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CLASHINDARROCH WIND FARM

**PROPOSED ACCESS ROUTE:
ECOLOGICAL IMPACT ASSESSMENT**

SUPPLEMENTARY ECOLOGICAL REPORT
Report 2 of 3

A Report to:
AMEC Wind Energy

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SUMMARY

A vegetation survey and impact assessment was undertaken for the proposed access track route from the C115S public road to the proposed wind farm. Standardised methods, using the Phase 1 Habitat Survey methodology (JNCC 1993) and a National Vegetation Classification (NVC) survey (Rodwell 1992-95) were undertaken in order to appraise the conservation importance, assess ecological impacts and define any recommendations for mitigation relative to vegetation and flora.

Key Findings

The majority of the study site is comprised of Planted Coniferous Woodland of *Negligible Value*. However, the Phase 1 habitat survey and NVC confirmed the presence of the following vegetation types listed on Annex 1 of the *EU Directive on the Conservation of Natural Habitats and Wild Fauna and Flora* (92/43/EEC):

Non-priority Habitats

- Dry Heath (Phase 1 equivalent = Dry Dwarf-shrub Heath)

Within this habitat type, the NVC survey of the SSSI differentiated the various plant associations comprising the heath communities into:

- H10 *Calluna vulgaris-Erica cinerea* heath, comprising the H10a Typical sub-community and the H10c *Festuca ovina-Anthoxanthum odoratum* sub community
- H12 *Calluna vulgaris-Vaccinium myrtillus* heath, comprising the H12a *Calluna vulgaris* sub-community and the H12b *Vaccinium vitis-idaea-Cladonia impexa* sub-community
- H12a/U5 *Calluna vulgaris-Vaccinium myrtillus* heath/*Nardus stricta-Galium saxatile* grassland mosaic.

The H12b *Vaccinium vitis-idaea-Cladonia impexa* sub-community was assessed to be of *National Value*, the H10a Typical sub-community, the H10c *Festuca ovina-Anthoxanthum odoratum* sub community and the H12a/U5 *Calluna vulgaris-Vaccinium myrtillus* heath/*Nardus stricta-Galium saxatile* grassland mosaic were assessed to be of *High Local Value*, with all other habitat types being assessed as *Low Local* or *Negligible Value*.

The study site supports the following plant species of conservation significance:

National significance:

- Spring Sandwort *Minuartia verna*, and
- Northern Bedstraw *Galium boreale*.

Regional Significance:

- Juniper *Juniperus communis*

The proposed access track route could result in impacts of:

- Moderate Significance to H10a and H10c *Calluna vulgaris-Vaccinium myrtillus* heath and Juniper *Juniperus communis* within the SSSI

The construction of an access track through a Site of Special Scientific Interest may be classed by Scottish Natural Heritage as a Potentially Damaging Operation under the Wildlife and Countryside Act 1981. This is defined as any operation appearing to SNH to be likely to damage the flora, fauna or any special features for which the site is designated.

The implication of this is that it would be an offence to undertake any management works within the Craigs of Succoth SSSI until a formal letter has been sent to SNH requesting permission to undertake the works; detailing the type of Potentially Damaging Operation which is proposed (taken from the SSSI citation), the details of the operations to be undertaken, the timing of such operations, and the avoidance and mitigation measures proposed; and that a written letter of consent for the proposed works has been received from SNH.

Mitigation measures are recommended which reflect best practice guidelines, including the production of a detailed Method Statement and Restoration Plan and taking cuttings of Juniper to grow on and plant out after construction work.

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1 INTRODUCTION

1.1 Terms of Reference

The following report presents the results of an independent study by Heritage Environmental Ltd (HEL) to provide an Ecological Impact Assessment (EclA) for vegetation using the Phase 1 Habitat Survey and National Vegetation Classification (NVC), relating to the access route for the proposed wind farm scheme at Clashindarroch, by Huntly, Aberdeenshire Council Area. The study was commissioned by AMEC Wind Energy in December 2003.

In accordance with the brief, the scope of consultancy service required was defined as follows:

- Provision of a Phase 1 Habitat Survey with target notes along the approximately 5km length of the proposed access route to the north of the site. Where this route passes through the Craigs of Succoth SSSI, a detailed National Vegetation Classification (NVC) will be undertaken;
- Provision of an impact assessment of the proposed development in relation to the above habitats;
- Provision of ecological mitigation and compensation measures (where required) in order to reduce and/or eliminate any potential negative impacts as a consequence of the proposed wind farm scheme.

1.2 Description of Proposed Access Track

The proposals for the Wind Farm Access Track include a route from where it leaves the C115S to a point at the north of the proposed wind farm boundary. This route follows existing forestry tracks in places, while the survey corridor takes in conifer plantation, open rides and drains.

A 100m stretch of this proposed route uses an existing track across the Craigs of Succoth SSSI. The existing track through the SSSI is 2m wide. The standard road width for the new access track will be 5m but will be reduced to 4m through the SSSI to minimise disturbance. The overall area of disturbance within the SSSI during construction will be approximately 9.5m, with widening being largely applied to the downslope part of the track with possibly a narrow zone uphill of the track to provide a firm road foundation and batter. The ditch on the upslope side of the track will probably require deepening, with the insertion of cross-drains to take run-off. All cross drains will end in a silt trap to retain any suspended solid matter.

2 APPRAISAL METHODOLOGY

2.1 Desk Study

A desk study was undertaken in order to collate and review any existing information held on the study site and in the vicinity. The following statutory and non-statutory organisations were contacted:

- Scottish Natural Heritage, Area Office

2.2 Phase 1 Habitat Survey

An assessment of the nature conservation significance of all habitats and higher plant species was appraised according to a standardised method using the Phase 1 Habitat Survey Method. The following provides a summary of the survey methods.

2.2.1 Fieldwork Methods

The Phase 1 Habitat Survey method outlined by NCC (1990) and revised by JNCC (1993) was employed to survey all habitat types encountered throughout the survey area. This method provides a standardised system for classifying and mapping the countryside (including urban areas), and ensures that surveys are carried out to a consistent level of detail and accuracy.

The methodology involves a trained surveyor visiting every parcel of land within the survey area and mapping the vegetation present. This was mapped in terms of some ninety specified habitat types found nationally with a minimum polygon size of approximately 30m x 30m.

