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Distribution, status and conservation of otters in Lower Austria

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Keywords: Otter, *Lutra lutra*, status, ecology, conservation, Austria

Zusammenfassung

Im Jahre 1999 wurde das gesamte Bundesland Niederösterreich erstmals systematisch auf das Vorkommen von Fischottern untersucht. Otter wurden über ihren Kot nachgewiesen. Befundeinheit waren 10 mal 10 Kilometer große Quadrate. Auf 22% der Landesfläche konnten hohe Losungsdichten gefunden werden, auf weiteren 12% geringe, und auf 6% sehr geringe. Auf den übrigen 60% der Fläche konnten keine Otter nachgewiesen werden. Das Ottervorkommen beschränkt sich derzeit im wesentlichen auf den Nordwesten des Landes, das Waldviertel. Südlich der Donau konnten Fischotter nur an wenigen Flüssen nachgewiesen werden. Im Osten von Niederösterreich konnte kein Ottervorkommen bestätigt werden. Auf Grund von Vergleichen mit früher durchgeführten regionalen Kartierungen konnte immerhin eine eindeutige Ausbreitungstendenz des Fischotters seit 1990 konstatiert werden. Mögliche Ursachen dieser Entwicklung werden diskutiert und Prioritäten für den Otterschutz skizziert.

Summary

In 1999 Lower Austria was the first time completely and systematically surveyed for the presence of otters. This was done by mapping spraints in 10 to 10 kilometres squares. High spraint densities were found in 22% of the area, low spraint densities in 12% and very low ones in 6%. In the remaining 60% of Lower Austria, no signs of otters could be found. Otters were mainly found in the northwest of the country (Waldviertel), and in a few sites along some rivers south of the River Danube. Otters appeared still absent from the east of Lower Austria. By comparing results of some regional surveys carried out earlier it was however possible to evidence an increase of otter distribution since 1990. Reasons for this trend and priorities for otter conservation were discussed.

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1. Introduction

Very little is known about the distribution and population trend of otters (*Lutra lutra*) in Lower Austria in the past. According to the traditional ecological knowledge of hunters and fishermen, hunting statistics and short comments in the literature, the otter was still quite wide-spread until the Second World War. However the population was already declining which lead to the full protection of the species under the Lower Austrian hunting law in 1947. In the second half of the 20th century, the decline of otters obviously accelerated. In the late 1970ies KRAUS (1981) found only few remnants in the north-west of the country. Otters were no longer found permanently living south of the River Danube or in the Danube itself.

Similar population declines also occurred throughout most of Europe (REUTHER & FESTETICS 1980, MASON & MACDONALD 1986) and led to considerable concern of conservationists. According to the knowledge of 1990, BAUER & SPITZENBERGER (1994) classified the otter as threatened by extinction (= endangered according IUCN) in the red data book of the mammals in Austria. Since the late 1980ies, however, first signs of a recovering otter population were noticed.

This paper reports about the first complete and systematic survey of the species throughout Lower Austria. It provides information about the habitat types, population trend and from there the status of the species. Finally it briefly discusses the main hypotheses of the population's decline in view of the present population trend, the role of conservation in this context and priorities of otter conservation in the future.

2. Study area and methods

Lower Austria covers 19185 km^2. It is located in the north-east of Austria (Fig. 1). From a geomorphological point of view the country comprises the following units:

- in the north-west of the country highlands made up by acid granite and gneiss located mainly north of the Danube (Waldviertel)
- in the north-east of the country midlands dominated by former glacial wind translocated sand Löss) north of the Danube (Weinviertel)
- large alluvial lowland river valleys: the River Danube and the River March (Morava) on the boarder to Slovakia in the east of the country
- a pan south and east of Vienna (Wiener Becken)
- midlands south of the Danube and north of the Northern Lime Stone Alps (Alpenvorland and Wechsel)
- the Northern Lime Stone Alps

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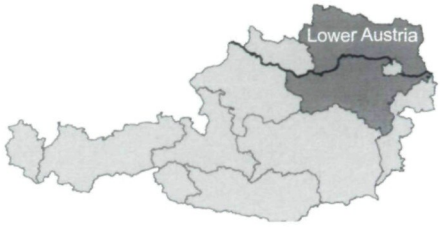

