

*Loch Kemp Storage - EIA Report*

*Appendix 10.7: Outline Habitat Management Plan  
(non-SAC)*

*November 2023*

**ash**

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# TECHNICAL APPENDIX 10.7

## LOCH KEMP STORAGE

### Outline Habitat Management Plan (non-SAC)

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## 1.0 Introduction

### 1.1 Background

SLR Consulting Ltd (SLR) was commissioned by ASH Design + Assessment Ltd and Statera Energy Limited (SEL) (“the Developer”) on behalf of Loch Kemp Storage Ltd. (the Applicant), to produce an outline habitat management plan (OHMP) (non-SAC) at the proposed Site for Loch Kemp Storage Scheme (the Proposed Development), to accompany the Environmental Impact Assessment (EIA) Report.

This OHMP (non-SAC) excludes proposed Compensation Measures which specifically address adverse effects upon Ness Woods Special Area of Conservation (SAC), which includes management of the full extent of Ness Woods SAC that lies within the Dell Estate Boundary, as well as management of some adjacent woodland areas. The proposed Compensation Measures are instead presented in a separate Ness Woods SAC Compensatory Measures Package, included in the Derogation Report<sup>1</sup> submitted in support of the Section 36 Application, and are not duplicated within this OHMP (non-SAC) document.

### 1.2 Site Description

The Site is located on the Dell Estate at Whitebridge, Stratherrick, approximately 13 km north-east of Fort Augustus, within The Highland Council (THC) administrative boundary (approximate central OS grid reference NH 45474 16589). The Site is currently used for shooting game and fishing.

Baseline conditions are detailed in EIA **Volume 4, Appendices 10.1 – 10.5 and 10.8** (in relation to the terrestrial ecology baseline), and summarised in EIA **Volume 1, Chapter 10** (Terrestrial Ecology), **Chapter 11** (Ornithology), **Chapter 12** (Aquatic Ecology), **Chapter 13** (Fish) and **Chapter 19** (Forestry).

The Site occupies the area of land between Whitebridge to the east and the shore of Loch Ness to the west / north-west. The north-western part of the Site comprises a section of Ness Woods SAC and Easter Ness Forest Site of Special Scientific Interest (SSSI), on uneven ground that slopes down to the Loch Ness shoreline.

Outwith Ness Woods SAC, the central areas of the Site comprise Loch Kemp along with several smaller surrounding Lochans, bordered by a mosaic of moorland habitats. The Allt an t’Sluichd watercourse drains from Loch Kemp into Loch Ness through Ness Woods SAC.

In the central areas of the Site, dense bracken and dry dwarf shrub heath are the dominant habitat types, with dry heath generally in a species-poor condition. Several pockets of blanket bog are also present, along with pockets of wet modified bog, and smaller pockets of wet dwarf shrub heath, unimproved acid grassland, acid flushes, and semi-improved neutral grassland. There are also several areas of native birch-dominated woodland, predominantly around the shores of Loch Kemp.

Whitebridge Plantation, a conifer plantation, covers the eastern and north-eastern parts of the Site, and a smaller conifer plantation occurs at Torr Cluanie, to the north of the proposed location for Dam 3.

Open moorland areas are not frequently grazed by sheep. Bog areas are not grazed by sheep; heathland areas, and occasionally some bracken areas, are grazed by sheep at low levels on an infrequent basis.

### 1.3 Details of the Proposed Development

The proposal is to build and operate a pumped storage scheme up to 600 Megawatt (MW) with an energy storage capacity of up to 9 Gigawatt hours (GWh), utilising the existing Loch Kemp as the upper storage reservoir and Loch Ness as the lower storage reservoir. To allow drawdown for storage, Loch Kemp would be raised by approximately 28 m from the existing elevation. Four new saddle dams and four minor cut off dams would be

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<sup>1</sup> Royal Haskoning DHV (2023) Loch Kemp Storage Derogation Report

constructed around Loch Kemp to form the upper reservoir. The proposal includes a powerhouse and related infrastructure on the Loch Ness shoreline within Ness Woods SAC, along with underground waterway systems, surge shafts, cable tunnel and vertical cable shaft, access roads and a security compound.

A full description of the Proposed Development is given in **Volume 1, Chapter 3: Description of Development** of the EIA Report.

## 1.4 Purpose and Scope

This OHMP outlines proposed habitat restoration and management measures that would form part of the Proposed Development (excluding Ness Woods SAC Compensation Measures as stated in Section 1.1), which would remain in place for a 75-year management period.

It details the habitat management and monitoring that is proposed to compensate for the direct and indirect loss of sensitive natural/semi-natural habitats, notably blanket bog and heath, as a result of construction of the Proposed Development, and to provide significant biodiversity enhancements, in accordance with planning policy requirements, including National Planning Framework 4 (NPF4).

The aim of this OHMP is to establish the key objectives and principles by which parts of the Site and surrounding area would be restored and managed to the benefit of biodiversity. This OHMP is intended as a precursor to a more detailed Habitat Management Plan (HMP), which would be produced and agreed with THC, in consultation with NatureScot and Scottish Environment Protection Agency (SEPA) post consent, prior to the commencement of construction. It is not the intention for this document to provide full details of proposed management, many of which cannot be determined fully at this stage.

Issues relating specifically to the construction of the Proposed Development (e.g., pollution control, disturbance to fauna) are not considered here. Further information about ecological mitigation measures to be employed during the construction period is included in EIA Report **Volume 1, Chapters 10 – 14**. An outline Construction Environmental Management Plan (CEMP) is also included in **Volume 4, Annex 3.3** of the EIA Report.

The spatial scope of the OHMP is contained within the Dell Estate, between Loch Ness and the B862 Road (excluding Ness Woods SAC), with additional bog restoration areas also located in the eastern part of the Dell Estate, to the east of the B862 (see **Figures 10.7.1-4**).



This OHMP has been prepared with reference to relevant HMP, peatland restoration, deer management, and other habitat management guidance<sup>2,3,4,5,6,7,8,9,10</sup>.

## 1.5 Evidence of Technical Competence and Experience

This OHMP has been authored by Hazel Douglas MCIEEM MBiolSci, Associate Ecologist with SLR Consulting. Hazel has over nine years' experience within ecological consultancy, and is a competent and experienced terrestrial ecologist, who specialises in Ecological Impact Assessment.

This report has been technically reviewed by Duncan Watson MCIEEM CEnv, Technical Director with SLR Consulting. Duncan is an Ecologist with over 25 years' professional experience, much of which relates to projects in the renewable energy sector.

## 1.6 Priority Features for Management Action

The features which form the subject of this OHMP have been determined through consideration of the relative importance of ecological features present at the Site, the extent to which they may be affected by the Proposed Development (as set out in the EIA Report), their potential to benefit from restoration or management, and local biodiversity priorities within the Highland Nature Biodiversity Action Plan<sup>11</sup>.

Taking the above into consideration, the OHMP primarily relates to the following key features:

- Habitats:
  - blanket bog;
  - heathland (dry and wet dwarf shrub heath); and

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<sup>2</sup> NatureScot (2016). *Planning for development: What to consider and include in Habitat Management Plans. Version 2*. Retrieved from <https://www.nature.scot/guidance-planning-development-what-consider-and-include-habitat-management-plans> [Accessed in September 2023].

<sup>3</sup> NatureScot (2016). *Planning for Development: What to consider and include in deer assessments and management at development sites. Version 2*. Retrieved from <https://www.nature.scot/sites/default/files/2019-08/Guidance%20-%20Planning%20and%20Development%20-%20What%20to%20Consider%20and%20Include%20in%20Deer%20Assessments%20and%20Management%20at%20Development%20sites.pdf> [Accessed in September 2023]

<sup>4</sup> NatureScot (2022) *Peatland ACTION – Technical Compendium*. Retrieved from: <https://www.nature.scot/doc/peatland-action-technical-compendium> [accessed in September 2023]

<sup>5</sup> IUCN (2023) *Peatland Code. Version 2.0*. Retrieved from [https://www.iucn-uk-peatlandprogramme.org/sites/default/files/2023-03/Peatland%20Code%20V2%20-%20FINAL%20-%20WEB\\_1.pdf](https://www.iucn-uk-peatlandprogramme.org/sites/default/files/2023-03/Peatland%20Code%20V2%20-%20FINAL%20-%20WEB_1.pdf) [Accessed in September 2023]

<sup>6</sup> Gilbert, O. L., & Anderson, P. (1998). *Habitat Creation and Repair*. New York: Oxford University Press

<sup>7</sup> NatureScot (2023) *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. Retrieved from [https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management#:~:text=National%20Planning%20Framework%204%20\(NPF4\)%202023,-The%20National%20Planning&text=Proposals%20must%20also%20protect%2C%20conserve,disturbance%20to%20soils%20from%20development.](https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management#:~:text=National%20Planning%20Framework%204%20(NPF4)%202023,-The%20National%20Planning&text=Proposals%20must%20also%20protect%2C%20conserve,disturbance%20to%20soils%20from%20development.) [Accessed in September 2023]

<sup>8</sup> Scottish Government (2008) *Scotland's Wild Deer: A National Approach*. Retrieved from: [https://www.webarchive.org.uk/wayback/archive/20220126143540mp\\_/https://www.nature.scot/sites/default/files/2017-06/C249895%20-%20Scotlands%20Wild%20Deer%20-%20A%20National%20Approach%20November%202008%20DCS.pdf](https://www.webarchive.org.uk/wayback/archive/20220126143540mp_/https://www.nature.scot/sites/default/files/2017-06/C249895%20-%20Scotlands%20Wild%20Deer%20-%20A%20National%20Approach%20November%202008%20DCS.pdf) [Accessed in September 2023]

<sup>9</sup> Scottish Natural Heritage (2012) *Code of Practice on Deer Management*. Retrieved from <https://www.nature.scot/professional-advice/land-and-sea-management/managing-wildlife/managing-deer/code-practice-deer-management> [Accessed in September 2023]

<sup>10</sup> <https://bestpracticeguides.org.uk/impacts/> [Accessed in September 2023]

<sup>11</sup> Highland Nature Biodiversity Action Plan 2021 – 2026. Retrieved from <https://www.highlandenvironmentforum.info/wp-content/uploads/2022/01/Highland-Nature-Biodiversity-Action-Plan-2021-2026-compressed-.pdf> [Accessed in September 2023]

- native woodland.
- Species / species groups:
  - Lichens;
  - Fish;
  - Aquatic macroinvertebrates;
  - Birds;
  - Pine marten (*Martes martes*);
  - Red squirrel (*Sciurus vulgaris*);
  - Bats;
  - Otter (*Lutra lutra*);
  - Reptiles; and
  - Terrestrial invertebrates.

Other important ecological features were identified by the EIA; however, it was established through the EIA process that none of these are likely to be significantly affected by the Proposed Development (subject to the implementation of “standard” good practice mitigation measures during the construction phase) and therefore these receptors are not considered priorities for management action in the OHMP. Further details relating to priority features are provided in Sections 3.0 and 5.1, and specific aims and objectives are provided in Sections 5.4 and 5.5.

## 2.0 Baseline Data Collection

This OHMP has been informed by baseline data collection as detailed in EIA **Volume 4, Appendices 10.1 – 10.5** and **10.8** (relating to the terrestrial ecology baseline), and summarised in EIA **Volume 1, Chapters 10 -13** and **19**. These are outlined below:

- Desk study: sources of information include protected and notable species records and non-statutory designated sites within 2 km of the site supplied by Highland Biological Recording Group (HBRG); and ornithological records from RSPB and Scottish Ornithologists' Club;
- Phase 1 habitat survey using standard JNCC methodology<sup>12</sup> and National Vegetation Classification (NVC) survey using standard methodology<sup>13</sup> in June and August 2021, and June 2023, covering land within the Development Area Boundary and land within at least 250 m of proposed infrastructure<sup>14</sup>;
- Protected Species walkover surveys comprising surveys for otter, Scottish wildcat (*Felis sylvestris*), badger (*Meles meles*), water vole (*Arvicola amphibius*), red squirrel, pine marten and bats, using standard methodologies<sup>15,16,17,18,19,20</sup>, in June and August 2021, and June 2023. Bat survey comprised a ground-level inspection of trees to assess their suitability for roosting bats<sup>21</sup>. Protected species surveys covered suitable habitat within a 100 m buffer from proposed infrastructure, extended to 200 m for otter, Scottish wildcat and water vole.
- Detailed bryophyte survey, comprising woodland and watercourse habitat within Ness Woods SAC within the Site boundary, undertaken in September 2021, April and June 2022;
- Detailed lichen surveys, comprising terrestrial lichens within Ness Woods SAC (including within the Site boundary as well as outwith the Site boundary within the Dell estate) and around Loch Kemp; and freshwater lichens along watercourses Allt à Chinn Mhonaich, an unnamed stream which drains from the Lochan a Choin Uire, and Allt an t-Sluichd, in April, May and July 2022; along with freshwater lichens on the rocky shore of Loch Kemp and surrounding moorland lichens in December 2022, and freshwater lichens in surrounding lochs and lochans in February and March 2023;
- Loch and riverine macroinvertebrate surveys of Loch Kemp, Loch Ness, Loch Cluanie, Lochan a Choin Uire, Allt Leachd Gowerie, Allt Loch Paiteag, Allt an t-Sluichd and Allt a Chinn Mhonaich, undertaken in July and September 2022;
- Suite of bird surveys including upland breeding bird survey, breeding raptor survey, waterbird surveys, and black grouse surveys, between April - August 2021 and April – July 2022;
- Otter pre-GI works survey within a 250 m buffer of proposed GI works areas, which includes the proposed powerhouse area and Dam 1 area within Ness Woods SAC, as well as areas around Loch Kemp, undertaken in May - June 2023;

<sup>12</sup> JNCC (2010), Handbook for Phase 1 Habitat Survey – a technique for environmental audit. Joint Nature Conservation Committee: Peterborough.

<sup>13</sup> Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough.

<sup>14</sup> With the exception of an area south of Whitebridge Plantation beyond the Site boundary, land east of the B682 beyond the Site boundary, and a north-east section of Whitebridge Plantation. These areas lie beyond the proposed infrastructure footprint.

<sup>15</sup> Bang, P. and Dahlstrøm, P. (2001) Animal Tracks and Signs. Oxford University Press

<sup>16</sup> Sargent, G. and Morris, P. (2003) How to find and identify mammals. The Mammal Society, London

<sup>17</sup> Davis, A. R. & Gray, D. (2010) The distribution of Scottish wildcats (*Felis silvestris*) in Scotland (2006-2008). Scottish Natural Heritage Commissioned Report No. 360

<sup>18</sup> Scottish Natural Heritage (2011) Scottish Wild Cat Naturally Scottish Series. SNH Battleby. <http://www.snh.org.uk/pdfs/publications/naturallyscottish/wildcats.pdf>

<sup>19</sup> Neal, E. and Cheesman, C. (2006) Badgers. Poyser Natural History, Cambridge, UK

<sup>20</sup> Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Chanin. The Mammal Society, London

<sup>21</sup> Collins, J. (2016) Bat Surveys for Professional Ecologists. Good Practice Guidelines. Third edition. Bat Conservation Trust, London

- Fish surveys including riverine fish habitat assessment, loch fish habitats assessment, and electrofishing survey, in 2021.

Potential peatland restoration areas that are available across the full Dell Estate were identified using the following methodology:

- A desk-based study was undertaken initially, to identify potential available areas, using a combination of review of aerial imagery, the 2016 Carbon and Peatland Map<sup>22</sup>, existing peat data<sup>23</sup> and landowner discussion;
- Potential restoration areas were subject to field survey to determine their suitability for restoration. The field survey of areas to the west of the B682 road was conducted by Orrin Ecology on 2<sup>nd</sup> May 2023 (see **Annex 10.7.1**), and areas to the east of the B682 road were also surveyed by Orrin Ecology on 26<sup>th</sup> October 2023 (see **Annex 10.7.2**). Information on the habitats present, their current condition<sup>24</sup>, grazing pressure, and presence of features with restoration potential was collected. A follow-up site visit of potential forest-to-bog restoration areas (Areas M and N in **Figure 10.7.1**) was undertaken by Crosscut Forestry Ltd on 2<sup>nd</sup> October 2023, where additional information on tree growth and peat depth was gathered<sup>25</sup>.
- An additional desk study and field survey of the potential bog restoration areas to the east of the B682 road was conducted by Caledonian Climate on 3<sup>rd</sup> November 2023, and involved collecting peat depth data points (on a 100 m grid), undertaking Habitat Impact Assessment<sup>26</sup>, collecting hag and gully measurements, assessing Peatland Condition<sup>27</sup>, and determining suitability for restoration (see **Annex 10.7.3**).
- All areas that were found to be suitable are brought forward within this OHMP.

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<sup>22</sup> NatureScot (2016) Carbon and Peatland 2016 map. Retrieved from <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map> [Accessed in May 2023]

<sup>23</sup> The James Hutton Institute, NAR/Hutton\_peat\_depth data <https://www.hutton.ac.uk/learning/natural-resource-datasets/peat-surveys/peat-deposits> [Accessed in September 2023]

<sup>24</sup> Condition Assessment used the condition assessment sheet for wetland, from Natural England Joint Publication JP039 Biodiversity Metric 4.0. Retrieved from <https://publications.naturalengland.org.uk/publication/6049804846366720> [Accessed in April 2023]. The Peatlands have also been assigned a Peatland Condition using NatureScot's Peatland Action Peatland Condition Assessment Guide (using four categories: near-natural, modified, drained or actively eroding): <https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf> [Accessed in September 2023]

<sup>25</sup> See EIA **Technical Appendix 19-3: Forest to Bog Proposals** for further information.

<sup>26</sup> <https://bestpracticeguides.org.uk/> [Accessed in September 2023]

<sup>27</sup> Peatland Action Peatland Condition Assessment Guide (using four categories: near-natural, modified, drained or actively eroding): <https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf> [Accessed in September 2023]

## 3.0 Baseline Data and Impact Assessment Summary

The baseline data and impact assessment are set in the EIA Report. The key effects upon important ecological features (excluding Ness Woods SAC) are summarised in Sections 3.1 – 3.2 below.

### 3.1 Habitats

Table 3-1 summarises habitats of local importance or greater that would be affected by the Proposed Development (outwith Ness Woods SAC), for which a significant effect is predicted.