Extensive use was also made of target notes in order to provide descriptive information and the location of rare or localised species and/or interesting habitats. The identification of areas which merit target notes was undertaken by the surveyor, using the guidelines provided in JNCC (1993). An assessment of individual areas of the main semi-natural habitats was made by the surveyor. This assessment was based on the primary evaluation criteria outlined by Ratcliffe (1977), and involved consideration of each habitats' naturalness, size, rarity, diversity and position in an ecological unit.

Invasive exotics including Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum* were target noted if present.

2.2.2 Survey Period

The survey was undertaken on 3rd and 4th May 2004 which is within the generally accepted period for undertaking Phase 1 Habitat Surveys in lowland and upland areas of Britain.

2.2.3 Survey Limitations

There were not considered to be any serious limitations to the survey, although any species that flower later in the season may not have been detected.

2.3 National Vegetation Classification Survey

An assessment of the nature conservation significance of all habitats and higher plant species was appraised according to a standardised method using the National Vegetation Classification (NVC). The study site for NVC included the section of access track crossing the Craigs of Succoth SSSI, plus 100m on either side. The following provides a summary of the methods.

2.3.1 Methods

The NVC survey was undertaken according to the methods outlined in *British Plant Communities (Vol.: 1-5)* (1991-95), edited by J.S. Rodwell.

The methodology involves a trained surveyor visiting every parcel of land within the survey area and mapping the vegetation present on to Ordnance Survey field maps at 1:10,000 scale, in terms of some 145 specified vegetation types encountered within Britain. The minimum polygon size mapped was approximately 30m x 30m.

In addition to the mapping of vegetation types, use was made of target notes in order to provide extra information on sites of rare or localised species and/or interesting habitats.

2.3.2 Survey Period

The survey was undertaken on 4th May 2004, which is within the generally accepted period for undertaking NVC surveys in upland areas of Britain.

2.3.3 Survey Limitations

There were no significant limitations associated with the proposed methodology and survey period. However, survey during late spring makes identification of certain species difficult due to reliance on flowerheads and seeds as diagnostic features. Identification may only be to genus in some cases. Identification to NVC sub-community may be restricted, however the main NVC community can be identified with confidence.

3 DESCRIPTION OF THE ECOLOGICAL RESOURCE

3.1 Desk Study

3.1.1 Statutory Designated Nature Conservation Sites

Scottish Natural Heritage have confirmed that the access route passes through the western extremity of the Craigs of Succoth SSSI. This site was designated for being one of the few areas in North East Scotland where serpentine rocks outcrop at the surface. Soils and groundwater derived from these rocks contain relatively high concentrations of certain minerals and give rise to rich and unusual flora (SNH 1990).

3.2 Site Description

The study site, approximately 165ha in extent, comprises a coniferous plantation with rides and access tracks, sections of watercourses and a section of open heath, part of the Craigs of Succoth SSSI.

3.3 Habitats

3.3.1 Description of Phase 1 Habitats

Map 1 shows the location and extent of all Phase 1 habitats within the study site. The following habitat types were recorded:

- Broadleaved Plantation Woodland
- Coniferous Plantation Woodland
- Scattered Trees
- Scrub
- Unimproved Acid Grassland
- Unimproved Neutral Grassland
- Marshy Grassland
- Poor Semi-improved Grassland.
- Dry Acid Dwarf-shrub Heath
- Dry Heath/Acid Grassland Mosaic
- Dry Heath/Neutral Grassland Mosaic
- Running Water
- Quarry
- Boundary Features

The following provides a general description of each habitat within the study site, with more detailed descriptions of features of note and species lists given in the Target Notes in Appendix 8.1.

A1.1.1 Broadleaved Plantation Woodland

This habitat category comprises small areas of recent planting of broadleaf tree species adjacent to the forest track, of between 10 and 25 whips in Tuley tubes, of too small an area to map and too numerous to target note. There is a more substantial area of recent broadleaf plantation adjacent to the public road at the entrance to the proposed access track. Species planted include Rowan *Sorbus aucuparia*, birch *Betula* sp. and Alder *Alnus glutinosa*.

A1.2.2 *Coniferous Plantation Woodland*

Conifer woodland occupies the largest area of habitat within the study site, comprising dense stands of predominantly Sitka Spruce *Picea sitchensis* with smaller stands of Scots Pine *Pinus sylvestris*. The plantation is fairly young, with tree heights of approximately 5-10m. The canopy is closed with ground flora being found only in forest rides.

A2 *Scrub*

Scrub is a plant community comprising native shrub species less than 5m tall. Continuous Scrub comprises two different types within the study site: Juniper *Juniperus communis* and willow *Salix* sp. The Juniper scrub is found in close association with the dry heath habitat, especially adjacent to the track at the Craigs of Succoth and continuing east along the track through the plantation, and also on the Craigs themselves.

The willow scrub exists as a small area on a wet flush below the track, just north of the SSSI.

Scattered scrub comprises individual Juniper bushes and the occasional Whin *Ulex europaeus*.

A3.3 *Scattered Trees*

Within the plantation rides and adjacent to the track in places there are scattered mature Scots Pine *Pinus sylvestris*, while on the open heath of the SSSI there are occasional small Rowan *Sorbus aucuparia*, with one single Scots Pine *Pinus sylvestris* on a crag near the track.

B1.1 *Unimproved Acid Grassland*

This habitat type is generally species poor and occurs on unenclosed hilly land, on soils with a pH less than 5.5.

Within the study site Unimproved Acid Grassland is found mostly as an intimate mosaic with Dry Dwarf-shrub Heath on the open ground of the Craigs of Succoth SSSI (See Section 4.4.2.3). Dominated by Mat Grass *Nardus stricta*, with Common Bent *Agrostis capillaris* and Sheep's Fescue *Festuca ovina*, there is a fairly species-poor sward comprising Green-ribbed Sedge *Carex binervis*, Heath Bedstraw *Galium saxatile*, with occasional Blaeberry *Vaccinium myrtillus*, Carnation Sedge *Carex panicea*, Great Wood-rush *Luzula sylvatica*, Wood Sorrel *Oxalis acetosella*, Heath Rush *Juncus squarrosus*, and Wavy Hair-grass *Deschampsia flexuosa*. Tufted Hair-grass *Deschampsia cespitosa* forms dense clumps in places.

B2.1 *Unimproved Neutral Grassland*

This habitat type includes a range of different plant communities on wet or dry soils with a neutral pH.

