Easter Inch Moss Habitat Survey Report for Ironside Farrar Ltd 28 March 2011

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4467	7/103 HABITAT SURVEY PLAN	

APPENDIX 1: TARGET NOTES

1. Introduction

Cameron Ecology Ltd was commissioned by Ironside Farrar Ltd to undertake an extended phase 1 habitat survey at Easter Inch Moss. The purpose of this survey was to inform the development of a revised management plan for the area, which is a local nature reserve (LNR).

2. Methods

2.1 Survey Methods

The survey followed the standard Phase 1 habitat survey technique published by the Joint Nature Conservation Committee (2003)¹. This survey method classifies habitats based on the dominant vegetation types present. The scope of the survey was extended to include recording protected mammals and other species of nature conservation importance. Plant names follow Stace 2010² for vascular plants and Atherton *et al* 2010³ for bryophytes.

In addition to the phase 1 classification, reference is also made to the National Vegetation Classification (NVC). The NVC classifies recognisable communities of plants that are often found growing together. Descriptions of these plant communities are published in Rodwell (1991)⁴.

2.2 Limitations

Timing

The survey was undertaken on Friday 21 January 2011, having been postponed due to snow cover during the latter part of 2010. Many annual plants are either not present or easily overlooked in mid-winter surveys. Some vegetative perennials such as fine-leaved grasses can be very difficult to identify in the field in winter surveys.

These limitations associated with timing mean that the species list is not likely to represent the full diversity of the site. However, overlooking some species due to the timing of the survey will not in this case affect the results of the phase 1 survey in terms of the habitat classification.

Peatland Hydrology

Part of the site is a raised bog. A full understanding of both the current nature conservation importance of this habitat and the implications for management and restoration potential must take into account a wide range of factors, and not be limited to vegetation. In practice the phase 1 categories relating to raised bog and related modified bog vegetation are subjective, and it is the current author's experience that similarly qualified surveyors often interpret these categories differently. A more detailed explanation of how the categories have been interpreted in this survey is provided in the relevant sections below. However, understanding the hydrology of the remaining peat mass is arguably more important in the context of the peatland interest of the site.

Joint Nature Conservation Committee (1990 (revised reprint 2003)) *Handbook for Phase 1 habitat survey – a technique for environmental audit* JNCC Peterborough.

² Stace, C. 2010 New Flora of the British Isles, 3rd ed Cambridge University Press, Cambridge.

³ Atherton, I, Bosanquet, S and Lawley, M. 2010 *Mosses and Liverworts of Britain and Ireland; a field guide* British Bryological Society, Edinburgh.

Rodwell, J.S. 1991 et seq British Plant Communities Vols 1-5 Cambridge University Press, Cambridge.

3. Results

Four broad habitat categories have been identified through this survey:

- Lowland raised bog
- Woodland and Scrub
- Grassland
- Ponds

Within each of these broad habitat categories there are a number of phase 1 habitat types. These are discussed below together with a brief discussion, where appropriate, of their nature conservation importance. In addition there are a number of other minor habitats which are included for completeness.

3.1 Lowland Raised Bog

As the name suggests, Easter Inch Moss appears to have formerly been an extensive lowland raised bog. Most of the peat mass has been subject to peat cutting and draining, and possibly other management measures.

Raised Bog

Only a small polygon has been mapped as "unmodified" raised bog, and even here in practice the vegetation is a mosaic, with some areas of highly modified vegetation. Evidence of past fires results in bare peat with a sparse covering of heather (*Calluna vulgaris*) and common cottongrass (*Eriophorum angustifolium*). However there are also areas where peat-forming mosses such as papillose bog-moss (*Sphagnum papillosum*) and magellanic bog-moss (*S. magellanicum*) persist in characteristic "lawns", interspersed with hare's tail cottongrass (*Eriophorum vaginatum*) and occasional cross-leaved heath (*Erica tetralix*). This vegetation corresponds in NVC terms with the M18 *Erica tetralix* – *Sphagnum papillosum* raised mire community. Walking in these areas is difficult due to the high water table and soft underlying peat.