**Table 3-1 Summary of Habitat Loss comprising a Significant Effect (Outwith Ness Woods SAC)**

Phase 1 Habitat Type & NVC Community	Habitat Loss from Permanent Infrastructure (ha)	Temporary Habitat Loss from Working Corridor / Indirect Loss (ha)	Total Loss (ha)	Significance of effect
Broad-leaved woodland: W17, W17b	5.5	0.6	6.1	Significant at a local level
Dry dwarf shrub heath: H10, H10a, H16	22.4	19.2	41.5	Significant at a local level
Wet dwarf shrub heath: M15 (incl. M15/U20, M15/U4), M15a, M15b	6.0	2.7	8.8	Significant at a local level
Blanket bog: M1, M2, M3, M17, M17a	6.5	0.4	6.9	Significant at a regional level
Wet modified bog: M17, M17/20, M20b, M25a, M15/17, M15/25	11.1	1.2	12.3	Significant at a local level
Coniferous woodland – plantation (long-established woodland of plantation origin)	1.5	4.9	6.3	Significant at a local level

### 3.2 Species

The Development Area has been found to support, or have the potential to support, the following species or species groups, assessed as being of local importance or greater:

**Table 3-2: Summary of Species / Species Groups of Local Importance or Greater**

Receptor	Evaluation
Terrestrial invertebrates	Local Importance
Reptiles: common lizard ( <i>Zootoca vivipara</i> ), adder ( <i>Vipera berus</i> ), slow-worm ( <i>Anguis fragilis</i> )	Local Importance

Receptor	Evaluation
Otter	International Importance (due to Ness Woods SAC qualifying feature status)
Pine marten	Local Importance
Red squirrel	Local Importance
Badger	Local Importance
Bats	Local Importance
Birds: Golden eagle ( <i>Aquila chrysaetos</i> ), red kite ( <i>Milvus milvus</i> ), osprey ( <i>Pandion haliaetus</i> ), white-tailed eagle ( <i>Haliaeetus albicilla</i> ), snipe ( <i>Gallinago gallinago</i> ), common sandpiper ( <i>Actitis hypoleucos</i> ), cuckoo ( <i>Cuculus canorus</i> ), mallard ( <i>Anas platyrhynchos</i> ), teal ( <i>Anas crecca</i> ), bullfinch ( <i>Pyrrhula pyrrhula</i> ), common redstart ( <i>Phoenicurus phoenicurus</i> ), grasshopper warbler ( <i>Locustella naevia</i> ), grey wagtail ( <i>Motacilla cinerea</i> ), meadow pipit ( <i>Anthus pratensis</i> ), mistle thrush ( <i>Turdus viscivorus</i> ), reed bunting ( <i>Emberiza schoeniclus</i> ), sedge warbler ( <i>Acrocephalus schoenobaenus</i> ), skylark ( <i>Alauda arvensis</i> ), song thrush ( <i>Turdus philomelos</i> ), tree pipit ( <i>Anthus trivialis</i> ), whinchat ( <i>Saxicola rubetra</i> ), willow warbler ( <i>Saxicola rubetra</i> ), woodpigeon ( <i>Columba palumbus</i> ), wren ( <i>Troglodytes troglodytes</i> ).	Local - Regional Importance
Fish: Arctic charr ( <i>Salvelinus alpinus</i> ), Atlantic salmon ( <i>Salmo salar</i> ), brook lamprey ( <i>Lampetra planeri</i> ), river lamprey ( <i>Lampetra fluviatilis</i> ), sea lamprey ( <i>Petromyzon marinus</i> ), brown trout ( <i>Salmo trutta</i> ), ferox brown trout ( <i>Salmo ferox</i> ), sea trout ( <i>Salmo trutta</i> ), European eel ( <i>Anguilla Anguilla</i> ).	Local - International Importance
Rocky shore and moorland lichen assemblages	National Importance

A summary of potential significant effects upon protected and notable species is provided below (once embedded mitigation and good practice mitigation measures have been applied):

- Loss of lichen assemblages on rocky shore and surrounding moorland of Loch Kemp;
- Loss of up to 57.6 ha of locally important invertebrate habitat;
- Loss of up to 46.0 ha of habitat suitable for reptiles;
- Loss of up to 53.5 ha of woodland suitable for pine marten (up to half of the territory of one individual), red squirrel (including one drey and the territories of up to six individuals) and foraging / commuting bats; and
- Loss / damage of up to eight trees with bat Potential Roosting Features (PRFs), including one confirmed bat roost.

In addition, two (non-breeding) otter holts and four otter lay-ups would be lost, although this has been assessed as constituting a non-significant effect (see Section 10.8 of EIA **Volume 1, Chapter 10**).

Further effects upon important ecological features have been assessed as constituting non-significant effects.

### 3.3 Bog Restoration Areas

Information on the baseline survey of potential bog restoration areas is provided in **Annexes 10.7.1 – 10.7.3**.

## 4.0 HMP Working Group and Review

A group of key stakeholders in the HMP would be invited to form a HMP working group, their role would be to provide input into and comment on the detailed HMP and subsequent revisions to the HMP during the lifetime of the Proposed Development.

It is envisaged that the working group would include the following stakeholders:

- The Developer (Statera Ltd) of the Proposed Development and their ecologist(s);
- The landowner;
- The Highland Council;
- NatureScot; and
- SEPA.

Further details, including terms of reference for the HMP working group, would be provided in the detailed HMP, post consent.

The HMP will be reviewed and amended appropriately on a regular basis to enable assessment of progress toward achieving aims and objectives and to inform active management. Proposed review timescales are set out in Table 6-1.

As the Developer, Statera Ltd is ultimately responsible for meeting the commitments made in this OHMP. The implementation of the final HMP would be undertaken by suitably experienced contractors and all monitoring would be undertaken by suitably qualified and experienced ecologists and/or hydrologists.



## 5.0 Restoration and Management Proposals

### 5.1 Rationale for Inclusion of Priority Features

The rationale for the inclusion of the features set out in Section 1.6 is provided below.

#### Bog and Heathland

Peatland is a general term for a wide range of peat soils and habitats that occupy more than 20% of Scotland's land area<sup>28</sup>. Scotland holds around 60% of the UK's peatlands soils<sup>29</sup>. Peatland has been identified as a national conservation priority within Scotland's National Peatland Plan (SNPP), for its importance for biodiversity, water quality, and as a carbon store<sup>24</sup>. The most extensive and deepest peat soils occur under blanket bog and raised bogs. These habitats cover an area of around 1.9 million hectares in Scotland and are recognised as internationally important under the EU Habitats Directive (as Annex 1 habitats). Blanket bog is also listed on the Scottish Biodiversity List<sup>30</sup> and for Highland is subject to a Habitat Action Plan (HAP) (as part of the Peatland and wetland HAP)<sup>11</sup>. Restoration of peatlands is also identified as a priority under National Planning Framework 4 (NPF4), Policy 5. Blanket bog is therefore considered to be a priority habitat for conservation both nationally and locally. Bog restoration would also improve habitat for a range of faunal species including invertebrates, and a range of upland birds, potentially including curlew (*Numenius arquata*) and other breeding wader species.

Wet dwarf shrub heath and dry dwarf shrub heath are also recognised as internationally important under the EU Habitats Directive, as Annex 1 habitats. Upland heathland is listed on the Scottish Biodiversity List, and heath is also a local priority habitat for Highland and is included in the Upland and moorland HAP<sup>27</sup>. Heathland is therefore also considered to be a priority for conservation both nationally and locally. Heathland restoration/improved management would also improve habitat for a range of faunal species, including invertebrates, reptiles, and bird species including upland waders and raptors.

As summarised in Table 3-1, the EIA Report predicts that the Proposed Development would result in the permanent loss (direct and indirect/temporary) of up to 6.9 ha of blanket bog and 12.3 ha of wet modified bog. There would also be a direct loss of 28.4 ha and indirect/temporary loss of 21.9 ha of heathland habitat (wet dwarf shrub heath and dry dwarf shrub heath). The targeted restoration and management of peatland and heathland habitats proposed here is intended to compensate for these losses and provide a significant biodiversity enhancement.

#### Native Woodland

A commitment to protect, regenerate and restore native woodland is contained within the Woodland and Forest HAP within the Highland Nature Biodiversity Action Plan<sup>27</sup>. The intention of NPF4 Policy 6 is to protect and expand forests, woodland and trees.

Outside of the Ness Woods SAC, the EIA Report predicts that the construction of the Proposed Development would result in the loss of 6.1 ha of broad-leaved semi-natural woodland, and 41.9 ha of conifer plantation woodland<sup>31</sup> (6.3 ha of which is classified as long-established woodland of plantation origin). There is a

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<sup>28</sup> SNH (2015) *Scotland's National Peatland Plan: Working for our future*. [Online] Available at: <https://www.nature.scot/doc/scotlands-national-peatland-plan-working-our-future> [Accessed in September 2023]

<sup>29</sup> SEL (2009) Scottish Environment Link. *Peatlands Briefing May 2009*. [Online] Available at: <http://www.scotlink.org/pdf/LINKPeatlandsBriefingMay09.pdf> [Accessed February 2017]

<sup>30</sup> NatureScot (2023) *Scottish Biodiversity List SBL* [online] Retrieved from: <https://www.nature.scot/doc/scottish-biodiversity-list> [Accessed September 2023]

<sup>31</sup> This includes clear-fell and non-clear-fell commercial forestry which would not be subject to commercial re-stocking, as it falls within the inundation areas or permanent infrastructure areas. Commercial forestry re-stocking is covered separately in EIA Report Volume 1,

requirement to provide compensatory woodland for any woodland lost, under the Scottish Government's Control of Woodland Removal Policy (CoWRP). Further details are provided in **Volume 1, Chapter 19: Forestry**.

Native woodland is therefore considered an appropriate priority feature for inclusion in the OHMP.

## Species

The priority species/species group features which form the subject of this OHMP have been included due to the potential effect on them as a result of the Proposed Development (as set out in the **EIA Volume 1, Chapters 10 – 13** and summarised in Section 3.2), their status as local or national conservation priorities, including consideration of the Highland Nature Biodiversity Action Plan<sup>11</sup>, and/or their potential to benefit from action outlined in this OHMP. Details are provided in Section 5.6.6, including measures which comprise mitigation or compensation, and measures which comprise enhancement.

## 5.2 Rationale for Habitat Restoration and Management Areas Required

### Bog

A total of 6.88 ha of blanket bog and 12.27 ha of wet modified bog would be directly or indirectly lost. Bog restoration would be undertaken over a total area of c. 119.3 ha to provide compensation, which provides a ratio of 1:6.2 of bog habitat lost to bog habitat restored. The restoration ratio proposed is lower than the 1:10 compensation ratio recommended in NatureScot's recently published peatland guidance<sup>32</sup>, although it is understood that this guidance is likely to be revised in the near future. It is also noted that the restoration area proposed comprises the full extent of available bog habitat that is suitable for restoration across the Dell Estate.

### Heathland

A total of 28.4 ha of heathland would be permanently lost. A further 21.9 ha would be temporarily lost/damaged during construction but reinstated. In order to provide compensation and significant enhancement, a total of 29.6 ha of new heathland habitat is proposed for creation/restoration (from conversion of bracken to heathland, via bracken control), and a further c. 260 ha of heathland is proposed to be managed to improve its condition. This comprises all retained heathland habitat within the Dell Estate to the west of the B862 (outwith Ness Woods SAC). This would result in an overall increase in the extent of heathland habitat in the mid- to long-term, as well as an improvement in the condition of the heathland habitat.

### Native Woodland

A compensation ratio of at least 1:1 in terms of woodland lost to woodland created is required to comply with the Scottish Government's CoWRP<sup>33</sup>. A total of 63.1 ha of native broadleaved woodland creation is proposed

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Chapter 19: Forestry and Appendix 19-2: Woodland Management Plan. Compensatory woodland creation would be provided to compensate for woodland lost, to accord with the Scottish Government's policy on the Control of Woodland Removal (CoWRP), as detailed in Chapter 19: Forestry and Appendix 19-2: Woodland Management Plan, and outlined in this OHMP (non-SAC). This figure excludes 5.76 ha which would be restored via forest-to-bog restoration, and 1.57 ha required for forest management which would be felled irrespective of the Proposed Development, which are not covered under CoWRP requirements (see Appendix 19-2: Woodland Management Plan and Appendix 19-3: Forest to Bog Restoration for further details). This figure also excludes 0.81 ha of broadleaved woodland within the plantation, which is instead included in the separate broad-leaved woodland loss figure.

<sup>32</sup> NatureScot (2023) Advising on peatland, carbon-rich soils and priority peatland habitats in development management, Available at: <https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management> [Accessed in August 2023]. It is understood that this guidance is likely to be revised in the near future, as indicated at the Scottish Renewables Onshore Wind and Planning and Consents Forum on 2nd November 2023, where it was noted that the guidance was produced without consultation, and is proving to be unworkable for the renewable energy industry. It was also noted at the Forum that during a meeting of the Scottish Government's Peatland Advisory Group, on 31st October 2023, NatureScot accepted that the guidance is not fit for purpose and must be revised.

<sup>33</sup> Forestry areas proposed for forest-to-bog restoration (5.8 ha) are excluded from compensatory planting requirements under the Scottish Government's Control of Woodland Removal Policy (CoWRP). An assessment of the forest-to-bog restoration areas against

(see Section 5.6.3), which exceeds the 1:1 minimum ratio required by the Scottish Government (and equates to a 1:1.2 lost to created ratio overall). Given that 41.9 ha of the woodland being lost comprises conifer plantation (out of a total of 52.9 ha of woodland being permanently lost overall which requires compensatory planting, which includes 5.52 ha loss within Ness Woods SAC), which is being replaced by native broadleaved woodland creation, the proposals would result in a significant increase in native broadleaved woodland habitat (an increase of 51.5 ha), of higher conservation value than the conifer plantation habitat being lost, which would provide a significant enhancement.

### 5.3 Identification of Restoration and Management Areas

The methodology used to identify areas for bog restoration is provided in Section 2.0, with further details provided in **Annexes 10.7.1 - 10.7.3**. Further information on the identification of forest-to-bog restoration proposals is also provided in **EIA Volume 4, Appendix 19.3**. In summary, the areas included within this OHMP comprise all available areas within the full estate which have been assessed as being suitable for bog restoration. Areas identified for inclusion within bog restoration areas comprise degraded bog habitat, on flat or gently sloping topography, which has been artificially drained, and/or which has erosion features (such as hags, gullies and bare peat) which could be restored using established peatland restoration methods<sup>34</sup> (see **Annexes 10.7.1 – 3** for further details). In the instance of forest-to-bog restoration, the areas taken forward within this OHMP are drained forestry areas on deep peat, supporting conifer trees (planted in 1958) with poor and very poor growth rates, with the presence of adjacent bog habitat beyond the plantation (see **EIA Volume 4, Appendix 19-3** for further details).

Additional areas that were investigated, but were deemed to be unsuitable for restoration, are detailed in **Annexes 10.7.1 - 10.7.3**. Areas within Dell estate which are excluded from bog restoration comprise: areas with non-bog habitat or a lack of deep peat; bog areas that are unsuitable for restoration due to their near-natural condition or unsuitable topography; and areas that are unavailable for restoration due to existing commitments and schemes (including the Dell Wind Farm proposals (planning ref.: 22/01097/SCOP), an existing tree planting scheme, and Carbon Capture Scheme (planning ref.: 23/03694/PNO)).

The areas proposed for heathland restoration and management, comprise all areas of retained open heathland within the Dell Estate, to the west of the B862 road (excluding Ness Woods SAC). This includes land both within and outwith the Site boundary, as shown in **Figure 10.7.2**. This area has been included within the OHMP as it comprises a contiguous connected unit of open moorland habitat, which is not separated by fencing or other landscape/habitat features that would cause a barrier to ecological connectivity. The proposed management area includes the full heathland areas within the Site that have been subject to baseline survey as part of the EIA Report, as well as some areas to the north and south which lie beyond the EIA habitat survey area. However, given the absence of ecological barriers between the surveyed and non-surveyed areas of land, and the fact that all of these areas are subject to the same existing land management practices, it is considered a reasonable assumption that heathland areas beyond the survey area are similar in condition to those within the survey area. This OHMP has therefore been based on this assumption. The heathland management measures proposed (goat/deer grazing control, bracken control and clearance of self-seeded conifers) complement the Compensatory Measures Package for Ness Woods SAC (detailed in the separate Derogation Report). This is because the management areas are adjacent to one another, and because large-scale goat/deer control (via culling, rather than fencing, as is proposed in both areas) will also benefit adjacent land. The extent of heathland

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Forestry Commission guidance '*Deciding future management options for afforested deep peatland (2015)*' is included in EIA Volume 4, Appendix 19-3. As detailed in Appendix 19-2: Woodland Management Plan, a further 1.57 ha of forestry clearance is required for forest management purposes which would be undertaken irrespective of the Proposed Development, which does not require restocking under the CoWRP. The CoWRP allows for the clearance of areas associated with normal forest practice such as the creation of access tracks for forest management to be cleared without the need for restocking.

<sup>34</sup> NatureScot (2022) *Peatland ACTION – Technical Compendium*. Retrieved from: <https://www.nature.scot/doc/peatland-action-technical-compendium> [accessed in September 2023]

within the non-surveyed parts of the management area has been estimated based on aerial images. Baseline survey would be undertaken as part of the monitoring commitment (see Section 5.9).

Native woodland creation areas have been identified by the appointed EIA Forestry Consultant (Crosscut Forestry Ltd) in consultation with Scottish Forestry, and the areas proposed have been agreed by Scottish Forestry as being suitable. Native woodland creation areas are situated on open moorland dominated by heathland and bracken, and no planting would be undertaken within areas of blanket bog and deep peat. The proposed woodland creation areas are all located within the Scottish Forestry Highland Native Woodland Target Area and are identified as very suitable or suitable for W18 Native Pinewood and W4 Native Upland Birchwood on Scottish Forestry Open Data Climatic Suitability data. The Highland Council Highland Forest and Woodland Strategy (November 2019) categorises the proposed areas for compensatory planting as “Potential with Sensitivities” which means the land offers potential for woodland types which predominantly deliver biodiversity, landscape and/or amenity objectives.

## 5.4 Aims

The broad principal aims of the OHMP are as follows:

- to restore and manage c. 119.3 ha of bog habitat within the Dell Estate (the areas targeted for bog restoration are shown in **Figure 10.7.1**);
- to create/restore c. 29.6 ha of heathland habitat (via bracken control) and improve the condition of c. 260 ha of retained heathland habitat via improved management (see **Figure 10.7.2**);
- to create c. 63.1 ha of native woodland (see **Figure 10.7.3**);
- to translocate a proportion of rocky shore and moorland lichens within the Loch Kemp inundation area, if feasible;
- To improve fish passage and spawning habitat on the Allt Loch Paiteag;
- to provide habitat features for reptiles, otter, red squirrel, pine marten, bats, birds and aquatic macroinvertebrates (see **Figure 10.7.4**).

A secondary aim of the OHMP is as follows:

- to re-instate c. 30.4 ha of habitat temporarily disturbed/damaged during construction.