Within the study site this habitat type is represented by a sward almost completely dominated by Tufted Hair-grass *Deschampsia cespitosa*. Common Bent *Agrostis*

capillaris and mosses including *Hypnum* sp, *Pleurozium schreberei*, *Rhytidiadelphus loreus*, are frequent with occasional *Dicranum*. Other species recorded include Red Fescue *Festuca rubra*, Yorkshire Fog *Holcus lanatus*, Spear Thistle *Cirsium vulgare*, Ribwort Plantain *Plantago lanceolata* and Dog-violet *Viola riviniana*.

Unimproved Neutral Grassland occurs within the study site adjacent to the forest track, in the forest rides and as small patches within the Craigs of Succoth SSSI.

B5 Marshy Grassland

Marshy Grassland is a very variable habitat type, represented within the study site by a sward of co-dominant Soft Rush *Juncus effusus* and Tufted Hair-grass *Deschampsia cespitosa*, found in the more open and wetter parts of the plantation firebreaks and rides. Other species occurring at lower frequency include; Tormentil *Potentilla erecta*, Marsh Thistle *Cirsium palustre* and *Sphagnum* moss species.

B6 Poor Semi-improved Grassland

This plant community is represented by swards which are so heavily grazed that they are dominated by coarse grasses, or have been improved in the past and are now neglected, reverting back to a more diverse sward. Whatever their history, these swards have a limited abundance of meadow plants, reflecting the intensity of management.

Within the study site this habitat type is located alongside the access track, between the public road and the forestry plantation, with a small area by a ruined steading on the forest track. Species recorded include; Yorkshire Fog *Holcus lanatus*, Cock's-foot *Dactylis glomerata*, Red Fescue *Festuca rubra*, Common Bent *Agrostis capillaris*, Tufted Hair-grass *Deschampsia cespitosa*, Soft Rush *Juncus effusus*, Creeping Buttercup *Ranunculus repens*, Creeping Thistle *Cirsium arvense*, Common Sorrel *Rumex acetosa*, Nettle *Urtica dioica*, Broad-leaved Dock *Rumex obtusifolius*, Common Chickweed *Stellaria media*, Ribwort Plantain *Plantago lanceolata*, Meadow Buttercup *Ranunculus acris*, Sneezewort *Achillea ptarmica*, Whin *Ulex europaeus* and *Rhytidiadelphus squarrosus*.

D1.1 Dry Acid Dwarf-shrub Heath

This habitat type is characterised by vegetation with more than 25% coverage of ericoid shrubs, such as Heather *Calluna vulgaris*, Bell Heather *Erica cinerea* or Blaeberry *Vaccinium myrtillus*, typically occurring on free-draining, base-deficient substrates. Within the study site it is found in the forest rides and firebreaks, and on the open ground of the Craigs of Succoth SSSI. It also exists as a vegetation mosaic with Unimproved Acid Grassland, and with Unimproved Neutral Grassland.

Dry Heath within the study site is characterised by a dominant canopy of Heather *Calluna vulgaris* with Bell Heather *Erica cinerea*, Blaeberry *Vaccinium myrtillus*, Cowberry *Vaccinium vitis-idaea*, Mat Grass *Nardus stricta*, Sheep's Fescue *Festuca ovina*, Wavy Hair-grass *Deschampsia flexuosa*, Heath Rush *Juncus squarrosus*, Green-ribbed Sedge *Carex binervis*, Great Wood-rush *Luzula sylvatica*, *Polytrichum communis*, *Hylocomium splendens* and *Sphagnum capillifolium*.

D5 Dry Heath/Acid Grassland Mosaic

This habitat type exists as a mosaic of dry heath and acid grassland vegetation in patches too small to map individually. It is found within the study site on the flanks of the rock outcrops of the Craigs of Succoth SSSI.

Dx Dry Heath/Neutral Grassland Mosaic

This category is not a recognised Phase 1 category but it is present within the study site adjacent to the forest track. As a consequence of disturbance to soils and hydrology, coupled with the combined effects of the initial NPK loading of the soil at the time of the forest planting and the general acidification of the surface waters from conifer needles, the vegetation has developed as a patchy mosaic which is difficult to place in any specific habitat category.

Vegetation is a mixture of small stands of Heather *Calluna vulgaris* and other heath species, with stands of Tufted Hair-grass *Deschampsia cespitosa* and a mossy ground layer. Nearer the northern edge of the plantation the ground flora is more species-rich, with more typical neutral grassland species present, including: Crested Dog's-tail *Cynosurus cristatus*, Red Fescue *Festuca rubra*, Common Bent *Agrostis capillaris*, Common Mouse-ear *Cerastium fontanum*, Selfheal *Prunella vulgaris*, and Yarrow *Achillea millefolium*.

G2 Running Water

The Running Water category comprises rivers and streams. Within the study site the main watercourse is the Dry Burn (*sic*), which is a high-energy storm burn, with mainly Soft Rush *Juncus effusus* as emergent vegetation. There are drainage ditches through the plantation and adjacent to the forest track which carry run-off from the forest.

I2.1 Quarry

A pit with large rocks lies adjacent to the forest track – presumed to be a borrow pit for road surfacing materials. The substrate is mainly bare.

J2 Boundary Features

Post and wire fences are the boundary features present within the study site.

3.3.2 Description of National Vegetation Classification Communities

Map 2 shows the location and extent of all NVC plant communities lying within the part of the Craigs of Succoth SSSI which falls within the study site boundary. The following provides a summary of the plant communities.

Heathland

3.3.2.1 H10: *Calluna vulgaris-Erica cinerea* heath

The H10 *Calluna-Erica* heath is the dominant dry, sub-montane heath type, more commonly found in western Scotland. This community occurs on both siliceous and

basic rocks, where edaphic factors combined with aspect and slope determine the distribution of sub-communities.

Within the study site H10 *Erica-Calluna* is present where the dry heath occurs on slopes which have better drainage and therefore drier soils, especially in the open forest rides in the plantations. The H10 *Erica-Calluna* heath can tend toward a transition to U5 *Nardus stricta-Galium saxatile* acid grassland on the open hillside of the Craigs of Succoth SSSI.

The sub-communities represented here are the typical sub-community (H10a) and the *Festuca ovina-Anthoxanthum odoratum* sub-community (H10c).

