

SIGNS OF THE PRESENCE OF THE EURASIAN BEAVER (*Castor fiber*, Linnaeus, 1758) IN THE PRE-DELTAIC AREA OF ROMANIA

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Abstract

The beaver has a historical presence on Romania's territory. The European beaver is nicknamed the "engineer of ecosystems" for the ingenuity through which it builds a mosaic of habitats. In their habitats it stores water and, in the same time, does something more like expanding wetlands which are helpful for adapting to the climate change. Moreover, this herbivorous species has a long-term impact on the environment in which it lives, enriching the biodiversity of these habitats. The purpose of this manuscript is to update the information about the beaver populations in the pre-deltaic area of Romania. The information was collected during period 2019-2022, when we effectuated researches in weekly in the dig-mal flood zone of the Danube River, between Grindu locality and Tulcea city and in the area of the Somova-Parches aquatic complex. All the researches were done using the method of signs of presence, a methodology also approved by the IUCN working group. Finding signs of presence on other territories apart from the well known us, led us to the conclusion that the number of beavers in Danube's avandelta has expanded since it was reported in 2010 by occupying favourable habitats.

Key words: Danube's avandelta, Eurasian beaver, presence.

INTRODUCTION

The Anthropocene is the historical period we are currently living in, characterised by a phase of severe decline of biodiversity worldwide, mostly due to habitat loss and fragmentation, and biological invasions (Dirzo et al., 2014; Bellard et al., 2016, Mori et al., 2021). As a young region, in continuous formation and consolidation, the Danube Delta is the most suitable place for the development of a unique fauna in Europe.

Inside the Delta, several main ecosystems can be distinguished: flowing waters, stagnant waters, marshy and floodable surfaces, fluvial and maritime dykes. The areas of contact between fluvial and maritime waters constitute a special ecosystem called Avandelta.

For millions of years, beaver has been an integral part of the Danube basin fauna. This

rodent mammal loves to carry his life out in habitats like: the ones of freshwater, with woods all around, different types of canals maybe agriculture one or both areas suburban and urban. The Romanians known the beaver as the "breb", but more than that has also is nicknamed as "engineer of ecosystems". An important quality: ingenuity of building mosaic of natural surface, having the capability of retaining water and expanded a wetland, conducted to this nicknamed. This capability is very useful in the action condition like elonged droughts and the other changes because of the climate (<https://www.carpathia.org/ro/castorul-revine-in-sud-estul-muntilor-fagaras/>).

Beaver's introduction in a certain area must be preceded by a feasibility study because it's presence there can be helpful or unwanted by humans. The advantages can be: the shifts of

river dynamics, nutrient cycling, biodiversity, and human cultural experience while the disadvantages are associated damages caused to humans (Blewett et al., 2021).

After the disappears of this specie in the first part of 19th century from all the Romania and the most of the Europe, it became a strictly protected species. He disappeared for the same reasons: excessive hunting for fur and for the used castoreum in the perfume industry and habitat modification. Then, through some projects, the beaver was reintroduced almost in all countries.

Thus, in 2020, the majority of the beaver population in Europe was located in the central and eastern parts of the continent (Wrobel, 2020). According Pasca et al., 2018 the estimation is 2145-2250 exemplares.

In Romania, in the Somova-Parches complex, the presence of beavers was reported in 2010 on Parches Lake. During the last years, the beavers have been noticed along the Danube, downstream from the confluence with the Ialomița until the Danube Delta.

Via the trap's camera, the teams of WWF-Romania and Rewilding Europe have revealed to media images with beavers taken from Somova - Parches Complex.

Even in the Small Inland of Brăila was seen a family of beavers, this being the most recent reports. Thus, nowadays the beaver can be seen in Romania in places like rivers Olt, Mures, Ialomița and the Danube basin downstream of the confluence with the Ialomița and the Somova-Parches complex area of the Danube Delta.

MATERIALS AND METHODS

Research zone

The research zone contains: mainly of Isaccea-Tulcea floodplain, Somova - Parches aquatic complex and Danube River between Cotul Pisicii and Isaccea. Isaccea-Tulcea floodplain is located upstream of Tulcea.

