

## REPORT

### DISTRIBUTION OF THE EURASIAN OTTER (*Lutra lutra*) IN THE REPUBLIC OF MACEDONIA IN 2007

Lukáš POLEDNÍK<sup>1\*</sup>, Kateřina POLEDNÍKOVÁ<sup>1</sup>, Václav BERAN<sup>1,2,3</sup>,  
Jitka THELENOVÁ<sup>4</sup>, Martin VALÁŠEK<sup>5</sup>, Václav PRÁŠEK<sup>2</sup>,  
Vlasta ŠKORPÍKOVÁ<sup>6</sup>, Mojmír DOSTÁL<sup>7</sup>

<sup>1</sup> ALKA Wildlife, o.p.s., Liděřovice 62, 38001 Dačice, Czech Republic; [polednici@centrum.cz](mailto:polednici@centrum.cz)

<sup>2</sup> Moravian museum, Department of Zoology, Zelný Trh 6, 65937 Brno, Czech Republic

<sup>3</sup> Museum Ústí nad Labem, Masarykova 3/1000, 40001 Ústí nad Labem, Czech Republic

<sup>4</sup> PLA Jizerské hory, U jezu 10, 460 01 Liberec, Czech Republic

<sup>5</sup> Podyjí National Park Administration, Na Vyhlídce 5, 669 01 Znojmo, Czech Republic

<sup>6</sup> Lukov 44, 669 02 Lukov, Czech Republic

<sup>7</sup> Ostrovní 16, 335 61 Spálené Poříčí, Czech Republic

\*corresponding author



(received 13<sup>th</sup> July 2008, accepted 29<sup>th</sup> October 2008)

**Abstract:** The distribution survey of Eurasian Otter (*Lutra lutra* L.) in the Republic of Macedonia was carried out in spring 2007 by searching for otter signs. During the survey 36 sites, spaced out over the whole territory of the country, were controlled. Totally 70% of points surveyed were positive and the majority of the country appears occupied by otter. Two bigger areas show low or no otter occurrence: the upper part of the Crna River catchment seems to be unoccupied by otter and the catchment of the Strumica River shows low site occupancy. The gaps in the occurrence of otter are probably connected with pollution – industrial (the Kriva Lakavica River) and agricultural (the Crna River, the Strumica River). Nothing can be said about population trends, because there are no historical data available.

**Keywords:** Eurasian otter, distribution, survey, Macedonia, Balkan

## INTRODUCTION

Until 1991 the territory of the Republic of Macedonia was part of Yugoslavia and otter was assumed as widespread there (Foster-Turley et al., 1990). However, the atlas of Mammals in Europe (Mitchell-Jones et al., 1999) shows a gap in distribution respectively knowledge just in the area of the Republic of Macedonia. In 2002 Micevski and in 2003 Petkovski published a few records of otter presence in Macedonia (Figure 3). Up to now, no systematic survey was carried out. Our investigation summarises records from a trip throughout the country in spring 2007. They cast some light on the situation of otters in that country and may be useful for future surveys and conservation efforts. Moreover due to the central position of Macedonia in the Balkan Peninsula and its hydrographical properties (see below) the otter population there may play important role in connecting the Balkan populations.

## STUDY AREA

The Republic of Macedonia is located in the central part of Balkan Peninsula (Figure 1), it covers about 26 000 km<sup>2</sup> and holds about 2,000.000 people (79 persons per km<sup>2</sup>), a figure comparable with the population density e.g. in Austria. The west and the east of the country are mountainous whereas the rest are lowlands. The River Vardar has a catchment area, which covers about 80% of the country. It drains to the Aegean Sea in Greece. The River Cerni Drim holds 13% of the catchment areas of Macedonia. It drains from the Šara-Pindus mountain range (highest peak of 2748 m) to the Adriatic Sea in Albania. The River Strumica (catchment area 7%) is located in the south east of the country and rains to the Aegean Sea. Apart from these rivers, there are three big natural lakes (Ohrid (348 km<sup>2</sup>), Prespa (285 km<sup>2</sup>) and Dojran (43 km<sup>2</sup>) and several reservoirs which might serve as otter habitat.



