twigs, leaves, grasses, weeds) will be transported and deposited at the landfill; over

Nr. crt	Type of waste	Estimated quantity	Management mode
			time, the presence of these vegetation residues will favor the renaturation process of the landfill.
6.	***Iron and steel scrap*** (code 17.04.05)	59.358 kg	This category of waste, resulting from the rebar cutting operations, will be temporarily stored in a special container which the contractor will dispose of from the site in accordance with its own waste management procedures.
7.	***packaging waste paints, varnishes, primers*** (code 15.01.10*)	150 kg	They will be stored in special containers and recovered by specialized companies.
8.	***household waste*** (code 20.03.01)	5 kg/day	They will be sorted in special containers and recovered by specialized companies.

The estimation of the quantities of waste generated was done by summing up all types of waste resulting from the construction activity (including demolition phase) for each category.

Waste management

The waste resulting from the realization phase of the proposed project will be managed by the contractor executing the works on the basis of a comprehensive Waste Management Plan in accordance with the provisions of GEO no. 92/2021 on the waste regime which will contain the following elements:

- an inventory of the types and quantities of waste generated, including information on their hazardousness;
- assessing opportunities to reduce the generation of solid waste, in particular hazardous or toxic waste types (where appropriate);
- determining how and who is responsible for implementing waste management measures.

Mainly, the selective collection of recyclable waste and the regular delivery of recoverable waste to authorized companies will be ensured. If waste avoidance is not always possible, then the amount of waste generated will be minimized through reuse, recycling and energy recovery. The disposal step (e.g. by burning) of waste shall only be applied after all other means have been used in a responsible manner so as not to cause negative environmental impacts.

e) Noise and vibration

During the construction works, noise sources will be temporary in nature, generating local effects for a limited time. The physical pollution associated with the project at this stage is caused by noise and vibration generated by construction activities (vehicle and machinery engines, material handling, operation of earthmoving equipment used for site development, etc.).

The noise level regulated by STAS 10009/2017, "Urban acoustics, permissible noise level limits" is 65 dB(A) at the site boundary. According to the Order of the Ministry of Health No.

119/2014 for the approval of the Hygiene and Public Health Norms on the living environment of the population, the continuous equivalent weighted sound pressure level (AeqT), measured outside the dwelling according to the SR ISO 1996/2-08 standard, at 1.5 m height from the ground, shall not exceed 55 dB and the noise curve Cz 50. During the night (23:00 - 7:00), the continuous equivalent weighted sound pressure level shall not exceed 45 dB and the noise curve Cz 40.

In order to assess the level of impact generated by the proposed project, a noise source modeling was performed using the Sound Plan Essential 2.0 software application. A scenario considered as very likely, i.e. one in which several noise sources operate simultaneously during the execution of the works, was taken into account, considering the following noise levels:

- 1 bulldozer 110 dB(A);
- 1 truck 105 dB(A);
- 1 compactor 100 dB(A);
- 1 crane 104 dB(A);

The sources of noise will be of temporary character, being represented by:

- ✓ building operations loading/unloading/loading materials and equipment;
- ✓ operation of equipment and vehicles involved in construction/erection works;
- ✓ vehicular traffic necessary for carrying out the works.

Normally construction work will take place during the day between 08:00 - 18:00. There are, however, operations that need to be carried out continuously, such as pouring concrete for foundations, which may also require night work.

The results of the modeling carried out with the SoundPLAN software show that, during the construction phase, the noise level generated by the project will not have a significant impact on the quality of living in the neighboring villages at the level of the nearest receptors, the operation of the equipment used in the modeling generating a maximum noise level of about 39 dB. The noise generated by the construction activities is not able to change the current noise level induced mainly by the motor traffic in the area.

At the level of protected areas, the noise generated by construction activities may lead to an increase in the equivalent noise level of up to 100 dB(A) over a distance of maximum 50 m, which could lead to a disturbance of species (especially birds) during the works, but given the site area in a forested area this increase will be significantly reduced in the immediate vicinity of the project.

At the same time, taking into account the location of the works in relation to inhabited areas, the noise value is within the limits set by Order No. 119/2014.

Taking into account that the works carried out in the analyzed project will have a low contribution to the noise level generated in inhabited areas, we consider that no special measures are necessary to reduce the noise level in relation to the settlements.

5.3. Cumulative impact

The following table provides a **tabular presentation of the characteristics of other plans/projects (under implementation, approval or under assessment) that may have cumulative impact with the assessed project on Natura 2000 sites in the project's area of**

influence, according to the structure in Annex no. 5A of the Annex to the Order MMAP no. 1.682/2023 for the approval of the Methodological Guide on the appropriate assessment of the potential effects of plans or projects on protected areas of community interest.

Table 106 - Characteristics of other PPs (under implementation, approved or under evaluation) that may have a cumulative impact on ANPIC with the evaluated PP

No. crt.	Name PP	Location in relation to ANPIC	Effects generated	Impacts
1.	*Design and execution of Sibiu - Pitesti Highway, Section 2: Boita Cornetu, km 14+150- km 44+500*, owner National Road Infrastructure Management Company S.A.	Partially within the perimeter of Natura 2000 sites ROSAC0122 Făgăraș Mountains, ROSAC0085 Frumoasa, ROSPA0043 Frumoasa, including crossings of the Olt watercourse within the perimeter of Natura 2000 site ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu.	Increased noise levels which may induce increased disturbance to species of Community interest (primarily large carnivores, their prey species, bird species of Community interest).	Potential slight spatial retreat of some species of community interest (primarily large carnivores, their prey species, etc.) due to the fact that the pressure will occur in heavily anthropized areas.

Information on protected areas of Community interest likely to be affected by the development of the project

Data on protected areas of Community interest

The following table shows the relationship of the project sites in relation to the ecological network of Natura 2000 protected areas.

Table 107 Relationship of project sites to the ecological network of Natura 2000 protected areas

home hydropower	Natura 2000 site in the area of influence	Natura 2000 site area	Natura 2000 site area crossed by the project (ha)	Intersection share of total Natura 2000 site area (%)
CHE Racovita	ROSAC0132	2.910,5	22,90	0,79
	ROSAC0304	22.840,8	0,29	0,001
	ROSPA0003	2.943,7	26,93	0,91
	ROSPA0098	71.201,70	0,09	0,0001
CHE Lotrioara	ROSAC0132	2.910,5	88,25	3,03
	ROSAC0122	198.620,5	15,43	0,008
	ROSAC0085	137.256,1	4,07	0,003
	ROSAC0304	22.840,8	0,02	0,00009
	ROSPA0043	130.890,8	4,07	0,003
CHE Câineni	ROSAC0132	2.910,5	19,62	0,67

5.4. Transboundary Nature of the Impact

The distance from the project site (i.e., CHE Câineni) to the Bulgarian border exceeds 200 km. Additionally, between CHE Câineni and the confluence of the Olt River with the Danube, there are more than 20 large dams (Robești, Cornetu, Călimănești, Drăgănești, etc.).

The regulation of the Olt River's flow upstream of its confluence with the Danube is managed by the Izbiceni Dam, which is located more than 190 km downstream of CHE Câineni. At the groundwater level, the project site overlaps with ROOT07 – Făgăraș Depression, which is situated more than 200 km from the Olt-Danube confluence.

From a climatic perspective, the project is implemented at a local scale, exerting a limited impact without influencing climatic elements at a national or transboundary level.

From a landscape perspective, considering the significant distance from the Bulgarian border (approximately 200 km), no transboundary impact is anticipated, particularly as the project is situated within the Carpathian Arc. Consequently, in relation to the existing landscape, the project's implementation will not generate any transboundary visual discomfort.

In conclusion, it can be concluded that the project will not generate any impact in a transboundary context.

5.5. Impact matrix of the proposed project

The assessment of impacts on environmental factors (air, soil/soil, population, noise and vibration, landscape and cultural heritage) was based on an assessment matrix, with scores given according to the type of impact: significant negative impact, insignificant negative impact, no impact.

For the most sensitive environmental factors in the project area, i.e. water and biodiversity, the impact analysis (including medium and long term, direct and indirect) was carried out in detail for each water body or for each species/habitat of conservation interest in the protected areas (results are detailed in the previous tables).

It should be noted that the sensitivity of the project area is given by the area of its implementation in relation to protected areas and water bodies, which is why the assessment of the impact on these elements was carried out in detail, based on reliable information from the project area and taking into account the most sensitive elements of interest (e.g. species of Community interest with reduced mobility, the area of priority habitats).

In determining the significance of the impact, the nature of the impact (direct, indirect, secondary, secondary, cumulative, short-, medium- or long-term, permanent and temporary, positive and negative) including the reversibility of the impact and the likelihood of the impact occurring, was taken into account.

These impact categories have also been associated with colors, as follows:

Table 108 Impact significance

Color code	The significance of the impact
	Significant negative impact
	Negligible negative impact

	No impact

6. DESCRIPTION OF THE FORECASTING METHODS USED TO IDENTIFY AND ASSESS SIGNIFICANT ENVIRONMENTAL EFFECTS, INCLUDING DETAILS OF THE DIFFICULTIES ENCOUNTERED

Types of pollution likely to occur at the proposed project site and in the surrounding area:

- Pollution that is specific to construction works and consists of dust pollution, chemical emissions, noise and vibrations generated by construction machinery and means of transportation;
- Accidental pollution, especially accidental spills of petroleum products due to breakdowns of machinery and means of transport, emergency fuel supply from unsuitable containers without taking safety measures, etc.

Main pollutants generated by the proposed project during construction:

- ✓ Dust, generated on the construction site (excavation operations, loading - unloading, handling and transportation of excavated earth and bulk building materials) and on the access road during transportation (dust resulting from the movement of means of transport on the temporary earth road).
- ✓ Chemical fumes, generated by the combustion of fuels in the engines of machinery and means of transport on the access road;
- ✓ Noise, generated by machinery and transportation;
- ✓ Vibration, caused by machinery and transportation;
- ✓ Improperly managed waste

The proposed project does not envision the utilization of any radiation sources, therefore, the natural background radiation will not be altered in any way in the area.

The implementation of the proposed project does not involve the use of chemicals hazardous to flora, fauna or public health.

The methodology considered for analyzing the project proposes a differentiation between the concept of '*effect*' and '*impact*'.

The effects refer to changes caused to the bio-physical environment as a direct consequence of the causes (interventions) generated by the project (both during the execution and the operation phase).

Impacts include changes at the level of sensitive receptors such as Natura 2000 components (Natura 2000 habitats, Natura 2000 populations, Natura 2000 species habitats). The identification of impacts involved the following steps:

- Analysis of proposed project interventions;
- Identify activities resulting from the execution and operation of project components;
- Identify the changes (effects) that occur in the physical environment as a result of the realization and operation of project components.

Of interest for evaluation are mainly those effects that can be quantified and that lead with certainty to some form of impact. The magnitude of impact is a combination of all elements characterizing an impact (nature, type, reversibility, extent, duration, intensity) based on the experience of the assessor. The criteria for determining impact magnitude differ for physical, biological and social environmental factors.

