

## *The Otter (*Lutra lutra* L.) Signs and the Banks Tree Cover: A Survey in Central and Eastern Bulgaria*

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**Abstract.** The study was carried out during 2011 – 2012 at different water basins (rivers and micro dams) situated in Central and Eastern Bulgaria. Transects with 600 m length were walked along the banks in otter signs search. The search was stopped when the first otter signs were registered. As a whole we found domination of the very good or excellent bank tree cover. A total of 61% of transects were with tree cover between 50% and 100%. Almost equal were the stretches without or with little tree vegetation. At all transects surveyed the spraints dominated with 61%. All other otter signs were with low percentage. The otter tracks (foot prints) were on second place with 20% of occurrence, followed by the food remains with 7%. At 12% of transects we did not find any otter signs. As a whole the otter was registered in 88% of transects, a sign for a good population. Highest preference we registered for walking or feeding of the otter at the open banks with no or with weak tree cover.

**Key words:** otter, *Lutra lutra*, activity, vegetation.

### **Introduction**

The European otter (*Lutra lutra* L.) is a semi-aquatic carnivore having home ranges mainly situated at the littoral zone of the water basins, at the stripe about 20 meters away from the water edge. The marking of these home ranges is made by excrements (so called “spraints”) and anal gland secretions. The tree bank vegetation favors the species making good shelter and hunting sites under water (KRUUK, 1992; 2006).

According to different statistical analyses, some authors register positive correlation between the tree cover and the otter activity (BAS *et al.*, 1984; MACDONALD & MASON, 1985) or lack of such correlation (KRUUK, 2006). Using infrared cameras GUTER *et al.* (2008) found that the presence

of more otter signs is strongly related with often otter presence at a particular area.

The otter signs are widely used for the species population monitoring (FOSTER-TURLEY *et al.*, 1982; MACDONALD & MASON, 2004) which is now in progress in Bulgaria (GEORGIEV, 2008).

The aim of our study is to (i) investigate the habitat condition according to the bank tree cover in different water basins in Bulgaria, and (ii) to study if some otter activity is related with the different percentage of the tree cover on the banks.

### **Material and Methods**

The study was carried out during 2011 – 2012 at different water basins (rivers and micro dams) situated in Central and Eastern Bulgaria. Transects with 600 m length were

walked along the banks in otter signs search. The search was stopped when the first otter signs were registered (FOSTER-TURLEY *et al.*, 1982). The banks tree cover was noted as 0% (lack of tree vegetation), up to 25%, up to 50%, up to 70% and 100% (dense flood forest wood). A total of 80 such stretches were investigated at the rivers Mochuritsa, Tulovo, Topolyane and Gradina forests, Sredetska, Merichlerska, Sazlyika, Stryama, Omurovska, Sokolitsa, Blatnitsa, Pyasachnik, Maritsa, small stretch at the Danube near village of Vardim, rivers and micro dams in Derwent Heights and Stara Planina.

The preference index was calculated  $P = P_{i1}/P_{i2}$ , where  $P_{i1}$  is the proportion of a particular otter sign (tracks, spraints or food remains), and  $P_{i2}$  - the proportion of a particular bank stretch according to the percentage of the tree cover (mentioned above).

### Results and Discussion

*Habitat condition.* As a whole we found domination of the very good or excellent bank tree cover. A total of 61% of transects were with tree cover between 50% and 100%. Almost equal were the stretches without or with little tree vegetation (Fig. 1).

*Otter signs and population condition.* At all transects surveyed the spraints dominated with 61%. All other otter signs

were with low percentage. The otter tracks (foot prints) were on second place with 20% of occurrence, followed by the food remains with 7%. At 12% of transects we did not find any otter signs.

As a whole, the otter was registered in 88% of transects, a sign for a good population (Foster-Turley *et al.*, 1982).

*The preference.* Among all the otter signs the spraints strongly dominated but mostly at the stretches with 100% bank tree cover (Fig. 3). At the other tree cover types the otter signs were more evenly distributed. The highest percentage without any otter signs had these transects without tree cover.

Highest preference we registered for walking or feeding of the otter at the open banks with no or weak tree cover (Table 1).

### Conclusion

1. As a whole we found domination of the very good or excellent bank tree cover and good otter population at the study area.

2. Among all the otter signs the spraints strongly dominated but mostly at the stretches with 100% bank tree cover so the species monitoring surveys could be focused on such stretches.

3. Highest preference we registered for walking or feeding of the otter at the open banks with no or weak tree cover so a priority of such banks can be given in food remains or footprint measure studies.

**Table. 1.** Number of different otter signs found in various banks according to the tree cover and preference index: TC - type of the tree cover, N - number of transects with such cover, P - preference index.

