ARDERSIER PORT ENERGY TRANSITION FACILITY PORT EXTENSION

Haventus

November 2025

Appendix 12.14 Habitats, Vegetation and GWDTE

Haventus Expansion Area

Habitats, vegetation & GWDTE

Status:	**Final 1.0**
Date:	**29/08/2025**
Prepared by:	**Dr Andy McMullen**
Email:	**andy@botanaeco.co.uk**
Web:	**www.botanaeco.co.uk**

Please note: • This report is designed for viewing on a screen. It can be printed legibly at A4 although formatting is at A3, the scale for printing if full map resolution is required.
• Pressing the 'Alt' + ' ◂ ' keys will return the page view to a followed hyperlink.

Contents

Tables

Maps

Appendices

Cover picture: Overview of the marshy grassland & scattered trees backing onto gorse scrub, at the eastern end of the site.

Summary

This report describes the results of a habitat-focused survey & assessment of the Haventus Expansion Area (**HEA**) associated with Ardersier Port, a component of the Cromarty Firth Green Freeport, on Whiteness Head, 5.3 km west of Nairn, in Highland.

The **aim** of the report is to describe the habitat baseline & assessment process to identify habitat constraints & opportunities

The HEA extends across 16.9 ha of sand spit at around 4 m to 5 m above sea level, and within 330 m of an estuarine inlet. It is currently succumbing to the spread of gorse scrub, with birch woodland closely succeeding. Current management is apparently limited to the cutting of trackways and to irregular vehicle passes, as well as some light, foot traffic.

Several **statutory designations** are located in proximity to the site, including Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas and a Ramsar site.

The **Carbon & Peatland Map** identifies no Class 1, Class 2 or Class 5 peatland or peat soils.

Ancient Woodland Inventory sites are located at 22 m distance.

Habitat areas: Dense continuous scrub accounts for 11.6 ha (69 %) of the site and there is a moderate, 2.9 ha (17 %) extent of broadleaved (birch) woodland. The other habitats each account for less than 0.5 ha (3 %), including: unimproved, acid, dune & neutral grasslands; drain; dune heath; standing, oligotrophic water; & track.

Only one **notable plant species** has been recorded by the survey: juniper. Additional species & assemblages are of local interest.

No **peatland** is present.

No **deep peat** is present.

Ecological importance of the habitats ranges from Local to Site.

GWDTE are not identified in a site-specific context.

The key habitat **constraints** identified by the survey & assessment are juniper shrubs included within the Scottish Biodiversity List and as a Priority Species in the UK Biodiversity Action Plan.

Habitat-related **mitigation** requires avoidance/conservation, translocation or off-setting for any impacts on juniper.

Additional **biodiversity enhancement**-related options include avoidance/conservation, translocation or off-setting of impacts upon distinctive:

- H11c dry heath (including the area identified by Target Note 6 in Appendix 1).
- M6c-M23b mosaic
- MC9a dune grassland
- W17b birch woodland.

3D representation of the habitats at the Haventus Expansion Area.
(Solid green = broadleaved woodland; hatched green = scrub; orange & pink = acid/neutral flush - marshy grassland flush; orange = grassland; yellow = heath).

1 Introduction

Remit

1.1 This report describes the results of a habitat-focused survey & assessment of the Haventus Expansion Area (**HEA**) associated with Ardersier Port, a component of the Cromarty Firth Green Freeport, on Whiteness Head, 5.3 km west of Nairn, in Highland.

Aim & objectives

1.2 The aim of the report is to describe the habitat baseline & assessment process to identify habitat constraints & opportunities by meeting the following objectives:

- Phase 1 habitat & National Vegetation Classification survey.
- Assessment of habitat importance & sensitivity, including designations, peat/peatland & Groundwater Dependent Terrestrial Ecosystems (GWDTE).

The site

1.3 The HEA extends across 16.9 ha of sand spit at around 4 m to 5 m above sea level, and within 330 m of an estuarine inlet. It is currently succumbing to the spread of gorse scrub, with birch woodland closely succeeding. Current management is apparently limited to the cutting of trackways and to irregular vehicle passes, as well as some light, foot traffic.

2 Approach

2.1 In preparation of the baseline, a desk-based study of environmental information is undertaken, to identify relevant data (on designations, etc), and then a field-based survey. The resulting, desk study & survey data is then assessed to identify sensitivities in relation to guidance & legislation. Details on the methods & sources are provided in the following sections.

