



# Longcroft Wind Farm

## Technical Appendix 8.2: UKHab and NVC Survey Report

### Renewable Energy Systems (RES)

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## 1.0 Introduction

### 1.1 Overview

Renewable Energy Systems Ltd (RES) ('the applicant') intends to submit an application to the Scottish Government Energy Consents Unit under Section 36 of the Electricity Act 1989 to develop a renewable electricity generating station, including a wind farm and battery storage site, at Longcroft, located within the Scottish Borders.

The proposed Longcroft Wind Farm (the proposed development) is based on a layout of 19 wind turbines with a tip height of 220m, associated wind turbine foundations, crane hardstands, access tracks, substation compound and battery energy storage system compound. A range of temporary construction phase features will also be developed, including borrow pits, construction compounds and laydown areas.

SLR was appointed by the applicant to carry out a range of ecological studies to inform the Environmental Impact Assessment (EIA) for the proposed development. This report details the results of a UK Habitat Classification (UKHab) and National Vegetation Classification (NVC) survey carried out during April, May, and August 2023.

### 1.2 Site Location and Description

The 'site' refers to all land within the red-line boundary, as displayed in **Figure 8.2.1**.

The site is located north-east of the A697, approximately 8.5km north-north-east of Lauder in the Scottish Borders. The site is within the administrative boundary of Scottish Borders Council.

The topography of the site is undulating, ranging from approximately 215 metres (m) Above Ordnance Data (AOD) within the river valley at the site entrance, to approximately 490m AOD near the summit of Hunt Law within the northwest of the site. Landscape within the site is defined by two main watercourses and associated river valleys - the Soonhope Burn and Whalplaw Burn, which intersect the site in a northeast to southwest direction. Upland areas within the site are managed primarily as active grouse moor, while lower elevations are managed largely for sheep and cattle grazing.

### 1.3 Scope of Study

The primary aim of the study was to record, map and describe habitats present within the site and an appropriate survey buffer in accordance with UKHab and NVC survey protocols.

Specific study objectives were to:

1. Map baseline habitats present on site to UKHab and NVC Classification using geospatial mapping software (ESRI ArcGIS);
2. Assess and assign a baseline condition for each habitat parcel recorded using a standardised algorithm; and
3. Identify any habitats of nature conservation importance<sup>1</sup> within the site.

The results of the study provide baseline information on the nature conservation value of vegetation communities identified within the site and areas of potential ground water

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<sup>1</sup> This includes habitats listed on Annex 1 of the Council Directive EEC of 21 May 1992 on the Conservation of Natural Habitats and Wild Fauna and Flora (the Habitats Directive), those listed on the Scottish Biodiversity List, those included in the Scottish Borders Local Biodiversity Action Plan, and those classified and as potential Ground Water Dependant Terrestrial Ecosystems.



dependency. This data can in turn be used to inform the infrastructure design stage and the Environmental Impact Assessment (EIA) process.



## 2.0 Methods

### 2.1 Desk Study

A desk-based study was carried out by SLR in February 2023 to inform the Scoping Report for the proposed development (see **Technical Appendix 8.1** of the EIA Report). The study involved a search for data relating to statutory and non-statutory designated sites and protected and/or notable species within defined search areas of the site. Data of relevance to this report includes:

- Statutory designated sites within 10km of the site that support habitats and/or plant species as qualifying/notified features of nature conservation importance – obtained through the NatureScot Site Link web-based application;
- Non-statutory designated sites within 2km of the site that support habitats and/or plant species of nature conservation importance – obtained from The Wildlife Information Centre (TWIC);
- Records of protected and/or notable plant species (including invasive non-native species) within 2km of the site - obtained from TWIC; and
- Habitats and or plant/species of nature conservation importance recorded during ecological surveys for nearby development projects (Amec Foster Wheeler, 2015 for Fallago Rig Wind Farm and SLR Consulting, 2017 for Gilston Hill Wind Farm).

### 2.2 Field Survey

The survey of the main site was carried out by Senior Ecologist Hannah Rowding (BSc (Hons), MSc, ACIEEM) between 24 and 28 April, and 08 and 12 May 2023.

The survey of the proposed access route and temporary turbine laydown area was carried out by Senior Ecologist Beth Hanlon (BSc (Hons), MSc, ACIEEM) and Senior Ecologist Callum Taylor (MSc, QualCIEEM) between 29 and 30 August 2023. Weather conditions were considered to be appropriate for the survey<sup>2</sup>.

#### 2.2.1 Survey Area

The 'main site survey area' incorporated all land within the main site and an associated 250 m survey buffer, to accord with Scottish Environmental Protection Agency (SEPA) guidelines relating to areas of potential groundwater dependency (SEPA, 2017).

The 'access track survey area' incorporated the existing access road to Longcroft and proposed new access track to the site, and an associated 100m survey buffer.

#### 2.2.2 UKHab Survey

UKHab is a comprehensive habitat classification system that is used for rapidly recording and classifying terrestrial, freshwater, and coastal habitats across the UK. The system enables habitats to be mapped using a hierarchical 'Primary Habitat' system (capturing ecosystems, broad habitats, priority habitats and Annex 1 habitats) and non-hierarchical Secondary Codes. It has been designed to build on existing habitat mapping techniques and enable integration with European Union and other UK classification systems, including Phase 1 Habitat Survey, NVC, and European Union Nature Information Systems (EUNIS).

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<sup>2</sup> Weather conditions during the access track survey: temperature = 16°C; cloud cover = 50-100%; wind = 3-4 Beaufort scale; and rain = occasional light showers.





The UKHab survey was conducted in conjunction with the NVC survey, in accordance with methods described in the UK Habitat Classification User Manual (Butcher *et al.*, 2020). During the survey, habitats were recorded in ArcGIS Field Maps software using digital tablet devices. The survey identified habitats of conservation concern, protected or notable plant species and invasive non-native species. Target notes (TNs) were also recorded to describe any particularly notable features such as flushes, areas with habitat disturbance, or habitats that were too small to map.

As required by the UKHab mapping system, the metadata of relevance to this study is shown in Appendix A.

### 2.2.3 Habitat Condition Assessment

Habitat Condition Assessment is a means of measuring variation in the quality of areas of the same habitat type across defined areas of land. This process considers a habitats key physical characteristics and ability to support typical flora and fauna.

