

# Fen Raft Spiders in the Broads



Volunteer training at Carlton Marshes

## **Final Report to *Love the Broads***

**2015-2018**

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## Summary

1. This report describes work funded by *Love the Broads* to support the conservation programme for the Fen Raft Spider between 2015 and 2019. The spider is one of Britain's rarest, largest and most spectacular species and had become confined to three sites, including Redgrave and Lopham Fen in Broadland.
2. Since 2010, new populations of Fen Raft Spiders have been established in the Broads by translocation as part of the national Action Plan to reduce the species' vulnerability to extinction. The fourth of these populations was established on the Ludham Potter-Heigham Marshes national nature reserve by introductions made in 2014 and, as part of this project, in 2015.
3. Monitoring of the Ludham-Potter-Heigham population in 2016-2018 showed that it initially grew rapidly in relation to the three other new Broadland populations before declining slightly in size, although still increasing in range, in 2018. The decline was almost certainly due to a local crash in the population of Water Soldier, the floating rosettes of which provide important supports for the spider's nursery webs. The populations of both species are expected to recover but the Fen Raft Spiders should be able to maintain a low density population even in the absence of Water Soldier.
4. The project supported six training courses in Fen Raft Spider population monitoring methods for volunteers. These resulted in enthusiastic volunteer teams able to undertake approximately weekly counts at all sites, allowing detailed assessment of the success of the new populations. This monitoring also informs developments in the translocation methodology and any need for augmentation of the new populations.
5. Local engagement with, and ownership of, the programme is considered essential for its sustainability and success. In addition to involving local people through the volunteer training courses, eight talks on the project were given to local and regional audiences during the project period.
6. The project supported an evaluation of a potential translocation to the Catfield area, including assessment of habitat and hydrological suitability, potential impacts on other species and stakeholder support. The evaluation followed established guidelines and it was eventually concluded that a translocation to this area is currently inappropriate because no consensus could be reached among relatively large number of stakeholders with wildlife conservation interest in the area.
7. The Fen Raft Spider is among the species considered to rely on the Broads for their survival in the UK, and is also considered business critical for the area. This project made an important contribution to the conservation programme for this iconic Broadland species by advancing the translocation programme to help secure its future both locally and nationally, and by involving many more local people and visitors in its story.

## 1 Introduction

The Fen Raft Spider is one of Britain's most beautiful and least common animals. It is classified as Vulnerable to extinction not only in Britain (Harvey *et al.* 2017) but also internationally (World Conservation Monitoring Centre 1996), and is one of only two British spider species to have full legal protection. As a result largely of taxonomic confusion (Smith in press), it was not definitively described from Britain until 1956 when it was found on the river Waveney at Redgrave and Lopham Fen. It has since been found at only two other sites, on the south coasts of England and Wales; as a lowland wetland specialist, it is likely to have been in severe decline since large-scale land drainage began in the East Anglian fens in the 17<sup>th</sup> Century. The well-known desiccation of Redgrave and Lopham Fen as a result of artesian abstraction between the 1970 and 1990s brought this single, remnant Broadland population close to extinction and made it a focus of conservation concern for the species' future in Britain. Detailed population monitoring from the early 1990s (eg Smith 2000, Smith 2019) and later studies of the spider's ecological requirements and genetics (Vugdalic 2006, Holmes 2008, Pearson 2008) provided a firm foundation for conservation action to reduce the threat of extinction.

The Fen Raft Spider was identified by UEA's Broads Biodiversity Audit, as one of the top priority 66 species that rely on the Broads for their survival in the UK (Panter *et al.* 2011). As a wetland specialists like the Fen Orchid, Swallowtail and Norfolk Hawker, this iconic and much publicised species is 'business critical' for the Broads area. This combination of extreme national vulnerability and regional importance, led to a pioneering programme of work to re-establish a sustainable population of the spiders in Broadland from the area's fragile population at Redgrave and Lopham Fen. This work formed part of the national action plan for the species, which set a target of 12 sustainable populations by 2020 (Smith 2019). Translocations of the spiders to new sites began in 2010 following several years of assessment of the proposed programme's appropriateness, viability and potential mechanism (Smith in press). In 2014, when the translocation programme had already established three new Broadland populations, all of which appeared to be thriving, a fourth translocation was begun on the Ludham and Potter Heigham Marshes National Nature Reserve.

