Loch Kemp Storage - EIA Report

Appendix 10.2: Bryophyte Survey Report

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Bryophyte Survey at the Proposed Loch Kemp Pumped Storage Scheme – Final Report

A Report for ASH

by

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Bryophyte Survey at the Proposed Loch Kemp Pumped Storage Scheme

N.G. Hodgetts

Introduction

Loch Kemp Storage Ltd. ("the Applicant"), is proposing to construct the 600 Megawatt (MW) Loch Kemp Pumped Storage Scheme (hereafter referred to as "the Proposed Development"), located within the Dell Estate, approximately 13 kilometres (km) to the north-east of Fort Augustus. The site of the Proposed Development is shown on Figure 1.

Loch Kemp, on the south-east side of Loch Ness, is the proposed location for the upper reservoir of the new pumped storage scheme, whilst Loch Ness would act as the lower reservoir. The Proposed Development would operate by transferring water between Loch Ness and Loch Kemp through the tailrace tunnel, powerhouse, high pressure tunnel and headrace tunnel. This would involve increasing the water level of Loch Kemp by approximately 28 m to approximately 205 m AOD through the construction of up to eight dams. The construction of a powerhouse, substation, access tracks and other associated temporary and permanent infrastructure would also be required.

The Proposed Development lies in an area that is potentially rich in bryophytes (mosses and liverworts) and lichens and includes part of Ness Woods Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The site lies within the Highland Council (THC) area, and Watsonian vice-county 96 (East Inverness-shire). Initially, a preliminary walkover survey was commissioned in September 2021, in order to assess whether a full bryophyte and/or lichen survey might be necessary (Hodgetts 2021). In line with the recommendations of this survey, further work on the bryophytes was undertaken in selected targeted areas in April and June 2022. Following pre-application advice provided by NatureScot, the burns draining from Loch Kemp (the Allt an t-Sluichd) and Lochan a' Choin Uire (unnamed burn), and the Allt a' Chinn Mhonaich near the south-west boundary of the Proposed Development site were surveyed as part of the fieldwork undertaken in June 2022. Surveys were also undertaken for terrestrial and aquatic lichen species; however, the results of these are detailed in a separate report.

Sites chosen for hydro schemes are often potentially rich bryophyte and lichen sites. The western Scottish Highlands are of global importance for bryophytes, and the Kemp scheme is just beyond the edge of this area. The temperate, wet climate of western Scotland is ideal for many oceanic species that are globally very rare and restricted climatically to areas with a high rainfall and only moderate temperature fluctuations. Their importance was first recognised by Ratcliffe (1968), who coined the term 'Atlantic bryophytes'. The document *Guidance for applicants on supporting information requirements for hydropower applications* (SEPA 2009) recognises the necessity for a full bryophyte survey of potentially rich hydro sites so that green energy production can go ahead without damaging Scotland's natural heritage. The potential impacts of small hydroelectric schemes on bryophytes and lichens were considered by Demars & Britton (2011).

Averis *et al.* (2012) have produced a scheme for assessing the bryological importance or potential importance of ravines for bryophytes and making recommendations in relation to small hydroelectric schemes. This uses 29 species of nationally uncommon humidity-demanding bryophytes to classify sites to one of five levels of bryological importance. Unsurveyed or partly surveyed sites are also assessed using maps and aerial photographs. This work assessed 5629 watercourses in western Scotland for their bryological interest. The majority of these have not yet been surveyed, but many have potential for high bryophyte interest. At least 136 sites have so far been identified that are of such bryological significance that hydroelectric development could have an impact of national importance.

There is no evidence of this site having been surveyed previously by other bryologists. According to the NBN Atlas (https://nbnatlas.org), only the common aquatic moss *Fontinalis antipyretica* and '*Sphagnum*' have been recorded here. The same source reveals that a few notable lichens have been recorded, principally on trees, including relatively scarce species such as *Microcalicium ahlneri*, *Lobaria scrobiculata* and *Ochrolechia microstictoides*.

Methods

Fieldwork was carried out on 21 September 2021 (walkover survey), and 6 April and 3 June 2022. The walkover survey started on the shore of Loch Ness, where the proposed powerhouse site would be located. The site was walked uphill to the fishing cabin on the eastern shore of Loch Kemp, concentrating on the proposed powerhouse site, woodland within the Ness Woods SSSI/SAC, and the proposed inundation area around Loch Kemp. The second visit concentrated on the immediate environs of the proposed powerhouse site, the lowermost parts of the unnamed burn draining from Lochan a' Choin Uire, and access track routes. The final visit consisted of a detailed survey of the whole lengths of the unnamed burn draining from Lochan a' Choin Uire and the Allt an t-Sluichd, and all of the Allt a' Chinn Mhonaich, close to the proposed works.

Bryophyte lists were made on standard Biological Records Centre RP35 cards, with further notes made where appropriate. Specimens were collected where necessary for later microscopic examination. By the burns, the survey was limited to the burns themselves and rocks, banks and trees in the immediate vicinity. With a few exceptions, most of the lengths of all the burns were accessible with care. Some digital photographs were taken in the field. Bryophyte nomenclature follows the current British and Irish bryophyte checklist (Blockeel *et al.* 2021), with names used in the recent past in brackets. Frequency of species is shown on the DAFOR scale. Oceanic, or 'Atlantic', species, according to the definitions of Hill *et al.* (2007), and 'Western British' species, as defined by Ratcliffe (1968), are highlighted. The site was also given a score according to the guidelines for the selection of Sites of Special Scientific Interest (Bosanquet *et al.* 2018). Pescott (2016) lists Nationally Rare and Nationally Scarce species. Lichen nomenclature follows the taxon dictionary on the British Lichen Society website (https://britishlichensociety.org.uk).

