Opinion

Reintroduction of the otter (*Lutra lutra*) in the Netherlands meets international guidelines

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Abstract: In the past, the otter (*Lutra lutra)* was a predator in Dutch freshwater ecosystems. Due to hunting, fishing, destruction and fragmentation of its habitat, pollution, traffic mortality and disturbances due to recreation, the otter became extinct. Fourteen years after extinction, the otter has been reintroduced in the Weerribben, an area in the northwest of Overijssel province. There was much discussion about releasing otters in the Netherlands. This paper discusses the reintroduction project in the light of the IUCN (International Union for Conservation of Nature and Natural Resources) guidelines, which are internationally recognized and applied in many reintroduction projects. The IUCN guidelines stress the importance of biodiversity and public nature conservation awareness (important in a highly populated country as the Netherlands). The guidelines stipulate that the former causes of death should have been removed or minimised in the release area and that the chances of a spontaneous recolonisation by otters, sufficient to establish a viable population, should be small. Capturing otters for reintroduction should not have negative effects, the released otters should be genetically similar to the extinct otter population and the project has to be monitored. Assessment of the project to reintroduce otters into the Netherlands shows that that the IUCN guidelines were followed.

Keywords: otter, *Lutra lutra*, reintroduction, IUCN guidelines, Weerribben, The Netherlands, nature conservation, biodiversity.

Introduction

The otter (*Lutra lutra*) was a common predator in the Netherlands, but has been persecuted for over a century (Broekhuizen et al. 1992). After legal protection in 1942, hunting was no longer the main cause of death, but mortalities increased as wet ecosystems were reclaimed for agriculture or built upon. Eutrophication and pollution were responsible for bad water quality. The road infrastructure expanded very rapidly and became an important cause of mortality. Roads became more dangerous to cross and also fragmented the remaining small patches of habitat. This decreased exchange between isolated local populations and was one of the major reasons for the extinction of the otter in the Netherlands (Broekhuizen et al. 1992). In addition, illegal hunting and drowning in fykes, further contributed to the decline of the population. Despite increased efforts in nature conservation, the otter became extinct in 1988.

The Ministry of Agriculture, Nature management and Fisheries started efforts to retrieve the otter population, by setting up a working group It mainly addressed the quality of the freshwater ecosystem that the otter used to inhabit. For fourteen years, it has been worked on improving freshwater quality, which is now deemed suitable for otters (Jansman et al. 2003). In July 2002, seven otters were released in the Weerribben, followed by a second group of eight individuals at the end of 2002. Not everybody was pleased with the reintroduction plan. Its advantages and drawbacks were extensively discussed and this discussion has continued after the rein-

troduction. This discussion has motivated this evaluation of the reintroduction project against the internationally accepted guidelines of the International Union for Conservation of Nature and Natural Resources (IUCN).

IUCN guidelines

The IUCN tries to protect the integrity and diversity of nature worldwide and the sustainability and preservation of natural resources. To carry out this vision, the IUCN has drawn up guidelines (IUCN 1995), which are internationally recognised. Reintroduction is defined by the IUCN as "an attempt to establish a species in an area, which was once part of its historical range, but from which it has been extirpated or become extinct". From this perspective, releasing otters in the Netherlands is a reintroduction. Under IUCN guidelines, a basic reintroduction programme should involve a study to investigate the opportunities for reintroduction and a preparation phase. Monitoring should always follow the actual releasing phase. IUCN states that the main aim of a reintroduction project should be the re-establishment of a viable, free-ranging population of a species, subspecies or race, which has become locally extinct or naturally extinct in the past. These guidelines cover several issues which will be discussed in the context of the Dutch otter project.

