THE ICHTHYOCENOSIS WITHIN THE NATURA 2000 SITE ROSCI0032 CHEILE RUDARIEI

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Abstract. *After Romania's accession to the European Union, it assumed responsibility for the implementation of the European legislative stipulations in all fields, including in the field of environmental protection, which means implementation of the Habitats Directive (92/43 EEC) provisions, which refers to the conservation of community interest species and habitats. In this context, specific conservation strategies have been developed according to the biotic and abiotic profile of the Natura 2000 Sites. The profile of the ichthyocenosis within the Natura 2000 Site ROSCI0032 Cheile Rudariei was based on the scientific queries (inventory and monitoring of the community interest ichthyofauna, SR EN 14011:2003), that followed: identification of species, the number of individuals, individuals waist, the biomass, sex and age, as well as physical and chemical parameters of the aquatic environment. The ichthyocenosis within the Natura 2000 Site ROSCI0032 Cheile Rudariei have in their structure the following species: (1138 CN 2000) Barbus meridionalis (community interest species), Salmo trutta fario, (1163 CN 2000) Cottus gobio (community interest species), Phoxinus phoxinus, (4123 CN 2000) Eudontomyzon danfordi (community interest species), Nemachilus barbatulus, Leuciscus cephalus, (1124/6144 CN 2000) Romanogobio albipinnatus (community interest species) and Alburnoides bipunctatus. Barbus meridionalis population is well represented at the site because the aquatic ecosystem has specific habitats for feeding, rest, reproduction and winterin. The habitat area of the species was 2.0-3.0 ha, and the species population size was estimated at 5,000-10,000 individuals (class 6). The population of Eudontomyzon danfordi occupied an area of 0.5-1.0 ha at the site level and the population was estimated at 500-1,000 individuals (class 4). Cottus gobio species is well represented at the site because the species population size was estimated at 1,000-5,000 individuals (class 5) and the habitat area of the species was 1.5-2.0 ha. The community interest species Romanogobio albipinnatus was identified in the neighborhood of the Natura 2000 Site ROSCI0032 Cheile Rudariei. Processing of gross data has highlighted the fact that the ichthyocenosis conservation status at the site level was favorable and has a stable trend. Temporary or permanent hydrotechnical facilities without scientific approval represent the current and future anthropogenic pressure that may influence the conservation status of the community interest ichthyocenosis, but scientific queries have allowed the development of a package of conservation strategies found in the Management Plan of Natura 2000 Site ROSCI0032 Cheile Rudariei, approved by normative act.*

Keywords*: ichthyocenosis, fish, Natura 2000 Site, conservation, community, environment*

INTRODUCTION

After Romania's accession to the European Union, it assumed responsibility for the implementation of European legislative provisions in all areas, including environmental protection, which means, mainly for the aquatic environment, the implementation of the Habitats Directive (92/43 EEC) provisions, which concerns to the species and habitats of community interest conservation. According to Article 2 of the Habitats Directive, it is mandatory to maintain or restore to a favorable conservation status the species populations listed in Annexes II, IV and V. For this activity to be possible, it is first necessary to know the existing species and their current conservation status (BANATEAN-DUNEA I. et al, 2015).

Thereby, the inventory and monitoring of habitats and species of community interest has become a mandatory requirement as a Member State of the European Union.

Starting from the mandatory requirements of Romania, several national strategies were developed, including the Romania's National Strategy for Sustainable Development, which was and is supported by specific financing programs.

Natura 2000 ROSCI0032 Cheile Rudariei has been designated by the Environment and Sustainable Development Ministry Order no. 1964/2007 refers to the establishment of the protected natural areas rules for the community interest sites, as an integral part of the Natura 2000 European Ecological Network in Romania, modified and completed by the Environment and Forests Ministry Order no. 2387/2011.

Natura 2000 ROSCI0032 Cheile Rudariei has an area of 290.50 hectares and is located in the continental biogeographic region with the following coordinates: latitude 44.0134916, longitude 22.0079416. The Natura 2000 site is located in the territory of Caras-Severin County.

Cheile Rudariei is an integral part of the Almajului Mountains, which are a geological and morphological unit of the Banat Mountains (Order No. 1187/2016).