Wet Modified Bog

Most of the open habitat of Easter Inch Moss has been coded as wet modified bog. Purple moor-grass (*Molinia caerulea*) is the dominant plant over much of this area, with occasional cross-leaved heath (*Erica tetralix*). Bog-moss (*Sphagnum*) is absent from much of the area, and the species present are generally not those associated with active peat formation. Acute-leaved bog-moss (*S. capillifolium*) can be common, this is a moss that can tolerate relatively drier conditions. Blunt-leaved bog-moss (*S. palustre*) is also present, this is a moss that tolerates a wide range of nutrient levels and so is not restricted to low nutrient bog environments. Much of this vegetation corresponds to the NVC type M25 – Purple moor-grass (*Molinia caerulea*) – Tormentil (*Potentilla erecta*) mire.

There are also wetter areas with more Common cotton-grass (*Eriophorum angustifolium*). Walking in these areas can again be difficult due to the high water table and soft ground conditions. There are deep ditches throughout the area, some of these have stands of bottle sedge (*Carex rostrata*) associated with them.

Dry Modified Bog

Around the periphery of the bog, and in some open areas of plantation forestry on the peat there are areas that have been coded as dry modified bog. Sometimes these areas have only heather (*Calluna vulgaris*), sometimes the vegetation includes some hare's tail cotton-grass (*Eriophorum vaginatum*) and cross-leaved heath (*Erica tetralix*) or occasionally blaeberry (*Vaccinium myrtillus*). If these areas were not on deep peat and connected to the lowland raised bog they might be classified as dry heath. However, in this context it is appropriate to classify them as dry modified bog.

3.2 Woodland and Scrub

Semi-natural Broad-leaved Woodland

The semi-natural category has been used to classify broadleaved woodland that did not obviously originate from planting. In this case birch (*Betula pubescens*) woodland around the periphery of Easter Inch Moss to the west was the most extensive area that lacked clear evidence of planting. Relatively dense stands of birch appeared to have an impoverished ground flora, with occasional broad bucklerfern (*Dryopteris dilatata*), and raspberries (*Rubus idaeus*).

In the sparser areas, the ground flora was essentially wet modified bog. These areas correspond with the NVC community W4 (*Betula pubescens – Molinia caerulea* woodland). The presence of birch around the periphery of raised bogs can be interpreted as a natural component of the bog system as a whole. However, some perceive a threat to the integrity of bogs through the encroachment of birch and other species which can have a drying effect on the peat.

Plantation Broad-leaved Woodland

This category was more variable than the semi-natural woodland. It includes some areas of planted birchwoods which are floristically very similar, but have some evidence of being planted in rows. However, on Seafield Bing to the east, planted broadleaved woodlands include a variety of willows (*Salix sp*), alder (*Alnus sp*), ash (*Fraxinus excelsior*), and oak (*Quercus sp*).

Plantation Coniferous Woodland

Much of the periphery of Easter Inch Moss has been planted with coniferous forestry. The two most common tree species planted here were sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta*). Where this planting is at a commercial spacing, the trees have mostly grown sufficiently well to shade out any ground vegetation, leaving only a carpet of dead needles in the ground layer. There are similar areas of plantation on the bing in the eastern part of the area.

Plantation Mixed Woodland

Much of the southern part of the bing supports mixed plantation woodland. The species mix in these areas is predominantly broadleaved, but some larch (*Larix sp*) and scot's pine (*Pinus sylvestris*) have been included in this species mix.

Dense Scrub

Areas of the bing that have not been planted with plantation woodland support a mixture of dense and scattered scrub. Gorse (*Ulex europaeus*) is the main species and broom (*Cytisus scoparius*) is also present. In the densest areas the gorse is suppressing the ground flora through shading.

