

EARBA STORAGE

A GILKES ENERGY COMPANY

Earba Pumped Storage Hydro Scheme EIA Report

Appendix 8.2: Extended Phase 1 Habitat Survey (2022)

February 2024



Quality Information

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Lochan na h-Earba: Extended Phase 1 Habitat Report

Introduction

Blairbeg Consulting Ltd have been commissioned to carry out terrestrial ecological surveys in summer 2022 on behalf of ASH Design and Assessment Ltd in the vicinity of Loch na h-Earba, near Ardverikie, Highlands.

The objectives of the survey are as follows:

- To provide base-line information on the location, extent and floristics of the existing vegetation, and presence and status of protected species within the site as delineated by the site boundary;
- To produce an annotated vegetation map using the Phase 1 classification to identify and map the habitats. This is supported by habitat descriptions and target notes.

Methodology

Background survey

Baseline data on the nature conservation interest of the site and its surroundings, including information on protected species and habitats records were sought from the following sources:

- Joint Nature Conservation Committee (JNCC) website (<http://www.jncc.gov.uk/>);
- NatureScot Site Link website (<http://sitelink.nature.scot/>);
- Large-scale 1:10,000 Ordnance Survey (OS) maps in conjunction with colour 1:25,000 OS map (to determine the presence of ponds and other features of nature conservation interest).

Further information relevant to evaluation of the nature conservation features that could be affected by the development and the assessment of its effects upon them was obtained through searches of internet sources (e.g. UKBAPs, LBAPs) and the relevant published literature (i.e. relevant guidance documents and scientific papers).

Protected Species survey

Protected species surveys were undertaken in summer 2022, and followed the methodologies described below. An evaluation of the mammal species present on this site is provided in the results below.

Otter (Lutra lutra)

Otter field signs were searched for, as described in Bang & Dahlstrøm (2001)¹ and Sargent & Morris (2003)², and include:

- Holts – these are underground features where otters live. They can be tunnels within bank sides, underneath root plates or boulder piles, and even man-made structures such as

¹ Bang, P. & Dahlstrom, P. (2001). *Animal Tracks and Signs*. Oxford University Press, Oxford.

² Sargent, G & Morris, P. (2003). *How to Find and Identify Mammals*. 2nd Edition. The Mammal Society

disused drains. Holts are used by otters to rest up during the day, and are the usual site of natal or breeding sites. Otters may use holts permanently or temporarily;

- Couches – these are above ground resting-up sites. They may be partially sheltered, or fully exposed. Couches may be regularly used, especially in reed beds and on in-stream islands. They have been known to be used as natal and breeding sites. Couches can be very difficult to identify, and may consist of an area of flattened grass or earth. Where rocks or rock armour are used as couches, these can be almost impossible to identify without observing the otter in situ;
- Prints – otters have characteristic footprints that can be found in soft ground and muddy areas;
- Spraints – otter faeces are often used to mark territories, usually deposited on in-stream boulders. They can be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains;
- Feeding signs – the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter;
- Paths – these are terrestrial routes that otters take when moving between resting-up sites and watercourses, or during high flow conditions when they will travel along bank sides in preference to swimming; and
- Slides and play areas – slides are typically worn areas on steep slopes where otters slide on their bellies, often found between holts/couches and watercourses. Play areas are used by juvenile otters in play, and are often evident by trampled vegetation and the presence of slides. These are often positioned in sheltered areas adjacent to the natal holt.

Any of the above signs are diagnostic evidence of the presence of otter; however, it is often not possible to identify couches with confidence unless other field signs are also present. Spraint is the most reliable identifiable evidence of the presence of this species. Any evidence of otter presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

Scottish Wildcat (Felis sylvestris)

Field signs of wildcat are described in Davis & Gray (2010)³ and SNH (2011)⁴. Field evidence searched for includes:

- Dens – can be found in hollow trees, rock crevices, rabbit burrows, disused fox dens and badger setts and under fallen debris;
- Prints – are distinctive cat prints, with no claw marks visible and a small palm pad with two indentations at rear;
- Scat – is usually cylindrical with a tapered end and contains feathers, fur and bone;
- Scratching posts on trees and fence posts; and
- Sightings.

³ Davis A.R., Gray D. (2010). The distribution of Scottish wildcats (*Felis sylvestris*) in Scotland (2006-2008). Scottish Natural Heritage Commissioned Report No. 360

⁴ Scottish Natural Heritage. (2011). *Scottish Wild Cat* Naturally Scottish Series. SNH Battleby.
<http://www.snh.org.uk/pdfs/publications/naturallyscottish/wildcats.pdf>

Any of the above can be taken as diagnostic evidence of the presence of cats in the area. However, further surveys are required in order to identify if the cats present are wildcat or are a hybridisation with domestic cats i.e. feral cats.

If signs were found then further field survey methods would be required in order to establish if a den is present and if it is active. This can take several days/weeks depending upon the potential numbers of cats and habitat suitability. In areas where there are signs of wildcats camera traps can be used to try and verify presence and also to prove if a wildcat/hybrid or feral cat is present based on pelage characters. This would be the third step in the survey process if required (following the initial site assessment).