The Habitat Condition Assessment was carried out in conjunction with the UKHab survey, through which the quality of habitats were measured using standardised habitat condition assessment criteria<sup>3</sup>. During this process, habitat polygons were assessed against condition criteria outlined within relevant condition assessment proforma, whereby a 'pass' or 'fail', (or, depending on the habitat being assessed, a value between 1 and 3) was assigned for each criteria. Through use of an ArcGIS digital survey tool, the scores were automatically summed and compared to overall score thresholds for the habitat group being assessed, before reaching a final condition classification result:

- Good (Score = 3, at or close to the perceived optimum for that habitat);
- Moderate (Score = 2); and
- Poor (Score = 1).

### 2.2.4 NVC Survey

The NVC is a detailed classification system for mapping and recording vegetation communities using plant species presence and abundance. The NVC survey was carried out in accordance with standard methodology and guidelines (Rodwell, 1991 *et seq*, 5 volumes; and Rodwell, 2006). During the survey, NVC communities were mapped in the field by applying polygons around visible boundaries of homogenous vegetation. Where readily identifiable, stands were classified and mapped at sub-community level.

Due to variability in vegetation communities and the presence of transitional habitats within the survey area, some polygons represent complex mosaics of two or more NVC communities. Where polygons have been mapped as mosaics, an approximate percentage coverage of each NVC community within the polygon has been provided so that the dominant community could still be ascertained.

Vegetation communities were assessed primarily through qualitative sampling to record dominant and constant species, as well as and subordinate species, within stands. The DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) scale was applied when recording target notes to indicate species abundance relative to other associates within a particular NVC community.

Quantitative (quadrat) sampling was also applied to provide an indication of representative habitat communities present across the survey area. It should be noted however that this

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<sup>3</sup> Standardised habitat condition assessment sheets are provided within the Biodiversity Metric 3.1 publication webpage at <https://publications.naturalengland.org.uk/publication/5850908674228224>



form sampling was not used extensively as it is not necessarily required where vegetation communities can be easily identified by qualitative sampling. Where quadrat sampling was used, the following methodology was adopted:

- Sampling of vegetation types was carried out as recommended in the NVC users' handbook, by sampling random stands of vegetation 'judged by eye to be floristically and structurally homogeneous'.
- The size of quadrat used was 2x2m. Within each quadrat, all vascular plants and bryophytes of frequent occurrence were identified and an estimate of cover value of each made, using the DOMIN scale of cover, as shown in **Table 2-1**.

**Table 2-1: DOMIN Scale**

DOMIN Scale	Percentage Cover
10	91 – 100%
9	76 – 90%
8	51 – 75%
7	34 – 50%
6	26 – 33%
5	11 – 25%
4	4 – 10%
3	Many individuals
2	Several individuals
1	Few individuals

### 2.2.5 Ground Water Dependant Terrestrial Ecosystems

Groundwater Dependant Terrestrial Ecosystems (GWTDEs) are wetland habitats that derive their water supply primarily from groundwater as opposed to being rain or surface water fed, often supporting diverse, botanically rich ground-flora communities (CONFOR, 2018). NVC communities recorded during the survey were assessed against the SEPA guidelines for identifying potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) (SEPA, 2017).

## 2.3 Nomenclature

Botanical nomenclature in this report follows Stace (2019) for vascular plants and Atherton *et al* (2010) for bryophytes. For ease of reading, English plant names have been applied in the main body of the report with corresponding scientific names listed after each species name is applied for the first time.

## 2.4 Limitations

### Survey Timing

Habitat surveys can be carried out year-round, though the optimal survey season is April to August. The UKHab and NVC survey was carried out in late April and early May 2023. While considered optimal timing for habitat surveys, it is important to note that some herbs were only beginning to emerge at this time. In instances where it may not have been possible to



define specific plant species, vegetation communities were classified to NVC community level only. Through utilising competent habitat surveyors, communities have been classified to at least Level 4 in the UKHab system, with relevant condition assessment criteria successfully completed for each habitat type.

### **Digital Data Capture**

The UKHab and NVC Minimum Mapping Unit for the field survey was 50x50 m (2,500m<sup>2</sup>), which in turn may result in smaller areas of notable habitat (e.g., habitats of principle importance) being excluded from output maps. In order to ensure all areas of notable habitat were effectively captured, target notes detailing the location of each notable habitat, key species, and notes on general condition were recorded during the field survey.

### **Survey Access**

The land to the west and south of the proposed wind farm access route, and west and north of the proposed turbine laydown area, could not be accessed at the time of survey. Where possible this land was surveyed from a distance with binoculars, however some limitations resulted, where assumptions had to be made as to species present and habitat condition.



## 3.0 Results

### 3.1 Desk Study

#### 3.1.1 Statutory and Non-Statutory Designated Sites

A total of one statutory designated site of international interest and six statutory sites of national interest that support habitats of nature conservation importance were identified within 10km of the site boundary, as detailed in **Table 3-1**.

**Table 3-1 Statutory Designated Sites within 10km of the Site**

Site Name	Designation	Qualifying/ Notified Features	Approximate Distance and Direction from Site Boundary
River Tweed	SAC	3260 Watercourses of plain to montane levels with stream-Ranunculus fluitantis and Callitriche-Batrachion vegetation	Within the site
	SSSI	Vascular plant assemblage	
Lammer Law	SSSI	Blanket bog and juniper scrub	0.8km north
Airhouse Wood	SSSI	Upland oak ancient woodland	4.5km south-west
Danskine Loch	SSSI	Fens and fen woodland	7.5km north
Papana Water	SSSI	Upland mixed ash woodland	8.4km north
Fala Flow	SSSI	Blanket bog	8.9km north-west
Table notes: <b>SAC</b> – Special Area of Conservation; <b>SSSI</b> - Site of Special Scientific Interest			

A total of five non-statutory designated Local Biodiversity Sites (LBS's) and seven provisional Local Biodiversity Sites (pLBS), identified for supporting plants and/or habitats of nature conservation interest, were identified within 2km of the site boundary. Details of each are provided in **Table 3-2**.

