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# MONITORING *Lutra lutra* HABITATS IN PORTUGAL: A CONCEPTUAL PLAN

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**Abstract:** The Eurasian otter is widespread in Portugal but their range may be reducing. Its survival depends on protecting its habitat. A method for monitoring the quality of otter habitat by regularly assessing certain habitat descriptors is proposed. If carried out over several years in the same conditions, this would enable habitat quality changes to be assessed

## THE STATUS OF THE OTTER IN PORTUGAL

In Portugal *Lutra lutra* occupies a wide range of freshwater habitats (estuaries, marshes, dams, rivers, streams) as well as the rocky SW coast. The species is widespread throughout the country, in oligotrophic upland streams, lowland rivers, near rice-fields, fish farm ponds, "canalised" rivers among others, but there is evidence that its range is probably becoming restricted in some areas.
Since 1974 it is a legally protected species in Portugal.

The Portuguese population is usually considered as one of the most important in Europe.

The future of *Lutra lutra* in Europe depends on safeguarding the individuals and its habitats in those countries where the species is still widespread and thriving. Conservation of currently viable population must be given top priority (Mason, 1990 in: Foster-Turley, MacDonald and Mason eds.).

## OTTER AND HABITAT

The types of habitat required to meet the life requisites of vertebrate species have been extensively documented. Thus, vertebrates are often considered to be useful indicators of how environmental conditions are changing within those habitats. Vertebrates can serve as integrators of cumulative impacts, because they are often the trophic end points of a biological continuum that is exposed continuously to a broad range of negative effects (EPA, 1991).

Our knowledge on the ecology of the European otter is still scarce, in many aspects, but we do know the basic requirements necessary for its survival. We know that *Lutra lutra* needs freshwater throughout the year, sufficient food and shelter, and breeding sites.

Otters' presence is usually associated with healthy wetlands and a strong otter-good habitat quality relationship exist. As otters are at the top of a food chain, they can be important indicators of environmental change.

## MONITORING WILDLIFE HABITATS

Inventory and monitoring of wildlife habitats is based on the assumption that measurements of a set of habitat attributes can be used to predict presence or abundance of wildlife species.

Wildlife habitat monitoring consists of repeatedly measuring habitat variables to infer changes in the capability of the land to support wildlife. It provides the essential data on how systems are changing and how fast. The purpose is usually issue-oriented, i.e., to determine how human activities, such as industry or gravel extraction, are affecting a wildlife habitat and ultimately a wildlife population. Otters are shy, elusive and largely nocturnal thus being an difficult study object. It is widely accepted that

field surveys can provide the most accurate and objective results on otter distribution and relative status within a country or region.

Typically, a monitoring programme consists of measuring habitat variables that are required by key species or which correlate with the presence or abundance of such species.

The presence or absence of mammalian carnivores, which occupy the higher trophic levels, may serve as warning signs that habitat conditions or pollutant loads are reaching critical levels. For example, clearing riparian vegetation in a river bed can thus be assumed to cause a reduction in the number of otter signs. Otters disappear, maybe temporarily, from areas where no suitable habitat remains.

Having this in mind, we have designed a conceptual plan for monitoring *Lutra lutra* habitats in Portugal.

**PURPOSE - What is the aim of monitoring *Lutra lutra* habitats?**

It is aimed at analysing current wetland status, providing a basis for the detection of changes and trends through time in wetland habitats and, consequently, on otters distribution.

**METHOD - What is to be monitored? How can this aim be achieved?**

Although no national survey has been carried out, data collected recently (1990-1993) indicate that otters are distributed all over the country (Figure 1). The 0tter is one of the native mammals most dependent on wetlands and given the impossibility of monitoring all Portuguese wetlands we must choose some sampling sites.

