

# Decline and recovery of the otter in Europe. Lessons learned and future challenges

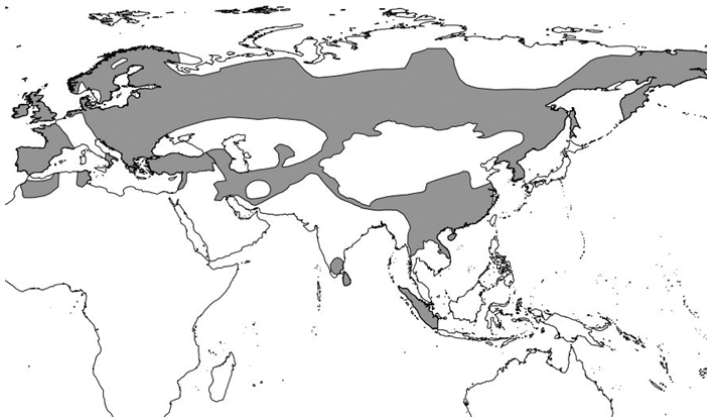
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The Eurasian otter *Lutra lutra* has one of the widest distributions of all Palearctic mammals, from Europe through North Africa and Asia (Hung and Law, 2016). Over one-third of the range lies in Russia (Figure 1). However, many populations within the range are extinct or reduced to small, sometimes isolated enclaves, like southern Italy and south-east India (Loy, 2018). The European populations of the Eurasian otter belong to the widest distributed subspecies *L. l. lutra*, the other ten subspecies occurring in North Africa, Middle East and Asia (Hung and Law, 2016).

Due to its wide range and the recovery in western Europe, the Eurasian otter has been recently downgraded from Vulnerable to Near Threatened in the IUCN Red List of Threatened Species (Ruiz-Olmo et al., 2008; Roos et al., 2015).

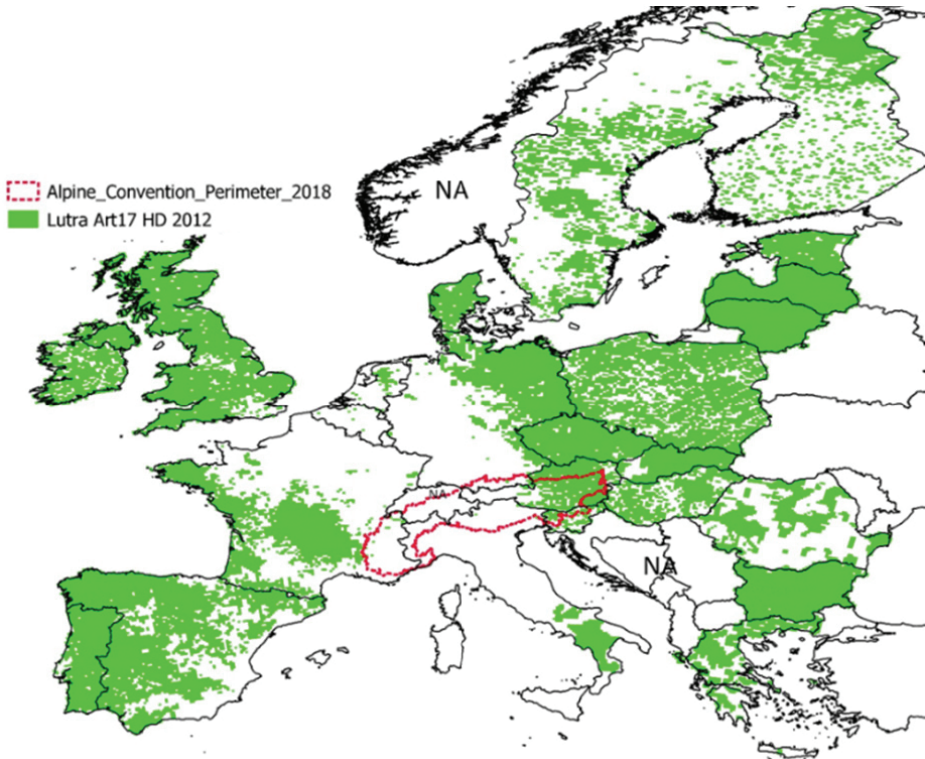
The European continent portion of the Eurasian otter's range is the best monitored following early standard monitoring procedures set by the IUCN Otter Specialist Group (Reuther, 2000) and monitoring obligations derived from the Habitat Directive (42/93/EC) since 1993. According to the last reporting cycle (2006–2012) and the most updated literature, the otter is still common in Portugal,



**Figure 1** The Eurasian otter range.

Source: IUCN Red List of Threatened Species.

