



Global Re-introduction Perspectives: 2013

Further case-studies from around the globe

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IUCN/SSC Re-introduction Specialist Group (RSG)





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Translocation and augmentation of the fen raft spider populations in the UK

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Introduction

The fen raft spider (*Dolomedes plantarius*) is one of Britain's largest, most spectacular and rarest spiders. Thought to be confined to just three lowland wetland sites (two in England, one in Wales) its UK distribution is highly disjunct. Because of degradation and loss of wetland habitat over much of its range it is the only European spider species to be listed as internationally Vulnerable (IUCN, 1996), as well as being Red Listed by many European countries. In the UK it is regionally listed as Endangered (Bratton, 1991) and is one of only two spider species fully protected by law (Wildlife and the Countryside Act 1981) and is listed under Section 41, NERC Act 2006. It has been the subject of a Natural England Species Recovery Program (SRP) since 1991, and a Species Action Plan since 1999. One of the SRP targets in England is to establish additional populations by translocation. This was considered necessary because of the small number of unconnected populations (one of which is extremely vulnerable: Smith, 2000 & 2013), a propensity for low dispersal (Pearson, 2008), and fragmented distribution of suitable habitat. This target augments and influences habitat management work to secure the existing populations.



Adult fen raft spider in natural habitat © Helen Smith

Goals

- Goal 1: The overall goal is to secure the future of *D. plantarius*



Fen raft spider release in 2012 © Ian Hughes

as a UK species by increasing the number of sustainable populations from the current three to 12 by 2020. This to be realized by a combination of direct translocations and captive rearing initiatives.

- Goal 2: Identify the most appropriate provenance of UK stock for release at new sites over two successive years to create populations with a natural age structure.
- Goal 3: Identify new receptor sites, with

appropriate management of suitable habitat already in place, that also have high levels of landscape-scale connectivity to allow natural expansion of new populations.

- Goal 4: Consider impacts of climate change in the selection of new sites. The previous UK range of this species is not known (it was not described in the UK until 1956). New host sites are being considered not only within the range described by existing populations but also further north; the UK is mid-latitude range for this species.
- Goal 5: Subsequently monitor population size, range increase and genetic diversity. This involves convening a steering group of stakeholders and experts to advise on and oversee this process.

Success Indicators

- Indicator 1: Pre-program work confirms understanding of this species current status.
- Indicator 2: Identification of sufficient host sites with both appropriate connected habitat and guaranteed continuity of sympathetic management and ownership, in appropriate geographical areas.
- Indicator 3: Collaboration between all relevant government agencies, NGOs, landowners and other stakeholders including establishment of a multi-disciplinary steering group.
- Indicator 4: Assurance of ability of largest surviving UK population to sustain annual harvesting of 10 - 20 adult females for direct release and of smallest population to sustain removal of 5 - 10 adult females for the *ex situ* rearing program with associated protocols for *ex situ* biosecurity and pre- and post-release disease monitoring.
- Indicator 5: Appropriate post-release monitoring program in place to ensure long term target of self-sustaining populations expanding in range on 12 UK sites.

Project Summary

Feasibility: Field surveys by British Arachnological Society volunteers, initiated three years before the recovery began, confirmed the current status of *D. plantarius* and identified potential new English receptor sites. Confirmation of species' status also came from checking records of its congener *D. fimbriatus*, with which it is easily confused, and from a public appeal for *Dolomedes* sightings. Field survey work is ongoing.

Implementation phase: By 2010 receptor sites had been identified and prioritized, and work undertaken to establish appropriate provenance of stock. The priority sites were on the same river system as the most vulnerable extant population but with habitat much more similar to that of the more distant English population. Although these two populations differed genetically, no evidence was found of either inbreeding depression or hybrid vigor when they were crossed in captivity (Smith, 2011). It was therefore decided to stock new sites from both populations to maximize genetic diversity. Introductions to new sites of spiders from the smaller and more vulnerable of the English populations (Smith, 2000) used three-month-old spiderlings that had been captive-reared in individual test tubes. With mean brood size of over 500 and survival to three months in captivity of >80%, large numbers of spiderlings were available for release from relatively small numbers of wild-caught females. These females were also retained in captivity until they produced second broods (this species stores sperm) before re-release at their point of capture. Successful second brood production is significantly greater in captivity than in the wild and so this method helped to offset depletion of the source population. Females from the larger English population were also caught from the wild carrying egg sacs and were retained in captivity until their broods hatched. They were then released to new sites with their broods (this species shows maternal care), removing the risk of predation of the female and her egg sac.

