Global Re-introduction Perspectives: 2013

Further case-studies from around the globe

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IUCN/SSC Re-introduction Specialist Group (RSG)

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Re-introduction of the brown bear in the central Alps, Trentino, Italy

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Introduction

The brown bear (*Ursus arctos* Linnaeus, 1758) population of northern Italy is one of the smallest in Europe and is central for the restoration of the species in the Alps (Swenson *et al.*, 2000). The decline of the brown bear population in the Alps started during the 18th century due to human persecution and habitat loss and fragmentation (Mustoni *et al.*, 2003). Bears in northern Italy became isolated from the larger Dinaric-Balkanian population, and by the end of the 1990s, only few relict individuals survived in the central Alps, in the Trento province (Trentino) and the population was considered biologically extinct. In 1999 - 2002, nine bears from Slovenia were released in Trentino as part of a translocation program (Life-Ursus Project). Since then, the population has grown to 43 - 48 bears in 2012 (estimates are over 50 bears for 2013), and has expanded into part of the former range (Groff *et al.*, 2013). The modern Alpine ecosystem, a mosaic of natural and human dominated environments, poses the main challenge for the management and conservation of this population. Brown bears are globally listed as of Least Concern (IUCN), the population of northern Italy is in Annex II of the CITES (Washington, 1973) and its protection is regulated at the national and European level.

Goals

- Goal 1: Use translocation of brown bears from Slovenia to avoid the extinction of one of the large carnivores of the Alps, assure the continuity of brown bear presence in the region and preserve the legacy of the native brown bear population, re-establish a minimum viable population of 40 - 60 bears in the central

Brown bear © C. Frapporti

Typical bear habitat © Archives Forest Service

Alps in 20 - 40 years and a brown bear meta-population in the Alps in the longer term.

- Goal 2: Promote the co-existence between humans and bears by increasing awareness of the human population towards brown bears and the re-introduction project, through environmental education and media information, and involving local stakeholders in the project.
- Goal 3: Mitigate human-bear conflicts through protocols for damage evaluation, establishment of damage compensation schemes, prevention of damage to properties, and management of problem bears and of emergency situations.
- Goal 4: Monitoring and scientific research to measure success of the re-introduction and allow timely intervention if deemed necessary.
- Goal 5: Establish a network, at the national and international level, between the different relevant authorities to promote population level management.

Success Indicators

- Indicator 1: Number of founders surviving and reproducing after translocation, positive population growth and reproduction.
- Indicator 2: Preservation of the genetic legacy of the last bear population of the Italian Alps and maintenance of genetic diversity.
- Indicator 3: Habitat use and distribution of the population, connectivity with other bear populations in the eastern Alps.
- Indicator 4: Support to the project (number of local administrations, stakeholders and other associations adhering to the project, attitude of the public opinion during and after the translocation).
- Indicator 5: Level of knowledge acquired through monitoring, number and impact of research projects and activities.

Project Summary

Feasibility: A feasibility study was carried out by the former National Wildlife Institute (now ISPRA) to evaluate the environmental, organizational, administrative, socio-economic and normative aspects of a brown bear re-introduction in the central Alps in Italy based on the analysis of ecological, social and economical data (Dupré *et al.*, 1998). The study estimated that only 2 - 3 relict bears remained in Trentino, based on genetic analysis of feces collected in the region during the years preceding the project. Based on a sample area of 6,495 km^2, the study verified the existence of a minimum suitable habitat of

~1,700 km^2 for supporting a MVP of 35 - 50 bears, taking into account bear ecological requirements, environmental features, and human presence. The attitude of the human population living in non-urban areas was surveyed and found to be mostly (>70%) favorable to the re-introduction, despite lower levels of acceptance in some areas. The study also highlighted the necessity of improving prevention and compensation measures for damages possibly caused by bears. Finally, it was determined that, to achieve project objectives 9 bears (3 males and 6 females and approximately 2 - 6 years old) should be released in the area were the last relict bears of Trentino still existed. The Slovenian population should be the source of the translocated bears given the short time the populations have been separated, the behavioral characteristics, and the sustainability of the removal (stock taken from the Slovenian hunting quota). The study concluded that a re-introduction was feasible and could lead in the mid- to long-term to the successful re-establishment of the species in the central Alps.

Implementation: The main agencies responsible for the implementation of the project were the Parco Naturale Adamello Brenta, which first promoted the re-introduction, the Provincia Autonoma di Trento, which coordinates management activities, and the former National Wildlife Institute, which provides scientific support. Formal technical and administrative agreements were established with other local administrations, including neighboring provinces and countries where the bears were likely to expand.