Table 109 Determination of impact significance according to magnitude and receiver sensitivity

	Small magnitude	Average magnitude	High Magnitude
Low value/sensitivity	Minor	Minor	Moderated
Average value/sensitivity	Minor	Moderated	Major
High value/sensitivity	Moderated	Moderated	Major
The significance of the impact			
No or negligible impact	The impact generates no quantifiable (visible or measurable) effects on the natural state of the environment.		
Minor significance	The impact is of low magnitude, within standards and/or associated with receptors of low or medium value/sensitivity. Medium magnitude impact affecting low value receptors		
Moderate significance	Impact within limits, with low magnitude affecting high value receptors, or medium magnitude affecting medium value receptors, or high magnitude affecting medium value receptors		
Major significance	Impact that exceeds limits and standards and has a high magnitude affecting medium value receptors or medium magnitude affecting high value receptors.		

The estimation of emissions was carried out according to the provisions of *Order no. 3299/2012 for the approval of the methodology for conducting and reporting inventories of air pollutant emissions* - mobile sources represented by the operation of mobile motorized machinery and equipment and mobile sources represented by vehicle traffic in the project site, taking into account the need for equipment, machinery and heavy vehicles used in the pre-construction phase and the duration of the project.

The methodology applied in the noise assessment includes the establishment of the noise level, assessed according to the noise generating sources based on the available information on the machinery and equipment used in the realization of the project and taking into account the provisions of Government Decision no. 1756/2006 on limiting the level of noise emissions into the environment produced by equipment intended for use outside buildings.

An element of difficulty in preparing this study was the assessment of the cumulative impact of the proposed project with other projects. While both existing activities on neighboring sites have been taken into account, it is possible that new projects may arise during the construction of the proposed project that are not known at this time.

7. A DESCRIPTION OF THE MEASURES ENVISAGED TO AVOID, PREVENT, REDUCE OR, WHERE POSSIBLE, OFFSET ANY SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS IDENTIFIED AND A DESCRIPTION OF ANY PROPOSED FOLLOW-UP MEASURES

A. ***Proposed measures***

Although the impact on the environmental factors has been assessed as negative-significant and manifested only during the construction period (for air, soil, noise, population and cultural heritage), a series of organizational measures are required to be adopted throughout the construction period.

a) Environmental factor measures Water (SEICA takeover)

Following the assessment of the impacts on water bodies, a series of mitigation measures (including cumulative impacts) were proposed in the study to minimize the impacts on those quality elements for which cause-effect mechanisms were identified.

In view of Annex 3 of Order No. 828/2019, the following proposed measures are for the mitigation/reduction of the impacts, including the cumulative impacts generated by the works of A.H.E. Cornetu Avrig.

Moreover, according to the 2021-2027 HWMP, the measures for ensuring ecological flow/ easement and improving longitudinal connectivity are basic, mandatory measures that apply to all water bodies.

b) Measures for the environmental factor air

Even if the impact of the implementation of the project on the environmental factor air has been assessed as insignificant, some organizational measures are required. The proposed measures to control particulate emissions resulting from the entrainment of particulate matter by transport vehicles are operational measures specific to this type of source, as follows:

- ✓ Limiting particulate emissions from earth-moving activities will be achieved by:
  - surface wetting activities;
  - covering of carrier vehicles loaded with pulverized materials;
  - limiting the traveling speed of heavy vehicles for transportation of materials.
- ✓ use of equipment and machinery technically compliant with the best available technology;
- ✓ during periods with no precipitation, wetting of access roads and areas with active works will be ensured in order to reduce particulate emissions and bring concentrations (PM_{10}/ $PM_{2.5}$) within the limit values set by the legislation in force;
- ✓ the transportation of earth, waste and any dust-generating materials will be carried out throughout the project exclusively by tarpaulin-covered trucks (tarpaulins for bene) in order to reduce particulate emissions;
- ✓ cleaning vehicle wheels before leaving the site on public roads;
- ✓ regular technical inspections of the vehicles and equipment used to carry out the works;
- ✓ avoid carrying out work involving the handling of large quantities of soil (stripping/filling) during periods of high winds;
- ✓ ensuring proper management of materials used during construction;
- ✓ stopping the engines of machines during periods when they are not engaged in work;
- ✓ proper disposal of the resulting waste;

- ✓ stabilization of areas where construction materials have been obtained, i.e. areas where excavation works have been carried out and where surplus excavated material has been stockpiled;
- ✓ landscaping of all areas affected by the works.

No specific measures to reduce the impact on the environmental factor air are required during the operational period.

c) Measures for the soil/soil environmental factor

- ❖ in the organization of the construction site, solutions that ensure that surfaces are kept to a minimum will be used as a priority;
- ❖ soil pollution with oils and petroleum products will be avoided by ensuring the proper functioning of machinery and carrying out maintenance operations in specially designated areas;
- ❖ avoid the direct placement of construction materials and construction waste on the ground;
- ❖ temporary on-site storage of the waste resulting from the works, as well as household waste, until it is collected by specialized companies for final disposal or recovery, will be carried out in appropriate containers in specially designated areas;
- ❖ installing local control measures such as sediment fences or settling tanks;
- ❖ collecting and discharging stormwater to avoid mixing with sediment-containing waters;
- ❖ the use of technically appropriate vehicles for the execution of the works, as well as for the transportation of materials and for the collection and transportation of waste resulting from the construction works;
- ❖ maintenance, refuelling or cleaning of vehicles and equipment shall be carried out in specially designated areas away from sensitive areas or within the site organization;
- ❖ Strict compliance with waste management, fuel distribution and supply, sewage disposal and emptying of the ecological toilets;
- ❖ in case of soil contamination, the affected portion will be removed and treated / disposed of according to the type of contamination; the site organization will be properly equipped with specific absorbent materials for each type of material / substance that may cause pollution as a result of improper management;
- ❖ the final layout of the platforms shall take into account the natural slope of the land so as to allow rainwater run-off;
- ❖ it is strictly forbidden to plant/planting with allochthonous, invasive, ruderal, nitrophilous or non-native species;

No specific measures to reduce the impact on the soil/soil environmental factor are required during the operational period.

d) Measures to limit noise/vibration

During the implementation period, the following operational measures are recommended:

- ✓ the use of modern working equipment/tools that generate as little noise as possible;
- ✓ the noise-absorbing system fitted to machinery must be regularly maintained;
- ✓ work will only be carried out during the day (7.00 - 20.00);

- ✓ Reducing the speed of heavy vehicles in the area of site organization (according to the literature, low speed can reduce noise levels by up to 5 db);
- ✓ in order to limit vibrations caused by heavy traffic, it is recommended that the speed does not exceed 20 km/h when passing through the locality;
- ✓ periodically checking and repairing machinery to comply with permissible noise levels;
- ✓ construction materials will be stored, where necessary and possible, within the site organization in such a way as to create a sound barrier towards the dwellings;
- ✓ the site will be fenced and no work will be carried out during rest hours;
- ✓ for the transportation of construction materials, residential areas should be avoided as much as possible, and where through settlements, the speed will be limited to a maximum of 40 km/h.

During operation no specific measures to reduce the impact on the environmental factor noise/vibration are required.

e) Measures for the environmental factor biodiversity (taking over the Appropriate Assessment Study)

"*The project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu-Avrig hydropower project - continuation of the works to be executed at the Cornetu-Avrig AHE*" - continuation of the works to be executed at the Cornetu-Avrig AHE will be implemented almost entirely within the perimeter of the Natura 2000 ecological network.

In order to correctly base the measures to prevent, avoid and reduce the impact of the project on the elements of conservation interest in the protected natural area, specific studies were carried out on each group of species/habitat, the results of which are presented in the previous chapters, with emphasis on the assessment of the impact of the project on each species/habitat of conservation interest.

The present study paid particular attention to the connectivity of the aquatic habitat present on the surface of the protected natural area ROSAC0123 Oltul Mijlociu-Cibin-Hârtibaciu, in order to maintain its connectivity.

The residual impact after project implementation has been estimated to be insignificant, provided that the prevention, avoidance and mitigation measures proposed in this environmental study are respected. At the same time, both during the construction period and later during the operation phase, monitoring of biodiversity elements is necessary in order to accurately calculate the generated impacts and possibly recalibrate the mitigation measures.

Table 110 Centralizing prevention/avoidance/reduction measures for biodiversity

MEASURE CODE	MEASURE NAME
M1	In order to avoid the risk of introduction or spread of non-native, non-characteristic of habitat types, ruderal or nitrophilous species (e.g. *Robinia pseudacacia, Salix capraea, Betula pendula, Populus tremula*) into the area of habitat 92A0, specimens of these species will be removed during construction works

MEASURE CODE	MEASURE NAME
M2	Throughout the construction period, non-native, non-habitat type, ruderal or nitrophilous tree and shrub species identified on the project site will be carefully monitored to prevent their spread. If necessary, their removal will be accomplished, including removal of shoots/roots from their roots.
M3	The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. If it is necessary to occupy additional areas, these will be subject to regulatory and approval procedures
M4	Prior to the start of construction works, all areas within the project site will be inspected (with emphasis on the CHE Lotrioara area) in order to identify specimens of *Bombina variegata* or *Emy orbicularis* and in case individuals of these species are observed, all necessary measures will be taken to relocate them to other favorable habitats.
M5	Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara
M6	Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni
M7	With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend the fish ladder at the outlet of the Șebeș stream into the Olt River
M8	Connectivity will be ensured between the Olt River and the Rîndibou Valley
M9	Raising of the crest elevation at the spillway related to the development of the Sebeș stream outlet and reprofiling of the bed
M10	Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig
M11	Water diversion works (including those for the lowering of the slope in the area of section 2 of the Racovița CHE tailrace canal) will be carried out outside the fish species prohibition period and only during low-flow periods, preferably in August-October
M12	When working on the watercourse, involving various substances/materials (e.g. concrete, oils, paints, primers), special attention will be paid to their handling in order to minimize the risk of accidental pollution.
M13	Washing of machinery in riverbeds is prohibited, subject to other measures related to the water bodies indicated in the SEICA. For work in the riverbed, only checked machinery that does not leak oil/fuel will be used.
M14	An accidental pollution prevention and response plan will be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or on land.
M15	Quiet machinery and means of transport will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. At the same time, machinery will be checked periodically to avoid oil and fuel spills on the surface of habitats or near watercourses.

