

Natural England Ecological Report 7. Evidence and Advice to the Environment Agency for Ant Broad and Marshes SSSI (Broadland SPA/Ramsar and The Broads SAC).

Aims of the report:

1. The Environment Agency (EA) are undertaking an appropriate assessment on two licences AN/034/0009/008 and AN/034/0009/009 on Ant Broad and Marshes SSSI part of the Broadland SPA/Ramsar and The Broads SAC.
2. This is the seventh evidence and advice report that Natural England has provided to the EA to help in the development of their appropriate assessment.

This report collates Natural England's response to EA questions October 17th 2013 and brings to the attention of EA new information from a recent site visit and recent reports

Question 1. Taking account of what NE understand to be the current condition of Sutton Fen and Sharpe Street, please can you advise whether there are any factors which may influence the level of confidence that we would place in our using the approach agreed with NE, during our Review of Consents process, for an Appropriate Assessment into any possible impacts associated with the renewal of the Alston abstraction licenses, on these two Fen compartments?

1. Site condition (units assessed 2010)

Sutton Fen (unit 10) and Broads (unit 30)	Unit 10	unfavourable recovering Reason: Scrub clearance programme to be continued
	Unit 30	unfavourable declining Reason: awaiting actions to be defined to address drainage and ochre issues recognised in the water level management plan due 2015.
Sharp Street	Unit 4	Favourable

2. NE advises the EA that the following factors are relevant in assessing whether the approach used under the Review of Consents should be adopted in the Appropriate Assessment of the licenses under current consideration.

2.1 The Appropriate Assessment of the licenses is undertaken in relation to the conservation objectives for the European site. The European site is the Broads SAC. The relevant component SSSI in this case is Ant Broad and Marshes. We advise that a consistent approach in assessment should be applied across all the units comprising this SSSI which are likely to be significantly affected by license proposals. Therefore the approach adopted for Sutton Fen and Broad and Sharp Street should be consistent with that adopted for Units 3 and 11.

2.2 The Appropriate Assessment is required under Regulation 61 of the Habitats Regulations. The Review of Consents was undertaken under Regulations 63 followed by 64. The EA will need to be confident that the approach to be applied meets the

requirements of Regulation 61.

2.3 Both Sutton Fen and Broad and Sharp Street Fen border the highland, and similar to Catfield may well receive lateral groundwater inputs. Sharp Street Fen is in part isolated from the influence of river water (similar to Catfield) and is therefore potentially especially sensitive to changes in ground water inputs.

2.4 Some of the highest value vegetation in the Broads, the *Peucedano-Phragmitetum caricetosum* (Ppc)/M9-3 *Carex diandra-Peucedanum palustre* mire (Wheeler et al., 2009), has been noted as occurring at Sutton Fen and Broads directly adjacent to the highland. This is an exceptionally rare vegetation type, and forms part of the of the SAC feature; it also contains the rare and highly protected fen orchid *Liparis loeselii*.

2.5 Vegetation similar to M9-3 was observed on the recent visit by NE/RSPB/BC (Nov 2013). However, the ELP(2010) survey was not able to confirm the continued presence of this community unambiguously (Please refer to point 4). This vegetation type is characteristic of early succession from open water. It is found on semi-floating rafts and appears to be particularly susceptible to successional change. It is also located at the edge of the fen where the potential influence of lateral (and or vertical water inputs) may be more likely. The dynamism of this type of fen vegetation and other herbaceous rich fen in the Broads is not considered stable even where vegetation and hydrological management is maintained. As a consequence, the application of the “historic abstraction” scenario as was applied in the Review of EA Consents is not considered adequate. Natural England recommends that EA applies a naturalised scenario.

2.6 The Review of Consents did not consider the impacts of climate change, which is now normally taken into account, particularly in relation to longer term water resource assessment

Question 2. Has NE evidence of ecological change which you believe might lead to you judging that Sutton Fen and Sharpe Street could move into unfavourable condition, in the medium to long term?

3. Sutton Fen and Broads is judged to be in unfavourable condition as a consequence of a need to reduce the cover of scrub and increase open fen and the need to identify what is needed and implement measures to address drainage and ochre. Sharp Street Fen is noted as in favourable condition.

4. Natural England does not have clear evidence of ecological change indicating that Sutton Fen and Broad and Sharp Street Fen should be assessed as unfavourable declining in the medium term (2015) or long term (2027). Significant vegetation change was not recorded by the Broads Authority/RSPB 2013 survey in relation to the former site. However, there is concern that at Sutton Fen and Broad the vegetation community M9 – 3 has not been confirmed by either the 2005 or 2012 surveys. Loss of extent and quality of this community as a result partly / largely of non-natural change¹ would lead to unfavourable declining condition. Loss of the community as a result of partly / largely non-natural change would be recorded as “loss”.

¹ This phrase is used because conservation objectives recognise that changes in attributes of “features” may be as a consequence of natural change.

Question 3: In light of the 2012 Broads Authority/RSPB report, please can you confirm that the above advice takes account of this information, and that nothing in that report materially alters the advice that you have so far provided to us for Catfield Fen.