This report describes the four key outcomes of a *Love the Broads* project that contributed to the Fen Raft Spider conservation programme between 2015 and 2018. The project helped to fund a second introduction of Fen Raft Spiders to the Ludham site in 2015; the previous translocations has all established successfully after two successive years of introductions. It also supported training of local volunteers to monitor the success of this and other translocations in the Broads. This training was designed to deliver essential assessment of the success of the introductions and improvements to the methods used. At the same time, it promoted all-important local engagement with, and sense of ownership of, the project. Wider local engagement was promoted by the *Love the Broads* project through a series of talks to local and regional interest groups. Finally, the project helped to support an assessment of a fifth potential translocation site for Fen Raft Spiders in Broadland.

## 2 Key project outcomes

### 2.1 Translocation of Fen Raft Spiders to Ludham-Potter Heigham National Nature Reserve

This translocation of Fen Raft Spiders formed part of the Fen Raft Spider Translocation Programme Steering Group's plan to decrease the species' vulnerability to extinction in Britain by creating new populations by translocation, in this case establishing a fourth new population in the Broadland grazing marshes. The work followed well established translocation protocols (IUCN/SSC 2013, JCCBI 2010, JNCC 2013) involving the

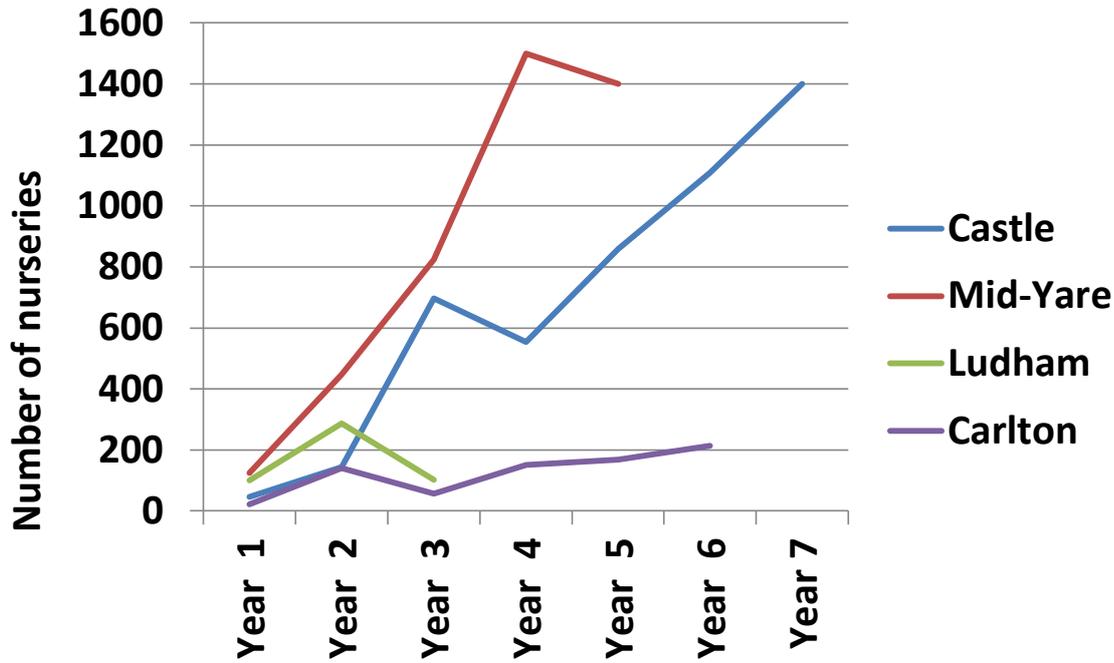
introduction of spiders to the site in two consecutive years; 2014 and 2015. The 2015 work, part-funded by *Love the Broads*, was completed in early September and saw the introduction of 10 adult female spiders with their newly-hatched broods; these augmented the 13 females introduced with broods in 2014 (Smith 2015). Post-introduction monitoring showed that at least five of the 2014 females went on to produce second broods on the Ludham ditches that summer, further augmenting the initial introductions.

The detailed methodology for the Ludham translocation was reported to Natural England (Smith 2015) and differed in one important respect from the previous three Broadland translocations. The spiders that were introduced were all collected from the now very large population established by translocation at Suffolk Wildlife Trust's Castle Marshes nature reserve on the lower Waveney. This, and the other two earlier Broadland translocations, were all stocked from the two, remnant, natural populations in England, at Redgrave and Lopham Fen and on the Pevensey Levels, East Sussex; the capacity to collect sustainability from Castle Marshes brought cost savings and meant that the translocation programme no longer had any impact on these populations.