The name of Cheile Rudariei, it is actually an area from the Almajului mountain area, which overlaps with the watercourse of Rudaria Stream, where it flows from the mountainous area to the Depression of Almaj or Bozovici.

The boundary of the natural protected area can be traced along an irregular line joining a series of interfluves and peaks: from the Eftimie Murgu commune, the boundary climbs up the right slope of the gorges to the top (682 m) that dominates the steep from the Fața Guniștii, then further on the interfluve of the valley to the Peak Rudina Mare (826 m), then continue to nearby of Prislop Hill Peak (898 m), which it does not touch, then get down the valley below the previously mentioned peak to the Rudaria stream riverbed, continue about 1 km downstream along the riverbed, then climbs up the right slope below the Marinovacea Peak (857 m), then descend along the valley flowing under the Cioaca Mare Peak (Socoloțu) of 710 m., and on the gorge steepage sector the boundary climbs the left interfluve of the valley which follows until the entrance to the village of Eftimie Murgu where the SCI area closes (Order No. 1187/2016 approving the Management Plan of the Natural Reserve and the Natura 2000 Site ROSCI0032 Cheile Rudariei).

In 2011, the Natura 2000 Standard Form reveal a single fish species of community interest (*Barbus meridionalis*) on the Natura 2000 ROSCI0032 Cheile Rudariei. After approval of the Management Plan by Order no. 1187/2016 approving the Management Plan of the Natural Reserve and the Natura 2000 Site ROSCI0032 Cheile Rudariei, the Natura 2000 Standard Form of the Site was updated and modified (Table 1)

Table 1.

Natura 2000 Standard Form - ROSCI0032 Cheile Rudariei

Species		Population						Site			
Code	Scientific name	Type	Size		Unit of measure	Categ.	Quality of data	AIBICID	AIBIC		
			Min	Max		CIRIVIP		Pop.	Conserv	Isolation	Global
4123	*Eudontomyzon danfordi*	P	10	20	i	R	M	C	C	B	B
1138	*Barbus meridionalis*	P				P		D			
1163	*Cottus gobio*	P	1	9	i	C	G	A	B	C	B

The overall assessment of the conservation status in Romania has highlighted the fact that the conservation status is inadequate with an unknown trend for the species *Eudontomyzon danfordi* and *Barbus meridionalis*, and for the species *Cottus gobio* is favorable with an unknown trend (Table 2).

Table 2.

Overall assessment of conservation status in Romania
(MIHAILESCU S et al., 2015; http://bd.eionet.europa.eu/article17/reports2012/species/report/)

Eudontomyzon danfordi					
Bioregions / Parameter	Biogeographical regions				
	Alpine	Continental	Pannonian	Steppe	Pontic
Area (km^2)	U1/15.700	U1/9.600			
Population	U1	U1			
Habitat of the species	U1	U1			
Perspectives	U1	U1			
Barbus meridionalis					
Bioregions / Parameter	Biogeographical regions				
	Alpine	Continental	Pannonian	Steppe	Pontic
Area (km^2)	U1/54.500	FV/76.800	n/a	n/a	n/a
Population	U1	U1	n/a	n/a	n/a
Habitat of the species	U1	U1	n/a	n/a	n/a
Perspectives	U1	U1	n/a	n/a	n/a
Cottus gobio					
Bioregions / Parameter	Biogeographical regions				
	Alpine	Continental	Pannonian	Steppe	Pontic
Area (km^2)	FV/50.800	FV/81.100	n/a	n/a	n/a
Population	FV	FV	n/a	n/a	n/a
Habitat of the species	FV	FV	n/a	n/a	n/a
Perspectives	FV	FV	n/a	n/a	n/a

Interpretation: U1 - orange for „unfavorable-inadequate"; FV - green for „favorable".

At national level, species within the Natura 2000 site, *Eudontomyzon danfordi*, *Barbus meridionalis* and *Cottus gobio*, benefit from a national and regional conditions (Table 3).

Table 3.