Figure 1: The location of the Republic of Macedonia within Europe.

## METHOD

The survey was carried out in spring 2007 by searching for indirect signs of otters (tracks, spraints). Signs were searched in chosen points distributed through the country so that all main river basins were covered. The survey was conducted within the whole territory of Macedonia (Figure 2). However the density of checked points was not very high and they were not evenly distributed. Thus for example data from the downstream part of the River Crni Drim catchment are missing. Preferably points were located under bridges and no additional stretch of bank was checked. However in some areas no bridges were available, therefore approximately 600 m long stretches of bank of a water body were surveyed instead a single point. Only presence or absence of any otter sign (track or spraint) were recorded. The site was considered as a “positive” when at least a single otter sign was found and “negative” when no otter sign was found.

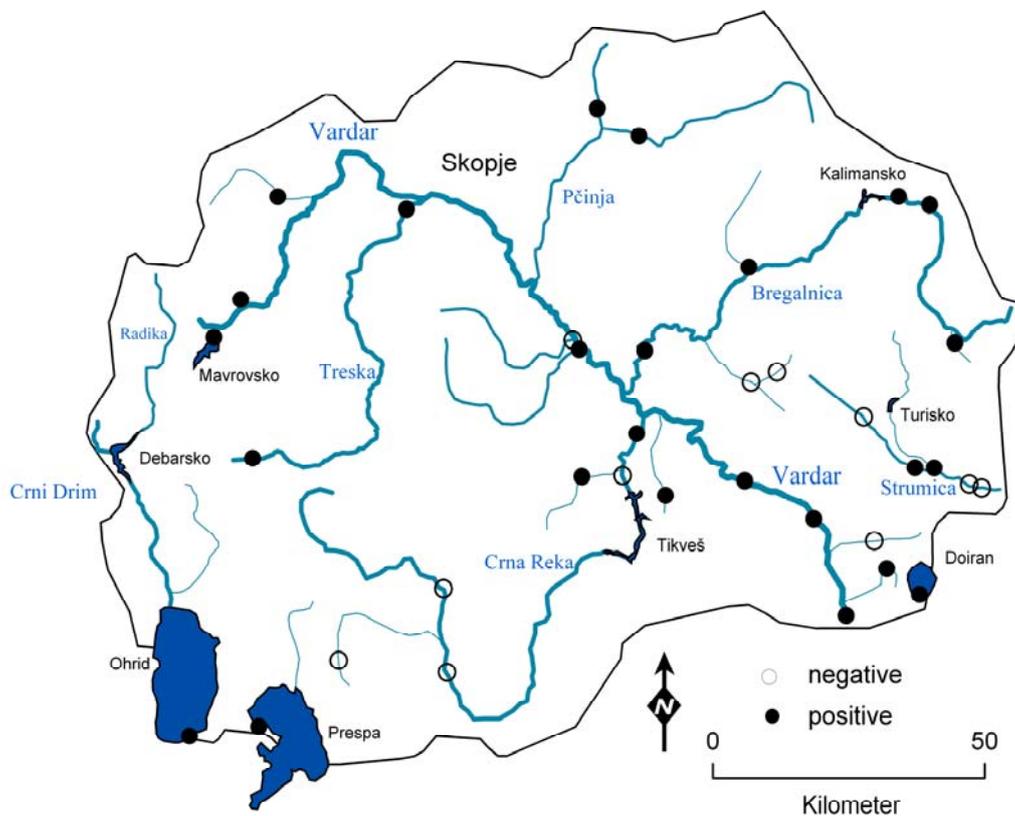


Figure 2. Result of the present otter survey in the Republic of Macedonia with marked records of otter presence or absence; black circle = otter positive in 2007; white circle = otter negative in 2007.