MEASURE CODE	MEASURE NAME
M16	Proper waste management shall be practiced; selective collection, recovery and regular disposal of waste shall be carried out in order to avoid attracting animals, making them ill or causing them to injure themselves.
M17	Particular attention will be paid to sediment management so that sediment is returned to the river bed as efficiently as possible
M18	Upon completion of the project works on both banks of the reservoirs related to CHE Lotrioara and CHE Câineni (where the terrain allows) will be planted and maintained white poplar *(Populus alba), black poplar (Populus nigra), anin (Alnus sp.) and willow (Salix sp.)* so as to restore the affected riparian vegetation (they will be planted in rows, parallel to the direction of flow of the Olt River, so that they have the appearance of forest cords).
M19	Once the works are completed and the 3 dams are filled to the projected levels (Racovița, Lotrioara and Câineni), the water level will be maintained as constant as possible in order to favor the establishment (in the shoreline/coastal areas) of reed and papyrus vegetation
M20	Project work will be carried out exclusively during the day, between 07:00-20:00
M21	In all the sites in the area of the dams / spillways of CHE Câineni and CHE Lotrioara where works will be carried out, mobile sound absorbing panels will be used to fence off the areas
M22	There shall be no harvesting, capture, killing, destruction or harming of specimens of wild flora and fauna species protected at national and/or international level, in their natural environment, at any stage of their life cycle and that could accidentally end up in the area of the work perimeter; in this regard, the training program for the personnel involved must also include specific information on protection and management of situations in which employees interact with fauna and flora species within protected areas.
M23	All elements of biodiversity (amphibian, reptile, mammal, bird and fish species) in the project area will be monitored throughout the construction period and for a minimum of 3 years (except for ichthyofauna, which is recommended to be a minimum of 5 years) during the operational period. In order to be able to compare presence/absence data we recommend that monitoring should be carried out at the same locations as presented in the Appropriate Assessment Study.
M24	Monitoring fish ladders/passages

f) Landscape measures

Given that the visual and aesthetic value of the landscape is given by the combination of structuring factors, namely topography, climate, hydrography, vegetation, fauna and anthropogenic factors, all measures to reduce the impact on the landscape overlap with the measures proposed for the other environmental factors mentioned above.

The measures proposed to prevent, minimize any significant adverse environmental effects during both construction and operation are:

- all necessary measures will be taken to avoid the pollution of environmental factors or affecting the health or comfort of the population as a result of activities generating dust and/or noise, and it is mandatory to comply with the norms, standards and legislation on environmental protection;
- waste from the works will not be set on fire and will be collected by an accredited operator or deposited on the temporary storage platform for disposal or recovery;
- the occupation of areas other than those already affected by the implementation of the project is strictly prohibited;
- reduced vehicle speed to avoid large amounts of dust;
- cleaning the premises where the activities take place;
- emptying waste containers frequently to avoid overfilling;
- during the operation period of the hydropower plant, it is recommended to maintain the constructed elements of the hydropower plant and the maintenance works will be carried out using the latest and most efficient equipment that does not leak oil/fuel and with lower emission of noxious emissions and fuel consumption.

g) Measures for the population and material goods

Measures to reduce or prevent impacts on the human component during the realization and operation of the project are:

- Marking and fencing off areas where work is to be carried out to prevent access and mitigate direct risks to public safety;
- Cleaning the site of waste before and after construction works;
- Daytime activities only (including transportation of materials to and from the site);
- Regularly check the operating condition of machinery in order to avoid possible malfunctions and accidents that may endanger the site personnel;
- Data will be requested from the competent authorities regarding the forecast and the level of flows in the watercourses in order to avoid possible damage downstream of the site that may reach the localities;
- Access with machinery on the site will be made only on the roads already prepared;
- The use of modern machinery with sound-screened engines;
- Limitation of the speed and frequency of timber transportation vehicles in localities;
- It is recommended that local manpower (preferably from the site's local construction units) be used to carry out the works and to operationalize them;

The archaeological analysis shows that in the project implementation area, namely in the area of the Lotrioara reservoir, there is an archaeological site, namely the Medieval Tower, RAN code 145845.02, LMI code SB-I-s-A-11947, which could be affected by the implementation of the works.

The impact generated during the works on the elements of the archaeological heritage will be ***insignificant negative for the archaeological objectives outside the project site (with the exception of the Medieval Tower)*** and due in particular to the sensitivity of the monument buildings to vibrations generated by the traffic of machinery and trucks during the works. It is

worth mentioning that the impact will be limited, reversible, reduced in intensity and limited in time only during the realization of the works, during the operation phase there will be no impact on archaeological elements.

Table 111 *Archaeological sites discussed in the study on the* hydropower development of the Olt river gorge on the Cornetu - Avrig sector and the distance to the project objectives

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Distance to CHE Câineni (km)	Distance to CHE Lotrioara (km)	Distance to CHE Racovița (km)
BRADU						
1.	**Bradu, Roman settlement , RAN code 144072.07.**	Between Bradu and Săcădate, on the right bank of the Olt. The point cannot be precisely localized.	The point cannot be precisely localized.	21,6	11,1	2,1
2.	**Bradu-Atzenau, RAN code 144072.06.**	Towards the Dolman forest, between Bradu and Săcădate. The point cannot be precisely localized.	The point cannot be precisely localized.	21,6	11,1	2,1
3.	**Bradu - Poiana cu șopruri, RAN code 144072.01, LMI code SB-I-s-A-11948.**	On the Coșoltului slope, between Bradului and Dracului Hills. The point cannot be precisely localized.	The point cannot be precisely localized.	21,6	11,1	2,1
4.	**Bradu - settlement Noa, RAN code 144072.05, LMI code SB-I-s-A-11948.**	On the east side of the village of Bradu, towards Avrig, to the right of the national highway Sibiu-Făgăraș. The point cannot be precisely localized.	The point cannot be precisely localized.	21,6	11,1	2,1
5.	**Bradu, Bronze Age settlement, RAN code 144072.02**	In the country, on an old Olt terrace. The point cannot be precisely localized.	The point cannot be precisely localized.	21,6	11,1	2,1
6.	**Isolated discovery. Stone axe.**	NE of the village of Bradu, on the Buhoi river valley, 30-40 m from its	The point cannot be precisely localized.	23,9	13	3,8

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Distance to CHE Câineni (km)	Distance to CHE Lotrioara (km)	Distance to CHE Racovița (km)
		confluence with the Bradului valley.				
RACOVIȚA						
1.	**Racovița - Bâlea area, RAN code 145364.01.**	In the central area of the Făgăraș Mountains. The point cannot be precisely localized.	The point cannot be precisely localized. The archaeological objective will not be affected by the project.	17,4	8	2,3
2.	**Isolated discovery. Racovița - Cărțăoaia's Garden, RAN code 145364.02.**	At the place called Cărțăoaia's Garden, located on one of the upper terraces of the Olt, at confluence of the Valea Lupului and the Church Creek.	The point cannot be precisely localized. The archaeological target will not be affected by the project.	17,1	8,5	3,2
TURNU RED						
1.	**A Eneolithic stone from Turnu Roşu. RAN Code 145943.01.**	To the left of Olt, at the southern edge of the village, towards Boița.	The point cannot be precisely localized. The archaeological objective will not be affected by the project.	12,5	2,8	2
THE CÂINENII MARI						
1.	**Archaeological site of Câinenii Mari - Arxavia. RAN Code 169137.01. LMI Code VL-I-s-B-09522.**	On the right bank of the Olt, north-west of the bridge over the Olt connecting Câinenii Mari and Câinenii Mici, on either side of the DN7 road and the railroad between Câineni and Radu Vadului, in the outskirts of Câinenii Mari, to the east.	The point is precisely localized. The archaeological objective will not be affected by the project.	0,6	6,4	17,9
2.	**Fragments of the Austrian Via Carolina, RAN code 169137.03. LMI code VL-II-m-B-B-09707.**	400 m N, on D.N.7.	The point is precisely localized. The archaeological objective will not be affected by the project.	0,5	6,3	17,8

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Distance to CHE Câineni (km)	Distance to CHE Lotrioara (km)	Distance to CHE Racovița (km)
CÂINENII MICI						
1.	**Roman Tower of Câinenii Mici - Pons Vetus / La Turnulețe, RAN code 169128.03.**	In the village of Câinenii Mici, in the northeastern part, about 300 meters northeast of the left bank of Olt, about 0.33 km north of DN7D, at the foot of Mount Pleașa.	The point is precisely localized. The archaeological objective will not be affected by the project.	1	6,6	17,8
GREBLEȘTI						
1	**Greblești - Roman settlement, RAN Code 169146.01, LMI code VL-I-s-B-09539.**	V from the village, up to the Olt riverbed.	The point cannot be precisely localized.	3,3	9,2	20,6
ROBEȘTI						
1	**Robești - archaeological site, RAN code 169173.01, LMI code VL-I-s-B-09569.**	In the heart of the village.	The point is precisely localized. The archaeological objective will not be affected by the project.	5,5	11,2	23
RACOVIȚA (Vâlcea) - Praetorium II						
1.	**Racovița (Praetorium) II, Cetate, RAN code 172518.01, LMI code VL-I-s-A-09564.**	The site is located south of Racoviță locality and Valea Satului, about 210 meters east of the Olt River, 150 meters west of the DC8 communal road, 85 meters north of the county road DJ 703P and about 92 meters northwest of the town hall of Copăceni.	The surge tank and the Roman road are located in the immediate vicinity of the Olt stream and the Cornetu dam. The archaeological objective will not be affected by the project.	11,1	16,8	28,6
COPĂCENI						
1.	**Copăceni - At the mill. RAN code 172554.01, LMI code VL-I-s-A-09525.**	The site is located on the left bank of the Olt, on a high terrace, north of the Cornetu Hydropower Plant, on either side of the DJ703P road, east	The point is precisely localized. The archaeological objective will not be affected by the project.	12	17,8	29,5

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Distance to CHE Câineni (km)	Distance to CHE Lotrioara (km)	Distance to CHE Racovița (km)
		of Copăceni, on the locality's islet.				
2.	**Copăceni-burgus Roman, RAN code 172554.02.**	The fortification is located east of Copăceni, north of the stream Cordoaia Mică.	The point is precisely localized. The archaeological objective will not be affected by the project.	11,8	17,6	29,2
3.	**Copăceni, Roman road, RAN Code 172554.03.**	The road runs parallel to the east bank of the Olt, southwest of Copăceni.	The point is precisely localized. The archaeological objective will not be affected by the project.	12,4	18,1	29,9
BOIȚA						
1.	**Boița - Ruda, RAN code 145845.01, LMI code SB-I-s-A-11946.**	The site is located about 2 km east of the village, near the curvature of the Olt, on the right bank of the Olt, beyond the Old Tile Factory, 700 m east of the village, on the second terrace of the river.	The point is precisely localized. The archaeological objective will not be affected by the project.	11,3	0,3	4
2.	**Roman road, RAN code 145845.03.**	The Roman road can be seen 4 km south of the village and north of the Roman fort at Ruda.	The point is precisely localized. The archaeological objective will not be affected by the project.	11,5	0,6	4,5
3.	**Medieval tower, RAN code 145845.02, LMI code SB-I-s-A-11947.**	The archaeological site of Turnul Spart is located on the territory of the village of Boița, south of it, in the Olt gorge. Today the site is located on a narrow stretch of embankment between the Olt and the national road DN 7, between km 245 + 430.000 and 245	**The archaeological objective could be affected by the development of the Lotrioara reservoir.**	6,5	**On site**	8,5

No. crt.	Archaeological objective in the project area	Location / distance from the project	Possible effect of the project on the objective	Distance to CHE Câineni (km)	Distance to CHE Lotrioara (km)	Distance to CHE Racovița (km)
		+ 520.000 of the latter.				
4.	**Turnu Roșu Fortress, RAN code 145845.04, LMI code SB-II-m-A-A-12337.**	The tower is located north of the Lotrioara Fortress, at the entrance to the pass from Sibiu, on the right bank of the Olt.	The point is precisely localized. The archaeological objective will not be affected by the project.	10,8	0,1	4,8
5.	**Lotrioara Fortress of Boița, RAN code 145845.05.**	The Lotrioara Fortress is located in the Turnu-Roșu pass, at the Lotrioara's spill into the Olt, on the right bank of the Olt, 9 km south of Turnul Roșu.	The point is precisely localized. The archaeological objective will not be affected by project.	5,8	0,3	9,7

The following measures are needed to protect the "Turnul Spart":

- It is necessary to protect the monument by enclosing it in a concrete trough. The section of the wall surrounding the monument is that of the protective wall on the right bank of the reservoir;
- The water stored in this basin will be discharged into the right slope culvert box;
- For the Lotrioara development, it is recommended that during the technical design phase, the works for the conservation of the monument (Turnul Spart) will be carried out in the presence of a delegate of the heritage of the cults.
- In accordance with the legislation in force, from the beginning of the investment until the end, archaeological monitoring will be carried out and in case of discovering archaeological elements, the competent authorities will be notified.