IUCN aims for reintroductions

One IUCN aim of a reintroduction is to enhance the long-term survival of an endangered species. In the last century, and especially over recent decades, otter numbers have been in constant decline in Europe. However, as the area of distribution of the otter stretches from Ireland to Japan (Broekhuizen et al. 1992) the otter as a species is not globally endangered. Some populations on the Iberian Peninsula and in Eastern Europe have been expanding, due to improving environmental conditions and successful reintroductions (Sjöåsen 1996, Ruiz Olmo 2002). A sustainable local population in the Netherlands could function in a future network of local populations within Europe and contribute to the sustainability of these populations.

Another aim is the re-establishment of a "keystone species" in the ecological sense. According to the IUCN, a keystone species represents an indispensable species, whose extinction may cause a structural change of an ecosystem. However, a structural change of the freshwater ecosystem is not expected, because of their small impact on the ecosystem as top predator (H. Jansman, personal communication). So, the otter is not a keystone species in the ecological sense.

As the top predator of freshwater ecosystems, otters could accumulate heavy metals and PCBs in their fatty tissue. The absence of otters, or their decreased fitness, could also indicate poor water quality. Good water quality is a prerequisite for their reintroduction. Reintroducing otters in the Netherlands means that freshwater ecosystems might be more complete as the conditions should be suitable for other species as well.

The third IUCN aim, preservation or restoration of natural biodiversity, also fits the Dutch situation, as otters used to be an integral part of Dutch biodiversity (Broekhuizen et al. 1992). Historically, the Netherlands was a marshland with characteristic peat bog areas and lakes, but reclamation and urbanisation resulted in a drastic decrease of these areas. Establishing and restoring nature conservation areas is important to preserve these (future) animal habitats. Other characteristic marshland species already profit from measures included in the otter reintroduction programme.

The fourth aim covered by the IUCN is the expected long-term economic benefit to the local or national economy. More visitors could be expected in the release areas, but this effect might be quite minimal as otter sightings are rare. Realisation of this aim might thus be difficult.

The last aim for reintroduction, according to the IUCN, can be to enlarge public nature awareness. This public awareness is especially important for densely populated countries such as the

Netherlands. The Netherlands have an average of over 450 inhabitants per square kilometre. Over the last twenty years, an area with the size of the province of Utrecht has been turned into farmland, roads and cities (Statistics Netherlands 2003). While urbanisation was only permitted on formerly agricultural land, claims for land will increase in the future as the Dutch population grows further: Statistics Netherlands (2003) predicts 17 million inhabitants in 2015. Nature and biodiversity need social protection against ongoing human pressure. Otters easily attract attention (Mulder 2002) and public opinion puts them high on the list of favourite animals such as koalas, pandas and elephants (Rientjens 2000). By using the otter as a symbol to stimulate nature awareness, the last aim for reintroduction from the IUCN guidelines can be met.

IUCN criteria for reintroduction

Besides these aims for reintroduction, the IUCN has developed a list of criteria, which should be taken into consideration before starting a reintroduction programme. This list includes pre-project biological activities such as conducting a feasibility study, background research and thorough research into previous reintroductions. Preliminary research into previous otter reintroductions, such as in Spain and Sweden, are important, as they provide crucial information on the chances of success (Sjööåsen 1996, Ruiz Olmo 2002). Other biological criteria are related to the choice of the release site and type, evaluation of the reintroduction site, the availability of suitable release stock and the release of captive stock. Besides biological criteria, also socio-economic and legal requirements are distinguished (IUCN 1995).

The following criteria from the IUCN list for reintroductions will be discussed in the following paragraphs: preliminary research, elimination of previous causes of decline, feasibility study, chances of spontaneous recolonisation, release of captive or captured wild otters and possible negative effects on wild host populations, genetic relations with original native stock, local human attitude assessment and a post-project monitoring stage. These criteria cover most of the IUCN reintroduction guidelines and we focus on these topics as they also formed the basis of the discussion around the reintroduction project.

