

HABITAT SUITABILITY FOR THE OTTER (*LUTRALUTRA*) OF SOME RIVERS OF ABRUZZO REGION (CENTRAL ITALY)

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ABSTRACT – During the period 1990-93 the presence of the otter (*Lutra lutra*) in Abruzzo region (central Italy) has been regularly recorded on the Orta river; some signs were also found on the Vella river only in 1993. Eight rivers were investigated in order to evaluate the habitat suitability for the otter; an index of suitability was calculated considering the following parameters: riparian vegetation cover, water quality and antropic pressure. About 1/3 of 355 km of river was considered suitable for the species. The reinforcing of the native otter population should be considered in combination with the restoration of otter habitats.

Key words: Otter, *Lutra lutra*, Distribution, Habitat suitability, Central Italy.

RIASSUNTO – *Idoneità ambientale per la lontra (Lutra lutra) di alcuni fiumi dell'Abruzzo* – Nel 1990-93 la presenza della Lontra (*Lutra lutra*) in Abruzzo è stata accertata con regolarità per il fiume Orta e sporadicamente per il fiume Vella. Per 8 fiumi è stata valutata l'idoneità ambientale per la specie calcolando un indice ottenuto dai dati raccolti sulla copertura vegetale riparia, qualità delle acque e pressione antropica. Su un totale di 355 km di fiume, solo 1/3 è risultato idoneo alla specie. Un programma di ripopolamento della specie potrebbe essere considerato solo dopo interventi di riqualificazione ambientale finalizzati a ristabilire una buona continuità di habitat favorevoli alla specie.

Parole chiave: Lontra, *Lutra lutra*, Distribuzione, Idoneità ambientale, Italia centrale.

INTRODUCTION

In the last decades the presence of the otter (*Lutra lutra*) in central Italy has been recorded in some rivers with few and scattered signs (Macdonald & Mason, 1983; Cassola, 1986). For the Abruzzo region, the otter seems to occur only on the Orta river (Barrasso et al., 1992).

This paper reports on the results of a field survey carried out from 1990 to 1993 on the main rivers of the Abruzzo region in combination with an evaluation of the riverine habitat suitability for the otter, based on some parameters such as riparian vegetation cover, water quality and antropic pressure.

STUDY AREA

The survey was conducted in the central part of the Abruzzo region (Fig. 1) on the following rivers: Orta, Orfento, Vella, Gizio, Sagittario, Tirino, Aterno-Pescara, and Sangro. The altitude of the study area varied from the sea-level to 1370 m a.s.l. The riparian vegetation was generally scattered and dominated by *Salix* spp. and *Populus* spp. often associated with

Quercus spp., *Sambucus* spp. and *Carpinus* spp. In the upper course of the rivers, the bank-sides were generally covered by herbaceous and scrub vegetation (mainly *Rubus* spp.), sometime with small scattered woods of *Fagus sylvatica*. Pine forests (*Pinus* spp.) mainly occurred in the middle course of the Vella river; a broadleaves wood (*Quercus ilex*, in prevalence) was present close to the mouth of the Sangro river. Crops (orchards, kitchen gardens, corn fields) bordered the bank-sides in several stretches of the middle-low course of the rivers. Water drawing for electric power and irrigation purpose was widespread with a heavy reduction of the rivers' flow; in addition, long stretches of Sangro and Aterno rivers were embanked. Gravel extraction occurred on the lower course of the Sangro river.

Organic pollution, mainly due to urban effluents, occurred in several stretches of almost all the rivers investigated (AA.VV., 1988): the Gizio river was the most polluted, while the Orfento river seemed to preserve a good water quality. Pollution increased in summer in relation to the decrease of the rivers' flow and to the high tourist pressure.

Fish was represented by *Salmo trutta fario* and *Salmo gairdneri* in all the rivers investigated; cyprinids (*Leuciscus cephalus cabeda*, *Rutilus rutilus*, *Barbus plebejus*), and *Anguilla anguilla* mainly occurred in Sangro and Orta rivers. Crustaceans, *Austropotamobius pallipes italicus* and *Potamon fluviatile fluviatile*, were fairly widespread only in Tirino river (the first species) and in Orta river (both species).

