



Global Re-introduction Perspectives: 2010

Additional 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 Southern Damselfly to Venn Ottery Common, Devon, UK

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Introduction

The southern damselfly (*Coenagrion mercuriale* (Charpentier)) is protected within Europe. It is listed on the Bonn Convention for the conservation of Migratory Species of Wild Animals, on Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats (1979), which outlaws the collection or possession of listed species, on Annex II of the European Community Habitat and Species Directive (1992), which requires the designation of Special Areas of Conservation (SACs) for animal and plant species of community interest and on Schedule 5 of the UK Wildlife and Countryside Act (1981), which protects against damage and killing of individuals, and damage or destruction of habitat, and protects biotopes in localities designated as Sites of Special Scientific Interest (SSSIs). It is also listed as Rare (Category 3) in the British Red Data Book and features on the red lists of other European countries (Grand 1996). It was the only species of Odonata to appear in the first UK Biodiversity Action Plan (HMSO 1994). The UK is on the edge of its European range and its populations there are fragmented. This re-introduction project took place in south-west England where southern damselfly populations are small and genetically depauperate.

Goals

- Goal 1: Investigate sites from which the species had gone extinct within the last 30 years.
- Goal 2: Attempt to determine the reason(s) why the species had gone extinct.
- Goal 3: Restore the habitat to a condition that is favourable for the long-term persistence of the species on the site.
- Goal 4: Establish a management plan for the species on the site including the provision for long-term monitoring.

Success Indicators

- Indicator 1: Establish a self-sustaining population on the re-introduction site.
- Indicator 2: Establish a population close to existing populations so



Andromorph female of southern damselfly consuming a prey item © PC Watts

that there is a possibility of gene flow from the newly established population towards the genetically depauperate neighbouring populations.

Project Summary

Following the publication of the UK's Biodiversity Action Plan in 1994 a steering group was set up to look after the interests of the southern damselfly. It contained representatives from English Nature, the Countryside Council for Wales, the Environment Agency, the Wildlife Trusts and Liverpool University, a centre of expertise in dragonfly and damselfly research. One of the aims of the plan devised by this group was to research the ecology of the species and ultimately to begin re-introductions into sites from which it had gone extinct in the UK. One of the early findings of a Studentship funded by the group was that southern damselfly sites had declined in number by more than 30% since 1960. Once the habitat requirements of the southern damselfly had been established the search began for sites from which it had gone extinct and for which habitat restoration was feasible. Venn Ottery Common, a Devon Wildlife Trust reserve lost southern damselfly in 1989, largely due to injudicious ditch digging which altered water courses to the detriment of southern damselfly, coupled with a relaxation of grazing which led to the spread of tussocks of *Molinia caerulea* which effectively covered the runnels passing down the site. It was chosen as the first re-introduction site for four reasons. First, it had lost southern damselfly relatively recently and water chemistry tests revealed that the water quality was within the range acceptable. Second, there was a strong resolve on the part of the site owners, Devon Wildlife Trust to restore southern damselfly to the site and to raise funds so to do. Third, there was enthusiastic local support from the two people most responsible for improving the status of southern damselfly on two other sites on the East Devon Pebble Beds, Aylesbeare and Colaton Raleigh Commons (Kerry, 1989). Finally there was the possibility that a meta-population structure might be established, and with it gene flow between populations (Thompson, Watts & Saccheri, 2007)

From 2002 onwards researchers at Liverpool University had estimated genetic variation in all the known sites for southern damselfly in the UK and had determined population sizes and some of them. Beaulieu Heath in the New Forest was chosen as the donor site for the re-introduction on the grounds that it had the highest population density recorded in the UK and contained the most genetically diverse population. Licences to undertake the work were obtained at the national level from Natural England, from the Forestry Commission representing the donor site and from Devon Wildlife Trust representing the recipient site. On 10th June 2007, 57 mature individuals were taken from Beaulieu Heath to Venn Ottery Common in three modified cylindrical butterfly rearing cages. The water level at Venn Ottery had dropped surprisingly in the ten days since the site had been visited previously. The decision was taken to stop the re-introduction until the water supply at Venn Ottery was more reliable, but the animals transported were released in any case. Between the summer of 2007 and spring 2009 Devon Wildlife Trust make great efforts to secure the water supply to the runnels in which southern damselfly was likely to breed. Large numbers of birch trees were removed and Devon cattle were brought in to graze the site. In addition a fast-

flowing, unsuitable stream on the edge of the site was transformed by the introduction of eleven dams which produced in parts conditions for southern damselfly similar to those at the other two East Devon Pebblebed sites. Growth of *Potamogeton polygonifolius*, a favoured oviposition plant for southern damselfly, was encouraged. By summer 2009 conditions at Venn Ottery were looking much better, with a steady flow of water down the runnels into which it was hoped that southern damselflies would breed. The re-introduction program was set to proceed. It was given a timely boost by the discovery of some breeding adults on the site, which must have been descendants of the cohort introduced in 2007. Four hundred females and 100 males were transported from Beaulieu Heath to Venn Ottery Common over the course of ten days in six different batches. The car journey lasted roughly three hours but only three individuals did not survive the journey. Exclusively mated females (distinguishable by their muddy abdomen tips) were taken in the first two trips. Females store sperm and oviposit alone in the absence of males. As males were re-introduced later during the programme they would mate with females on site and by removing sperm deposited during previous matings in the New Forest (a unique feature of damselfly mating behaviour) would guarantee the highest genetic diversity per introduced female. Almost all individuals seemed unaffected by the car journey and many had begun to show reproductive behaviour within minutes of being released at Venn Ottery.



Habitat of the Damselfly at Shipton Bottom, New Forest, one of the re-introduction donor sites © PC Watts

Southern damselflies have a two-year life cycle in the UK. The first monitoring took place in 2009 in order to check whether any of the 2007 pilot introductions had bred.

Major difficulties faced

- Securing a year long water supply in the form of shallow runnels with a slow flow rate suitable for larval survival - diverting the water that was passing too quickly down one side of the site towards the runnels that were prone to drying out in the summer.
- Implementing a grazing regime that would ensure that the runnels would not be covered by encroaching vegetation.

Major lessons learned

- Habitat creation for a species with a complex life cycle such as a damselfly is multidimensional. All aspects of its habitat requirements need to be catered for from suitable plants into which the adult females can oviposit, to slow-flowing water in which the larvae are able to find food, to a structured terrestrial habitat in which the adults can find food and shelter. Often attention has been focussed into what has been perceived as the key stage of the life cycle.
- Prior to the re-introduction itself, a management plan, with details of funding for such a plan needs to be in place.

Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- The project is only at an intermediate stage at the moment. A pilot re-introduction in 2007 led to breeding adults being recorded on site in 2009, prior to the main re-introduction effort. With time the project is likely to be classed as successful or highly successful
- The expectation of success is largely due to confidence in the stability of the water supply, the spread of suitable oviposition plants on site in the last five years and the observation that large numbers of the re-introduced animals were mating and ovipositing within hours of being released.
- What would constitute highly successful would be if there was some exchange of genes from this site with one or other of the two neighbouring sites to establish a meta-population structure for the species rather than there being three isolated sites within the region.

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