



# 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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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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## Head-starting, re-introduction and conservation management of the agile frog on Jersey, British Channel Isles

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### Introduction

Agile frogs (*Rana dalmatina*), found throughout much of Europe and northern Turkey, are listed on Appendix II of the Bern Convention, Appendix IV of the EU Habitats Directive, and as Least Concern in the IUCN Red List. The Channel Island of Jersey (117 km<sup>2</sup>) is towards the northern edge of the species' range, and hosts the only agile frog population in the British Isles. In Jersey, population declines occurred throughout the 1900s, with animals becoming restricted to a single 10 ha dune heathland site (L'Ouaisné Common) by 1988. Causes of decline are thought to include habitat loss and fragmentation due to development, pollution of groundwater, water shortages and the loss of breeding ponds (Racca, 2002), and an increased predation pressure due to the introduction of non-natives (States of Jersey, 2006). The agile frog is therefore regarded as locally Critically

Endangered within Jersey, and is protected under the Conservation of Wildlife (Jersey) Law 2000.

Furthermore, Jersey's agile frogs show lower genetic variability than other European populations (Racca, 2004). The population has been the subject of a Species Action Plan since 2001, with captive husbandry undertaken by Durrell Wildlife Conservation Trust (DWCT).



Agile frog © Jersey States Department of the Environment

## Goals

- Goal 1: To ensure that there is protection of, and a conservation management program for, all existing natural sites, introduction sites or re-introduction sites.
- Goal 2: To increase the number of populations and widen the species' distribution through introductions/re-introductions.
- Goal 3: To maintain a viable breeding population of frogs through head-starting and translocation with a minimum of 20 adult animals at a minimum of three locations (a minimum of 60 adults in total).
- Goal 4: To have annual monitoring of spawning in all populations.
- Goal 5: To further investigate the threats to, and applied ecology of this species in Jersey.

## Success Indicators

- Indicator 1: Protection of all sites where the species occurs, and where it will be introduced/re-introduced.
- Indicator 2: Restoration of wild, naturally spawning populations at more than one site.
- Indicator 3: Wild frog populations of at least 20 adults breed successfully at a minimum of three locations.
- Indicator 4: Populations are monitored annually allowing detection of annual variation in spawning.
- Indicator 5: Research carried out to determine ecological requirements.

## Project Summary

**Feasibility:** This project aimed to restore the population to the point where it is self-sustaining at multiple sites. The European habitat for the agile frog comprises slow-flowing or stagnant water bodies of 30 - 80 cm depth for breeding, and woodland for their terrestrial phase. Jersey's population shows some differences in habitat use compared to its mainland counterparts, by their use of coastal habitats (States of Jersey, 2006). Survival of eggs to metamorphosis in Jersey is higher than the expected rate of 1.0% - 2.0% for wild anurans, at 2.4% - 17.1% per year when spawn is protected or head-started (Racca, 2004). The agile frog population in Jersey declined in both range and numbers from the early 1900s until the 1990s. In the 1970's frogs were known from seven localities, and by the mid-1980s this had fallen to two sites; Noirmont and L'Ouaisné. A pesticide spill in 1987 decimated the Noirmont population, prompting the first intervention for the population. Declines are attributed to poor water quality and quantity through intensive agriculture and water extraction leading to a shortened hydroperiod and earlier pond desiccation; disturbance and loss of habitat; and an increase in both native and introduced predators (States of Jersey, 2006). Frogs migrate between terrestrial and breeding habitat, requiring identification of suitable habitat and engagement with stakeholders to encourage sympathetic management. Further obstacles include road mortality during migration, water pollution from agricultural sources, and limited available habitat with poor connectivity. The partner organisations working on this project provide a strong knowledge-base for the various actions requiring implementation, increasing the likelihood of success of this project. Consideration must be made for biosecurity both *in-* and *ex-situ* as

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Agile frog head-starting container © Matt Goetz

captive management carried out by Durrell Wildlife Conservation Trust (DWCT) has to ensure strict separation between its captive population of exotics and the agile frogs. Re-introduction sites can be identified through historical distribution, habitat suitability and connectivity to the existing population.