Survey boundary & buffers

2.2 The survey area is defined in Map 1 *et seq*. It includes the site boundary & GWDTE only in a 100 m buffer.

Desk study

2.3 A desk study is undertaken to identify habitat designations, including:

- Sitelink[1] to identify nature conservation designations.
- Carbon & Peatland Map[2] to identify 'Class 1' or 'Class 2' peatland, or Class 5 peat soils.
- Ancient Woodland Inventory[3] to identify native woodlands.

Survey

2.4 There are two elements to the survey: a 'Phase 1' habitat survey and a more detailed 'National Vegetation Classification' (NVC) of vegetation within the habitats. The data from these is mapped & described; and supplemented by field assessment of habitat/vegetation condition & groundwater dependency. The methods are described in the following sections.

Phase 1 habitat survey

2.5 Phase 1 habitat survey is undertaken within the site boundary according to the standard method[4] & guidance[5]. As a 'broad-brush' approach, Phase 1 habitat survey is now somewhat outdated by current legislation & initiatives but it still provides a well-established & useful overview. Furthermore, it includes unvegetated habitats not covered by the more detailed National Vegetation Classification described below. In the Habitats & vegetation baseline (below), the vegetation communities are grouped & described under the heading of the corresponding Phase 1 habitat.

[1] SiteLink data, including mapping & site documentation available at https://sitelink.nature.scot/home. Accessed 29/08/2025.

[2] Carbon & Peatland Map details are available at https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/. Accessed 29/08/2025.

[3] *A guide to understanding the Scottish Ancient Woodland Inventory* is available at https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awi. Accessed 29/08/2025.

[4] JNCC 2010. *Handbook for phase 1 habitat survey - a technique for environmental audit* and other relevant information available at http://jncc.defra.gov.uk/page-2468. Accessed 29/08/2025.

[5] Chartered Institute of Ecology and Environmental Management 2018. *Guidelines for Ecological Impact Assessment in the UK & Ireland*. Available at https://www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpea-. Accessed 29/08/2025.

National Vegetation Classification

2.6 The National Vegetation Classification (NVC) is more precise than the Phase 1 habitat method; and is necessary for identifying habitats/plant communities of relevance to modern legislation (such as Annex I of the Habitats Directive, or GWDTE of the Water Framework Directive). It is therefore the primary system to which vegetation (& habitat) is related within this report, for the purposes of identification, mapping & description.

2.7 Vegetation is identified, mapped & described according to *British Plant Communities*[6] in accordance with the *NVC Users Handbook*[7]. This involves walking the site on a route determined by topography/viewpoints and the need to sample distinctive areas. Boundaries are mapped onto rectified aerial photographs overlain with contours & other physical features. A single vegetation community, or a mosaic or transition of two or communities, is identified within a boundary, depending upon the scale & patterning of the habitat/vegetation. Where mosaics or transitions are mapped, the percentage cover of each NVC community is stated.

Target notes

2.8 Characteristics of the vegetation in particular locations, and point-features too small to otherwise map, are recorded as 'Target Notes' (in Appendix 1). These notes include a description of the feature/habitat, the coordinates and an illustratory photograph.

Habitat & vegetation description

2.9 In this section, the approach to describing vegetation biodiversity & patterning is described.

Biodiversity: species richness, evenness & distinctiveness

2.10 Biodiversity is defined as the variation in genes, species & interactions in an area. In order to describe the biodiversity of habitats & vegetation, the following measures are used on a three-point scale (high, medium/moderate & low):

- Species richness (or α diversity) is a measure of the number of species
- Evenness (or β diversity) is a measure of how equally the species are distributed.
- Distinctiveness (or γ diversity) is a measure of how much the habitat contributes to biodiversity.

2.11 Species richness relates the number of species and by inference: the number of genes & interactions. Evenness relates how many of the interactions are dominated by small number of species, or a single species, and is often indicative of habitat condition, for example: invasive species (e.g. bracken) create 'uneven' vegetation because of their exclusive dominance. Some habitats are naturally species poor but these are usually distinctive, such as reedbeds, that are dominated by a single grass but are rare in the landscape, and they host notable species. As such, distinctiveness is broadly a measure of naturalness &/or rarity.

2.12 Use of species richness, evenness & distinctiveness as measures of habitat/vegetation biodiversity therefore aids appraisal of habitat/vegetation composition, condition & ecological importance.