Results

General

A total of 161 bryophyte taxa were recorded from the site of the Proposed Development (see Appendix 2, Table 1). The area on the shore of Loch Ness where it is anticipated the powerhouse would be located (See Appendix 3, Photos 9-11) is dominated by birch and rowan, with some alder and ash, largely on dry ground with bracken. While mostly of limited interest, with alder and birch the dominant trees, the lochshore here also supports some ash trees with a richer flora (see Figure 2, Target Note 5). Nothing rare was seen, but *Frullania dilatata* and *Orthotrichum striatum* are both present. The small burn draining from Lochan a' Choin Uire runs through the site.

The boulders on the shore of Loch Ness have a variety of common and widespread species (see Figure 2, Target Note 3), including an abundance of the mosses *Fontinalis antipyretica, Hygrohypnum luridum, Racomitrium aciculare* and *Sciuro-hypnum plumosum* and *Thamnobryum alopecurum*. Some of the larger ones support *Grimmia hartmanii* and *Nogopterium* (*Pterogonium*) *gracile*, and the tiny liverwort *Lejeunea cavifolia* is also present.

The trees by the loch shore have abundant common epiphytes (see Figure 2, Target Note 3), including the bryophytes *Frullania* spp., *Hypnum andoi* and *Ulota crispa* s.l., and the lichens *Parmelia* spp. (in the broad sense), *Platismatia glauca*, *Ramalina* spp., *Usnea* sp. and numerous crusts. Rocks and boulders also have common and widespread species such as the bryophytes *Dicranum scoparium, Frullania tamarisci* and *Isothecium myosuroides*. The oceanic liverwort *Plagiochila spinulosa* is also present. There are some shaded outcrops that appear to support only common species, but there are some mildly base-rich outcrops with mosses such as *Amphidium mougeotii, Anoectangium aestivum* and *Hylocomiadelphus* (*Rhytidiadelphus*) *triquetrus*. There is an almost continuous line of sheltered, more or less vertical low rock faces just above the loch shore but above the beach. These support a wide variety of bryophytes, including many basicolous species and extensive stands of the oceanic *Plagiochila spinulosa*. Species seen include *Amphidium mougeotii, Anoectangium aestivum, Bartramia pomiformis, Blepharostoma trichophyllum, Neckera crispa* and *Tortella tortuosa*.

The woodland immediately above the proposed powerhouse, along the line of the proposed access track, consists of dry, open birch woodland with bracken below, and is mainly of little interest (See Appendix 3, Photos 12 & 13). There are a number of stands of hazel (See Appendix 3, Photo 15), including some very old trees of some interest for bryophytes, and possibly more interest for lichens (e.g. at NH45361615, south of the track, NH45351635, NH45281630 – see Figure 2, Target Note 2), supporting a rich bryophyte flora dominated by the common epiphytes *Isothecium myosuroides, I. alopecuroides, Frullania tamarisci, Homalothecium sericeum, Hypnum* spp. and *Ulota* spp. Although there are no rarities, more interesting species include *Antitrichia curtipendula*, *Neckera complanata, N. pumila,* and *Orthotrichum striatum*. A specimen of *Ulota* was collected here which was later identified as *U. intermedia*, new to East Inverness-shire. This is not a rare species, but a recently-described segregate of the *U. crispa* complex (see Blockeel 2017). This area (see Figure 2, Target Note 4) also

has extensive bryophyte-dominated boulder scree on steep NW-facing slopes (See Appendix 3, Photo 14). The rocks support a variety of species, including large liverworts such as *Bazzania trilobata, Plagiochila punctata, P. spinulosa* and *Scapania gracilis*. There are also several good stands of the moss *Hylocomiastrum umbratum* (e.g. at NH45361647).

Above the woodland, the track crosses dry open bracken and heath (See Appendix 3, Photo 16), intensively managed for game birds, with rearing pens and mown areas. The occasional rock outcrops in this zone are of very limited interest, with *Andreaea* spp., *Campylopus atrovirens, Racomitrium* spp. dominant in the mosses, and *Cladonia* spp. *Cornicularia normoerica*, *Parmelia omphalodes* and other *Parmelia* spp. (in the broad sense) and crustose species dominant in the lichens. The moss *Hedwigia stellata* is occasional. The proposed surge shaft is on a hilltop with dry heath and rock outcrops, with only the same common species present.

The proposed inundation zone around Loch Kemp is mainly rather dry and acidic, but there are some low-lying wet areas. These are also of little interest, and support mainly common calcifuge species, especially widespread species of *Sphagnum* beneath plants such as heather and bog myrtle. There is some mature birch woodland with large trees, especially on steep ground on the south and west sides of the loch (See Appendix 3, Photos 17 - 19), which supports a fairly varied lichen community, including *Mycoblastus sanguinarius, Ochrolechia* spp., *Parmelia* spp. (in the broad sense), *Pertusaria* spp., *Sphaerophorus globosus* and *Usnea* spp. There is an area of conifer plantation (partly felled) on the south-east side of the loch that is of no interest for bryophytes or lichens. The outfall from Loch Kemp, near the ford, has nothing of particular significance although there are some fairly mature birch trees with lichen cover.

