

## Annex 1. Report 7 Summary of individual plant species change at Catfield Fen 2007 – 2012

### RSPB to NE 13.11.13. R. Mason

#### Summary

During the meeting between NE, RSPB and BC on 05/11/2013 there was some discussion around the “Analysis of Vegetation Change at Sutton and Catfield Fens between 2007 and 2012” OHES, 2013. To summarise there was ambiguity as to whether the Ellenberg values for Catfield Fen showed a significant change and if this change was indicative of drying or not.

It was agreed that I would look more closely at some of the key plant species to pick up further evidence of this change. This is presented below and in addition, the Ellenberg values has been put through a rigorous statistical analysis to detect if the apparent changes from 2007 to 2012 are significant. This is presented in a document which I will send through later.

**Table of change of all species;** 2012 average DOMIN minus 2007 average DOMIN. Negative value = less in 2012 than in 2007.

Species	Common name	Change on DOMIN scale	Approx. % change*
<i>Utricularia vulgaris</i>	Bladderwort	-1.69	-25.38%
<i>Calliergon giganteum**</i>	Moss	-1.56	-23.46%
<i>Phragmites australis</i>	Reed	-1.18	-17.69%
<i>Carex elata</i>	Tufted sedge	-1.10	-16.54%
<i>Typha angustifolia</i>	Lesser reedmace	-0.87	-13.08%
<i>Juncus subnodulosus</i>	Blunt flowered rush	-0.74	-11.15%
<i>Salix cinerea</i>	Grey willow	-0.67	-10.00%
<i>Sphagnum flexuosum</i>	Moss	-0.51	-7.69%
<i>Potentilla palustris</i>	Marsh cinquefoil	-0.44	-6.54%
<i>Lythrum salicaria</i>	Purple loosetrife	-0.38	-5.77%
<i>Dryopteris cristata</i>	Crested buckler fern	-0.31	-4.62%
<i>Utricularia minor</i>	Lesser bladderwort	-0.31	-4.62%
<i>Calyptogeia muelleriana</i>	moss	-0.28	-4.23%
<i>Carex pseudocyperus</i>	Cyperus sedge	-0.28	-4.23%
<i>Lysimachia vulgaris</i>	Yellow loosetrife	-0.28	-4.23%
<i>Sphagnum subnitens</i>	moss	-0.28	-4.23%
<i>Sphagnum palustre</i>	moss	-0.26	-3.85%
<i>Cardamine pratensis</i>	Cuckoo flower	-0.23	-3.46%
<i>Eurhynchium praelongum</i>	Moss	-0.23	-3.46%
<i>Plagiomnium rostratum</i>	moss	-0.23	-3.46%
<i>Campylium stellatum</i>	moss	-0.21	-3.08%
<i>Betula pubescens</i>	Birch	-0.18	-2.69%
<i>Dryopteris dilatata</i>	Broad buckler fern	-0.18	-2.69%
<i>Lemna minor</i>	Duckweed	-0.18	-2.69%
<i>Potamogeton coloratus</i>	Fen pondweed	-0.18	-2.69%
<i>Schoenus nigricans</i>	Black bog rush	-0.18	-2.69%
<i>Iris pseudacorus</i>	Iris	-0.15	-2.31%
<i>Sium latifolium</i>	Greater water parsnip	-0.15	-2.31%