Further details, including specific objectives to meet the aims and the restoration and management prescriptions proposed to meet the objectives, are provided in Sections 5.5 – 5.6 respectively.

## 5.5 Specific Objectives

To achieve the broad principal aims, the following specific objectives are proposed:

- Bog restoration (see **Figure 10.7.1**):
  - To fell trees within a c. 5.8 ha area of conifer plantation and maintain the area free of trees (Areas M and N);
  - To remove self-sown trees across c. 9.7 ha, on an ongoing basis, from bog restoration areas that currently contain scattered trees (Areas A, D, and part of M);
  - To increase the water table across c. 58.3 ha, through drain blocking, in order to restore the underlying processes suitable for blanket bog restoration (Areas A – N);

- To restore eroded bog habitat via hag reprofiling, gully and bare peat restoration, across c. 61 ha of bog restoration areas (Areas 3 – 6)<sup>35</sup>;
- To avoid heather cutting or burning within c. 19.5 ha of restoration areas (Areas H, I, K and L);
- To reduce deer and goat grazing/browsing levels across c. 119.3 ha (Areas A – N and 3 – 6);
- To create conditions that should, over time increase the abundance and distribution of bog plants, particularly peat forming *Sphagnum* mosses, across c. 119.3 ha (Areas A – M and 3 – 6);
- To improve the condition of existing bog habitat within Bog Restoration Areas A – L and 3 – 6 (c. 113.5 ha), to target good condition blanket bog in a near-natural state (which would be monitored against a control plot, see Sections 5.6.1 and 5.9).
- Heathland restoration / management (see **Figure 10.7.2**):
  - To create/restore c. 29.6 ha of heathland via bracken control; and
  - To enhance c. 260 ha of existing heathland via reduced grazing/browsing pressure and removal of self-seeding conifers.
- Native woodland creation (see **Figure 10.7.3**):
  - To enclose a total of c. 63.1 ha to encourage native broadleaved woodland regeneration, with native woodland planting also undertaken.
- Lichen translocation:
  - To translocate a proportion of rocky shore and moorland lichens within the Loch Kemp inundation area, into surrounding lochs/lochans and retained moorland, where feasible.
- Watercourse habitat improvement for fish (see **Figure 10.7.4**):
  - To open up a c. 820 m section of watercourse channel, and add gravel and boulder sized sediment to an additional c. 675 m section, of the Allt Loch Paiteag, to improve fish passage, spawning and in-stream habitat.
- Provision of habitat features for specific species/species groups (see **Figure 10.7.4**):
  - To create two artificial otter holts;
  - To create four reptile hibernacula;
  - To erect two pine marten boxes;
  - To erect 20 red squirrel boxes;
  - To erect 30 bat boxes;
  - To erect 30 bird boxes, including two barn owl (*Tyto alba*) boxes;
  - To submerge coarse woody debris around loch shoreline areas to create new habitats for loch macroinvertebrates and fish; and
  - To create log piles, to benefit invertebrates, herpetofauna and small mammals.

To achieve the secondary aim, the following specific objective is proposed:

- to carefully store and re-instate soils in the correct profile following construction, within areas to be temporarily damaged/disturbed during construction (i.e., within the working corridor but outwith the

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<sup>35</sup> Areas 1 and 2 (see Appendix 10.7.3) have not been brought forward for restoration within this OHMP, as they have been identified by Caledonian Climate as having minimal or no restoration potential.

permanent infrastructure footprint); to allow suitable conditions for the regeneration of heathland habitats from the seed bank.

## 5.6 Restoration and Management Prescriptions

### 5.6.1 Bog Restoration

Areas proposed for bog restoration are shown in **Figure 10.7.1**. The proposed restoration methods are based on published literature and established restoration methods<sup>36,37,38</sup>, and case studies where these approaches have been effective, such as within the RSPB Forsinard Flows Reserve<sup>39</sup>, Black Moss and Langlands<sup>40</sup>.

A comparative analysis of 70 publications relating to peatland restoration projects in Scotland<sup>36</sup> found that the effectiveness of bog restoration techniques, including those proposed here, was deemed very high in terms of restoring the underlying processes (i.e. re-wetting). Another study of restoration techniques in Scotland<sup>41</sup> found that the combination of forest-to-bog treatments proposed here was most successful at consistently recovering the water table, and that the vegetation composition had started reverting towards open bog (via comparison with an open bog control site) over a study period of ten years.

The methods set out below are a high-level overview of the approach to be taken. This will be discussed with key stakeholders, including NatureScot and the chosen contractor, and the agreed approach will be set out in detail in the detailed HMP post consent.

For all proposed Bog Restoration Areas, the following preparation work is proposed:

- 1) A botanical monitoring survey would be undertaken to establish an up-to-date baseline for the vegetation types present. The botanical survey, paired with drone monitoring or other aerial photography, would then be used as a baseline for ongoing monitoring (see Section 5.9 for further details). Baseline botanical monitoring would be undertaken at the appropriate time of year, prior to restoration works (except for tree felling in restoration areas M-N, which would be undertaken prior to baseline monitoring, as described further in the following sections).
- 2) A drain slope survey and mapping exercise would be undertaken across all Bog Restoration Areas, prior to restoration works, including hags and gullies. Taking levels of the drain water surface would allow for the creation of drain slope profiles across the restoration areas. In general terms, the aim would be to insert a dam for each 10cm drop in level of each drain – this is intended to ensure that the water level across the restoration site is maintained within 10cm of the bog surface to allow for the growth of peat-forming plants.

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<sup>36</sup> E.g. Artz, R. E., Faccioli, M., Roberts, M. and Anderson, R. (2018) *Peatland restoration – a comparative analysis of the costs and merits of different restoration methods*. The James Hutton Institute (on behalf of Climate Xchange), Dundee.

<sup>37</sup> NatureScot (2022) *Peatland ACTION – Technical Compendium*. Retrieved from: <https://www.nature.scot/doc/peatland-action-technical-compendium> [Accessed in September 2023]

<sup>38</sup> Lunt, P., Allot, T., Anderson, P., Buckler, M., Coupar, A., Jones, P., Labadz, J. and Worrall, P. (2010) *Impacts of Peatland Restoration*. IUCN. Retrieved from: [https://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/Review%20of%20Impacts%20of%20Restoration\\_0.pdf](https://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/Review%20of%20Impacts%20of%20Restoration_0.pdf) [Accessed in October 2023]

<sup>39</sup> SNH (2015) *Climate change adaptation case study #2: Making space for natural processes: forest to bog restoration at RSPB Forsinard Flows Reserve*. SNH, Inverness.

<sup>40</sup> NatureScot Peatland ACTION case study: What's the connection between peat and nature? Retrieved from: <https://www.nature.scot/doc/peatland-action-case-study-whats-connection-between-peat-and-nature> [Accessed in October 2023]

<sup>41</sup> Anderson, R. and Peace, A. (2017) Ten-year results of a comparison of methods for restoring afforested blanket bog. *Mires and Peat* 19: 1-23

Restoration measures are further described below, split up for the separate Bog Restoration Areas (see **Figure 10.7.1**).

#### *Drain blocking*

Damming is the most appropriate response to the artificial drainage of Areas A – L. Wallage (2007)<sup>42</sup> found that drain blocking can be highly effective for improving both carbon storage and upland water quality.

The generally small size of the drains in these areas means that peat dams are likely to be appropriate along most drain lengths. Peat excavated from construction activities can be used to block the drains, subject to suitability/feasibility, supplemented by suitable peat excavated from alongside drains as required. Wave damming (where the sides of the drain are pinched together) can also be employed where the drains are small enough.

Consideration would also be given to the use of plastic or wooden dams on any larger drains, as these have also been demonstrated to have been used successfully in the UK over the last twenty years<sup>37,43</sup>.

Dam frequency is likely to be relatively low because of the gentle gradients across the Bog Restoration Areas, but this, along with the type of dams to be used, would be informed by the drain slope survey and mapping exercise to inform the preparation of the detailed HMP post consent.

Drain blocking work would be undertaken outwith the breeding bird season, or if this is not practical following checks for breeding birds to allow mitigation to avoid disturbance and/or damage to active nests.

#### *Removal of self-seeding trees*

Self-seeding trees are currently present in Bog Restoration Areas A and D, and part of Area M. These shall be removed, and any further regeneration removed on an ongoing basis.

All other Bog Restoration Areas would also be monitored for tree regeneration, and trees removed on an ongoing basis for the duration of the OHMP, as required (see Section 5.9 for further monitoring details).

Removal would be undertaken in a manner which minimises impact on the existing vegetation and peat/soils as far as possible, for example via hand/chainsaw if trees are small enough, or with low ground pressure machinery.

#### *Avoidance of heather cutting / burning*

Heather burning or cutting shall be avoided within all Bog Restoration Areas.

#### *Forest-to-Bog Restoration*

Forest-to-bog restoration is proposed for Bog Restoration Areas M and N.

The following restoration prescriptions are proposed:

- 1) All conifer trees within Bog Restoration Areas M - N would be felled, to promote recovery of the bog habitat. The trees would be felled using the whole timber harvesting method (whereby trees are severed at the stump and the whole trees are then extracted to roadside where they are chipped and delivered to the biomass market). Some trees may be too small to be suitable for whole tree harvesting. These would be felled using either the whole tree harvesting machinery or chainsaws, and the material used to lay into plough furrows to aid ground smoothing (see Prescription 2) or used to create brash mats which would keep machinery “afloat” and help to protect the underlying soils. Tree felling would be undertaken outside of the bird nesting season. Tree felling would be undertaken in accordance with

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<sup>42</sup> Wallage, Z. (2007) *Dissolved organic carbon and colour dynamics in drained and restored blanket peat*. PhD thesis, University of Leeds.

<sup>43</sup> E.g. use of plastic dams at Flanders Moss: Ross, S. and Blackshaw, A. (2022) Monitoring the success of Peatland Action – establishing a baseline condition for vegetation. NatureScot Research Report 1278

Forestry Commission good practice guidelines<sup>44</sup> and relevant SEPA guidance<sup>45</sup>. The guidelines state that the effects of tree harvesting on surface water acidity are difficult to discern when 20% or less of a catchment is felled within any three-year period. The proposed felling represents considerably less than 20% of the relevant catchment and thus it can be expected that acidification of nearby watercourses/waterbodies would not occur because of tree felling. The final specific tree removal/harvesting technique(s) would be confirmed with a specialist site contractor in advance of restoration works.

- 2) To remove the stump/ridge furrow legacy of the conifer plantation, and therefore to re-instate the natural topography of the restoration area, ground smoothing would be undertaken, subject to feasibility. Ground smoothing has been found to be successful in trials at improving water levels<sup>46</sup>. This would involve un-ploughing the ground by overturning tree stumps into existing plough furrows. When combined with tracking by low-ground-pressure machinery, this results in a flattened surface providing protection from erosion. This method has also been shown to be effective in the control of regenerating trees, which were found to fail to survive the treatment, and in the absence of further sources of seed, long-term regeneration was expected to be limited within the trial. Strips of untreated land would be left at intervals within the treated area and at the periphery to act as buffers to help reduce sediment export. Literature<sup>38</sup> encourages undertaking ground smoothing in stages where large areas are involved, to minimise the risk of adverse effects on local water chemistry (particularly dissolved organic carbon, water colour and suspended solids). However, in this instance, due to the relatively small area involved, and the small proportion of the catchment affected, staging of ground smoothing is not considered necessary. To monitor the water chemistry downstream, a surface water monitoring point would be installed at a downstream location. A continuous logger would be installed, which would monitor for turbidity, dissolved oxygen, pH and electrical conductivity. The water chemistry would be monitored for a period before, during and after the tree felling and ground smoothing works to quickly identify any potential issues. In the unlikely event any downstream water quality issues were identified, remedial measures would be employed as appropriate. The location and schedule of the water monitoring and the nature of any remedial measures, if required, would be agreed as part of the detailed CEMP.
- 3) Active drains would be dammed to raise the water level sufficiently to create conditions suitable for the growth of *Sphagnum* mosses. The same methodology would be used as described above for Areas A – L. Precise details of dam type and location would be ascertained following the drain slope profile and mapping exercise.
- 4) Following tree clearance and drain blocking the area would be allowed to revegetate naturally as it is anticipated that there will be a sufficient seed bank available from the existing adjacent bog vegetation. Restoration projects on other afforested sites have had success without using re-seeding/re-vegetation methods<sup>38</sup>, and re-seeding/re-vegetation was only reported to be used in restoration of bare peat areas with significant erosion<sup>37</sup>. Based on the above, there is a high likelihood that the natural regeneration of bog vegetation would be successful. However, this would be monitored and in the unlikely event that the natural regeneration of bog vegetation does not take place within a reasonable timescale, remedial measures will be considered (see Section 5.9.2).

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<sup>44</sup> Forestry Commission (2011) *Forests and water: UK Forestry Standard Guidelines*. Forestry Commission, Edinburgh

<sup>45</sup> SEPA (2014) Use of Trees Cleared to Facilitate Development on Afforested Land. Land Use Planning System SEPA Guidance Note LUPS-GU27, Version 1, 09 April 2014. Joint guidance from SEPA, SNH and FCS

<sup>46</sup> Short, R. and Robson, P. (2016) *An innovative approach to landscape-scale peatland restoration*. CIEEM In-Practice, Issue 93, September 2016.



### *Bog Restoration Areas 3 – 6 (east of the B862 road) – Hag Reprofilling, Gully and Bare Peat Restoration*

Bog Restoration Areas 3 – 6 contain actively eroding features and bare peat with restoration potential (see **Annex 10.7.2** and **10.7.3**). Restoration methods for these areas would be determined in the detailed HMP, and would take into account any new methods available at that time. A Peat Slide Risk Assessment would also be undertaken as part of the development of restoration plans at the detailed HMP stage, given the presence of some peat pipes. A summary of methods likely to be used is provided below:

- Hag reprofilling<sup>47</sup>: Peat hag restoration would most likely involve the reprofilling of peat hags and other eroded banks to create a stable slope angle of approximately 30°, by rolling back the vegetation on the top of the hag, removing the underlying peat to create a stable sloping bank, and then rolling the vegetation back on and compacting to cover the newly profiled slope. For smaller hags, this is all that is likely to be required. In the case of larger hags, additional techniques may also be required, which would potentially involve re-vegetation of bare peat and further actions to provide sufficient stabilisation (see below);
- Gully and bare peat restoration<sup>47</sup>: flow management may be required initially in gully systems and peat pans, to slow the flow of water down. In gullies that have eroded to the mineral layer, stone dams or other specialist solutions may be required, depending on whether there is sufficient peat at the base of gullies. Surface bunds can be used in gullies, using materials such as peat turves, coir logs, wood, peat filled geo-textile sacks, heather bales or mineral. Following flow management, where required, stabilisation and revegetation would then be undertaken. Reprofilling of any gully or peat banks would be undertaken as described above for hag reprofilling. Where reprofilling is not possible, or there are large areas to cover, re-vegetation techniques may be required. This may involve the placing of textiles (such as coco mesh, sisal netting or geo-jute) over brash. Whole turving can also be undertaken to re-vegetate areas of bare peat, by covering with turves from donor sites. Transplanting plugs or propagules, or adding *Sphagnum* fragments onto, bare peat to encourage revegetation on bare peat, can also be considered.
- Any smaller drains present would be blocked as described under the ‘drain blocking’ section above.

#### *Reducing grazing pressure*

Grazing impacts, resulting from high densities of wild deer (and some wild goats), are evident in Bog Restoration Areas A – L (see **Annex 10.7.1** for further details). Therefore deer / goat control shall be undertaken to reduce grazing impacts and allow the vegetation within the Bog Restoration Areas to recover, in tandem with the other restoration methods proposed above. For these areas, grazing control is proposed via reduction culling, rather than fencing. This is considered to be the most suitable approach, as it complements reduction culling being undertaken within the adjacent Ness Woods SAC (as part of the Compensatory Measures Package, detailed in the separate Derogation Report), as well as reduction culling proposed across the full extent of open moorland habitats within the Dell Estate, west of the B862 road (see Figure **10.7.2**), aimed at benefitting the heathland habitat, as well as the blanket bog habitat. Details of deer / goat control across the Bog Restoration Areas and wider open moorland areas are included in Section 5.6.2 and shall be informed by ongoing monitoring (see Section 5.9).

Herbivore impacts were also noted in Bog Restoration Areas 3 – 6 at the eastern end of the estate. In order to protect restoration, deer management measures would be required. Control via deer culling is considered less feasible given the locations of these areas, well away from the main deer / goat management area. Consideration would therefore be given to fencing, to protect restored areas from deer damage.

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<sup>47</sup> <https://www.nature.scot/doc/peatland-action-technical-compendium> [Accessed in November 2023]

## Control Area

Control plots of good condition blanket bog that the habitats within the Bog Restoration Areas could reasonably be expected to revert to following drain blocking should be identified within Dell Estate and monitored to aid in monitoring bog restoration success and the setting of site-specific vegetation targets for bog habitats (e.g., % cover of *Sphagnum* etc.), along with identifying any possible changes in condition due to external factors.

### 5.6.2 Heathland Management

#### Bracken control

Areas preliminarily identified for bracken control are shown on **Figure 10.7.2**, totalling c. 23.0 ha. In addition, bracken areas within the working corridor reinstatement area, would be restored back to heathland following construction, via bracken control (to control any re-establishing bracken after reinstatement), totalling c. 6.6 ha (see Section 5.6.7).

This management measure aims to restore these areas back to heathland habitat, of higher ecological value. The areas proposed for bracken control encompass bracken stands situated within surrounding heathland habitat, or areas of heathland with heavy bracken coverage, across the Site. It is considered a reasonable assumption that these areas have heathland restoration potential, given the presence of the existing surrounding heathland habitat.

Asulam, a herbicide most commonly historically used for bracken control, is not currently authorised for use in Scotland<sup>48,49</sup>. If Asulam or another suitable herbicide is authorised for use in Scotland at the time of HMP implementation, then this control method can be used. Non-chemical approaches to control of bracken such as cutting shall be required if a suitable herbicide is not readily available. Non-chemical methods have been found to be effective at controlling bracken in heathland restoration<sup>50</sup>.

The approach to bracken control would follow best practice<sup>51</sup> and would be set out in the detailed HMP, taking into consideration availability of appropriate herbicides at that time, and would be agreed in consultation with key stakeholders including NatureScot. Care would be taken if herbicides are to be used near watercourses. Follow-up treatment and aftercare will be required, to ensure bracken continues to be suppressed, with the treatment programme required dependent upon bracken recovery rates, determined by monitoring.

It is expected that heather and associated flora would naturally regenerate following bracken control, from the existing seed bank. However, if this is not the case, such as within patches of particularly dense bracken (as determined through monitoring), then remedial action would be undertaken, such as re-seeding or spreading heather brush, to increase the speed of the recolonisation of heath vegetation (see Section 5.9).