**Table 3-2 Non-statutory Sites within 2km of the Site Boundary**

Site Name	Designation	Area (ha)	Site Description	Approximate Distance and Direction from Site
Soonhope Burn Upper, The Howe	LBS	144.3	Upland birchwoods, cleughs and flushes with both Borders and UK priority species	Within site
Soonhope Burn upper and Longformacus Burn	LBS	118.8	Upland burnsides, cleughs and flushes with notable plants	0.8km north
Soonhope Burn, Lower	pLBS	124	No data	Within site



Site Name	Designation	Area (ha)	Site Description	Approximate Distance and Direction from Site
Whalplaw Burn, Upper	LBS	223.9	Burnside and flush communities including fine base-rich flushes and juniper	Within site
Earnscelugh Water – Nether Stirkstruther	pLBS	131.8	No data	0.54km east
Earnscelugh Water - Bermuda	pLBS	84.7	No data	0.61km east
Earnscleugh Water – Borrowston Rig	pLBS	64.0	No data	1.05km south-east
Earnscleugh Water, Earns Cleugh	pLBS	53.2	No data	1.63km south
Addinston Hill Meadow	pLBS	18.6	No data	0.25km south-west
Kelphope Burn Dod Cleugh to Hazeldean Wood	pLBS	11.4	No data	0.48km east
Crib Law	LBS	272.2	Summit heath, burnside, flushes, moorland with nationally scarce and locally rare plants and priority flushes.	1.98km north-west
Wester Black Burn	LBS	96.3	Burnsides and degraded moorland with one fine acid flush.	1.86km north-east

Table Notes:

**LBS** – Local Biodiversity Site (to be adopted); **pLBS** = provisional Local Biodiversity Site

No ancient woodland habitat was identified within 2km of the site.

### 3.1.2 Records of Protected and/or Notable Plant Species

Data records returned from TWIC identified a total of nine records of notable plant species within 2km of the site, recorded within the last 15 years (**Table 3-3**).



**Table 3-3: Records of Protected and/or Notable Plant Species within 2km**

Species	Year of Most Recent Record	Nearest distance and orientation from Site	Status
Good King Henry <i>Chenopodium bonus-henricus</i>	2009	1km southwest	SBL, RLGB.VU
Hairy stonecrop <i>Sedum villosum</i>	2011	0.2km west	NS-excludes, RLGB.Lr(NT)
Common juniper <i>Juniperus communis</i>	2009	Within site	SBL
Black bindweed <i>Fallopia convolvulus</i>	2000	Approximately 1.25km south-west	SBL
Purple ramping fumitory <i>Fumaria purpurea</i>	2000	Approximately 1.25km south-west	SBL, NS-excludes
Welsh poppy <i>Meconopsis cambrica</i>	2009	Approximately 1.3km north-west	NS - excludes
Charlock <i>Sinapis arvensis</i>	2009	Approximately 200m west	SBL
Lichen - <i>Lecania cyrtella</i>	2012	Approximately 800m north-west (four figure grid reference only)	SBL
Lichen - <i>Ramalina fraxinea</i>	2012	Approximately 800m north-west (four figure grid reference only)	SBL
Table notes <b>SBL</b> – Scottish biodiversity List; <b>NS-excludes</b> – Nationally scarce; <b>RLGB.VU</b> – GB Red List – Vulnerable; <b>RLGB.Lr(NT)</b> – GB Red List – near threatened			

### 3.1.3 Existing Ecological Data

There were no records of protected and/ or notable plant species returned from a review of habitat and vegetation reports for nearby development projects (Amec Foster Wheeler, 2015 and SLR Consulting, 2017).

## 3.2 Field Survey

The results of the UKHab and NVC survey are displayed in **Figure 8.2.2** and **Figure 8.2.3** respectively. Habitat Condition Assessment results are displayed in **Figure 8.2.4**. Target Notes (TNs) are provided in **Appendix B**, of which are designed to be reviewed in conjunction with figures. NVC quadrat data is presented in **Appendix C**.



### 3.2.1 Grassland

#### Upland Acid Grassland (UKHab g1b)

##### U4 *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland

Upland acid grassland, corresponding to the U4a typical sub-community, was recorded within unenclosed pasture at higher elevations within the south and south-east of the site. This acid grassland often occurred in mosaic with bracken and/ or dry heath, and in linear stretches adjacent to watercourses where it was commonly interspersed with rush pasture (**Photo 3-1**). This community was formed of a short, grazed sward of common bent *Agrostis capillaris* and sweet vernal grass *Anthoxanthum odoratum*, with abundant tormentil *Potentilla erecta* and white clover *Trifolium repens*, frequent heath bedstraw *Galium saxatile*, yarrow *Achillea millefolium*, field wood rush *Luzula campestris*, bracken *Pteridium aquilinum*, and occasional germander speedwell *Veronica chamaedrys* and mountain pansy *Viola lutea*. Bryophyte cover within this community generally comprised a mixture of glittering wood moss *Hylocomium splendens*, *Rytidiadelphus* species, and neat feather moss *Pseudoscleropodium purum*.

##### U5 *Nardus stricta* – *Galium saxatile* grassland

The U5 *Nardus stricta* – *Galium saxatile* grassland was characterised by a tussocky sward dominated by mat grass *Nardus stricta* with frequent heath rush *Juncus squarrosus*, tormentil *Potentilla erecta*, heath bedstraw and field wood rush, with a ground cover dominated by glittering wood moss and red stemmed feather moss *Pleurozium scheberi*. The dominance of mat grass and frequency of tormentil and heath bedstraw within swards lends this vegetation to the typical sub-community U5a. This community was most commonly encountered within upland grazing pasture in the south and southwest of the site (in mosaic/transition with U4 and U6) and adjacent to rush-dominated communities (Je/M23) throughout the site.

##### U6 *Juncus squarrosus* – *Festuca ovina* grassland

This grassland community was recorded as small stands within upland field systems comprised predominantly of U5 *Nardus stricta* – *Galium saxatile* grassland. It was characterised by a shift from a grassland dominated by mat grass, to one dominated by heath rush with frequent mat grass and common haircap moss *Polytrichum commune*, occasional bilberry and common bent, and a bryophyte layer formed of glittering wood moss and red stemmed feather moss.

