Global conservation translocation perspectives: 2021

Case studies from around the globe

Edited by Pritpal S. Soorae





IUCN SSC Conservation Translocation Specialist Group

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Cover photo: Clockwise starting from top-left:
I. Darwin's rhea (*Rhea pennata pennata*) © Cristián Saucedo
II. Orinoco turtle (*Podocnemis expansa*)
III. Leopard cat (*Prionailurus bengalensis*) © Mei-Ting Chen
IV. White saxaul (*Haloxylon persicum*) © EAD
V. Southern pygmy perch (*Nannoperca australis*) © Michael Hammer

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An overview and analysis of the reintroduction project case studies

Pritpal S. Soorae, Editor

Introduction

This is the 7th issue in the *Global conservation translocation perspectives* series and has been produced in the same standardized format as the previous six to maintain style and quality. The case studies are arranged in the following order: a) Introduction, b) Goals, c) Success Indicators, d) Project Summary, e) Major Difficulties Faced, f) Major Lessons Learned and g) Project outcome - with reasons for success or failure.

Case studies per issue

The following numbers of case studies have been collated for the last seven issues: 1) 2008 issue - 62 case studies, 2) 2010 issue - 72 case studies, 3) 2011 issue - 50 case studies, 4) 2013 issue - 52 case studies, 5) 2016 issue - 54 case studies, 6) 2018 issue - 59 case studies and 7) 2021 (this issue) - 69 case studies. This is a total of 418 case studies in all seven issues.

IUCN Statutory Regions

The IUCN Statutes have established a total of eight global regions for the purposes of its representation in council. The IUCN's "statutory regions" are a list of States by Region, as per article 16 and 17 of the Statutes and Regulation 36 of the Regulations.

All eight global regions are represented within these case studies and the numbers of case studies in the regions are as follows:

1. North America & Caribbean - 9 case studies
2. West Europe - 14 case studies
3. South & East Asia - 10 case studies
4. Oceania - 15 case studies
5. West Asia - 1 case studies
6. Africa - 3 case studies
7. Meso & South America - 18 case studies
8. East Europe, North & Central Asia - 8 case studies

There are 69 case studies with a total of 78 species as some case studies have multiple species.

Success/Failure of projects

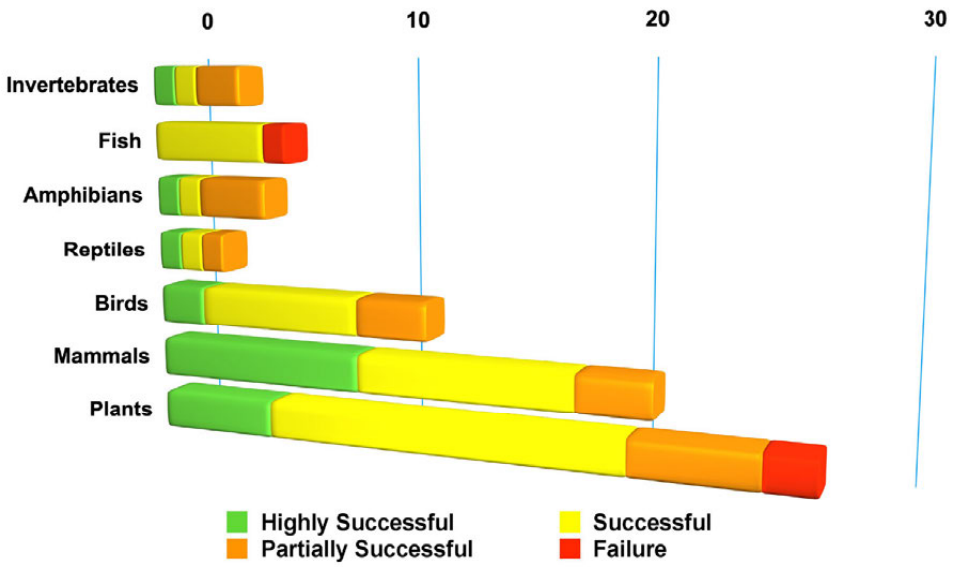
The projects presented here were ranked as Highly Successful, Successful, Partially Successful and Failure. Out of the 69 case studies, there were some cases of multiple rankings, as some projects had multi-species restorations. A total of 19 projects were Highly Successful (24%), 39 were Successful (50%), 17 were Partially Successful (22%) and 3 were listed as Failures (4%).

Success according to the taxa

An analysis was done to gauge the three different levels of success (highly successful, successful and partially successful) and failure against the seven major taxa i.e. invertebrates, fish, amphibians, reptiles, birds, mammals and plants as can be seen in figure 1.

As can be seen below the majority of case studies were covered in the following order - plants, mammals, birds, fish, amphibians, invertebrates and reptiles. Out of the seven major taxa only fish did not have a project ranked as Highly Successful. Successful projects were ranked in all 7 taxa. Only fish did not have a Partially Successful project. Only fish and plants had case studies ranked as a Failure.

Figure 1. Success / failure of projects according to major taxa



Restocking of the Apennine yellow-bellied toad in Central Italy

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Introduction

The Apennine yellow-bellied toad (*Bombina pachypus*) is an anuran species endemic to Italy, where it is unevenly distributed between central Liguria and Calabria. *Bombina pachypus* is listed as Endangered in the IUCN Red List (Andreone *et al.*, 2009). The species was formerly common in suitable habitat. However, it has declined in most of its range (with the exception of Calabria, where several populations remain stable) over the last 20 years. The species occurs in ephemeral shallow, unshaded pools where spawning and larval development takes place. Threats to this species were identified in the loss and fragmentation of wetlands to drainage for agricultural purposes. However, many populations appear to have declined or gone extinct in areas of presumably intact habitat. In most places the population are reduced to 6 - 20 individuals, thus being highly prone to stochastic extinctions. This species might also be threatened by chytridiomycosis. The very small size of most populations suggests restocking with captive-bred animals as the main conservation measure after removing the possible causes of decline. We report a pilot restocking project in two demes in central Italy that underwent dramatic decline with population size <10 individuals.