The H10a Typical sub-community is located on the western slope below the serpentine rock outcroppings of the Craigs of Succoth. It exists with patches of Juniper *Juniperus communis* scrub (W19) along the forest track through the SSSI. Structurally, it comprises a canopy of tall Heather *Calluna vulgaris* with little other vegetation below apart from hypnoid mosses and bare ground. Other plant species occur as stragglers climbing through the canopy and in small, open areas in the heather canopy.

Constant species in this sub-community are: Heather *Calluna vulgaris*, Bell Heather *Erica cinerea*, Tufted Hair-grass *Deschampsia cespitosa*, *Pleurozium schreberi*, *Hylocomium splendens*, *Hypnum jutlandicum* and *Dicranum* sp.

Associated species include: Blaeberry *Vaccinium myrtillus*, Cowberry *Vaccinium vitis-idaea*, Crowberry *Empetrum nigrum*, Heath Bedstraw *Galium saxatile*, Hard Fern *Blechnum spicant*, Heath Rush *Juncus squarrosus*, Tormentil *Potentilla erecta*, Green-ribbed Sedge *Carex binervis*, Mat Grass *Nardus stricta*, Wavy Hair-grass *Deschampsia flexuosa*, Heath Milkwort *Polygala serpyllifolia*, Foxglove *Digitalis purpurea*, Wood Sorrel *Oxalis acetosella*, Wood Anemone *Anemone nemorosa*, Dog-violet *Viola riviniana*, Common Bent *Agrostis capillaris*, *Cladonia* sp., *Racomitrium lanuginosum*. Bare ground is frequently encountered under the Heather canopy.

The H10c *Festuca ovina-Anthoxanthum odoratum* sub-community is to be found in close conjunction with the flanks of the Serpentine rock outcrops. This community can be differentiated from the H10a typical sub-community by the increased presence of calcicolous and mesotrophic herbs such as Wild Thyme *Thymus praecox* and Dog-violet *Viola riviniana* in the sub-canopy. The structure is more open than the H10a sub-community, with Heather *C. vulgaris* having a lesser dominance in the canopy.

Constant species in this sub-community are: Heather *Calluna vulgaris*, Bell Heather *Erica cinerea*, Sheep's Fescue *Festuca ovina*, and Heath Bedstraw *Galium saxatile*.

Associated species include: Tormentil *Potentilla erecta*, Dog-violet *Viola riviniana*, Heath Milkwort *Polygala serpyllifolia*, Green-ribbed Sedge *Carex binervis*, Crowberry *Empetrum nigrum*, Juniper *Juniperus communis*, Cowberry *Vaccinium vitis-idaea*, Blaeberry *Vaccinium myrtillus*, Wavy Hair-grass *Deschampsia flexuosa*, Mat Grass *Nardus stricta*, Tufted Hair-grass *Deschampsia cespitosa*, Common Bent *Agrostis capillaris*, Wild Thyme *Thymus praecox*, Hard Fern *Blechnum spicant*, *Hypnum jutlandicum*, *Pleurozium schreberi*, *Hylocomium splendens*, *Racomitrium lanuginosum*, *Rhytidadelphus loreus* and *Cladonia* sp. Bare ground is infrequently encountered

under the sward.

3.3.2.2 H12: *Calluna vulgaris*-*Vaccinium myrtillus* Heath

H12 heath is the commonest type of dry, heather-dominated vegetation occurring at moderate altitudes in the colder, less oceanic parts of upland Scotland.

Within the study site H12 heath occurs on more level ground and on the serpentine rocky outcrops of the Craigs of Succoth. The H12 *Erica-Vaccinium* heath exists as a coarse-grained mosaic with U5 *Nardus stricta-Galium saxatile* acid grassland on the open hillside of the Craigs of Succoth SSSI.

The sub-communities represented here are the *Calluna vulgaris* sub-community (H12a) and the *Vaccinium vitis-idaea-Cladonia impexa* sub-community (H12b).

The H12a *Calluna vulgaris* sub-community covers the flanks and gentle slopes adjacent to the rocky outcrops of the Craigs, in a coarse mosaic with U5 *Nardus-Galium* acid grassland and with thick clumps of grassy vegetation dominated by Tufted Hair-grass *Deschampsia cespitosa*, which has been ascribed to the MG9 *Holcus-Deschampsia* vegetation community (although fairly atypical of either sub-community).

Constant species in this sub-community are: Heather *Calluna vulgaris*, Blaeberry *Vaccinium myrtillus*, Wavy Hair-grass *Deschampsia flexuosa*, *Pleurozium schreberi*, *Hypnum jutlandicum*.

Associated species include: Sheep's Fescue *Festuca ovina*, Bell Heather *Erica cinerea*, Common Bent *Agrostis capillaris*, Heath Bedstraw *Galium saxatile*, Tormentil *Potentilla erecta*, *Dicranum* sp., *Hylocomium splendens*, Mat Grass *Nardus stricta*, Tufted Hair-grass *Deschampsia cespitosa*. Bare ground is infrequent in this sub-community

The H12b *Vaccinium vitis-idaea-Cladonia impexa* sub-community is found covering the rocky crags of the Craigs of Succoth. This community can be differentiated from the H12a *Calluna vulgaris* sub-community by the increased presence of calcicolous and mesotrophic herbs such as Wild Thyme *Thymus praecox* and Dog-violet *Viola riviniana* in the sub-canopy, along with a greater abundance of lichens and bryophytes on the rocks and in the heather canopy. The grass component is much reduced in the canopy and the increased frequency of Blaeberry *Vaccinium myrtillus* distinguishes this vegetation community from the H10 *Calluna-Erica* communities.

Constant species in this sub-community are: Heather *Calluna vulgaris*, Blaeberry *Vaccinium myrtillus*, Cowberry *Vaccinium vitis-idaea*, Wavy Hair-grass *Deschampsia flexuosa*, *Pleurozium schreberi*, *Hypnum jutlandicum*, and *Cladonia* sp.