B. Monitoring

The environmental monitoring, both during the construction and decommissioning, as well as during the operation of the Cornetu Avrig hydropower Project, will aim to implement additional measures, as appropriate, leading to a minimum impact on the environment, population and human settlements, so as to respect the concept of sustainable development.

Monitoring is the only way to accurately determine the impacts generated during the different phases of a project. Also, only proper monitoring can verify whether mitigation measures are correctly implemented and whether they are effective or whether other mitigation measures are needed (with the approval of the MMAP/APM/ACPM), making it possible to adapt them to updated field conditions, towards increasing their effectiveness.

It is recommended that the monitoring should be carried out according to the proposed plans, as it has an essential role in identifying and establishing sensitive areas in terms of the impact of the project on environmental components.

Measurements will be carried out periodically, according to the established monitoring plan, by an accredited laboratory on the compliance of the activities carried out within the work fronts with the permissible pollution limits regarding the concentrations of pollutants in air, water, soil, noise level.

Based on the monitoring data, the monitoring plan will be regularly updated in agreement with the competent environmental protection authorities.

Where exceedances of the maximum permissible limits are recorded, measures to mitigate the environmental impact will be proposed and analyzed by the competent environmental protection authorities for implementation.

The monitoring results will be transmitted and kept at the holder/contractor/builder and will be submitted at the request of MMAP, ANPM,/APM, SGA, GNM-CG and/or GNM-CJ.

Monitoring, i.e. measurements and samplings, should be carried out according to the current SR or EN/ISO standards referred to in Annex V of the Water Framework Directive and the monitoring/determination of hydromorphological parameters should be carried out with specific equipment and according to national guidelines/methodologies.

B.1. Biodiversity Impact Monitoring Program

Table 112 - Program for monitoring measures

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	Habitat degradation by increasing the proportion of non-characteristic species	M1. In order to avoid the risk of introduction or spread of allochthonous, non-native, ruderal or nitrophilous species (e.g. *Robinia pseudacacia, Salix capraea, Betula pendula, Populus tremula*) into the area of habitat 92A0, specimens of these species will be removed during construction works	Permanent, under construction	In all construction areas, especially at CHE Lotrioara	Number of trees of non-characteristic/invasive/potentially invasive species removed	buc	Whenever necessary	In all construction areas, especially at CHE Lotrioara	During the construction period	High	1000 lei	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)		M2. Throughout the construction period, non-native, non-habitat type, ruderal or nitrophilous tree and shrub species identified on the project site will be carefully monitored to prevent their spread. If necessary, their removal will be accomplished, including removal of shoots/roots from their roots.	Permanent, under construction	In all construction areas, especially at CHE Lotrioara	Proportion and distribution of unsuitable, allochthonous, nitrophilous species including unsuitable ecotypes	Degree of coverage+attendance places	Monthly from April to September	In all construction areas, especially at CHE Lotrioara	During construction	high	1000 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	Reducing habitat area	M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and approval procedures	Permanent, under construction	In all construction zones	Additional areas occupied for project implementation (categories of use, types of vegetation affected, trees removed, shrubs affected)	ha	Monthly during the construction period	In all construction zones	During construction	high	500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0085 Frumoasa	1193	*Bombina variegata*	Species distribution	Reducing the number of habitats	M3 The works will be carried out strictly on the areas	Permanent, under construction	In all construction zones	Additional areas occupied for the implementation of project (categories of use, types of	ha	Monthly during the	In all construction zones	During construction	high	500 lei/month	Project Owner/

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
				favorable to the species	mentioned in the project, without affecting the vegetation/land bordering the project site. If additional areas need to be occupied, these will be subject to regulatory and approval procedures			vegetation affected, trees extracted, shrubs affected)		construction period					Contractor/ Builder
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 MUNTII FĂGĂRAȘ)	1193	Bombina variegata	Species distribution	Reducing the number of habitats favorable to the species											
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Population size	Reducing the number of individuals of the species in the protected natural area	M4. Prior to the start of construction works, all areas within the project site will be inspected (with emphasis on the CHE Lotrioara area) in order to identify specimens of *Bombina variegata, Emy orbicularis* and if individuals of this species are observed, all necessary measures will be taken to relocate them to other favorable habitats.	Before the construction period	In all areas with works	No. of specimens relocated, species relocated, location of relocation (report according to the regulations in force)+photos	No. relocation reports	Once, at the start of work	In all project areas	At the beginning of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0085 Frumoasa	1193	*Bombina variegata*	Population size	Reducing the number of individuals of the species in the protected natural area											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Population size	Reducing the number of individuals of the species in the protected natural area											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Population size	Reducing the number of individuals of the species in the protected natural area											
ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Population size	Reducing the number of individuals of the species in the protected natural area											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Habitat size	Reducing the number of habitats favorable to the species	M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and	Permanent, under construction	In all construction zones	Additional areas occupied for project implementation (use categories, types of vegetation affected, trees removed, shrubs affected)	ha	Monthly during the construction period	In all construction zones	During construction	high	500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size	Reducing the number of habitats favorable to the species											
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122	1193	Bombina variegata	Habitat area	Reducing the number of habitats favorable to the species											

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
FĂGĂRAȘ MOUNTAINS)					approval procedures										
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Habitat area	Reducing the number of habitats favorable to the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Habitat area	Reducing the number of habitats favorable to the species											
ROSAC0085 Frumoasa	1193	*Bombina variegata*	Habitat area	Reducing the number of habitats favorable to the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	Reducing the number of habitats favorable to the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	Reducing the number of habitats favorable to the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Natural hydromorphology	Modification of the natural structure of the Olt riverbed on the Racovița-Câineni sector	M5. Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara	During the construction period	The CHE Lotrioara	Fish ladder/channel realized (location + construction details, species that can use it, flow rate, other elements considered relevant for it, etc.)	Report	Once upon completion of the works	CHE Lotrioara	On completion of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Natural hydromorphology												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Natural hydromorphology		M6. Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni	During the construction period	At CHE Câineni	Realized bypass channel (location + construction details, including necessary arrangements for fish species, species that can use it, flow, other elements considered relevant for this, etc.)	Report	Once upon completion of the works	CHE Câineni	On completion of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology		M7. With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend	During the construction period	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	Extended fish ladder on the Sebeș stream (construction details, species that can use it, flow, other elements considered relevant to it, etc.), including the descent distance of the ladder	Report	Once upon completion of the works	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	On completion of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul -	1032	*Unio crassus*	Natural hydromorphology												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
Cibin - Hârtibaciu					the fish ladder at the outlet of the Șebeș stream into the Olt River										
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species	Changing the structure of the aquatic habitat into a lake ecosystem	M8 Connectivity between the Rîndibou Valley and the Olt River will be ensured	During the construction period	At CHE Lotrioara at the confluence of Vl. Rîndibou with R. Olt	Connectivity elements present (length of river course providing connectivity, vegetation present/planted) and constructive elements blocking connectivity (sills, walls, etc.)	Report	Once upon completion of the works	Confluence area between Rîndibou Valley and Olt River	On completion of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species		M9. Raising the elevation of the crest at the spillway related to the Sebeș stream outflow and reprofiling the bed	During the construction period	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	Length of bed reprofiling, length of spillway crest elevation (including construction details)	Report	Once upon completion of the works	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	On completion of the construction period	high	2500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species												
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of the network of flowing water suitable for the species		M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	Permanent, during construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	Average monthly values of ecological flow	Report	Monthly	Olt River downstream of CHE Racovița, downstream of CHE Lotrioara and downstream of CHE Câineni	During construction and during operation (minimum 5 years)	high	3500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	Degradation of the habitat quality of the species, including spawning habitat by changes in the sedimentary structure of the bed of the riverbed in the area of section 2 of the Racovita CHE tailrace channel	M11. The water diversion works (including those for lowering the embankment in the area of section 2 of the Racovița CHE tailrace) will be carried out outside the fish prohibition period and only during low-flow periods, preferably in August-October	Permanently, during the construction phase, with particular attention during the period when work is being carried out on the Racovița CHE escape channel	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	Length of the diverted watercourse, period during which the diversion was carried out, approximate volumes needed to achieve the diversion (aggregates, excavation of the river bed)	Report	Monthly, during periods when work is being carried out in the river bed	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	During the construction period	high	3500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors												
ROSAC0122 MOUNTAINS FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	The length of sectors affected by anthropogenic interventions, which have changed the character of these sectors												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on ecological indicators	Degradation of aquatic habitat quality	M11. The water diversion works (including those for lowering the embankment in the area of section 2 of the Racovița CHE tailrace) will be carried out outside the fish prohibition period and only during low-flow periods, preferably in August-October	Permanently, during the construction phase, with particular attention during the period when work is being carried out on the Racovița CHE escape channel	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	Length of river diverted, period during which the diversion took place, approximate volumes required to achieve the diversion (aggregates, bed excavation)	Report	Monthly, during periods when work is being carried out in the river bed	In all areas with works in the minor riverbed of the Olt River (with emphasis on the Racovița CHE tailrace)	During the construction period	high	3500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on physico-chemical indicators												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on chemical and physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical and physico-	Degradation of aquatic	M12. In works to be carried out on		In all areas with works in	Water quality by pH, COD-Cr, BOD_5, petroleum products,	Feature of each parameter	Monthly	Minimum one	During construction	high		Project Owner/