The three main burns that would potentially be affected by the Proposed Development were examined in more detail:

Allt an t-sluichd (See Appendix 3, Photos 1-3)
The top part of the Allt an t-sluichd (the burn draining from Loch Kemp) is of little interest, winding through open boggy woodland with *Sphagnum* spp. until it steepens into a rocky ravine at *ca.* NH46921737 (see Figure 2, Target Note 11). At this point, it becomes much richer, with Wilson's filmy fern *Hymenophyllum wilsonii* frequent, and luxuriant cushions of mosses and liverworts, notably *Breutelia chrysocoma, Plagiochila spinulosa, Bazzania tricrenata, Hylocomiastrum umbratum, Ptilium crista-castrensis* and *Scapania gracilis*. Downstream, the bryophytes remain luxuriant, covering boulders, banks and tree bases. Damp shaded rocks in and near waterfalls are particularly interesting. Although there are no Nationally Rare or Nationally Scarce species present, the oceanic flora is reasonably rich considering the site is close to the eastern extreme of the distribution of many of these plants. In particular, several stands of *Radula aquilegia* were found on damp rocks near waterfalls, along with all three common species of *Lejeunea* (*L. cavifolia, L. lamacerina* and *L. patens*). A colony of *Pseudohygrohypnum* (*Hygrohypnum*) *subeugyrium*, a plant only recently recognised in Britain (Blockeel *et al.* 2019), was found semi-submerged in the lower stretches of

this burn. This burn is the least base-rich of the three burns examined in detail, but there are stands of *Thamnobryum alopecurum* on shaded rocks towards the lower end.

Unnamed burn draining from Lochan a' Choin Uire (See Appendix 3, Photos 4-6)
This burn (see Figure 2, Target Note 8) is moderately rich in species, including some oceanic species. Wilson's filmy fern *Hymenophyllum wilsonii* is present. All three of the more widespread *Lejeunea* species are present, and *Cololejeunea* (*Aphanolejeunea*) *microscopica* was seen a number of times, here at the eastern extremity of its distribution. *Plagiochila spinulosa* is abundant on rocks and tree bases, and *P. punctata* is also present. *Pseudohygrohypnum* (*Hygrohypnum*) *eugyrium* was seen on rocks in the burn.

The substrata are moderately to strongly base-rich, and several basicolous species were seen, including *Metzgeria pubescens*, growing with *Neckera complanata* on an old hazel at NH45581665 (see Figure 2, Target Note 6). *Conocephalum salebrosum*, *Marchantia* (*Preissia*) *quadrata*, *Neckera crispa* and *Tortella tortuosa* were also seen. A considerable area of block scree below a cliff (*ca.* NH45731660) is fairly rich, with *Bazzania trilobata*, *Dicranum fuscescens*, etc. A large, old ash tree at NH45631661 (see Figure 2, Target Note 9) supports a characteristic flora, including *Zygodon conoideus*.

Allt a' Chinn Mhonaich (See Appendix 3, Photos 7 & 8)
The part of the Allt a' Chinn Mhonaich adjacent to the Proposed Development was examined during the June 2022 survey (see Figure 2, Target Note 1). This burn is surrounded by open mixed woodland dominated by birch, with hazel, rowan, oak and holly also present. The bryophyte flora here is very similar to that of burn draining from Lochan a' Choin Uire. However, *Dichodontium pellucidum, Scapania undulata* and *Thamnobryum alopecurum* are more in evidence, especially in the splash pool below the main waterfall. The tiny oceanic liverwort *Cololejeunea* (*Aphanolejeunea*) *microscopica* occurs in several places on damp shaded rocks. There is a short section of shallowly-incised wooded ravine above the waterfall, where the bryophyte flora is fairly typical, not as rich as the other burns examined, but the liverwort *Solenostoma paroicum* was found on wet rocks near water level. Upstream from that, the burn is more open and less diverse, dominated by common species such as *Racomitrium aciculare*, and there is little of much bryological interest.

Conclusions

The bryophyte interest of most of the site is fairly poor, as the ground is rather uniform, consisting of acidic dry heath or open birch woodland, dominated below by bracken and heather, and much of it intensively managed for sheep and/or game birds. However, parts of the site, especially the burns on the south-western slopes of Loch Ness and more sheltered areas within the Ness Woods SSSI/SAC, are of more interest. Here, bryophyte cover is luxuriant, and includes significant stands of some oceanic species, near the eastern edge of their range in Scotland. *Plagiochila spinulosa* is particularly abundant, often covering rocks, boulders and tree bases in thick stands. *P. punctata* is also frequent. No Nationally Rare or Nationally Scarce species (Pescott 2016) were seen. The oceanic 'target species' used to assess water courses in Averis *et al.* (2012) are also not common, with only *Aphanolejeunea microscopica* and *Radula aquilegia* represented, and these only very locally.

Allt an t-sluichd

The ravine of the Allt an t-sluichd (See Figure 2, Target Note 11) is notable for its variety and abundance of bryophytes, including significant populations of oceanic species near the edge of their range and some big stands of *Bazzania tricrenata*, *Plagiochila spinulosa* and *Ptilium crista-castrensis*. The stands of *Radula aquilegia* here represent one of the most easterly occurrences of this species in mainland Scotland. The occurrence of *Pseudohygrohypnum* (*Hygrohypnum*) *subeugyrium* is of some interest, though this species is still presumably under-recorded in Scotland.