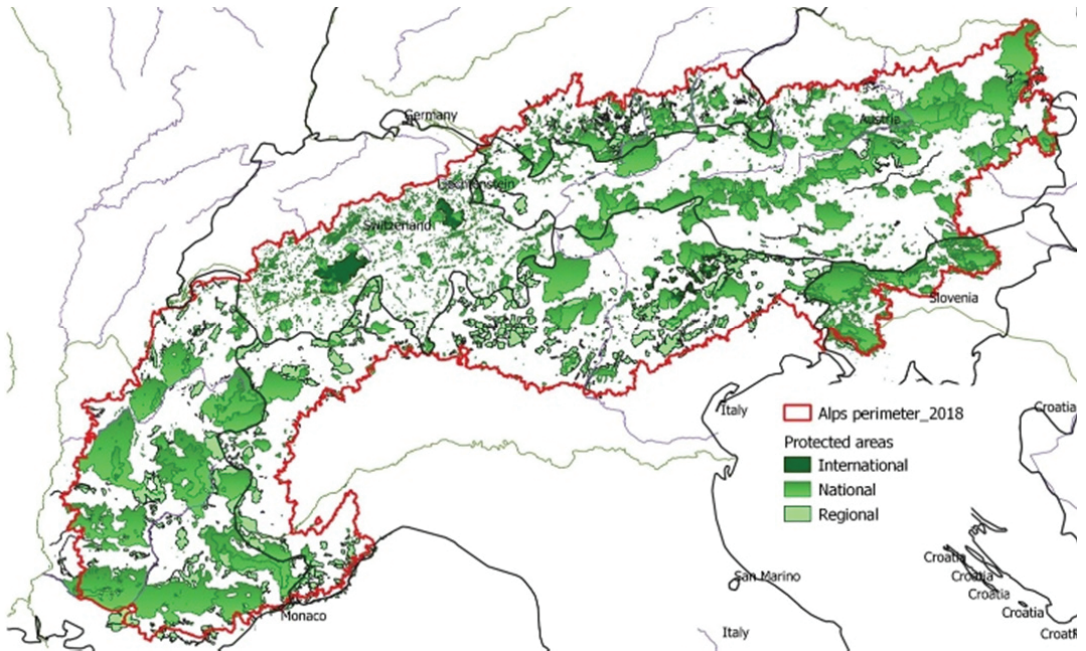
Finland, Lithuania, Estonia, Serbia, Macedonia and Ireland, and is recovering in UK, Germany, Spain, France, Austria, Denmark, Sweden, Italy, Poland, Czech Republic, Slovakia, Slovenia and East Germany (Ruiz-Olmo et al., 2008; Roos et al., 2015; Loy, 2019). The recovery of otters within the European Union was probably related to the adoption of strict regulation, mainly the inclusion in Appendix I of CITES, and in Annexes II and IV of the Habitat Directive 42/93/EEC. Law enforcement also included regulations for the prevention of water pollution. It has been suggested that the main driver of the otter's recovery in Europe since the 1990s was the banning of PCB compounds used as pesticides in agriculture (Directive 2002/32/EC, EC regulation n. 1881/2006) (Ruiz-Olmo et al., 2008; Roos et al., 2015). Habitat protection is guaranteed by the establishment of 4,111 Natura 2000 sites designated for the otter (source: European Environmental Agency <https://eunis.eea.europa.eu/species/1435>), and it is expected to further improve following obligations of the Water Framework Directive 60/2000/EEC.