Scattered Scrub

Areas coded as scattered scrub support more widely spaced gorse (*Ulex europaeus*), with the ground flora in between mostly being neutral grassland (see below).

3.3 Grassland

As noted in the methods section, due to the time of year, species lists for the grasslands on site are necessarily incomplete. However, this will not change the broad habitat categories, as the principal components of each vegetation type are still recognisable during a winter survey.

Unimproved Neutral Grassland

Open areas on Seafield Bing may have been sown with a grass seed mix at some point in the past. These areas are now relatively rich in herbaceous plants such as ribwort plantain (*Plantago lanceolata*), white clover (*Trifolium repens*), thistles (*Cirsium* species) with black knapweed (*Centaurea nigra*), and a mixed grass sward.

Marshy Grassland

There are at least three forms of marshy grassland present in the survey area.

There are areas in the middle of the wet modified bog which show signs of increased nutrient levels. In addition to the purple moor grass (*Molinia caerulea*) there are also tussocks of tufted hair-grass (*Deschampsia cespitosa*), and sometimes an increasing proportion of the grass Yorkshire fog (*Holcus lanatus*). Marsh thistle (*Cirsium palustre*) and other herbaceous plants are more common in these areas. There are small patches of marshy grassland of the NVC type MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland. This is a tussocky form of wet grassland that often develops on agricultural land that has been abandoned. There are also some strips of M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture usually associated with watercourses. This habitat is of value to water voles, which have been recorded from this site in the recent past.

3.4 Swamp and Ponds

Swamp

Some shallow ponds and other inundated areas support swamp vegetation. In the north-east of the site a complex wetland has developed associated with water treatment ponds in this area. Some of the surrounding area also supports emergent Bulrush (*Typha latifolia*) and common reed (*Phragmites australis*). In addition to the mapped areas these vegetation types occur around the margins of a number of small ponds in fringes too small to map.

Oligotrophic/Eutrophic/Mesotrophic Open Water

Ponds are common throughout the site. From a winter survey it is not always possible to be confident about the trophic status of waterbodies. Ponds in peat would normally be expected to be oligotrophic (i.e. have very low nutrient levels), however, few if any of the ponds in the survey area appeared to be in this category. Based on the emergent vegetation most of the ponds appear to be eutrophic, meaning they are relatively high in nutrients. This habitat is of value to amphibians. All three species of newt native to the UK (including great-crested newt *Triturus cristatus*) are known from ponds within the survey area.

3.5 Other Habitats

This section is included for completeness:

Spoil

Some bare ground persists in steep areas of the bing where there may be some erosion or vegetation is slow to colonise. Where this is clearly associated with the spoil from Seafield Bing, this has been mapped as spoil.

Bare Ground

Other areas of bare ground include the roads/paths and an area of blaes on the western edge of the survey area.

4. Discussion

This section presents a brief evaluation of the nature conservation importance of the habitats recorded.

Past management of this lowland raised bog has been damaging in several ways. The moss layer which both protects accumulated peat and lays down new peat has been removed from most of the peat mass. The plants characteristic of raised bogs are now restricted to a small area close to the foot of Seafield Bing. Deep drains throughout the peat mass are lowering the water table limiting the potential for recolonisation by peat-forming mosses. These drains may also be a safety hazard. Our current knowledge suggests that carbon from the peat is being released to the atmosphere through both gaseous exchanges and as dissolved and particulate carbon, contributing to climate change. Drainage also means that fires are likely to be more damaging when they occur.

The woodland planted on the bing is increasing in value as it matures. Roe deer and badger were recorded using this site, both of these species are of value in the context of the function of this area as a local nature reserve.

Evidence suggests that gorse scrub is increasing both in extent and density, and that there is a corresponding loss of open grassland. Scrub is of value in creating structurally diverse habitats that can be important for birds and other species. However, it is most valuable when present in a patchy mosaic with open grassland and woodland. In the absence of any specific management scrub is likely to continue increasing in cover and density. Very extensive stands of scrub in this environment may present a fire risk which could threaten some of the woodland plantings. Maintaining a network of open grassland within the scrub and woodland is likely to maximise the value of these habitats for wildlife.