Associated species include: Sheep's Fescue *Festuca ovina*, Bell Heather *Erica cinerea*, Common Bent *Agrostis capillaris*, Heath Bedstraw *Galium saxatile*, Tormentil *Potentilla erecta*, *Dicranum* sp., *Hylocomium splendens*, *Racomitrium lanuginosum*, Mat Grass *Nardus stricta*, Tufted Hair-grass *Deschampsia cespitosa*, Crowberry *Empetrum nigrum*, Dog-violet *Viola riviniana*, Wild Thyme *Thymus praecox*, Juniper *Juniperus communis*, Rowan *Sorbus aucuparia* saplings, Primrose *Primula vulgaris*, Spring Sandwort *Minuartia verna*, Northern Bedstraw *Galium boreale*, Hard Fern

Blechnum spicant, Cuckooflower *Cardamine pratense*, *Dryopteris* sp., Brittle Bladder Fern *Cystopteris fragilis*, and *Polytrichum alpinum*. Bare ground is common in this sub-community in the form of exposed rock with occasionally a thin soil covering supporting individual plant species on small ledges.

Grassland

3.3.2.3 U5: *Nardus stricta*-*Galium saxatile* grassland

The U5 *Nardus*-*Galium* grassland is the typical upland grassland on moist, peaty, infertile soils, providing poorer quality rough grazing.

Within the study site U5 grassland occurs mainly in a coarse mosaic with H12 *Calluna*-*Vaccinium* heath on the more gentle slopes of the Craigs of Succoth SSSI. There is a band of vegetation on the northern slope of the rocky outcrops in which the Heather *Calluna vulgaris* component is much reduced and the grasses, including clumps of Tufted Hair-grass *Deschampsia cespitosa*, are dominant. This would appear to be a drainage channel from the adjacent curve of the rocky outcrops, too moist for the Heather *Calluna vulgaris* to maintain its abundance.

The U5 *Nardus*-*Galium* grassland within the study site is dominated by coarse tufts of Mat Grass *Nardus stricta*, with Sheep's Fescue *Festuca ovina*, Wavy Hair-grass *Deschampsia flexuosa* and Common Bent *Agrostis capillaris* well distributed throughout the sward. Blaeberry *Vaccinium myrtillus* is constant but with low cover, with *Pleurozium schreberi* and *Hylocomium splendens* in close association. Tufted Hair-grass *Deschampsia cespitosa* is frequent throughout, although not dominant, except downslope of the drainage flush where the Mat Grass *Nardus stricta* drops out of the sward to be replaced by Tufted Hair-grass *Deschampsia cespitosa* (MG9 *Holcus*-*Deschampsia* grassland).

The sub-community represented here is not easily identified as it is a species-poor sward, indicating U5a, the Species-poor sub-community. However, Carnation Sedge *Carex panicea* is present in places, supported by base enriched flushing from the serpentine rocks, but of low frequency and cover, too scattered to map as the U5c *Carex panicea*-*Viola riviniana* sub-community. Nor can the sward be ascribed to a U5a-U5c transition, as the coarse tufts of Tufted Hair-grass *Deschampsia cespitosa* fit into neither of these sub-communities. The sward is best described to community level only.

Constant species in this community are: Mat Grass *Nardus stricta*, Green-ribbed Sedge *Carex binervis*, Blaeberry *Vaccinium myrtillus*, Common Bent *Agrostis capillaris*, Sheep's Fescue *Festuca ovina*, Wavy Hair-grass *Deschampsia flexuosa*, Heath Bedstraw *Galium saxatile*, Tormentil *Potentilla erecta*, *Hylocomium splendens* and *Pleurozium schreberi*.

Associated species include: Wood Sorrel *Oxalis acetosella*, Carnation Sedge *Carex panicea*, Common Sorrel *Rumex acetosa*, Tufted Hair-grass *Deschampsia cespitosa*, Great Wood-rush *Luzula sylvatica*, Heather *Calluna vulgaris*, *Hypnum jutlandicum*, *Polytrichum commune*, and *Carex* sp.

3.3.2.4 MG9: *Holcus lanatus*-*Deschampsia cespitosa* grassland

The MG9 *Holcus*-*Deschampsia* grassland is characteristic of damp, periodically inundated, circumneutral soils, on level to moderately steeply sloping ground. The dominance of Tufted Hair-grass *D. cespitosa* relies on the ability of this grass species to tolerate the anaerobic conditions of high soil moisture.

Within the study site this community is represented by a single stand between the edge of the conifer plantation and the wet U5 *Nardus-Galium* drainage flush from the rocky outcrops. However, smaller patches of this community type are distributed throughout the U5 *Nardus-Galium* and H12 *Calluna-Vaccinium* mosaic. The species diversity within this community is limited and exhibits characteristics of both neutral and acid grassland types, with the soil moisture inhibiting typical species composition and preventing categorisation of the community type.

The sub-community was not easily identified due to the atypical nature of the sward

Constant species in this community are: Tufted Hair-grass *Deschampsia cespitosa*, Common Bent *Agrostis capillaris*, Heath Bedstraw *Galium saxatile*, and *Hypnum jutlandicum*.

Associated species include: Red Fescue *Festuca rubra*, Spear Thistle *Cirsium vulgare*, Dog-violet *Viola riviniana*, Ribwort Plantain *Plantago lanceolata*, *Rhytiadelphus loreus*, *Pleurozium schreberi*, *Dicranum* sp. and *Carex* sp.

4 EVALUATION OF HABITATS AND PLANTS

4.1 Levels of Value

In this section the vegetation resource within the study site is assigned a value, based on its status within the area. Table 5-1 has been used as a guide using adapted guidelines for assessing nature conservation value (IEEM 2002). A summary of findings is presented in Table 5-2.

Table 5-4.1 *Value of Ecological Resources.*

(Where species or habitats occur in more than one category, the highest value is applicable).

Level of Value	Examples
International	Internationally designated or proposed sites such as Ramsar Sites, Special Protected Areas, Biosphere Reserves and Special Areas of Conservation, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species in internationally important numbers, i.e. Annex 1 of Birds Directive, migratory species on migration routes, or in breeding, moulting, wintering or staging areas.
National	SSSI or NNR designated or qualifying sites holding species or assemblage of national importance. Sites supporting viable breeding populations of Wildlife and Countryside Act Schedule 1 species and supplying critical elements of their habitat requirements. Sites supporting nationally important numbers of a single species (>1% UK population). Species contributing to the integrity of an SPA or SSSI but which are not cited as species for which the site is designated.
Regional	Sites not meeting SSSI criteria but comfortably exceeding SINC criteria. Species subject to special conservation measures in UK BAP or sites holding viable breeding populations or supplying critical elements of their habitat requirements. Sites containing regionally important numbers of a single species (>1% regional population).
High Local	Sites meeting the criteria for a county area designation (SINC or Wildlife Site), Designated Local Nature Reserves or holding viable populations of any priority habitats or species identified in the Local BAP. Sites supporting viable breeding populations of substantial number of species known to be Red or Amber List Species of Conservation Concern and supplying critical elements of their habitat requirements.
Moderate Local	Undesignated sites, or features considered to appreciably enrich the habitat resource within approximately 10 km radius from the site. Sites supporting viable breeding populations of a small number of species listed as Red list or Amber list Species of Conservation Concern or supplying critical elements of their habitat requirements.
Low Local	Undesignated sites, species or areas considered to enrich the species richness within the immediate environs of the site.
Negligible	Areas with a poor species richness and none of the above. Any other species.