Nine oceanic or hyperoceanic (= Atlantic) species were recorded:

Liverworts
Lejeunea lamacerina
Lejeunea patens
Plagiochila punctata
Plagiochila spinulosa
Radula aquilegia
Saccogyna viticulosa
Scapania gracilis

Mosses
Breutelia chrysocoma
Zygodon conoideus

Only one of the 29 'target species' listed by Averis *et al.* (2012) was found – *Radula aquilegia* – giving the site a score of 1 point. This means that this part of the site can be placed into Category C:

"The site has a score of between 0 and 5 points, and the survey of the watercourse area was sufficiently thorough that it seems unlikely that further survey will produce enough additional records of uncommon hygrophilous species to raise the site score to 6 or more points. No further survey should be necessary in relation to a proposed hydroelectric scheme. With a score of <6 points the site is of low to medium bryological importance and hydroelectric development is unlikely to have a significant national/international impact on humidity-demanding oceanic bryophyte assemblages. However, the following points should be noted for a hydroelectric scheme at a site in

this category: (1) the bryophyte flora may be of local importance, for example including a species that is rare locally or is at the edge of its geographical range; (2) the watercourse may be important for other groups such as invertebrates; (3) the ecological acceptability of a proposed scheme might be reduced if many other watercourses in the local area already have hydroelectric schemes (i.e. few unmodified watercourses left in the area concerned)." (Averis *et al.* 2012.)

Unnamed burn draining from Lochan a' Choin Uire

This small burn (See Figure 2, Target Note 8) also supports luxuriant bryophyte communities and is moderately rich in oceanic species. The richness is further increased by the good representation of basicolous species.

Eight oceanic or hyperoceanic (= Atlantic) species were recorded:

Liverworts
Cololejeunea (*Aphanolejeunea*) *microscopica*
Lejeunea lamacerina
Lejeunea patens
Plagiochila punctata
Plagiochila spinulosa
Saccogyna viticulosa
Scapania gracilis

Mosses
Breutelia chrysocoma

Only one of the 29 'target species' listed by Averis *et al.* (2012) was found – *Cololejeunea* (*Aphanolejeunea*) *microscopica* – giving the site a score of 1 point. This means that this part of the site can also be placed into Category C (see above).

Allt a' Chinn Mhonaich

The relevant section of this burn (See Figure 2, Target Note 1) is similar to the burn draining from Lochan a' Choin Uire; it also supports some luxuriant bryophyte communities and is moderately rich in oceanic species, but nothing particularly unusual.

Nine oceanic or hyperoceanic (= Atlantic) species were recorded:

Liverworts
Cololejeunea (*Aphanolejeunea*) *microscopica*
Lejeunea lamacerina
Lejeunea patens
Plagiochila punctata
Plagiochila spinulosa
Saccogyna viticulosa
Scapania gracilis
Solenostoma paroicum

Mosses
Plenogemma (*Ulota*) *phyllantha*

Only one of the 29 'target species' listed by Averis *et al.* (2012) was found – *Cololejeunea* (*Aphanolejeunea*) *microscopica* – giving the site a score of 1 point. This means that this part of the site can also be placed into Category C (see above).

Other

The 'other' areas within the Proposed Development site where there is some significant bryophyte interest are located on and near the shore of Loch Ness, near where it is anticipated the powerhouse would be located, and on the scattered groves of old hazel. The groves of old hazels (See Figure 2, Target Note 2), while not supporting any bryophytes of great rarity, are of considerable interest, as are the areas of boulder scree above the proposed powerhouse site (See Figure 2, Target Note 4),the shore of Loch Ness and the low NW-facing rock faces just above the beach (See Figure 2, Target Note 3).

Using the guidelines for the selection of Sites of Special Scientific Interest (Bosanquet *et al.* 2018), the site as a whole scores 8 on the basis of oceanic species present (with no Nationally Rare or Nationally Scarce species present), not reaching the 12 point 'threshold' suggested for consideration for notification.

Recommendations

A few general recommendations relevant to design of the Proposed Development are advised. Construction activities on the shore of Loch Ness should be minimised in the vicinity of the powerhouse, as much as possible, in particular avoiding disturbance to the low facing rocks. Disturbance in the areas of boulder scree above the proposed powerhouse site and the low NW-facing rock faces just above the beach should be avoided or minimised during construction. Disturbance to sheltered rotten logs and rock outcrops should also be avoided or minimised wherever possible. Mature trees, ash and hazel should be left standing and undisturbed wherever possible. Dry areas of heath and bracken should be disturbed in preference to wet areas.