Mosaics, transitions & admixtures

2.13 Distinction is made between mosaics & transitions in the mapping & assessment. Mosaics are mapped where two or more habitats or NVC communities are juxtaposed as discrete areas at a scale below the resolution of the mapping (≈1:10,000). For example: acid grassland over water-shedding mounds, among marshy grassland in waterlogged depressions.

2.14 Transitions represent dynamic situations where established habitat(s) &/or NVC communities are being displaced by others. For example: bracken or purple moor-grass invading into grassland or blanket bog. In these transitions, the habitats/communities are blended together, with the invasive species/community diffusely scattered throughout in a distribution that cannot be mapped at an operable scale.

2.15 Very minor areas of one habitat within another, such as small flushes within blanket bog, are considered as admixtures to the dominant type. To maintain the clarity of the mapping, etc., these admixtures are included within the dominant habitat (and not defined as mosaics) because the admixture is usually less than 2 % of the total area. However, their presence & cover is indicated in the labelling of Map 4.

Scale

2.16 Survey is undertaken at a scale of around 1:5,000 to 1:8,000 and the habitat mapping is rendered at a scale of around 1:5,000 on small sites (<100 ha) or around 1:10:000 to 1:1:12,500 on larger sites (as specified on the maps). Small features (less than 2 m to 5 m) are not mapped, or are recorded as points or lines; and/or as Target notes, if they are ecologically significant (e.g. springs, dykes or animal burrows).

Quantification of species abundance

2.17 Plant species abundance within habitats/vegetation is semi-quantified using the DAFOR scale. This scale broadly relates abundance/cover as follows:

- **D**ominant: >51 % cover
- **A**bundant: 30 % to 50 % cover
- **F**requent: 15 % to 30 % cover
- **O**ccasional: 5 % to 15 % cover
- **R**are: <5 % cover.

[6] Rodwell, J.S. 1991-2000. *British plant communities*. 5 Volumes. Cambridge University Press.

[7] Rodwell, J.S. 2006. *NVC Users' Handbook*. Available at http://jncc.defra.gov.uk/page-3724. Accessed 29/08/2025.

Notable species

2.18 Notable species are included in nature conservation designations & listings. The 2016 JNCC spreadsheet of taxa designations[8] defines these species and is the main point of reference in addition to the *Highland Biodiversity Action Plan*[9]. Species are referred to as 'notable' to avoid confusion with the use of 'rare' in the DAFOR scale (see Quantification of species abundance).

Nomenclature

2.19 Standardised vernacular names are used for the vascular plants (ferns, herbs & trees). Scientific names (italicised within the text) are used for the moss, liverwort & lichen species because although vernacular names are now in existence, they are not in general usage. This approach assists discrimination of the plant groups and avoids long, tedious lists of vernacular & scientific names. The standard checklists for the names are employed[10].

Peat depth

2.20 Peat depth is assessed during survey on an *ad hoc* basis, to provide preliminary data on its distribution. The depth is assessed in exposures (such as in drains or eroded faces) or by use of a 1.5 m probe.

Survey accuracy

2.21 Survey accuracy is influenced by a number of factors including the following:

- GPS error.
- Georectification errors in the aerial photography used for base-mapping.
- Gradual transitions between habitats & vegetation that are poorly-defined with a simple line.
- Transitional habitats & vegetation similar to two or more habitats or NVC communities.

2.22 Furthermore, the fit of vegetation to the published NVC communities is often imperfect and the closest approximation is therefore adopted (with explanation in the habitat/vegetation descriptions in the Habitats & vegetation baseline). Surveying in Scotland also has the added limitation that NVC sampling was weighted towards England, so the published descriptions, and even community titles, are not always directly applicable (for example: eponymous species may not be present in Scotland).

Assessment

2.23 Assessment of the baseline is undertaken against local, national & international, legislation & initiatives, to identify priorities for nature conservation & sensitive habitats. The methods described in the following sections have been applied in assessment of the baseline.

Peatland Condition Assessment

2.24 Peatland Condition Assessment[11] is employed in the field to determine the condition of the peatland habitat. This assessment classifies the peatland into four classes:

- Near-Natural
- Modified
- Drained
- Actively Eroding.

2.25 Field-based assessment of a series of key indicators identifies the appropriate class for each area of peatland. These indicators include features such as the *Sphagnum* cover & vegetation condition; evidence of fire frequency & intensity; bare peat; and scrub/tree invasion[12]. Condition indicators relevant to the site are listed in the Peatland Condition Assessment section.