<i>Salix caprea</i>	Goat willow	-0.13	-1.92%
<i>Solanum dulcamara</i>	Bittersweet	-0.13	-1.92%
<i>Molinia caerulea</i>	Purple moor grass	-0.10	-1.54%
<i>Ophioglossum vulgatum</i>	Adder's tongue fern	-0.10	-1.54%
<i>Polytrichum commune</i>	moss	-0.10	-1.54%
<i>Sphagnum fimbriatum</i>	moss	-0.10	-1.54%
<i>Berula erecta</i>	Lesser water parsnip	-0.08	-1.15%
<i>Carex acutiformis</i>	lesser pond sedge	-0.08	-1.15%
<i>Carex disticha</i>	Brown sedge	-0.08	-1.15%
<i>Chara virgata</i>	Stonewort	-0.08	-1.15%
<i>Cicuta virosa</i>	Cowbane	-0.08	-1.15%
<i>Galium palustre</i>	Marsh bedstraw	-0.08	-1.15%
<i>Hypnum cupressiforme</i>	Moss	-0.08	-1.15%
<i>Juncus articulatus</i>	Jointed rush	-0.08	-1.15%
<i>Juncus effusus</i>	Soft rush	-0.08	-1.15%
<i>Menyanthes trifoliata</i>	Bogbean	-0.08	-1.15%
<i>Pellia endiviifolia</i>	Liverwort	-0.08	-1.15%
<i>Ranunculus flammula</i>	Lesser spearwort	-0.08	-1.15%
<i>Rumex hydrolapathum</i>	Great water dock	-0.08	-1.15%
<i>Salix aurita</i>	Eared willow	-0.08	-1.15%
<i>Thelypteris palustris</i>	Marsh fern	-0.08	-1.15%
<i>Aulacomnium palustre</i>	Moss	-0.05	-0.77%
<i>Cirsium dissectum</i>	Meadow thistle	-0.05	-0.77%
<i>Lemna trisulca</i>	Ivy leaved duckweed	-0.05	-0.77%
<i>Ranunculus lingua</i>	Greater spearwort	-0.05	-0.77%
<i>Rubus fruticosus</i> agg.	Bramble	-0.05	-0.77%
<i>Hydrocharis morsus-ranae</i>	Frog bit	-0.03	-0.38%
<i>Lychnis flos-cuculi</i>	Ragged robbin	-0.03	-0.38%
<i>Myosotis laxa</i>	Water forgetmenot	-0.03	-0.38%
<i>Oenanthe fistulosa</i>	tubular water dropwort	-0.03	-0.38%
<i>Pellia epiphylla</i>	Liverwort	-0.03	-0.38%
<i>Quercus robur</i>	Oak	-0.03	-0.38%
<i>Rhamnus cathartica</i>	Alder buckthorn	-0.03	-0.38%
<i>Riccardia multifida</i>	Liverwort	-0.03	-0.38%
<i>Campylium stellatum</i> var. protensum	Moss	0.03	0.38%
<i>Carex panicea</i>	Carnation sedge	0.03	0.38%
<i>Carex remota</i>	Remote sedge	0.03	0.38%
<i>Equisetum fluviatile</i>	Water horsetail	0.03	0.38%
<i>Lophocolea bidentata</i>	Liverwort	0.03	0.38%
<i>Myosotis scorpiodes</i>	Water forgetmenot	0.03	0.38%
<i>Osmunda regalis</i>	Royal fern	0.03	0.38%
<i>Polystichum setiferum</i>	Soft shield fern	0.03	0.38%
<i>Carex rostrata</i>	Bottle sedge	0.05	0.77%
<i>Cladium mariscus</i>	Saw sedge	0.05	0.77%
<i>Holcus lanatus</i>	Yorkshire fog	0.05	0.77%

Liparis loeselii	Fen orchid	0.05	0.77%
Pedicularis palustris	Marsh lousewort	0.05	0.77%
Riccardia chamedryfolia	Liverwort	0.05	0.77%
Mentha aquatica	Water mint	0.08	1.15%
Typha latifolia	Greater reedmace	0.08	1.15%
Calystegia sepium	Moss	0.10	1.54%
Carex lasiocarpa	Slender sedge	0.10	1.54%
Stellaria palustris	Marsh stitchwort	0.10	1.54%
Frangula alnus	Alder buckthorn	0.13	1.92%
Eupatorium cannabinum	Hemp agrimony	0.15	2.31%
Plagiomnium elatum	Moss	0.15	2.31%
Betula sp.	Birch	0.21	3.08%
Drosera rotundifolia	Round leaved sundew	0.31	4.62%
Dryopteris carthusiana	Narrow buckler fern	0.31	4.62%
Lycopus europaeus	Gypsywort	0.31	4.62%
Peucedenum palustre	Milk parsley	0.31	4.62%
Cirsium palustre	Marsh thistle	0.36	5.38%
Scutellaria galericulata	Skullcap	0.41	6.15%
Hydrocotyle vulgaris	Marsh pennywort	0.49	7.31%
Epilobium palustre	Marsh willowherb	0.64	9.62%
Plagiomnium affine	Moss	0.64	9.62%
Salix sp.	Willow	0.64	9.62%
Brachythecium rutabulum	Moss	0.67	10.00%
Sphagnum squarrosum	Moss	0.69	10.38%
Kindbergia praelongum	Moss	0.74	11.15%
Myrica gale	Bog myrtle	0.74	11.15%
Calamagrostis canescens	Purple small reed	0.92	13.85%
Calliergonella cuspidate**	Moss	1.54	23.08%

\* Percentage change values are **very** crude - assumes change of 1 = 15 % as the mean difference between DOMIN scores.

\*\* It is suspected that C.giganteum and C. Cuspisdata are the same species and was misidentified in one year or the other.

It is difficult to write about the above table constructively; instead I have highlighted in red those which I associate with drier fen and in blue those which I associate with wetter fen. This is very much open to interpretation, but in general many of those species which I associate with wet fen have decreased and those associated with dry fen have increased. I think that in combination with water level data and anecdotal evidence this is further evidence that the site has become drier from 2007 to 2012.

I have compiled similar lists for the other three hydrological units (Sutton Broad, Sutton Fen, Wood Fen) these do not show similar changes. There is some indication of increased wetness on Sutton Broad but Sutton Fen and Wood Fen show little significant change.

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