Depending on the intensity and duration of the floods in the meadow, different lands and water categories are distinguished, floodable or non-floodable lands and water basins, some permanently with water, others temporary, which, with the decrease of the waters,

significantly reduce their surface and depth or sometimes it dries up completely.

The aquatic complex Somova-Parches is considered a mini delta of Romania, being located in a field on the right side of Danube, upstream to entrance in the Danube Delta. Its surface is 9170 ha and it is a proper habitat for a large number of species of animals. This complex consists of fishing resources of fresh water of the Danube Delta Biosphere Reserve.

All the channels and brooks have a length of 35.5 km. The most important lakes of the complex are: Rotundu (228 ha), Gorgonel (141 ha), Telincea (188 ha), Parches (196 ha), Somova (123 ha), Caslita (153 ha) and Somova (149 ha) (Burada, 2016; Popescu, 2022).

Methodology

Our investigations regarding European castor of aquatic complex Somova-Parches, Isaccea-Tulcea floodplain and Danube River between Cotul Pisicii and Isaccea were made between years 2019-2022.

We used the indirect monitoring method, based on the analysis of the traces left by the beaver in its living environment. Indirect methods allow not only the detection of the presence of species (in the case of rare ones), but also estimates of their abundance as well as obtaining data on various aspects of their biology or ecology (Ionescu et al., 2013). To respect the methodology, we effectuated transects of 1200 m, keeping the distance of 2 meters between them. For those too small habitats, we investigated the entire aquatic body.

RESULTS AND DISCUSSIONS

The monitoring of beavers in the Danube Delta, carried out by the WWF-Romania team and Rewilding Europe, in partnership with the Forestry Research and Development Institute (ICAS) Braşov, began in April 2014 at the recommendation of the Danube Delta Biosphere Reserve Administration (ARBDD). The reintroductions of the species, which were carried out in different parts of Europe, including Romania, as well as the rate of natural growth led to an increase in the number of individuals.

According to Ionescu et al. (2010), the exemplars of beavers from the repopulated Romania come from Germany and more precise from Bavaria. We remark a growth from 64 individuals to 217 individuals in Ialomita (Carpathian Foundation, 2014). Kiss et al. (2011) made a report to let us know that the population extended these territories: along the Danube, reaching the Danube Delta downstream.

Using the transect the team focused on finding: shelters, footprints, bites, beaver paths, territorial marking, or others. We starting the investigations in July 2019. We only presented the successfully transects.

The first observation of signs of beaver (inactive shelter) was identified on August 02, 2019.

As signs of inactivity, we highlight the covering of entrances with spontaneous vegetation, a sign that they are not used.

Almost one year after the first observation, in order to monitoring the shelter, on May 20, 2020, at the same coordinates, the shelter was damaged and the surrounding vegetation burned (Figure 3 A, B). The channel was transited by fishermen with motor boats, towards Telincea Lake. 2019, on the hill of Parches Lake (45°22'56" N 28°56'66" E) (Figure 1).



Figure 1. Inactive shelter of beaver (photo: Ibanescu)

Vegetation is crucial for the beaver's habitat (Bouroş et al., 2022).

The shelter was observed on a 1200 m transect with mixed vegetation: forest, shrubs and grassy vegetation (Figure 2).



Figure 2. Hill of canal shelter (photo: Popescu)



Figure 3A. Burned vegetation (photo: Cristescu)



Figure 3B. Burned vegetation (photo: Nica)

On November 11, 2020, on a transect carried out on the channel bed (beginning: 45 ° 22'87" N, 28 56 ° 73'75" E; ending: 45 ° 23'89" N, 28 ° 56'89" E), a large entrance to the shore was identified, at the coordinates: 45 ° 22'92" N/ 28 ° 56'65" E (Figure 4).



Figure 4. Large entrance to the shore (photo: Ibanescu)

The next observations were done in July, 16, 2021, on a transect carried out by boat on Parches Lake.