Deep peat

2.26 The peat depth data is used to broadly discriminate shallow peat (<0.5 m deep), shallow deep peat (0.5 m to 1.5 m deep) &/or very deep peat (>1.5 m deep); and its distribution in relation to habitat features.

Ecological importance

2.27 The habitat & species baseline established by the desk study & survey is assessed against the following to identify priorities for protection:

- Peatland & Carbon Map[2]
- Ancient Woodland Inventory[3]
- Highland Biodiversity Action Plan[9]
- Annex I of the EU Habitats Directive[12]
- Scottish Biodiversity List[13].

[8] JNCC spreadsheet of taxa designations & further information available at: http://jncc.defra.gov.uk/page-3408. Accessed 29/08/2025.

[9] Highland Biodiversity Action Plan 2021-2026. Available for download at https://www.highlandenvironmentforum.info/biodiversity/action-plan/. Accessed 29/08/2025.

[10] BSBI *List of British & Irish Vascular Plants & Stoneworts*, for higher plants, available at https://bsbi.org/taxon-lists. For mosses and liverworts, the *Census Catalogue of British and Irish Bryophytes 2021* available at https://www.britishbryologicalsociety.org.uk/publications/census-catalogue/. Accessed 29/08/2025.

[11] NatureScot 2017. *Peatland Condition Assessment*. Available for download from https://www.nature.scot/sites/default/files/2017-10/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf. Accessed 29/08/2025.

[12] List & descriptions of Habitats Directive Annex I habitats available at http://jncc.defra.gov.uk/Publications/JNCC312/UK_habitat_list.asp. Accessed 29/08/2025.

[13] Further details and download of the Scottish Biodiversity List available at https://www.nature.scot/doc/scottish-biodiversity-list. Accessed 29/08/2025.

2.28 The assessment is undertaken according to the Ecological Impact Assessment guidance[14], which recommends that a level of ecological importance is assigned to features using a geographical context as defined in Table 1.

Table 1: Ecological importance categories.

Importance	Context	Characteristics
International	Europe	• An area of habitat designated as a Ramsar site; Special Area of Conservation &/or Special Protection Area.
National	UK\Scotland	• An area of habitat designated as a Site of Special Scientific Interest. • Habitat area >1% of the national resource.
Regional	Highland	• A vague definition including habitats of more importance than county level but not sufficient for SSSI designation.
County	Moray Firth	• County-designated (e.g. Biodiversity Action Plan) habitats. • Habitat area >1% of the county resource. • Semi-natural, ancient woodland >0.25ha in extent.
Local	Site & 2 km buffer	• Habitats that are unique, or of some other significance, in the local area. • Areas of habitat that contribute to the local ecological resource.
Site	Site only	• Common, often anthropogenic habitats, or dominated by invasives.

Notable species

2.29 Mapping of notable species is constrained by the habitat survey method that requires different search patterns & seasons to those required for effective species survey. A key focus is therefore on the identification of species assemblages that can be efficiently identified & protected to highlight & conserve most, if not all, of the species present on a site. It also allows for the protection of less valued species alongside those that are notable.

2.30 Assemblages are usually located on unproductive areas (e.g. crags or waterlogged basins) where they have been able to escape a legacy of management or development. Furthermore, their location is usually predictable in these areas, and amenable to detection during a habitat survey

Groundwater dependent terrestrial ecosystems

2.31 Potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) were identified during the NVC survey according to Confor[15] & SEPA[16] guidance. Location-specific groundwater dependency is assessed because GWDTE are not always groundwater dependent, so their inappropriate consideration can cause unnecessary constraint. Assessment is based on the physical environment (geology, hydrology & topography) of the potential GWDTE as well as their floristics.

Constraints & mitigation

2.32 Habitat-related constraints are identified from the assessment of Ecological importance and appropriate mitigation is broadly defined to reduce the intensity of potential impacts.

Biodiversity enhancement

2.33 Opportunities for biodiversity enhancement are primarily identified in relation to the Peatland Condition Assessment; assessment of ecological importance; and current, legislative priorities.

