A R T I C L E

FISH FARMING REGIONS AS KEY ELEMENTS FOR NATURAL RECOLONISATION ALONG AN OTTER EECONET

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Abstract: High density otter populations currently exist in fish farming regions in central Europe. Migrating otters from these expanding populations can help recolonise depleted otter ranges in Western Europe. However, conflicts between fish farming interests and predating otters puts the latter at risk. Killing or relocating otters and large scale fencing (in effect habitat destruction) to protect fishery interests will disrupt the surplus character of these otter populations. A joint international effort is proposed to find the political and financial means to help solve this problem.

Key words: otter, fish farming, recolonisation

INTRODUCTION

The otter (*Lutra lutra*) is critically endangered or extinct within the industrialized core of western Europe. However, in several East European countries viable populations still exist (Macdonald and Mason, 1994). Opinions as to the means of repopulating depleted areas in western Europe vary from rapid recolonisation by artificial reintroduction to a much slower recolonisation as a result of natural dispersal. Such factors were discussed at a workshop on Ecological Networks during the 1994 Seminar on the Conservation of the European Otter (Council of Europe, 1996). Wolters (1996) envisioned the development of the European Ecological Network (EECONET) as a necessary tool in otter conservation and recolonisation. Reuther (1996) argued for natural migration as the soundest way of recolonising and presented suggestions on the possible routes for reconnecting the isolated otter populations in different countries in the form of a European Otter Habitat Network.

The present article will elaborate that for a successful natural recolonisation the fish farming regions of Central Europe play an, as yet undervalued, key role by harbouring locally expanding otter populations. It is recognised that the present high density otter populations in those regions inflict economic damages upon fish farming and this will continue if the fish farming regions are to continue in their role as otter suppliers. At present the possibilities of damage compensation are scarce and do not offer a final solution. The authors argue that the otter populations in fish farming regions should receive extra protection and a mechanism to compensate for the damages they inflict should be established on an international level to enlist the full cooperation of the fisheries in our effort to secure the expanding character of these otter populations.

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Surplus populations

A really natural recolonisation of depleted areas in the Czech Republic and in western Europe requires the presence of high density, expanding otter populations which can function as otter sources (surplus populations) (Dulfer and Plesnik in prep). Evidence from several countries in the Central European region indicate that the presence and survival of such high density otter populations in Germany, Poland, the Czech Republic, Austria and Hungary is linked with commercial fish farming. The highest density is found in the vicinity of fish ponds, with lower densities in the surrounding areas (Ansorge, 1994; Bodner, 1996b; Janda, 1991; Kemenes and Nechay, 1990; Kemenes, 1991; Kokes and Andera, 1994; LfUG, 1996; Reuther, 1996a; Toman et al, 1996; Wlodek et al, 1989).

A simple habitat selection model, modified from Fretwel (described in Krebs, 1994, p 70), assumes that a habitat with a high suitability for a species will be characterized initially by immigration exceeding emigration and a higher reproductive success than less suitable habitats. This will result in an increase in density and eventually in overcrowding of this habitat. The model predicts that the suitability of the good habitat will decrease to a point at which it becomes equally or even more profitable for an individual to live in the adjacent, initially less suitable but less crowded, habitat (Krebs, 1994). The fish pond areas in the central European region have developed into semi-natural landscape elements, characterised by a high species diversity in flora and fauna (Biodiversity hot-spot) (Pecharova and Plesnik, in press, Franke and Bayer, 1995; LfUG, 1996). With high food availability throughout the year and ample cover for breeding and resting, the ponds can be considered as extreme good or even optimal otter habitat. According the mentioned habitat selection model the increase in otter density in the pond habitats should eventually result in overcrowding and subsequently individual otters will disperse towards the adjacent habitats which have a much lower suitability due to the lower food availability. Several studies mention that recent years in and around the central European fish farming regions most of the otter populations are or seem to be expanding and the populations in the adjacent regions are considered to originate from, or be sustained by, the surplus from the populations in the fish ponds (Ansorge, 1994; Bodner 1996a,b; Brezinsky and Romanowski, 1996; Janda, 1991; Kemenes and Nechay, 1990; Kemenes, 1991; Kokes and Andera, 1994; Kranz, 1995; Reuther, 1996a; Wlodek et al., 1989; Reuther, pers. comm.). Dispersal was also observed in our investigations in the Czech Trebon Biosphere Reserve. A radio-tagged sub-adult male migrated from his release-site in the most optimal habitat of the Reserve with the highest otter density to the less occupied and presumable less suitable region just outside the Biosphere Reserve (Dulfer, unpubl. res.).