To assess the establishment success of the new populations, the numbers of nursery webs in which female Fen Raft Spiders guard their broods were monitored at weekly intervals throughout the breeding season from late June to mid-October (Smith 2015). Nursery webs are constructed in the grazing marsh ditches using marginal emergent vegetation and, when present, the floating rosettes of Water Soldier *Stratiotes aloides* as supports (Fig. 1). Unlike the spiders themselves, nurseries are static and conspicuous which makes them easy to count and a good proxy for the size of the adult female population. Most females attempt to breed twice in their single breeding season and so the breeding population is likely to be rather over a half of the nursery total each year.

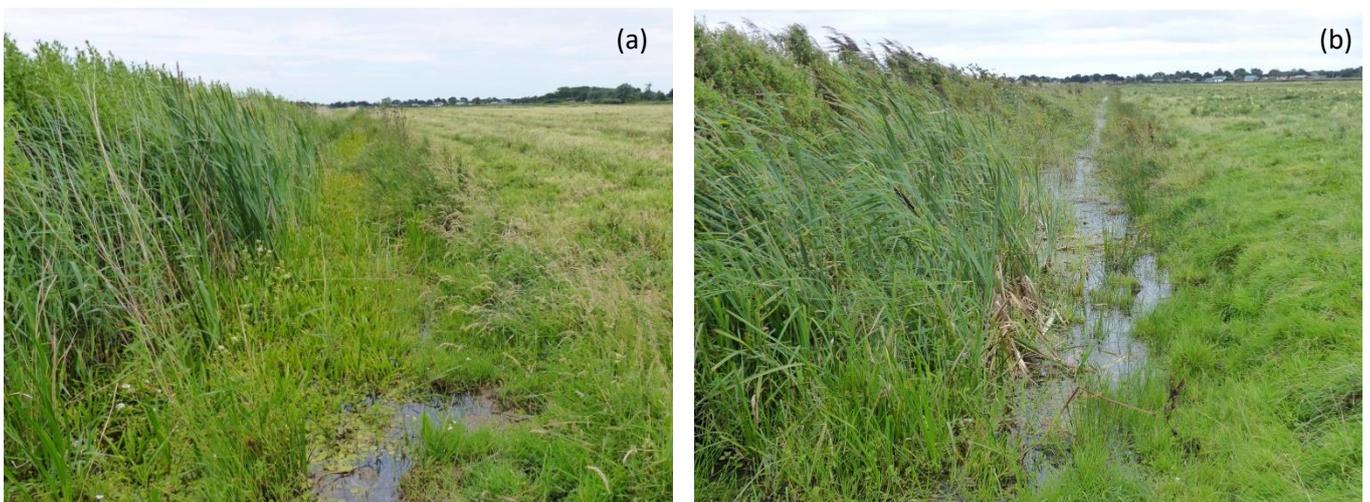


**Figure 1** Fen Raft Spider *Dolomedes plantarius* nurseries in the floating rosettes of Water Soldier *Stratiotes aloides*



**Figure 2** Minimum estimates of Fen Raft Spider nursery web numbers at each of the four Broadland translocation sites in the years since completion of the introductions

Minimum estimates of nursery web numbers at Ludham in 2016 and 2017 - the first two post-introduction years - show that the population grew more rapidly than at an equivalent stage on the mid-Yare marshes, now the largest of the new populations (Fig. 2). However, despite this rapid initial rate of increase, Ludham nursery numbers declined in 2018 as a result of a local crash in the abundance of Water Soldier (for example, see Figs. 3a & b). Water Soldier is prone to periodic and as yet unexplained population fluctuations. Previous crashes have been recorded at Ludham in the years since assessment for the translocation programme began in 2013. On other sites Water Soldier supports around 50% of nurseries; its decline at Ludham, while reducing the growth of the Fen Raft Spider population, is therefore highly unlikely to affect its persistence and viability. The smallest of the other three new populations is at Carlton Marshes where the Water Soldier population also fluctuates considerably between years; it has nevertheless sustained a slow growth in population size (Fig. 2).