#### Reducing grazing pressure

Current deer grazing/browsing levels are reasonably high within the Dell Estate, which is evident from vegetation herbivore effects. Feral goats are also known to occur, primarily within Ness Woods SAC. No formal deer management plan is in place for the areas of the Dell Estate which fall within this OHMP, therefore detailed information on current deer densities is not available. However, sika deer (*Cervus nippon*), red deer (*Cervus*

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<sup>48</sup> <https://www.brackencontrol.co.uk/>

<sup>49</sup> <https://www.webarchive.org.uk/wayback/archive/20220726135114/https://www.nature.scot/doc/bracken-control-guide-best-practice>

<sup>50</sup> Marrs R.H., Lowday J.E., Jarvis L., Gough M.W. & Rowland A.P. (1992) Control of bracken and restoration of heathland. IV. Effects of bracken control and heathland restoration treatments on nutrient distribution and soil chemistry. *Journal of Applied Ecology*, 29, 218-225

<sup>51</sup> SEARS (2008) Bracken control: A Guide to Best Practice. Available online: [https://www.webarchive.org.uk/wayback/archive/20210721104123mp\\_/https://www.nature.scot/sites/default/files/Publication%20008%20-%20Bracken%20Control%20-%20A%20Guide%20to%20Best%20Practice.pdf](https://www.webarchive.org.uk/wayback/archive/20210721104123mp_/https://www.nature.scot/sites/default/files/Publication%20008%20-%20Bracken%20Control%20-%20A%20Guide%20to%20Best%20Practice.pdf) [Accessed in September 2023]

*elaphus*) and roe deer (*Capreolus capreolus*) are known to be present on the estate, and deer stalking is undertaken, with approximately 200+ deer shot annually.

Culling is proposed to reduce deer densities, eradicate feral goats, and allow vegetation to regenerate. As described in Section 5.6.1, this approach complements reduction culling proposed within the adjacent Ness Woods SAC (as part of the Compensatory Measures Package detailed in the separate Derogation Report).

The area proposed for deer (and goat) control is shown in **Figure 10.7.2** and encompasses all retained and re-instated unenclosed moorland habitat within the Site and wider Dell Estate (heathland, bog, unimproved acid grassland and bracken habitats, along with some scattered trees and broadleaved woodland), to the west of the B862 road. This area totals c. 516 ha, and includes approximately 260 ha<sup>52</sup> of retained heathland, as well as the Bog Restoration Areas described in Section 5.6.1.

NatureScot advise that deer densities of <3-5 deer/km<sup>2</sup> may be appropriate for blanket bog sites, while <8-12 deer/km<sup>2</sup> may be appropriate for some less susceptible moorland habitats, but that the actual numbers a particular site can sustain without damage will depend on a range of factors including habitats, soils, altitude, and other land uses in the area<sup>53</sup>. NatureScot advise that monitoring over time may be required to find the site's real carrying capacity<sup>43</sup>. Long-term management should be based on assessment both of actual impacts and apparent density of deer<sup>54</sup>.

Detailed deer/goat culling methodologies would be provided in the detailed HMP post-consent, in consultation with the HMP working group. Deer management activities shall abide by the Code of Practice on Deer Management<sup>55</sup>. The broad proposed approach is summarised below:

- Undertake a count of the deer and goat populations across the Dell Estate deer/goat control area (see **Figure 10.7.2**) using direct observation counting. Details of the most suitable method would be provided in the detailed HMP and are likely to involve counting using thermal imaging cameras.
- Agree the scale of a reduction cull in consultation with the HMP working group. It is proposed that a density of <3 - 5 deer per km<sup>2</sup> shall be targeted, in order to provide optimal densities for the most sensitive habitats within the deer/goat control area, and to encourage rapid habitat recovery in re-instated and restored areas, by heavily reducing grazing of new growth, which has a short growing season and is otherwise likely to be preferentially grazed by deer.
- Undertake a reduction cull for deer and an elimination cull for feral goats. Regular, heavy culling is likely to be necessary initially.
- Continue to eliminate feral goats and maintain the target lower density of deer long-term across the deer/goat control area through stalking; with the numbers of deer to be targeted (culling intensity) to be determined through ongoing monitoring.
- Monitor levels of habitat herbivore impact (using Habitat Impact Assessment<sup>56</sup>, see Section 5.9.2 for monitoring details) and determine whether the deer densities and culling intensity requires adjustment to achieve low herbivore impact, based on monitoring results.

### *Removal of self-sown trees*

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<sup>52</sup> The estimate of the extent of heathland habitat within the proposed deer / goat control area (see Figure 10.7.2) has been calculated using the existing habitat survey information within the EIA Survey Area, along with a review of aerial imagery for areas to the north and south of the existing Survey Area. Baseline monitoring shall be undertaken prior to the proposed management measures, in order to record the baseline habitat extends across the full areas covered by this OHMP (see Section 5.9.2).

<sup>53</sup> Scottish Natural Heritage (2016) *Planning for development: What to consider and include in deer assessments and management at development sites. Version 2*. March 2016.

<sup>54</sup> Putman, R., Longbein, J., Green, P., Watson, P. (2011) *Identifying threshold densities for wild deer in the UK above which negative impacts can occur*. Mammal Review.

<sup>55</sup> Scottish Natural Heritage (2012) Code of Practice on Deer Management. Retrieved from <https://www.nature.scot/professional-advice/land-and-sea-management/managing-wildlife/managing-deer/code-practice-deer-management> [Accessed in September 2023]

<sup>56</sup> <https://bestpracticeguides.org.uk/> [Accessed in September 2023]

Some areas of existing heathland are being invaded by self-sown exotic conifer species, primarily in areas surrounding Whitebridge Plantation. Self-sown exotic conifers shall be removed, and all heathland management areas would be monitored for regeneration, and further regeneration removed on an ongoing basis (see Section 5.9 for monitoring details).

Removal would be undertaken in a manner which minimises impact on the existing vegetation and soils as far as possible, for example via hand/chainsaw if trees are small enough, or with low ground pressure machinery.

### 5.6.3 Native Woodland Creation

Native woodland creation proposals are detailed in a separate Woodland Management Plan<sup>57</sup> document. The native compensatory woodland creation proposals are illustrated in **Figure 10.7.3** and summarised below<sup>58</sup>.

A total of 63.1 ha of native woodland is proposed, including 15% designed open ground, across six separate enclosures (CP1 – CP6). The largest enclosure (CP1, extending for 51.0 ha) is proposed around the slopes of Meall na Targaid and Tom a Chliabhain. Enclosures CP2-6 (extending for 12.1 ha) are proposed around the new inundation level of Loch Kemp.

Enclosures CP2 – 4 have been created in 2023, pre-application, with the aim of enabling early woodland establishment to minimise the visual impact of the loss of woodland around Loch Kemp and are treated as advanced compensatory planting. The existing semi-natural broadleaved woodland around Loch Kemp provides an existing seed source close to areas CP2 – 4 and enclosing these areas at an early stage will allow this seed source to be utilised prior to its removal in the event of the Project being consented. Enclosures CP5 – 6 would be created post-construction, as they partially fall within the construction footprint/working corridor, and the final design would be subject to a post-construction survey. CP1 would be created pre-construction.

Natural regeneration is expected to be the principal method of achieving compensatory woodland creation in areas CP2 – 4. Deer fencing has been erected around these areas, and with an existing semi-natural woodland seed source nearby, regeneration of birch is anticipated along with rowan and willow. The target stocking density for naturally regenerated areas is 400 trees/ha by Year 5. This reflects the requirement of the Scottish Government's Forestry Grant Scheme option for New Natural Regeneration. Monitoring (see Section 5.9) would be carried out to assess the extent of semi natural woodland regeneration in relation to target densities and an appropriate enrichment planting plan prepared for implementation following consent if target densities have not been achieved.

Natural regeneration is also the preferred means of establishing new woodland in Areas CP 5 and 6. However as this work is post construction and some establishment will be required on reinstated ground, the appropriate establishment method will be reviewed post construction and planting will be carried out if deemed necessary.

Planting is proposed in enclosure CP1, which would be carried out following Forestry Commission guidance<sup>59</sup>. Ground preparation would be hinge mounding carried out by a tracked excavator. An average density of 1600/ha across the site would be targeted, with densities varying to reflect site conditions, such as within or near wet flushes, where a lower density is a more realistic replication of woodland grading into wetland, or around the open areas next to crags. There will be no drainage works carried out and relevant guidance<sup>60</sup> would be adhered to.

The following species composition is proposed:

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<sup>57</sup> EIA Volume 4, Appendix 19.2: Loch Kemp Pump Storage Project. Woodland Management Plan.

<sup>58</sup> Re-stocking of the commercial forestry is not included in this OHMP and is instead detailed in the separate Woodland Management Plan document.

<sup>59</sup> Rodwell, J. & Patterson, G. (1994) Creating New Woodlands. Forestry Commission Bulletin 112. HMSO, London, xii + 82pp.

<sup>60</sup> FCS, SEPA, SNH & Confor (2018) Practice Guide for Forest managers to Assess and Protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation.

Caledonian Scots pine (*Pinus sylvestris*) (35%); downy birch (*Betula pubescens*) (25%); goat willow (*Salix caprea*) (7.5%); rowan (*Sorbus aucuparia*) (7.5%); sessile oak (*Quercus petraea*) (5%); alder (*Alnus glutinosa*) (5%); gean (*Prunus avium*) (5%); bird cherry (*Prunus padus*) (2.5%); aspen (*Populus tremuloides*) (2.5%); juniper (*Juniperus communis*) (2.5%) and eared willow (*Salix aurita*) (2.5%).

The enclosures would be protected by perimeter fencing to exclude deer. Fences would be marked as per Forestry Commission guidance to reduce grouse collisions<sup>61</sup>.

During establishment maintenance works including weeding and beating up may be required, this will be informed by monitoring (see Sections 5.8 and 5.9). Full details of aftercare and management would be provided in the detailed HMP.

#### 5.6.4 Lichen Translocation

The rocky shore lichen assemblage on the shoreline of Loch Kemp is likely to be lost over time due to the rapid filling and emptying hydrological regime because of the Proposed Development. Similarly, some of the moorland lichen assemblage surrounding Loch Kemp is also expected to be lost due to inundation.

Uncertainty exists over the likely success and feasibility of lichen translocation in this situation. Lichen translocation, using a range of methods, is known to be successful (defined as the transplanted material setting a self-sustaining population) in some situations<sup>62</sup>, with microhabitat being a critical determinant of survival, although long-term research is lacking, and short-term studies have mostly focussed on a small sample of species, primarily foliose lichens such as *Lobaria pulmonaria*.

Translocation of the Loch Kemp rocky shore lichens of high value may not be feasible for many of the specimens, as some are attached to large outcrops which would be difficult to remove in pieces of suitable sizes. It may be feasible to translocate the smaller boulders, supporting *Poina interjungens*. Translocation to the outer edge of Loch Kemp inundation zone is unlikely to provide the required microclimatic conditions due to the frequent emptying/re-filling regime and is therefore not proposed. However, translocating to rocky shore locations within the surrounding lochs (such as Lochan a Choin Uire, Loch Paiteag, Lochan a Mhonaich, Lochan nan Nighean and Lochan Scristan) may be feasible, if the microclimatic conditions are suitable.

Translocation of the moorland lichens of high value is likely to have higher feasibility, which could be removed as plugs and 'plugged in' to similar retained heathland within the wider Site, if the microclimatic conditions are suitable.

An investigation into the feasibility of lichen translocation would be undertaken by an appropriately experienced lichenologist to inform the preparation of the detailed HMP, post-consent. Where deemed to be feasible, lichen translocation would be attempted, with the methodology, implementation and monitoring overseen by an appropriately experienced lichenologist. A lichen translocation methodology would be included in the detailed HMP.

#### 5.6.5 Watercourse Habitat Improvements for Fish

Fish passage would be improved by opening up the channel on the Allt Paiteag between Loch Cluanie and the limit of maximum inundation (see **Figure 10.7.4**). This would allow brown trout access to the upper reaches of the Allt Paiteag where spawning may take place. Spawning habitat would be improved in the upper reaches by the addition of gravel sized sediment, and in-stream habitat would be improved by the addition of boulder sized sediment, providing cover for fish.

<sup>61</sup> Forestry Commission (2012) Fence Marking to Reduce Grouse Collisions

<sup>62</sup> Steele, B. (2021) A Systematic Review of Translocation Methods in Lichens. Royal Botanic Gardens Edinburgh & The University of Edinburgh

The detailed methodology would be provided in the detailed HMP, post-consent.

### 5.6.6 Boxes and Other Species-Specific Habitat Features

The following species-specific habitat features shall be installed, to provide species-specific compensation and enhancement (see **Figure 10.7.4**). Box and habitat features shall be sited, and their installation overseen, by a suitably experienced ecologist. Details of the compensatory habitat features that provide mitigation for the loss of protected species resting places shall be agreed with NatureScot, as part of the protected species licencing process (see **Volume 1, Chapter 10: Terrestrial Ecology** of the EIA Report for further details). Specific locations for boxes / other habitat features shall be identified and agreed within the detailed HMP.

#### *Pine Marten*

Two pine marten boxes shall be erected on mature trees within undisturbed areas of retained broadleaved woodland. The boxes shall provide compensatory habitat for pine marten, whilst replacement woodland creation matures.

#### *Bats*

A total of 30 bat boxes shall be installed on mature trees in retained broadleaved woodland. The specifications would include at least five boxes suitable for maternity colonies, at least five boxes suitable for hibernating bats, with the remaining suitable for typical summer roosts. The box specifications shall be suitable for crevice-dwelling species known to occur locally including pipistrelles (*Pipistrellus spp.*) and brown long-eared bat (*Plecotus auritus*). Eight of these boxes would comprise compensation for the potential loss of up to eight trees with Potential Roosting Features (PRFs) including one confirmed bat roost. The remaining 22 boxes shall comprise an enhancement for roosting bats.

#### *Red squirrel*

A total of 20 red squirrel boxes shall be installed on mature trees within retained broadleaved woodland. Six of these boxes comprise compensatory habitat (to compensate for the loss of one confirmed drey, and the loss of woodland habitat), whilst replacement woodland creation matures. The remaining 14 boxes comprise an enhancement for red squirrel.

#### *Otter*

Two otter holts shall be re-created, to compensate for the loss of two (non-breeding) otter holts. Otter holt creation shall be overseen by a suitably experienced and otter licenced ecologist, under a development licence from NatureScot. The exact method and location would be agreed with NatureScot, however the aim would be to re-create the lost otter holts on a like-for-like basis, using the same material if possible, in order to encourage occupation of the re-created holt features, using scent. The holts would be located in undisturbed areas of retained broadleaved woodland in close proximity to watercourses/waterbodies, situated at least 200 m away from the working corridor, to minimise long-term disturbance.

#### *Reptiles*

Four reptile hibernacula shall be constructed to compensate for the loss of reptile habitat. The design features would follow those detailed in the Reptile Habitat Management Handbook<sup>63</sup>. The hibernacula would be located in dry heath areas on the southern margins of retained and new woodland areas, away from areas with potential to flood or become waterlogged. Materials won during habitat clearance should be used for the construction of the hibernacula where possible.

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<sup>63</sup> Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth

### *Bird boxes*

A total of 30 bird nest boxes shall be installed. These boxes would comprise alternative nesting habitat whilst replacement woodland creation matures, and would provide enhancement for nesting passerine species in the long-term. Two of these boxes would be suitable for barn owl. Barn owl box locations would be determined through landowner consultation, with agreed positions provided in the detailed HMP. Barn owl boxes would be installed in suitable buildings if available, or alternatively on retained mature trees. The remainder of the bird boxes would be installed across retained native woodland.

### *Coarse woody debris*

Coarse woody debris (CWD) would be submerged around loch shoreline areas and secured in place to create new habitats for loch macroinvertebrates. Broadleaved trees removed during the construction of the Proposed Development can be reused for this purpose. This would also provide an added benefit for fish. Areas for CWD submersion would be confirmed in the final HMP, and would comprise retained lochs/lochans which are not subject to rapid water level changes, such as Lochan a Choin Uire, Loch Paiteag, Lochan a Mhonaich, Lochan nan Nighean and Lochan Scristan.

### *Log piles*

Log piles shall be created using logs and brash from tree felling activities during construction. Log piles shall be situated within and on the margins of retained and newly created woodland areas, facing a range of aspects, to create a mixture of sunny and shady conditions. The log piles should provide habitat for a range of invertebrates and herpetofauna.

## **5.6.7 Habitat Reinstatement**

Reinstatement of areas subject to temporary disturbance/damage during construction (i.e., within the working corridor, but beyond the permanent infrastructure or inundation areas, see **Figure 10.7.2**) will be undertaken as soon as reasonably practical once construction has ceased. Prompt implementation of reinstatement measures would aim to reduce the effects of compaction of subsoil (which can lead to inhibited drainage and root growth), and exposed ground (which can cause loss of topsoil, dust and water pollution through wind blow and erosion). Prompt reinstatement would also help to ensure integrity of the vegetation seed bank is maintained.

Planned reinstatement will be informed by further consultation with stakeholders, pre-construction surveys and site conditions. Reinstatement details shall be included and confirmed in the CEMP and detailed HMP, post consent. Reinstatement is likely to comprise the following considerations and measures:

- Temporary working areas will be reinstated to their original condition and returned to their previous use, usually within the autumn following the construction phase;
- Excavated materials would be stored according to good practice taking care to separate turves, topsoils, soils and peat layers;
- Reinstatement would ensure that soils are carefully replaced in the correct soil profile, and that turves are replaced on the surface;
- Where compaction may have occurred a 'sub-soiler', which lifts and shatters the subsoil will be used before the topsoil is reinstated, if necessary;
- Stripped soil will be reinstated as close to where it was removed as possible; and
- Reinstatement works would be undertaken in suitable weather conditions, avoiding very wet conditions or very hot, dry and windy conditions, if possible.

Natural regeneration of habitats will be promoted as advised by the Ecological Clerk of Works (ECoW).

Away from the commercial forestry areas<sup>64</sup>, the majority of the areas within the temporary working corridor to be re-instated currently comprise heathland and bracken habitat.

Once construction has finished and the soils and turves have been replaced in the correct profile, it is expected that heathland vegetation shall be allowed to naturally re-generate from the seed bank within the soil and seeds from the turves and adjacent vegetation. The re-establishment of heathland involves the development of ericoid dwarf shrub dominance which then creates a micro-climate suitable for establishing and maintaining heathland vegetation<sup>65</sup>. Heather seeds have long longevity (up to 70 years in some situations), and therefore there should be a good viable seed source within the soil. On this basis, there is a high likelihood that the natural regeneration of heathland vegetation would be successful. However, this would be monitored and in the unlikely event that natural regeneration of heathland vegetation is unsuccessful within a reasonable timescale, then remedial measures will be considered, such as seeding, spreading heather brush, or using donor turves (see Section 5.9.2).