##### Je *Juncus effusus* acid grassland community

Stands of vegetation dominated primarily by soft rush with either very limited ground flora (due to density of rushes) or a scattered distribution of common bent, common sorrel, wavy bittercress *Cardamine flexuosa* and *Rytidiadelphus* species were noted in areas of sloping ground within the site (**Photo 3-2**). While similar in appearance to the M23b and MG10 rush pasture communities, the underlying ground flora more closely resembled that of an acid grassland. This type of vegetation is known to be common on moist acidic soils in areas of rough grazing pasture within upland environments and has therefore been labelled with the UKHab code for other upland acid grassland (g1b6) with secondary code for dominant rushes (15).





**Photograph 3-1: Upland acid grassland (U4)**



**Photograph 3-2: Upland acid grassland (Je)**



**Upland Calcareous Grassland (UKHab g2b)**

CG10 *Festuca ovina* – *Agrostis capillaris* – *Tymus praecox* grassland

A narrow linear stretch of grazed calcareous grassland was recorded near to the base of the slope immediately north of the site access track. In this area, soils were thin and the underlying bedrock was very close to the ground surface, with areas of open rock face also noted. The distribution of species present were attributed to the *Trifolium repens* – *Luzula campestris* sub-community CG10a, being characterised by the presence of frequent white clover, tormentil, field wood rush, common dog violet *Viola rivianna*, sweet vernal grass, wild thyme *Thymus praecox*, and common rock rose *Helianthemum nummularium*, with occasional bilberry *Vaccinium myrtillus*, ribwort plantain *Plantago lanceolata*, bitter vetch *Lathyrus linifolius* and mouse-ear hawkweed *Pilosella officinarum*.





### Neutral Grassland (UKHab g3c)

Neutral grassland was recorded in the fields surrounding the proposed access track and as occasional pockets of damp grassland within the main site.

Neutral grassland (and corresponding NVC communities) recorded adjacent to the proposed access track include:

#### MG1 *Arrhenatherum elatius* grassland

Several areas of *Arrhenatherum elatius* grassland were recorded in the north and south sections of the access track survey area (**Photo 3-3**). In these areas false-oat grass *Arrhenatherum elatius* was dominant with frequent Yorkshire fog *Holcus lanatus*, red fescue *Festuca rubra*, cock's-foot *Dactylis glomerata*, common bent *Agrostis capillaris* and creeping thistle *Cirsium arvense*. In one field in the north of the access track bracken (U20) was dominant.

#### Photograph 3-3: Neutral grassland (MG1)



#### MG6 *Lolium perenne* – *Cynosurus cristatus* grassland

The MG6 vegetation community was recorded in field systems adjacent to the existing access track. In these areas, sheep grazing and agricultural improvement were not intensive enough to for perennial rye-grass *Lolium perenne* to dominate the sward, as such these areas have been characterised as neutral grassland (UKHab g3c) as opposed to modified grassland (g4). Species within this community commonly comprised perennial rye-grass, cock's-foot, crested dogs tail *Cynosurus cristatus*, Timothy grass *Phleum pratense*, rough meadow grass *Poa trivialis*, Yorkshire fog, yarrow *Achillea millefolium*, white clover *Trifolium repens*, creeping thistle and common nettle *Urtica dioica*. In areas of thinner soils close to scrub habitat, species such as lady's bedstraw *Galium verum*, ribwort plantain *Plantago lanceolata*, birds foot trefoil *Lotus corniculatus*, eyebright *Euphrasia sp.*, common cats ear *Hyphochaeris radicata*, lesser stichwort *Stellaria graminea* and cutleaf geranium *Geranium dissectum* were also noted.

The Cleekhimin Burn intersects the south of the access track survey area, for which land immediately adjacent to the watercourse comprised a mosaic of unmanaged neutral



grassland and scrub (**Figure 8.2.2**). The unmanaged conditions in turn had allowed species such as teasel *Dipsacus fullonum*, yarrow, common knapweed *Centaurea nigra*, perforate St John's wort *Hypericum perforatum*, silverweed *Potentilla anserina*, coltsfoot *Tussilago farfara*, common sorrel *Rumex acetosa* and mint *Mentha sp.* to develop among the neutral grassland sward. Neutral grassland habitat recorded within the main site comprised the following NVC community:

MG10 *Holcus lanatus* – *Juncus effusus* rush pasture

Two small stands of *Holcus lanatus* – *Juncus effusus* grassland were recorded in mosaic with acid grassland (U4a). Species within such stands were dominated by soft rush, with a field layer comprising frequent Yorkshire fog *Holcus lanatus*, white clover, creeping buttercup *Ranunculus repens* and common mouse-ear chickweed *Cerastium fontanum*.

#### Modified Grassland (UKHab g4)

MG6 *Lolium perenne* – *Cynosurus cristatus* grassland

Within the south of the main site, two large fields comprised of agriculturally improved pasture, attributed to the MG6a *Lolium perenne* – *Cynosurus cristatus* grassland typical sub-community, were recorded. This community was characterised by a lush green sward dominated primarily by white clover and perennial rye grass *Lolium perenne*, with creeping thistle *Cirsium arvense*, scattered nettle *Urtica dioica*, soft rush *Juncus effusus* and tufted hair grass *Deschampsia cespitosa* noted closer to some field margins.

MG7 *Lolium perenne* leys and related grassland

This habitat was found in heavily sheep grazed fields surrounding the access track. Perennial rye grass and white clover were dominant, with broadleaved-dock *Rubus obtusifolius*, common nettle, and creeping buttercup also present.

### 3.2.2 Woodland

#### Upland Birchwoods (w1e)

Two stands of upland birchwood, dominated by birch *Betula sp.*, were identified within the main site survey area. The first, positioned within the south of the main site, comprised a field layer of bracken, tufted hair grass *Deschampsia cespitosa* and Yorkshire fog *Holcus lanatus* below the tree canopy, while bilberry, field wood rush and ling heather *Calluna vulgaris* were frequent in open areas receiving more light (**Photo 3-4**). Due to the variety of ground layer vegetation present, this stand has not been attributed to an individual NVC community.

W11 *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland

The second stand, positioned within the southwest of the main site survey area, comprised a limited field layer reflecting a reduction of light due to the dense tree canopy (**Photo 3-5**). Creeping soft grass *Holcus mollis* formed the dominant grass cover, with scattered hairy wood rush *Luzula pilosa*, wild primrose *Primula vulgaris*, wood sorrel *Oxalis acetosella*, wood sage *Teucrium scorodonia*, common dog violet and occasional deer fern *Blechnum spicant* also noted. The assemblage of species present within the field layer can be attributed to the NVC community W11 *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland.