The key criteria for identifying Scottish wildcat are complex due to their ability to interbreed with domestic and feral cats. Scottish wildcat features and recognition are summarised in research by Kitchener *et al.*, 2005 with clear methods for identification based on pelage (coat characteristics) from the study of dead cats. However, with live cats in the field this is more problematic due to the difficulty in observing cats. In addition, it is believed from field research that true wildcats are now very rare in the field with very low populations in many areas with much larger feral populations now present. Detailed field research is still required to accurately determine wildcat densities in many areas.

Any evidence of Scottish wildcat presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

Badger (Meles meles)

Badger field signs that were searched for, as described in Neal & Cheeseman (1996)⁵, Bang & Dahlstrøm (2001) and SNH (2003)⁶, included:

- Setts – are places of shelter often located in woodland, at woodland edges, in hedgerows or amongst dense patches of gorse and scrub close to fields;
- Prints – tracks lead from setts to latrines and foraging areas and prints are identifiable from broad palm-pad and five toe pads with claw marks in a row;
- Latrines (and dung pits used as territorial markers) – are where badgers deposit faeces in small excavated pits, and are often located at territory edges or close to a main sett;
- Hairs – are often left in barbed wire or fencing as badgers pass through or underneath and are distinctive for their oval shape when rolled between finger and thumb; and
- Feeding signs (snuffle holes) - where badgers have dug up roots, grubs, or wasps nests and can be found throughout their territory.

Any of the above signs can be taken as diagnostic evidence of the presence of badger. Any evidence of badger presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

⁵ Neal, E. & Cheeseman, C. (1996). *Badgers*. Poyser Natural History, London

⁶ NatureScot. (2003) Best practice badger survey guidance note. <https://www.nature.scot/doc/guidance-licensing-badgers-badger-survey-best-practice>

Water vole (Arvicola amphibus)

The methodology prescribed in Dean *et al.* (2016)⁷ was followed in order to search for field signs of water vole. The field signs searched for included:

- Faeces – recognisable by their size, shape, and content. If not too dried-out these are also distinguishable from rat droppings by their smell;
- Latrines – faeces, often deposited at discrete locations known as latrines;
- Feeding stations – food items are often brought to feeding stations along pathways and hauled onto platforms. Recognisable as neat piles of chewed vegetation up to 10cm long;
- Burrows – appear as a series of holes along the water's edge distinguishable from rat burrows by size and position;
- Lawns – may appear as grazed areas around land holes;
- Nests – where the water table is high. Above ground woven nests may be found;
- Footprints – tracks may occur at the water's edge and lead into bank side vegetation. May be distinguishable from rat footprints by size; and
- Runways in vegetation – low tunnels pushed through vegetation near the water's edge, less obvious than rat runs.

Any of the above signs can be taken as diagnostic evidence of the presence of water vole. Any evidence of water vole presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

Red squirrel (Sciurus vulgaris)

Through areas of woodland any sightings of red squirrel, signs of feeding and evidence of active dreys were recorded to determine the presence of the species within the Site:

- Dreys – are comprised of an outer shell of twigs and branches, with an inner layer of mosses, leaves, grass and conifer needles. Dreys are usually built close to the main stem of a tree;
- Feeding signs – can be stripped and nibbled conifer cones, split hazelnuts, nibbled fungus and berries.

Any evidence of red squirrel presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

Pine marten (Martes martes)

The field signs searched for included:

- Scats – These are typically dark in colour and 4-12cm long x 0.8-1.8cm in diameter. They often have a coiled twisted appearance, typical of many mustelid scats. Scats will often contain food remains including fur, feathers, bone, plant content and seeds. Scats vary tremendously in size, shape and colour, and it's difficult even for experts to identify some pine marten scats. Scats are placed in latrines at well-used dens (e.g. on lids of den boxes),

⁷ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

as well as at sites elsewhere in an individual's home range, where they probably fulfil a social communication role. Given the difficulty in confirming pine marten scat, any suspected scat will be sent for genetic analysis to conclusively distinguish it from other species.

- Footprints – The five-toed but slightly cat-like forefoot imprints measure approximately 40 x 45mm for females and 55 x 65mm for males; fur on the underside of feet in winter may blur prints and make them look larger, especially in soft snow, but pine martens have less fur on their feet pads than stone martens (present in continental Europe). Indistinct trails of bounding martens (stride length 60-100cm) may resemble those of hares, with prints in groups of two or three where one or both hind feet have registered over prints of forefeet.
- Den sites – Dens are usually not distinctive unless revealed by a visible concentration of scats. Elevated den sites are preferred to keep martens safe from predators and provide insulation and shelter from the elements, and so hollow trees, owl boxes and the roofs of dwelling houses are often used, as well as purpose-built pine marten den boxes. Where such elevated dens are absent, they may den on the ground in rabbit burrows, rocky outcrops or under tree roof plates.

Any evidence of pine marten presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS.

Habitat survey

The vegetation was described and mapped following the methods the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Surveys (JNCC, 2010)⁸. Plant species were identified and habitat types assigned and mapped in the field. Mapping polygons were delineated based on the composition of habitats. Polygons were laterally assigned a Phase 1 Habitat Classification, according to the relationships described in Phase One Habitat Classification (JNCC 2010). For the purposes of creating a visual representation of habitat types, the dominant Phase One Habitat Classification for each polygon is reflected.