As such, that what we would like to achieve with the concept of surplus populations as part of an OTTER EECONET already, unintentionally and without human interference, seems to be happening: a really natural dispersal toward less populated areas.

The conflict of economy and ecology

To ensure that the process of natural dispersal continues toward a reconnection of the otter populations in Eastern Europe and towards a westward dispersal, one first and utmost important prerequisite should be met. This first prerequisite of all scenarios of nature conservation and of a proper functioning of any ecological network has to be to protect the existing valuable habitats and viable populations (Bennet, 1994; MacDonald and Mason, 1994; Reuther, 1996A; Wolters, 1996). This was expressed for the otter in the IUCN Otter Action Plan (Foster-Turley et al., 1990) and more strongly stressed by MacDonald and Mason (1994): *'It is essential that the otter and its habitat be protected rigorously in those*

areas where viable populations still remain. All the money and goodwill available in Western Europe for national but isolated, contaminated and fragmented populations will achieve nothing if real strongholds are allowed to perish unseen'.

Presently there is, however, a tendency to the opposite in Central Europe as a result of the ongoing privatisation of fish farms. In several countries, economic damage inflicted by otters on fish farming, and for that matter angling waters, is becoming a serious problem. With large and state-owned fisheries, the damage inflicted by otters was mostly neglected because production was defined as fish measured over a large number of ponds. Where large pond complexes remained within one company after the privatisation, otter damage is still regarded as less important, as is the situation with the Czech Trebon Fisheries Ltd. (managing 7,000 ha). However, a lot of ponds were restored to their former owners and at present there are a lot of small owners or owners' associations in central Europe who manage one or more relatively small ponds (0.5-50 ha) and build their existence on fish farming. For example, in the Czech Republic fish farming is the only agriculture activity in which incomes have not declined since 1989 (Pecharova and Plesnik, in press). It is here that the otter inflicts the largest relative economic damage. Here, a single otter foraging on a small pond can take away all profit or even threaten the existence of the business. This is the most common situation outside of South Bohemia. Complaints from these owners are rising rapidly and, because there is no damage compensation or funds for taking preventive measures, the tolerance toward the otters is declining with the same speed. An acceptable solution has to be found as quickly as possible for these owners because it is here that the otter runs the biggest risk of being killed illegally (Bodner, 1996b; LFUG, 1996; Dulfer and Roche, 1996; Kemenes, 1991; Romanowski 1996, pers. comm.).

Legal Protection for Otters causing Damage

Theoretically, the otter, being an endangered species, has sufficient protection in the central European countries under different national laws and international conventions like the Bern Convention. Otters in Germany and Austria enjoy additional protection through the so-called E.U. Habitat Directive (European Union, 1992). However, most national laws, and even the Bern Convention and the E.U. Habitat Directive allow for removal or killing of protected animals under specific conditions, in particular in the case of local high densities combined with 'problem animals causing what is considered to be excess economic damages'.

In Poland, otters are fully protected but permission for live-catching and relocating animals causing excessive damage in fish ponds are granted by special permission of the Ministry of Environment, Natural Resources and Forestry. Shooting permits can be applied for under the same law but have never been granted and illegal killing around fish ponds is thought to be substantial (Romanowski, 1996 pers. comm.). In Hungary, otters are fully protected but problems with otters around fish farms are large. Special permits are issued for shooting otters around fish farms (Macdonald and Mason, 1994) and illegal killing is thought to happen regularly (Kemenes, 1991; Macdonald and Mason, 1994). In a recent workshop on otters and fish farming in Austria it was suggested that it should be possible to discuss the option of shooting otters in Austria as well and the latest amendments to the Czech hunting law brings this possibility frighteningly close in the Czech Republic.

