



Global Re-introduction Perspectives: 2016

Case-studies from around the globe

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IUCN/SSC Re-introduction Specialist Group (RSG)



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Cover photo: Clockwise starting from top-left:
i. Bolson's tortoise, USA @ Turner Endangered Species Fund
ii. Wetapunga, New Zealand @ Richard Gibson
iii. Morelos minnow, Mexico @ Topiltzin Contreras-MacBeath
iv. *Silene cambessedesii*, Spain @ Emilio Laguna
v. Tasmanian Devil, Maria Island, Tasmania @ Simon DeSalis
vi. Agile frog, Jersey @ States of Jersey Department of the Environment

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Trial re-introduction of the Eurasian beaver after an absence of 400 years to Scotland, UK

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Introduction

Eurasian beaver (*Castor fiber*) is a large, semi-aquatic, herbivorous rodent that was once found in freshwater habitats from the Chinese-Mongolian border across to its most western distribution in Britain. By the beginning of the 20th century, the species had been driven to near-extinction, largely as a result of over-exploitation by humans, who hunted beavers largely for their fur but also for meat and the glandular secretion castoreum, which was used for medicinal and perfumery purposes. The species is thought to have become largely extinct in England and Wales between the 12th and 13th centuries and in Scotland by the 16th century. By the end of the 20th century, the species had shown a remarkable recovery across Europe due to relaxation of hunting pressure, followed by natural recolonization in some areas and, latterly, artificial re-introduction programs which led to a sharp rise in the population and distribution of the species in Europe. The Eurasian beaver is currently listed as Least Concern by IUCN, but, under the EU's Directive 92/43/EEC Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') Article 22, there is responsibility for member states to consider its re-introduction.

Goals

- Goal 1: The overall goal to collate and provide information that will support Scottish ministers in making a decision on the future of beavers in Scotland.
- Goal 2: To study the ecology and biology of



Eurasian beaver (released adult female)

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the Eurasian beaver in the Scottish environment and to assess the effects of beaver activities on the natural and socio-economic environments.

- Goal 3: To generate information during the proposed trial release that will inform a potential further release of beavers at other sites with different habitat characteristics.
- Goal 4: To determine the extent and impact of any increased tourism generated through the presence of beavers.
- Goal 5: To explore the environmental education opportunities that may arise from the Trial itself and the scope for a wider program should the Trial be successful.

Success Indicators

- Indicator 1: Survival of released individuals and evidence of breeding in a Scottish environment.
- Indicator 2: Delivery of scientific monitoring program and ongoing fulfillment of Scottish Government licence conditions over a 5 year period.
- Indicator 3: Changes in public support during the duration of the trial period.
- Indicator 4: Positive socio-economic impacts in the local community.

Project Summary

Feasibility: Beavers are widely considered to be ‘ecosystem engineers’ of freshwater and associated riparian habitats, having demonstrable positive influences on biodiversity. Beavers can provide a range of ecosystem services including water storage, flood alleviation, sediment retention and water quality improvement. The Eurasian beaver has now recovered across most of its natural range, and been successfully re-introduced to over 24 European countries. The issues surrounding beaver re-introduction to Scotland have been the subject of intense investigation and discussion over the last 20 years. In 2007, no standard format existed for making a licence application to the Scottish Government for the release of a species not resident in Scotland. Due to concerns about beaver re-introduction by some stakeholders, a time-limited, scientific trial re-introduction was agreed. Therefore, a document containing all the required information was written and submitted on behalf of the Scottish Beaver Trial partnership by the Royal Zoological Society of Scotland and Scottish Wildlife Trust, drawing upon content from the previous application and supporting information prepared by Scottish Natural Heritage (SNH).

Included with the licence request was essential additional information in support of the application to the Scottish Government. These included sections on: legal matters, the public consultation summary report, the proposed release area and sites, budgets, public-health issues, education initiatives, socio-economic impacts, source population and animal health, quarantine methods, post-release management methods, exit strategy, research and monitoring methods, risk assessment and dealing with potentially damaging effects, success and failure criteria, and project-management structure.

Implementation: The Scottish Beaver Trial was a relatively large-scale project involving several organizations over a number of years, with considerable resource implications for all of the main partners and SNH. There was consensus by all involved that it would be necessary to draw up legal agreements or Memoranda of Agreement between the various parties in order to clarify roles and responsibilities and to protect individual organizations' interests. In May 2008, a license was granted for the SBT on behalf of the Scottish Government, to release up to four families of beavers. The licence was subject to 31 conditions relating to animal and project management, research and monitoring, and mitigation measures. No template existed for a species re-introduction license application prior to the SBT. More recently, Scotland's National Species Re-introduction Forum has - partly based on the experience of beaver releases in Scotland - produced 'The Scottish Code for Conservation Translocations' and the accompanying 'Best Practice Guidelines for Conservation Translocations in Scotland', both based on the IUCN 'Guidelines for Re-introduction and Other Conservation Translocations'. These documents provide greater clarity to the re-introduction process and help to provide a checklist of actions for applicants to consider, including aspects of planning, legal status, permissions, consultation, resources and monitoring.