More widely, target notes were also collected to provide an overview of the habitat types present, features of interest and to place the proposed development in the context of site. All target notes are accompanied by at least one photograph and provided in Appendix 1: Target notes.

Following the field survey, the conservation status of each habitat recorded was identified based on the following:

- Annex I habitats listed on the EC Habitats Directive, as translated into British and Scottish law by The Conservation (Natural Habitats, &c.) Regulations 1994 and subsequent legislation;
- UK Biodiversity Action Plan (UKBAP) priority habitats. Although superseded by the UK Post-2010 Biodiversity Framework in 2012, the UKBAP remains a useful resource for assessing UK conservation status and informs regional conservation priorities; and
- Scottish Biodiversity List (SBL) priority habitats for conservation.
- Plant species of national significance (as defined below) where present, were recorded as target notes: Higher plant species of Lower plants (bryophytes) listed as Critically

⁸ JNCC (2010), *Handbook for Phase 1 Habitat Survey – a technique for environmental audit*. Joint Nature Conservation Committee: Peterborough

Endangered (CR), Endangered (EN) or Vulnerable (VU), on the respective red data lists for Great Britain as based on International Union for Conservation of Nature (IUCN) criteria;

- Nationally rare (NR) – occurring in 15 hectares or fewer in Great Britain; or
- Nationally scarce (NS) – occurring in 16-100 hectares in Great Britain; and
- UK Biodiversity Action Plan (UKBAP) priority species.

Nomenclature for vascular plants follows Stace (2019)⁹, bryophytes and liverworts follow Atherton et al (2010)¹⁰ and for lichens Dobson (2011)¹¹. A full species list for higher plants identified within the site is provided in Appendix 2: Species List.

⁹ Stace, C.A. (2019) *New Flora of the British Isles*, 4th edition. C&M Floristics.

¹⁰ Atherton, I., Bosanquet, S. Lawley M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. British Bryological Society.

¹¹ Dobson, F. S. (2011), *Lichens: An Illustrated Guide to the British and Irish Species*, 6th edition. The Richmond Publishing Co. Ltd, Slough.

Baseline Conditions

Protected Species

Evidence of otter and water vole was recorded during the course of field surveys. Locations of shelters and signs for all protected species are documented in Appendix 1: Target notes.

Otter

Otter activity was recorded along the banks of Loch na h-Earba, with two fresh spraints recorded on rocks along the loch shore.

Water vole

Potential water vole burrows were recorded along the short section of river between the two lochs that comprise Lochan na h-Earba.

Habitat descriptions

Woodlands and scrub

Areas of woodland and scrub are limited within the site boundary. Scattered semi-natural coniferous woodland is present along the upper banks of Lochan na h-Earba, on the slopes of Binnein Shios and Creag a Chuir and towards the north-eastern outlet of the loch. These woodland fragments are dominated by Scot's pine *Pinus sylvestris*, and occasional downy birch *Betula pubescens* and typically over a damp understorey dominated by purple moor-grass *Molinia caerulea*. A few scattered Scot's pine trees are also present along the southern banks of Lochan na h-Earba. To the far north-eastern extent of the site boundary, there is a large coniferous woodland plantation extending to the north and towards Ardverikie. Small fragments of woodland are also present along the access track near Luiblea and the banks of the River Spean.

Bracken *Pteridium aquilinum* is present in small patches along the northern shore of Lochan na h-Earba, in amongst a wider extent of wet heath habitat. Typically these stands are scattered, and above an understory of purple moor-grass. Gorse *Ulex europaeus* scrub is also present along the access track near Luiblea.

Heaths and mires

Wet heaths are the dominant habitat type across most of the site, being present on gently sloping ground on the banks of Lochan na h-Earba, Loch a Bhealaich Leamhain and alongside access tracks which are routed alongside Allt Coire Pitridh and between Lochan na h-Earba and Luiblea. Typically wet heath habitats are dominated by purple moor-grass, cross-leaved heath *Erica tetralix*, deergrass *Trichophorum germanicum* agg. and heather *Calluna vulgaris*. Tormentil *Potentilla erecta*, bell heather *Erica cinerea*, bog myrtle *Myrica gale* and heath rush *Juncus squarrosus* are locally occasional to frequent in the sward. Most wet heaths reflect the M15 *Trichophorum germanicum*-*Erica tetralix* wet heath typical sub-community, but in many areas where purple-moor grass becomes more dominant these are transitional to M25 *Molinia caerulea*-*Potentilla erecta* mires. These transitional habitats may arise in areas of historic muirburn practices and/or on slightly deeper peat substrates. Wet heaths are frequently flushed, with frequent cover of bog asphodel *Narthecium ossifragum*, butterwort *Pinguicula vulgaris*, round-leaved sundew *Drosera rotundifolia* and *Sphagna*. These form frequent runnels and seepage lines on the slopes around Lochan na h-Earba, and reflect the M15a *Carex panicea* sub-community. In some areas runnels are dominated by bog pondweed *Potamogeton polygonifolius* and *Sphagna* and are more reflective of M1 *Sphagnum*

denticulatum mires. Wet heaths within the site also form mosaic habitats with acid and marshy grasslands. The former are typically areas of wet heath interspersed with small areas of heath rush, mat grass *Nardus stricta*, common bent *Agrostis capillaris* and sweet vernal grass *Anthoxanthum odoratum*. These wet heath/acid grassland mosaics are typically present on shallower soil substrates and may also have small areas dominated by heather in amongst. Wetter areas have higher cover of soft rush *Juncus effusus*, Yorkshire-fog *Holcus lanatus*, star sedge *Carex echinata*, common sedge *Carex nigra* and *Sphagna* and are typically present where the water table is higher, or at the fringes of mire habitats as wet heaths transition to bog habitats. Wet heaths are also present in mosaics with, or as transitional habitats to, blanket mires.