Removal of Otters Causing Economic Damage

There are strong arguments against following such a course. It can easily be predicted from the same habitat selection model mentioned above (Krebs, 1994) that legal or illegal killing or removal of otters in a high density otter population around fish ponds will have a counter-productive effect with respect to this natural dispersal.

Killing will lower the otter density in the optimum fish farming region, crowding of this habitat will cease and free space for additional otters becomes available. It can be predicted from the earlier mentioned model that otters in less optimum habitats will move toward the optimum to fill the free space until a new equilibrium is established. The farmer is again confronted with otters and will again kill them, until finally most otters in the entire region are killed. The option of killing - and for that matter removal and re-location of otters - is therefore counter-productive with respect to the protection of viable populations and with the success of natural recolonisation.

Fencing to Prevent Economic Damage

Fencing would normally be considered the solution if the easiest and cheapest solution of killing otters cannot be used. It can be argued that complete fencing of all ponds is equally undesirably and counter-productive for two reasons.

The first reason is that the fish ponds are the main food source for the otter. The 2-4 year carp production cycle, and in particular the associated growth of non-commercial fish species, guarantees a year-round food supply for the otter, since ponds which harbour fish during winter are kept partly ice-free. Fencing would very efficiently reduce the food availability and hence reduce the habitat quality substantially.

The second reason is that the fish ponds, in general, provide excellent habitat features for otters. Most fish farming ponds in Central Europe were constructed up to 4-600 years ago and they now have become almost natural elements in the landscape (Pecharova and Plesnik, in press; Janda, 1994; Kvet, 1992). In particular the reed stands and the vegetation resulting from the filling and terrestrialisation processes in the shallowest parts of the ponds developed into a very suitable habitat, offering ample cover for breeding females. The practise of clearing the bottom and creating deposit islands from cleared sediment provided another potentially good shelter for otters. Fencing would block the access to large parts of this habitat and should be regarded as a form of habitat destruction.

Fencing therefore results in a strong decrease in habitat quality as a result of food depletion, less suitable breeding conditions and habitat loss. Following the habitat selection model (Krebs, 1994) one can predict that a rapid reversal from optimum to poor habitat would result in an otter exodus, very likely followed by a rapid decline of otter numbers in the entire region, especially if, as in the case of the Hungarian, Austrian and South Bohemian otter populations, survival of a metapopulation is largely dependent on the continuing breeding success of a core population around the fish pond.

Apart from the direct negative effects that fencing might have on the otter population, it may also conflict with other conservation programmes (CHKO Trebonsko 1996 pers. comm.). Finally, this measure is impractical and too expensive, certainly in the case of the professional fish farming industry in the Czech Republic: the ponds simply are too large and,

with approximately 20,000 fish ponds in the Czech Republic (Pecharova and Plesnik, in press), too numerous for that.

