

**Report 5. Natural England advice to the Environment Agency on Condition Assessment at Catfield Fen: consideration of recent trends in distribution of *Potamogeton* and *Liparis* in Unit 3. Provided by Mr Harris 24 June 2014**

The Environment Agency requested (25 June 2014) Natural England comments on the above report and specifically whether the information in this report changes NE condition assessment for unit 3 (unfavourable recovering at hydrological and species risk).

This report and that of RSPB (referred to in this report and commented on by NE in report 4) are welcome.

NE response covers 3 main aspects

1. The relevance of condition assessment in assessing hydro-ecological change
2. Specifics in relation to new evidence - *Potamogeton* species and pH mapping
3. Relevance of this report for NE's advice to EA on site condition and advice to date on water abstraction licences

**Relevance of condition assessment in assessing hydro-ecological change.**

1. Mr Harris provided NE on Dec 13 2013 a paper "Use of Condition assessment at Catfield Fen". This paper includes a number of points also referred to in the June report relating to the degree of relevance of condition assessment in identifying and assessing change and hydrological change in particular.
2. Natural England's responded to the December 2013 paper. The following points are worth noting here and emphasising further
3. Condition Assessment (based on Common Standards Monitoring) is not intended to be the only monitoring which takes place on protected sites. If a feature is in unfavourable condition or a threat identified then further investigations should be made to ascertain the reasons, solutions and actions taken.
4. Some of the concerns raised by both reports relate to the application of condition assessment to specific uses for which it is not designed or used nationally or specifically. It is not designed as a tool to monitor changes which may be considered to be a response to a specific impact or even suite of impacts. A condition assessment of the site will be an indication of the current state of the designated features of the sites at that time against a base line. It relies on information on a suite of attributes including the sampling of attributes of the vegetation. A comparison of data gathered between condition assessments can be used to assess change. Mr Harris and RSPB have in fact used a similar approach in their reports.
5. Natural England has not sought to extend the use of condition assessment information beyond that for which it is intended.
6. The June 2014 report highlights more detailed information which will not have been provided by condition assessment

**Potamogeton**

7. As stated by Dr Parmenter, *P. coloratus* is a species characteristic of both standing open water which includes ditches and shallow pools and runnels on the surface. It is associated with more base rich conditions as compared to *P. polygonifolius* which is associated with less base rich conditions.
8. *P. coloratus* is a species noted in CA as a an indicator of " high quality" for Lowland Ditch System criteria feature for Ant Broads and Marshes. Both *Potamogeton* spp are

associated with the very wet M9 vegetation community (*Carex rostrata-Calliergon cuspidatum/giganteum* mire), with *P. coloratus* more strongly associated with the more base-rich sub-communities, i.e. M9b (Rodwell, 1991) and M9-2 (Wheeler et al., 2009) that are characteristic of the Broads, and *P. polygonifolius* more strongly associated with the M9a sub-community which is more characteristic of valleyhead wetlands, often in heathland/moorland complexes. Wheeler et al. (2009) also list *P. coloratus* as occurring in S24 (probably S24e, but this is not stated) and S2, although Rodwell (1991) does not have either species in the S2 or S24 floristic tables. *P. polygonifolius* is characteristic of the more acidic transition mire communities such as M4 and S27, although Wheeler et al. (2009) list *P. coloratus* as occurring in S27, presumably in particularly base-rich examples.

9. Both species are associated with shallow runnels and pools on the fen surface where vegetation communities are transitional in nature between base rich and more base poor conditions as is the case in transitional mire types. *P. coloratus* will be restricted to the most base-rich environments and would soon be lost from acidifying surfaces.

10. NE accepts the correct identification by Jo Parmenter of *P. polygonifolius* samples from Catfield Unit 3 (specifically Catfield Sedge Fen) and *P. coloratus* from Sutton Fen. Dr Parmenter is very experienced indeed and these samples have been expertly verified.

11. Dr Parmenter has questioned whether NE has mis-identified *P. coloratus* and consequently failed to recognise the extent of change and its significance.