Acknowledgements

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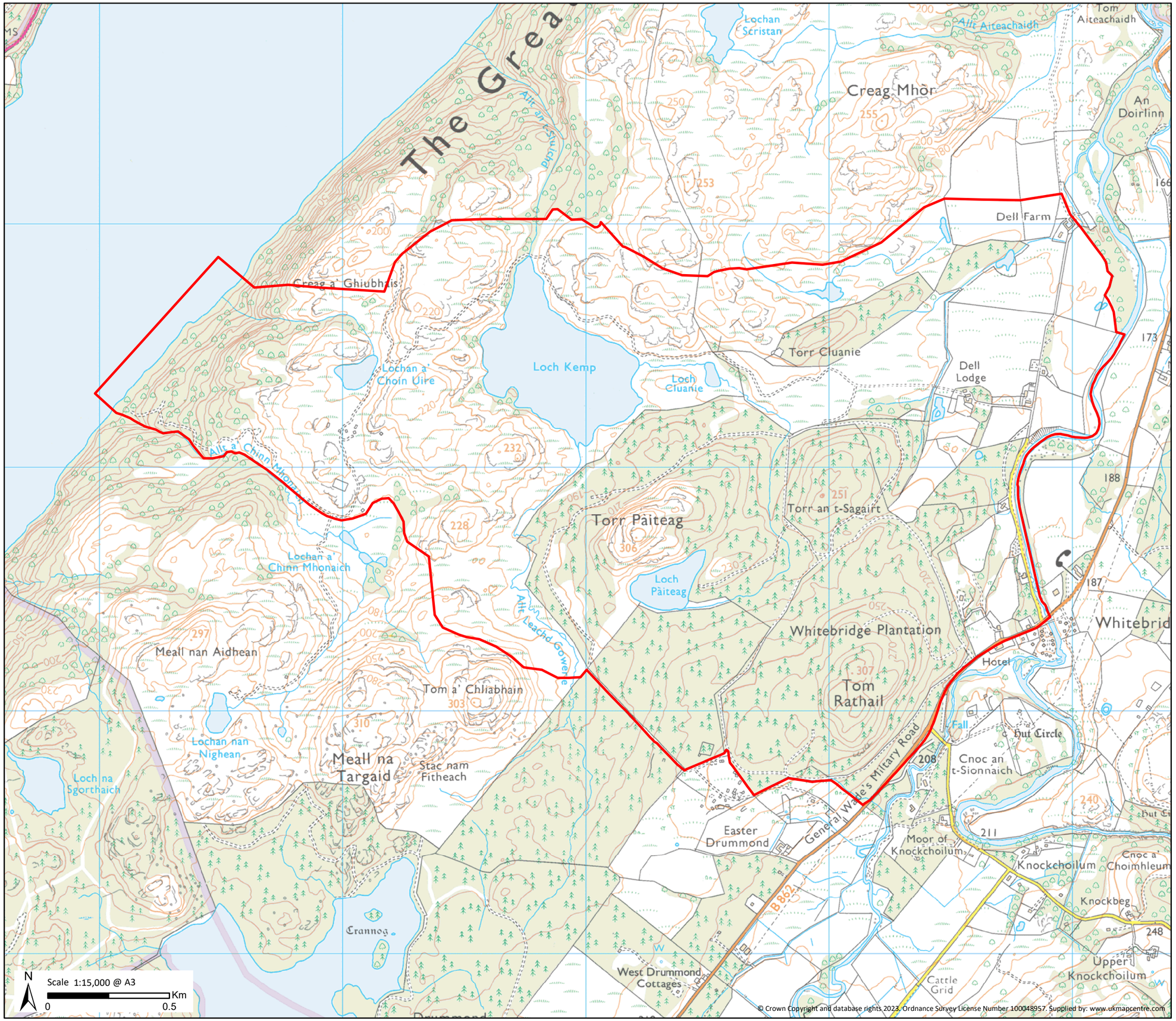
Appendix 1 - Figures



Key

Site Boundary

Loch Kemp Storage
EIA Report

Figure 1
Site Location

Drawn by: SK **Date:** 14/11/2023

Drawing: 120019-D-BS1-1.0.0

Loch Kemp Storage
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Areas of Bryological Interest

Bryophyte Location (Area)

Bryophyte Location (Point)

1 - Allt a' Chinn Mhonaich Burn – this watercourse supports abundant bryophyte communities and is moderately rich in oceanic species. No Nationally Rare or Nationally Scarce species were identified.

2 - Stands of hazel supporting a rich bryophyte flora. No rare bryophyte species were identified but these hazel groves do contain bryophytes of interest.

3 – Loch shore boulders, rocks and low rock faces have a variety of common and widespread bryophyte species. The trees by the loch shore have abundant common epiphytes. Vertical low rock faces above beach also have a wide variety of bryophytes, including basicolous sp. and extensive stands of the oceanic *Plagiochila spinulosa*.

4 – North-west facing scree slopes dominate by bryophyte sp. The rocks support a variety of species, including the liverworts *Bazzania trilobata, Plagiochila punctata, P. spinulosa and Scapania gracilis* and the moss *Hylocomiastrum umbratum*.

5 – Ash trees located near powerhouse site with rich flora. No rare bryophyte sp. identified but *Frullania dilatata* and *Orthotrichum striatum* are both present.

6 – *Metzgeria pubescens* growing with *Neckera complanata* on an old hazel tree.

7 - Stands of hazel with bryophyte interest. No Nationally Rare or Nationally Scarce species were identified.

8 - Unnamed burn draining from Lochan a' Choin Uire - this watercourse supports abundant bryophyte communities and is moderately rich in oceanic and basicolous species. No Nationally Rare or Nationally Scarce species were identified.

9 – Old ash tree supporting characteristic flora, including *Zygodon conoideus*.

10 – Area of scree rich with *Bazzania trilobata, Dicranum fuscescens*, etc.

11 - Allt an t-sluichd – this watercourse is notable for its variety and abundance of bryophytes, including significant populations of oceanic species and large stands of *Bazzania tricrenata, Plagiochila spinulosa* and *Ptilium crista-castrensis*. No Nationally Rare or Nationally Scarce species were identified.

Hazel Tree

Ash Tree

The Great

Allt an t-sluichd

Creag a' Ghiubhais

Lochan a' Choin Uire

Loch Kemp

Allt a' Chinn Mhonaich

200 220 220 232 220 190

1 2 3 4 5 6 7 8 9 10 11

N

Scale 1:8,000 @ A3

0 0.5 Km

Key

Site Boundary

Ness Woods SAC

Loch Kemp Storage EIA Report

Figure 2
Bryophytes

Drawn by: SK **Date:** 14/11/2023

Drawing: 120019-D-BS2-1.0.0

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Appendix 2 - Target Notes

Table 1. Bryophyte species recorded from the Proposed Development Site

1: Allt an t-Sluichd
2: unnamed burn draining from Lochan a' Choin Uire
3: Allt a' Chinn Mhonaich
4: other
Frequency on DAFOR scale: d = dominant, a = abundant, f = frequent, o = occasional, r = rare. The qualifier 'l' ('locally') is also used where appropriate.
Oceanicity: HST = Hyperoceanic southern-temperate, HT = Hyperoceanic temperate, OBT = Oceanic boreal-temperate, OST = Oceanic southern-temperate, OT = Oceanic temperate (Hill *et al.* 2007), WB = Western British (Ratcliffe 1968).
Status: LC = Least Concern, NE = Not Evaluated.