C	N	spraints	tracks	food remains	no signs	P-sprainting	P-walking	P-feeding
0%	15	7	4	1	4	0,73	1,71	1,21
10%	7	5	0	1	1	1,12	0,00	1,70
25%	9	6	3	0	1	1,05	1,50	0,00
50%	12	8	2	0	2	1,05	0,75	0,00
100%	37	25	8	4	2	1,06	0,96	1,36
<b>Total</b>	80	51	17	6	10	-	-	-

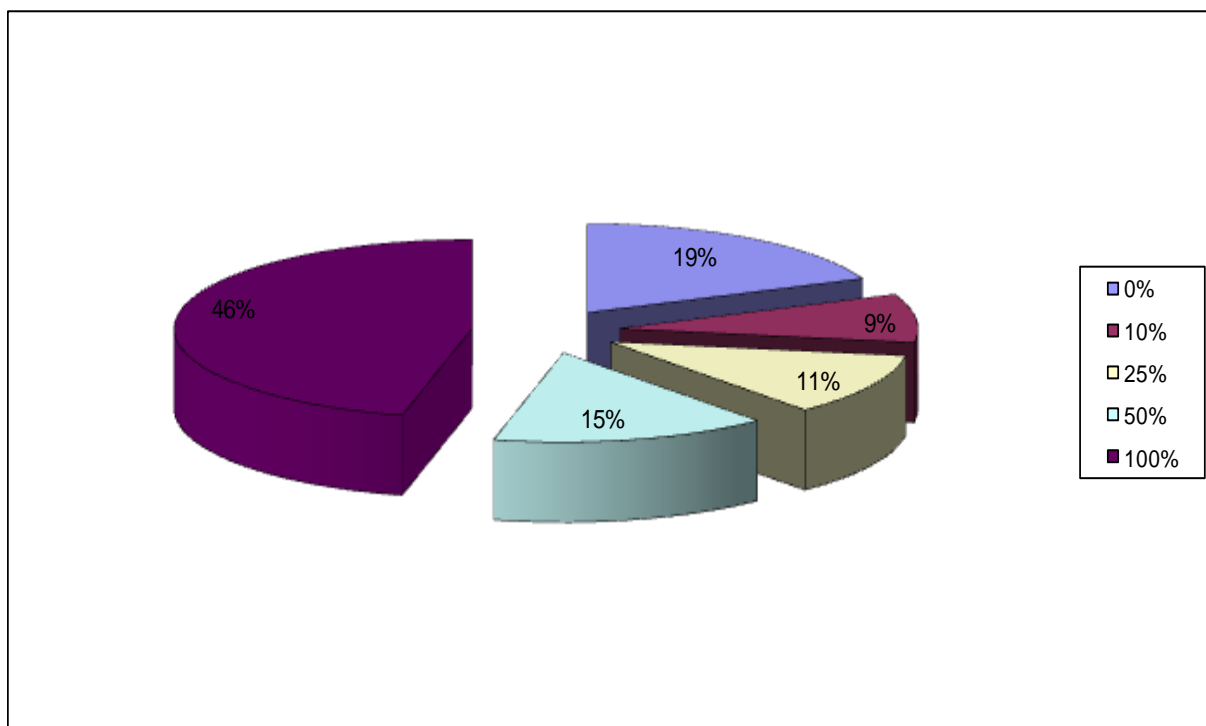


Fig.1. Percentage of transects with different bank tree cover at the study area.