12. It is possible that NE mis-identified *P. coloratus* in 2013 condition assessment. Whilst NE surveyors are experienced botanists with some 35yrs experience between them of working on Broadland fens, identifications were not supported with voucher specimens nor were records verified by a referee. However, the following points are relevant and indicate similar assumptions have been in the past by others who are experienced and skilled:

- The Broads' fen survey (NE and BA) surveyed unit 3 in 2007; *P. coloratus* was identified in 9 samples and *P. polygonifolius* not identified. It would seem unlikely that there would have been a complete shift from *P. coloratus* to *P. polygonifolius* within 7 years.
- Similarly, The Ant Broads & Marshes Management Plan (2013-2018) (written by Richard Mason, RSPB, on behalf of Butterfly Conservation), states in section 1.5(open fen) – 'on the trampled areas of the fen near to Catfield staithe a very rich community of plants has developed, including *P. coloratus*, *Chara* sp. and *Utricularia* sp.' Also in section 1.5 (open water) – 'the dyke edges are very valuable for a range of fen species such as *Potamogeton coloratus*, *Sium latifolium*, *Peucedenum palustre* and *Cicuta virosa*'.
- Appendix 1 (taken from 2008-2013 Management Plan) refers to *P. coloratus* records from 1991 no references to *P. polygonifolius*.

13. Past records indicate that both species have been found in the site. It is entirely possible that within Catfield Sedge Fen (where transition mire is located) there may be a mix of both *Potamogeton* species.

14. Rather than debating point 13 further, on the basis of information over a period of time that appear to show inconsistencies (potentially in identification and / or duration of a shift to *P. polygonifolius* we need to turn our attention to the possible significance in relation to changes on the site.

15. Turning to *P. polygonifolius* within Catfield Sedge Fen. Both species are associated with transition mire where *P. polygonifolius* will be indicative of the transition from base rich to base poor fen. This may happen as a consequence of terrestrialisation of former turf ponds (as found in unit 3) leading to increasing prevalence of wet but base-poor conditions. It may also happen as a consequence of changes to the hydrological regime due to water abstraction and / or lack of circulation of base rich water in the ditch/dyke system. In such a dynamic system *P. coloratus* will only persist for the earlier base-rich transitional stages.

16. Annex 5 featuring surface water pH readings from Units 3 and 11 is helpful in providing up-to-date information. Dr Parmenter uses this information to indicate that the pH is unsuitable for *P. coloratus*. This is likely to be the case. However, this may not be new phenomenon. Parts of Unit 11 were known from early Giller and Wheeler studies to be particularly acidic compared to other Broadland sites, perhaps as a consequence of its isolation from the influence of river water, location close to the mineral ground and influence of drying-induced acidification resulting from past management.. There does not appear to be any reference to *P. coloratus* from this area from the Fen Resource Survey.

### ***Liparis***

17. Natural England has provided advice (Report 4) to the EA on the recent information in relation to *Liparis* provided by RSPB on which Dr Parmenter's report is based.

18. Dr Parmenter does not add any further substantive evidence to the above. However, she helpfully highlights the point noted by RSPB of a decline in extent of S24e (1.25ha) to *Sphagnum* dominated fen.

19. The information on *Liparis* is new. There has not been such a comparative survey undertaken previously.

20. The loss of *Liparis* and lack of apparent suitable habitat for the orchid to find a future niche in the face of the increase in *Sphagnum* habitat is of concern to NE. It should be noted that the *Liparis* population and extent of current suitable habitat is an attribute of the condition tables whereas the extent of S24e is not.

### **Relevance of this report for NE's advice to EA on site condition and advice to date on water abstraction licences**

21. The information presented is not definitive as evidence as to the relative influence of man made impacts and natural changes and importantly the significance of the water abstraction as a component of the former.

22. The information does emphasise the change which is happening on the site. Significantly, it indicates that this change is in one direction. It might be reasonable to expect that a dynamic site might be showing a variety of changes, but this does not seem to be the case.

23. The information in relation to *Potamogeton* and *Liparis* is consistent with previously reported changes indicating declines in both Ellenberg indices for reaction and wetness, and frequency in a number of species indicative of more calcareous and wetter conditions.

24. The information confirms Natural England's concerns about hydrology in terms of changes in the hydrochemical environment at fen surface

25. It highlights caveats to the application of condition status by the EA in such a situation. In particular caveats in relation to:

1) the relatively coarse scale of approach of condition assessment eg it does not allow for the assessment of Calcareous fen sub communities of S24 beyond extent/quality of the main community, i.e. it does not address extent and quality of sub communities.

2) condition assessment allows for certain amount of change but the degree of which does not necessarily trigger a change in conclusion.

3) the added complication is that more acid transition mire is a feature of interest in its own right.

26. The decline in *Liparis* and its habitat and the limited extent of potentially suitable future habitat is considered by NE to:

1) confirm the assessment of Unit 3 as being in unfavourable condition and

2) brings into question the current status of unfavourable recovering condition. We believe it justifies re-classifying to unfavourable declining condition.