Fig. 1: Lower Austria is the largest federal country of Austria, located in the north-east of Austria. Within Lower Austria is the capital of Austria, Vienna, a federal country on its own

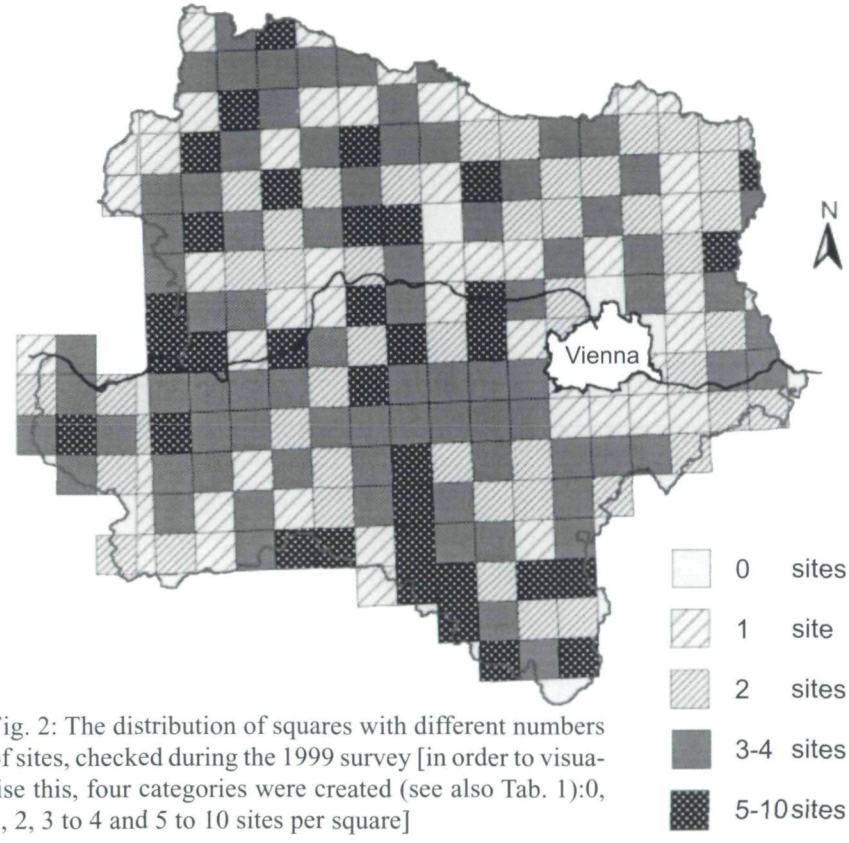

Fig. 2: The distribution of squares with different numbers of sites, checked during the 1999 survey [in order to visualise this, four categories were created (see also Tab. 1):0, 1, 2, 3 to 4 and 5 to 10 sites per square]

Table 1: Number of squares with different number of sites (bridges and stretches) surveyed

Sites	0	1	2	3	4	5	6	7	8	9	10
Squares	2	47	48	52	27	14	10	4	2	1	2

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From the point of view of potential otter habitats, Lower Austria offers the following types:

- rivers and streams inhabited predominantly by salmonids which can be found mainly in the highlands and the Alps
- rivers and streams inhabited predominantly by cyprinids and percids which can be found mainly in the midlands, the lowlands, the pan and the lower parts of the highlands
- natural lakes in the Alps
- manmade fish ponds for carp production concentrated in the north of Lower Austria and trout ponds scattered throughout the country
- man-made reservoirs along rivers scattered throughout the country
- quarries, filled with water

Otter presence was evidenced by excrements (spraints) found in the field. The observation units were 10 x 10 km squares, except those narrow ones at the meridians 31 and 34. One to 10 sites were checked in order to classify the presence of otters in each square (2 squares were not surveyed due to a lack of aquatic habitat). Tab. 1 shows the number of squares with different numbers of sites surveyed and Fig. 2 visualises their distribution throughout Lower Austria. In total 537 sites were suitable bridges, 84 sites were stretches of river bank. The survey was conducted from early June until late November 1999. Squares which were not known to hold otters from prior surveys and which were positive during the 1999 survey, were revisited a second time in another season in order to distinguish between permanently living and migratory otters. Spraint numbers found per square were scored into the following categories and visualised accordingly on the map:

1. high spraint density: on average three or more spraints per site per square
2. low spraint density: on average less than 3 spraints per site per square, but otter presence evidenced during at least two seasons
3. irregular spraints: on average less than 3 spraints per site and square which could not be confirmed within a second run
4. no spraints per square

This score was defined after the survey was conducted. The number of spraints found under bridges in the category one and two are illustrated in Fig. 3. The average spraint number per square found under bridges scored as high sign density was 11.3, ranging from 3 to 27. Under bridges of squares scored as low sign density the average spraint number per square was 1.3, ranging from 0.17 to 2.67.

