

Contributions to knowledge of the otter (*Lutra lutra*) in the Rodna Mountains National Park and Natura 2000 Site (ROSCI0125)

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Abstract

Studiul a constatat în evaluarea efectivelor și a distribuției vidrei (*Lutra lutra*) în Parcul Național Munții Rodnei pe baza transectelor desfășurate în perioada 2004-2017. Prezența vidrei reflectă păstrarea calității apei din habitatele investigate și păstrarea stocurilor de pește în cursurile de apă observate.

Accidentele rutiere rămân o cauză a mortalității non-naturale a vidrei, alături de braconajul ca urmare a pagubelor create prin pătrunderea în numeroasele ferme piscicole existente în Valea Anieşului, Valea Cormaia, Valea Parva, Valea Vinului.

Suprafața luată în calcul este reprezentată de 14 văi montane cu o lungime fiecare de circa 20 km și o lățime de 0,5 km, respectiv un total de 140 km². Dacă luăm în calcul prezența medie a 34 vidre, va rezulta o densitate de 0,24 indivizi/km². Un mascul de vidră poate utiliza între 20-40 km sector de vale, pâraie asociate, bazine acvatice, iar femelele au un teritoriu mai mic cuprins între 1-20 km.

Introduction

The Rodna Mountains (ROSCI0125 code of Natura 2000 site) is located in the alpine biogeographic region of Rodna Mountains. The site's surface is 48.062 ha, with an altitude ranging from 595 to 2.303 m (Standard Form of the Natura 2000 site), with a medium altitude of 1.424 meters (fig. 1). Administratively, 20% of the site is located in Maramureș County and 80% in Bistrița-Năsăud County (<http://biodiversitate.mmediu.ro/rio/natura2000>).

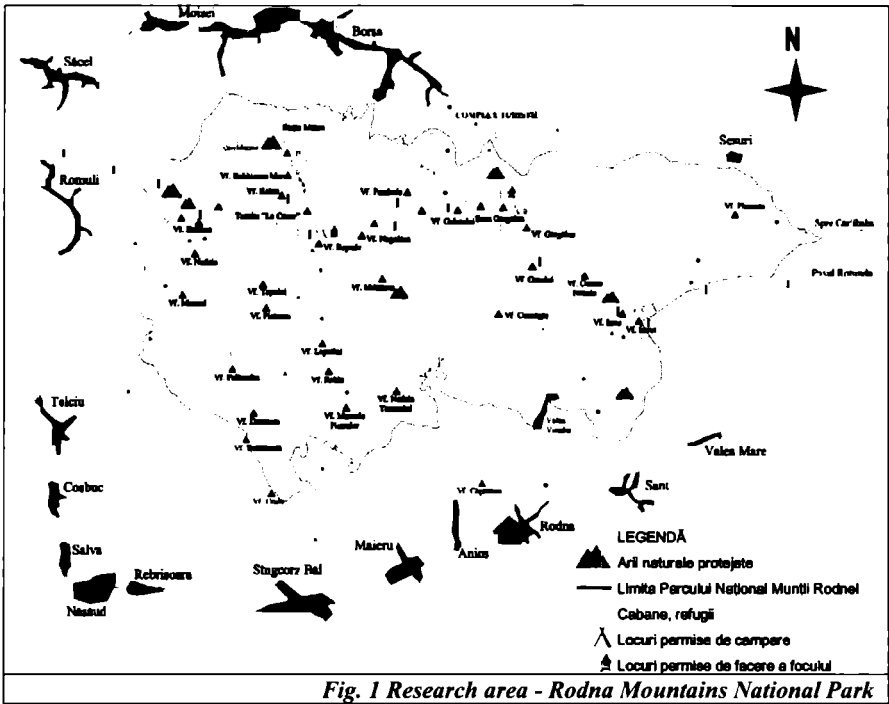


Fig. 1 Research area - Rodna Mountains National Park

The Eurasian otter (*Lutra lutra*), listed in Annex II of the Habitats Directive, used to be widespread throughout Europe (Chanin, 1985, Mason&Macdonald 1986). It is an umbrella species for freshwater ecosystems and, with its charismatic image, plays an important role as a flagship species in protection of other freshwater species. However, today, its distribution is scarce as a result of pollution and habitat loss.