METHODS

Otter signs (spraints, footprints, anal secretions) were searched along the entire length of the rivers. In 1990 the survey was carried out only on the Orfento, Orta and Vella rivers, while during 1991-93 the whole rivers were investigated. The frequency of occurrence of the otter was expressed as positive recordings on the total of recordings carried out on each river.

In order to evaluate the habitat suitability for the otter each river was divided in stretches of 5 km in length (river-unit). For each stretch the following parameters were evaluated: i) riparian vegetation cover (RCV): on a scale from 1 (0-10%) to 5 (70-100%); ii) disturbance (D): on a scale from 1 (presumably absent) to 5 (very heavy); fishing, angling, agricultural activities and villages were noted; iii) water quality (WQ): on a scale with three levels: 1 (much or heavy polluted water), 2.5 (polluted water), 5 (little polluted or unpolluted water); for the evaluation of this parameter, data collected in specific studies were also considered (AA.VV., 1984; AA.VV., 1986; AA.VV., 1988; Maiolini & Marchetti, 1991).

Using these parameters an index of suitability was defined as follows:

$$I = \frac{RCV + WQ}{D}$$

This index varies from a minimum of 0.4 to a maximum of 10. On the basis of the index's value four categories of suitability were defined: 1 (very low), 2 (low), 3 (fairly good), 4 (good). The contiguous river-units with the same suitability were joined together.

RESULTS AND DISCUSSION

Otter signs were found only on Orta and Vella rivers: the former was positive for the whole study period, the latter only in 1993 (Tab. 1). Signs were mainly footprints; spraints were recorded in 6 cases only.

Tab. 1 – Percent frequency of occurrence (F%) of positive recordings for otters on Orta and Vella rivers (N. = number of recordings; * data collected by Barrasso et al., 1992).

YEAR	ORTA		VELLA	
	N.	F%	N.	F%
1989*	21	66.6	3	0.0
1990	12	66.6	3	0.0
1991	7	57.1	3	0.0
1992	7	71.4	3	0.0
1993	9	66.6	11	27.2
Mean	56	66.1	23	13.0

About 1/3 of 355 km of river investigated presented fairly good/good conditions for otters (Tab. 2; Fig. 1). Orfento and Orta rivers were the most suitable; this was also true for the upper course of the Sangro river and for the lower course of the Aterno-Pescara river. The other rivers were scarcely suitable for otters.

Tab. 2 – Rivers' partition in relation to habitat suitability for otters. L. = length in km of the rivers investigated; length in km of the rivers with very low/low habitat suitability (1-2 H.S.), and fairly good/good habitat suitability (3-4 H.S.).

RIVERS	L. IN KM	1-2 H.S. (%)	3-4 H.S. (%)
Sangro	117	75 (64.1)	42 (35.9)
Aterno-Pescara	110	73 (66.4)	37 (33.6)
Tirino	15	15 (100.0)	0 (0.0)
Sagittario	34	28 (82.4)	6 (17.6)
Vella	16	12 (75.0)	4 (25.0)
Gizio	18	15 (83.3)	3 (16.7)
Orta	29	11 (37.9)	18 (62.1)
Orfento	16	2 (12.5)	14 (87.5)
Total	355	231 (65.1)	124 (34.9)

The distribution of the otter in the study area seems to be limited by the fragmentation of suitable habitats and probably by the shortage of food resources, mainly fish. Cyprinids, that are the staple of the otter diet in Italy (Prigioni & Fumagalli, 1992), seem to occur with fairly good populations only in some rivers, particularly in the Orta river (Barrasso et al., 1992). This river seems to maintain few otters that occasionally move to the surrounding water bodies (e.g. Vella river).

The preservation of the otter in Abruzzo region should involve the restoration of the riverine ecosystem in order to achieve a wide continuity of suitable habitats for the species. Only in this case could a reinforcing program of the native exiguous population of otters be considered.