4.2 Planning Policy

NPPG 14 Natural Heritage states that “the presence of a protected species or habitat is a material consideration in the assessment of development proposals”. Planning authorities should take particular care to avoid harm to species or habitats protected under the Wildlife and Countryside Act 1981 or European Directives or identified as *Priorities in the UK Biodiversity Action Plan*.”

In addition “planning authorities should seek to prevent further fragmentation or isolation (of habitats) and identify opportunities to restore links which have been broken.” Article 10 of the Habitats Directive requires Member States to encourage the appropriate management of features of the landscape which are of major importance for wild flora and fauna.

The features concerned are those which because of their linear and continuous structure or their function as ‘stepping stones’ or ‘wildlife corridors’ are essential for migration, dispersal or genetic exchange. Features which may be of value in the development of habitat networks include areas of woodland, rivers and burns, lochs, ponds and wetlands, traditional field boundaries such as dykes or hedgerows, unimproved grasslands and herb rich meadows, heaths and peatland and coastal habitats”.

4.3 Legislative Overview

An obligation to conserve certain habitats is laid upon the UK Government by a number of international nature conservation conventions and directives. The most important international legislation concerning the protection of habitats is the *EU Directive on the Conservation of Natural Habitats and Wild Fauna and Flora* (92/43/EEC). This Directive lists habitats that are important in the EU because they are rare, endangered or vulnerable.

In Scotland 52 habitats have been identified as types of EU importance, including 14 “priority” habitats which are particularly threatened in global terms and the EU contains a significant proportion of their natural range. Protection of habitats under the *EU Habitats & Species Directive* is secured through the designation of Special Areas of Conservation (SAC). For habitats important to bird species under the *EU Birds Directive* conservation is secured through the designation of Special Protection Areas (SPA), although not all examples are, or will be, designated.

Examples of habitat types identified within the study site as types which are important in a European context are not necessarily of International Importance (i.e not listed as potential SPAs or candidate SACs), but require appraisal to assess their nature conservation significance (see Table 6-1).

The protection of habitats of National Importance is provided under the provisions of the *Wildlife & Countryside Act 1981* (as amended), which designates sites that fulfil the designation criteria as Sites of Special Scientific Interest (SSSI).

Habitats of district-wide importance, often called Sites of Importance for Nature Conservation (SINC) or Wildlife Sites (WS), may be identified by local planning

authorities, with policies to protect these sites listed in the appropriate Local Plan.

In addition to the above legislation, the UK and Local Biodiversity Action Plans list a number of habitats as *Priority Habitats*.

4.4 Designated Sites

The Craigs of Succoth SSSI lies partly within the study site. The qualifying interest for the site lies with the serpentine grassland flora, with the heathland providing an interesting contrast with the species-rich rocky outcrops. Small areas of heathland will be affected by base-rich flushing, but the main importance lies with the flora associated with the serpentine rock outcropping. Some 5.8ha of the 225.4ha SSSI lie within the study site boundary.

4.5 Evaluation of Habitats

4.5.1 Summary of Habitats of Conservation Value

The Phase 1 habitat and NVC surveys confirmed the presence of the following vegetation types listed on Annex 1 of EU Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC):

Priority Habitats

No Priority Habitats were recorded.

Non-Priority Habitats

- Dry Heath (Phase 1 equivalent – Dry Acid Dwarf-shrub Heath; NVC communities H10 *Calluna vulgaris-Erica cinerea*, H12 *Calluna vulgaris-Vaccinium myrtillus*)

The following UK Biodiversity Action Plan (UKBAP) Key Habitats are present within the study site:

- Upland Heathland (Phase 1 equivalent – Dry Acid Dwarf-shrub Heath; NVC communities H10 *Calluna vulgaris-Erica cinerea*, H12 *Calluna vulgaris-Vaccinium myrtillus*)

The following North East Scotland Local Biodiversity Action Plan priority habitats are present within the study site:

- Moray Moorlands (Local Habitat)

Table 5-2: Summary Evaluation of NVC types and other habitats in the study site.

Habitat Type/NVC community	Size	Rarity	Diversity	Naturalness	Fragility	Typicalness	Conservation Value
Broadleaved Plantation Woodland	Low	Low	Low	Low	Low	Medium	Low Local
Coniferous Plantation Woodland	High	Low	Low	Low	Low	High	Negligible
Scattered Trees	Low	Medium	Low	High	Medium	Medium	Low Local
Scrub	Low	Low	Low	High	Low	High	Low Local
Unimproved Acid Grassland	Medium	Low	Low	Medium	Low	Medium	Low Local
Unimproved Neutral Grassland	Low	Low	Low	Medium	Low	Low	Negligible
Marshy Grassland	Low	Low	Low	High	Low	Medium	Negligible
Poor Semi-improved Grassland.	Low	Low	Low	Medium	Low	Medium	Negligible
Dry Acid Dwarf-shrub Heath	Low	Low	Low	High	High	Medium	Low Local
Dry Heath/Acid Grassland Mosaic	Low	Low	Medium	Medium	Medium	Medium	Low Local
Dry Heath/Neutral Grassland Mosaic	Low	Low	Low	Low	Low	Low	Negligible
Running Water	Low	Low	Low	Medium	High	Medium	Low Local
Quarry	Low	Low	Low	Low	Low	High	Negligible
H10a	Medium	Low	Medium	High	Medium	High	High Local
H10c	Medium	Low	Medium	High	Medium	High	High Local
H12b	Low	High	High	High	Medium	Medium	National
MG9	Low	Low	Low	Medium	Low	Medium	Negligible
U5	Medium	Low	Low	Medium	Low	Medium	Low Local
H12a/U5 mosaic	Medium	Low	Low	Medium	Medium	Medium	High Local

4.5.2 Evaluation of Habitats

Table 5-2 provides a summary of the nature conservation importance of the Phase 1 habitats and NVC vegetation types identified within the study site. The criteria for habitat appraisal are those as defined in A Nature Conservation Review (Ratcliffe 1977), which allows the habitats to be graded according to their nature conservation

interest, as defined in Table 5-1 Value of Ecological Resources.