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
			chemical elements	habitat quality	the watercourse involving various substances/materials (e.g. concrete, oils, paints, primers), particular attention shall be paid to their handling in order to minimize the risk of accidental pollution	Permanent, during construction	the minor bed of the Olt river	heavy metals (Mn, Cd, Pb, Ni, Cu, Zn)			monitoring point on the Olt River, upstream and downstream of the 3 CHE (Racovița, Lotrioara and Câineni)			2000 lei/month	Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements	Degradation of aquatic habitat quality	M13. Washing of machinery in riverbeds is prohibited, subject to other measures related to water bodies indicated in the SEICA. For work in the riverbed, only tested machinery that does not leak oil/fuel will be used.	Permanent, during construction	In all areas with works in the minor bed of the Olt river	Water quality by pH, COD-Cr, BOD_5, petroleum products, heavy metals (Mn, Cd, Pb, Ni, Cu, Zn)	Feature of each parameter	Monthly	Minimum one monitoring point on the Olt River, upstream and downstream of the 3 CHE (Racovița, Lotrioara and Câineni)	During construction	high	2000 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality	M14. An accidental pollution prevention and response plan shall be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or onto land.	Permanent, during construction	In all areas with works in the minor bed of the Olt river	Accidental pollution response plan developed, no. of accidental pollution incidents, areas/lengths of watercourse affected, how to respond and report	Report	At the beginning of the project and whenever necessary	In all areas with works in the minor bed of the Olt river	During construction	high	2000 lei	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality Degradation of aquatic	M15. Quiet machinery and means of transport	Permanent, during construction	In all areas with works in	Noise level+ Accidental oil/fuel spills	dB(A) + no. of accidental pollution	Monthly	At least one monitoring	During construction	high	800 lei/month	Project Owner/

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
				habitat quality	will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. At the same time, machinery will be checked periodically to avoid oil and fuel spills on the surface of habitats or near watercourses		the minor bed of the Olt river				point in each of the work zones				Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Water turbidity	Degradation of aquatic habitat quality	M16. Proper waste management shall be practiced; selective collection, recovery and regular disposal of waste shall be carried out in order to avoid attracting animals, making them ill or causing them injury.	Permanent, during construction	In all areas with works	No. of landfill sites for construction waste (including activity-related waste)	No. locations	Monthly during the construction period	In all areas with works	Monthly during the construction period	high	500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Water turbidity	Degradation of aquatic habitat quality											
ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Water turbidity	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Water turbidity	Degradation of aquatic habitat quality	M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	Permanent, during construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	Average monthly values of the ecological flow rate	Report	Monthly	Olt River downstream of CHE Racovița, downstream of CHE Lotrioara and downstream of CHE Câineni	Monthly, during construction and during operation (minimum 5 years)	high	1500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Water turbidity	Degradation of aquatic habitat quality											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	Degradation of aquatic habitat quality	M17 Particular attention will be paid to sediment management so that sediment is returned to the river bed as efficiently as possible	Permanent, in operation	All 3 CHE (Racovita, Lotrioara and Câineni)	No. of washouts + period of realization	Report	Annual	All 3 CHE (Racovita, Lotrioara and Câineni)	In operation	high	1500 lei/month	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	Reduced resting/feeding habitat for the species	M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land	Permanent, under construction	In all construction zones	Additional areas occupied for project implementation (categories of use, types of vegetation affected, trees removed, shrubs affected)	ha	Monthly during the construction period	In all construction zones	During construction	high	500 lei/month	Project Owner/ Contractor/ Builder

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats	Reduced resting/feeding habitat for the species	bordering the project site. If additional areas need to be occupied, they will be subject to regulatory and approval procedures										
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	Reduced resting/feeding habitat for the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Length of linear vegetation providing connectivity between shelter and foraging habitats	Reduced resting/feeding habitat for the species											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks	Reduced nesting, roosting or refuge areas for species											
ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Area of woody vegetation along the banks	Reduced nesting, roosting or refuge areas for species											
ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Area of woody vegetation along the banks	Reduced nesting, roosting or refuge areas for species											
ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Area of woody vegetation along the banks	Reduced nesting, roosting or refuge areas for species											
ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks	Reduced nesting, roosting or refuge areas for species											
ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of woody vegetation along the banks	Reduced wintering, refuge or nesting areas for species											

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSCA0122 MUNTII FĂGĂRAȘ (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	Bombina variegata	Natural vegetation near breeding habitats	Reducing shading of aquatic habitats (including amphibian habitats)	M18 Upon completion of the project works on both banks of the reservoirs related to CHE Lotrioara and CHE Câineni (where the terrain allows), white poplar (*Populus alba*), black poplar (*Populus nigra*), anin (*Alnus* sp.) and willow (*Salix* sp.) trees will be planted and maintained in order to restore the affected riparian vegetation (they will be planted in rows, parallel to the direction of flow of the Olt River, so that they will look like forest cords).	At the end of the construction period	Racovița, Lotrioara and Câineni reservoirs	No. of seedlings planted, species planted, areas or lengths of planted cordons, success of plantations + work to complete plantations	No., km (length), ha, plantation condition report	On completion of construction works (including afforestation)	At the reservoirs CHE Racovița, CHE Lotrioara and CHE Câineni, in the areas with such works	Once, on completion of construction works (including afforestation)	High, very important measure	7500 lei	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Riparian vegetation	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse	Reduced foraging habitat for the species											
ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu	1193	*Bombina variegata*	Natural vegetation near breeding habitats	Reducing the degree of shading of aquatic habitats (including habitats characteristic of amphibian species)											
ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Natural terrestrial vegetation around breeding habitats (meadows, shrubs, forest)	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSAC0085 Frumoasa	1193	*Bombina variegata*	Cover of natural terrestrial habitats (grasslands, shrublands and forests) around breeding habitats	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Riparian vegetation	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation	Reducing shading of aquatic habitats (including amphibian habitats)											

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation	Reducing shading of aquatic habitats (including amphibian habitats)											
ROSAC0132 Oltul Mijlociu - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation	Reducing the degree of shading of aquatic habitats (including habitats characteristic of amphibian species)											
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long	Reducing shading of aquatic habitats (including amphibian habitats)											
Rospa0043 Frumoasa	A253	Delichon urbicum	Area of habitats	Loss of habitat characteristic of the species	M3 The works will be carried out strictly on the areas mentioned in the project, without affecting the vegetation/land bordering the project site. Where additional areas need to be occupied, these will be subject to regulatory and approval procedures	Permanent, under construction	In all construction zones	Additional areas occupied for project implementation (categories of use, types of vegetation affected, trees removed, shrubs affected)	ha	Monthly during the construction period	In all construction zones	During construction	high	500 lei/month	Project Owner/ Contractor/ Builder
Rospa0043 Frumoasa	A262	Motacilla alba	Area of habitats	Loss of habitat characteristic of the species											
ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Habitat area	Loss of habitat characteristic of the species	M14. An accidental pollution prevention and response plan shall be implemented, including concrete measures to prevent accidental spills of diesel, oil or other hazardous substances/pollutants into water or onto land.	Permanent, during construction	In all areas with works in the minor bed of the Olt river	Accidental pollution response plan developed, no. of accidental pollution incidents, areas/lengths of watercourse affected, how to respond and report	Report	At the start of the project and whenever necessary	In all areas with works in the minor bed of the Olt river	During construction	high	2000 lei	Project Owner/ Contractor/ Builder
ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Habitat area	Loss of habitat characteristic of the species	M16. Proper waste management shall be practiced; selective collection, recovery and	Permanent, during construction	In all areas with works	No. of landfill sites for construction waste (including activity-related waste)	No. locations	Monthly during the construction period	In all areas with works	Monthly during the construction period	high	500 lei/month	Project Owner/ Contractor/ Builder

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Habitat surface - wet meadows	Loss of habitat characteristic of the species	regular disposal of waste shall be carried out in order to avoid attracting animals, making them ill or causing them injury.										
ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Area of nesting and foraging habitat	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Foraging habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Foraging habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	Loss of habitat characteristic of the species											
ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Foraging habitat area	Loss of habitat characteristic of the species	M19 Once the works are finalized and the 3 dams are filled to the projected levels (Racovița, Lotrioara and Câineni), the water level will be maintained as constant as possible in order to favor the establishment (in the shoreline/coastal areas) of reed and papyrus vegetation	In operation	In the area of the 3 dams (Racovița, Lotrioara and Câineni), in the shallow water areas of these dams	Areas under reed in new accumulations + locations of presence	ha	Once on completion of the works and once after the third year of operation	In the area of the 3 dams (Racovița, Lotrioara and Câineni), in the shallow water areas of these dams	Once on completion and once after the third year of operation	The measure will create habitats for species	2500 lei	Project Owner/ Contractor/ Builder
ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Reed area	Loss of habitat characteristic of the species											
ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Area of reedbeds	Loss of habitat characteristic of the species											
ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Area of reedbeds	Loss of habitat characteristic of the species											
ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of reedbeds	Loss of habitat characteristic of the species											
ROSPA0003 Avrig-Scorei-Făgăraș	A081	*Circus aeruginosus - Reed cattail*	Distribution pattern	Disruption of species activity	M20. The project works will be carried out exclusively during the day, between 07:00-20:00	Permanent, under construction	On all sites concerned by the execution of the remaining works	Noise level	dB(A)	Monthly	At least one monitoring point in each of the work zones	During construction	high	500 lei/month	Project Owner/ Contractor/ Builder
ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A122	*Crex crex - Field Cricket*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus - Uligan fish*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus - Uligan fish*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A229	*Alcedo atthis - Common Kingfisher*	Distribution pattern												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSPA0003 Avrig-Scorei-Făgăraș	A031	*Ciconia ciconia - White Stork*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A068	*Mergus albellus - Smew*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A338	*Lanius collurio*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Distribution pattern		M15. Quiet machinery and means of transport will be used to reduce noise due to specific activities, as well as equipment with efficient systems to minimize and contain pollutants in the atmosphere. The machines will also be checked periodically in order to avoid spills of oils and fuels on the surface of habitats or near watercourses.	Permanent, during construction	In all areas with works	Noise level+ Accidental oil/fuel spills	dB(A) + no. of accidental pollution	Monthly	At least one monitoring point in each of the work zones	During construction	high	800 lei/month	Project Owner/ Contractor/ Builder
ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A168	*Actitis hypoleucos*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A165	*Tringa ochropus*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A086	*Accipiter nisus*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A247	*Alauda arvensis*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A207	*Columba oenas*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A208	*Columba palumbus*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A113	*Coturnix coturnix*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A212	*Cuculus canorus*	Distribution pattern												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSPA0003 Avrig-Scorei-Făgăraș	A253	*Delichon urbica*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A269	*Erithacus rubecula*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A359	*Fringilla coelebs*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A315	*Phylloscopus collybita*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A275	*Saxicola rubetra*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A210	*Streptopelia turtur*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A311	*Sylvia atricapilla*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A308	*Sylvia Curruca*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A283	*Turdus merula*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A285	*Turdus philomelos*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A284	*Turdus pilaris*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A364	*Carduelis carduelis*	Distribution pattern												
ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Distribution pattern												
Rospa0043 Frumoasa	A239	*Dendrocopos leucotos (White-backed Woodpecker)*	Distribution pattern		M21 In all the sites in the area of the dams/ spillways of CHE Câineni and CHE Lotrioara where works will be carried out, mobile sound absorbing panels will be used to fence the areas	Permanent, under construction	In all areas with works on the dams of CHE Lotrioara and CHE Câineni	Sound absorbing panels placed	Achieved/ Unfulfilled	Monthly	In all areas with works	During construction	high	2500 lei/month	Project Owner/ Contractor/ Builder
Rospa0043 Frumoasa	A236	*Dryocopus martius (Black Woodpecker)*	Distribution pattern												
Rospa0043 Frumoasa	A321	*Ficedula albicollis (Gularate Muscar)*	Distribution pattern												
Rospa0043 Frumoasa	A338	Lanius collurio (Red-backed Shrike)	Distribution pattern												
Rospa0043 Frumoasa	A072	Pernis apivorus (Viespar)	Distribution pattern												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
Rospa0043 Frumoasa	A234	Picus canus (Southern Snowdrop)	Distribution pattern												
Rospa0043 Frumoasa	A220	*Strix uralensis (Ural Owl)*	Distribution pattern												
Rospa0043 Frumoasa	A086	*Accipiter nisus*	Distribution pattern												
Rospa0043 Frumoasa	A247	Alauda arvensis	Distribution pattern												
Rospa0043 Frumoasa	A087	Buteo buteo	Distribution pattern												
Rospa0043 Frumoasa	A208	Columba palumbus	Distribution pattern												
Rospa0043 Frumoasa	A350	Corvus corax	Distribution pattern												
Rospa0043 Frumoasa	A212	Cuculus canorus	Distribution pattern												
Rospa0043 Frumoasa	A237	Dendrocopos major	Distribution pattern												
Rospa0043 Frumoasa	A269	Erithacus rubecula	Distribution pattern												
Rospa0043 Frumoasa	A359	Fringilla coelebs	Distribution pattern												
Rospa0043 Frumoasa	A330	Parus major	Distribution pattern												
Rospa0043 Frumoasa	A325	Poecile palustris	Distribution pattern												
Rospa0043 Frumoasa	A315	Phylloscopus collybita	Distribution pattern												
Rospa0043 Frumoasa	A235	Picus viridis	Distribution pattern												
Rospa0043 Frumoasa	A332	Sitta europaea	Distribution pattern												
Rospa0043 Frumoasa	A311	Sylvia atricapilla	Distribution pattern												
Rospa0043 Frumoasa	A308	Sylvia Curruca	Distribution pattern												
Rospa0043 Frumoasa	A265	Troglodytes troglodytes	Distribution pattern												
Rospa0043 Frumoasa	A283	Turdus merula	Distribution pattern												
Rospa0043 Frumoasa	A285	Turdus philomelos	Distribution pattern												
Rospa0043 Frumoasa	A253	Delichon urbicum	Distribution pattern												
Rospa0043 Frumoasa	A262	Motacilla alba	Distribution pattern												
Rospa0043 Frumoasa	A168	*Actitis hypoleucos*	Distribution pattern												
Rospa0043 Frumoasa	A053	Anas platyrhynchos	Distribution pattern												
Rospa0043 Frumoasa	A028	Ardea cinerea	Distribution pattern												
Rospa0043 Frumoasa	A604	Larus cachinnans / Caspian Gull	Distribution pattern												
Rospa0043 Frumoasa	A017	Phalacrocorax carbo	Distribution pattern												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos (Mountain Eagle)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia (White Stork)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (Black Stork)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus (Reed cattail)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus (Black-headed Erytra)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A122	*Crex crex (Field Cricket)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus (Peregrine Falcon)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio (Red-backed Shrike)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus (Viespar)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A234	*Picus canus (Southern Snowdrop)*	Distribution pattern												
ROSPA0098 Făgăraș Piedmont	A220	*Strix uralensis (Ural Owl)*	Distribution pattern												
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1352*	Canis lupus	Prey population density												
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ	1354*	Ursus arctos	Prey population density												