Species	**1**	**2**	**3**	**4**	**Habitat**	**Frequency**	**Oceanicity**	**Status**
Liverworts								
Aneura pinguis	x		x		Damp rocks	o		LC
Bazzania tricrenata	x	x			Boulder scree, banks	o	WB	LC
Bazzania trilobata		x		x	Boulder scree	r	WB	LC
Blepharostoma trichophyllum		x	x		Damp rocks	r		LC
Calypogeia fissa	x	x	x		Banks	o		LC
Calypogeia muelleriana	x	x			Shaded banks	r		LC
Cephalozia (*Nowellia*) *curvifolia*		x	x		Rotten wood	o	WB	LC
Cephalozia bicuspidata	x	x	x		Banks etc	f		LC
Cephalozia lunulifolia	x	x			Banks, rotten wood	o		LC
Cololejeunea (*Aphanolejeunea*) *microscopica*		x	x		Damp shaded rocks	r	HST	LC
Conocephalum conicum			x		Damp shaded rocks	r		LC
Conocephalum salebrosum		x			Damp shaded rocks	r		LC
Diplophyllum albicans	x	x	x	x	Rocks, banks, trees	f/la		LC
Frullania dilatata	x	x	x	x	Trees	o		LC
Frullania tamarisci	x	x	x	x	Trees, rocks	f		LC
Jungermannia pumila			x		Damp rocks	r		LC
Lejeunea cavifolia	x	x	x		Damp shaded rocks	f		LC
Lejeunea lamacerina	x	x	x		Damp shaded rocks	o	HST	LC
Lejeunea patens	x	x	x		Damp shaded rocks	f	HST	LC
Lepidozia reptans		x			Rotten wood, boulder scree	r		LC
Lophocolea bidentata	x	x	x		Banks	o		LC
Lophozia ventricosa	x	x		x	Banks, rotten wood, rocks	o		LC
Marchantia (*Preissia*) *quadrata*		x	x		Shaded rocks	r		LC
Marsupella aquatica (*M. emarginata* var. *aquatica*)	x		x		Wet/submerged rocks	o		LC

Marsupella emarginata	x	x	x		Rocks, banks	f		LC
Metzgeria conjugata	x	x	x		Rocks, tree bases	o/lf	WB	LC
Metzgeria furcata	x	x	x		Rocks, trees	f		LC
Metzgeria pubescens		x			Base of old hazel by burn	r		LC
Microlejeunea ulicina	x				Trees	r		LC
Nardia scalaris		x	x		Bare ground	o		LC
Orthocaulis attenuatus (*Barbilophozia attenuata*)				x	Exposed rocks	r		LC
Pellia endiviifolia	x	x	x		Damp rocks & ground	f		LC
Pellia epiphylla	x	x	x		Damp rocks & ground	f		LC
Pellia neesiana	x				Flushed hollows	r		LC
Plagiochila asplenioides	x		x		Banks	o		LC
Plagiochila porelloides	x	x	x	x	Banks, rocks	f		LC
Plagiochila punctata	x	x	x	x	Rocks, trees	f	HST	LC
Plagiochila spinulosa	x	x	x	x	Rocks, tree bases	a	HST	LC
Porella arboris-vitae		x			Trees	r		LC
Radula aquilegia	x				Damp shaded rocks	r	HST	LC
Radula complanata	x	x	x		Trees	r		LC
Radula lindenbergiana	x		x		Damp shaded rocks	o		LC
Riccardia palmata		x	x		Rotten wood	r	WB	LC
Saccogyna viticulosa	x	x	x		Damp shaded rocks, banks	f	OST	LC
Scapania gracilis	x	x	x	x	Rocks, boulder scree, tree bases	a	HST	LC
Scapania scandica		x			Banks	r		LC
Scapania umbrosa		x	x		Rotten wood, wet rocks	o		LC
Scapania undulata	x	x	x	x	Wet/submerged rocks	f		LC
Schistochilopsis (*Lophozia*) *incisa*	x	x			Shaded rocks, banks	r		LC
Solenostoma gracillimum				x	Tracks	o/lf		LC
Solenostoma hyalinum	x		x		Wet rocks	o/lf		LC
Solenostoma paroicum			x		Wet rocks	r	OT	LC
Tritomaria quinquedentata	x	x	x		Banks	o		LC
Mosses								
Amphidium mougeotii	x	x	x	x	Rock crevices	o/lf		LC
Andreaea rothii				x	Exposed rocks	r/lf		LC
Andreaea rupestris				x	Exposed rocks	r/lf		LC