The important Phase 1 Habitat types or NVC communities, assessed as being of *Moderate Local Value* or higher, within the study site resulting from this appraisal are discussed below:

NVC types H10, H12 (Phase 1 equivalent- Dry Acid Dwarf-shrub Heath)

These vegetation communities are included within the European Dry Heath habitat type listed in Annex 1 of the *Habitats and Species Directive* and are regarded as being a component of the Upland Heathland Priority Habitat in the UK Biodiversity Action Plan. They are also included within the Moray Moorlands Habitat Action Plan of the North East Scotland Local Biodiversity Action Plan.

Dwarf-shrub heaths are recognised as being of international importance because they are largely confined within Europe to the British Isles and the western seaboard of mainland Europe (UKBAP 1999).

The dry heath vegetation (H10 *Calluna vulgaris-Erica cinerea* heath and H12 *Calluna vulgaris-Vaccinium myrtillus* heath) is itself reasonably robust and forms intimate mosaics with other mire, grassland, woodland and freshwater habitats, but can be affected by activities like grazing, trampling, burning and physical disturbance of soils which may suppress *Calluna vulgaris* and allow coarse grasses to dominate, thus reducing it to a less than favourable condition. Conversely, lack of grazing allows the heather canopy to increase at the expense of herb species, thereby reducing species diversity.

Within the study site the H10 *Calluna vulgaris-Erica cinerea* heath exhibits fairly natural structure, a continuous canopy with occasional gaps, and a variety of associated species at low frequency scattered throughout. The H12 *Calluna vulgaris-Vaccinium myrtillus* heath by itself is found only on the rocky outcrops where the thin soils and base-rich geology results in a fairly open heather canopy with a richer flora component than would be expected. On the flanks of the rocks the H12 *Calluna-Vaccinium* heath is found in a mosaic with U5 *Nardus stricta-Galium saxatile* acid grassland.

The Upland Heathland Habitat Action Plan (HAP) states that “upland heath in ‘favourable condition’ is typically dominated by a range of dwarf shrubs such as Heather *Calluna vulgaris*, Bilberry *Vaccinium myrtillus*, Crowberry *Empetrum nigrum*, Bell Heather *Erica cinerea*”. The HAP also recognises the importance of the complex mosaics formed with other vegetation types (UKBAP 1999).

Within the study site these species are all well represented in the dry heath stands, and the heath communities within the study site may well be interpreted as being in a favourable condition. However, the structure of the communities needs to be taken into account also, and with tall, maturing heather and significant clumps of coarse grasses present it may well be interpreted that the favourable condition is declining due to the lack of age classes among the heath communities and the dense sward produced by the grasses.

The Upland Heathland HAP has as a target to “maintain the current extent and overall distribution of the upland heathland which is currently in favourable condition.” (UKBAP

1999).

Although inclusion of these dry heath vegetation communities in the Upland Heathland HAP and Annex 1 of the *Habitats and Species Directive* appears to suggest that these vegetation types within the study site are of national/international importance, it is considered that these particular examples are not of international importance, i.e. of SAC status.

Both the H10 and H12 communities are included within the Craigs of Succoth SSSI, but are not the main qualifying feature for SSSI designation, which is species-rich serpentine grassland. Within the study site no serpentine grassland community could be identified by itself through the NVC process, but the qualifying features were present within the H12b *Vaccinium vitis-idaea-Cladonia impexa* sub-community which overlies the rock outcrops. The H12b *Vaccinium vitis-idaea-Cladonia impexa* sub-community is therefore assessed to be of *National Importance*, while the H10a Typical, H10c *Festuca ovina-Anthoxanthum odorata* sub-communities and the H12a/U5 heath/acid grassland mosaic, due to their providing “an interesting contrast with the species-rich serpentine influenced areas” (SNH 1990), are assessed to be of *High Local Value*.

Other areas of Dry Acid Dwarf-shrub Heath outwith the SSSI are narrow forest firebreaks and are assessed to be of *Low Local Value*.

4.6 Evaluation of Flora

Legislative Overview

An obligation to conserve certain plant species is laid upon the UK Government by a number of international nature conservation conventions and directives. The most important international legislation concerning the protection of plant species are the Bern Convention, the EU Habitats & Species Directive, the Ramsar Convention, the CITES Convention and the UN Convention on Biological Diversity. Wigginton (1999) provided a review of all plant species for which the UK has international obligations for their protection, and provides the definition here of Internationally Important Species.

Enhanced statutory protection for plant species in Britain is provided under the Wildlife & Countryside Act (1981). Schedule 8 of the Act lists 110 vascular plant species that are given special protection throughout Britain.

Plant species of nature conservation importance in a British context are reviewed in the British Red Data Books 1: Vascular Plants (Wigginton 1999). This lists all vascular plants considered to be most in need of conservation action by providing the definitive statement on the current distribution and status, and describing recent changes and trends in distribution and status.

Evaluation

The following plant species of *National Value* as defined in Table 5-1 were recorded within the study site:

- Spring Sandwort *Minuartia verna*
- Northern Bedstraw *Galium boreale*

These plants are assessed to be of *National Value* as they are specifically mentioned in the SSSI citation as being notable grassland plants on the serpentine rock outcrops for which the site has been notified.

The following plant species of *Regional Value* as defined in Table 5-1 was recorded within the study site:

- Juniper *Juniperus communis*

This plant is assessed to be of *Regional Value* due to its inclusion in the UK Biodiversity Action Plan for which a Species Action Plan has been written for this plant species.

5 IMPACT ASSESSMENT

The potential impacts relative to vegetation and flora consist of those that could take place during the construction phase, those that could take place during the operation of the site, and decommissioning of the wind farm.

Following guidelines being developed by the Institute of Ecology and Environmental Management, and guidance in SNH (2000a) a set of criteria has been produced to determine the significance of each effect. The significance of an impact on a particular ecological resource can be divided into two parts: the magnitude of the impact and the value of the resource.