The decrease in populations in the 1960s and the 1970s was probably caused by the cumulative effects of toxic chemicals (e.g. DDT), hunting and loss of habitat. Assessment of the otter populations from the 1990s showed a general recovery in Europe (Conroy&Chanin, 2002, Reuther, 2002) which is believed to be due to e.g. active and passive protection, general improvement and rehabilitation of wetlands, and a decrease in environmental pollutants.

However, the population recovery coincided with a resume of the species persecution, due to real or suspected damage caused by otters (Kranz, 2000, Reuther 2002) mainly in Central Eastern Europe after privatization of fish ponds during that decade. The treatments of fish ponds are getting more and more intensive, which also contributes to this problem (Gyalog et al, 2011).

Since the presence of the otter as one of the top predators indicates a healthy environment (McDonald&Duplax, 1983), the conservation of otter populations might be extrapolated to the elimination of concerns about environmental issues in relation to the well-being of humankind.

Understanding the relationship between the status of otter populations and environmental deterioration through man-made activities requires an understanding of the environmental biology of otters, including their distribution, feeding habits, and reproduction, if their conservation or restoration is intended (DEFRA, 2001).

The presence of the otter is closely related to the existence of food resources. In Romania, the otter is widespread throughout the country, especially in the lakes and valleys of large waters (Brehm, 1964). The existence of fish-rich places attracts the otter up to the mountain, over 1,500 meters, around the trout streams. Sometimes, in search of favorable places, the water falls over the ridge of the mountains.

The main assortment of otter food is the fish of all shapes and sizes, for it also dares to attack large fish which, after being taken away, pulls it on the shore, depositing it in a particular place under a stone or a log, where it can hold him for a long time, then he only eats the good parts of it. Outside of the fish, the otter is eaten by crayfish, amphibians, snails, birds, and water mice (Manolache 1977 et al.).

In Romania, the otter has demonstrated a great ecological flexibility, occupying a vast distribution area, from sea level to the subalpine, at 1.700 meters altitude (Georgescu, 1994).

Materials și methods

The assessment and monitoring of the otter (*Lutra lutra*) is generally based on the identification of excrements, traces, anal jelly or other signs indicating the presence of the species. The otter, being an aquatic mammal, visits wetlands and riparian habitats. That is why the presence signs left by the otter are searched in these preferred damp wet areas.

The front and rear labels printed by the otter on surfaces with mud, mud, sand or snow can be seen on the banks of the water. Depending on the size of the traces, one can recognize the age and gender of the individual as follows: <5.0 cm - juvenile, 6.0-7.0 cm - adult female, > 7.0 cm - adult male (Ottino and Giller, 2004).

The otter trails can be observed throughout the year, both in the snow and in the autumn, in the summer and spring on the banks of sand, fine gravel, mud or river mud. The easiest to identify in an otter-populated habitat is the excrement because it is kept for a long time in the areal, in periods without precipitation. Depending on the study period, the content and form of the excrement varies, which is due to the diet that varies from one season to another. The otter leaves contain mostly bones and vertebrae of fish and amphibians but also remains of snails, coleopterus, mice can be identified (Risto et al., 2007).

Throughout their range in Europe the diet of otters in fresh water is dominated by fish. Amphibia and crayfish may also form a significant proportion of the diet in some areas, although their significance varies seasonally, crayfish being taken mainly in summer and frogs usually in winter and spring.

Most of the excrements are found under bridges, on stony stones, on promontories, mounds, concrete walls, and can easily be recognized by the content of fish bones, amphibians and the strong smell of fish (Mason & MacDonald, 1986).

Excrements are also used to mark the territory, but for that purpose the otter is more marked with an anal jelly, easily recognizable as it does not contain vertebrates or debris from the prey. In general, the otters are true to the sites of defecation, so in certain points true latrines are formed (Chanin, 2003).