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
MOUNTAINS)															
ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1361	Lynx lynx	Prey population density												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Species distribution in the site												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Species distribution in the site												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Species distribution in the site												
ROSAC0304 South-West Hartibaciu	1308	*Barbastella barbastellus (Barbastella barbastellus)*	Species distribution in the site												
ROSAC0304 South-West Hartibaciu	1321	*Myotis emarginatus (Geoffroy's Bat)*	Species distribution in the site												
ROSAC0304 South-West Hartibaciu	1303	*Rhinolophus hipposideros (Little horseshoe bat)*	Species distribution in the site												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Species distribution												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Species distribution												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within and outside the site boundaries)	Disruption of aquatic habitat connectivity	M5. Design and construction of a fish ladder after completion of the existing weirs at CHE Lotrioara	During operation (fish ladder maintenance)	The CHE Lotrioara	Fish ladder maintenance (maintenance works, locations, functionality)	Report	Annual	CHE Lotrioara	Annually for 5 years	high	2500 lei/year	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Lateral fragmentation						Report	Annual			high		

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Longitudinal fragmentation		M6. Adaptation of the right embankment embankment counterchannel with the additional function of realizing the longitudinal connectivity of the Olt river downstream of CHE Câineni	During operation (bypass maintenance)	At CHE Câineni	Bypass channel maintenance (maintenance works, locations, functionality)			CHE Câineni	Annually for 5 years		2500 lei/year	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation		M7. With the lowering of the slope of the Olt River in the area of section 2 of the Racovița CHE tailrace, it is necessary to extend the fish ladder at the outlet of the Șebeș stream into the Olt River	During operation (fish ladder maintenance)	At CHE Racovița at the confluence of R. Olt with Pr. Sebeș	Fish ladder maintenance (maintenance works, locations, functionality)	Report	Annual	CHE Lotrioara	Annually for 5 years	high	2500 lei/year	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation												
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation		M8. Connectivity will be ensured between the Olt River and the Rîndibou Valley	During both construction and operation	At CHE Lotrioara at the confluence of R. Olt with Vl. Rîndibou	Connectivity elements present (length of river course providing connectivity, vegetation present/planted) and constructive elements blocking connectivity (sills, walls, etc.)	Report	Annual	Confluence area between Rîndibou Valley and Olt River	In the first 5 years of operation	high	2500 lei/year	Project Owner/ Contractor/ Builder
ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)		M10. Maintaining the ecological flow on the Olt river downstream of all storage reservoirs belonging to AHE Cornetu-Avrig	Permanent, during construction and operation	All 3 CHE (Racovita, Lotrioara and Câineni)	Average monthly values of the ecological flow rate	Report	Monthly	Olt River downstream of CHE Racovița, downstream of CHE Lotrioara and downstream of CHE Câineni	Monthly, during construction and during operation (minimum 5 years)	high	1500 lei/month	Project Owner/ Contractor/ Builder
All protected areas in the project's area of influence	-	All species of Community interest assessed as present or potentially present in the project area of influence	-	-	M22. There shall be no harvesting, capture, killing, killing, destruction or harming of specimens of nationally and/or internationally protected wild flora and fauna species in their natural environment, at any stage of their life cycle, that could accidentally end up in the area of the work perimeter; in	Permanent, under construction	In all areas with works	Accidental fatalities during construction (species+location+cause of death+photos)	No of specimens per species	Monthly	In all areas with works	In the construction phase	high	1500 lei/month	Project Owner/ Contractor/ Builder

ANPIC affected (COD, name)	Affected species/habitat			Form of impact	Reduction measure	Period of implementation of the measure	Location of implementation of the measure	Monitoring indicators	Units of measurement	Frequency of monitoring	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget*	Responsible monitoring
	Natura 2000 Code	*Scientific name habitat/species*	Parameter addressed by the measure												
					this regard, the training program for the personnel involved shall also include specific information on protection and management of situations in which employees interact with flora and fauna species within protected areas.										
All protected areas in the project's area of influence	-	All species of Community interest assessed as present or potentially present in the area of influence of the project	-		M23 All biodiversity elements (species of amphibians, reptiles, mammals, birds and fish) in the project area will be monitored throughout the construction period and for a minimum of 3 years (except for ichthyofauna which is recommended to be a minimum of 5 years) during the operational period. In order to be able to compare presence/absence data we recommend that monitoring is carried out in the same locations presented in the Appropriate Assessment Study.	Permanent (recommended monthly) during the construction phase and the first 3 years during the operational phase for all habitats and species except for ichthyofauna, which are recommended for a minimum of 5 years	In all project areas	Presence of species of Community interest in areas affected by construction - qualitative and quantitative data. Quantitative data will be collected for the groups for which quantitative data can be collected. Distribution of species of community interest in areas affected by construction. Dynamics influenced by construction works on species of community interest. Significance of the impact on the habitats of fauna species of Community interest for those species that are strictly associated with the habitats to be affected (wetlands, etc). Significance of impact on fauna species of Community interest).	Database (list) of identified species	Monthly	In all areas with works	Permanent (recommended monthly) during the construction phase and the first 3 years during the operational phase for all habitats and species except for ichthyofauna, which are recommended for a minimum of 5 years	high	5500 lei/month	Project Owner/ Contractor/ Builder
All protected areas in the project's area of influence	-	All fish species of Community interest assessed as present or potentially present in the project area of influence	-		M24 Monitoring fish ladders/passages	For a minimum period of 5 years	In all project areas where such elements have been built	Species using the fish ladder, assessing the degree of ladder use, proposing measures to improve the efficiency of the ladder, finding malfunctions	Report	Monthly	All fish ladders made	For a minimum period of 5 years	high	4500 lei/month	Project Owner/ Contractor/ Builder

B.2. Program for monitoring the impact of the project on other factors

Table 113 Environmental monitoring program

Environmental factor	Periodicity	Monitoring points	Parameters monitored	Location	Responsible
Air	Monthly throughout the construction period	- CHE Câineni - Overflow dam - CHE Lotrioara - Spillway dam - Excavation excavation works for the escape channel section 2 (CHE Racovița)	Imissions (NO_2, SO_2, particulate matter, VOC), emissions* (CO, NO, NO_x)	- work fronts; - site organization	Contractor/Builder
Sol	Monthly throughout the construction period	- CHE Câineni - Overflow dam - CHE Lotrioara - Overflow dam	pH, heavy metals (cadmium, copper, chromium, manganese, nickel, lead, zinc), TPH	- working fronts; - site organization	Contractor/builder
Noise	Monthly throughout the construction period	- CHE Câineni - Overflow dam - CHE Lotrioara - Overflow dam - Excavation excavation works for the escape channel section 2 (CHE Racovița)	noise level, dB (A)	- working fronts; - site organization	Contractor/builder

*The monitoring program for the water part is included in the SEICA study

8. A DESCRIPTION OF THE EXPECTED SIGNIFICANT ADVERSE EFFECTS OF THE OBJECTIVE ON THE ENVIRONMENT, DETERMINED BY ITS VULNERABILITY TO MAJOR-ACCIDENT AND/OR DISASTER HAZARDS RELEVANT TO THE OBJECTIVE IN QUESTION

Risk is defined as the probability of exposure of humans, the assets they create and the components of the environment to the action of a hazard of a given magnitude. Risk is the probable level of loss or damage caused by a particular natural phenomenon or group of phenomena in a given place and time.

Risk is defined as:

R = f x C

Where:

R = risk, in units of "consequence" per unit time;

f = frequency of occurrence of the event (time units);

C = consequence of the event, in appropriate units (financial loss, health impact).

The choice of a risk assessment method depends primarily on the activity, objective or substance being analyzed, but also on the available data and knowledge.

The risk assessment procedure includes the following steps:

- Hazard identification;
- Exposure assessment (determining the magnitude of physical effects of undesirable events);
- Consequence assessment (assessment of possible damage caused by the occurrence of undesirable events);
- Risk estimation (integrating the estimation of the likelihood of the undesirable event with the assessment of the consequences).
- Environmental risk assessment is not always mathematically quantifiable.