**Photograph 3-4: Upland birchwood (no NVC community assigned)**



**Photograph 3-5: Upland birchwood (W11)**



#### **Mixed Woodland (w1h)**

A single stand of woodland, comprised primarily of non-native coniferous trees and bordered by broadleaved species such as rowan *Sorbus aucuparia*, sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior* and silver birch *Betula pendula*, was noted immediately to the east of the existing access track. Given the presence of broadleaved species, this stand has been mapped to the UKHab category 'other woodland; mixed; mainly conifer' (w1h6).

#### **Other Coniferous Woodland (w2c)**

Several stands of coniferous woodland, serving as shelterbelt plantation, were recorded within the south of the main site and in the east of the access track survey area. Species



within such stands were formed primarily of non-native Sitka spruce *Picea sitchensis* with occasional European larch *Larix decidua*, with a species poor ground flora limited by shade cast by the canopy.

Within the access track survey area, some stands of coniferous woodland had been felled and have therefore mapped as other coniferous woodland (w2c) with the secondary code '53 - Felled'.

As conifer plantation is not covered in the NVC, it has been labelled as 'CF' within **Figure 8.2.3**.

### 3.2.3 Heathland

#### Upland heathland (h1b)

##### H9 *Calluna vulgaris* – *Deschampsia flexuosa* heath

The H9 *Calluna vulgaris* – *Deschampsia flexuosa* heath was the most common heath community recorded within higher elevations of the main site. This community has established as a result of frequent moor burning practice, resulting in an overwhelming dominance of ling heather of uniform age (**Photo 3-6**). Within the main site survey area, it was distributed as a patchwork of linear stands in mosaic with H12 *Calluna vulgaris* – *Deschampsia flexuosa* and H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* heaths, M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire, M20 *Eriophorum vaginatum* blanket mire, and heath vegetation recently subject to burning for which an NVC community could no longer be derived (denoted as RB on **Figure 8.2.3**).

In terms of sub-communities, stands comprising almost no other sub-shrubs, very little vascular content, and a bryophyte cover limited to Cypress-leaved plait moss *Hypnum cupressiforme* and occasional rusty-swan neck moss *Campylopus flexuosus* were attributed to the species poor sub-community H9c.

Within the north of the main site survey area, some previously burned stands were noted to be regenerating as a mosaic of species poor H9c and the purple moor grass *Molinia caerulea* sub-community H9e whereby pioneering vegetation comprising abundant shoots of ling heather, bilberry, and purple moor grass were developing with frequent heath rush *Juncus squarrosus* over a ground cover dominated by rusty-swan neck moss.

In addition to the above, several stands of transitional heath, representing an intermediate between H9 and H12 *Calluna vulgaris* – *Vaccinium myrtillus* communities, were noted. Like the H9 community, these areas of heath were dominated by ling heather and lacked vascular content. However, the bryophyte layer trends more towards that of H12, with an abundance of glittering wood-moss *Hylocomium splendens* and red-stemmed feather moss *Pleurozium scheberi*. As such, these communities have been labelled as H9-H12 on **Figure 8.2.3**.

##### H10 *Calluna vulgaris* – *Erica cinerea* heath

Two small stands of upland dry heath, corresponding to the H10 *Calluna vulgaris* – *Erica cinerea* NVC community, were identified within the southwest of the main site survey area (TN 8 and 42). Both stands had been subject to historic burning and were regenerating with abundant ling heather and bell heather *Erica cinerea*, with frequent bitter vetch and occasional field wood rush throughout.

##### H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath

The H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath community was characterised by a sward dominated by ling heather, with frequent to abundant bilberry, occasional tormentil *Potentilla erecta*, and a ground layer formed of glittering wood moss, red-stemmed feather



moss, and rusty-swan neck moss. This community was commonly recorded along sheltered sloping ground above watercourses that had been secluded from burning management regimes, resulting in a more diverse sward. It was also found to be regenerating as short, heavily-grazed swards in areas of the main site that had been subject to more recent burning.

#### H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* heath

This community was found to occur on freely draining slopes within the main site survey area, often in association with H9 and H12 heath communities and as pioneering vegetation in response to burning regimes. Stands of H18 were generally formed of a short, grazed sward dominated by bilberry, with occasional wavy hair grass *Deschampsia flexuosa* and mat grass *Nardus stricta* and a dense bryophyte layer of glittering wood moss, red-stemmed feather moss and *Rhytidiadelphus* moss species (**Photo 3-7**).

In some areas of site, an intermediate community formed of abundant purple moor grass (of which is likely to have developed as a result of historic burning) with frequent to abundant shoots of bilberry and a ground layer of glittering wood moss and red-stemmed feather moss was recorded (e.g. TN 31). Due to the co-dominance of purple moor grass and regenerating bilberry within the sward, areas with such species assemblage have been classified as M25 – H18 (Figure 8.2.3).

#### **Photograph 3-6: Upland heathland (H9)**





### Photograph 3-7: Upland heathland (H18/H12)



#### 3.2.4 Dense scrub

W23 *Ulex europaeus* – *Rubus fruticosus* scrub

Scattered stands of scrub dominated by gorse *Ulex europaeus* (UKHab h3e), were noted adjacent to the Whaplaw Burn, within the south of the main site survey area (TN 22). These stands have been recorded as target notes as they were too small to map.

Within the access track survey area, stands of gorse scrub and mixed scrub (UKHab h3h) were recorded adjacent to the Cleekhimin Burn. Gorse was the most abundant species, but other species also present included broom *Cytisus scoparius*, bramble *Rubus fruticosus*, raspberry *Rubus idaeus*, willow *Salix sp.* and elder *Sambucus nigra*. Tall forbs and grasses of the surrounding grassland habitats were also present. The scrub was mainly mature with some sheltered edges and openings.

#### Other scrub

A stand of willow scrub (UKHab h3) was also noted within the southeast of the main site survey area, on sloping ground above a stand of upland birch woodland. The field layer beneath the scrub was formed of bracken and heather.