Overall, 36 sites were checked for presence of otter signs during the survey (Table 1). In total, 28 suitable bridges, four rivers' stretches and four places located along the coast of large lakes were surveyed.

## RESULTS

Totally 70% sites were positive and the otter occupies the vast majority of the territory of Macedonia surveyed (Figure 2, Table 1).

Table 1. Overview of points checked for presence of otter signs during the survey

Point	UTM square	Date	Bridge/stretch	Water body	Description	Otter sign presence
1	34TEM3		Stretch	Pčinja River	Upstream of Vojnik	Pos
2	34TEM3		Stretch	Kriva River	Close to Dimonce	Pos
3	34TEM4	27.5.2007	Stretch	Bregalnica River	Downstream of Creška	Pos
4	34TDL4	29.5.2007	Stretch	Ohrid Lake	Sveti Naum	Pos
5	34TDL4	29.5.2007	Stretch	Prespa Lake	Stenje	Pos
6	34TEL2	30.5.2007	Bridge	Šemnica River	Kažani	Neg
7	34TEL2	30.5.2007	Bridge	Crna River	Road Bitola-Novaci	Neg
8	34TEL1	30.5.2007	Bridge	Crna River	Road 106	Neg
9	34TEL3	30.5.2007	Bridge	Raec Stream	Upstream of Raec	Pos
10	34TEL3	30.5.2007	Bridge	Crna River	Vozarci	Neg
11	34TEL3	30.5.2007	Bridge	<i>Tributary of Vardar</i>	Upstream of Vataša	Pos
12	34TEL3	31.5.2007	Bridge	Crna River	Rosoman: Road 108	Pos
13	34TFL1	31.5.2007	Bridge	Bošavica River	Demir Kapija: road 103	Pos
14	34TFL1	31.5.2007	Bridge	Vardar River	Davidovo	Pos
15	34TFL1	31.5.2007	Bridge	Anska River	Road 604	Neg
16	34TFL1	1.6.2007	Stretch	Dojran Lake	Stari Dojran	Pos
17	34TFL1	1.6.2007	Bridge	<i>Tributary of Vardar</i>	Crničani: road 111	Pos
18	34TFL1	1.6.2007	Bridge	Vardar River	Gevgelija: road 111	Pos
19	34TFL3	2.6.2007	Bridge	Strumica River	Mokrino	Neg
20	34TFL3	2.6.2007	Bridge	Strumica River	Smolari	Neg
21	34TFL3	2.6.2007	Bridge	<i>Tributary of Strumica</i>	Turnovo: road M6	Pos
22	34TFL1	2.6.2007	Bridge	Strumica River	Bosilovo: road M6	Pos
23	34TFL1	2.6.2007	Bridge	Strumica River	Zleovo	Neg
24	34TFM2	2.6.2007	Bridge	Kriva Lakavica River	Goračino: road 107	Neg
25	34TFM2	2.6.2007	Bridge	<i>Tributary of Kriva Lakavica</i>	Topolnica: road M6	Neg
26	34TFM4	3.6.2007	Bridge	<i>Tributary of Bregalnica</i>	Ratevo: road 523	Pos
27	34TFM2	3.6.2007	Bridge	Bregalnica River	Delčevo	Pos
28	34TFM1	3.6.2007	Bridge	Bregalnica River	Bigla: road M5	Pos
29	34TFM2	3.6.2007	Bridge	Zletovska River	Ularci: road M5	Pos
30	34TEM4	4.6.2007	Bridge	Babuna River	Veles: road 103	Pos
31	34TEM4	4.6.2007	Stretch	Topolka River	Veles: road 103	Neg
32	34TEM2	4.6.2007	Bridge	Treska River	Glumovo	Pos
33	34TDM4	4.6.2007	Bridge	Vardar River	Gostivar: E65	Pos
34	34TDM4	4.6.2007	Stretch	Mavrov Lake	Leunovo	Pos
35	34TDL3	4.6.2007	Bridge	Treska River	Kičevo: road 416	Pos
36	34TDM4	4.6.2007	Bridge	Tetovska stream	Tetovo: road E65	Pos

Most of the surveyed sites were positive in the River Vardar valley (83%, n=12 points), and the sites on the main tributaries the Bregalnica River (67%, n=6), the Pčinja River (100%, n=2) and the Treska River (100%, n=2) too. Also all three sites checked on main lakes in the Macedonia (Ohrid, Prespa, Dojran) were positive.