Dry heaths are much less common within the site, and present only on drier, shallower soils on the crags and summit of Creag Pitridh and the southern slopes of Geal Charn above Loch a Bhealaich Leamhain. These heaths are typically summit heath dominated by wind-clipped heather, *Cladonia* lichens, bell heather, heath rush, crowberry *Empetrum nigrum* and green-ribbed sedge *Carex binervis*. These summit heaths are wind-clipped variants of H12 *Calluna vulgaris*-*Vaccinium myrtillus* heaths and H13 *Calluna vulgaris*-*Cladonia arbuscula* heaths. On the southern flanks of Geal Charn dry heaths are present in mosaic with acid grassland habitats.

Mire habitats are present as discrete areas of blanket bog, typically dominated by heather, hare's-tail cotton grass *Eriophorum vaginatum*, bell heather, woolly-fringe moss *Racomitrium lanuginosum* and *Cladonia* lichens. Blanket mires are present on flatter ground at the southern and central areas of Lochan na h-Earba and flatter areas along the track from Lochan na h-Earba to Luiblea. Typically these mires reflect the M17b *Trichophorum germanicum*-*Eriophorum vaginatum* blanket mire *Cladonia* sub-community. Often these mires are hagged and there are patches of exposed peat soils, sometimes recolonised by common cottongrass *Eriophorum angustifolium* and heath rush.

On the southern banks of Loch a'Bhealaich Leamhain the gently sloping areas are dominated by blanket mire habitat dominated by leggy heather, hare's-tail cottongrass, cowberry *Vaccinium vitis-idaea*, blaeberry *Vaccinium myrtillus*, feather mosses and *Sphagna*. This mire reflects the M19c *Calluna vulgaris*-*Eriophorum vaginatum* blanket mire *Vaccinium vitis-idaea*-*Hylocomium splendens* sub-community. This blanket mire transitions to M17b blanket mire to the south-eastern corner of the loch, with more frequent haggling and erosion features present along the Allt Loch a'Bhealaich Leamhain.

Acid and basic flush habitats are also present throughout the site. Frequently these are too small to map, but examples are illustrated in target notes. Larger acid flushes are present on slopes around Loch na h-Earba and are typically grassy in nature and dominated by soft rush, star sedge, common sedge, mat grass, sweet-vernal grass, velvet bent *Agrostis canina* and *Sphagna*. These flushes typically reflect M6b *Carex echinate*-*Sphagnum fallax/denticulatum* mire *Carex nigra*-*Nardus stricta* sub-community. Small basic flushes are also present, and tend to be stony in nature with bulbous rush *Juncus bulbosus*, butterwort, small yellow sedge *Carex demissa* and carnation sedge *Carex panicea*, and reflect the M10a *Carex dioica*-*Pinguicula vulgaris* mire *Carex demissa*-*Juncus bulbosus* sub-community.

Grasslands and montane habitats

Grassland habitats are typically present in small, fragmented amounts in mosaic with wet and dry heath habitats. However larger expanses of acid grassland are present on flatter ground near Lochan na h-Earba. These acid grasslands are typically dominated by sweet vernal-grass, common bent, sheep's fescue *Festuca ovina*, Yorkshire-fog, heath bedstraw *Galium saxatile*, tormentil, and

occasional white clover *Trifolium repens*, yarrow *Achillea millefolium* and heath wood-rush *Luzula multiflora*. In damper areas marsh violet *Viola palustris* and carnation sedge can become more common, and sometimes occasional *Sphagna* and heath rush are present. Typically these acid grasslands reflect communities of U4 *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* grasslands with areas of U5 *Nardus stricta*-*Galium saxatile* grassland and U6 *Juncus squarrosus*-*Festuca ovina* grassland.

Damp grassland areas are typically dominated by rush-pasture vegetation with more abundant soft rush, broad-leaved dock *Rumex obtusifolius*, marsh thistle *Cirsium palustre*, marsh bedstraw *Galium palustre* and marsh willowherb *Epilobium palustris*. In many areas these damper marshy grasslands are present in fine-scale mosaics with acid grasslands. Marshy grasslands reflect MG10 *Holcus lanatus*-*Juncus effusus* rush-pastures and M23 *Juncus effusus/acutiflorus*-*Galium palustre* rush-pastures. Many marshy grasslands also have high cover of purple moor-grass and can be transitional to M25 *Molinia caerulea*-*Potentilla erecta* mires.

Aquatic communities, swamps and tall herb fens

Aquatic communities are limited within the site, with Loch na h-Earba largely devoid of marginal vegetation. Small patches of A22 *Littorella uniflora*-*Lobelia dortmanna* community and A24 *Juncus bulbosus* community are present along some shores however.