#### 3.2.5 Blanket bog

Blanket bog habitat (UKHab f1a) was common across relatively flat or gently sloping ground at higher elevations within the main site survey area. Due to a history of moor burning within the site, resulting in a reduction in species diversity and altered hydrological regime, much of this habitat type has been classified as degraded bog (f1a6).

M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire

This vegetation community was characterised by a dominance of hares tail cottongrass and ling heather within the sward. Heavily grazed sprigs of billberry were frequent throughout, with scattered cross-leaved-heath *Erica tetralix*, and a bryophyte layer comprised of red-stemmed feather moss, heath plait moss *Hypnum jutlandicum* and occasional to frequent waved silk-moss *Plagiothecium undulatum*. This community was generally very dry in



appearance, with little or no red bog moss *Sphagnum capillifolium* noted. As such, most stands were considered to represent a degraded form of the typical sub-community M19b.

An area of good condition intact M19b blanket mire was however noted within the far north of the survey area (**Figure 8.2.3**), within which the ground layer was less dried out, comprising frequent red bog moss, hypnaceous mosses and *Cladonia* lichen species.

#### M20 *Eriophorum vaginatum* blanket mire

This vegetation community was commonly recorded within the north and central section of the main site survey area. It was characterised by hummocks of relatively dry vegetation dominated primarily by hares tail cottongrass and hypnaceous moss species, with only occasional cross-leaved heath and ling heather. This form of degraded blanket mire was generally assessed as moderate condition.

#### M25 *Molinia caerulea* – *Potentilla erecta* mire

Within the north and west of the main site survey area, some stands of dry, degraded blanket bog and heath habitat, comprising purple moor grass as the most dominant species, were recorded. Other associates included frequent, grazed, bilberry regrowth and a bryophyte layer of glittering wood moss and little shaggy moss. Due to the generally dry ground and dense cover of purple moor grass, of which is most likely related to historic burning, this community has been classified as degraded bog (f1a6) in accordance with the UKHab classification system.

#### **Photograph 3-8: Degraded blanket bog (M20)**



### Photograph 3-9: Degraded blanket bog (M25)



#### 3.2.6 Purple moor grass and rush pasture

M23 *Juncus effusus/ acutiflorus* – *Galium palustre* rush pasture

This community was generally found to occur adjacent to watercourses or areas of water seepage along slopes, often in mosaic with acid grassland (U4 and U5) and flush (M6) communities. Stands within the main site survey area were dominated by either sharp flowered rush (M23a) soft rush (M23b), or both species (M23), with a field layer comprising frequent Yorkshire fog, creeping buttercup, wavy bittercress, common sorrel and occasional tufted hair grass *Deschampsia flexuosa*. In species rich stands (e.g. TN 39), marsh marigold *Clathra palustris*, cuckooflower *Cardamine pratensis*, marsh willowherb *Epilobium palustre* and marsh bedstraw *Galium palustre* were also noted.

It should however be noted that much of the M23 community was generally species poor, with a field layer limited to occasional Yorkshire fog, creeping buttercup, wavy bittercress, common sorrel and thistle *Cirsium* species, and bryophyte layer of glittering wood moss and *Rhytidiadelphus* moss species. While classified as M23 rush pasture according to NVC, species poor stands have been mapped as other upland acid grassland (g1b6) with secondary code for dominant rushes (15) to accord with the requirements of the UKHab system (Figure 8.2.2).

#### 3.2.7 Upland flushes, fens and swamps

M6 *Carex echincata* – *Sphagnum fallax/ denticulatum* mire

This community was identified as small linear stands stretching along sloping ground, often in mosaic with acid grassland (U5) rush pasture (M23) and blanket mire (M19 and M20) communities. Species within swards were typically dominated by soft rush or sharp flowered rush with occasional to frequent Yorkshire fog and underlayer vegetation with frequent common haircap moss, common sorrel, creeping buttercup, flat-topped bog moss *Sphagnum fallax* and occasional blunt leaved bog moss *S. palustre*.

#### 3.2.8 Standing open water

Two man-made ponds (UKHab r1) were identified within the southeast of the main site survey area, measuring approximately 12m<sup>2</sup> and 750m<sup>2</sup> respectively (TNs 37 and 38).





Vegetation surrounding the ponds was dominated by dense soft rush with an underlayer of bent grass species, common sorrel, and marsh willowherb, with ground layer of common haircap moss, glittering wood moss, and occasional flat-topped bog moss.

Six additional man-made ponds were also recorded just outside the western site boundary. These ponds were recently excavated, each measuring approximately 100m<sup>2</sup>, surrounded by acid grassland and rushes (**Photo 3-10**).

In addition to the above, a natural pond measuring approximately 6,370m<sup>2</sup> (TN43) was also recorded alongside the Cleekhimin Burn within the access track survey area (**Photo 3-11**). There was limited observable marginal vegetation and no duckweed *Lemna minor* or algae covering the water surface. Vegetation of the surrounding grassland grew up to the pond edge. Mature trees shaded the eastern edge of the pond, and mature trees on an island in the centre of the pond also contribute to shade levels.

**Photograph 3-10: Man-made pond (r1)**



### Photograph 3-11: Natural Pond (r1)



## 3.2.9 Rivers

### Rivers

Two main watercourses and associated minor tributaries intersect the main site survey area; the Whaplaw Burn and Soonhope Burn. These are relatively narrow (up to approximately 5m wide) and shallow in nature, meandering through river valleys within the survey area.

Within the access track survey area, the Whaplaw Burn and Soonhope Burn merge to form the Cleekhimin Burn. At this point the flow of the watercourse varied from fast riffles to slower pools, creating different microhabitats for invertebrates. All three watercourses form part of the River Tweed SAC and have therefore been classified as priority habitat (r2a) under the UKHab classification scheme.



**Photograph 3-12: Rivers (r2a)**



**Photograph 3-13: Rivers (r2a) Cleekhimin Burn**



### **Other rivers and streams**

Allers Burn runs through the access track survey area until reaching a confluence with Whalplaw Burn. This burn is narrow and shallow and does not fall within the River Tweed SAC, as such it has been classified as 'other rivers and streams' (UKHab r2b). At the time of survey it was of moderate flow with neutral grassland bankside vegetation.

### **3.2.10 Cereal crops**

Field systems comprising recently harvested cereal crops (UKHab c1c) were recorded within the east of the access track survey area (**Photo 3-14**). As cereal crops do not have an NVC category and they have been mapped as N.A. within **Figure 8.2.3**.