Areas of bracken amongst the heathland shall be targeted for restoration to heathland habitat, to increase their ecological value from baseline conditions. Bracken control would be undertaken for any regenerating bracken in these areas, as detailed under Section 5.6.2.

The above works are expected to result in the reinstatement or restoration of the following habitat areas (totalling 30.4 ha):

- 19.2 ha of dry dwarf shrub heath;
- 4.3 ha of wet dwarf shrub heath;
- 6.6 ha of former bracken restored to dry dwarf shrub heath; and
- 0.3 ha of unimproved acid grassland.

## 5.7 External Factors

It is important to note that external factors such as climate change can influence habitat restoration success. Over the lifetime of the OHMP it is possible that climate change will affect the habitats on site and in the surrounding area. This should be taken into account during monitoring and reporting, including monitoring of control areas (see Section 5.9.1). This may lead to restoration objectives being beyond the developer's control.

## 5.8 Ongoing Management and Maintenance

The requirement for ongoing management and maintenance will be determined based on monitoring results (see Section 5.9). Requirements are likely to include:

- Bog Restoration Areas:
  - Repair of any dams that are eroded or otherwise damaged, as required, subject to the outcome of monitoring, and repair / replacement of any dislodged geotextiles or pegs used in bare peat restoration (see Section 5.9.4).
- Heathland Restoration/Management Areas:
  - Additional treatments of bracken in bracken control areas.
- Bog and Heathland Restoration/Management Areas:
  - Ongoing deer/goat control, with ongoing culling intensity informed by Habitat Impact Assessment and botanical monitoring (see Section 5.9.2); and
  - Removing re-growth of self-seeding trees (the frequency at which the trees would need to be removed would be subject to the speed of regeneration and would be determined following monitoring, see Section 5.9).

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<sup>64</sup> Which shall be re-instated via re-stocking, as detailed in the separate Woodland Management Plan document.

<sup>65</sup> Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland and Historic Environment Scotland (2015) Good Practice during Wind Farm Construction. Version 3.



- Native Woodland Creation and Planting Areas:
  - Weeding, watering or beating up of trees in the tree planting areas, as required during establishment, informed by monitoring (see Section 5.9.5).
- Boxes and other species-specific habitat features:
  - Replacing any damaged or missing boxes and habitat features.

Further remedial action may be required if monitoring indicates that the aims and objectives are not being met, as detailed in Section 5.9.

## 5.9 Monitoring and Review

All monitoring would be undertaken by suitably qualified and experienced ecologists and hydrologists.

### 5.9.1 Aims

The purpose of the proposed monitoring is twofold. First it would aim to document the development of habitats within the HMP areas, which would determine the extent to which the overall aims and objectives of the HMP are being met. Secondly, it would inform the need for ongoing adaptive management and remedial action.

Monitoring would record the following indicators, as appropriate, to monitor progress towards achieving the OHMP aims and objectives:

- Condition of restored or created habitats, including bracken and tree cover, and herbivore impacts;
- Water table;
- Tree growth and survival;
- Translocated lichen survival and growth; and
- Uptake and functionality of boxes and other species-specific habitat features.

### 5.9.2 Botanical Monitoring: Blanket Bog and Heathland HMP areas

#### *Drone survey*

A drone survey or other aerial photography survey would be undertaken of the HMP areas, to document the baseline and monitor vegetation changes using drone-captured high-resolution aerial images. This survey technique would first be undertaken prior to restoration measures (and in the case of Areas M-N, following tree felling but prior to other restoration measures). This would then be undertaken in Year 5 after completion of the initial restoration measures, and repeated every five years after, until at least Year 20, with the frequency of further monitoring determined in Year 20. The drone surveys would be undertaken during summer, at a similar time of year each year, to allow for comparison of the captured aerial photographs to be undertaken to establish if, and to what extent, restoration of the target vegetation has taken place. The survey would also be used to monitor bracken and tree regeneration extent.

The survey would be supported by ground-based botanical monitoring. The methods of botanical monitoring would be detailed in the HMP and would be bespoke to allow for the specific monitoring against the HMP objectives. The likely methodologies are summarised below:

#### *Common Standards Monitoring*

The botanical monitoring for bog and heathland areas is likely to be based on the Common Standards Monitoring (CSM) protocol for upland habitats<sup>66</sup>, which assesses habitat condition.

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<sup>66</sup> Joint Nature Conservation Committee (2005) *Common Standards Monitoring Guidance for Upland Habitats*. Version May 2005. Joint Nature Conservation Committee, Peterborough.

CSM provides a detailed insight into the changes in vegetation and some abiotic factors that pick-up trends in vegetation changes that are valuable to understanding the progress of habitat restoration and management works and informing further management. CSM is designed to assess whether features (e.g., habitats) are in favourable or unfavourable condition and whether condition is being maintained, recovering, or declining over time. The assessment is based on habitat-specific criteria involving key indicator species and vegetation structure.

CSM would be undertaken in the Bog Restoration Areas and bog restoration control sites to assess the progress of restoration techniques implemented. CSM would also be undertaken in heathland areas within the HMP management areas, monitoring the change in habitat condition driven by the restoration and management actions.

The thresholds in CSM that delineate habitats in favourable condition from those in unfavourable condition were designed to equate to the minimum standard for SSSI site selection<sup>67</sup>. The objective of this HMP is to improve habitat condition compared to baseline condition, not to meet the minimum standard for SSSI site selection. The threshold conditions would therefore be adjusted accordingly following the first round of CSM data collection. CSM targets would then be updated for this site in the next HMP revision.

CSM transect lines would be set up in Bog Restoration Areas to give coverage of each restoration area. Transects would also be set up within the bog control areas, and the heathland habitats within the heathland restoration/management area. Grid references would be recorded to allow re-location on return monitoring visits. Quadrat sampling along the transect lines would use 2 m x 2 m quadrats.

The criteria used to assess the data from each quadrat would depend on the vegetation community within the quadrat. CSM guidance provides a list of which NVC communities compose each of the broader habitat types that CSM relates to. Therefore, the surveyor would record the NVC community for each quadrat to make sure that it is assessed using the correct criteria.

#### *Peatland Condition*

Bog Restoration Areas would also be monitored for Peatland Condition, using criteria within NatureScot's Peatland Action Peatland Condition Assessment Guide<sup>68</sup>, with the Bog Restoration Areas being classified as in 'near-natural, modified, drained or actively eroding' condition. A condition of 'near-natural' would be targeted for Bog Restoration Areas. This assessment would be undertaken alongside the CSM monitoring, following the same programme.

#### *Herbivore Impact Assessment*

Monitoring would assess the impacts of grazing/browsing across the HMP areas. The assessment would follow the Best Practice Guides Habitat Impact Assessment<sup>69</sup> method for assessing deer impacts, for dwarf shrub heath and blanket bog. The assessment should be undertaken at representative sample locations across the site, in the same locations as the CSM monitoring so that these surveys can be undertaken at the same time. A Habitat Impact Assessment would be undertaken within each CSM quadrat, and within the area surrounding each CSM quadrat where the assessment calls for a larger sample area. A reduction in deer impacts over time is targeted, with 'light' impacts in relation to browsing and trampling targeted using the methodology.

#### *Bracken and self-sown trees*

Within bracken control areas, notes would be taken on the % cover of bracken and its health.

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<sup>67</sup> JNCC (2004) Common Standards Monitoring Guidance for Habitats. Peterborough: Joint Nature Conservation Committee  
<sup>68</sup> <https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf> [Accessed in September 2023]

<sup>69</sup> <https://bestpracticeguides.org.uk/statutory-guides/deer-impacts/> [Accessed in October 2023]

The regeneration of self-sown trees shall be monitored in tandem with the botanical monitoring, covering the full HMP area, to inform the frequency at which self-seeded trees would require removal.

#### *Monitoring programme*

Botanical monitoring would be undertaken during the optimal survey period for plant species (May – August inclusive). As with the drone survey, the botanical monitoring would be undertaken during the summer prior to restoration measures (and in the case of Areas M-N, following tree felling but prior to other restoration measures), to provide a baseline. Further monitoring of the HMP areas (to assess changes to the baseline) would then take place in the first year following restoration, and repeated every five years thereafter, until at least Year 20, with the frequency of further monitoring determined in Year 20.

#### *Remedial action*

Should the botanical monitoring find that target conditions, and therefore the aims and objectives of the HMP are not being met, then remedial action would be employed, and the HMP updated accordingly, in consultation with the HMP Working Group.

Remedial actions would be dependent on the habitat and nature of aim/objective not being met. Possible remediation measures could include:

- If ericoid dwarf shrub cover is not developing or recovering as expected, then remedial action such as heather brash spreading or seeding would be explored;
- If bog plants are not successfully regenerating in Bog Restoration Areas as expected, then consideration of using re-seeding/re-vegetation techniques would be explored;
- If herbivore impacts are found to continue to be moderate or high, then grazing/browsing control would be adjusted to further reduce densities and culling intensity;
- If bracken persists within bracken control areas, then repeat treatment and aftercare would continue as required, or alternative treatments tried, to suppress bracken growth for the period of this HMP.

### **5.9.3 Monitoring of Water Table Height: Bog Restoration Areas**

Monitoring of water table height would take place by the installation and monitoring of hand-driven dipwells (or a similar method for monitoring water table levels) within the Bog Restoration Areas. If feasible, dipwells would be installed prior to drain blocking, to provide a baseline. The location and density of dipwells would be determined within the detailed HMP.

Unless the water table monitoring method selected allows for continuous data logging at set intervals, quarterly monitoring of dipwells should be undertaken in each monitoring year, to measure water levels and assess if they are high enough to promote bog vegetation growth.

Dipwell monitoring would be undertaken prior to the bog restoration works to provide a baseline, as well as in the first year and fifth year following restoration, with the need for further monitoring determined in year five, depending on monitoring results.

### **5.9.4 Drain Blocking Checks: Bog Restoration Areas**

For the bog restoration to be successful the dams / bunds of drains / gullies that are created during the restoration process need to remain effective. During drain / gully blocking, all the dam / bund locations should be recorded.

In the first two monitoring years all the dam / bund locations should be checked for signs of effectiveness, damage and requirements for maintenance. In subsequent monitoring years, especially if dam / bund performance has been good with little maintenance requirement, then it may be appropriate to spot check only a proportion of dam locations.

### **5.9.5 Monitoring of newly created woodland**

As detailed in the separate Woodland Management Plan document, a suitably experienced Forest Manager, would inspect the implementation of the native woodland creation. Reviews would be at regular intervals (year 1, 5 and 10) to ensure that the trees are planted correctly, maintained to the required standard, and ultimately established into woodland.

### **5.9.6 Monitoring of translocated lichens**

Subject to the findings of the feasibility study of rocky shore and moorland lichen translocation, a monitoring programme would be devised to monitor the effectiveness of any lichen translocations undertaken. The monitoring programme would be devised by a suitably experienced lichenologist and provided in the detailed HMP. The monitoring would aim to determine the effectiveness of the lichen translocation, in terms of growth and survival.

### **5.9.7 Monitoring of Boxes and Other Species-Specific Habitat Features**

The boxes and other habitat features (listed in Section 5.6.6) shall require a regime of inspection, such that damaged features can be identified, fixed, or replaced. The precise details will be developed and contained within the final HMP.

### **5.9.8 Report and Review**

Monitoring results would be reported annually (in years when monitoring takes place) and recommendations made for changes to management prescriptions if objectives are not being met, as appropriate. As such, the HMP shall be a live document, such that it can be altered following monitoring results, unexpected events or evolving guidance. Any amendments to the HMP because of the outcome of monitoring would be agreed with the HMP Working Group in advance of any such revised prescriptions being implemented (see Section 4.0).

## 6.0 Indicative Programme

An indicative programme for the implementation of management and monitoring works set out in this OHMP is provided in Table 6-1.

A more detailed programme would be provided in the detailed HMP, post consent.

**Table 6-1: OHMP Outline Schedule of Works**

Task	Post FID <sup>70</sup> / Pre-construction	Construction	Post-Construction									
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Beyond Year 20	
<b>Enabling Tasks</b>												
Formation of HMP working group												
Detailed HMP Preparation and Finalisation												
Drain mapping/slope surveys for dams in Bog Restoration Areas												
Dipwell installation in Bog Restoration Areas												
<b>Capital Works</b>												
Bog Restoration: Drain blocking / hag reprofiling / gully and bare peat restoration												
Forest-to-Bog Restoration: tree felling, ground smoothing, drain blocking												
Bracken control												

<sup>70</sup> Financial Investment Decision

Task	Post FID <sup>70</sup> / Pre-construction	Construction	Post-Construction									
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Beyond Year 20	
Deer/goat control												Ongoing for lifetime of the project
Removal of self-sown trees (Bog and Heathland Restoration / Management Areas)			Tree clearance frequency determined by rate of re-growth and monitoring results.									
Watercourse Enhancements for Fish												
Woodland Creation												
Woodland creation aftercare and review period												
Lichen translocation												
Create species-specific features: pine marten boxes, red squirrel boxes, bat boxes, bird boxes, otter holts, reptile hibernacula, log piles, submerged coarse woody debris in aquatic habitat.												
Re-instatement of habitats within temporary construction corridors												
On-going adaptive management and maintenance												

Task	Post FID <sup>70</sup> / Pre-construction	Construction	Post-Construction									
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Beyond Year 20	
<b>Monitoring &amp; Associated Reporting</b>												
Drone Survey												Requirement for further monitoring to be determined by monitoring results in Year 20
Botanical monitoring surveys												
Drain Blocking Checks												
Dipwell monitoring												
Monitoring new woodland establishment												
Monitoring translocated lichens												Requirement for further monitoring to be determined by monitoring results in Year 20
Monitoring functionality of boxes / species-specific habitat features												
<b>HMP Review and Adaptation</b>												



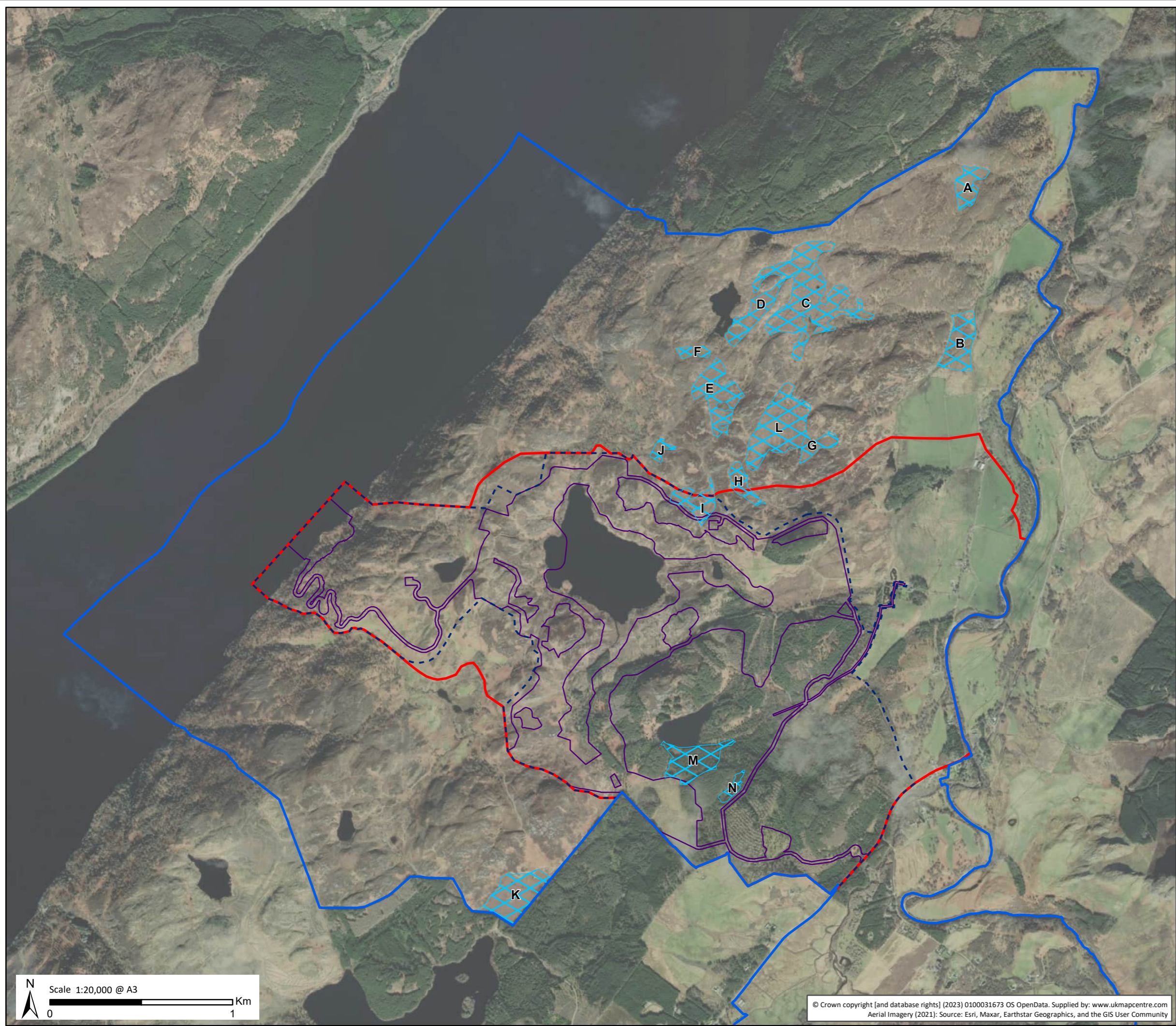
Task	Post FID <sup>70</sup> / Pre-construction	Construction	Post-Construction										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Beyond 20	Year	
HMP review and updates			Undertake					Undertake	Undertake	Undertake	Undertake	Every five years for lifetime of project	five for of
Ongoing adaptive management via agreement with HMP working group			Undertake					Undertake	Undertake	Undertake	Undertake		

Table key:

	<i>Undertake</i>
	<i>If required</i>

## FIGURE 10.7.1

### Proposed Bog Restoration Areas



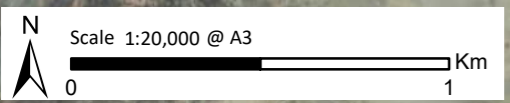
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- Site Boundary
  - Dell Estate Boundary
  - Development Area
  - Working Corridor
  - Bog Restoration Area