**Figure 3** The decline in the floating rosettes of Water Soldier *Stratiotes aloides* exemplified by one Ludham ditch between (a) 2015 and (b) 2018

Despite the decline in nursery numbers at Ludham between 2017 and 2018, the population continued to make substantial advances in colonising the site (Fig. 4). This increases its resilience and will make it better able to exploit a recovery in the Water Soldier population.

## 2.2 Local volunteers trained for post-release monitoring at all sites

Monitoring the new populations after translocation is an integral and essential part of the translocation process (IUCN/SSC 2013, JCCBI 2010, JNCC 2013). It provides all-important data on the success of the new populations. This in turn informs whether or not they need further augmentation and also provides critical feedback on the methodology that enables progressive improvements to the translocation methods.

To recruit volunteers for this task I ran a total of six training workshops in 2015, 2017 and 2018. Numbers attending training workshops for all aspects of biological recording are usually significantly higher than those eventually committing to the task. However, even for those unable, for diverse reasons, to make the level of commitment required, these sessions raise awareness and local buy-in to the project.



**Figure 4** The distribution of Fen Raft Spiders on the Ludham Potter Heigham Marshes. Yellow lines show the ditches to which spiders were introduced in 2014 and 2015 and red lines the distribution by the end of 2018

Training workshops and their outcomes each year were as follows:

- 2015: Two local volunteers were trained to undertake post-translocation monitoring at both Ludham and Carlton Marshes, making approximately weekly visits from July until early October and contributing around 150 hours of work. In 2016 volunteers trained in 2015 undertook most of the

monitoring at Ludham, Carlton Marshes and on the RSPB's mid-Yare Marshes, making weekly visits at all sites and a huge contribution to the project. Between them they contributed 290 hours to the project. In addition to their contribution, I undertook the monitoring at the Castle Marshes on a voluntary basis, contributing a further 120 hours.

- 2017: Volunteer training days were held at both Ludham and Carlton Marshes. They were attended by a total of 15 people and both were very successful in recruiting new volunteers to the teams monitoring nursery webs at these sites. This increase in capacity enabled the maintenance of weekly counts while extending the area covered as the spiders extended their range. All of the monitoring at Ludham, Carlton Marshes and on the RSPB's mid-Yare Marshes in 2017 was undertaken by volunteers. Once again, I undertook the monitoring at Castle Marshes and at Redgrave & Lopham Fen on a voluntary basis. The estimated volunteer contribution to the project in 2017 was over 700 hours. One of the Carlton Marshes volunteers, Vincent Forte, wrote a lovely blog about the project and what it has meant to him; it can be found at <https://docdoolittle.blog/category/the-fen-raft-spider>.
- 2018: Training days for potential new volunteers were held at Carlton Marshes and Redgrave & Lopham Fen to further increase participation in the project and maintain high quality monitoring of the expanding populations. A total of 18 attended, resulting in another increase in the pool of volunteers at Carlton and a new and enthusiastic team at Redgrave and Lopham Fen.



**Figure 4** Training new volunteers at Redgrave and Lopham Fen NNR

Particularly in the current difficult funding environment, the volunteer input to the translocation programme is mission critical. The many hundreds of hours the volunteers invested in monitoring work during each year of this project is testament to this and to their hard work and enormous commitment.

In developing a dependency on volunteers for critical and ongoing aspects of any conservation project, it is important bear in mind that, in addition to initial training, volunteers need ongoing support to check and refresh their skills and to continue to drive their enthusiasm. Data collation, inputting and analysis and reporting are also needed and the extent to which on-site conservation staff and volunteers can take this on is inevitably very variable depending on their work loads and skills. In addition to training/refresher session at the start of each season, I now visit volunteers throughout the season and organise end-of-season meetings to assess initial results, share experiences and concerns, and plan the forthcoming season. I also continue to collate, input and analyse and report on the data.

### **2.3 Talks given to local interest groups (2015-2018)**

During the *Love the Broads* award period I gave talks to promote the project to the following audiences:

- Norwich Science Festival
- Norfolk & Norwich Naturalists' Society
- Waveney & Blythe Arts
- Suffolk Wildlife Trust's annual general meeting
- Ipswich Group of the Suffolk Wildlife Trust
- Aylesham Wildlife Group
- Felixtowe Group the Suffolk Wildlife Trust
- Broadland Group of the Norfolk Wildlife Trust - guided walk at Ludham Marshes

During each year of the project, it was also promoted as part of the British Arachnological Society's stand at the Rutland Birdfair where the Fen Raft Spiders attracted audiences of thousands.