As well as establishing new site populations, the translocation program sought to expedite recolonization of recently restored habitat within the more vulnerable English site. The population there had become confined to two small areas and had undergone a sharp decline in genetic diversity over a 20 year period (Holmes, 2008). Captive reared stock from these residual areas was released into two areas of restored habitat between 2010 and 2012 and a chain of new ponds excavated to help



Spider release into the wild © Sheila Tilmouth

restore hydrological connectivity between them. A conservative approach was adopted, using stock only of local provenance for these re-introductions.

Much of the captive rearing of spiderlings was undertaken by a consortium of UK zoos and collections recruited through the British and Irish Association of Zoos and Aquaria Terrestrial Invertebrate Working Group, operating under a biosecurity protocol developed by the Zoological Society of London (ZSL) (Hopkins & Sainsbury, 2013). An ongoing pathological study by ZSL of unusual mortality events during captive-rearing is informing further development of the rearing protocol. All of the work on this species is subject to license in the UK under the Wildlife and the Countryside Act 1981 and all aspects of sourcing and releasing the spiders on sites designated as Sites of Special Scientific Interest are conditional on formal Natural England consents under this Act and the Countryside and Rights of Way Act 2000.

Post release monitoring: By 2012, introductions had been made in two successive years at two sites on the same river system and a first introduction had been made at one more distant site. Successful breeding was confirmed at the first two sites, from spiders released in 2010, with nursery web densities similar to the highest encountered in the source populations. Because of this, there are no current plans for augmentation at these sites. The process of site assessment and translocations is ongoing with monitoring results informing development of the methodology. If the new populations continue to thrive, captive rearing from the fragile population is likely to be a short-lived phase. Subject to the results of genetic monitoring, future stock for translocation is likely to be harvested from the new populations. Successful breeding has also been confirmed in the releases at the most vulnerable natural site but quantitative assessment of success is more problematic because the habitat is much more difficult to monitor. This species always attracts a high level of UK media attention and the breeding and release program gained extensive national and international media coverage. The involvement of 10 UK zoos in 2012 also brought the work to the attention of a large new audience. The public profile of the project is being used to promote awareness not only of the plight of this species but also of the many other rare species suffering from the loss of lowland wetland habitats. In addition, the work has provided a focal point for those working on the conservation of this species throughout its European range. It continues to increase understanding of the species' biology that unpins effective conservation delivery.

Major difficulties faced

- The captive rearing work was initially undertaken only by the project coordinator but the increasing participation of UK zoos and collections made this labor-intensive aspect of the program much more viable, with groups of 100 – 200 spiderlings being taken per institution.
- Problems with generating an appropriate food supply for the captive-reared spiders without resort to buying-in from the live-food industry with accompanying pathogen/parasite risks.

- Problems with annual funding uncertainties for the longer-term program, particularly for the critical post-translocation monitoring phase.
- Lack of funding for monitoring necessitates dependence on volunteers. The difficulties both of recruiting sufficient volunteers, and of designing robust protocols that can be delivered reliably, threaten effective delivery of the original monitoring goals.

Major lessons learned

- Ease of post-translocation monitoring, and consequent likelihood of detection of successful establishment, is highly dependent on habitat accessibility. Because of this the program is now concentrating on habitat where success is easily proven before moving on to habitat in which success is also likely but where detection is more difficult.
- Although spiders are often recipients of negative press coverage, the huge media and public response to this translocation program was overwhelmingly positive and an excellent platform for promoting wider issues around the conservation of spiders and other invertebrates.

Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

Reason(s) for success/failure:

- The *D. plantarius* translocation program is at a relatively early stage and ongoing. Preliminary indications are that the introductions are highly successful on some sites but more difficult to assess on others.
- Any success is due to adherence of the program plan, protocols and associated funding support.

References

Bratton J. H. (Ed.) 1991. British Red Data Book 3 Invertebrates other than Insects. JNCC, Peterborough.

Holmes, A (2008) The Conservation and Genetics of the Fen Raft Spider. Thesis submitted to the University of Nottingham for the degree of Master of Research.

Hopkins, T. and Sainsbury, T (2013) Disease Risk Management for the fen raft spider (*Dolomedes plantarius*). Zoological Society of London.

Pearson. P.I. (2008) The ecology and conservation of the Fen Raft Spider (*Dolomedes plantarius*) in the UK, Unpublished PhD thesis, University of East Anglia.

Smith, H. (2000) The status and conservation of the fen raft spider (*Dolomedes plantarius*) at Redgrave and Lopham Fen National Nature Reserve, England. Biological Conservation, 95, 153-164.

Smith, H. (2011) Fen Raft Spider Translocation Project Report 2010. Unpublished Suffolk Wildlife Trust report.

Smith, H. (2013). The fen raft spider web site. <http://www.dolomedes.org.uk/conservation/index.html>. 26/06/13