**Photograph 3-14: Cereal crops (c1c)**



## 4.0 Evaluation of Nature Conservation Interest

The NVC communities recorded during the field survey can be compared with several classifications systems to assess their nature conservation interest and potential groundwater dependency. These classifications include:

- Annex I habitats listed under Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive);
- Priority habitats detailed within the Scottish Biodiversity List (SBL)<sup>4</sup>;
- Priority habitats listed within the Scottish Borders Local Biodiversity Action Plan (Scottish Borders Council, 2020); and
- Potentially groundwater dependant terrestrial ecosystems (GWDTEs) as defined by the Scottish Environmental Protection Agency (SEPA, 2017).

**Table 4-1** provides a summary of the nature conservation interest and potential groundwater dependency of each UKHab and NVC community identified during the field survey.

### 4.1 Annex I Habitats

Annex I habitats are natural habitat types whose conservation requires the designation of Special Areas of Conservation and are generally regarded as being of European importance. These habitats are of ecological value and should be considered in further Ecological Impact Assessment (EclA). Habitat communities within the survey area that are considered to meet the criteria for Annex 1 classification are illustrated in **Figure 8.2.5**, with details provided in **Table 4-1** and summarised below:

- Upland heathland (h1b) – NVC communities H9, H10, H12 and H18 - H4030 European dry heaths
- Blanket bog (f1a) – NVC communities M19 and M20 – H7130 Blanket bogs

### 4.2 Scottish Biodiversity List Habitats

The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats which the Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The purpose of the list is to identify species and habitats which are the highest priority for conservation in Scotland, of which are termed 'priority habitats'.

NVC communities identified that correspond with SBL priority habitats are presented in **Table 4-1** and can be summarised as follows:

- Upland acid grassland – U5 and U6;
- Upland heathland - H9, H10, H12 and H18;
- Blanket bog – M19, M20 and M25;
- Purple moor grass and rush pasture – M23 and M25;
- Upland flushes, fens and swamps – M6
- Rivers

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<sup>4</sup> The Scottish Biodiversity List is a list of animals, plants and habitats which the Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The list is available online at: <https://www.nature.scot/doc/scottish-biodiversity-list>



### 4.3 Scottish Borders Local Biodiversity Action Plan (LBAP)

Habitats communities identified during the survey that correspond with priority habitats described within the LBAP include:

- Upland flushes, fens and swamps - M6 and M23;
- Blanket bog – M19, M20 and M25
- Rivers and burns;
- Upland cleugh and scrub woodland (upland birchwood) – W11;
- Upland heathland - H9, H10, H12 and H18; and
- Grassland and enclosed farmland – U4, CG10.

### 4.4 Groundwater Dependant Terrestrial Ecosystems

The potential groundwater dependency of each NVC community identified during the field survey is outlined in **Table 4-1**, illustrated in **Figure 8.2.6** and summarised below.

Moderate potential GWDTE:

- M25 *Molinia caerulea* – *Potentilla erecta* mire\*;
- U6 *Juncus squarrosus* – *Festuca ovina* grassland\*; and
- MG10 *Holcus lanatus* – *Juncus effusus* rush pasture\*.

High potential GWDTE:

- M6 *Carex echinata* – *Sphagnum fallax* mire;
- M23 *Juncus effusus/ acutiflorus* – *Galium palustre* rush pasture; and
- CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus praecox* grassland\*.

Note that the potential groundwater dependency of the communities listed above with an asterisk largely depends on their hydrogeological setting. Further assessment of the GWDTE potential can be found in **Chapter 10: Hydrology, Hydrogeology and Geology** of the EIA Report.

### 4.5 Notable species

Three notable plant species were identified during the field survey:

- Rock rose (Scottish Borders LBAP species) – recorded within calcareous grassland habitat on sloping ground immediately west of the existing access track (TN18);
- Common juniper (SBL and Scottish Borders LBAP species) – recorded as scattered occurrences along the banks of Whaplaw Burn within the south of the survey area (TN 19 and 21); and
- Wild pansy *Viola tricolour* (SBL and Scottish Borders LBAP species) - recorded within upland acid grassland habitat in several locations within the survey area.

**Table 4-1 Summary of vegetation communities recorded and corresponding Annex I and SBL habitat types and potential GWDTE status**

UKHab classification	Corresponding NVC communities	Area (ha)	Annex I habitat	SBL Priority Habitat	Potential GWDTE Status
	U4 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> –	66.40	N/A	N/A	N/A



UKHab classification	Corresponding NVC communities	Area (ha)	Annex I habitat	SBL Priority Habitat	Potential GWDTE Status
Other upland acid grassland (g1b)	<i>Galium saxatile</i> grassland				
	U5 <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland	70.29	N/A*	<i>Nardus stricta</i> – <i>Galium saxatile</i> grassland	N/A
	U6 <i>Juncus squarrosus</i> – <i>Festuca ovina</i> grassland	2.84	N/A*	<i>Juncus squarrosus</i> – <i>Festuca ovina</i> grassland	Moderate**
	Je <i>Juncus effusus</i> acid grassland community	13.44	N/A	N/A	N/A
Bracken (g1c)	U20 <i>Pteridium aquilinum</i> – <i>Galium saxatile</i> community	193.55	N/A	N/A	N/A
Upland calcareous grassland (g2b)	CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland	1.06	N/A*	Upland calcareous grassland	High**
Other neutral grassland (g3c)	MG1 <i>Arrhenatherum elatius</i> grassland	1.55	N/A	N/A	N/A
	MG10 <i>Holcus lanatus</i> – <i>Juncus effusus</i> rush pasture	0.90	N/A	N/A	Moderate
Modified grassland (g4/g3c)	MG6 <i>Lolium perenne</i> – <i>Cynosurus cristatus</i> grassland	43.62	N/A	N/A	N/A
	MG7 <i>Lolium perenne</i> leys and related grassland	1.23			
Upland birchwoods (w1e)	W11 <i>Quercus petraea</i> – <i>Betula pubescens</i> – <i>Oxalis acetosella</i> woodland	1.79	N/A	Upland birchwoods	N/A
Other coniferous woodland (w2c)	N/A – mapped as CF	9.88	N/A	N/A	N/A
Upland heathland (h1b)	H9 <i>Calluna vulgaris</i> – <i>Deschampsia flexuosa</i> heath	299.95	H4030 European dry heath	Upland heathland	N/A
	H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath	0.66			
	H12 <i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> heath	85.95			



