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More case studies from around the globe
Edited by Pritpal S. Soorae

IUCN/SSC Re-introduction Specialist Group (RSG)

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Re-introduction program for the common midwife toad and Iberian frog in the Natural Park of Peñalara in Madrid, Spain: can we defeat chytridiomycosis and trout introductions?

Bárbara Martín-Beyer[1], Saioa Fernández-Beaskoetxea[1], Gerardo García[2] & Jaime Bosch[1]*

[1]* - Departamento de Biología Evolutiva y Biodiversidad, Museo Nacional de Ciencias Naturales, CSIC, c/José Gutiérrez Abascal 2, 28006 Madrid, Spain
bosch@mncn.csic.es
[2] - Durrell Wildlife Conservation Trust, Les Augres Manor, Trinity, Jersey JE3 5BP, Channel Islands, UK

Introduction

The common midwife toad (*Alytes obstetricans*) is a broadly distributed toad in Western Europe cataloged as a near threatened species in the National Red List of Spain (Pleguezuelos *et al*., 2002), although in Madrid it is considered as endangered. In the Natural Park of Peñalara, a rocky montane area with around 250 ponds, the toad population was very abundant in the past, but declined during the late 90's due to the disease caused by the chytrid fungus *Batrachochytrium dendrobatidis* (Bosch *et al.*, 2001). The Iberian frog (*Rana iberica*) is endemic of the Iberian Peninsula and is distributed mostly in the northwest, with few fragmented populations in the center and north of Spain. Its populations have been cataloged as Vulnerable in the National Red List of Spain, being threatened by habitat deforestation and alien species introduction. In Peñalara, due to past introductions of brook trout (*Salvelinus fontinalis*) and translocations of common trout (*Salmo* trutta), the Iberian frog disappeared from vast areas and is now confined to breed in suboptimal ponds where the trout were not present (Bosch *et al.*, 2006)

Goals

- Goal 1: Maintain a captive population of *Alytes obstetricans,* preserving genetic identity, and develop a successful husbandry method.
- Goal 2: Rear *Rana iberica* larvae.
- Goal 3: Reinforce existing populations

Midwife toad (*Alytes obstetricans*) © J. Bosch

and establish new ones for both species, with individuals reared in the Rearing Center.

- Goal 4: Develop effective treatment methods against the fungus infection for a successful re-introduction of *Alytes obstetricans*.
- Goal 5: Eliminate all introduced trout within the Natural Park.

Success Indicators

- Indicator 1: Successful reproduction of *A. obstetricans* in the Rearing Center.
- Indicator 2: High survival rates of metamorphs of both species in the Rearing Center.
- Indicator 3: Increased number of adults of both species found in the field during monitoring programs, and number of reproductive events.
- Indicator 4: Higher rates of uninfected individuals of *A. obstetricans* in the field.
- Indicator 5: Smaller numbers of non-native trout found in the streams from year to year.

Project Summary

Feasibility: The common midwife toad was the most abundant amphibian in the Park before the outbreak of the disease. The male carries the eggs in their limbs for several weeks and then releases them in ponds, where tadpoles can remain in the water for several years before completing the metamorphosis. Such extended larval period increases the probability of contact with the waterborne zoospores of *B. dendrobatidis*. The low number of eggs in the clutches and the high rates of metamorphic mortality due to the disease drove the population almost to collapse within a few years. Two factors hinder the success of re-introductions. Even though the animals are treated before release, they become infected when they come into contact with the fungus. To avoid this problem, the first releases are being conducted in temporary ponds, where there is no overwintering larvae and, therefore, the probability of infection is lower. On the other hand, the genetic variability of the population is now reduced after a bottleneck. Therefore, to ensure the viability of re-introductions a microsatellite study has been carried out, and now we are sorting the crossbreedings to keep the maximum available genetic variability.

Iberian frog (*Rana iberica*) © J. Bosch

The Iberian frog's decline was not so dramatic. The high number of visitants and specially the trout introduction reduced the breeding sites of the species to only a few. The efforts of the Regional Government to recover

natural conditions began in the 1990s, and included the brook trout eradication in the original pond where the species was introduced by using bottom nets. Unfortunately, brook trout colonized the outlet of the original pond and, additionally, local anglers moved common brown trout from nearby downstream sites further upstream. Therefore, we have been electrofishing for trout during the last 9 years until the complete eradication of introduced trout in the Park. Obviously, the feasibility of re-introductions also depends on environmental awareness leading to the abandonment of these practices.