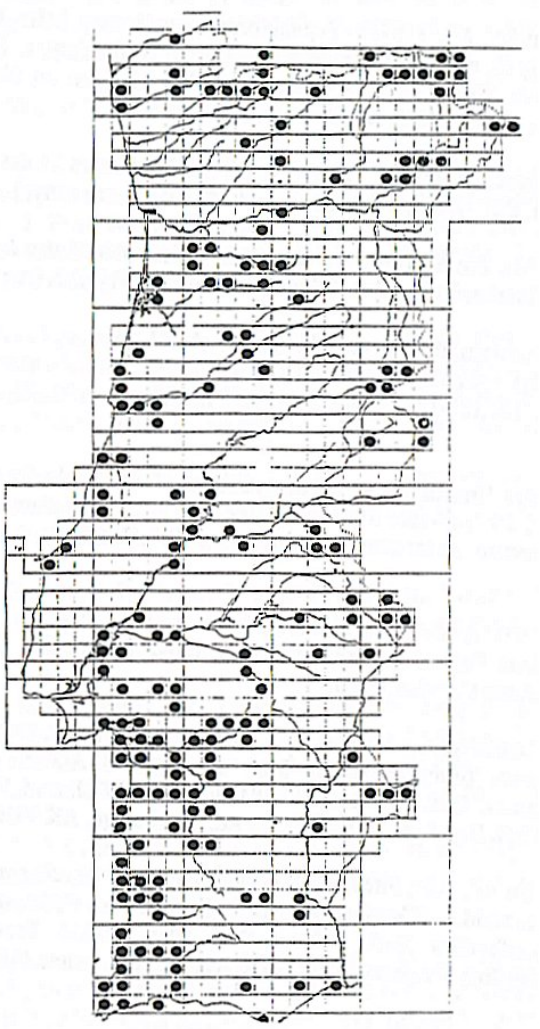

**Figure 1.** Otter distribution in Portugal (presence confirmed after 1990).

**Site selection**

Sites will be selected in order to assure a national geographical coverage and the "representativeness" of the multiplicity of habitat types (river, stream, marsh, dam, etc.). All catchments will be considered (Figure 2). In larger catchments one site per 1000 $km^2$ of catchment total area will be analysed and in smaller catchment areas at least one site would be considered Sites are not randomly selected but weighed in terms of representativity of each catchment characteristics.


**Figure 2** . Main catchment areas in Portugal

Indicators of ecological condition of the wetland site which included physical, chemical and biological descriptors (habitat variables and otters presence) are measured.

A data sheet is completed at each survey site and the scores are summed. An essential component of monitoring is the repeated collection of data over time The frequency of monitoring must be at 2-3 years intervals. It is advisable to survey the same regions in the same season and ideally once when the water level is minimal (dry season) and once when it achieves its maximum (rainy season).
Descriptors (Table I)

**Table 1**: Some physical, chemical and biological descriptors

| | |
|---|---|
| Water Colour | Condition of habitat |
| Water Smell | Layers of vegetation |
| Visible water pollution | Water presence |
| Turbidity | Cover |
| Water quality | Availability of potential prey |
| PH | |
| BOD | Main threat factors |
| Presence of PCBs, heavy metals, etc | Amount of Human disturbance |
| Mean water temperature | Type of human disturbance |
| Mean depth | Land use and impacts |
| Mean river width | Man-made features |
| Flow (velocity) | Distance to the closest village |
| Bank slope | Accessibility |
| Substrate | |
| Geology | Area of the catchment area |
| | Weather and climate (rainfall, evaporation, |
| Geomorphological features | temperature, etc.) |
| Habitat description | Altitude |
| List of plant species | Distance to the riverhead |
| | Total length (river, stream, coastline) or area |
| List of animal species | (dam, marsh, etc) |
| | Otter signs |
| | Otter's historical occurrence |

***Habitat Variables*** - It is not possible to measure everything - choice is imperative. Habitat variables are chosen to represent elements of habitat structure, including cover, quality of water and human disturbance, among others. Each variable will be scored according to a scale of values. Despite physical and chemical variables being relatively easy to measure they provide little information about the response of ecosystems or species. As living organisms integrate the impact of many variables and their biological efficiency, productivity or balance within the ecosystems, they indicate the overall health of a system (Holdgate in Spellerberg, 1991). Thus the direct surveillance of biological characteristics should also be considered. The descriptors should be strictly comparable.

***Otters' Presence*** - The presence of the species is normally assessed by signs (spraints, smears, anal jellies and footprints). At each site a maximum of 600m is searched for otter signs, and in their absence the site is considered negative for otter presence (standard survey methodology in Macdonald 1983) The same author stressed that there is no known direct relationship between the number of signs found and the number of animals present. Field surveys can only provide some indication of the relative status of otter population.

***Data Analysis - How can the data be analysed?*** Development of data analysis procedures will be an ongoing activity of the program. The data analysis could be conducted in order to quantify the current status and condition of wetlands on a national scale, detect trends in wetland condition through time and diagnostics for identifying plausible causes of declining or improve wetland conditions.
Attempts are made to find appropriate index that incorporate a set of information. Similarity index and cluster analysis can be used to quantify differences between successive samples from each site. Multivariate and discriminant analysis could quantify differences between sites where signs of presence are found and those where signs absent and identify the variables responsible for such differences.

***Data Interpretation - What might the data mean?*** - Its results can be as difficult to evaluate as any other scientific data about complex systems. The collected data will provide periodic assessment of wetland status and trends. The rate of change considering the presence/absence of otter in one site can be quantified and used along with habitat variables, giving a fairly detailed but informative account of the changes which took place, as a basis for evaluating the threatened status of *Lutra lutra* in Portugal.

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