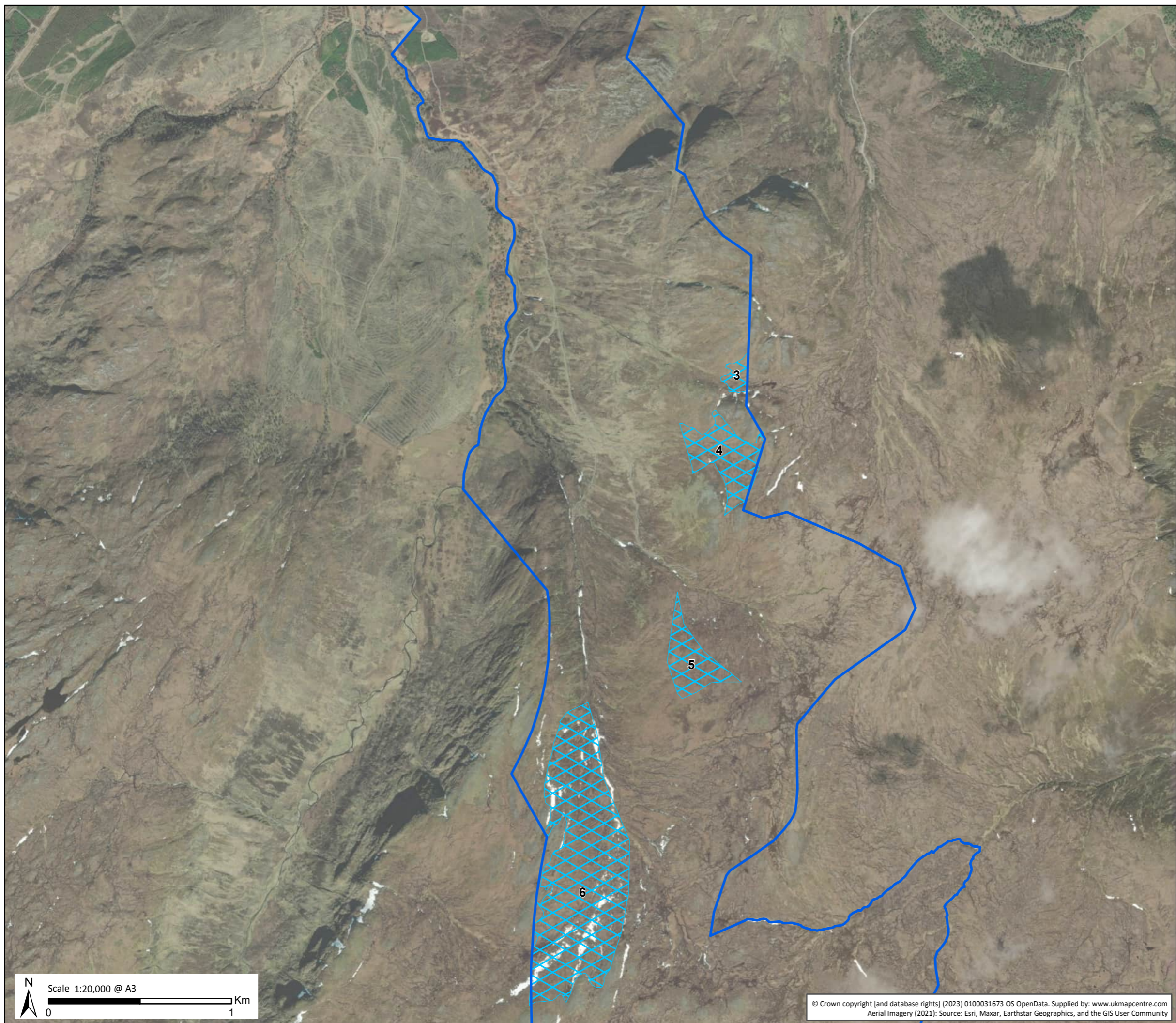
**Loch Kemp  
Pumped Storage Scheme  
Ecology**

**Figure 10.7.1  
Proposed Bog Restoration Areas  
Page 1**

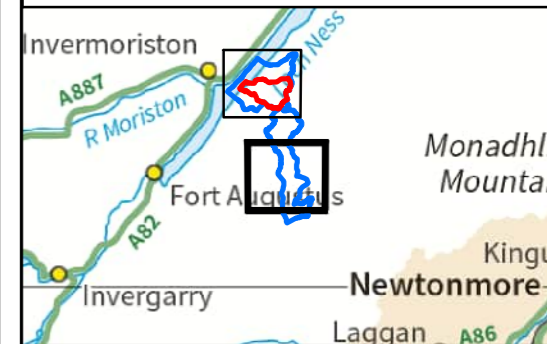
Drawn by: CN Date: 13/11/23  
Drawing: 04707.00036.00037.0



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- Key**
-  Dell Estate Boundary
  -  Bog Restoration Area



**Loch Kemp  
Pumped Storage Scheme  
Ecology**

**Figure 10.7.1  
Proposed Bog Restoration Areas  
Page 2**

Drawn by: CN Date: 13/11/23  
Drawing: 04707.00036.00037.0

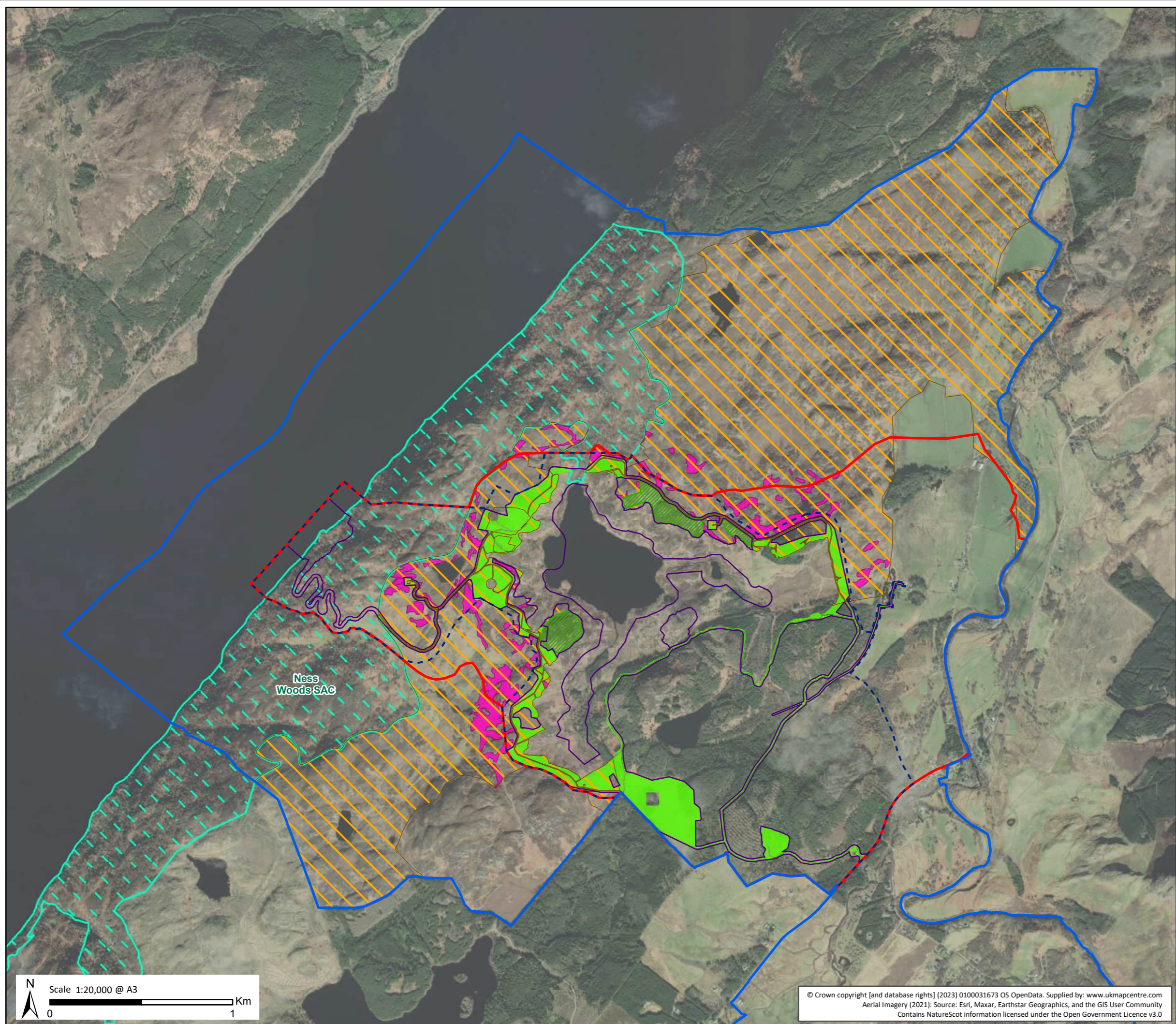


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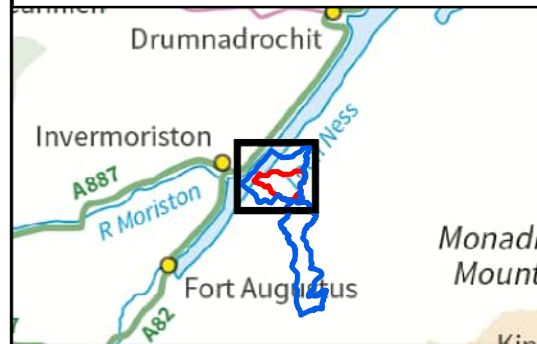
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## FIGURE 10.7.2

### Proposed Heathland Management Areas



- Key**
- Site Boundary
  - Dell Estate Boundary
  - Development Area
  - Working Corridor
  - Fenced Native Woodland Natural Regeneration Areas (Pre-Construction)
  - Ness Woods Special Area of Conservation (SAC)
  - Goat/Deer Control Areas - For Improved Heathland Management - Removal of Self-sown Conifers Also to be Undertaken in These Areas
  - Bracken Control Area - For Heathland Restoration
  - Habitat Reinstatement



**Loch Kemp  
Pumped Storage Scheme  
Ecology**

**Figure 10.7.2  
Proposed Heathland Management Areas**

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**Loch Kemp  
Storage**  
A STATERA COMPANY

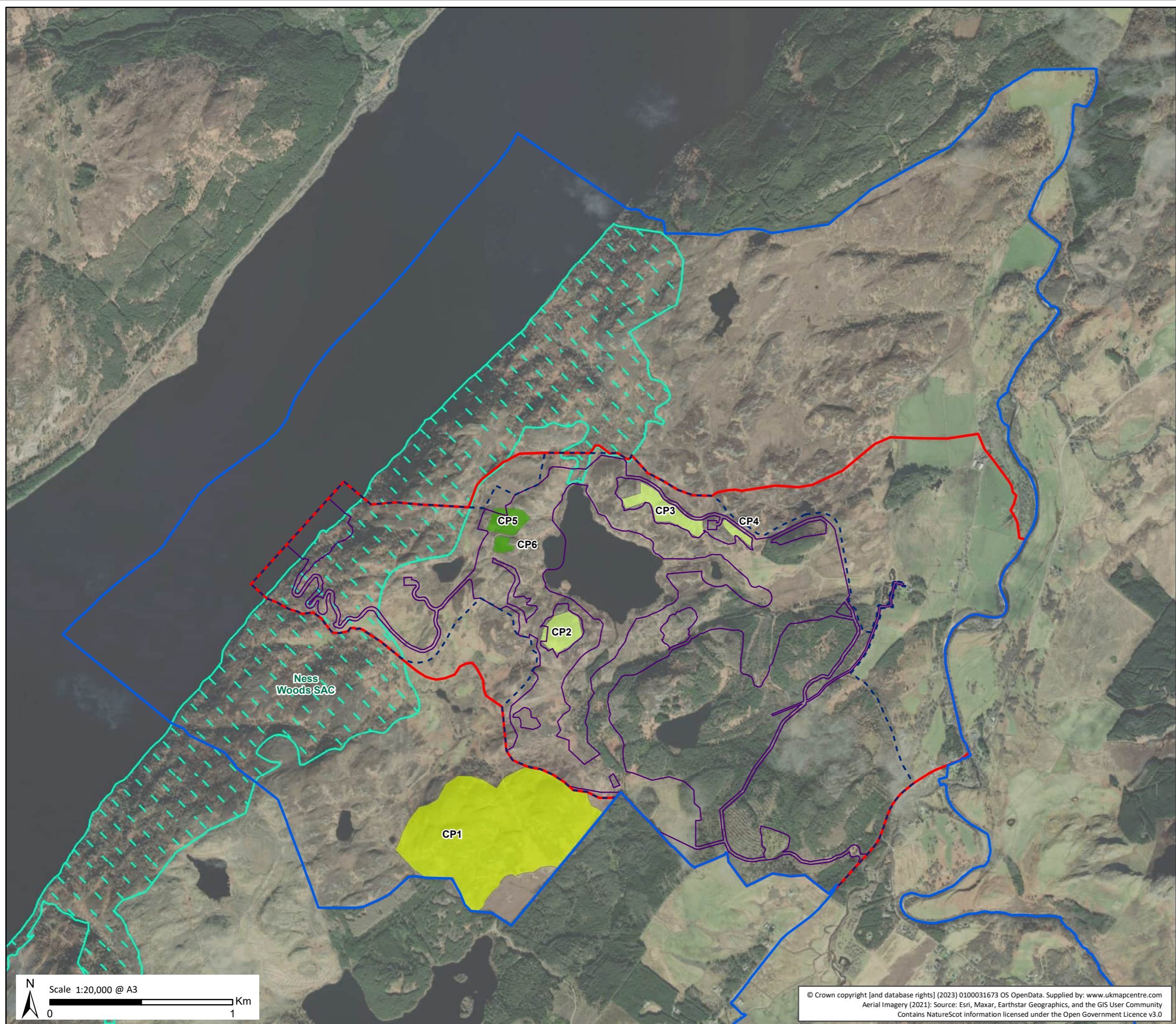


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## FIGURE 10.7.3

### Native Woodland Creation

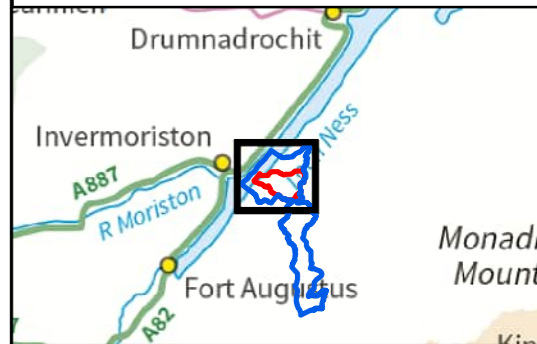


**Key**

- Site Boundary
- Dell Estate Boundary
- Development Area
- Working Corridor
- Ness Woods Special Area of Conservation (SAC)

**Native Woodland Creation**

- CP1: Native Woodland Creation (Pre-construction)
- CP2-4: Native Woodland Creation (Pre-application)
- CP5-6: Native Woodland Creation (Post-construction)



**Loch Kemp  
Pumped Storage Scheme  
Ecology**

**Figure 10.7.3  
Native Woodland Creation**

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**Loch Kemp  
Storage**  
A STATERA COMPANY



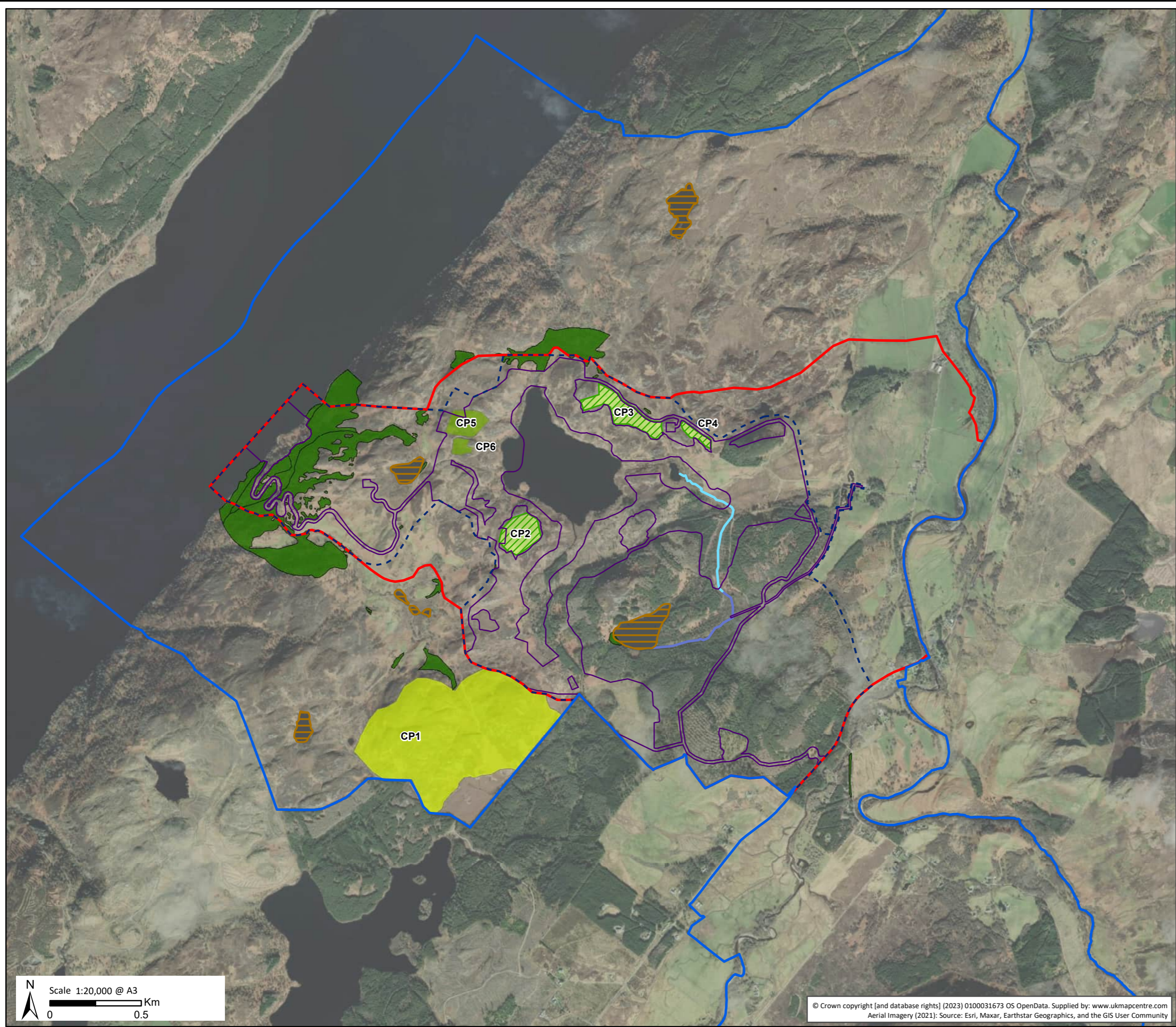

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0 1 Km

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## FIGURE 10.7.4

### Watercourse Enhancement, Boxes and Other Species-Specific Habitat Features



**Key**

- Site Boundary
- Dell Estate Boundary
- Development Area
- Working Corridor
- Fenced Native Woodland Natural Regeneration Areas (Pre-Construction)
- Retained Broadleaved Woodland
- Within Loch Shoreline Areas - Submerge Course Woody Debris