Anoectangium aestivum				x	Rock crevices	r		LC
Antitrichia curtipendula				x	Old hazel	r		LC
Atrichum undulatum	x	x	x		Banks	o		LC
Aulacomnium palustre	x				Boggy ground	r/lf		LC
Bartramia pomiformis	x	x	x	x	Rock crevices	o		LC
Blindia acuta	x	x	x		Wet rocks	f		LC
Brachythecium rivulare	x	x			Wet rocks, banks	o		LC
Brachythecium rutabulum				x	Tracks	r		LC
Breutelia chrysocoma	x	x			Banks, boulder scree	lf	HT	LC
Bryum capillare		x		x	Rocks, old hazels	r		LC
Bryum pseudotriquetrum	x	x			Wet ground	o		LC
Calliergonella cuspidata		x	x		banks, wet ground	o		LC
Campylopus atrovirens				x	Exposed wet rocks	r	HT	LC
Campylopus flexuosus	x	x			Rocks	r		LC
Campylopus introflexus		x		x	Rocks, banks	o		LC
Campylopus pyriformis	x				Rotten wood	r		LC
Ceratodon purpureus				x	Tracks	r		LC
Chionoloma (*Trichostomum*) *tenuirostre*	x				Wet rock crevices	o	WB	LC
Ctenidium molluscum	x	x	x		Banks, rocks	lf		LC
Dichodontium pellucidum	x	x	x		Wet rocks & crevices	f		LC
Dicranella heteromalla		x		x	Bare ground, tracks	r		LC
Dicranum fuscescens	x	x			Trees, rocks	o		LC
Dicranum majus	x	x	x		Banks	o/lf		LC
Dicranum scoparium	x	x	x	x	Trees, rocks, banks	a		LC
Ditrichum heteromallum				x	Tracks	r		LC
Eurhynchium striatum		x	x		Banks	o		LC
Fissidens adianthoides			x		Wet ground	o		LC
Fissidens dubius	x	x	x		Rock crevices	f		LC
Fissidens osmundoides	x	x			Wet rocks	o		LC
Fissidens taxifolius		x	x		Banks	o		LC

Fontinalis antipyretica		x		x	Wet/submerged rocks	lf		LC
Fontinalis squamosa	x				Wet/submerged rocks	o		LC
Grimmia hartmanii	x	x		x	Rocks	o	WB	LC
Grimmia ramondii	x				Rocks	r		LC
Hedwigia stellata				x	Exposed rocks	r/lf		LC
Heterocladium flaccidum	x				Shaded rock crevices	r		LC
Heterocladium heteropterum	x	x	x		Rock crevices, banks	f		LC
Homalothecium sericeum		x		x	Trees	o		LC
Hookeria lucens		x	x		Damp shaded crevices	o		LC
Hygrohypnum luridum		x			Wet rocks	o		LC
Hylocomiadelphus (*Rhytidiadelphus*) *triquetrus*	x	x	x		Banks, rocks	f		LC
Hylocomiastrum umbratum	x	x	x	x	Banks, boulder scree	o/lf	WB	LC
Hylocomium splendens	x	x	x	x	Banks, rocks	a		LC
Hypnum andoi		x		x	Trees	f		LC
Hypnum cupressiforme	x	x	x	x	Rocks, trees	a		LC
Hypnum jutlandicum	x	x		x	Banks, rocks	o		LC
Isothecium alopecuroides	x	x	x	x	Rocks, tree bases	f/la		LC
Isothecium myosuroides	x	x	x	x	Rocks, tree bases	a		LC
Kindbergia praelonga	x	x	x		Banks	f		LC
Loeskeobryum brevirostre	x	x	x	x	Banks, rocks, boulder scree	f/la		LC
Mnium hornum	x	x	x		Shaded banks	f		LC
Neckera complanata		x		x	Trees	r		LC
Neckera crispa		x		x	Trees, cliffs	o		LC
Neckera pumila				x	Old hazels	r		LC
Nogopterium (*Pterogonium*) *gracile*				x	Boulders by loch	r		LC
Orthothecium intricatum				x	Shaded damp rock crevices	r		LC
Orthotrichum striatum				x	Trees	r		LC
Palustriella commutata			x		Flushed rocks	r		LC
Philonotis fontana	x				Boggy ground	r		LC
Plagiomnium undulatum	x	x	x		Banks	f		LC
Plagiothecium succulentum	x				Shaded rock crevices	o		LC

Plagiothecium undulatum	x	x	x		Banks, rocks, boulder scree	f		LC
Plenogemma (*Ulota*) *phyllantha*			x		Trees	r	OBT	LC
Pleurozium schreberi	x	x	x	x	Banks, rocks	f/la		LC
Pogonatum aloides		x	x	x	Bare ground	f		LC
Pogonatum urnigerum		x		x	Bare ground	o		LC
Pohlia cruda	x		x		Rock crevices	r		LC
Pohlia nutans				x	Tracks	r		LC
Pohlia wahlenbergii		x			Bare wet ground	r		LC
Polytrichum commune	x	x	x		Wet ground	f		LC
Polytrichum formosum	x	x	x		Rocks, banks	f		LC
Pseudohygrohypnum (*Hygrohypnum*) *eugyrium*		x		x	Wet/submerged rocks	o/lf		LC
Pseudohygrohypnum (*Hygrohypnum*) *subeugyrium*	x				Wet/submerged rocks	r		NE
Pseudoscleropodium purum	x	x		x	Banks, tracks	a		LC
Ptilium crista-castrensis	x	x			Banks, rocks, boulder scree	o/lf		LC
Racomitrium aciculare	x	x	x	x	Wet/submerged rocks	a		LC
Racomitrium ericoides				x	Tracks, exposed rocks	r/lf		LC
Racomitrium fasciculare	x	x	x	x	Rocks	f		LC
Racomitrium heterostichum	x	x	x	x	Rocks	f		LC
Racomitrium lanuginosum	x	x	x	x	Rocks, banks	f		LC
Rhizomnium punctatum	x	x	x		Wet ground	o		LC
Rhytidiadelphus loreus	x	x	x	x	Banks, rocks	a		LC
Rhytidiadelphus squarrosus	x	x	x	x	Banks	a		LC
Sciuro-hypnum plumosum	x	x	x	x	Wet/submerged rocks	a		LC
Sphagnum angustifolium	x	x			Boggy ground	o/la		LC
Sphagnum cuspidatum	x				Boggy ground	o		LC
Sphagnum denticulatum	x	x			Boggy ground, wet hollows	f		LC
Sphagnum fallax	x	x			Boggy ground	o/la		LC
Sphagnum girgensohnii	x	x	x		Banks	f/la		LC
Sphagnum inundatum	x				Boggy grounds	o		LC