### Implementation:

Interventions to arrest the declines began in 1987. A

collaboration between the States of Jersey Department of the Environment (DoE), DWCT, the Société Jersiaise and a number of private stakeholders created the Jersey Agile Frog Group (now the Jersey Amphibian and Reptile Group). This group has worked to implement a head-starting, re-introduction and habitat management program (Racca, 2002). This has resulted in deepening of slacks to lengthen the period that water is held, regular water quality monitoring, and localised habitat management in order to improve habitat suitability (Racca, 2004). Protection of spawn clumps *in-situ*, and removal of spawn clumps for head-starting has taken place, with tadpole rearing undertaken by the herpetology department at DWCT since 1986, and the use of a dedicated biosecure unit since 2008. Head-started individuals achieve greater mass and survival than those left *in-situ* (Jameson, 2009), and have enabled the translocation of tadpoles to new sites. In 2000 tadpoles were re-introduced back to Noirmont following work to improve water quality, and by 2012 re-introductions had taken place at a further two sites, resulting in a total of four sites receiving monitoring and management. Both principal agile frog breeding areas at L'Ouaisné and Noirmont were designated as ecological Sites of Special Interest (SSI) in 2007. Furthermore, management plans for L'Ouaisné and Noirmont SSI's have been prepared by the DoE to ensure appropriate management for amphibian populations. Further work with local stakeholders to encourage sympathetic habitat management outside of protected areas could result in improvement in the future. Press coverage, involvement of and visits to educational institutions, and printing of educational materials have all attempted to raise public awareness of the issues surrounding the conservation of Jersey's amphibians.

**Post-release monitoring:** Night surveys are made to each site during the breeding season to count breeding adults and spawn clumps. This monitoring has detected an increase in the number of clumps per year and the number of sites at which spawning occurs; from 12 in 1987 at a single site, to 134 spawn in 2014 at three sites, with no spawning in some years (Ward & Griffiths, 2015). Daytime

visits are also made to each site to check the condition of spawn clumps and provide spawn protection where needed. Ongoing monitoring and research has allowed identification of effective methods for maintaining a population increase, which in this case is head-starting of individuals from egg to tadpole (Ward & Griffiths, 2015). It has also enabled intervention to take place when reductions in numbers of spawn or individuals have occurred, as well as improved our knowledge of the species ecology and threats. Water quality has also been monitored at all potential wild breeding sites.

## Major difficulties faced

- Determining suitable release sites due to lack of appropriate sites isolated from external threats such as agricultural runoff as well as poor connectivity in a densely populated island.
- Understanding the differences in ecology between agile frog populations in Jersey and mainland Europe, particularly the terrestrial phase.
- Unpredictable recruitment due to annual variation in water levels.
- Impacts on the population from human disturbance, including road mortality.
- Difficulties in securing staff time and funding for head-starting.

## Major lessons learned

- With assistance (head-starting and spawn protection), the frog population was able to maintain a steady increase in population size, and has led to the recovery of the population at L'Ouaisné.
- Restoration to previous population levels may be difficult due to habitat availability and connectivity, and the time taken for populations to establish.
- Habitat management has probably played an important role in sustaining the population.
- Biosecurity measures put in place to reduce the threat of diseases (e.g. *B. dendrobatidis*) may have played an important role, as did monitoring of sites to mitigate unexpected threats to the habitat in the way of invasive freshwater plants (*Crassula helmsii*). This highlights the importance of being cautious, and that external factors otherwise unrecognised could play a role in the success or failure of conservation programs.
- Captive-breeding enclosures had mixed success and required a large amount of



Agile frog release into a re-introduction site

© Rob Ward

# Amphibians

resources, whereas head-starting wild clumps proved to be more cost effective.

## Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

### Reason(s) for success/failure:

- Intervention with spawn protection and head-starting avoided complete population loss.
- Both principal breeding sites given protection, being designated as ecological Sites of Special Interest, with habitat management programs implemented.
- Agile frog numbers are increasing at L'Ouaisné, with some wild breeding also occurring at Noirmont, Woodbine corner and Beauport, following re-introduction.
- Research into the ecology of Jersey's agile frog population has been carried out by a PhD student (Racca, 2004), as well as further research undertaken by other students to assess the success of different conservation strategies and methods applied to the population.
- There are a limited number of potential release sites, with little data on which to base their selection. Furthermore connectivity between sites further afield is likely to be poor.

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