UKHab classification	Corresponding NVC communities	Area (ha)	Annex I habitat	SBL Priority Habitat	Potential GWDTE Status
	H18 <i>Vaccinium myrtillus</i> – <i>Deschampsia flexuosa</i> heath	42.83			
	RB Recently burned	142.10	H4030 European dry heath	Upland heathland	N/A
Gorse scrub (h3e)	W23 <i>Ulex europaeus</i> – <i>Rubus fruticosus</i> scrub	0.11	N/A	N/A	N/A
Blanket bog (f1a)	M19 <i>Calluna vulgaris</i> – <i>Eriophorum vaginatum</i> blanket mire	95.33	H7130 Blanket mire	Blanket bog	N/A
	M20 <i>Eriophorum vaginatum</i> blanket mire	154.37			
	M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire	21.60	N/A	Blanket bog	N/A
Purple moor grass and rush pasture (f2b)	M23 <i>Juncus effusus/ acutiflorus</i> – <i>Galium palustre</i> rush pasture	24.95	N/A	Purple moor grass and rush pastures	High
Upland flushes fens and swamps (f2c)	M6 <i>Juncus echinata</i> – <i>Sphagnum fallax/ denticulatum</i> mire	3.44	N/A	Upland flushes, fens and swamps	High
Cereal crops (c1c)	N.A.	10.23	N/A	N/A	N/A
Rivers (r2a)	N/A	-	N/A	Rivers	N/A
<p>* Due to limited species diversity in the sward, the U5 <i>Nardus stricta</i> – <i>Galium saxatile</i> community and CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland community identified during the survey are not considered to conform to the Annex I habitat '6230 Species-rich <i>Nardus</i> grassland on siliceous substrates in mountain areas'.</p> <p>**Moderately groundwater dependant based on hydrogeological setting</p>					



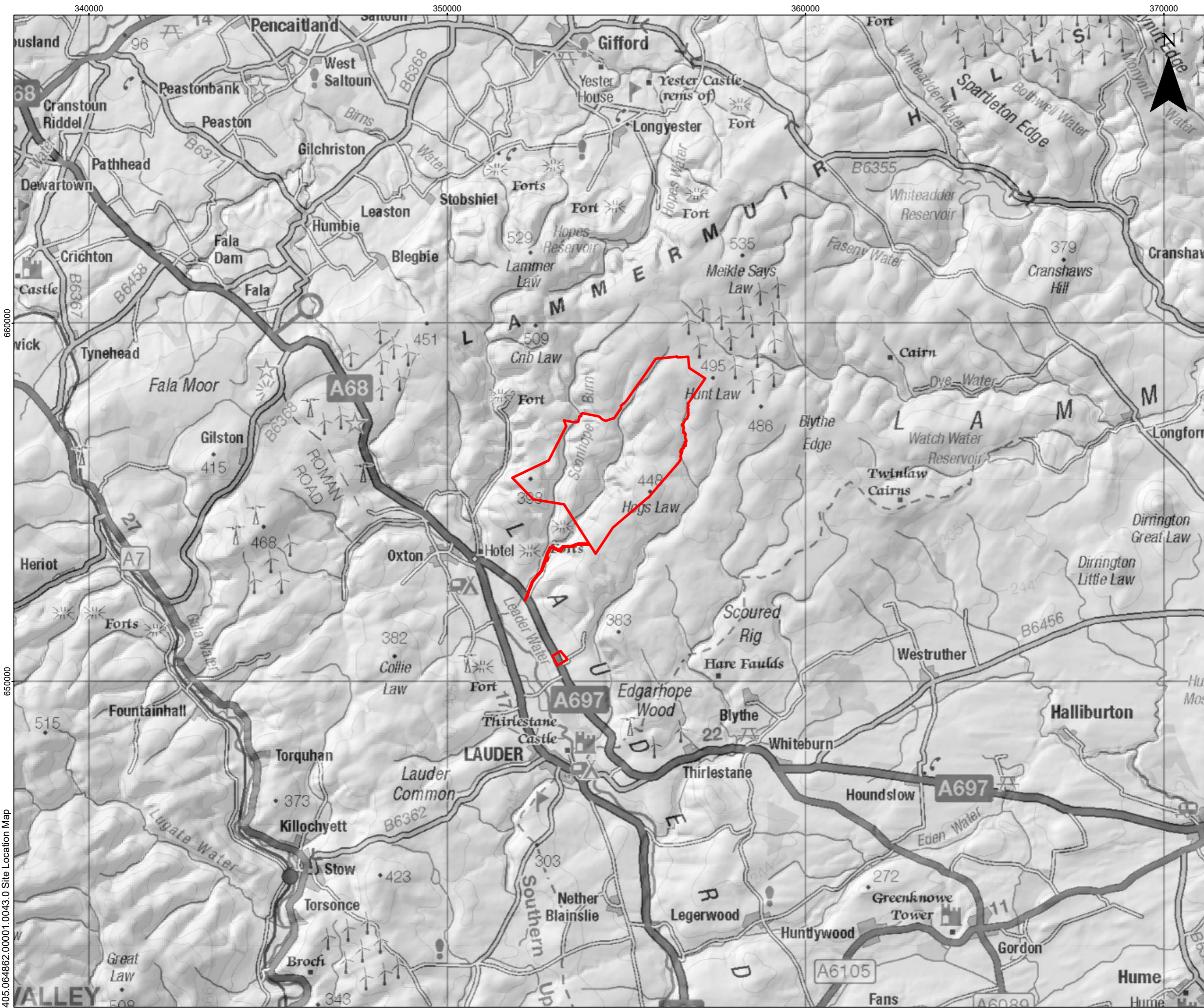


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**LEGEND**

Site Boundary



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**LONGCROFT WIND FARM**  
**LONGCROFT HABITAT REPORT**  
**SITE LOCATION MAP**

**FIGURE 8.2.1**

Scale 1:100,000 @ A3      Date OCTOBER 2023

405.064862.00001.0043.0 Site Location Map