However two important areas have showed no or low otter site occupancy. The first area is situated in upper part of the Crna River catchment and it seems to be

unoccupied by otter. However only three points were checked in a relatively big area, thus the presence of otter cannot be excluded. Low occurrence of otters has been recorded also in the catchment of the Strumica River, the possible connection to rivers in Bulgaria. Both areas are intensively used for agricultural purposes and heavy pollution of the rivers by intensive farming can explain this fact. Indeed these parts of the rivers are considered as waters that may be used in their natural condition only for irrigation purposes and, after applying common processing methods (conditioning) with industries that do not need waters of drinking quality (class III) or as waters that may be used for other purposes only after appropriate conditioning (class IV) (State of Environment Report, Republic of Macedonia 2000). Another small area unoccupied by otter was found on the Kriva Lakavica River, which is obviously connected with heavy industrial pollution of the stream from a nearby copper mine.

## DISCUSSION

Otters are currently occupying most of the country, however in the south and southeast there are areas with low or no otter population.

Due to the lack of information from previous years it is not possible to infer an otter population trend in Macedonia. According to Foster-Turley (1990), otters were widespread in the former Yugoslavia. However the distribution map of Mitchell-Jones et al. (1999) shows a big gap in the knowledge of distribution just in the area of the Republic of Macedonia. In the distributional review for otter in former Yugoslavia done by Liles and Jenkins (1984), no record of otter presence for the Republic of Macedonia was mentioned. Such a gap could result from no otter population or no survey. All published records summarized by Micevski (2002) and Kryštufek and Petkovski (2003) come from the areas where otters was also recorded by the present survey. See Figure 3 for a summary.

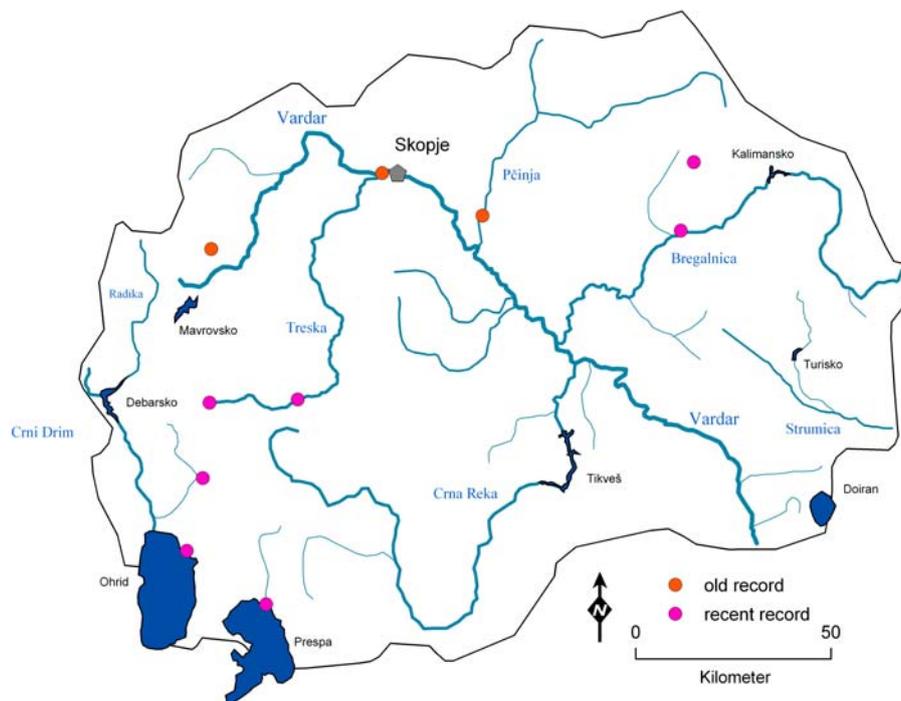


Figure 3. Summary of published records of occurrence of Eurasian otter in Macedonia; orange circle = old records (1949 up to 1990) of otter presence; pink circle = recent records (since 1990); according to Kryštufek and Petkovski 2003 and Micevski 2002.