Additional background

2.34 Additional background on the approaches employed are available on the Botanæco blog at the following links:

General survey

- Using a mobile device on ecological surveys
- Setting up a speedy, mobile GIS using QField
- Habitat survey kit
- Approaches to survey
- Semi-automating vegetation data entry

Habitats & vegetation

- Conserving relict species assemblages
- A way to describe vegetation
- Fitting Phase 1 habitats & NVC communities to their designations.

Peat & peatlands

- Peat depth survey - a modern approach
- Confusion over peat depth & other mire sediment types
- Peatland Condition Assessment.

GWDTE

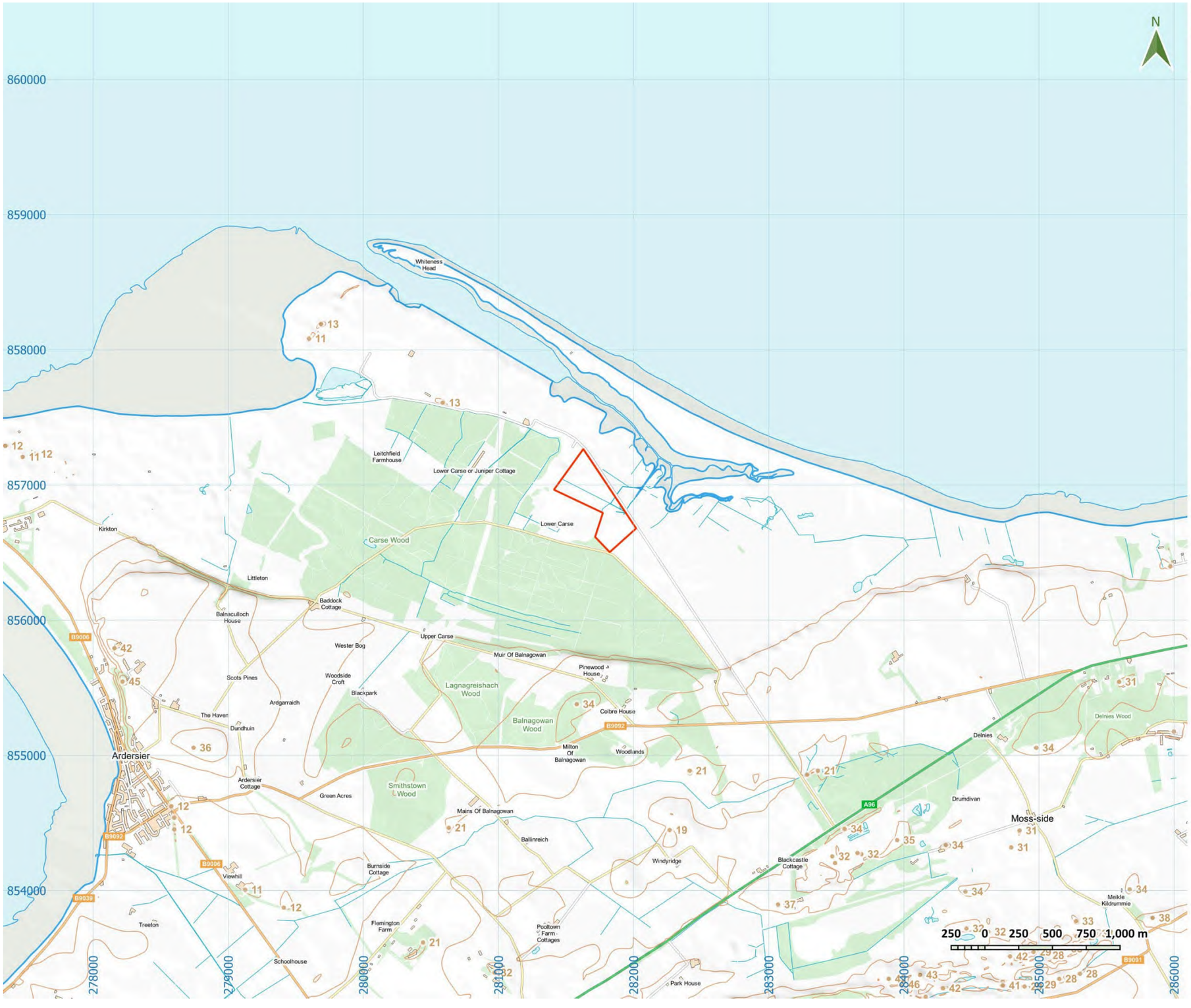
- GWDTE: a field guide
- A contribution to the risk-based assessment of GWDTE
- GWDTE 2: A quick guide to GWDTE
- GWDTE I: Go with the flow on survey.