One of the first prerequisites for any species reintroduction is that the conditions that caused the extinction in the past should no longer be present. After a feasibility study, carried out initiated by the Dutch government, a cooperative effort of several organisations (Ministerie van Landbouw, Natuurbeheer en Visserij, Stichting Otterstation Nederland, Staatsbosbeheer, Vereniging Natuurmonumenten, It Fryske Gea, Natuur en Milieu Overijssel, Provincie Overijssel, Provincie Friesland, Waterschap Reest en Wieden, Waterschap Friesland, Rijkswaterstaat, Alterra, Technische Commissie Muskusrattenbestrijding) selected five wetland areas in the northeast of the province of Overijssel and in the southwest of the province of Friesland as potential reintroduction areas. These were Lindevallei, Rottige Meenthe, National Park de Weerribben, Wieden and Oldematen. Although these areas were already well-connected special devices, such as otter-friendly tunnels and ledges under bridges, were established to increase exchange. This created a 12,000 ha marsh and bog area, where the shores provide otter habitat and places where otters can easily get out of the water (Jansman et al. 2003). To reduce traffic mortality passages under fenced roads have been built in and around the release area. Water quality had improved since the otter extinction (Stichting Otterstation Nederland 1998), while fishermen and muskrat catchers in the reintroduction area use different fykes and cages from the ones that are normally used in the Netherlands (Faber 2002). Adult otters are not able to swim into these adapted fykes.

Hunting (forbidden in the Netherlands since 1941) was assumed to be of no significance for this reintroduction project and disturbance from recreation to have a minimal impact because of

the existence of many restricted access areas in the reintroduction area.

The IUCN guidelines also specify that the chances of spontaneous colonisation from neighbouring populations should be minimal. The closest viable otter populations are found in Eastern Germany. Specialists are convinced of the possibility of otters returning by themselves, but the time needed establish a viable otter population by spontaneous colonisation is a matter of debate. Some claim that German otters move rapidly in western direction and will reach the eastern provinces of the Netherlands within ten years (Reuther 1998). Otter footprints and spraints are occasionally found in the Southern province of Limburg, near the German and Belgian border (Smit 1991, Winter 1993, Backbier & Jansen 2002). Others predict that a spontaneous establishment of a viable population cannot be expected within fifty years (De Jongh 1998). Human population growth and land use will continue to put pressure on, or even destroy, potential habitats and nature conservation areas will become islands in a sea of urban or agricultural areas.

The IUCN criteria recommend the release of captured wild otters, because of their higher ability to adapt to natural situations. Wild caught otters in a Swedish reintroduction project showed higher survival rates than those released from captivity. One year after release, 79% of the captured wild otters had survived, against 42% of former captive ones (Sjöåsen 1996). Also the age of the released animals is important. The survival rate of introduced captive otters increases when young otters are reintroduced that were taken from their mother at a low age. Captured wild animals of two years or more should not be released, as they are likely to try to leave the release areas in an attempt to return to their original source areas.

Capturing wild animals in their original habitat should not have a negative impact on the source populations. For this project the original intention was to reintroduce 12 wild caught otters in 2002, but due to delays and capture problems, only three wild otters and four otters out of zoos were reintroduced in the Weerribben. (This after a short quarantine time, and with a thorough veterinary screening). With the release of previously captive individuals the project did not fully follow the suggestions of the IUCN guidelines. This first group was followed a few months later by a second group of eight wild caught otters. In all, the project involved the capture of 40 otters in Belarus and Latvia, which would not effect the large and stable populations in these countries (about 5,000 otters in Latvia, Jansman et al. 2003). However, four otters died during the capture process, and as a result the Dutch Minister of Agriculture, Nature Management and Fisheries immediately and indefinitely halted the capture in Eastern Europe, because of animal welfare concerns (Veerman 2002).

Another IUCN criterion is that reintroduced otters should be genetically similar to the former Dutch otters. Some have disapproved of the reintroduction of Eastern European otters in the Netherlands, because they believe that otter populations in Eastern Europe possess genetic differences (Anonymous 2002). These newly established Dutch otters could mix with German ones, causing a loss of genetic variation and a higher susceptibility to diseases. Recent research rejected this hypothesis: DNA from different otter populations in eastern Europe was compared with DNA belonging to historic Dutch individuals out of museums, and minimal genetic differences were found between these samples (Mulder 2002).