**Figure 2** Eurasian otter occurrence in the European Union countries according to the III ART. 17 reporting cycle (2006–2012). In red, the Alpine convention boundaries.

Source: <https://eunis.eea.europa.eu/species/1435> and Alpine Convention <http://www.alpconv.org/pages/default.aspx?AspxAutoDetectCookieSupport=1>

NA = countries that are not members of the European Union.



**Figure 3** Distribution of protected areas within the Alpine range. National areas include National Parks and Natura 2000 sites.

Although with variable outcomes, recovering of populations was also reinforced by reintroduction or restocking projects in the Netherlands, north-east Spain, south-west UK and south Sweden (Sjoasen, 1996; Saavedra, 2002; Arrendal et al., 2004; Arrendal, 2007; Hobbs et al., 2011).

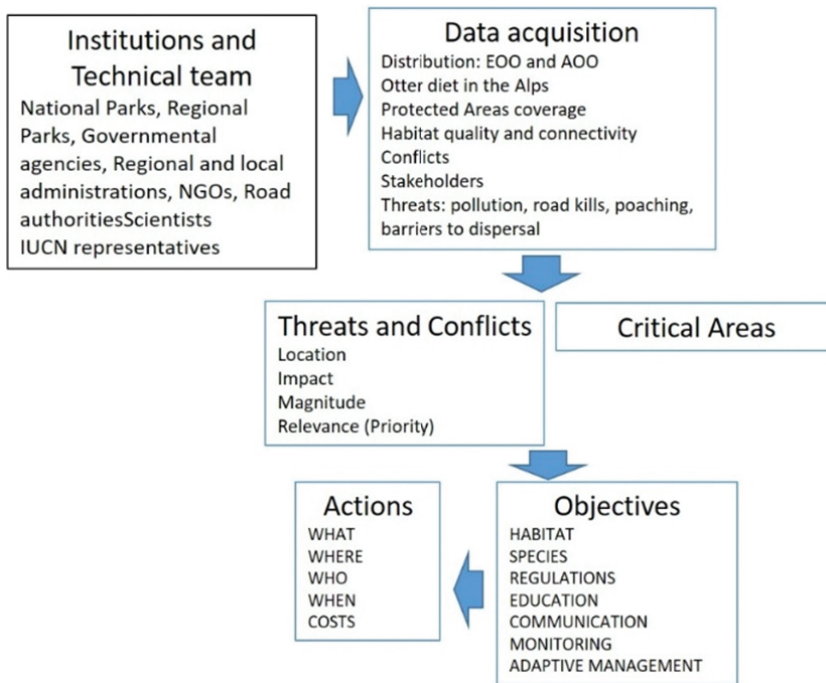
However, otter recovery proceeds at different rates in European countries, and the status of the otter is listed as unfavourable/inadequate in some bioregions, including the Alpine and the Continental (Figure 2). Among the most critical areas are central Europe and the Alpine region, where otters first disappeared in the 1970s, mainly due to the strong anthropogenic pressures on both river and riparian habitats, especially in the highly productive lowlands (Cassola, 1986).

Hosting a network of 10 national parks and about 2,000 Natura 2000 sites, the Alpine range has a strategic role in connecting and promoting the rejoining of the current eastern and western parts of the otter range in Europe (Figure 1). Among countries involved in the Alpine range, Austria experienced the most rapid otter recovering, and the expanding population has now reached north-eastern Italy (Pavanello et al., 2015; Lapini and Bonesi, 2011). In France, Slovenia and Germany, populations are expanding at lower but constant rates (see contributions in this volume), and otters are still rare in the Alpine regions of these countries. The species became extinct in Switzerland in the 1980s. However, it has been recently recorded in localized sites across the country (Angst and Weinberger this volume).

Italy, hosting the majority of the Alpine range territory, shows the most critical situation, with few records localized at the Slovenian and Austrian boundaries (Loy et al, 2015; Lapini and Bonesi, 2011; Pavanello et al., 2015; Marcolin, 2017), and mainly depending on the dispersal from the source population from Austria. This process might be compromised by otter culling authorized in some Austrian areas to mitigate conflicts with anglers and fish farms (Kranz and Polednik, this volume), and by the high rate of road kills recorded in Friuli (Lapini, 2011).