[14] CIEEM 2018. Guidelines for Ecological Impact Assessment in the UK & Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Available at https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/. Accessed 29/08/2025.

[15] Confor 2018. Practice guide for forest managers to assess and protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation proposals. Available at https://www.confor.org.uk/media/246950/practice-guide-on-ground-water-dependent-terrestrial-ecosystems.pdf. Accessed 29/08/2025.

[16] Land Use Planning System SEPA Guidance Note 31. Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available at https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf. Accessed 29/08/2025.

Map 1:
Physical features.



Haventus Expansion Area

Physical features

Legend

- Expansion Area

Physical features

- Point height (m)
- Contour (10 m)
- Building
- Foreshore
- Primary Road
- B Road
- Minor Road
- Waterbody
- High Water Mark
- Low Water Mark
- Tidal water
- Watercourse
- Woodland

Scale: 1:30,000 at A3

botanæco

Map contains:
• OS data © Crown copyright and database right (2025).

3 Baseline

3.1 In this section, the habitat baseline of the site is described in relation to its general characteristics, designations, habitats, vegetation communities & notable plant species.

General description

3.2 The site of the ADA is lightly undulating, with an amplitude of little over 1 m, and relatively level (see Map 1). Topographic drainage is therefore limited but the sandy soil is otherwise free-draining. In addition, drains cross the site and are concentred in its southeast where there is a pond and peripheral waterlogging. Gorse scrub (with broom) is extensive; there is a moderate extent of birch woodland in the south; and there are minor areas of acid grassland, coastal grassland, dune heath, marshy grassland, neutral grassland & open water.

Designations

3.3 In this section, statutory & non-statutory nature conservation designations associated with the site are identified. The distribution of designated habitats & sites is illustrated in Map 2 & Map 3 (note that for clarity, woodland is not illustrated in these and subsequent maps).

Statutory designations

3.4 Statutory nature conservations designations provide a legal basis to the protection of certain sites and their specified features. Their distribution is illustrated in Map 2 & designated features listed in Table 2.

3.5 Whiteness Head Site of Special Scientific Interest (SSSI) and the Inner Moray Firth Special Area of Conservation (SAC) & Special Protection Area (SPA) are located within 0.02 km distance, to the northeast. The SSSI is designated for its coastal habitats & processes; and bar-tailed godwit. At 0.75 km distance, the Moray Firth SAC & SPA are respectively designated for sandbanks & dolphin; and for a range of coastal bird species. The Ardersier Glacial Deposits SSSI is designated for geomorphological features, at a distance of 2.9 km; and at 3.5 km distance, the Kildrummie Kames SSSI is designated for wetland habitat & juniper scrub. There is therefore a wide range of coastal bird & habitat; land form; and wetland & scrub features in the vicinity of the site.

Table 2: Statutory designations, their location & qualifying features.

Site	Designation	Distance & orientation	Qualifying features	
Whiteness Head	SSSI	0.017 km, northeast	• Coastal geomorphology • Bar-tailed godwit • Knot • Sandflats	• Saltmarsh • Sand dunes • Shingle
Moray Firth	SAC	0.75 km, northeast	• Subtidal sandbanks	• Bottlenose dolphin
	SPA	0.75 km, northeast	• Common eider • Common goldeneye • Common scoter • European shag • Great northern diver • Greater scaup	• Long-tailed duck • Red-breasted merganser • Red-throated diver • Slavonian grebe • Velvet scoter
Inner Moray Firth	SPA	0.017 km, northeast	• Bar-tailed godwit • Common tern • Cormorant • Curlew • Goldeneye • Goosander • Greylag goose • Osprey	• Oystercatcher • Red-breasted merganser • Redshank • Scaup • Teal • Waterfowl assemblage • Wigeon
	Ramsar	0.017 km, northeast	• Mudflat • Sandflat • Saltmarsh • Sand dune • Shingle • Bar-tailed godwit • Common tern • Cormorant • Curlew • Goldeneye	• Goosander • Greylag goose • Osprey • Oystercatcher • Red-breasted merganser • Redshank • Scaup • Teal • Wigeon
Ardersier Glacial Deposits	SSSI	2.9 km, west	• Quaternary geology & geomorphology	
Kildrummie Kames	SSSI	3.1 km, south	• Open water transition fen	• Eutrophic loch • Juniper scrub