During daily activities, the otter may leave other signs of presence in a particular area. In particular, the otter is predominantly used to breed the breeding sites for amphibians, while they are piling up, so dozens of amphibian remains are placed on the edges of these ponds. Throughout the year we can observe the carcasses on the banks of the water, the author of these signs being still otter (Dulfer et al, 1998).

In winter the traces left by the otter and its tail can be observed, and when the snow is higher, there are true snow ditches, otter-produced, sliding on the snow. Also in winter, tunnels under snow and small ice holes can be observed, used to feed food, ice hunting (Garcia-Diaz et al, 2010).

The otters are easy to spot because of the latrines near them, usually they are dug in the banks strongly attached to the roots of the trees. The prisons usually have two entrances, one air and one underwater (Tumanov, 1998).

In the area used for otter can be observed in areas with large and dense grass, small color, in the form of a tunnel, which are used by the otter. Also in these areas we can see places used by the otter to dry their fur and for rest, usually they are devoid of vegetation and have a sandy substrate (Ionescu, 1994).

The otter is an animal with nocturnal and auroral activity. When he lacks food, he moves a lot, away from the water, and can cross the mountain over the water, from one river basin to another.

In the case of otter monitoring, direct observations and trace analysis are sufficient. Generally, it is preferable to estimate the size of populations of protected carnivorous species at the end of winter or early spring, when mortality due to extreme cold season conditions is considered to have ended. In this way, the minimum size of the population of the species is estimated, avoiding over-evaluation. The direct observation method can be applied by staying in observation points using binoculars, telescopes or other optical

instruments necessary to identify the species and individuals. Devices that make it possible to shoot and / or shoot individuals at predetermined points at night by self-timer can be used.

The tracking and tracking method was applied at the end of winter or early spring. This action has good results if it runs seriously, and gives a good image of the "mother". Reporting the density of otter populations can be expressed by (Chanin, 2003) the number of individuals per kilometer.

Results and discussions

The aquatic habitats occupied by otters and investigated during 2004-2017 in the Rodna Mountains National Park are extremely vulnerable to human-induced changes. A noted threat is the fragmentation of habitats by transport networks, causing numerous traffic accidents, resulting in the death of otter specimens, which collided with the means of transport, as found in the Valley of Anieș, Vinului, Cormaia.

Poaching is a major threat, the species is not braced for its hunting importance, but for the damage it produces to the owners of fish farms in the Cormaia area, Valea Anieșului.

Canalization of rivers, removal of vegetation from the banks, construction of dams and micro-hydropower plants, drainage of wetlands, fish farming and aquaculture activities and other impacts associated with human activities on aquatic ecosystems are unfavorable for otter populations.

The otter is a species strictly protected under international law and different conventions. It is listed in Annex I of CITES, Annex II of the Berne Convention, Annexes II and IV of the Habitats and Species Directives of the European Union and Annex I of the Bonn Convention (Convention on the Conservation of Wild Animal Migratory Species (CMS), which recommends the highest degree of protection.

Otters require clean rivers with an abundant, varied supply of food and plenty of bank-side vegetation offering secluded sites for their holts. Riversides often lack the appropriate cover for otters to lie up during the day. Such areas can be made more attractive to otters by establishing "otter havens", where river banks are planted-up and kept free from human disturbance. Marshes may also be very important habitat, for raising young and as a source of frogs (Madson&Prang, 2001).

As a result of the field observations carried out during 2004-2017, there were identified traces (pits or pisces), leaves, "jellies" or undigested debris in which the bones of fish and amphibians were distinguished, on the basis of which the map distribution of the otter at the Rodna Mountains National Park (Figure 2).

