

An assessment of *Sphagnum* moss and fen orchid *Liparis loeselii* on [REDACTED] and [REDACTED] at Butterfly Conservation Catfield Fen

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Parts of this report have been redacted to remove detail to protect the fen orchid population on Catfield Fen. This population is of national importance and such information could risk attempts to visit the colony to either view plants and/or to collect plants. Full details of the population have been made available to Natural England and the Environment Agency.

1. Introduction

The report, "A survey of *Sphagnum* moss at Butterfly Conservation Catfield Fen and comparison with past surveys. RSPB. 2014" identifies expansion of *Sphagnum* moss cover at Catfield Fen between 1986 and 2014. This corresponds with anecdotal evidence of loss of suitable fen orchid *Liparis loeselii* habitat to *Sphagnum* moss, and loss of commercial reed bed to *Sphagnum* moss.

The most significant increase was found in [REDACTED] (an increase in cover of 452% from 0.25ha to 1.13ha). The expansion of *Sphagnum* moss at this location has been largely at the expense of S24e fen habitat (RSPB, 2014).

In 2009, a *L. loeselii* colony was found on [REDACTED] (this colony had almost certainly been present here for many years, but had gone undetected). In 2011, the colony was surveyed by Plantlife using a trial method. The trial survey proved to be unsuccessful in providing good distribution data or providing a reliable population estimate. However, this survey did provide a number of grid referenced records of *L. loeselii*.

In 2013, RSPB surveyed part of the *L. loeselii* colony thoroughly, and this has provided many grid referenced records of *L. loeselii*. In 2013, a plant was found on [REDACTED] and, although this area has not been surveyed, it is likely that there are more to be found in this much under recorded part of the site.

The aims of the report are to:

- Illustrate the current *Sphagnum* cover on [REDACTED] and [REDACTED],
- Illustrate the change in *Sphagnum* cover from 1986 in the same area,
- Record the current *L. loeselii* distribution and
- To make observations on the perceived threat of *Sphagnum* moss spread on the *L. loeselii* population.

This report sets out the currently known *Sphagnum* cover on [REDACTED] and [REDACTED], the change in *Sphagnum* cover from 1986 in the same area, highlight the currently known *L. loeselii* distribution, and make some observations on the perceived threat of *Sphagnum* moss spread on the *L. loeselii* population. This report does not endeavour to link *Sphagnum* increase to local water abstraction, or explain why reduction in groundwater input should lead to *Sphagnum* increase. These issues have already had much debate. However, the RSPB understands that reduced groundwater input is likely to increase the rate at which *Sphagnum* can spread and it is possible that local water abstraction is accelerating this process.

2. Compartment map

Figure 1: Compartment map showing [redacted] (1.77ha) and [redacted] (3.50ha).

3. 1986 Sphagnum cover

Figure 2: Area of *Sphagnum* mapped in Giller and Wheeler, 1986. (RSPB, 2014)
Green hatch = *Sphagnum – Dryopteris* community.

4. 2014 *Sphagnum* cover

Figure 3: Area of *Sphagnum* mapped in 2014 (RSPB, 2014).
Green hatch = *Sphagnum* dominated.
Green stars = *Sphagnum* patch < 3m x 3m.

5. New *Sphagnum* cover from 1986 to 2014

Figure 4: Area of *Sphagnum* recorded in 2014 but not in 1986 (RSPB, 2014).

Orange hatch = *Sphagnum* dominated present in 2014 but not in 1986. This does not include small patches which may have been missed in the 1986 survey.

6. NVC communities, 1991

Figure 5: NVC communities on [redacted] and [redacted], 1991 (Taken from Parmenter, 1991).

Orange hatch = *Sphagnum betula* (0.34ha)
Green hatch = S24e (4.35ha)
Dark blue hatch = S24d (0.06ha)
Light blue hatch = S24g (0.08ha)
Solid black = Carr (0.46ha)

7. NVC communities, 2014

Figure 6: NVC communities on [redacted] and [redacted], 2014. RSPB compilation from ELP, 2007; RSPB, 2014 and Catfield Fen Management Plan, 2013.

Orange hatch = *Sphagnum-Betula* (1.11ha)
Green hatch = S24 (various sub-communities) (3.70ha)
Dark blue solid = open water (0.12ha)
Solid black = Carr (0.20ha)

8. *L. loeselii* population, 2013

In June 2013, a survey for *L. loeselii* within four blocks of reed which had been cut in March 2013 was carried out. The blocks are marked with canes. The method involved one surveyor thoroughly surveying each block by searching along transects from West to East and back West. All *L. loeselii* spikes were recorded and logged with a handheld GPS. This method ensured a very thorough count within the survey blocks. Some orchids will inevitably have been missed, but the vast majority will have been found.

964 fen orchid 'spikes' were found in 2013, with 204 flowering, this equates to approximately 40% of the known UK population of *L. loeselii loeselii*, and given the partial coverage (not all of the area which holds *L. loeselii* at Catfield was surveyed) suggests that this colony is likely to be the largest and most important colony of *L. loeselii* in the UK (including the *L. loeselii ovata* subspecies in Wales).