The reasons include the lack of a generally accepted methodology, the lack of case studies and last but not least the lack of data needed to conduct a comprehensive risk analysis.

The following risk factors were identified for the project under analysis:

- Seismic risk (natural risk factor);
- Anthropogenic risk factors:
- Risk of accidental pollution;
- Risk of accidents at work;
- Risk of stormwater runoff from stormwater catchment.
- Natural risk factors
- Seismic risk. Refers to the occurrence of a particular seismic event associated or not with the occurrence of other risk factors.

Seismic risk characterization has been carried out in previous chapters.

Analysis of the risk to human health and safety, cultural heritage or the environment from accidents, armed attack or disasters

These risks have been highlighted:

- floods caused by natural overflows of watercourses, ice jams, landslides; floods caused by incidents, accidents or damage to buildings;
- Hazardous weather phenomena: heavy rain, heavy snow, thunderstorms and blizzards, ice, frost, ice, ice, ice, ice, frost, early or late frost, heat, hail and drought, tornadoes, avalanches;
- armed attacks, fires, explosions, accidental pollution of watercourses, soil, accidental polluting emissions into the atmosphere, earthquakes, damage or destruction of installations, equipment and hydro-technical constructions, floods, morphological and geological changes in the slopes of reservoirs and other serious natural disasters.

For all these situations there are measures included in the beneficiary's action plan, drawn up with the county prevention and defense committees. In this case, warning-alarm measures are applied to save people and property; the H.A. is shut down; the quick valve is closed; the dispatcher and the Emergency Situations Cell are notified; the level in the lake is monitored and if there is a danger of flooding the power plant, all CHE installations are de-energized and the CHE is left.

The characteristic defense measures defined in case of floods are:

c) For the dyked areas of watercourses:
   - Phase I of defense - when the water level reaches the foot of the outer embankment of the embankment for one third of its length;
   - Phase II defense - when the water level reaches halfway between the elevation of Phase I and Phase III defense;
   - Phase III of defense - when the water level reaches 0.2 m - 1.5 m below the level of the known maximum water levels or below the maximum level for which the dike was sized or when a critical point is exceeded.

d) For the un-dammed areas of watercourses in hydrometric station sections:
   - flood level - I.C. - the level at which significant overflows occur which may lead to flooding of the first objective;
   - hazard level - H.P. - the level at which special measures may be necessary to evacuate people and goods, restrictions on the use of bridges and roads, as well as special measures to be taken in the operation of hydro-technical constructions.

For reservoirs, the phases I, II and III of defense are established according to the water level in the lake and the tributary flow and are calculated by the designer/expert in the range between the Normal Retention Level (N.N.R.) and the Maximum Level of Exploitation (N.M.E.) established by the operating regulations.

For the behavior of dams, the critical thresholds are set by the designer for each objective according to:

- the water level in the lake when it exceeds the Normal Retention Level (N.N.R.);
- reaching certain limit values in the behavior of the construction. The limit values in construction behavior are:
- threshold of attention - the values of some of the parameters approach or even exceed the range considered normal, without the overall stability of the

construction being altered;

- alert threshold - dangerous changes in behavioral parameters with evolution towards incipient failure phenomena;
- hazard threshold - the dam undergoes changes that may lead to serious damage or failure.

In the case of flood hazards due to ice agglomeration and overflow, the following characteristic magnitudes are determined:

- Phase I - when the ice is breaking up and the debris is flowing down the watercourse and small piles appear;
- Phase II - when the ice-slides become congested and levels rise upstream;
- Phase III - when the landslides have become stuck in a slush, leading to damage by upstream overflow or downstream flow of the landslides due to slush failure.

The following characteristic magnitudes shall be established for flood hazards on agricultural land caused by rising groundwater table (inland floods):

- threshold of attention - the occurrence of waterlogging on an area of at least 30% of the total area of land potentially affected;
- warning threshold - water stands still in the flooded area for up to 72 hours
- warning/danger threshold - water stagnates in the flooded area for more than 72 hours

9. NON-TECHNICAL SUMMARY OF THE INFORMATION PROVIDED IN THE PREVIOUS PARAGRAPHS

a) WATER (Formulation of conclusions - taken from SEICA)

The SEICA aimed to analyze the potential effects on the ecological status/ecological potential and chemical status of surface water bodies (rivers), the quantitative and qualitative status of groundwater bodies, and the status of protected areas as a result of the project implementation. The study was prepared in accordance with Annex 3 of Order 828/2019 - Framework Content of the Impact Assessment Study on Water Bodies. The study also took into account the methodological and legislative instruments used in the field of water resources management (Water Framework Directive 2000/60/EC, Law 107/1996 with subsequent amendments and additions European guidelines, methodologies).

Out of the 10 water bodies potentially affected by the project, the works related to the Cornetu Avrig H.H.E. are designed on 5 water bodies.

The main quality elements affected by the completion and commissioning of the Caineni and Lotrioara waterfalls are the hydrological regime and the morphology of the bed (depth and width of the bed, substrate) on the water sector related to the height of the crown of the Lotrioara Caineni bif bifile.

The change in the category of the watercourse sector related to the completion of the two waterfalls (Lotrioara and Câineni) leads to the delimitation of the related water body (RORW8-1_B8) as a lake-type water body and implicitly to its designation as a heavily modified water body. Thus, the creation of the conjugate forebay generates effects on the flow dynamics given both by the reduction of the flow velocity, but also of the flow variation relative to the natural flow regime. An effect in terms of the depth and width of the bed is estimated for the bypassed sector, taking into account the retention times in this sector. In terms of bed structure and substrate, the estimated effect is small due to the pre-existing sediment stabilization exerted by the upstream reaches.

Concerning the ecological flow, the Caineni, Lotrioara falls are part of the planning scheme related to the Olt Defileu Hydro-energetic Plan, the Avrig- Cornetu sector, the scheme including five falls in the Racovita, Lotrioara, Caineni, Robesti and Cornetu areas, developed on a 55 km length of the Olt river. The connection between the fall stages is ensured by conjugated forebays, with variable lengths, in the case of the Lotrioara Cornetu forebay, this being 12 km.

Taking into account the provisions of HG 148/2020, Art.6, point b, namely "in the case of developments with conjugate forebays, the ecological flow is implicitly ensured by the operating regime, its determination being made downstream of the last dam section, thus not being necessary to calculate and measures to ensure it.

On longitudinal connectivity

The documentation for obtaining the water management permit, SEICA analysis provides for the construction of two fish ladders:

- fish ladder at the outlet of the Sebeș stream in the tailrace (the fish ladder has been realized, it will only be connected to the elevation of the projected invert of the tailrace section II once the works in the tailrace are realized)
- fish ladder step Lotrioara.

It should be noted that according to the provisions of the updated Olt River Basin Management Plan, approved by HG 392/2023, for 4 water bodies (ROLW8-1_B7 - OLT -am. Ac. Voila, Vistea, Arpas, Scorei Avrig and downstream ac. Racovita; ROLW8-1_B9- OLT -am.ac.Robesti, Cornet, Gura Lotrului, Turnu, Calimanesti, Daesti, Rm Valcea, Raureni, Govora and downstream ac.Babeni; ROLW8-1_B10- OLT -ac.Ionesti, Zavideni, Dragasani, Strejesti, Arcesti, Slatina, Ipotesti, Draganesti-Olt and downstream ac.Frunzaru; ROLW8-1_B11- OLT -accumulation Rusanesti and Izbiceni), water bodies that concern practically all hydropower developments on the Upper Oltul, Oltul gorge, Lower Oltul, less severe environmental objectives have been identified. According to the provisions of Art. 4.5. "on the achievement of less stringent environmental objectives for certain water bodies, if they are affected by human activity" of the WFD these water bodies were included in the category of water bodies that do not reach, in terms of ecological status, the objective of good status.

The justification for the exceptions, presented in the River Basin Management Plan approved by HG 80/2011, is based on the disproportionate costs related to the realization of fish ladders at each existing fall stage, costs caused by the significant adverse effect on the use of electricity generation. Thus the realization of fish ladders at the two steps located between water bodies for which the environmental objectives have been defined as less severe, according to Art 5 of the WFD is ecologically unfeasible, the ecological impact on ichthyofauna being reduced in the context of an environment already anthropically affected.

(b) AER

During the execution of the works, sources of air pollution will be generated on the one hand by the noxious fumes and dust from the exhaust gases of the contractor's machinery/transport equipment and on the other hand by their movement on the technological/access roads related to the execution of the works and connecting with existing public roads.

The presence of the pollutants emitted during these operations (CO, NO_x, VOC, H_2S, cement dust) will be felt exclusively locally, in the area where the operation is carried out; under the action of atmospheric factors, their dispersion will be achieved in a short time.

Under these conditions, the negative impact thus generated will be spatially limited and ***insignificant***.

The contractor will be required to keep his own machinery/means of transport in good working order and to maintain (spraying, leveling) the technological/access roads in good repair.

The cleaning/sandblasting operations of the various elements of the equipment that have already been purchased and require work to restore the anti-corrosion protection (armor, watertight gate, penstock sections, expansion compensator, etc.) will generate local air pollution, which will require work protection measures for the execution personnel.

In these circumstances, the negative impact thus generated will be a negative impact that will manifest itself throughout the entire period of the works, but which will be within acceptable limits and must be accepted.

Once the works are completed and this drop step is in operation, there will be no more sources of air pollution.

c) SOIL/SUBSOIL

During the execution of the works, the only possibility of soil pollution would be caused by any accidental loss of fuels and/or lubricants from the contractor's machinery/transport equipment.

In order to intervene in the event of such accidental soil pollution, the contractor will be required to have a minimum of absorbent materials (handkerchiefs, pillows, biodegradable absorbent, etc.).

The Contractor shall pay particular attention to the refueling operations (from mobile tankers) of the equipment required for the works. It should be noted that no additional land will be taken up for the remaining works.

Provided that the contractor keeps his own machinery/transport equipment in good working order, coupled with rapid and efficient intervention, the negative impact on the soil will be limited in space and ***insignificant***.

Once the works have been completed, the operation of this fall will not generate sources of soil pollution.

d) NOISE AND VIBRATION

The results of the modeling carried out with the SoundPLAN software show that, during the construction phase, the noise level generated by the project will not have a significant impact on the quality of living in the neighboring villages at the level of the nearest receptors, the operation of the equipment used in the modeling generating a maximum noise level of about 39 dB. The noise generated by the construction activities is not able to change the current noise level induced mainly by the motor traffic in the area.

At the level of protected areas, the noise generated by construction activities may lead to an increase in the equivalent noise level of up to 100 dB(A) over a distance of maximum 50 m, which could lead to a disturbance of species (especially birds) during the works, but given the site area in a forested area this increase will be significantly reduced in the immediate vicinity of the project.

Also taking into account the location of the works in relation to the inhabited areas, the noise value is within the limits set by Order 119/2014.