Present Systems of Damage Compensation

It must be stressed that all parties involved recognize that otters do cause economic damage, in particular in the winter season (Ansorge, 1994; Bodner, 1996b; Dulfer and Roche, 1996; Kemenes, 1991; LFUG, 1996; Wodlek et al., 1989; Romanowski, 1996 pers. comm.). A system of straight forward damage compensation or funds for preventive measures presently exists in a few countries, but a clear legal back-up for these payments is often missing (de Klemm, 1996). Most countries still regard the otter as *res nullius* (nobody's property). Even those countries who accept that the otter is, or should be, *res omnium* (the property of all), are hesitant to follow this line of reasoning to its logical end, i.e. a State liability which would offer a legal basis for damage claims (de Klemm, 1996). In Austria damages are compensated through a so-called 'otter account', funded by 4 NGOs. Payments are made voluntarily and there is no legal mechanism for claiming from it (Bodner, 1996b). In Sachsen (Germany) damage is not compensated for, but funds from the county are available for preventive measures. However, there is no legal mechanism for making claims on such funds (Thiem, 1996). In Hungary a grimmer situation exists without any legal mechanism for damage claims and no available funds at all for damage compensation or preventive measures (Kemenes, 1991). Poland has a system for relocating otters (Romanowski, 1996 pers. comm.) without compensation. The Czech Republic presently has no formal system of compensation but the problem is being studied; some compensation for damage to angling waters has been paid by the State in the last year and a new 'Act on damage inflicted upon private property by Specially Protected Species' is under preparation. It is recognised in all of the mentioned countries that the currently used systems for compensation are not satisfactory and that a better solution has to be found rapidly in the light of the increasing complaints and the decreasing tolerance of fish farmers towards otters causing damage.

Toward a Solution

This brings us back to the point stressed earlier regarding the 'protection of viable populations'. As argued above, shooting and relocating otters or complete fencing as prevention against economic damages in central Europe is undesirable from the point of otter conservation and recolonisation of former otter range in central and Western Europe. Given the seeming decline in effective legal protection and tolerance toward the otter it might therefor indeed be necessary to protect these populations literally 'at all costs', at least for the short term, to buy time until more effective measures can be established and take effect.

In this respect we would like to take the reasoning of the otter as *res omnium* beyond a State liability and argue that the protection of surplus otter populations is of international importance. If the otter in east and central European countries is to help recolonise the west European countries, finding, and in particular funding, a solution for the conflict between the economic interests of the fish farmers and the conservation interest of the otters is a matter of all countries involved. To simplify the matter: the countries (better, the fish farmers) in central Europe have the otters but not the money for any conservation solution, the countries in west Europe (assembled in the European Union) have the money for solutions but not the otters. It is our opinion that a joint effort could help those in need, be it of actual otters or of money for otter conservation.

Let us stress here that none of us believe that simply paying the fisheries whatever the damage claimed is the solution for the problem - on the contrary. But every solution suggested now or in the future will cost money which is not available yet and some damage will always remain which has to be paid for. West Europe should help solve the problem of these damage claims in such a way that otters do not become the next victim of privatisation. Only then can the thriving populations in central Europe really become the surplus populations providing the otters necessary for a natural recolonisation of presently depleted otter ranges.

CONCLUSION

The recolonisation of depleted otter ranges, in particular in Western Europe, depends largely on safeguarding the expanding character of otter populations in the central European fish farming regions. The tendency toward issuing permits for killing or relocating otters around fish ponds or fencing the ponds therefore should be reversed as quickly as possible and with all possible means if a natural recolonisation is to have any chance of success.

To be able to reverse this process a joint strategy of the central European countries involved is needed to find different practical and political solutions to minimize damage and to find funds to pay for these measures and for compensation of remaining damage. A first step could be that otter experts concerned with damage aspects in Poland, Hungary, Austria, Germany (Sachsen) and the Czech Republic prepare a joint statement summarizing the problem and develop a joint strategy including recommendations for State Authorities to approach the problem. A meeting to this effect has been scheduled in Trebon for early December. We will argue at this meeting for an internationally (E.U.) paid damage control and compensation scheme. This scheme could operate under the auspices of, for example, the Bern Convention, which could ensure a coordinated effort to help natural recolonisation along the OTTER EECONET.

In the long run, such an international scheme may well be relatively cheap compared with the large and costly reintroduction attempts that have already been undertaken in some Western European countries, especially if these then have to be followed, in a few decades or even less, by similar reintroduction projects for the then threatened or extinct otter populations in the fish farming regions because no money was made available presently for their protection.

Finally, it must be stressed that all measures can only be successful when strongly backed by good education and information campaigns both among the general public and some target groups (e.g. fish farmers, hunters, schoolchildren) to obtain the support of local people. As such practical international support will raise a lot of essential goodwill.

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