Apennine yellow-bellied toad © L. Vignoli

Goals

- Mitigate the main threats for the selected demes prior restocking: early drought of pools and alteration of wetlands by Wild boars (*Sus scrofa*).
- Produce a suitable captive-bred population of one year old metamorph individuals from wild caught eggs from the same place

selected for restocking.

- Release of one year old captive-bred individuals into the wild in four yearly restocking events from 2014 - 2017.
- Double (at least) the pristine population (i.e. N>20) after the fourth year of restocking.
- Create two long-term self-sustainable populations of *Bombina pachypus*.

Release site © A. Pieroni

Success Indicators

- Significant reduction or elimination of the main threats to the selected populations.
- Total captive bred individuals released during the four years of restocking and recaptured at the end of the fifth year of the project.
- Reproduction achieved of the released captive bred individuals after one year from restocking.

Project Summary

Feasibility: *Bombina pachypus* was declining all over its central and northern range. The species may be declining due to the loss of wetland habitat as a result of agricultural damage but also it faces a threat from Chytrid fungus (Canestrelli *et al.*, 2013). Neometamorph *B. pachypus* can experience high mortality, dying within 1 - 2 weeks from collection and a few days after experiencing symptoms. In captivity the infection was nearly always fatal for newly metamorphosed *B. pachypus* froglets, but only sometimes for sub-adults and adults. Two small populations (N<10) from a protected area (Natural Reserve Monti Cervia and Navegna, Latium region - Lat: 42.235435°; Long: 12.980531°) inhabiting unshaded pools along two hilly ridges were selected for a conservation program aimed at increasing the population size to reduce the risk of extinction from stochastic events. Epidemiological screening revealed no presence of chytrid fungus. The observed threats for the species at the study site were the high risk of pool desiccation at the early phase of reproductive season (i.e., June) and the alteration of the pools by Wild boars.

Pre-Action monitoring: The two populations were monitored from 2005 to 2013. The population size (i.e. number of distinct contacted animals) was 18 individuals (nine per site) and remained stable with just three new individuals entering the population in nine years. Each site consisted of one or two small ephemeral pools

Release at the recipient site © C. Maragoni

where toads started to breed in late March and stopped at the end of September.

Concrete actions: In 2012, two main conservation actions were performed to mitigate the main threats: 1) four additional pools per site were built and fed by perennial springs to prolong the hydroperiod from March to October; 2) each pool was fenced to prevent Wild boars from using the pools for drinking and bathing. After two years from the concrete conservation actions (2014), no population growth was observed.

Implementation: Since no population increase was observed after two years from the fulfilment of concrete actions, in 2014, we started a four year project aimed at increasing the population size through restocking of individuals collected from the selected demes at the egg stage and raised in *ex situ* facilities until one year from metamorphosis. The release of metamorph individuals close to age maturity allowed the individual recognition by means of ventral coloration pattern and was supposed to significantly decrease the mortality rate that has a peak at the egg and larval stages (Mirabile *et al.*, 2009). Overall, a total of 67 unsexed individuals were released (20 in 2014, 19 in 2015, 16 in 2016, and 12 in 2017).

Post-release monitoring: The post-release monitoring revealed that toads re-capture rate was highly variable across years of release. For instance, toads released in 2014 were 100% re-captured in 2015 and 50% in 2016 - 2018, whereas for the toads released in 2015, just two out of 19 were re-contacted in the following years. In 2018, we re-contacted a total of 21 restocked individuals (10 released in 2014, two in 2015, four in 2016, and five in 2017). The pristine population remained stable (13 individuals out 19 re-captured in 2018) with a few new recruited animals and a few losses. At the end of 2018, a net increment of 21 released individuals plus some from natural recruitment allowed to double the original population size. Moreover, restocked toads bred repeatedly over the years and captive-bred individual were ready to breed just after 13 months, well before the reported age at maturity for wild animals (three years). Considering the positive outcome of the restocking of the captive bred population, the release of further individuals in the considered demes was stopped but the monitoring is still ongoing. Given that further suitable sites where the species presence is not reported are available in the protected area, the reintroduction of the species in one or a few new sites has been proposed as a further action within the project of *B. pachypus* conservation.

Major difficulties faced

- Production of one year-old individuals from the egg stage requires proper facilities and high personnel effort.
- Identify the real causes behind the high inter-annual variability in individual recapture rate.
- Identify the real causes of failure in recapture released animals (i.e. death or dispersion).

Major lessons learned

- *Ex situ* captive bred toads can be used for restocking *B. pachypus* declining populations.
- Restocking should be performed by releasing individuals in distinct phases along a multi-year project to overcome the possible failure due to stochastic or unpredictable events.
- The success of the project can be achieved by coupling restocking to concrete actions (habitat implementation and protection).

Success of project

Highly Successful	Successful	Partially Successful	Failure

Reasons for Success:

- Restocking conducted in distinct repeated phases along four years.
- Threat mitigation before individuals are released through habitat implementation and protection.
- Monitoring with high frequency before and after release.

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