Swamps and tall herb fens are absent as discrete communities, however common reed *Phragmites australis* is present in some mire habitats around Loch na h-Earba.

Vegetation of open habitats

Open ground habitats are limited within the site, being restricted to access tracks and quarries. An area of sandy substrate at the southern shore of Loch na h-Earba is also present. Typically open habitat communities are small in extent and of low conservation value and include OV20 *Poa annua*-*Sagina procumbens* community and OV21 *Poa annua*-*Plantago major* community along track edges, dominated by patchy cover of annual meadow-grass *Poa annua* in frequently disturbed gravels.

Potential impacts

Construction of Dam A and Dam B, the powerhouse, permanent access tracks and the inundation of Loch na h-Earba and Loch a'Bhealaich Leamhain will result in the permanent loss of Annex 1 habitat types 4010 Northern Atlantic wet heaths with *Erica tetralix*, 4030 European dry heaths and 7130 Blanket bogs. These habitat types are also listed on the Scottish Biodiversity List and represent UK BAP priority habitat types. Additionally, inundation will also result in the loss of areas of habitat that are both highly (acid and basic flushes) and moderately (marshy grassland) dependent on groundwater.

The inundation zone also encompasses one water vole colony, which would be destroyed as a result of the raised water table. Whilst otter are present in the area, no shelters were found which may be impacted by the proposed development.

Further work

Future habitat survey work should aim to delineate vegetation communities according to National Vegetation Classification following the methods described in National Vegetation Classification user's handbook (Rodwell, 2006)¹².

Any wetland habitats should also be evaluated in terms of their potential to be groundwater-dependent terrestrial ecosystems (GWDETs). This should be done based on the hydrogeological setting of each habitat community identified, and with reference to SEPA guidance (SEPA, 2014)¹³ modified from the United Kingdom Technical Advisory Group (UKTAG) list of National Vegetation Classification (NVC) communities and associated groundwater dependency scores.

Protected species surveys should be repeated, focussing on areas of suitable habitat as identified from Phase 1 mapping and target notes.

¹² Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough.

¹³ Scottish Environmental Protection Agency (2014) Land Use Planning System: Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

Appendix 1: Target Notes

Target Note		Grid ref	Photograph
1	Photo looking northeast along north shore of Lochan na h-Earba	NN 46287 81324	
2	Photo looking east to south shore of Lochan na h-Earba	NN 46287 81324	

3	Looking west over outflow of Lochan na h-Earba	NN 46287 81324	
4	Photo looking east up slope toward Bealach Leamhain	NN 46287 81324	

5	Looking east into Coire Pitridh. Deep peat and peat hags in middle of coire.	NN 47713 80243	
6	Looking northeast across peat hags in Coire Pitridh toward location of proposed surge shaft on skyline.	NN 48693 80075	

7	Area of summit heath at Bealach Leamhain	NN 48980 79941	
8	Rocky basic flush	NN 49165 79901	

9	View east over Loch a' Bealach Leamhain	NN 49182 79900	
10	Bare peat at far west end of Loch a' Bealach Leamhain	NN 49335 78839	

11	Slope with hagged deep peat below crags	NN 49427 79719	
12	Extensive slope of deep peat and bog vegetation along whole south shore of Loch a' Bealach Leamhain	NN 49876 79438	

13	Looking east toward proposed temporary site compound, continuation of deep peat.	NN 50541 79214	
14	Bare deep peat and hags at east end of Loch a' Bealach Leamhain	NN 50548 79448	

15	View west over Loch a' Bealach Leamhain	NN 50520 79465	
16	Basic flush	NN 50493 79525	

17	Basic flush	NN 50216 79750	
18	View south over Loch a' Bealach Leamhain with proposed access track at mid-height through crags.	NN 50034 79889	

19	View northwest over Coire Pitridh toward proposed surge shaft location	NN 48818 80351	
20	Dwarf birch <i>Betula nana</i> (nationally scarce)	NN 47982 81292	

21	View west over proposed surge shaft location: summit heath on knoll, deep peat in hollow	NN 47935 81317	
22	View east into upper Coire Pitridh where access track is proposed. Mosaic of deep peat, wet heath and <i>Molinia</i> heath.	NN 47420 80680	

23	Existing track, bog vegetation on deep peat either side.	NN 46330 81166	
24	Existing track through bog and wet heath mosaic	NN 45203 80915	

25	View east from existing track. Bog vegetation on deep peat, Phragmites rush in wetter flushes.	NN 444478 81271	
26	View northeast along north shore of Lochan na h-Earba, slope dominated by wet heath.	NN 46664 81826	

27	View west up slope from loch shore, wet heath on peat <50cm.	NN 47463 82739	
28	Small acid flush	NN 47977 83258	

29	Flatter area with bog vegetation on deep peat.	NN 48038 83282	
30	Flushed area of wet heath and bog vegetation with <i>Phragmites</i> rushes.	NN 48233 83586	

31	View south over floodplain, deep peat and bog vegetation in foreground.	NN 48266 83650	
32	Area with several linear acid flushes.	NN 48325 83716	

33	View east, continuation of deep peat on shallow slope on edge of floodplain	NN 48460 83823	
34	Water vole burrow on south bank of burn	NN 48588 83912	

35	Water vole burrow on south bank of burn	NN 48690 84101	
36	View west, slope dominated by <i>Molinia</i> and bracken.	NN 49556 85086	