The area supports a network of ponds, many of which have emergent vegetation. However, woodland is beginning to shade some of these and this will have an effect on water temperatures, eventually limiting the suitability of these for some amphibians.

5. Recommendations

5.1 Peatland Restoration

Raised bog is a rare and threatened habitat in a global context. In addition to biodiversity value, the condition of these habitats is important because of the carbon stored in them. The primary requirement of any restoration would be to restore the hydrology of the site in order to restore suitable conditions for the growth of peatforming mosses. This would require the raising of the water table to be consistently near the surface.

5.2 Scrub and Grassland management

Extensive stands of dense scrub are of less value to wildlife than stands of scrub of varied density interspersed with open areas. In addition dense stands of gorse scrub may present a fire risk which could result in damage to planted trees. Consideration should be given to scrub management which would break up the stands of scrub, limiting the potential for damage from fires and creating open spaces. Such work would be best scheduled outside the bird breeding season (March-August).

5.3 Woodland Management

There may be scope for more woodland planting around Seafield Bing, together with the incorporation of a wider range of species, perhaps for example hazel (*Corylus avellana*) and rowan (*Sorbus aucuparia*) if ground conditions are suitable.

The forestry plantations on Easter Inch Moss are of less value for nature conservation. In particular, the coniferous plantation blocks add little from the perspective of the development of the area's value as a local nature reserve. Consideration should be given to the long term objective of removing these where they occur on the core of the raised bog, and replacing peripheral plantations with more native woodland types (such as sparse birch woodland (NVC W4 type).

5.4 Pond Management

Most ponds are well established and likely to be a valuable resource for local wildlife including amphibians and invertebrates. Consideration should be given to some local thinning or clearing around the edges of some ponds to ensure adequate light reaches the pond surface.

APPENDIX 1: TARGET NOTES

Target Note Number	Note	Easting	Northing
1	Birch (Betula) saplings	299991	666546
2	Bottle Sedge (Carex rostrata) fen indicating regular flooding of this area	300177	666577
3	Broad buckler-fern <i>(Dryopteris dilatata)</i> in understorey	299513	666880
4	Common reed (Phragmites)/ Bulrush (Typha) fen	300932	667019
5	Alder (Alnus) plantation	300774	666549
6	Forb rich form of M25, thistles, Avens (<i>Geum</i>) etc becoming prominent. Cup cladonia (<i>Cladonia fimbriata</i>) type lichens	299895	666531
7	Some cross-leaved heath (Erica tetralix)	299815	666646
8	Darker areas in this deep peat have common cotton- grass(<i>Eriophorum angustifolium</i>), Dense haircap moss (<i>Polytrichum commune</i>), acute-leaved bog- moss (<i>Sphagnum capillifolium</i>) and flat-topped bog- moss (<i>S. fallax</i>)	299815	666661
9	Small Lodgepole pine (<i>Pinus contorta</i>) plantation	299878	666785
10	Moor grass (<i>Molinia</i>) but with increasing proportion of Tussock grass (<i>Deschampsia cespitosa</i>) and Yorkshire Fog (<i>Holcus lanatus</i>)	300010	666837
11	Roe deer droppings	299945	666874
12	Mostly Sitka Spruce (Picea sitchensis)	300028	666887
13	M25, some Lodgepole pine (<i>Pinus contorta</i>)	300119	666792
14	M23b marshy grassland associated with banks of watercourse	300251	666870
15	Evidence of burning with Heather (<i>Calluna vulgaris</i>) and Common Bog-cotton (<i>Eriophorum angustifolium</i>), bare peat with small mosses, pocketmoss (<i>Fissidens</i> sp)	300240	666815
16	M18 bog with lawns of Sphagnum mosses (<i>Sphagnum papillosum</i> and <i>Sphagnum magellanicum</i>). Occasional cross-leaved heath (<i>Erica tetralix</i>) and Hare's-tail Cottongrass (<i>Eriophorum vaginatum</i>) tussocks.	300171	666763
17	Deep ditch with 1m of standing water. Bulrush (<i>Typha latifolia</i>)	300117	666542
18	Lawn-moss (<i>Rhytidiadelphus squarrosus</i>), Cypress-leaved plait-moss (<i>Hypnum cupressiforme</i>)	300064	666529
19	Birch (<i>Betula</i>) and Goat willow (<i>Salix caprea</i>). Red- stemmed feather-moss (<i>Pleurozium schreberi</i>), heath plait-moss (<i>Hypnum jutlandicum</i>) and lady's bedstraw (<i>Galium saxatile</i>)	299880	666486
20	Fox scat	299667	666546
21	Broad-leaved helleborine (Epipactis helleborine), Ribwort plantain (<i>Plantago lanceolata</i>)	299696	666507
22	MG9 grassland suggesting agricultural abandonment	299468	666976