**Watercourse Enhancement**

- Open Up Channel for Fish Passage
- Add Gravel and Boulder Sized Sediment, for Improved Spawning and In-stream Habitat

**Native Woodland Creation**

- CP1: Native Woodland Creation (Pre-construction)
- CP2-4: Native Woodland Creation (Pre-application)
- CP5-6: Native Woodland Creation (Post-construction)

Within retained native woodland, erect:

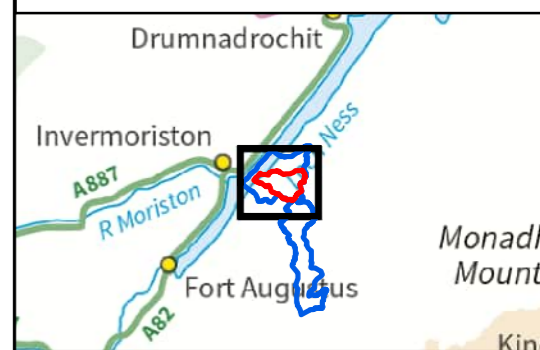
- Pine marten boxes (x 2)
- Bat boxes (x 30)
- Red squirrel boxes (x 20)
- Artificial otter holt (x 2)
- Bird Boxes (x 28)

Within suitable buildings or retained mature trees, erect:

- Barn owl boxes (x 2)

Within heathland on the margins of new woodland creation areas, create:

- Reptile hibernacula (x 4)



**Loch Kemp Pumped Storage Scheme Ecology**

**Figure 10.7.4 Watercourse Enhancement, Boxes and Other Species-Specific Habitat Features**



Drawn by: CN Date: 13/11/23  
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 Aerial Imagery (2021): Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

## ANNEX 10.7.1

### Baseline Information on Potential Bog Restoration Areas (west of B862)

AREA A (2.4 ha)*	
<p>Open glade within wooded area with scattered birch.</p> <p>Small number of shallow artificial drains present throughout the area.</p> <p>Herbivore effects high – tracks and trampling evident, with high browsing impacts.</p> <p><i>Sphagnum</i> cover is frequent.</p> <p>Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.</p> <p>Condition Assessment: Moderate.</p> <p><b>Conclusion: suitable for bog restoration (drain blocking, tree removal, herbivore control).</b></p>	 

<sup>71</sup> NatureScot (2016) Carbon and Peatland 2016 map. Retrieved from <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map> [Accessed in October 2023]. Class 1 is defined as 'nationally important carbon-rich soils, deep peat and priority peatland habitat', distinguished by the likelihood of 'high conservation value.'

## AREA B (4.8 ha)

Fenced area heavily grazed by livestock. No livestock present at time of survey, but compartment is adjacent to sheep fields.

Herbivore effects high – tracks and trampling evident, with occasional patches of bare peat.

Several small, shallow artificial drains present.

*Sphagnum* cover is scattered / infrequent.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**



### AREA C (10.5 ha)

Area of peatland on south side of plantation commercial forestry.

Several shallow artificial drains criss-cross the area.

Herbivore browsing impacts are high to moderate (highest closest to the forest edge).

*Sphagnum* cover is frequent, with occasional small bog pools.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**



## AREA D (7.0 ha)

Area of peatland on south side of plantation commercial forestry.

Several shallow artificial drains criss-cross the area.

Herbivore browsing impacts are high to moderate (highest closest to the forest edge). Some bare peat forming along herbivore tracks.

*Sphagnum* cover is frequent, with occasional small bog pools.

Non-native conifer trees scattered throughout peatland, which show high browsing impacts.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control, tree removal).**



### AREA E (5.2 ha)

Shallow artificial drains are frequent throughout this compartment.

Herbivore browsing impacts moderate.

*Sphagnum* cover is frequent.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**



### AREA F (0.8 ha)

Small area of peatland in between knolls.

Two minor shallow artificial drains.

Evidence of historical burning, but no heather cutting.

*Sphagnum* cover frequent.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**



### AREA G (1.5 ha)

Small number of shallow drains throughout area. Some heather cutting has taken place.

Herbivore browsing impacts high, with extensive tracking across area.

*Sphagnum* cover frequent.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**







#### AREA H (1.8 ha)

Extensive heather cutting has taken place within the compartment.

Shallow artificial drains are present throughout the area.

There is one area of historical peat cutting which is now fully revegetated, but shows signs of drying effects at cut edges and across the base of the cut bank (see last photograph).

Herbivore browsing impacts are high. Trampling and tracking is moderate.

*Sphagnum* cover is occasional to frequent.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control, alter heather management).**





### AREA I (2.6 ha)

Extensive heather cutting has taken place within the compartment.

Shallow artificial drains are present throughout the area.

Herbivore browsing impacts are high. Trampling and tracking is moderate.

*Sphagnum* cover is occasional to frequent.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control, alter heather management)**



### AREA J (0.8 ha)

Area transitional between mire and wet heath.

Herbivore browsing impacts are high, with several tracks evident throughout the area.

Small number of shallow artificial drains present.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control).**



### AREA K (5.8 ha)

Looking south-west onto area K where extensive heather cutting has been undertaken.

Small number of artificial shallow drains present.

Herbivore browsing impacts high. Tracks and trampling from deer moderate.

*Sphagnum* cover is frequent, with a small number of bog pools present within the area.

Partially mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.



Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control, alter heather management).**



### AREA L (9.3 ha)

Located north of Torr Cluanie, this area is open in character with no tree cover.

Several shallow artificial drains criss-cross the area.

Habitats are a mosaic of M17, M20 and H10.

Heather cutting has taken place across the area, evident as spirals in the photographs below.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Moderate.

**Conclusion: suitable for bog restoration (drain blocking, herbivore control, alter heather management)**



### AREA M (4.9 ha)

Located south of Loch Paiteag, this potential peatland restoration area is forested with mature non-native conifers. It comprises an area of blanket bog which was ploughed in the 1950s at approximately 1.8m centres, with occasional cross drains in no discernible pattern.

Artificial drainage surrounds the forestry coupe.

Within the forestry coupe, little light penetrates, with a ground flora dominated by needle litter. Forestry



furrows are evident and were largely dry during survey.

*Sphagnum* cover is very limited, found occasionally in depressions at the edge of the forestry coupe.

A small area with existing bog vegetation lies at the edge of this forestry coupe, which is becoming encroached by invading conifers.

There is some evidence of historic peat cutting, but no evidence of peat cracking was recorded.

Peat probing found this area to support deep peat<sup>72</sup>. Areas of the forestry coupe with a peat depth of <0.5m have been excluded from restoration within this OHMP.

Tree growth rates are generally poor to very poor on the deep peat.

**Conclusion: Peat depth data, along with the presence of nearby bog habitats, and presence of drains suitable for blocking, indicates that this area would be suitable for forest-to-bog restoration.**



<sup>72</sup> Peat depths recorded were predominantly >1 m, with small areas at the margins of this area recording a peat depth of 0.5 – 1 m. Further peat depth information is provided in EIA **Technical Appendix 19-3: Forest to Bog Proposals**, including a peat depth map, see **Figure 19-3-1**

## AREA N (0.9 ha)

Located south of Loch Paiteag adjacent to Area M, this potential peatland restoration area is forested with mature non-native conifers. It comprises an area of blanket bog which was ploughed in the 1950s at approximately 1.8m centres, with occasional cross drains in no discernible pattern.

Artificial drainage surrounds the forestry coupe. Within the forestry coupe, little light penetrates, with a ground flora dominated by needle litter. Forestry furrows are evident.

Peat probing found this area to support deep peat<sup>73</sup>. Areas of the forestry coupe with a peat depth of <0.5m have been excluded from restoration within this OHMP.

Tree growth rates are generally poor to very poor on the deep peat, with some areas of dying Lodgepole Pine due to waterlogging.

**Conclusion: Peat depth data, along with the presence of nearby bog habitats, and presence of drains suitable for blocking, indicates that this area would be suitable for forest-to-bog restoration.**



<sup>73</sup> Peat depths of >1 m were recorded across this area. Further peat depth information is provided in EIA Technical Appendix 19-3: Forest to Bog Proposals, including a peat depth map, see Figure 19-3-1

Additional areas investigated but not brought forward for restoration in the OHMP.

Located at central grid reference NH 48346 16483.

Within this compartment are areas which are not bog, e.g. acid grassland, rush dominated flushes and dry heath on rocky knolls, easily visible on aerial maps.

This area has been highly modified through burning and heather cutting to create tracks and artificial drainage to dry the area. Area used for target practice by the estate.

*Sphagnum* cover is scattered and where present has been burnt or mowed.

Condition Assessment: Poor.

**Conclusion: unlikely to be suitable for bog restoration, given the mosaic of different habitats present and the heavily modified nature, giving a low likelihood of restoration success.**








\*Refer to Figure 10.7.1 for locations of Bog Restoration brought forward for inclusion in the OHMP (Areas A – N)

## ANNEX 10.7.2

### Baseline Information on Potential Bog Restoration Areas (east of B862) (Orrin Ecology)

AREA 1 (1.67 ha)	
<p>Compartment located in bealach between Beinn Mheadhoin and Creag an Loin. Close to boundary with the remnants of the March fence with Garrogie Estate, where on opposite side of fenceline, Garrogie estate has previously undertaken peatland restoration works.</p> <p>Few hags are present but surface micro-erosion is frequent.</p> <p>Herbivore browsing impact is moderate.</p> <p>Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.</p> <p>Condition Assessment: Fairly Poor – Moderate (variable).</p> <p><b>Conclusion: restoration opportunities include reduction in herbivore pressure and dam installation.</b></p>	

## AREAS 2 & 3 – (2.89 & 1.97 ha)

Sitting in the bealach south of Meall nan Aighean Beag, is an area of bare peat with hags, crossed by the remains of the March fence with Garrogie Estate.

Standing water is present in some of the hags but is not indicative of a small lochan as the OS mapping suggests.

The bare peat is crossed several times by herbivore tracks, indicating a regular route for deer.

As the ground slopes off into Glen Brein, a small number of hags are present, with bare peat along their edges.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Fairly Poor – Moderate (variable).

**Conclusion: restoration opportunities include reduction in herbivore pressure, hag reprofiling, dam installation and peat pan revegetation.**





## AREA 4 –(11.32 ha)

Close to March fence with neighbouring Garrogie estate, this compartment includes higher knolls and slopes north-west down into Glen Brein.

Hags are found mostly along the eastern edge of the compartment and also in the centre where there is a slight bowl where the peat hags are deeper.

Bare peat bowl found at NH49710930 between knolls.

Herbivore browsing impacts are high to moderate.



An Argo track path cuts through the compartment.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Fairly Poor – Moderate (variable).

**Conclusion: restoration opportunities include reduction in herbivore pressure, hag reprofiling and dam installation.**



	
<b>AREA 5 (8.38 ha)</b>	
<p>Gently sloping area between two watercourses – Allt Dubh Cùil na Creige and Allt a’ Choire Dhuibh.</p> <p>Peat hags are generally associated with watershed and run north-east to south-west with the slope. Eroded down to mineral in places.</p> <p>Bare peat found mostly along hags, no large bowls of bare peat.</p>	

Herbivore effects high – tracks and trampling evident, with occasional patches of bare peat.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Fairly Poor – Moderate (variable).

**Conclusion: restoration opportunities include reduction in herbivore pressure, hag reprofiling and dam installation.**





#### AREA 6 (57.64 ha)

Open hill ground north of Carn Easgann Bàna. Habitats include a mosaic of blanket bog and wet heath, with exposed rock around the southern and western edges of the area. Acid flush habitat is frequent associated with the Alltan Dubh watercourse.

No artificial drains.

Erosion features focus around the Alltan Dubh watercourse running through the southern section of the area and along the eastern edge of the area. Peat hags with bare peat, eroded in places down to mineral.

NH48620675, at the western extent of the Alltan Dubh within the compartment, there is an extensive eroded peat bowl, with extensive bare peat. Limited *Eriophorum angustifolium* is recolonising the bare peat.





Herbivore effects moderate to high – tracks and trampling evident, with high browsing impacts.

Mapped as Class 1 on the Carbon and Peatland Map<sup>71</sup>.

Condition Assessment: Fairly Poor – Moderate (variable).

**Conclusion: restoration opportunities include reduction in herbivore pressure, hag reprofiling, dam installation and peat pan revegetation.**



## ANNEX 10.7.3

### Bog Restoration – Preliminary Appraisal (east of B862) (Caledonian Climate)

# Peatland Summary Report

## Loch Kemp, Dell Estate

08.11.2023

### Survey Summary

2 Surveyors covered the 6 Survey Areas on 3<sup>rd</sup> November 2023. Weather preceding and during the survey was heavy rain and very poor visibility with strong winds and temperatures around 3c.

- 110** Peat depth data points were collected across 6 Survey Areas, including condition class.
- 6** Habitat Impact Assessments were conducted across the Survey Areas.
- 32** Hag and Gully Measurements were taken across erosion features with supporting photos.
- 25** Georeferenced Field Notes were taken with supporting photos.

### Results Summary

Condition	No. of Points	% of Total (110 Points)
Actively eroding: Flat bare	3	2.7
Actively eroding: Hagg/gully	29	26.4
Drained: Hagg/gully	57	51.8
Modified	21	19.1

Depth (cm)	
Maximum	Average
278	88

### Restoration Areas Discussion

- In their current spatial layout, the restoration areas do not form natural restoration boundaries divided by hydrological (e.g. watersheds) terrain features (e.g. ridges). It is recommended the areas with restoration potential here are considered as part of a wider peatland restoration strategy to ensure no erosion sources remain that could threaten long term viability of restoration.
- Herbivore impact across the survey areas was generally high, mostly caused by red deer, although mountain hare were also observed amongst gully systems. While browsing was moderate, impact manifested generally as physical erosion through trampling, with vegetated ground giving way to bare peat. Reducing deer impact would be critical to future restoration viability in the long term, as the current level of trampling through rewetted areas is likely to cause structural damage to restoration techniques such as peat dams and bunds. It is recommended this takes place through consultation with the landowner and Deer Management Groups.
- Peat pipes were observed on site. A full Peat Slide Risk Assessment should be completed as part of restoration plans.

## Survey Results

Area 1: No significant erosion features present but extensive of deer leading to microerosion and - multiple tracks, wallows present.

**No restoration potential, recommend removing area from consideration.**

---

Area 2: Some small gullies present and some small areas of bare peat down to mineral layer. Deer impact considered relatively high.

**Minimal restoration potential, recommend removing area from consideration.**

---

Area 3: Some small gullies within the area, but significant erosion starts on eastern extent beyond area. Deer impact considered relatively high.

**Some restoration potential, recommend extending area to the east for meaningful restoration impact. Maximum potential area of restoration: 1.5ha**

---

Area 4: Some small erosion features present in lower ground between small, rounded summits. Significant trampling noted across all erosion features here. Bedrock often at the surface directly adjacent to erosion in deeper peat.

**Some restoration potential. Maximum potential area of restoration: 5.0ha**

---

Area 5: Erosion features present towards north and east of Area. Peat pipes present across the Area.

**Some restoration potential. Maximum potential area of restoration: 4.5ha**

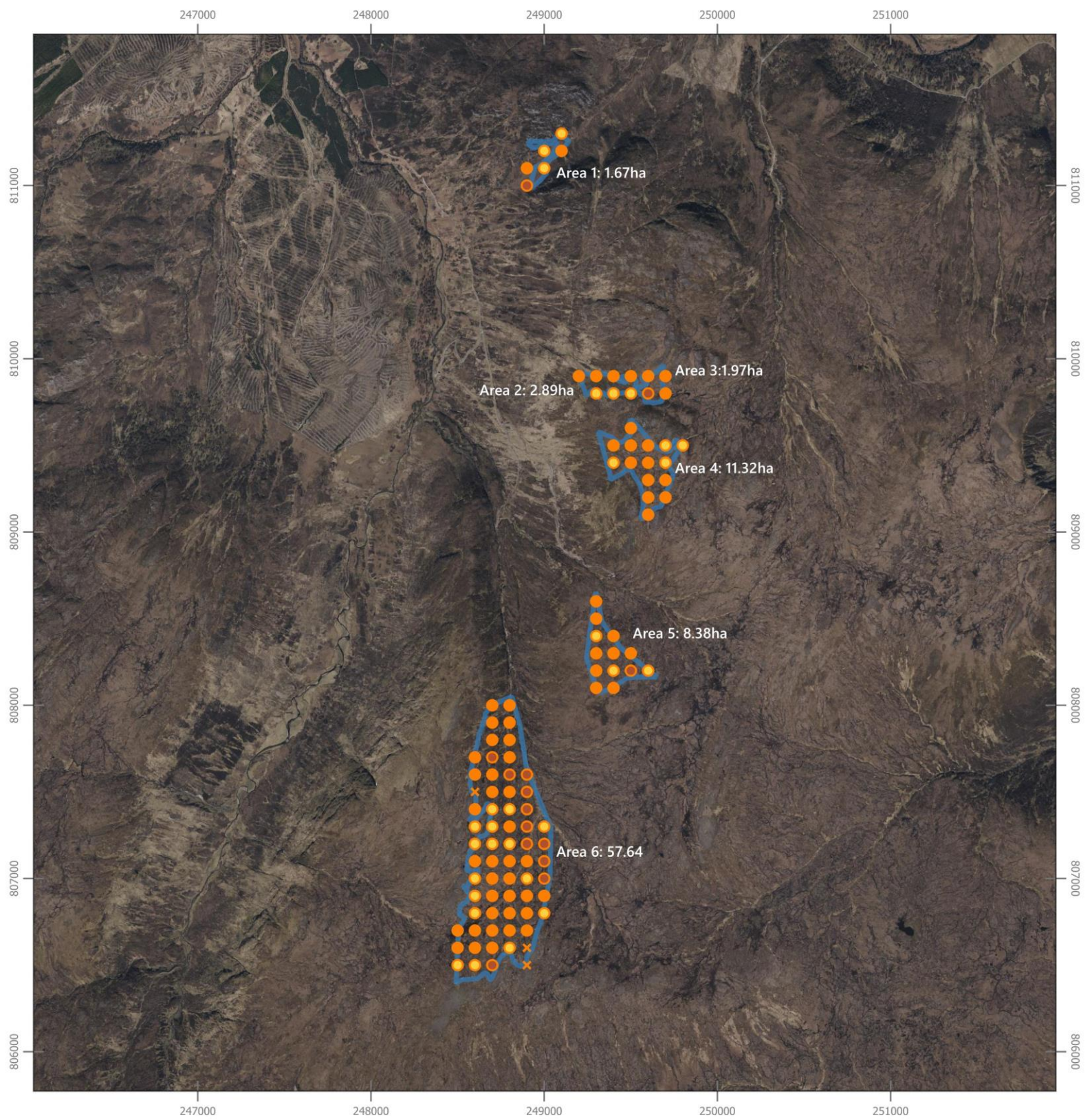
---

Area 6: Significant erosion features present across most of the survey Area. These were hag and gully systems that could in general be restored. Some areas may be challenging to access due to bedrock ridges and steep terrain features. Deer impact considered high.