The support of local stakeholders to the project was ensured through the involvement of the Hunting Association of the Trento Province, Trento WWF, and organizations of categories particularly affected by bear presence such as livestock farmers and beekeepers. Specific Guidelines were produced to define operational programs (i.e. monitoring, management of problem bears, damages and emergency situations, training of personnel, communication) and the specific roles of the various agencies involved. The Trento Province secured a budget for compensating damage losses and other management activities.

Translocations took place during four years, between 1999 and 2002. Bears were captured within two hunting reserves in southern Slovenia and released in the Parco Naturale Adamello Brenta in the western part of Trentino. An additional female was released to replace one that died in an avalanche shortly after release.

Brown bear with radio-collar © C. Groff

Post-release monitoring: All re-introduced bears were equipped with a VHF collar and two ear tags to allow precise determination of their position, at least twice per day, and evaluate potential risks to people and properties, therefore preventing situations of possible conflicts with humans. Radio-tracking was the main monitoring method from 1999 to 2003 and provided important data on survival, habitat use, and distribution of the translocated bears (Zibordi *et al.*, 2010). Radio-tracking through GPS/VHF technology is still used for close monitoring of problem bears. Starting in 2003, genetic monitoring became the principal mean to obtain demographic, reproductive, ecological, distribution and genetic information on the released bears and their descendants. The method is based on the analysis of the DNA extracted from biological samples, mostly bear hair and feces collected non-invasively in the field, using a variety of sampling techniques, but occasionally also tissue, blood, and bones retrieved during capture operations or from bear carcasses (De Barba *et al.*, 2010; Groff *et al.*, 2013). Data from radio and genetic monitoring is complemented with additional information from traditional sign survey, visual observation (i.e. female with cubs), and camera traps.

Most released bears survived and reproduced in Trentino (7 of the 9 founders, 2 males, 5 females); since the translocation the population grew rapidly to estimated 43 - 48 bears in 2012 (the threshold of 50 individuals will likely be met in 2013) due to high reproductive rate (34 documented birth events, at least 69 cubs in 2002 - 2012); survival rates over 11 years were 81,8%, 92,9%, 91,3% for cubs, juveniles, and adults respectively (Groff *et al.*, 2013); and the released bears and their descendants started to recolonize the former bear range in the Alps. Since the beginning of the project, 14 bears were found dead, additional 13 bears have not been detected through genetic monitoring for at least the two past years and two bears were placed in captivity and two bears dispersed outside the study area (Groff *et al.*, 2013).

The population is still demographically isolated; however long distance male-biased dispersal, from Trentino to the east and from Slovenia to the west, has recently resulted in the partial overlap, without gene flow, of the two bear populations. As a consequence, initially high genetic diversity is declining, five inbred litters, out of a total of 30 litters have been detected through pedigree reconstruction, and the effective population size (Ne) remains small (De Barba *et al.*, 2010). Repeated opinion surveys showed a dramatic decrease in the public support, despite the communication campaigns, and the efforts for damage prevention and compensation.

Major difficulties faced

- Higher than expected conflicts with humans and management of problem bears.
- Human caused mortality especially in neighboring countries.
- Lack of efficacy and coordination for the management and potential removal of the few problem bears, and consequent dramatic decrease in public support.
- Establishment of gene flow with the Slovenian population not yet recorded.
- Need for effective trans-national agreements for bear management in the Alps.

Major lessons learned

- Importance of support and involvement of local population and stakeholders, and of agreements with administrations affected by bear presence.
- Importance of long term, science based post-release monitoring and research.
- Importance of increasing awareness and education of human population and delivery of project status and results.
- Importance of trained scientists and field teams.
- Importance of effective and prompt measures to manage problem bears.

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- Survival and reproduction of majority (77%) of founders; high reproductive rates of re-introduced population and achievement of the minimum demographic objective of >50 bears in less than 20 years.
- High initial levels of genetic diversity comparable to the source Slovenian population.
- Geographic expansion and beginning of recolonization of former bear habitat in northern Italy and neighboring countries (Switzerland, Germany and Austria).
- Inter-regional agreements ensuring large scale monitoring, damage compensation and prevention, management of problem bears and emergencies, personnel training, communication to human population. In this context, an Alpine action plan for the Conservation of the Brown Bear (PACOBACE), endorsed by the Italian Ministry of Environment, ISPRA, and relevant regional administrations, was produced in 2010 for the Italian Alps. Efforts are presently carried out to officially recognize the international alpine bear group already operating since 2006.
- Effective and adaptive management strategies (monitoring, damages and emergencies, personnel training, communication).

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