Target Note Number	Note	Easting	Northing
23	M23 marshy grassland associated with banks of watercourse	299609	666991
24	Grey heron overflying	299548	666917
25	Birch (Betula) scrub but hare's tail cotton-grass (Eriophorum vaginatum) tussocks persist in wetter areas and heather (Calluna) in drier areas	299051	666622
26	Brown hare	299066	666464
27	deep ditches (over 2m deep)	299166	666403
28	Wetter areas with more Cottongrass (Eriophorum vaginatum), flat-topped bog-moss (<i>Sphagnum fallax</i>) and mud-bottomed pools	299322	666392
29	Dark colours here are H9 heather banks	299596	666360
30	Tall ruderal sp like Rposebay willow herb (<i>Chamerion angustifolium</i>), with much Tufted hair-grass (<i>Deschampsia cespitosa</i>) and Soft rush (<i>Juncus effusus</i>), indicating nutrient enrichment	299641	666347
31	Birch (Betula) scrub with hare's tail cotton grass (Eriophorum vaginatum) tussocks and some Bilberry (Vaccinium myrtillus)	299529	666190
32	Raspberry (Rubus idaeus)	299444	666097
33	Marshy grassland MG9 type with Rosebay willow herb (<i>Chamerion angustifolium</i>)	299359	666071
34	Birch (Betula) woodland with marshy grassland understorey	299403	666180
35	W4 type woodland with purple moor grass (<i>Molinia</i> caerulea), Yorkshire Fog (<i>Holcus lanatus</i>), scattered Birch (<i>Betula</i>) and Eared willow (<i>Salix aurita</i>) scrub	299223	666243
36	Bare ground/ruderal herbs. Blaes pitch	299203	666108
37	Birchwood with hare's tail cotton grass (<i>Eriophorum vaginatum</i>) and Heather (<i>Calluna vulgaris</i>), W4 type	299071	666303
38	Mixed woodland with some Rowan (Sorbus aucuparia), mostly Birch (Betula), Alder (Alnus) and Willow (Salix). Ground layer Soft Rush (Juncus effusus), Yorkshire Fog (Holcus lanatus), Tufted hairgrass (Deschampsia cespitosa).	299581	666175
39	Wet mixed woodland, some mature Oak (<i>Quercus</i>), ground layer has Sharp Flowered Rush (<i>Juncus acutiflorus</i>), floating sweet grass (<i>Glyceria fluitans</i>), Dense haircap moss (<i>Polytrichum commune</i>),heath plait-moss (<i>Hypnum jutlandicum</i>), flat-topped bogmoss (<i>Sphagnum fallax</i>) and blunt-leaved bog-moss (<i>S. palustre</i>).	299730	666270
40	Dry modified bog with H9 Heather (Calluna) vegetation, wetter areas have cross-leaved heath (<i>Erica tetralix</i>), common cotton grass (<i>Eriophorum angustifolium</i>), some bog-moss (<i>Sphagnum</i>)	299778	666348
41	M25	299853	666385
42	Mixed plantation mostly Lodgepole pine (Pinus contorta)	299980	666413