Cyclostomes and community interest fish species in Romania (Banatean-Dunea I. et al, 2015)

Scientific name	Annex to the Habitats Directive / OUG 57/2007 amended and approved by the Law no. 49/2011 (OUG 57/2007)	Presence in the biogeographical region as O.M. 2387/2011				
		Alpine	Continental	Pannonian	Steppe	Pontic
Eudontomyzon danfordi	Annex II/ Annex 3	•	•			
Barbus meridionalis	Annex II, V/ Annex 3, 5a	•	•			
Cottus gobio	Annex II/ Annex 3	•	•			

The general objective of the scientific queries was the inventory and monitoring of the community interest ichtyofauna within the Natura 2000 ROSCI0032 site Cheile Rudariei in order to assess the conservation status.

MATERIAL AND METHODS

The working protocol for the inventory and monitoring of the community interest ichtyofauna within the Natura 2000 ROSCI0032 site Cheile Rudariei is described in Table 4.

Table 4.

Work protocol for the inventory and monitoring of community interest ichtyofauna

Natura 2000 Site:	ROSCI0032 Cheile Rudariei	
The aquatic ecosystem interrogated scientifically:	Rudaria (reophil aquatic ecosystem; stream)	
Biogeographic region of the Natura 2000 site:	Continental	
Method of ichtyofauna inventory and monitoring:	Active mechanism [SR EN 149662:2006]	Electric fishing [SR EN 14011:2003]
		Electric fishing going through the water
Post sampling activities:	A. Identification of all collected species, based on phenotypic characters. B. Somatic query of individuals. C. Sex determination/identification. D. Age determination. E. Marking of individuals (if applicable). F. Release of the collected individuals. G. Querying the perimeter where the sampling was made.	
Equipment:	(1) GPS; (2) laptop; (3) portable multiparameter; (4) electrofishing; (5) fishing ned; (6) ichtyometer; (7) camera	
Data processing:	Assessment the conservation status of a species in terms of its population, of the habitat of the species, of the future trends of the species, as well as assessing the overall condition was done differently, for each species concerned.	
Interpretation:	SINCRON thresholds	
Methodology for assessing the appropriate area of the habitat of the species in the protected natural area:	In order to determine the appropriate habitat of the species in the protected natural area, the following elements were considered: - the river sector within the area; - average river width / sampling point / sampling station; - average river depth / sampling point / sampling station.	
The period of scientific query:	Inventory: 2012/2014 Activity financed under the Environment Sectorial Operational Program 2007-2013 (ESOP)	
	Monitoring: 2014/2015 Activity financed under the Environment Sectorial Operational Program 2007-2013 (ESOP)	
Other informations:	Natura 2000 site ROSCI0032 Cheile Rudariei was integrated (2011-2015) into the Monitoring Plan for Cyclostomes and Fish of Community Interest	

RESULTS AND DISCUSSIONS

The results obtained within the scientific queries that had as a general objective the inventory and the monitoring of the community interest ichtyophauna within the Natura 2000 site ROSCI0032 Cheile Rudariei are presented in Table 5.

Table 5.

Results obtained from scientific queries

Barbus meridionalis			
MPSANP	5.000-10.000 i (class 6)	SHSANP	2-3 ha
SCPS	FV	SCHS	FV
TSCPS	0	TSCHS	0