Following the visual investigation of the banks and the monitoring of the above-ground beaver shelter, fresh cracks were observed around the shelter (Figure 5), willow branches with a diameter of 2-3 cm and 5-6 cm (Figure 6A and 6B).



Figure 5. Active shelter of beaver (photo: Cristescu)



Figure 6A. Fresh rosacea (photo: Popescu)



Figure 6B. Beaver rosacea (photo: Nica)

On 17.12.2021 we carried out a new transect at the beaver shelter, on the canal connecting Parcheş and Telincea, coordinates; transect start: 45°23'05" N/ 28°57' 58" E; end of transect: 45°23'25"/28°56'60". Its condition was good, the shelter was rebuilt, height approximately 1.5 m, diameter 4 m (branches, plant debris were added); you can see willow branches with recent traces of frostbite.

Willow twigs and stumps with old rots, willow twigs (diameter = 10-20 cm) and willow stumps with very fresh rots, willow trunks (3 willows) with very fresh rots were found (Figure 7).



Figure 7. Willow trunk with rodents (photo: Nica)

All branches, stumps and gnawed trunks were found at the following coordinates: 45°23'04" N / 28°57'57"; 45°23'04" N / 28°57'55" E ; 45°23'05"/ 28°57'54" E; 45°23'01" N /28°57'49" E; 45°23'01" N /28°57'53" E; 45°23'00" N / 28°57'49" E; 45°23'01"N / 28°57'50" E; 45°22'99" / 28°57'47" E.

On 22.02.2022, new signs of the presence of the beaver were found at the coordinates: 45 ° 44'86" N / 28 ° 20'36" E (Figure 8).

The habitat investigated is presented in Figure 9.

Observations: the beam was full of branches with different fresh spines, branches of different diameters, a red willow trunk, with a diameter of approximately 30 cm (Figure 10).



Figure 8. Beaver rosacea (Photo: Cristescu)



Figure 9. Investigated habitat (Photo: Popescu)



Figure 10. Branches of different diameters (photo: Ibanescu)

Also, branches with rotten bark were found (Figure 11).

So, the beaver family passed the winter well.

Coordinates:

- 45 ° 23'03" N / 28 ° 57'53";
- 45 ° 23'03" N / 28 ° 57'55" E;
- 45 ° 23'02" N / 28 ° 57'53" E;
- 45 ° 23'00" N / 28 ° 57'49" E;
- 45 ° 22'95" N / 28 ° 57'37" E.



Figure 11. Branches with rotten bark (photo: Cristescu)

On 28.04.2022, a transect was carried out on the gravel between the Ivanova channel and Corciovata Mică lake, where the habitat is optimal for the *Castor fiber* species, with mixed vegetation, predominating shrubs.

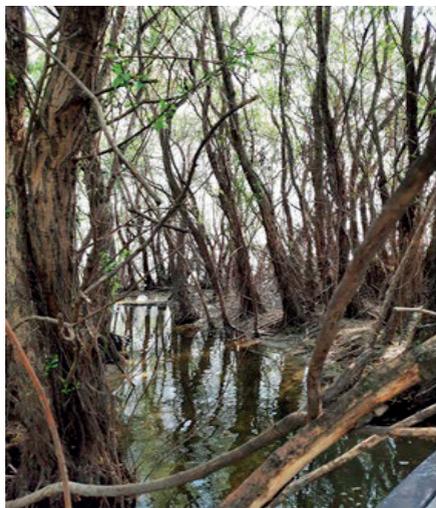


Figure 12. A ditch built by beavers

Figure 13 highlights the places where we found indisputable signs of the presence of the Eurasian beaver.



Figure 13. The coordinates of signs of beaver presence

CONCLUSIONS

The reintroductions played an important role in restoring the beaver population in Romania. Beaver gradually returns to the area, from which he was thoroughly eliminated away by people's selfishness.

The discovery of new territories occupied by the Eurasian beaver demonstrates that the beaver population in Danube's avandelta has expanded since it was reported in 2010 by occupying favorable habitats.

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