Target Note Number	Note	Easting	Northing
43	Mixed plantation mostly Lodgepole pine (<i>Pinus contorta</i>)	299976	666359
44	Part of old track - marshy grassland with Rosebay willow herb (<i>Chamerion</i>)	300060	666422
45	Lodgepole pine (<i>Pinus contorta</i>) plantation with very species poor ground layer, mostly bare ground/dead needles	300158	666446
46	Diverse woodland with some mature Oak (Quercus)	300172	666372
47	Birch (Betula) woodland with tufted hair-grass (Deschampsia cespitosa), Yorkshire Fog (Holcus lanatus) understorey	300264	666341
48	Pond in wet Willow (Salix)/ Birch (Betula) woodland	300255	666388
49	Willow (Salix)/ Birch (Betula) with wet understorey	300280	666479
50	more mixed scattered scrub with Birch (<i>Betula</i>) and Willow (<i>Salix</i>) amongst the Gorse (<i>Ulex</i>) / Broom (<i>Cytisus</i>)	300337	666424
51	Marsh Arrowgrass (Triglochin palustris)?	300288	666571
52	Pond with abundant emergent Bulrush (<i>Typha latifolia</i>)	300323	666603
53	More mature Birch (Betula) woodland	300304	666642
54	Neutral grassland with Black Knapweed (<i>Centaurea nigra</i>), White Clover (<i>Trifolium repens</i>), Ribwort plantain (<i>Plantago lanceolata</i>), crosswort (<i>Cruciata laevipes</i>), pointed spear-moss (<i>Caliergonella cuspidata</i>). Grasses include Creeping Bent (<i>Agrostis stolonifera</i>), Comon Bent (<i>Agrostis capilaris</i>), and a Fescue species (<i>Festuca (rubra?</i>))	300384	666788
55	Richer soil with cock's foot (<i>Dactylis glomerata</i>), marsh thistle (<i>Cirsium palustre</i>)	300456	666820
56	Small area of improved grass field included in survey area in error?	300637	667005
57	Scattered scrub, mostly Gorse (<i>Ulex europaeus</i>), some Broom (<i>Cytisus scoparius</i>).	300626	666940
58	Area of older trees with Birch (<i>Betula</i>) /Alder (<i>Alnus</i>) / Willow (<i>Salix</i>) mix	300740	667030
59	Raptor nest in Scots pine	300875	667005
60	Birch Birch (Betula) /Alder (Alnus) / Willow (Salix) plantation, richer soil with Nettle (Urtica diocia)	300845	667027
61	Badger sett under Elder (Sambucus nigra)	300900	667030
62	This area is a building site currently under development.	301061	667125
63	No access to this complex wetland with Alder and Willow carr, and much emergent Common reed (<i>Phragmites</i>) and Bulrush (<i>Typha</i>)	301068	667021
64	Marshy grassland with some Rosebay willow herb (Chamerion angustifolium)	301100	666901
65	Lodgepole pine (<i>Pinus contorta</i>)plantation	301006	666889

Target Note Number	Note	Easting	Northing
66	Young mixed plantation	301014	666809
67	Kestrel hunting over this area	300902	666757
68	Pond with abundant emergent Bulrush (<i>Typha latifolia</i>)	300791	666488
69	Broad-leaved woodland with Alder (Alnus), Birch (Betula) and Crack Willow (Salix fragilis). Floating Sweet grass (Glyceria fluitans) in ditches	300786	666425
70	Marshy grassland with MG9	300571	666321
71	Marshy grassland with MG9 and M23	300462	666360