37	Area of bog vegetation on deep peat.	NN 50090 85748	
38	Area of semi-natural scots pine woodland, blends into non-native plantation beyond.	NN 50177 85869	

39	View southwest along south shore of Lochan na h-Earba.	NN 50403 85787	
40	Area of bog vegetation on deep peat in slight hollow in slope	NN 50459 85730	

41	Otter spraint on rock on loch shore	NN 49742 84765		
42	Otter spraint on rock on loch shore	NN 49289 84194		

43	View northeast along south shore, acid grass on floodplain, wet heath on slope.	NN 48761 83749	
44	View southwest along south shore. Slope dominated by wet heath.	NN 48206 82919	

45	Area of bog vegetation on wet heath.	NN 47058 81576.	
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Appendix 2: Species List

Species	Common name
<i>Achillea millefolium</i>	Yarrow
<i>Achillea ptarmica</i>	Sneezewort
<i>Aegopodium podagraria</i>	Ground-elder
<i>Agrostis canina</i> s.l.	Velvet Bent
<i>Agrostis capillaris</i>	Common Bent
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Agrostis vinealis</i>	Brown Bent
<i>Aira praecox</i>	Early Hair-grass
<i>Alchemilla alpina</i>	Alpine Lady's-mantle
<i>Alchemilla mollis</i>	Garden Lady's-mantle
<i>Alnus glutinosa</i>	Alder
<i>Anemone nemorosa</i>	Wood Anemone
<i>Antennaria dioica</i>	Mountain Everlasting
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Bellis perennis</i>	Daisy
<i>Betula nana</i>	Dwarf Birch
<i>Betula pubescens</i>	Downy Birch
<i>Bistorta vivipara</i>	Alpine bistort
<i>Blechnum spicant</i>	Hard-fern
<i>Calluna vulgaris</i>	Heather
<i>Campanula rotundifolia</i>	Harebell
<i>Cardamine flexuosa</i>	Wavy Bitter-cress
<i>Carex bigelowii</i>	Stiff Sedge
<i>Carex binervis</i>	Green-ribbed Sedge
<i>Carex demissa</i>	Common Yellow-sedge
<i>Carex dioica</i>	Dioecious Sedge
<i>Carex echinata</i>	Star Sedge
<i>Carex hostiana</i>	Tawny Sedge
<i>Carex leporina</i>	Oval Sedge
<i>Carex nigra</i>	Common Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex pulicaris</i>	Flea Sedge
<i>Carex rostrata</i>	Bottle Sedge
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Chamaenerion angustifolium</i>	Rosebay Willowherb
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cirsium palustre</i>	Marsh Thistle
<i>Cirsium vulgare</i>	Spear Thistle
<i>Conopodium majus</i>	Pignut
<i>Crepis paludosa</i>	Marsh Hawk's-beard
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Cytisus scoparius</i>	Broom
<i>Dactylorhiza maculata</i>	Heath Spotted-orchid
<i>Danthonia decumbens</i>	Heath-grass
<i>Deschampsia cespitosa</i>	Tufted Hair-grass
<i>Digitalis purpurea</i>	Foxglove
<i>Diphasiastrum alpinum</i>	Alpine Clubmoss

<i>Drosera anglica</i>	Great Sundew
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Dryopteris affinis</i> agg.	Scaly Male-fern
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Eleocharis palustris</i>	Common Spike-rush
<i>Empetrum nigrum</i>	Crowberry
<i>Epilobium brunnescens</i>	New Zealand Willowherb
<i>Epilobium montanum</i>	Broad-leaved Willowherb
<i>Equisetum sylvaticum</i>	Wood Horsetail
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Eriophorum vaginatum</i>	Hare's-tail Cottongrass
<i>Euphrasia</i>	Eyebright sp.
<i>Festuca ovina</i>	Sheep's-fescue
<i>Festuca rubra</i>	Red Fescue
<i>Festuca vivipara</i>	Viviparous Sheep's-fescue
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Galium palustre</i>	Marsh-bedstraw
<i>Galium saxatile</i>	Heath Bedstraw
<i>Geum rivale</i>	Water Avens
<i>Glyceria fluitans</i> s.s.	Floating Sweet-grass
<i>Hieracium</i>	Hawkweed sp.
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Holcus mollis</i>	Creeping Soft-grass
<i>Huperzia selago</i>	Fir Clubmoss
<i>Hypericum pulchrum</i>	Slender St John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Jacobaea vulgaris</i>	Ragwort
<i>Juncus acutiflorus</i>	Sharp-flowered Rush
<i>Juncus articulatus</i>	Jointed Rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus bulbosus</i>	Bulbous Rush
<i>Juncus conglomeratus</i>	Compact Rush
<i>Juncus effusus</i>	Soft-rush
<i>Juncus squarrosus</i>	Heath Rush
<i>Lapsana communis</i>	Nipplewort
<i>Larix decidua</i>	European Larch
<i>Lathyrus linifolius</i>	Bitter-vetch
<i>Linum catharticum</i>	Fairy Flax
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Luzula multiflora</i>	Heath Wood-rush
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Lycopodium annotinum</i>	Interrupted Clubmoss
<i>Lycopodium clavatum</i>	Stag's-horn Clubmoss
<i>Melampyrum pratense</i>	Common Cow-wheat
<i>Molinia caerulea</i>	Purple Moor-grass
<i>Montia fontana</i>	Blinks
<i>Myosotis discolor</i>	Changing Forget-me-not
<i>Myrica gale</i>	Bog-myrtle