Sphagnum palustre	x	x			Boggy ground	r		LC
Sphagnum papillosum	x				Boggy ground	r		LC
Sphagnum quinquefarium	x	x	x		Banks	f/la	WB	LC
Sphagnum rubellum	x	x			Boggy ground, banks	f		LC
Sphagnum subnitens	x	x			Flushed ground	f		LC
Straminergon stramineum	x				Boggy ground	r		LC
Tetraphis pellucida	x	x			Rotten wood, rocks	o		LC
Thamnobryum alopecurum	x	x	x	x	Rocks, tree bases	f/la		LC
Thuidium tamariscinum	x	x	x	x	Banks, rocks, tree bases	a		LC
Tortella tortuosa		x			Rocks	r		LC
Trichostomum brachydontium	x				Rock crevices	o		LC
Ulota bruchii	x	x	x	x	Trees	f		LC
Ulota intermedia				x	Old hazels	r		NE
Zygodon conoideus	x				Trees	r	OT	LC
Zygodon rupestris				x	Trees	r		LC

Appendix 3 - Site Photographs

Photo 1. Allt an t-Sluichd: lower part of burn, looking upstream, June 2022.

Photo 2. Allt an t-Sluichd: middle stretch of burn, looking upstream, June 2022.

Photo 3. Allt an t-Sluichd: upper part of burn, at top of ravine, looking downstream, April 2022.

Photo 4. Unnamed burn draining from Lochan a' Choin Uire: looking upstream from shore of Loch Ness, Sept. 2021.

Photo 5. Unnamed burn draining from Lochan a' Choin Uire: looking upstream towards scree and cliffs, *ca.* halfway up, June 2022.

Photo 6. Unnamed burn draining from Lochan a' Choin Uire: lower part, looking upstream, April 2022.

Photo 7. Allt a' Chinn Mhonaich: lower part, looking upstream to main waterfall, April 2022.

Photo 8. Allt a' Chinn Mhonaich: shallowly incised wooded section above main waterfall, looking upstream, June 2022.

Photo 9. Image showing dry, open mixed woodland and bracken, looking towards the area where is anticipated the powerhouse would be located Sept. 2021.

Photo 10. Image looking towards the powerhouse site, Sept 2021.

Photo 11. Image showing stony loch shore with mixed woodland, looking towards the area where is anticipated the powerhouse would be located. Sept. 2021.

Photo 12. Representative view of Ness Woods SSSI/SAC from access track, showing dry, open birch woodland with bracken, Sept. 2021.

Photo 13. Representative view of Ness Woods SSSI/SAC near the route of the proposed access track, with dry open birch woodland and bracken, April 2022.

Photo 14. Area of bryophyte-rich boulder scree above where it is anticipated the powerhouse would be located at NH45431652, April 2022.

Photo 15. Old hazels near the existing 4x4 track leading to the eastern bank of Loch Ness at NH45361615, April 2022.

Photo 16. Representative view of dry heath above SSSI/SAC from existing access track, showing heather and bracken, Sept. 2021.

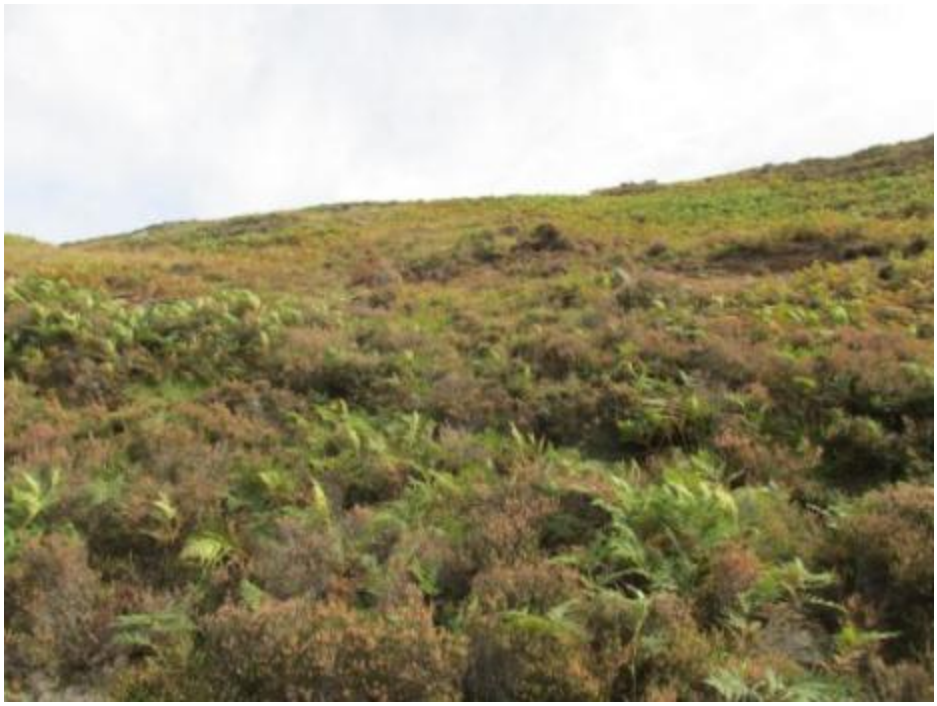

Photo 17. Mature birch woodland on south shore of Loch Kemp, with trees supporting a significant lichen flora, Sept. 2021.

Photo 18. View of south side of Loch Kemp, showing steep birch woodland in foreground and partly felled conifer plantation in background, Sept. 2021.

Photo 19. View of Loch Kemp from fishing cabin on the eastern side of the loch, Sept. 2021.