In the western part of the Italian Alps another concern is the establishment in the Ticino river of a small reproductive nucleus of ‘line B’ otters – i.e. otters not suitable for reintroduction due to a former crossbreeding of the founders with *L. lutra barang* – escaped from two enclosures in the Regional Parks of Piemonte and Lombardia (Prigioni et al., 2009).

This complex situation poses some challenges for the return of the otter in the Alpine range, as viable populations cannot be established unless coordinated actions are agreed among all countries within the range. These actions should primarily be addressed to get the most accurate information on threats and conflicts that might prevent the establishment of a viable population of otters in the Alpine range. This knowledge framework will allow identification of the most critical areas and stakeholders on which specific actions might take place (Figure 4).



**Figure 4** Work flow for the implementation of the strategy.

A first step toward a common view and a shared strategy was discussed in the international meeting organized by the Gran Paradiso National Park at Valsavaranche on 10–12 October, 2018, that was attended by public administrations, IUCN and NGOs representatives from Austria, France, Germany, Italy, Slovenia and Switzerland.

The meeting ended on a shared road map towards a common conservation strategy for the otter and for joined efforts to get a financial support for its implementation. A workflow of the strategy is shown in Figure 3.

Moreover, participants of the meeting agreed on a ‘IUCN Otter in the Alps Manifesto’, which is reported in the Appendix.

The identification of threats should not only take into account main drivers of otter extinction at the end of the last century, including direct persecution, habitat destruction and water pollution (Ruiz-Olmo et al., 2008), but also new emerging factors that could have a detrimental effect on otter populations in Europe. Among these main concerns are: effects of climate change, new water energetic exploitations, new water pollutants, and road kills. Specifically, climate changes are expected to affect otter resilience in a variety of ways, from small-scale effects related to extreme droughts and flooding events, to large-scale impacts like habitat shift, loss and fragmentation (Cianfrani et al., 2018). Exponential increase of mini hydroelectric power stations and their cumulative impacts at river basin scale, which are still largely unknown. Among new emerging pollutants, including microplastics and pharmaceuticals, the widespread Endocrine Disruptive Compounds are known to affect reproductive systems in fish, thus with a likely potential direct (i.e. magnification through the food web) and indirect (decreasing of prey composition and availability) effects on otters (Vos et al., 2000; Knacker et al., 2010). As for road kills, despite the fact that it is one of the main causes of otter incidental mortality, little is known about their impact on local otter populations. We have still much to learn!

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## APPENDIX

**IUCN/SSC Otter Specialist Group**  
*... leading global otter conservation*



Otter Specialist Group

## **Gran Paradiso Otters in the Alps Manifesto**

### *A transborder approach to a common conservation strategy*

**ACKNOWLEDGING** that conserving biodiversity and maintaining the resilience of aquatic ecosystems is essential for “sustainable nature for human well-being”, a priority area for the International Union of Conservation for Nature (IUCN);

**RECOGNIZING** that the Eurasian otters, given protection, clean rivers, and a good food supply will return to former habitats and can thrive and prosper once again;

**APPLAUDING** the return of otters in the Alpine region and the European Union due to improved water quality and conservation measures taken by the respective governments and due to the positive attitude of local communities;

**AWARE** that hitherto the eight Alpine countries have pursued different management approaches to monitoring the return of their otter populations;

**RECOGNIZING** that a local environmental accident or problem in one country can directly or indirectly influence and threaten the sustainability and food security of the aquatic ecosystems of neighboring countries;

**AWARE** that otters are persecuted for perceived fish losses, and that otter populations also decline due to factors such as pollution, road mortality, reduction of prey through overfishing, invasive alien species and increasing climate change impacts;

**UNDERLINING** the importance of otters as symbols of healthy wetlands and rivers, as well as freshwater biodiversity;

**FINALLY** our ultimate goal is to restore viable otter populations in the Alps that can exist in a favorable conservation status, compatible with human activities