<i>Myriophyllum alterniflorum</i>	Alternate Water-milfoil
<i>Nardus stricta</i>	Mat-grass
<i>Narthecium ossifragum</i>	Bog Asphodel
<i>Oreopteris limbosperma</i>	Lemon-scented Fern
<i>Pedicularis sylvatica</i>	Lousewort
<i>Picea sitchensis</i>	Sitka Spruce
<i>Pinguicula vulgaris</i>	Common Butterwort
<i>Pinus sylvestris</i>	Scots Pine
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Plantago major</i>	Greater Plantain
<i>Plantago maritima</i>	Sea Plantain
<i>Poa annua</i>	Annual Meadow-grass
<i>Poa trivialis</i>	Rough Meadow-grass
<i>Polygala serpyllifolia</i>	Heath Milkwort
<i>Polypodium vulgare</i> s.s.	Common Polypody
<i>Potamogeton polygonifolius</i>	Bog Pondweed
<i>Potentilla erecta</i>	Tormentil
<i>Prunella vulgaris</i>	Selfheal
<i>Pteridium aquilinum</i>	Bracken
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Rhinanthus minor</i>	Yellow-rattle
<i>Rubus chamaemorus</i>	Cloudberry
<i>Rubus fruticosus</i> agg.	Bramble
<i>Rubus idaeus</i>	Raspberry
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex acetosella</i>	Sheep's Sorrel
<i>Rumex obtusifolius</i>	Broad-leaved Dock
<i>Sagina procumbens</i>	Procumbent Pearlwort
<i>Salix aurita</i>	Eared Willow
<i>Scorzonoides autumnalis</i>	Autumn Hawkbit
<i>Selaginella selaginoides</i>	Lesser Clubmoss
<i>Sorbus aucuparia</i>	Rowan
<i>Stellaria alsine</i>	Bog Stitchwort
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Taraxacum</i>	Dandelion sp.
<i>Thalictrum alpinum</i>	Alpine Meadow-rue
<i>Thymus drucei</i>	Thyme
<i>Trichophorum cespitosum</i> s.l.	Deergrass
<i>Trifolium repens</i>	White Clover
<i>Triglochin palustris</i>	Marsh Arrowgrass
<i>Tussilago farfara</i>	Colt's-foot
<i>Ulex europaeus</i>	Gorse
<i>Urtica dioica</i>	Common Nettle
<i>Vaccinium myrtillus</i>	Bilberry
<i>Vaccinium vitis-idaea</i>	Cowberry
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Veronica officinalis</i>	Heath Speedwell
<i>Viola palustris</i>	Marsh Violet
<i>Viola riviniana</i>	Common Dog-violet

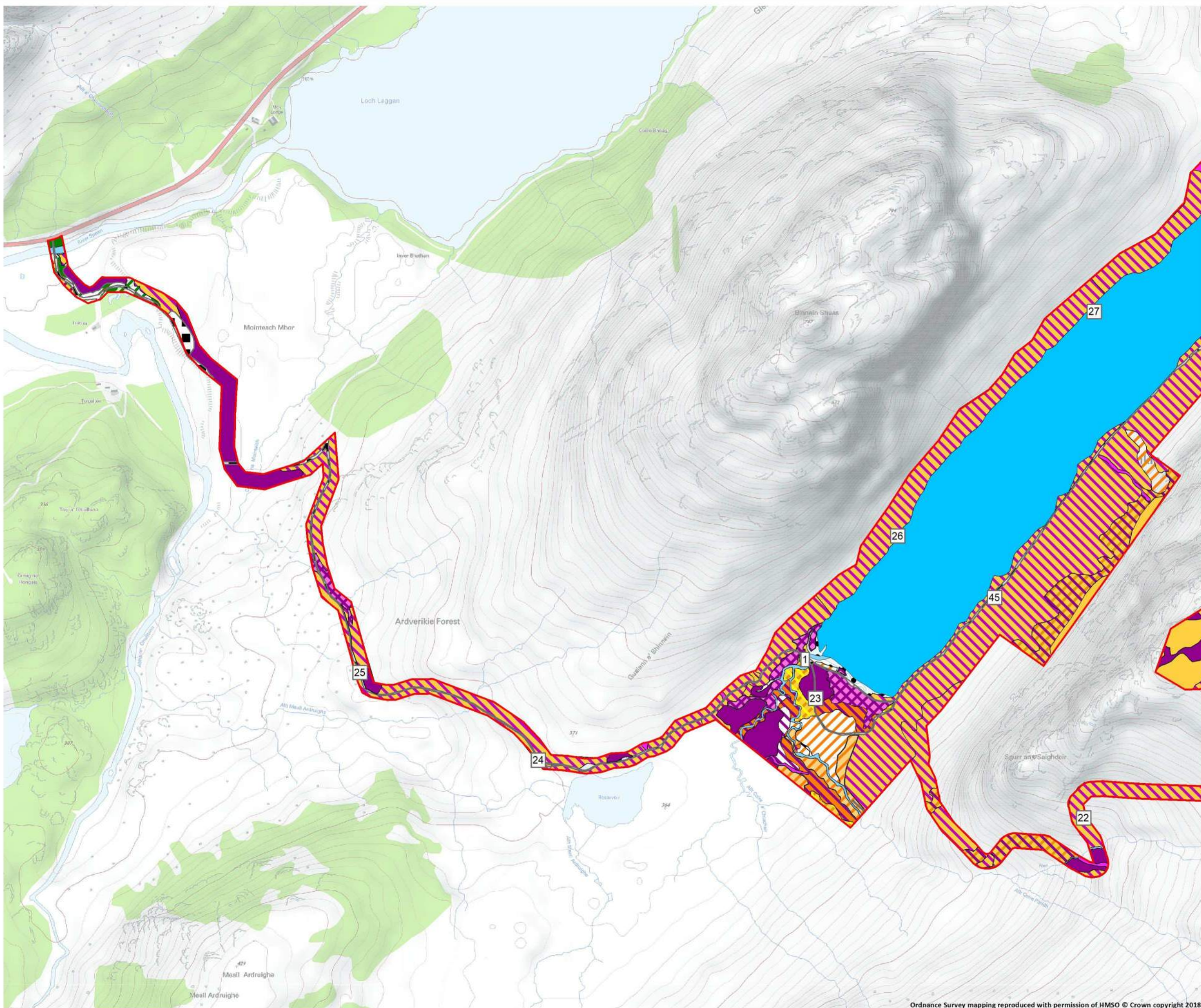
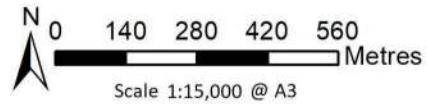