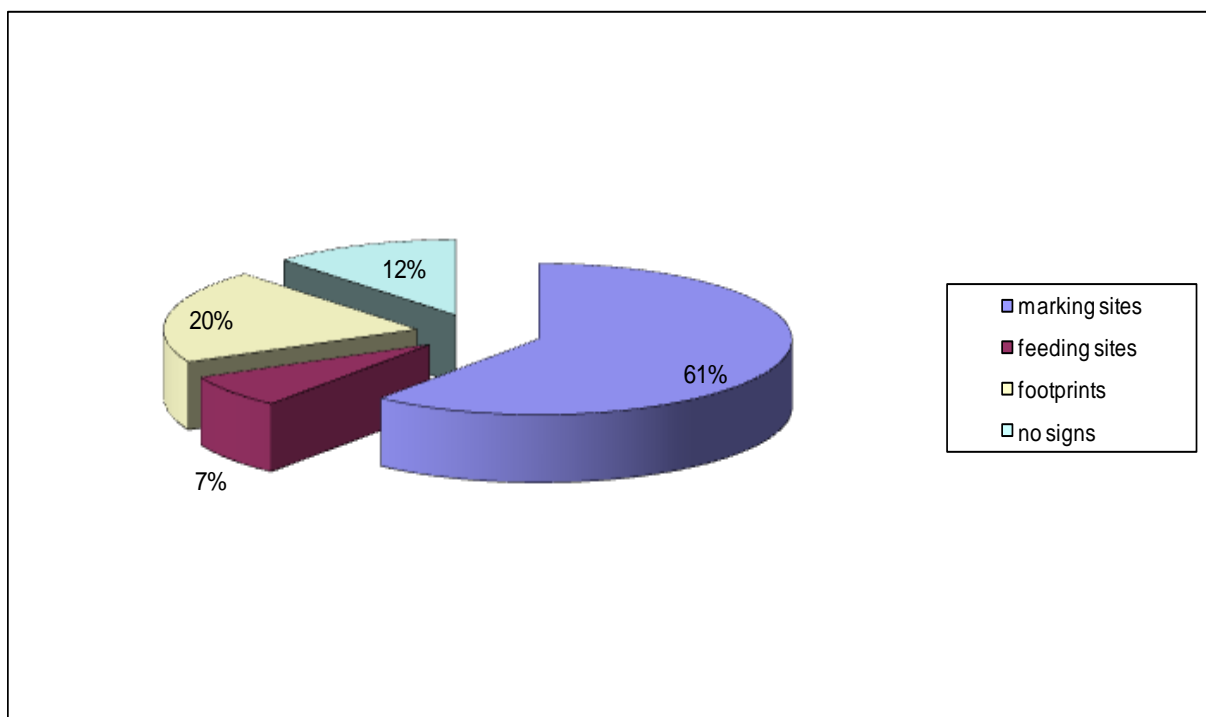


Fig. 2. Percentage of the different otter signs at transects studied.

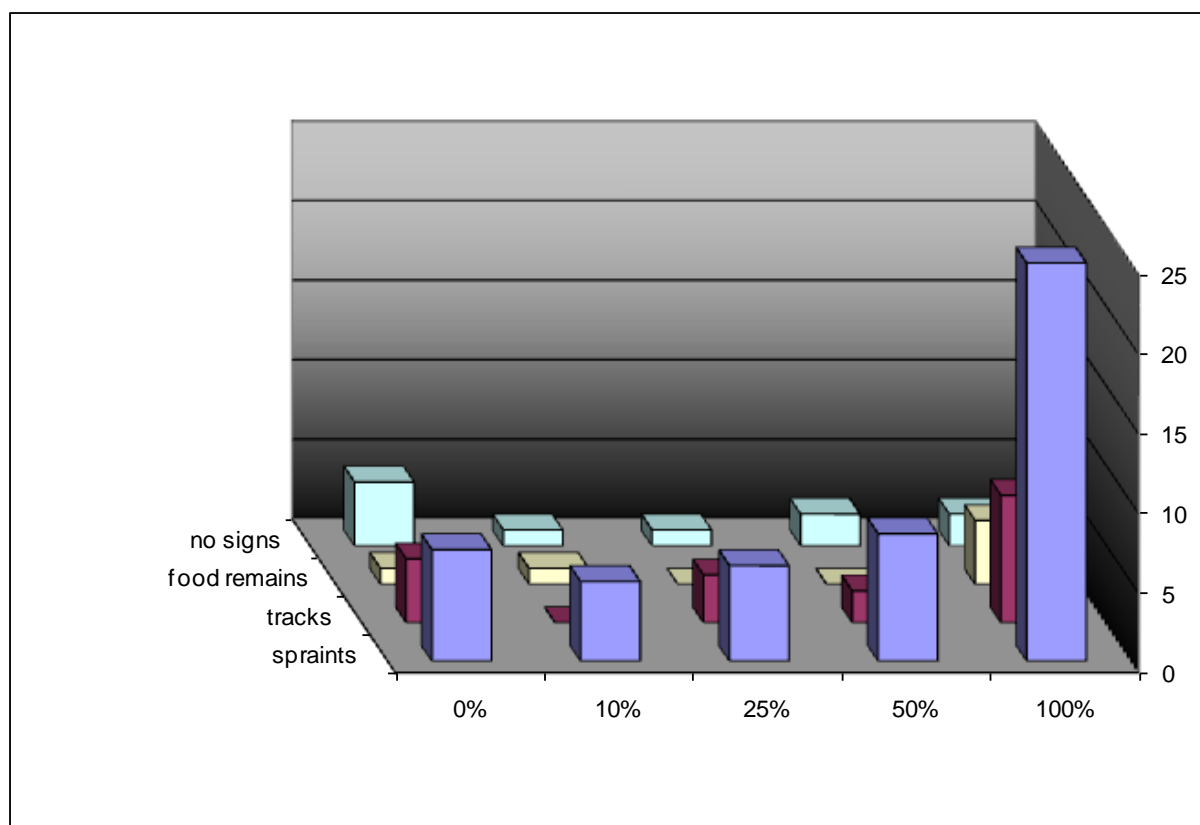


Fig. 3. Number of different otter signs found in various banks according to the tree cover.

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Received: 22.05.2012  
Accepted: 20.08.2012