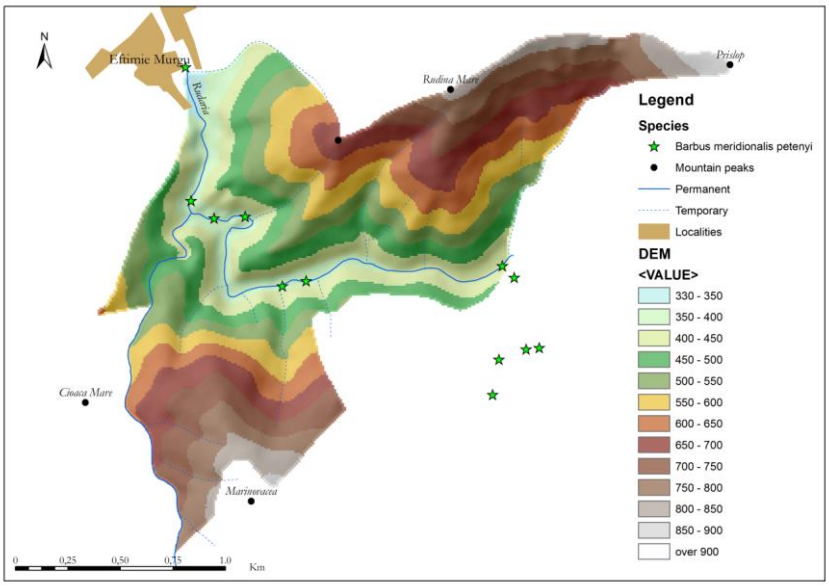

Fig. 1. Spatial distribution of *Barbus meridionalis* species

Eudontomyzon danfordi			
MPSANP	500-1.000 i (class 4)	SHSANP	0,5-1 ha
SCPS	FV	SCHS	FV
TSCPS	X	TSCHS	0

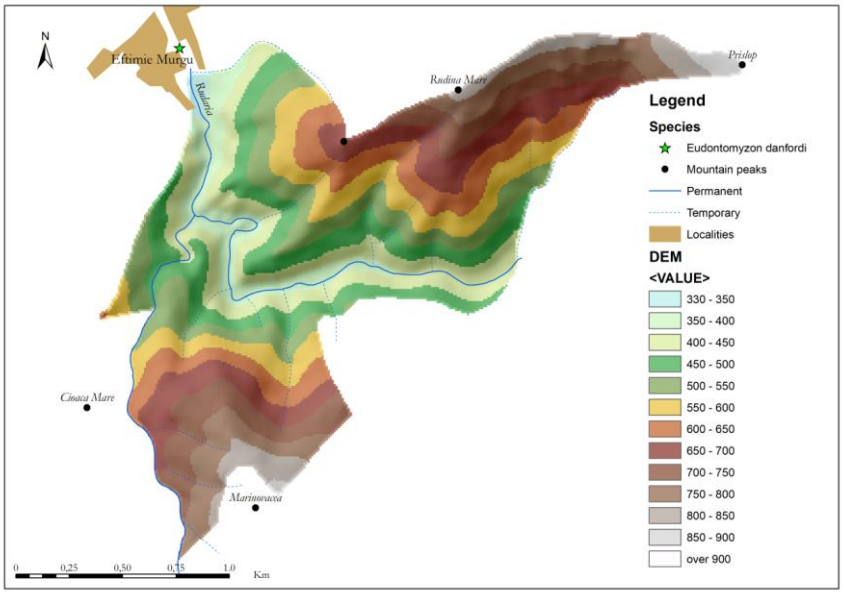

Fig. 2. Spatial distribution of *Eudontomyzon danfordi* species

Cottus gobio			
MPSANP	1.000-5.000 i (class 5)	SHSANP	1,5-2 ha
SCPS	FV	SCHS	FV
TSCPS	0	TSCHS	0

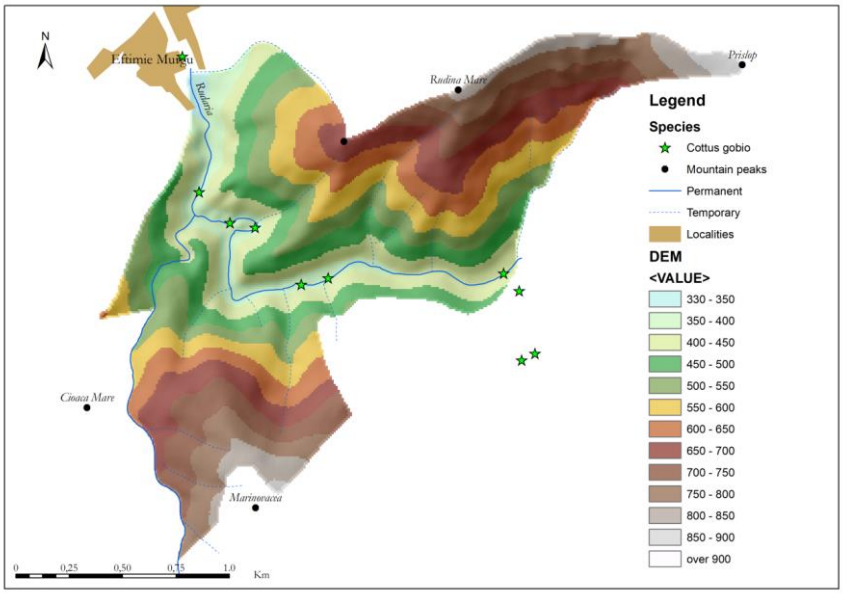

Fig. 3. Spatial distribution of *Cottus gobio* species

Gobio albipinnatus			
MPSANP	100-500 i (class 3)	SHSANP	0,1-0,5 ha
SCPS	FV	SCHS	FV
TSCPS	0	TSCHS	0