Based on the available data it is also difficult to infer about the relationship of otter populations in Macedonia and in neighboring countries. There is a lack of recent information about the distribution and trend of otter populations not only in Macedonia, but in the whole Balkan Peninsula, and older distribution data often come from different sources (surveys, questionnaires). Otters were proved to be a common species in Albania, Bulgaria, Greece and former Yugoslavia, but no new publications on the species from this area could be found (summary in Ruiz-Olmo, 2007).

During a survey in Albania (Prigioni et al., 1986), otters were widespread in much of the country (55% of points were positive), and presumably healthy populations were localised in rivers and marshes in the north-west and in the south. However the authors did not survey the upper part of the River Drim catchment coming from Macedonia.

In the 1980s, western Greece was stated to hold a good otter population (Gaethlich, 1988) and otters were also widespread in the east of the country (Macdonald and Mason, 1985). A decade ago up to 72% of sites were found positive in the area of Prespa Lakes on the Greece side (Urban, 1998). However, in the middle north of Greece in Axios (Vardar) and Aliakmon catchments, the area adjacent to Macedonia, otters were scarce (Macdonald and Mason, 1985).

In the eastern part of Bulgaria in the Struma river catchment, which is adjacent to Macedonia, the otter population was believed to be low or non-existent (Spiridonov and Spassov, 1989). This could correspond with many negative survey points on the Strumica River in Macedonia, which belongs to the Struma river catchment. A recent survey of the otter population was done only in the middle south and southeast of Bulgaria (Georgiev 2005).

In the early 1990s, the otter population in Serbia was considered stable and otters probably occurred throughout the whole country (Paunovic and Milenkovic, 1996). However the data from areas just adjacent to Macedonia are missing. In addition, it should be kept in mind by the end of the 1990s, Serbia was at war and many factories including oil refineries were destroyed and may have caused severe water pollution with serious impacts on otters.

## **CONCLUSION**

It is clear that the otter population in Macedonia has good connections to otters in Albania, part of Greece and probably Serbia. Moreover the Macedonian population can be seen as good source population for re-colonizing the lower parts of river Vardar (Axios), which in Greece is showing low occupancy. The most critical situation is in the east of the country, where the population on both side of the border (Macedonia, Bulgaria) is low and further decrease could lead to a fragmentation with the Bulgarian population.

**Acknowledgement** - We thank to Dilian Georgiev for providing us information on otter in Bulgaria and to Andreas Kranz for his valuable comments on a draft of the manuscript.

## **REFERENCES**

**Foster-Turley, P., Macdonald, S. and Mason, C.F. (1990).** Otters - An action plan for their conservation. An IUCN publication, pp. 62.