The IUCN states that a thorough assessment of attitudes of local people to the proposed project is necessary to ensure the long-term protection of the reintroduced population. This reintroduction project partly fulfilled this aim by educating local people through special newspapers, lectures and excursions into the release area, as well as television and radio programmes to inform citizens about the project.

Another IUCN criterion for reintroduction is that the newly established population is monitored. The well-being of the reintroduced otters should be followed for at least two or three years, so conclusions can be made about the success of the project. An intensive monitoring programme,

of at least four years, was set up to follow the released animals (H. Jansman, personal communication). Such monitoring requires the use of radio transmitters and telemetric methods (Sjöåsen 1996). Without using these methods, it is not possible to track otters (Niewold et al. 2002); other reintroduction projects, have found that otter sightings are very rare, owing to the shy nature of the animal (Sjöåsen 1996).

Besides these IUCN guidelines, there has been a specific debate in the Netherlands about why the reintroduced otters were captured in Latvia and Belarus, as opposed to populations from countries closer to the Netherlands. There would have been less debate if, for example, German or Polish otters had been released.

Conclusion

Looking at the IUCN guidelines and their meaning for the reintroduction of the otter in the Netherlands, it can be stated that the main aims are the enhancement of a top predator endangered in Western Europe, preservation or restoration of the Dutch biodiversity and stimulating the nature awareness of the Dutch inhabitants. The majority of the IUCN reintroduction criteria appear to have been followed by this otter reintroduction project: the causes of death in the past have been largely eliminated and, although a spontaneous colonisation of German otters within a short time span can not fully be excluded, it is not widely accepted that this will happen. Capturing wild otters in Eastern Europe will not have a negative impact on the source populations and minimal genetic differences have been found between different local otter populations in Eastern Europe and the former Dutch otters. A monitoring stage after release is being undertaken.

We conclude that the reintroduction project of the otter in the Netherlands has followed the IUCN guidelines, which are designed to promote the restoration of plant and animal populations, based on best available practice.

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Samenvatting

Herintroductie van de otter (*Lutra lutra*) in Nederland is in overeenstemming met internationale richtlijnen

De otter (*Lutra lutra*) vervulde in de Nederlandse zoetwaterecosystemen een rol als predator, maar bejaging, vernietiging en verkleining van zijn habitat, verontreiniging, verkeer en verstoringen door recreatie hebben geleid tot het uitsterven van de otter. Veertien jaar na zijn uitsterven is de otter opnieuw door herintroductie uitgezet in de Weerribben, een laagveengebied in noordwest Overijssel. Er is veel discussie geweest over het uitzetten van otters in Nederland. In dit artikel wordt het herintroductieproject besproken aan de hand van de richtlijnen van de International Union for Conservation of Nature and Natural Resources (IUCN), die internationaal herkend worden en door veel herintroductieprojecten worden nageleefd. De IUCN-richtlijnen benadrukken dat biodiversiteit en natuurbewustzijn belangrijk zijn (zeker belangrijk in een dichtbevolkt land als Nederland). De IUCN beschrijft in de richtlijnen dat de oorzaken die in het verleden als oorzaak werden gezien voor het uitsterven van een diersoort afwezig zijn in het uitzetgebied voordat er tot herintroductie overgegaan dient te worden en dat kans op een spontane herkolonisatie van een duurzame populatie van otters afkomstig uit het buitenland klein dient te zijn. De bronpopulaties dienen geen negatieve gevolgen te ondervinden van het vangen van otters voor een herintroductie. Verder moeten uitgezette otters genetisch identiek zijn aan de otters vóór het uitsterven. Monitoring na uitzetting is gewenst. Na toetsing van het herintroductieproject aan deze richtlijnen, concluderen we dat de IUCN-richtlijnen door het Nederlandse herintroductieproject worden opgevolgd.

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