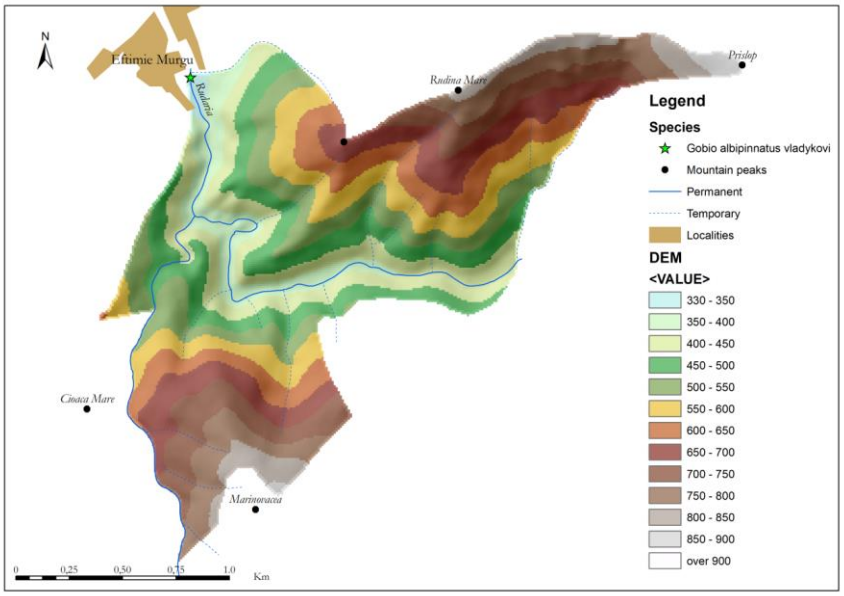

Fig. 4. Spatial distribution of *Gobio albipinnatus* species

Other species:	*Salmo trutta fario* *Phoxinus phoxinus* *Leuciscus cephalus* *Nemachilus barbatulus*

Assessing impacts caused by current pressures on the species	E03.01 - Storage of household waste / recreational waste	M
	H01 – Surface water pollution (limnic, groundwater, marine and, brackish water)	
	J03.02.01 - Artificial barriers that block the migration of nectonic species	

Interpretation: MPSANP - The size of the species population in the protected natural area; SCPS - Conservation status in terms of species population; TSCPS - Trend of conservation status in terms of species population; SHSANP - Surface of the habitat of the species in the protected natural area; SCHS - Conservation status in terms of habitat of the species; TSCHS - Trend of conservation status in terms of habitat of the species; i – individuals; FV – favorable; 0 – stable; X – unknown; ha – hectars; M – Localized average intensity of impacts caused by current pressures on the species.

CONCLUSIONS

The conservation status of community interest ichtyofauna within the Natura 2000 site ROSCI0032 Cheile Rudariei is favorable.

The specific habitats of feeding, reproduction and wintering are in a favorable conservation status.

Gobio albipinnatus species was not introduced into the Natura 2000 Site Standard Form even if it is a component of the Management Plan approved by Order no. 1187/2016 approving the Management Plan of the Natural Reserve and the Natura 2000 Site ROSCI0032 Cheile Rudariei.

Hydrotechnical arrangements represent a high risk of inbreeding for nectonic species within the Site.

Storage of domestic wastes near the aquatic ecosystem Rudaria is an anthropogenic pressure for all aquatic species within the site.

The content of this material does not necessarily represent the official position of the European Union or the Government of Romania

RECOMMENDATIONS

The introduction of the *Gobio albipinnatus* species into the Natura 2000 Standard Form ROSCI0032 Cheile Rudariei as this was identified both during the inventory period and during the monitoring period.

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