The LtB logo was used for all presentational material and the *Dolomedes* website <http://www.dolomedes.org.uk/> gratefully acknowledges the *Love the Broads* contribution to the translocation programme.

### **2.4 Pre-translocation survey of Catfield area sites completed and, if appropriate, a new translocation undertaken there in 2016/17**

As reported in 2017, full assessment of a proposed translocation of Fen Raft Spiders to land owned by Catfield United Charities and managed by Norfolk Wildlife Trust concluded that it was not currently appropriate (Smith 2017). Although the ecological assessment of the area suggested that it could support an extensive Fen Raft Spider population, it was not possible to reach a consensus among the different landowning and managing parties.

During the assessment period two meetings were held with eight stake-holding parties, including the owners and managers of immediately adjacent land managed primarily for its wildlife interest. Although Natural England (the lead partner for the Translocation Programme and agency ultimately responsible for the condition of the Ant Broads & Marshes National Nature Reserve and the wider Broads SAC) were fully supportive of the proposal, some parties retained significant misgivings. The reasons for these varied but included concern about the lack of past records for the Fen Raft Spider in the area (although see Smith in

press), a desire first to resolve complex current issues around the area's hydrology, and the potential impacts of the spiders on the area's nationally rare and threatened water beetles; I produced a detailed advisory report for the Norfolk Wildlife Trust evaluating the translocation, and particularly assessing the latter aspect of the proposal.

Stakeholder consultation and, wherever possible, agreement, is part and parcel of best practice in the evaluation of conservation translocations (IUCN/SSC 2013, JCCBI 2010, JNCC 2013). In this case the high conservation status of the surrounding sites, and the close physical, hydrological and ecological interconnections between them, sites made all-party support particularly important. Failure to achieve this made the decision not to proceed with a translocation to the Norfolk Wildlife Trust reserve at the present time entirely appropriate.

To continue to move towards the national target of an increase in the number of sustainable populations for this Vulnerable (World Conservation Monitoring Centre 1996, Harvey *et al.* 2017) and Priority Species (Schedule 41 of Natural Environment and Rural Communities Act 2006) assessment of other potential sites, both in the Broads and further afield, is ongoing.

### **3 The contribution of the project**

Between 2015 and 2019 the *Love the Broads* Fen Raft Spider project provided critical support for an ongoing programme of work to increase the population of this beautiful species in Broadland and reduce its vulnerability to extinction in Britain. It made an important contribution to the conservation recovery programme, enabling the completion of a translocation to establish the spiders on the Ludham-Potter Heigham national nature reserve, and the evaluation of a further potential Broadland site. The Ludham translocation is the fourth in the Broads and brings the number of British populations to seven, significantly reducing the extinction risk since 2010, when there were only three.

This species is one of a cluster of Broadland specialities that are considered business critical because of their status as icons of the Broads wetlands and consequent importance to the green tourist industry. The project built successfully on previous work to increase the accessibility of this species both to local people and visitors to the area. It also helped substantially to increase community engagement. This was achieved in part through training local volunteers to carry forward assessment of the success of the translocation programme and inform methodological improvements to future translocations. Both the volunteer training, and the series of talks given at regional events and to local interest groups, further promoted the *Love the Broads* project and the wider Fen Raft Spider conservation programme that it supported. Local understanding of, and support for the project is a key element in its sustainability, helping to ensure that these magnificent animals spiders have a future in the Broads.

### **Acknowledgements**

I am very grateful to *Love the Broads* for their generous support for key elements of the Fen Raft Spider translocation programme between 2015 and 2018. During this period, the Broads Authority (particular thanks to Andrea Kelly), and both Norfolk and Suffolk Wildlife Trusts also provided partnership funding to support the wider translocation and conservation programme. This recent phase of the programme built on earlier work financially supported by many organisations. These were led by Natural England and included the BBC Wildlife Fund and RSBP. The Sussex Wildlife Trust, 13 BIAZA-affiliated British Zoos and collections, and the Universities of East Anglian and Nottingham made other important contributions. Many individuals

associated with these organisations, and many more volunteers from the region helped to make Broadland's four new Fen Raft Spider populations a reality.

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