**Significant restoration potential. Maximum potential area of restoration: 50.0ha**

---

**Likely Maximum Restoration Potential: 61ha**



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**Loch Kemp, Dell Estate  
Survey Areas**






Created by: Abel McLinden

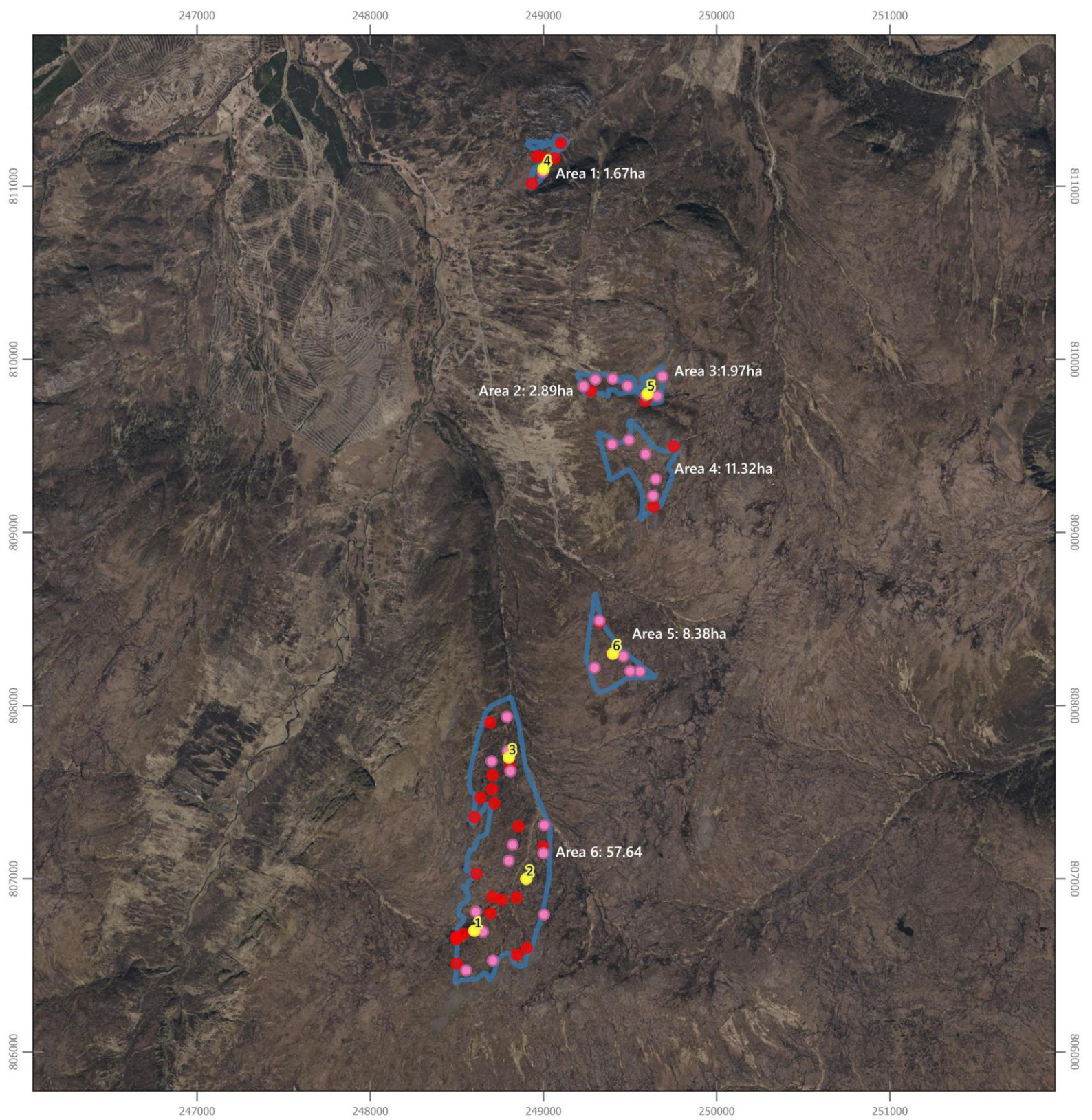
Date: 08-11-2023

Scale: 1:30000 (A4)

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0100031673

**Legend**

-  Survey Areas
-  No peat
-  Shallow peat (<50 cm)
-  Deep peat (50-150 cm)
-  Very deep peat (>150cm)



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**Loch Kemp, Dell Estate  
 Survey Areas**

Created by: Abel McLinden





Date: 08-11-2023

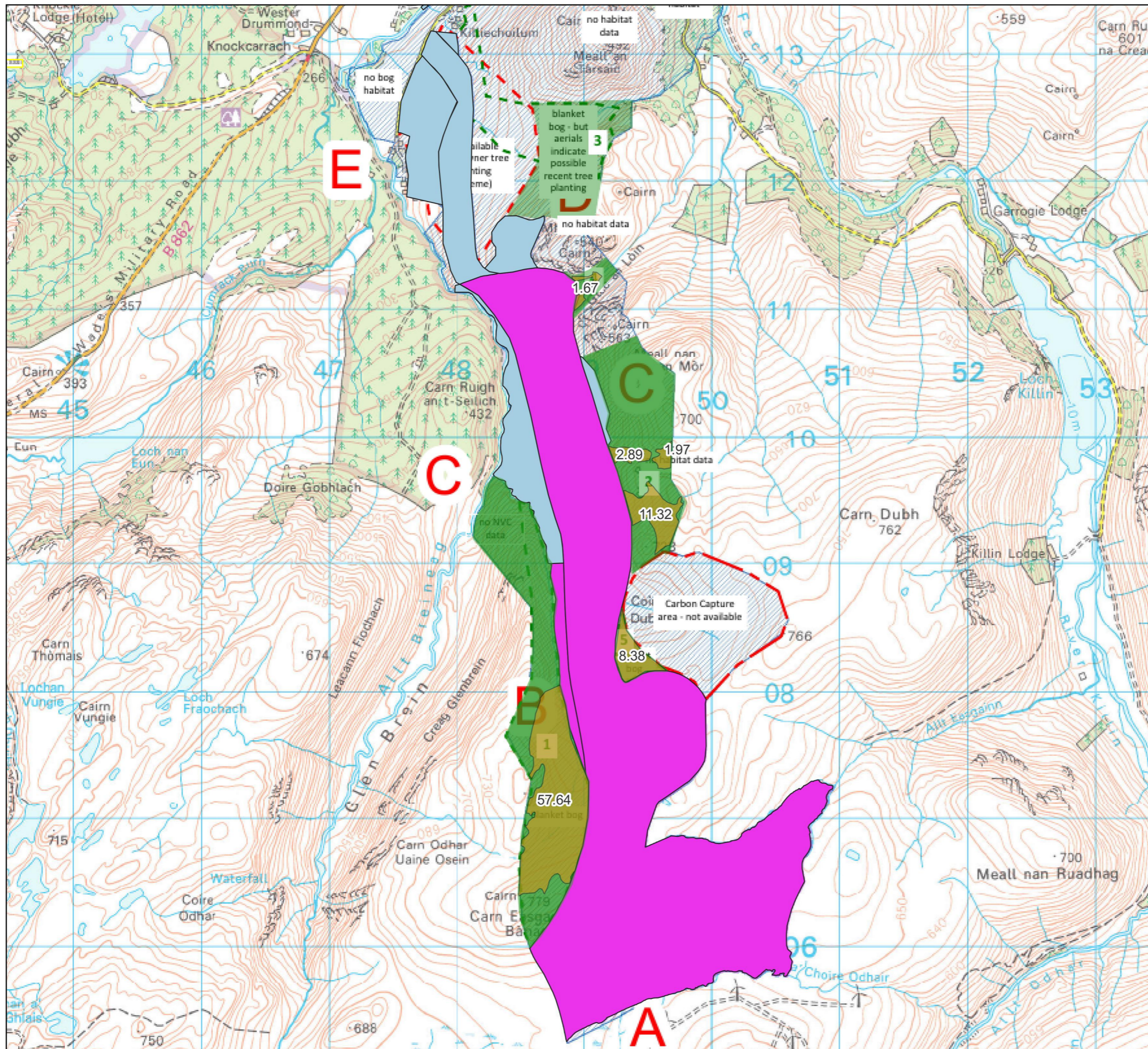
Scale: 1:30000 (A4)

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 0100031673



**Legend**

- Additional Data Collected**
-  Survey Areas
  -  Drain & Gully
  -  Field Notes
  -  HIA



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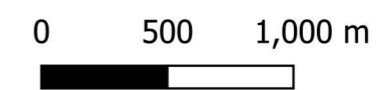
Mob: +44 (0) 7840 998 944

Peatland Restoration Opportunity  
Dell Estate (Loch Kemp Pump Storage)

Created by: Garth Mortimer

Date: 26/09/2023

Scale: 1:20 000 (A3)

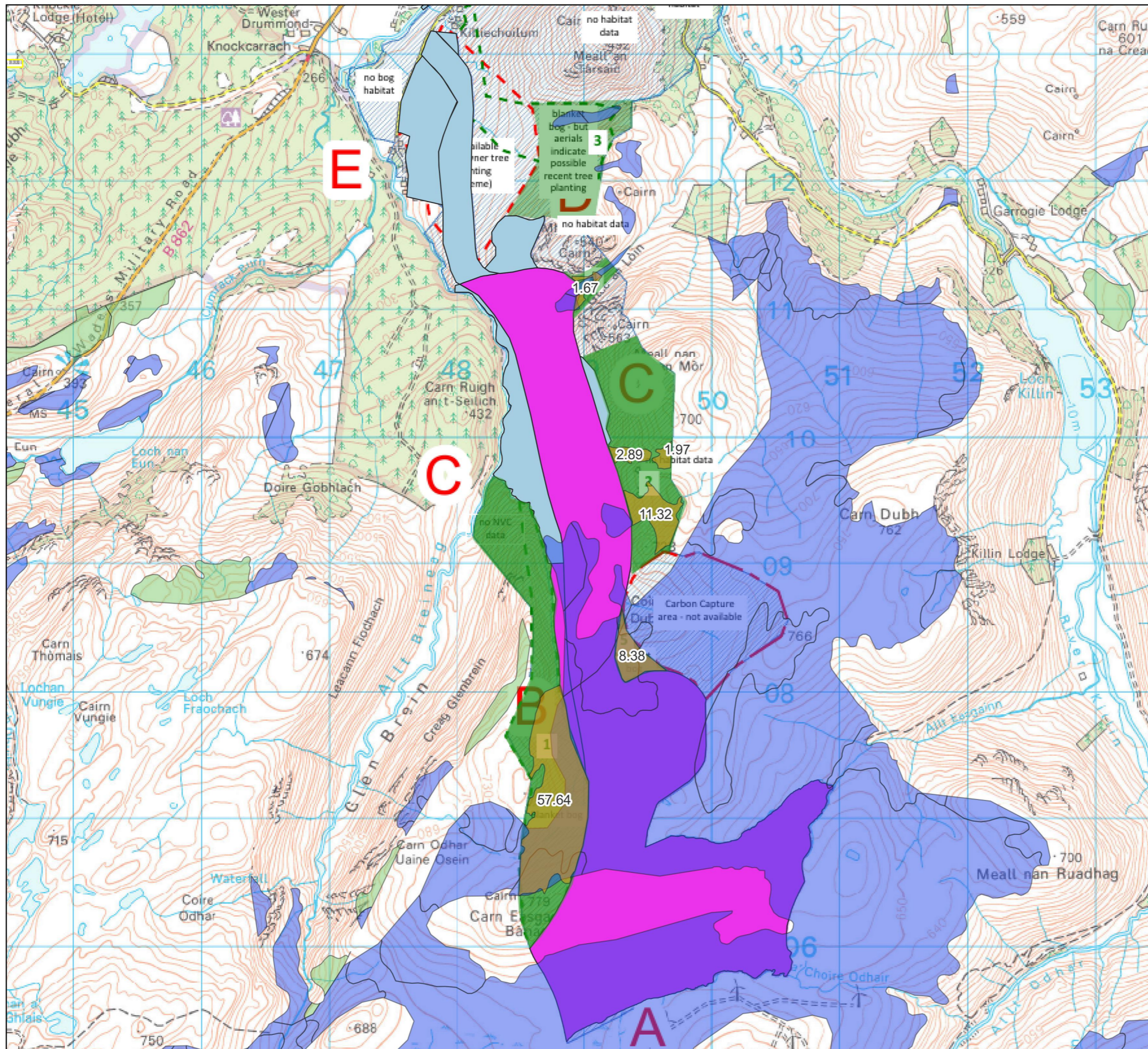


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Legend

- Peat Restoration Opportunity
- Net\_areas\_peat\_restoration
- Blue Areas
- Pink Areas

Peatland Restoration Opportunity  
83.87 ha: Degraded



info@caledonianclimate.com

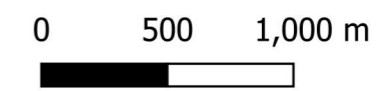
Mob: +44 (0) 7840 998 944

Peat Scotland Priorities  
Dell Estate (Loch Kemp Pump Storage)

Created by: Garth Mortimer

Date: 26/09/2023

Scale: 1:20 000 (A3)



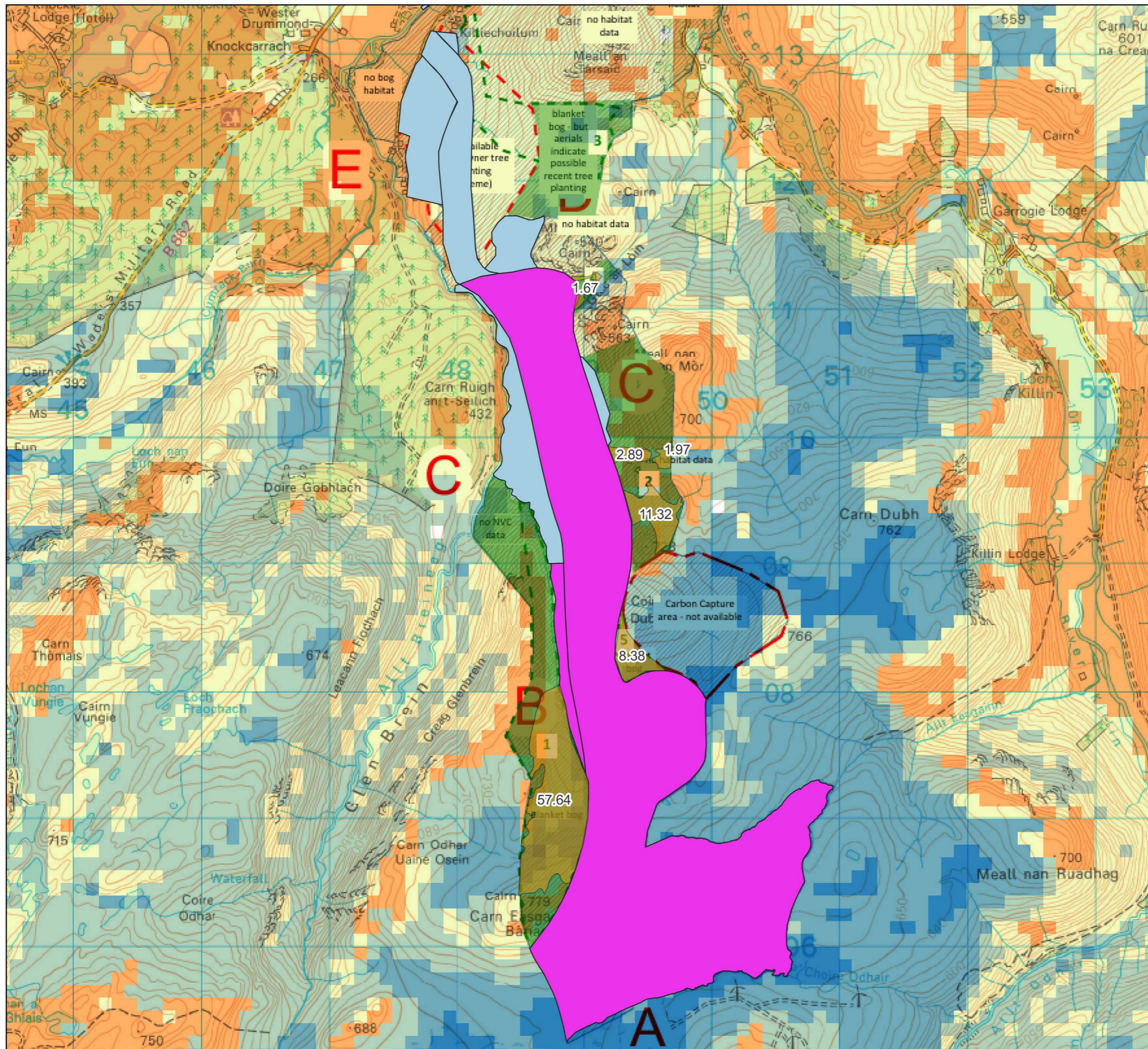
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Legend

- Peat Restoration Opportunity
  - Net\_areas\_peat\_restoration
  - Blue Areas
  - Pink Areas
- PEAT\_SCOTLAND
- 1
  - 2

Peatland Restoration Opportunity  
83.87 ha: Degraded





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JHI Peat Depth  
Dell Estate (Loch Kemp Pump Storage)

Created by: Garth Mortimer

Date: 26/09/2023

Scale: 1:20 000 (A3)

0 500 1,000 m



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Legend

- Peat Restoration Opportunity
- Net\_areas\_peat\_restoration
- Blue Areas
- Pink Areas

- peat\_depth
- Band 1 (Gray)
- <= 25cm
  - 25 - 50cm
  - 50 - 75cm
  - 75 - 100cm
  - > 100cm

Contains NAR/Hutton\_peat\_depth data © The James Hutton Institute, Aberdeen

Peatland Restoration Opportunity  
83.87 ha: Degraded

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