Figure 1a

- Key**
- Survey Boundary
 - Phase 1 habitat
 - Access track
 - Acid grassland - unimproved
 - Acid/marshy grassland
 - Bare ground
 - Bare peat
 - Blanket bog
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - plantation
 - Coniferous woodland - semi-natural
 - Dry dwarf shrub heath - acid
 - Dry heath/acid grassland mosaic
 - Dry modified bog
 - Flush and spring - acid flush
 - Marsh/marshy grassland
 - Running water
 - Scattered trees - broadleaved
 - Scattered trees - coniferous
 - Scattered trees/scrub
 - Scrub - continuous
 - Standing water
 - Wet dwarf shrub heath
 - Wet heath/scattered trees
 - Wet heath/acid grassland mosaic
 - Wet heath/blanket bog mosaic
 - Wet heath/marshy grassland mosaic
 - Wet heath/scattered bracken
 - Target Note



Client

Project **Lochan na h-Earba**

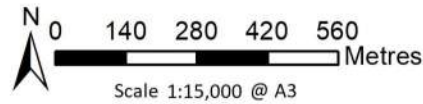
Title **Phase 1 Habitats**

Drwg No.	Date	Rev.	Drwn.	App'd
1	20/10/22	1	AF	

Figure 1b



- Key**
- Survey Boundary
 - Phase 1 habitat
 - Access track
 - Acid grassland - unimproved
 - Acid/marshy grassland
 - Bare ground
 - Bare peat
 - Blanket bog
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - plantation
 - Coniferous woodland - semi-natural
 - Dry dwarf shrub heath - acid
 - Dry heath/acid grassland mosaic
 - Dry modified bog
 - Flush and spring - acid flush
 - Marsh/marshy grassland
 - Running water
 - Scattered trees - broadleaved
 - Scattered trees - coniferous
 - Scattered trees/scrub
 - Scrub - continuous
 - Standing water
 - Wet dwarf shrub heath
 - Wet heath/scattered trees
 - Wet heath/acid grassland mosaic
 - Wet heath/blanket bog mosaic
 - Wet heath/marshy grassland mosaic
 - Wet heath/scattered bracken
 - Target Note



Client

Project
Lochan na h-Earba

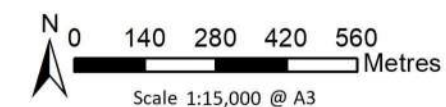
Title
Phase 1 Habitats

Drwg No.	Date	Rev.	Drwn.	App'd
1	29/10/22	1	AF	



Figure 1c

- Key**
- Survey Boundary
 - Phase 1 habitat
 - Access track
 - Acid grassland - unimproved
 - Acid/marshy grassland
 - Bare ground
 - Bare peat
 - Blanket bog
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - plantation
 - Coniferous woodland - semi-natural
 - Dry dwarf shrub heath - acid
 - Dry heath/acid grassland mosaic
 - Dry modified bog
 - Flush and spring - acid flush
 - Marsh/marshy grassland
 - Running water
 - Scattered trees - broadleaved
 - Scattered trees - coniferous
 - Scattered trees/scrub
 - Scrub - continuous
 - Standing water
 - Wet dwarf shrub heath
 - Wet heath/scattered trees
 - Wet heath/acid grassland mosaic
 - Wet heath/blanket bog mosaic
 - Wet heath/marshy grassland mosaic
 - Wet heath/scattered bracken
 - Target Note



Client				
Project				
Lochan na h-Earba				
Title				
Phase 1 Habitats				
Drwg No.	Date	Rev.	Drwn.	App'd
1	29/10/22	1	AF	