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3. Results and discussion

3.1 Abundance and distribution of otter signs in 1999 (Fig. 4)

High spraint density could be found in 22% of the area of Lower Austria, low spraint density in 12%, irregular spraints in 6% and no spraints in the remaining 60% of the country. Many spraints were only found in the north-west of the country and one additional square along the upper River Traisen south of the Danube. Squares with few signs were recorded in the north of the country, along the upper River Traisen and in the south-east of the country (Bucklige Welt). Irregular spraints were found along three rivers south of the Danube, the lower River Pielach, the lower River Ybbs and the River Schwarza.

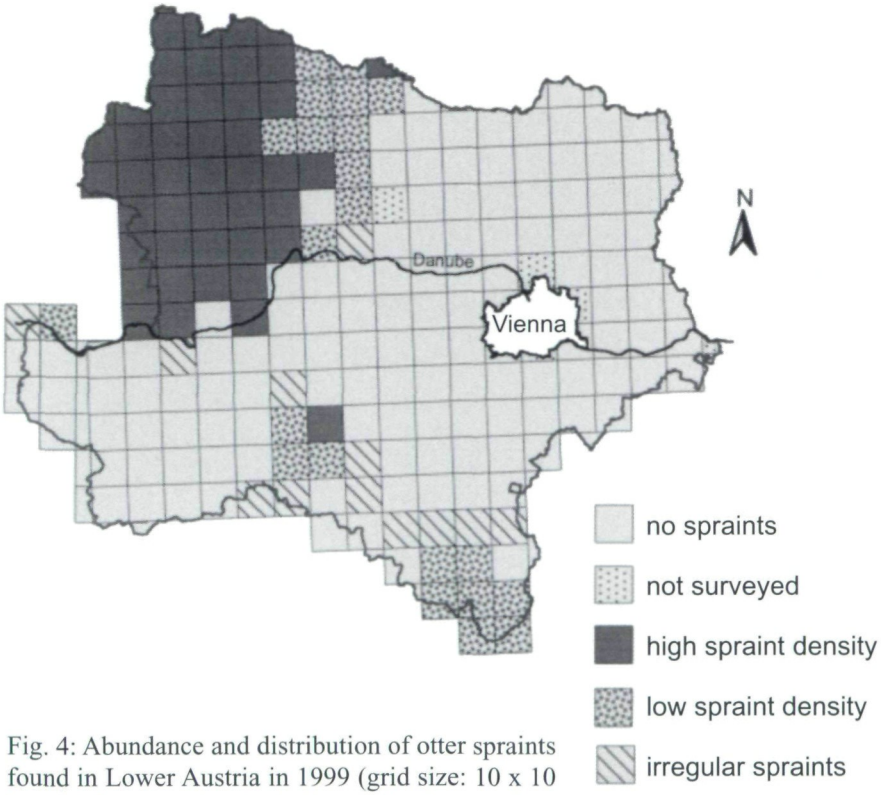

Fig. 4: Abundance and distribution of otter spraints found in Lower Austria in 1999 (grid size: 10 x 10 km); high spraint density indicates "high" otter density; low spraint density indicates "low" otter density; irregular spraints indicate migratory otters (details refer to text)

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3.2 Relative status of the population

The distribution and density of spraints per square provides some indication of the relative status of the population (MACDONALD 1990). Squares with less than 3 spraints per site were therefore judged to hold lower otter densities than those with 3 or more spraints per site and square. Squares with less than three spraints per site found only during a single survey, but not confirmed by a subsequent, were judged to originate from migratory otters. Squares without any otter signs were judged not to be inhabited by otters. This does not exclude the possibility that migratory otters may irregularly visit such squares. The very broad distinction (more than 3, less than 3 repeatedly or just once found and no spraints, see also Fig. 3) takes the influence of weather and seasonal sprainting behaviour (KRANZ 1996) into account. Since the observation unit was a 10 to 10 kilometre square and all the country was surveyed, it is very unlikely that otters were missed completely even in regions where they are rare (MACDONALD 1990).