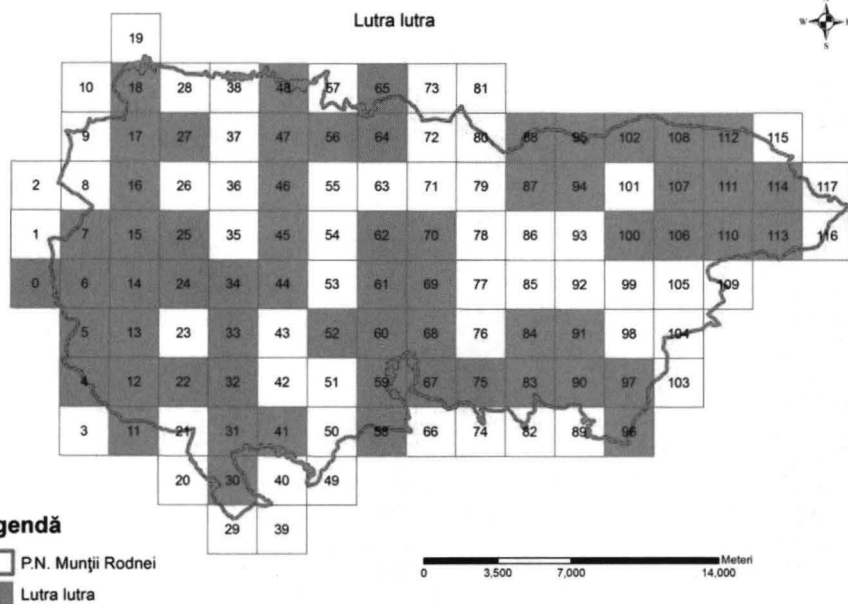


Fig. 2 Habitats of otter presence in the Rodna Mountains National Park

Field campaigns along the bedside from upstream to downstream have led to the identification of areas where otter activity is evident (Figure 2). In these areas, the traces of otter activity were reported on a length of about 8-9 km from a mountain valley, with a more intense nucleus of 4-6 km. Approximately 34 individuals are estimated to be present in the investigated area (Figure 3).

Eurasian otter abundance and distribution are related to a complex of environmental factors such as food availability, water quality, presence of riparian vegetation, human disturbance, etc. Habitats which sustain otter populations may be very diverse; however, all of them are characterized by the carrying capacity which enables foraging and breeding. Unfortunately, estimation of the quality of environmental parameters sufficient for existence of otter populations is difficult, the more so as riparian habitats often compose complicated system including more or less degraded patches. In general, unpolluted and unregulated rivers with well-preserved riparian vegetation along the banks offering various shelters are considered to be optimal otter habitats (Romanovski et al., 2013).



Fig. 3 Otter from Anieș Vallez (Rodna Mountains National Park), Photo: Claudiu Iușan

Conclusions

Only little is known worldwide about the numbers or densities of otters. Techniques for estimating the size of populations of otters are difficult to use and time consuming. A basic field survey method for estimating the presence of otters is based on counts and observations of spraints and footprints on riverbanks. Although all the currently used methods are difficult to use and time consuming, the monitoring of otter populations is very important for the purposes of conservation and management. For the countries belonging to the European Union, it is a legal duty to collect data on the distribution and population trends of threatened species such as the otter (Habitat Directive; 92/43/EEC, 1992). The otter is listed in appendices II and IV in the list of Interested Species of Community.

The study consisted in evaluation of the population and distribution of the otter (*Lutra lutra*) in the Rodna Mountains National Park based on the transects carried out during 2004-2017. The presence of the otter reflects the preservation of the water quality of the investigated habitats and the keeping of the fish stocks in the observed water courses.

Road accidents remain a cause of non-natural mortality of the otter, along with poaching as a result of the damage caused by the penetration of the

numerous existing fish farms in Anieș Valley, Cormaia Valley, Parva Valley, Vinului Valley.

The area taken into account is 14 mountain valleys each with a length of about 20 km and a width of 0,5 km and a total of 140 km² respectively. Taking into account the average presence of 34 otters, a density of 0,24 individuals/km² will result. A male otter male uses between 20-40 km of valley sector, associated river, aquatic basins, and females have a smaller territory of between 1-20 km.

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