- Gaethlich, M. (1988).** Otters in western Greece and Corfu. *IUCN OSG Bull.* **3**, 17-23.
- Georgiev, D.G. (2005).** Habitats of the otter (*Lutra lutra* L.) in some regions of Southern Bulgaria. *IUCN OSG Bull.* **22**, 6-13.
- Kryštufek, B. and Petkovski, S. (2003).** Annotated Checklist of the Mammals of the Republic of Macedonia. *Bonner zoologische Beiträge* **51**, 229-254.
- Liles, G. and Jenkins, L. (1984).** A field survey for otters (*Lutra lutra*) in Yugoslavia. *J. Zool., London* **203**, 282-284.
- Macdonald, S.M. and Mason, C.F. (1985).** Otters, their habitat and conservation in north east Greece. *Biol. Cons.* **31**, 191-210.
- Micevski, B. (2002).** Inventory of Macedonian Wetlands – as natural resources. Bird Study and Protection Society of Macedonia, Skopje. pp 42.
- Mitchell-Jones, A.J., Amori, G., Bogdanowicz, W., Kryštufek, B., Reijnders, P.J.H., Spitzenberger, F., Stubbe, M., Thissen, J.B.M., Vohralík, V. and Zima, J. (1999).** Atlas of European mammals. London; T & AD Poyser.
- Paunović, M. and Milenković, M. (1996).** The current status and distribution of the otter *Lutra lutra* L., 1758 in Serbia and Montenegro. *IUCN OSG Bull.* **13**, 71-76.
- Prigioni, C., Bogliani, G. and Barbieri, F. (1986).** The otter *Lutra lutra* in Albania. *Biol. Cons.* **36**, 375-383.
- Ruiz-Olmo, J. (2007).** Otters in Mediterranean countries. In: **Conroy, J.W.H., Gutleb, A.C., Ruiz-Olmo, J., Yoxon, G.M.** (eds.). Proceedings of the European Otter Conference “Return of the Otter in Europe – Where and How?” *J. Int. Otter Surv. Fund* **2**.
- Spiridonov, G. and Spassov, N. (1989).** The otter (*Lutra lutra* L., 1758) in Bulgaria, its state and conservation. *Hist. Nat. Bulg.* **1**, 57-63.
- State of Environment Report, Republic of Macedonia (2000).** Available at: <http://www.soer.moe.gov.mk/>
- Urban, P. (1998).** Eurasian otter (*Lutra lutra* L.) in the north western Greece – contribution to distribution, limiting factors and conservation measures. *Bull. Vydra* **8**, 44-47.

#### **RESUME:**

#### **REPARTITION DE LA LOUTRE (*Lutra lutra*) EN REPUBLIQUE DE MACEDOINE EN 2007**

L'enquête sur la distribution de la Loutre (*Lutra lutra* L.) en République de Macédoine a été menée au printemps 2007 grâce à la recherche de ses indices de présence. Durant l'enquête, 36 sites répartis sur l'ensemble du territoire ont été contrôlés. Au total, 70% des sites se sont avérés positifs et la majorité du pays semble occupé par la l'espèce. Deux zones importantes montrent peu ou aucun indice d'occurrence : la partie amont du bassin hydrographique de la rivière Crna paraît inoccupée et le bassin de la Strumica comporte de très rares sites occupés. Les barrières à la présence de la Loutre sont probablement dues à la pollution d'origine industrielle sur la rivière Kriva Lakavica et agricole sur les rivières Crna et Strumica. Au final, aucune tendance d'évolution de la population peut être avancée puisque aucune donnée historique n'est disponible.

#### **RESUMEN:**

#### **DISTRIBUCIÓN DE LA NUTRIA DE RÍO EUROASIÁTICA (*Lutra lutra*) EN LA REPÚBLICA DE MACEDONIA EN EL AÑO 2007**

El relevamiento de la distribución de la nutria de río euroasiática (*Lutra lutra*) en la República de Macedonia se realizó durante la primavera del año 2007 mediante la búsqueda de signos que indicaran la presencia de esta especie. Durante el relevamiento 36 sitios, espaciados en todo el territorio del país fueron relevados. Un 70 % del total de sitios relevados fueron positivos, indicando que la mayoría del país parecería estar ocupado por nutria de río. Dos áreas extensas muestran baja o no indicación de presencia de nutrias de río, la parte superior de la cuenca del Río Crna parece estar deshabitada, y la cuenca del Río Strumica muestra pocos sitios ocupados. La ausencia de nutria de río en estas áreas probablemente está conectada con contaminación industrial (en el Río Kriva Lakavica) y agricultura (Río Crna, Río Strumica). Nada puede decirse con respecto a las tendencias poblacionales porque no hay datos históricos disponibles.