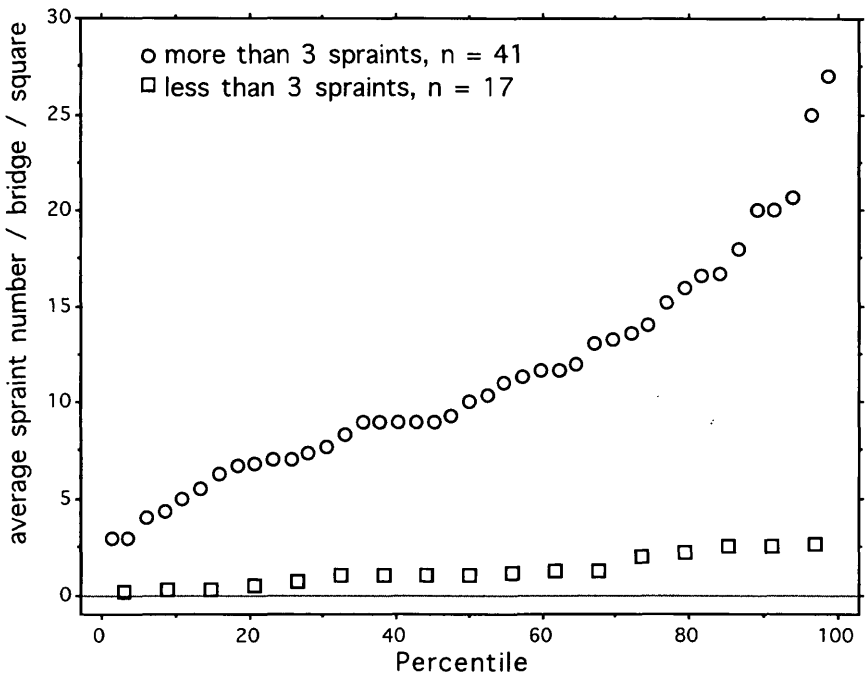

Fig. 3: Average spraint numbers per square found under bridges, scored into equal or more than 3 spraints per bridge and less than three spraints per bridge plotted against percentiles (for more details see text)

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Based upon these assumptions, otters live in higher densities in the highlands of the Waldviertel, than in any other part of the country. This region offers oligotrophic salmonids rivers, meso-trophic cyprinids rivers and fish ponds mainly for carp production. In this region otters use all types of natural and artificial water bodies such as small reservoirs and quarries filled with water (KRANZ & TOMAN, 2000).

South of the Danube, otters live in lower densities along the upper River Traisen, a typical alpine river. In addition they are found in low densities along several catchment areas in the midlands in the south-east of the country (salmonids dominated rivers; Zöbernbach, catchment area of Gr. Pitten). The irregular occurrence of migratory otters was further evidenced along the upper River Schwarza (trout river), the lower River Ybbs and the River Pielach, both of which hold salmonids and cyprinids populations. In the rest of the country, no otter signs could be found. This is in particular remarkable for the River March (Morava), the boarder river to Slovakia, which was surveyed twice, in summer and in autumn. KNOLLSEISEN (1998) found there signs of otter presence, but they apparently belonged to a migratory individual. Otters are also absent from the oxbows of the River Danube and accompanying streams although they are in close vicinity to the River Kamp, inhabited by otters. At present, otters do not inhabit any natural lakes since they are restricted to Alpine regions of Lower Austria which with few exceptions do not hold otters at all.

3.3 Population trend

Due to a lack of systematic otter surveys in the past, the expansion of the otter distribution can not be shown for the entire country. However, three surveys of the Waldviertel region and the westerly neighbouring Mühlviertel (Fig. 5) show, how otters expanded their range between 1990 and 1996 from the north throughout the Highlands south to the River Danube. In addition, otters have expanded into south-eastern Lower Austria (Pitten catchment). In 1997 JAHRL (1997) could not find any otter signs in this area. In 1999, several spraints could be found in several squares and in different seasons. This may be taken as evidence, that a few, presumably no more than three otters permanently use this area. Otter signs along the upper River Traisen also indicate a range expansion, since otters could not be found there in 1994 (KRANZ 1995). Single signs of migratory otters could be found along several rivers since 1990, however it is unclear whether this is due to range expansion or merely due to an increase of efforts to prove the presence of otters.