Taking into account that the works carried out in the analyzed project will have a low contribution to the noise level generated in inhabited areas, we consider that no special measures are necessary to reduce the noise level in relation to the settlements.

e) BIODIVERSITY (Appropriate assessment findings)

"*The project on increasing the share of electricity production from renewable sources by completing the works and ensuring permanent monitoring of the environmental impact of the Cornetu-Avrig hydropower project - continuation of the works to be executed at the Cornetu-Avrig AHE*" - continuation of the works to be executed at the Cornetu-Avrig AHE will be implemented almost entirely within the perimeter of the Natura 2000 ecological network.

In order to correctly base the measures to prevent, avoid and reduce the impact of the project on the elements of conservation interest in the protected natural area, specific studies were carried out on each group of species/habitat, the results of which are presented in the previous chapters, with emphasis on the assessment of the impact of the project on each species/habitat of conservation interest.

The present study paid particular attention to the connectivity of the aquatic habitat present on the surface of the protected natural area ROSAC0132 Oltul Mijlociu-Cibin-Hârtibaciu, in order to maintain its connectivity.

The residual impact after project implementation has been estimated to be insignificant, provided that the prevention, avoidance and mitigation measures proposed in this environmental study are respected. At the same time, both during the construction and later during the operation phase, monitoring of biodiversity elements is necessary in order to accurately calculate the generated impacts and possibly recalibrate the mitigation measures.

Table 114 - Findings of the adequate assessment

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
CONSTRUCTION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Abundance of unsuitable ecotopes / out of range species	Not significant	M1, M2	Not significant	Completing the remaining work	Established by CSAT Decision no. 169 on improving Romania's energy resilience in order to ensure security in the field by operational adaptation and development of new energy production capacities, in the context of the war in Ukraine and by Emergency Ordinance no. 175/2022 for establishing measures on investment objectives for the realization of hydropower facilities under implementation, as well as other projects of major public interest using renewable	Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Alien species abundance (invasive and potentially invasive)	Not significant	M1, M2	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	92A0	*Salix alba and Populus alba tunnel forests*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Species distribution	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Species distribution	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul -	1193	*Bombina variegata*	Population size	Not significant	M4	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Cibin - Hârtibaciu							remaining work	energy, and for amending and supplementing some normative acts		
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Population size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Habitat size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Habitat size	Not significant	M4	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Habitat area	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in	Not significant	M3	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				the littoral zone of habitats							
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Important microhabitats for the species - sun exposure areas in the littoral zone of habitats	Not significant	M3	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Nesemnificativ	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Natural hydromorphology	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of flowing water network appropriate to the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	*Barbus petenyi*	Length of the network of flowing water suitable for the species	Not significant	M5, M6, M7, M8, M9, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Length of sectors affected by anthropogenic interventions that have changed the	insignificant	M11	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
				character of these sectors							
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	The length of sectors affected by anthropogenic interventions that have changed the character of these sectors	insignificant	M11	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1138	Barbus petenyi	Length of sectors affected by anthropogenic interventions that have changed the character of these sectors	Not significant	M11	Not significant	Completing the remaining work		Not the case	-
CONSTRUCTION AND OPERATION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1032	*Unio crassus*	Water quality based on physico-chemical indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on biological elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul -	1355	*Lutra lutra*	Ecological status of water bodies based on chemical	insignificant	M10, M11, M12,	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Cibin - Hârtibaciu			and physico-chemical elements		M13, M14, M15, M16, M17		remaining work			
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on chemical and physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	4056	*Anisus vorticulus*	Ecological status of water bodies based on physico-chemical elements	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14,	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
						M15, M16, M17					
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Ecological status of water bodies based on ecological indicators	insignificant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul -	6143	*Romanogobio kesslerii*	Water turbidity	Not significant	M10, M11, M12,	Not significant	Completing the		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Cibin - Hârtibaciu					M13, M14, M15, M16, M17		remaining work			
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Water turbidity	Not significant	M10, M11, M12, M13, M14, M15, M16, M17	Not significant	Completing the remaining work		Not the case	-
CONSTRUCTION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Length of linear vegetation providing connectivity between shelter and foraging habitats	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Proportion of arboreal riparian vegetation on both banks	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of woody vegetation along the banks	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1193	*Bombina variegata*	Natural vegetation in the vicinity of breeding habitats	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Riparian vegetation with an average width of at least 3m on both banks of the watercourse	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1193	*Bombina variegata*	Natural vegetation near breeding habitats	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1193	*Bombina variegata - Yellow-bellied Toad*	Terrestrial natural vegetation around breeding habitats (meadows, tree vegetation , forest)	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0085 Frumoasa	1193	*Bombina variegata*	Cover of natural terrestrial habitats (grasslands, shrublands and forests) around breeding habitats	Not significant	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Riparian vegetation	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1220	*Emys orbicularis*	Natural riparian vegetation at least 10m long	**Significant**	M3, M18	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A253	Delichon urbicum	Area of habitats	insignificant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A262	Motacilla alba	Area of habitats	insignificant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus - Little Bittern*	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia* (White Stork)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus* (Black-headed Erytra)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio* (Red-backed Shrike)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos* (Mountain Eagle)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus* (Reed cattail)	Habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex* (Field Cricket)	Habitat surface - wet meadows	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus* (*Peregrine* Falcon)	Area of nesting and foraging habitat	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (*Black Stork)	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus* (Viespar)	Foraging habitat area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Reed area	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Area of reedbeds	Not significant	M3, M14, M16, M19	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A081	*Circus aeruginosus* - Reed cattail	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A022	*Ixobrychus minutus* - Little Bittern	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A122	*Crex crex* - Field Cricket	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A094	*Pandion haliaetus* - Uligan fish	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A229	*Alcedo atthis* - Common Kingfisher	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A031	*Ciconia ciconia* - White Stork	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A068	*Mergus albellus* - Smew	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A027	*Egretta alba*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A338	*Lanius collurio*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A017	*Phalacrocorax carbo*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A005	*Podiceps cristatus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A125	*Fulica atra*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A459	*Larus cachinnans*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A053	*Anas platyrhnchos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A168	*Actitis hypoleucos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A165	*Tringa ochropus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A298	*Acrocephalus arundinaceus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A295	*Acrocephalus schoenebaenus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A086	*Accipiter nisus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A247	*Alauda arvensis*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A207	*Columba oenas*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A208	*Columba palumbus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A113	*Coturnix coturnix*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A212	*Cuculus canorus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A253	*Delichon urbica*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A269	*Erithacus rubecula*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A359	*Fringilla coelebs*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0003 Avrig-Scorei-Făgăraș	A315	*Phylloscopus collybita*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A275	*Saxicola rubetra*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A210	*Streptopelia turtur*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A311	*Sylvia atricapilla*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A308	*Sylvia Curruca*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A283	*Turdus merula*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A285	*Turdus philomelos*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A284	*Turdus pilaris*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A364	*Carduelis carduelis*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0003 Avrig-Scorei-Făgăraș	A123	*Gallinula chloropus*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Rospa0043 Frumoasa	A239	*Dendrocopos leucotos* (White-backed Woodpecker)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A236	*Dryocopus martius* (Black Woodpecker)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A321	*Ficedula albicollis* (Gularate Muscar)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A338	Lanius collurio (Red-backed Shrike)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A072	Pernis apivorus (Viespar)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A234	Picus canus (Southern Snowdrop)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A086	*Accipiter nisus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A247	*Alauda arvensis*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A087	*Buteo buteo*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Rospa0043 Frumoasa	A208	*Columba palumbus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A350	*Corvus corax*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A212	*Cuculus canorus*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A237	*Dendrocopos major*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A269	*Erithacus rubecula*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A359	*Fringilla coelebs*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A330	*Parus major*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A325	*Poecile palustris*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A315	*Phylloscopus collybita*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A235	*Picus viridis*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Rospa0043 Frumoasa	A332	*Sitta europaea*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A311	*Sylvia atricapilla*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A308	*Sylvia Curruca*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A265	*Troglodytes troglodytes*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A283	*Turdus merula*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A285	*Turdus philomelos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A253	*Delichon urbicum*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A262	*Motacilla alba*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A168	*Actitis hypoleucos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A053	*Anas platyrhynchos*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	Rospa0043 Frumoasa	A028	*Ardea cinerea*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A604	*Larus cachinnans / Caspian Gull*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	Rospa0043 Frumoasa	A017	*Phalacrocorax carbo*	Distribution pattern	insignificant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A088	*Aquila chrysaetos* (Mountain Eagle)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A089	*Pomarina eagle*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A031	*Ciconia ciconia* (White Stork)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A030	*Ciconia nigra (*Black Stork)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A080	*Circaetus gallicus (Short-toed Snake Eagle)*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A081	*Circus aeruginosus* (Reed cattail)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A082	*Circus cyaneus* (Black-headed Erytra)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	ROSPA0098 Făgăraș Piedmont	A122	*Crex crex* (Field Cricket)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A103	*Falco peregrinus* (*Peregrine* Falcon)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A338	*Lanius collurio* (Red-backed Shrike)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A072	*Pernis apivorus* (Viespar)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A234	*Picus canus (Southern Snowdrop)*	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSPA0098 Făgăraș Piedmont	A220	*Strix uralensis* (Ural Owl)	Distribution pattern	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 MUNTII FĂGĂRAȘ (ROSCI0122 MUNTII FĂGĂRAȘ)	1352*	*Canis lupus*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122 FĂGĂRAȘ MOUNTAINS)	1354*	*Ursus arctos*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0122 FĂGĂRAȘ MOUNTAINS (ROSCI0122	1361	*Lynx lynx*	Predator population density	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
	FĂGĂRAȘ MOUNTAINS)										
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1303	*Rhinolophus hipposideros*	Species distribution in the protected natural area	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1308	*Barbastella barbastellus*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1318	*Myotis dasycneme*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1321	*Myotis emarginatus*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1308	*Barbastella barbastellus (Barbastella barbastellus)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1321	*Myotis emarginatus (Geoffroy's Bat)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0304 South-West Hartibaciu	1303	*Rhinolophus hipposideros (Little horseshoe bat)*	Species distribution in the site	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Species distribution	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1337	*Castor fiber*	Species distribution	Not significant	M15, M20, M21	Not significant	Completing the remaining work		Not the case	-

PP components description	ANPIC affected	Affected species/habitats		Conservation objective/ parameter affected	Impact types, including cumulative	Reduction measures	Residual impact	Alternative solution chosen	Imperative reasons of overriding public interest	Compensatory measures	Other issues
		Natura 2000 Code	*Scientific name habitat/species*								
CONSTRUCTION AND OPERATION	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	1355	*Lutra lutra*	Fragmentation elements for fish species - the main trophic base for otters (both within and outside the site boundaries)	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Lateral fragmentation	Not significant	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	6143	*Romanogobio kesslerii*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5339	*Rhodeus (sericeus) amarus*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5197	*Sabanejewia (aurata) balcanica*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5329	*Romanogobio vladykovi (Gobio albipinnatus)*	Longitudinal fragmentation	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-
	ROSAC0132 Middle Oltul - Cibin - Hârtibaciu	5266	*Barbus petenyi*	Longitudinal fragmentation (both within the site and upstream and downstream at least 30km from the site boundary)	**Significant**	M5, M6, M8, M8, M10	Not significant	Completing the remaining work		Not the case	-

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