The ongoing monitoring plan is to carry out a survey of each block cut the preceding winter, therefore in 2014 a different area will be surveyed and eventually the whole cut area will be surveyed. Funding is currently being sought to allow an annual count of the whole area and additional survey work to search for *L. loeselii* beyond the cut area.

In July 2013, a single *L. loeselii* plant was found during a separate quadrat survey in [REDACTED], the first ever recorded in the compartment. This area is particularly under-recorded and it is highly likely that *L. loeselii* have been present here for many years but gone unnoticed. It is highly likely that there are more *L. loeselii* plants in [REDACTED] and some additional survey work is planned for 2014. Funding is being sought for a full survey.

Before 2013, *L. loeselii* survey work in [REDACTED] was limited and not comparable to the 2013 survey. The colony was discovered in 2009, so there has not been much time for a good method to be developed.

Figure 6: Known *L. loeselii* population at Catfield Fen, 2013

Black lines: Perimeter of area surveyed in 2013;
Red dots = *L. loeselii* 'family groups';
Green star = *L. loeselii* spike found in [REDACTED].

9. Sphagnum and *L. loeselii*

Figure 7: *Sphagnum* cover and known *L. loeselii* population

Orange hatch =
Sphagnum
dominated;
Green star =
Sphagnum patch
Red dot = *L. loeselii*
spike

Figure 7 shows the 2014 *Sphagnum* dominated area and the 2013 *L. loeselii* population found within the surveyed blocks. It is very important to stress that the area of overlap **does not include areas where *Sphagnum* cover is 100%**. *L. loeselii* is only found within the fringe of the *Sphagnum* dominated area. *L. loeselii* plants were found growing on other moss species (largely *Calliergonella cuspidata* and *C. giganteum*), with a few on bare peat. One *L. loeselii* plant was recorded growing in what appeared to be a patch of 100% *Sphagnum*, but this is very much the exception. The one plant found growing on *Sphagnum* was non-flowering, stunted and yellow and is the **only record globally** of a *L. loeselii* plant growing on pure *Sphagnum* moss.

The transition from S24e to 100% *Sphagnum* cover is demonstrated below in Figure 8.

Figure 8 shows the results of a *Sphagnum* transect conducted in June 2013 overlaid onto the known survey locations. The transect was conducted by walking along the midline of each reed block and making a rapid assessment of *Sphagnum* cover with each step. This was then plotted onto Mapinfo and used to produce a thematic map showing *Sphagnum* cover along each transect line. This is important because it demonstrates that *L. loeselii* is able to survive (at least temporarily) in areas where *Sphagnum* cover is not complete.

Figure 8: *Sphagnum* transect and *L. loeselii* positions

Orange hatch = *Sphagnum* dominated
Green star = *Sphagnum* patch
Small Red dot = *L. loeselii* spike

Transect key:
Red dot = >70% *Sphagnum* cover
Dark orange dot = 50 – 70% cover
Light orange dot = 30 – 50% cover
Yellow dot = 0 - 30% cover
Green dot = 0% cover

10. Discussion

The aim of this report was to present the apparent recent spread of *Sphagnum* within an area of Butterfly Conservation Catfield Fen, which is of unique importance due to the widespread presence of the S24e fen community and particularly the SAC feature, *L. loeselii*. Whilst further monitoring is required to prove conclusively that the *Sphagnum* area continues to expand and that *L. loeselii* cannot persist once *Sphagnum* cover becomes total, the presented information combined with accepted knowledge about *L. loeselii* ecology presents a compelling case that;

- The Catfield *L. loeselii* population has already been reduced due to the advancement of *Sphagnum* moss from the North and West.
- The *Sphagnum* area has reached a critical point where it is advancing onto the main *L. loeselii* colony, which supports almost 40% of the known UK population.
- There has already been significant loss of the valuable S24e sub-community and a reduction in habitat suitable for *L. Loeselii*.
- The suitable habitat for *L. loeselii* to retreat into is reducing and is already limited.
- The situation is urgent and immediate and action needs to be taken immediately to avoid the loss of a European feature from Catfield Fen in the very near future.

11. References

English Nature (1997). *Site Management Statement for Catfield Fen*. English Nature.

Giller, K.E. (1982). *Aspects of the plant ecology of a flood-plain mire in Broadland, Norfolk*. Ph.D. Thesis, University of Sheffield.

Giller and Wheeler (1986). Past Peat Cutting and Present Vegetation Patterns in an Undrained Fen in the Norfolk Broadland. *Journal of Ecology*, **74**,219-247.

Giller and Wheeler (1988). Acidification and Succession in a Flood-Plain Mire in the Norfolk Broadland, U.K. *Journal of Ecology*, **76**, 849-866.

Harris, J (1993). *Catfield Fen Management Plan*. Butterfly Conservation.

Harris, J (2003). *Catfield Fen Management Plan*. Butterfly Conservation.

Mason, R (2014). *A survey of Sphagnum moss at Butterfly Conservation Catfield Fen and comparison with past surveys*. RSPB.

Parmenter, J (1991). *Fen Resource Survey*. Broads Authority.

RSPB (2013). *Catfield Fen Management Plan*. Butterfly Conservation.