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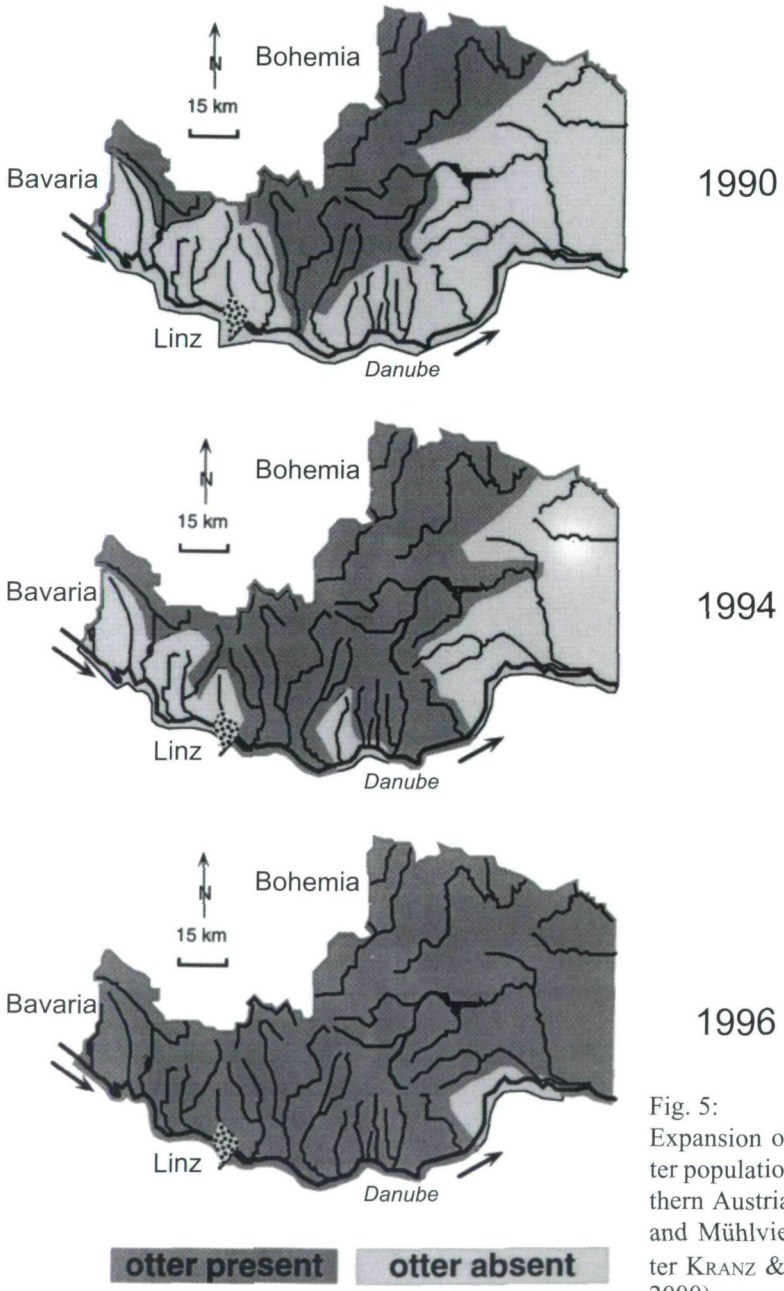

Fig. 5:
Expansion of the otter population in northern Austria (Wald- and Mühlviertel (after KRANZ & TOMAN, 2000).

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3.4 Status of otters in Lower Austria

In context with the otter distribution beyond Lower Austria and in context with the recorded expansion of otters, the distribution of otters found during the 1999 survey may be interpreted in the following way. In the north west of the country (Waldviertel Region), otters are part of a large population found in the Czech Republic and the Mühlviertel region of Upper Austria. Migratory otters along the River Ybbs and Pielach as evidenced in this survey or along other rivers such as Erlauf, Melk, Danube or March as evidenced since 1990, presumably originate from this source population in the north of Austria. The origin of otters along the upper River Traisen is unclear. The low density population in the south-east of the country (Pitten, Bucklige Welt) and the irregular signs of migratory otters along the River Schwarza are likely to originate from Styria and Burgenland south and east of Lower Austria.