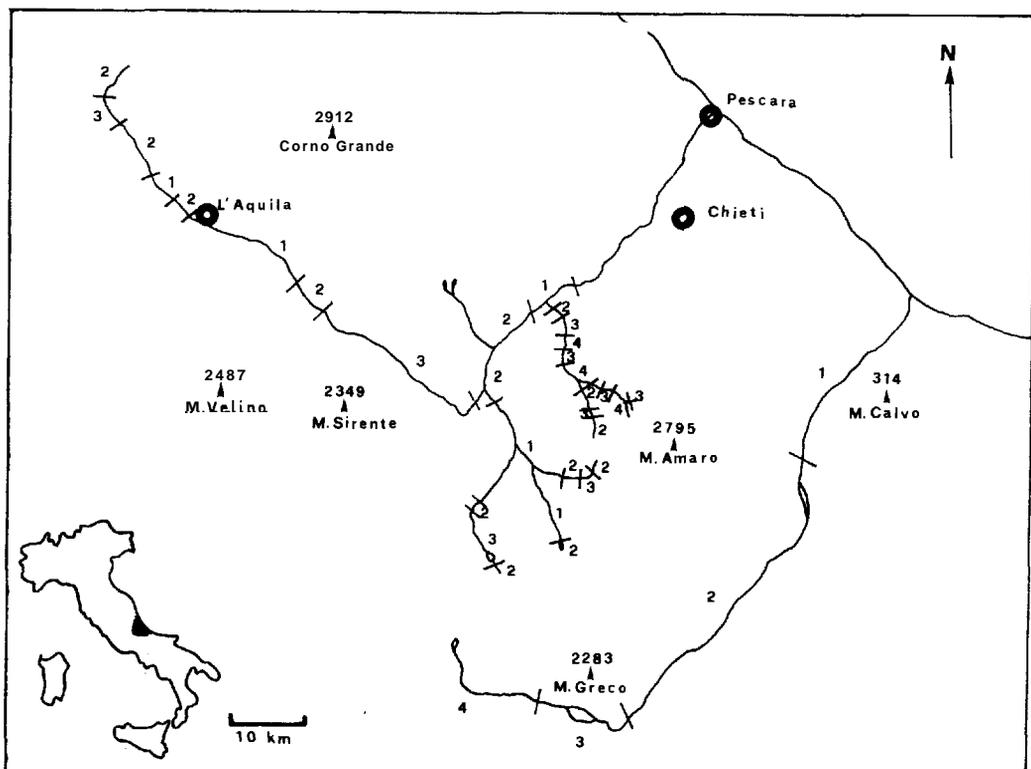


Fig. 1 - Habitat suitability for otters of the rivers investigated (1 = very low; 2 = low; 3 = fairly good; 4 = good).

REFERENCES

- AA.VV. 1984. Indagine sulla qualità delle acque del bacino dell'Alto Sangro. Comunità Montana Alto Sangro e Altopiano Cinquemiglia. Castel di Sangro, Regione Abruzzo, 56 pp.
- AA.VV. 1986. Provincia dell'Aquila: progetto ambiente n. 1. Amministrazione provinciale dell'Aquila. Quaderni di Provinciaoggi, 4, 391 pp.
- AA.VV. 1988. Indagine sulla qualità delle acque superficiali. Comunità Montana Peligna zona "F", Sulmona, 178pp.
- CASSOLA, F. (ed.). 1986. La Lontra in Italia. Censimento, distribuzione e problemi di conservazione di una specie minacciata. WWF, Serie Atti e Studi 5, 135 pp.
- BARRASSO, P., OTTINO, P., PRIGIONI, C. & A. VIGNA TAGLIANTI. 1992. Osservazioni preliminari sulla presenza della Lontra nei fiumi Orta e Orfento (Abruzzo, Massiccio della Maiella). *Hystrix* (n.s.) **4**:69-74.
- MACDONALD, S.M. & C.F. MASON. 1983. The Otter *Lutra lutra* in Southern Italy. *Biol. Conserv.*, **25**: 95-101.
- MAIOLINI, B. & S. MARCHETTI. 1991. Indagine sulla qualità delle acque del Parco Nazionale d'Abruzzo. Contributi scientifici alla conoscenza del Parco Nazionale d'Abruzzo, Roma, 42, 32 pp.
- PRIGIONI, C. & R. FUMAGALLI. 1992. La Lontra: status e conservazione in Italia. In "La Lontra: specie minacciata in Italia. Le ricerche in natura ed in cattività finalizzate alla sua conservazione". Ministero dell'Agricoltura e delle Foreste, Collana Verde, 89: 1-27.