5. The above advice takes into account the 2012 Broads Authority / RSPB report in relation to Sutton Broad and Fens.

6. The report does not cover Sharp Street Fen. On the basis of former condition assessment information and a brief visit (5.11.13) NE is not able to update EA further about any changes at Sharp Street Fen.

7. Turning to Catfield Fen Unit 3. Vegetation changes have been considered by the above report. In addition NE visited this unit on 5.11.13 and we have received further information from RSPB. This information confirms previous advice provided to EA. We have summarised this below and have drawn some comparison with information from Mr Harris (Dr Parmenter's survey comparing 1991 and 2013 vegetation data). It should be noted that most of Unit 3 is reflooded turf pond, in contrast to Middle Marsh (in Unit 11) which is solid peat.

- The Broads Authority / RSPB report confirms that there does not seem to have been a change at vegetation community-scale in Unit 3 in 2007 and 2012. Similar to the situation noted for Unit 11
- The report confirms that there have been changes at a finer scale within communities. This is notably an expansion in frequency and cover of bryophytes with cover increasing from 21.8% in 2007 to 44.8% in 2013. Whilst the report does not state that the bryophytes are *Sphagnum* species, from our visit and pers comm with RSPB we believe the species largely responsible for the increase are *Sphagnum*. On our visit we noted that the *Sphagnum* species were those associated with wet acidifying fens, although their presence and increase suggests a reduction in the frequency of influence/inundation with base-rich water. This expansion is similar to changes noted in unit 11, although the cause of the changes may be subtly different given the different state (solid peat vs. buoyant mat over turf pond) of the two units.
- Follow-up analysis provided by RSPB (Annex 1) using data contained in the report indicates change in the balance of fen plant species. In particular, there appears to have been a reduction in species of wetter fens, e.g. *Phragmites australis*, *Carex elata* and *Typha angustifolia*, and an increase in species of less wet conditions, e.g. *Calamagrostis canescens*, *Myrica gale* and *Kindbergia praelonga*. Dr Parmenter's survey of Unit 11 also noted a slight decline in the following herbaceous species indicative of very wet and base-rich conditions in Middle Marsh: *Carex elata*, *Rumex hydrolapathum*, *Lycopus europeus* and *Sium latifolium*.
- Follow-up analysis of the vegetation data (Annex 2) again provided by RSPB using data contained in the report shows a decline in Ellenberg moisture indicator between 2007 to 2012. This is a statistically significant change ($p < 0.0005$). Statistically significant decreases were also detected in Ellenberg reaction (i.e. indicating more acid conditions), Ellenberg light (i.e. less light available) and Ellenberg nitrogen (i.e. indicating lower nutrient conditions). Declines were detected in the index of 'high value' fen species although this was not statistically significant. It is noteworthy that Dr Parmenter's survey of Unit 3 also noted a slight decline in Ellenberg moisture indices although in this case the change was not statistically significant. Whilst statistical significance or not is a factor in terms of weight to be placed on such evidence, we consider it worth noting that such a change is shared across these units.

- We noted particularly frequent and abundant *Calamagrostis canescens* – a species which tends to be more abundant in drier fens - across large parts of Unit 3 on our visit on 5.11.13. Dr Parmenter recorded this in Unit 11 though she did not remark upon its frequency.

8. We wish to bring to EA the following in relation to hydrological change in Unit 3

- RSPB have provided NE a record of water table levels based on readings of EA gauge boards adjacent to the rond (NTG3261G1) in Unit 3 (Annex 3). These indicate not just a lower level but a declining trend. We strongly recommend that EA examines this data.
- Anecdotal information from RSPB notes changes in both vegetation and surface wetness in unit 3. This reflects anecdotal information for Unit 11.

Conclusions

9. Natural England recognises that the information presented in points 7 and 8 above has limitations. However, we consider that there is an increasing body of evidence and information which as a package:

a) clearly justify the application of the category of hydrologically at risk

b) confirm changes in the balance between base poor and base rich waters at the fen surface

10. This body of evidence and information taken together with the evidence on declining water table levels may indicate a trend towards drier conditions at the fen surface.

11. We request EA to consider actual water table data in addition to the modelling approach to inform the appropriate assessment.

Summary

12. Natural England advises EA:

- There is evidence of changes within vegetation communities units 11 and 3.
- These changes have not led to a change in vegetation community or in assessed condition.
- The key change is an increase in frequency and abundance of *Sphagnum* moss species associated with fens.
- The nature of vegetation change indicates increased influence of acid conditions in units 3 and 11, which is likely to be a result of an increase of the influence of rainfall compared with base rich water on the fen vegetation.
- There are a number of factors which may explain this change.
- Catfield Fen is isolated from the influence of the river and so hydrologically reliant on rainfall and groundwater inputs particularly sensitive to changes in the balance between water inputs.

13. There is a variety of other evidence and information which may indicate some drying is occurring. Natural England recognises that the strength of this indication is limited partly because the weight which might be given to each element can be debated. However, as a package including water table level information we consider that EA need to consider such changes within the appropriate assessment.

END