According to the IUCN definition (GEPP 1994), presently otters have to be classified as vulnerable in Lower Austria, since large parts of the former range in Lower Austria are not inhabited by otters, and because of the small population size in terms of actual otter numbers within the boarders of Lower Austria. This classification, does, however, not take into account two important facts. Firstly, the otter population in Lower Austria is not isolated, but interconnected with two much bigger populations, one in the Czech Republic and Upper Austria, the other in Hungary and Styria. Secondly, at present the population is expanding its range, both in Lower Austria and in the neighbouring countries (A. TOMAN for CZ and J. LANSZKI for H, both pers. comm.). Hence at present there are no immediate threats in those areas still supporting otters. This was also the conclusion of MACDONALD & MASON (1990b) in the "IUCN Otter Action Plan".

3.5 Hypotheses of the population decline

Pollution, habitat destruction and intentional and unintentional killing are generally considered as the main threats for otters (MACDONALD & MASON 1990a). Which of these factors may have accounted more than any other for the decline of otters in Lower Austria or was it a rather equal involvement of several or all these factors?

Focusing only on the population trend during the second half of the 20th Century, official hunting can be excluded, since the hunting season was closed since 1947 until today. Illegal killing might have occurred and it is arguable that poaching was more common in the 1950ies than in the 1960ies or 1970ies. For the 1990ies there is evidence for illegal persecution, both in northern Austria and the southern Czech Republic (KRANZ 1994, GUTLEB et al. 1998, KRANZ *et al* in press).

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Circumstantial evidence indicates that unintentional killing such as road casualties was extremely rare before 1985. Since then, it increased (GUTLEB 1994), presumably due to the increase of otters.

There is no doubt that the quality of habitat remarkably decreased during the last 50 years. Many rivers and streams were straightened and embanked, bank side vegetation destroyed and oxbow lakes filled up with soil. In addition, dams, built for power plants may have decreased the quality of riverine otter habitat as suggested for the River Kamp (KRANZ 1995). However, since a decade otters are expanding their range despite any habitat improvement along the rivers recolonised by otters (namely the following rivers and catchment areas: lower Kamp, Krems, Pitten, Purzelkamp, upper Traisen, Weitenbach, Ysper, Zöbernbach). This casts serious doubts that habitat destruction was the main factor for the recorded population crash in the second half of the 20th century.

Hence, pollution remains as the only possible factor contributing more than any single other to the population decline of otters in Lower Austria. Evidence is again circumstantial, since no or almost no monitoring has taken place here. However, otter population trends show a remarkable synchronisation throughout Europe as does otter relevant pollution (organochlorine insecticides, polychlorinated biphenyls, e.g. STRACHAN & JEFFERIES 1996).

3.6 Conservation in the past and priorities for the future

The first and perhaps only true milestone in otter conservation in Lower Austria was the legal protection under the hunting law in 1947. Similar to other European countries, otter conservation was no priority in the following decades until first otter damages occurred in the early 1980ies in carp farms in northern Austria. In order to appease fish farmers, a compensation system was installed (BODNER 1998), but it remains controversial, whether this policy appeased or fuelled the conflict between otters and fish farmers (KRANZ in press). In the light of increasing claims, additional management strategies such as life capturing and translocation of otters (KRANZ 1999) are under discussion. Conservation priorities for the future may include (see also KRANZ 1999):

a) systematic population monitoring in order to detect any changes in the population trend as soon as possible
b) monitoring of key pollutants in the food chain of otters
c) habitat improvement to foster the interconnection of the population in the north and the south of the country
d) law enforcement to reduce illegal persecution of otters; this is of general importance, but crucial in all those areas which are in the stage of being recolo-

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nised

e) an information campaign to inform fish farmers how to prevent otter damages, again this is of particular relevance for areas, where fish farmers are not used to the presence of otters any more
f) ecological and socio-economic research in order to identify drivers in the conflict of otters and fish farming.

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