Knapdale Forest, a working forest owned and managed by the Forestry Commission Scotland, in mid-Argyll, was selected as the trial site (~44 km²). This was specifically chosen as it was ecologically suitable for beavers, had a range of features that could be evaluated for beaver impact, it was considered to be naturally contained but with good access for field workers and visitors, local people were generally supportive and as a working forest the impacts of beavers on forestry could be assessed. This site includes a 'Special Protection Area', 'Site of Special Scientific Interest' and 'Special Area of Conservation', designated for their natural heritage interests. In collaboration with Telemark University College, Norway was identified as the most suitable donor country and source population for animals to be used as part of the Trial. Sixteen beavers were released in family units in individual lochs over 2009 - 2010. This was accompanied by a 5 year post-release scientific trial period and monitoring program involving 13 independent scientific partners specifically designed to test the main aims of the trial.

Post-release monitoring: Coordination of the independent monitoring of the Scottish Beaver Trial was the responsibility of Scottish Natural Heritage, in collaboration with the project partners. The delivery of the program, which by necessity was varied and complex, involved many organizations and individuals including SNH staff, SBT field staff and volunteers, independent field scientists and other governmental agencies. Post-release monitoring investigated a range of impacts including beaver ecology and health, freshwater and woodland habitat, fish communities, public health, archaeology, water chemistry and socio-economics. Prior to the first release of beavers in May 2009, independent baseline survey work was carried out on the majority of monitoring program areas so that comparisons could be made. The post-release monitoring program included a wide range of survey techniques including animal observations, animal



Beaver release loch, Knapdale forest, mid-Argyll

© SBT

trapping and sample collection (e.g. blood sampling for health assessment), field sign mapping via GIS, water sampling for chemistry testing, remote camera trapping, invertebrate surveys, vegetation transects, fluvial geomorphology assessment, and local business surveys.

The Trial provided an opportunity to undertake beaver-related research outside the implementation of the official scientific monitoring program. A

number of peer-reviewed publications and academic conference proceedings were produced, addressing research questions and topics requiring further examination, specifically in relation to animal health, welfare and genetic research.

The information derived from the Trial is currently being considered by Scottish ministers, and will support a decision on the future of beavers in Scotland.

Major difficulties faced

- The overall cost of the project, including the delivery of the monitoring program, and the need for ongoing fundraising.
- The mortality of animals in quarantine and their dispersal from the trial site.
- The viability of such a small number of released animals, especially the initially limitation of moving whole family units.
- The unofficial release of beavers in the east of Scotland.

Major lessons learned

- The provenance and sourcing of beavers for re-introduction projects should be discussed and agreed at a national level, including a pragmatic discussion on the latest genetic and veterinary information, IUCN guidelines, the status of beavers already present both in the wild and in captive collections, and the need for further beaver importation.
- Inevitably, any project of the scale and profile of the Scottish Beaver Trial will always involve many different organizations and individuals, sometimes with differing objectives - and this can be a challenging process to manage. Such roles and responsibilities should be captured in specific Memoranda of Agreement between the relevant partners. Through the planning and implementation phase of the Trial, it was considered essential to focus on the

core objectives of the release process to successfully launch a scientifically monitored re-introduction trial. This would also help to ensure that the welfare of the animals came above any other considerations such as media coverage or funder care.

- Trapping of wild animals, particularly as whole family units, is a stressful experience for these individuals, and the subsequent health effects of this stress should not be underestimated. Careful consideration of trapping, handling and transportation procedures, and temporary holding methods used should be carefully managed, and best practice employed at all times. Capture of entire beaver families can be problematic and resource-heavy. The selection of young pairs or single animals of dispersal age is recommended. Health screening and body condition scoring should ensure individuals are fit for release and in best physical condition. If beaver families are imported, it is important to consider the family-group structure, including age, sex and potential reproductive status of all individuals, as this may create various constraints upon their use and placement. The welfare of any unpaired and unused animals must be considered, including appropriate provisions for a life in captivity if they cannot be released.
- With a fixed-term, high-profile project, there is always the temptation for (and demand from) external institutions to consider numerous research outputs. Being selective about any studies, setting SMART aims and ensuring publication of findings at the onset of the project, is essential in order to ensure successful completion and to produce projects of higher scientific value. Health screening methodology and veterinary care was a relatively under investigated area requiring research investment for this project. Quarantine and health screening requirements for wild caught mammals imported to Britain requires stringent procedures. Further research should be undertaken to develop captive husbandry and investigate mortality rates for beaver quarantine and captive holding facilities.
- Experience suggests accurately forecasting an outline budget for such a project can be a challenge, and it should be recognized that significant contingencies and flexibility should be built in from the start to adapt to changing circumstances, particularly with regard to animal costs. As with all major project budgets, sufficient lead-in time is required to cost out detailed tasks and capital items. A



Beaver tail measurements as part of body condition post-release monitoring program © SBT

simple yet key point to make when considering the budget and fundraising for such a nationally important, groundbreaking initiative is that scientifically monitored trial projects cannot be done on the cheap and need to be well resourced and very carefully costed to ensure the best chances of success.

Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- The project was a milestone in UK conservation history, being the first official mammal re-introduction.
- The multidisciplinary approach and wide organizational collaboration to delivery of a robust scientific monitoring program.
- Majority public support, media interest and popular education outreach program.
- The flexibility to trial and develop animal management techniques.
- The ability of Eurasian beavers to survive in the Scottish environment.

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