Overview of the habitat © J. Bosch

Implementation: In the case of *A. obstetricans*, since 2006 we have been capturing tadpoles from every location in the Park. These larvae were treated against the fungus using elevated temperature and antifungal drugs. We reared them in aquariums indoors matching environmental conditions to the park and using the same water source until they achieved juvenile or adult size. Most of them were then released in the same places where they were captured, while only some individuals were kept to establish a captive colony. A big effort has been directed to establish a new population in one pond which often dries out at the end of the summer season, keeping a lower chytrid fungus level than the surrounding area. In the case of *R. iberica*, we collected egg masses or tadpoles from a stream which dries out at the beginning of the summer, avoiding the complete development of the larvae. We head-started them in aquariums of 80 liters with up to 50 tadpoles in the Rearing Center, at the same Natural Park of Peñalara, and released them in the field, in streams where fish have been removed. This year, for the first time, we have released not only juveniles but also tadpoles and adults in several locations, in order to compare potential different survival rates across live stages.

Post-release monitoring: We search for active individuals of common midwife toad and Iberian frog two times per week in the summer season. For identification, we previously mark them with VIE (Visible Implant Elastomer tags) or take individual photos. At the moment we have found two males carrying eggs, one gravid female and some tadpoles of *A. obstetricans*. This year we have found, for the first time, some individuals of *R. iberica* that were released last year, and some adults released earlier this year. Additionally, this season we have followed 20 adult animals (15 *Alytes* and 5 *Rana*) by using radio-tracking technology. Additionally, two automatic recording devices (frogloggers) were installed a few years ago to count calling males.

Major difficulties faced

- Length of time between collected tadpoles for head-starting and F1 captive bred toads in *A. obstetricans*.
- The high difficulty to eliminate introduced trout from streams.
- Larval stages are not suitable for re-introduction in both species because they are highly susceptible to both fish predation and fungus infection.

Major lessons learned

- The common midwife toad is easy to maintain in captivity, while the Iberian frog gets easily stressed.
- The mortality of metamorphs in the field during the winter seems to be high, so adult re-introduction at the beginning of the season could be the best choice.
- Indoor rearing of *A. obstetricans* metamorphs under elevated temperatures (around 20º C) is effective, while keeping breeding adults outdoor, under semi-captivity conditions, is the best option to achieve mating.
- Trout eradication from montane streams by using electrofishing requires a great effort but is possible, and recolonization of native amphibian species is considerably quick afterwards.

Success of project

Highly Successful	Successful	**Partially Successful**	Failure
		√	

Reason(s) for success/failure:

- In the Rearing Center we have produced over 180 tadpoles of *Alytes obstetricans* this year.
- Metamorphs of *A. obstetricans* and *Rana iberica* have survived almost one winter after its re-introduction.
- Completely successful reproduction (from calling males to tadpoles) of *A. obstetricans* has been recorded this year from released animals.

References

Bosch, J., Rincón, P., Boyero L. & Martinez-Solano I. 2006. Effects of Introduced Salmonids on a Montane Population of Iberian Frogs. Conservation Biology, Volume 20 No. 1: 180 - 189

Pleguezuelos, J. M, Márquez, R. & Lizana, M. 2002. Atlas y libro rojo de los reptiles y anfibios de España. Dirección General de la Conservación de la Naturaleza-Asociación Herpetológica Española. Madrid. 584 pp.

Bosch, J., Fernández-Beaskoetxea, S. & Martín-Beyer, B. 2010. Time for chytridiomycosis mitigation in Spain. Alien: the invasive species bulletin 30: 54 - 58

Bosch, J., Martínez-Solano, I. & García-París, M. 2001. Evidence of a chytrid fungus infection involved in the decline of the common midwife toad (*Alytes obstetricans*) in protected areas of Central Spain. Biological Conservation 97: 331 - 337