To determine the magnitude of an impact, the following factors should be considered:

- Duration;
- Timing and frequency;
- Extent;
- Reversibility;
- Cumulative impacts;
- Sensitivity.

The criteria that have been used to assess the magnitude of impacts are summarised in Table 6-1. Each impact is given a magnitude. The magnitude of the impact is then assessed in conjunction with the value of the resource to provide an indication of impact significance (see Table 6-2 and 6-3).

It should be noted that the impact magnitude and significance takes into account avoidance measures as detailed in the Environmental Statement, and is prior to any proposed mitigation recommendations as discussed in section 7.

Table 6-5.1: Guideline Criteria for assessing magnitude of Impacts

Impact	Guideline Criteria
High	Total loss of, or major alteration to key elements/features of the baseline (pre development) conditions such that post-development character, composition or attributes will be fundamentally changed.
Medium	Loss of, or alteration to one or more key elements/features of the baseline conditions such that post-development character, composition or attributes of the baseline condition will be partially changed.
Low	Minor shift away from baseline conditions. Change arising from loss or alteration will be discernible but the underlying character, composition or attributes of the baseline condition will be similar to pre-development circumstances or patterns.
Negligible	Very slight change from baseline conditions. Change barely distinguishable, approximating to the 'no change' situation.
Positive	Positive change from baseline conditions.

Table 6-5.2 Significance of Impacts in relation to magnitude of impact and value of feature.

Value of Feature	Magnitude of Impact			
	High	Medium	Low	Negligible
International	High	High	Moderate	Low
National	High	High	Moderate	Low
Regional	High	Moderate	Low	Low
High Local	Moderate	Moderate	Low	Low
Moderate Local	Moderate	Low	Low	Low
Low Local	Low	Low	Low	Low
Negligible	Low	Low	Low	Low

Table 6-5.3 Guideline Criteria for assessing significance of Impacts

Impact Significance	Guideline Criteria
High	Substantial loss of conservation value on a regional, national scale or international scale. Loss of conservation value on a national scale or international scale.
Moderate	Substantial loss of conservation value on a high local and moderate local scale, some loss of value on a regional scale and low impact on international or national scale.
Low	Negligible impact on any scale. Low impact on community or species, of regional value or below and medium impact community or species of moderate local impact or below. Substantial loss of conservation value on a very local scale (i.e. immediate environs of study area).

The potential impacts of constructing an access track within the study site is discussed below:

5.1 NVC Communities within the Craigs of Succoth SSSI

Avoidance measures have been proposed in Volume 2 of the Clashindarroch Wind Farm Environmental Statement (AMEC 2003) to reduce the impact of track construction on the sensitive areas of the SSSI. The track width will be reduced from the standard 5m to 4m where it crosses the SSSI, a geotechnical survey will be undertaken to assess the stability of the Craigs during such operations and an ecological survey undertaken to establish appropriate methods for the handling of soil, turf and juniper for their re-instatement when work is completed.

Permanent direct loss of habitat to track construction

Within the 58,444m² of SSSI that lies within the study site, there will be a permanent loss of approximately 170 m² of H10a *Calluna-Vaccinium* heath and approximately 70m² of H10c *Calluna-Vaccinium* heath to the widened access track.

Impact Magnitude:	Medium
Impact Significance:	Moderate
Mitigation Possible:	No

Temporary direct loss of habitat to track construction

Within the 58,444m² of SSSI that lies within the study site, there will be a temporary loss of approximately 467.5m² of H10a *Calluna-Vaccinium* heath and approximately 192.5m² of H10c *Calluna-Vaccinium* heath adjacent to the widened access track. This includes the H10a/W19 *Calluna-Erica-Juniperus* heath/scrub mosaic. This temporary loss is due to the 9.5m corridor of disturbance during the construction work. The ground disturbed which lies outwith the permanent track will be subject to restoration after construction.

Impact Magnitude:	Medium
Impact Significance:	Moderate
Mitigation Possible:	Yes

Permanent indirect impacts

There is a proposed deepening of the drainage ditch on the upslope side of the access track, plus the addition of new crossdrains to carry run-off. Silt traps will be constructed to retain suspended solids in run-off. This will result in reduced diffuse water inputs to downslope vegetation communities, but increased water input in the main drainage channel. Since the vegetation communities downslope from the access track are dry heath communities, a reduction in diffuse water inputs is not considered to have a significant effect.

Impact Magnitude:	Negligible
Impact Significance:	Low

Mitigation Possible: **Not required**

The gradients of the land adjacent to the widened access track will be altered, 2m upslope and 3.5m downslope along the length of the track. The vegetation communities present include H10a and H10c *Calluna-Erica* heath and H10a/W19 *Calluna-Erica-Juniperus* heath/scrub mosaic.

These new surfaces will have old soil and turf reinstated, as per the design statement in the Environmental Statement, but it is not clear if the removed turf will be sufficient to completely cover the newly exposed surfaces. The presence of substantial areas of Tufted Hair-grass *Deschampsia cespitosa* in the locale may result in the spread of this coarse grass on disturbed soils through the explosion of wind-driven, ripe seed from these plants, as is evidenced on the northern boundary of the SSSI and along the edge of the existing forest track. Once established *D. cespitosa* may expand to dominate the sward where wet soils prevail, e.g. within the drainage ditch, and along natural drainage lines and areas with impeded drainage.

Impact Magnitude: **High**

Impact Significance: **Moderate**

Mitigation Possible: **Yes**

Temporary indirect impacts

Temporary, indirect impacts potentially include dust, pollution incidents and sudden variations in the hydrological regime, including silt-laden run-off. There is a strong possibility that bare soil could be washed downslope during heavy rain while heavy plant is onsite

Impact Magnitude: **Medium**

Impact Significance: **Moderate**

Mitigation Possible: **Yes**

5.2 Phase 1 Habitat Types within the Study Site

The proposed access track will be approximately 5km long and 5m wide with an uphill and downhill batter of unknown width, depending on the actual terrain and depth of soil or peat (AMEC 2003). The proposed track will follow existing tracks in places, and will create a new track where gradients and other ground conditions prevent this. Given the unknown parameters, impacts will therefore be assessed on length of track only.

Permanent direct loss of habitat to track construction

There will be a permanent loss of approximately 2.1km of coniferous plantation, 1.7km of Dry Heath/Neutral Grassland mosaic, 0.87km of Dry Heath, 0.18km of Poor Semi-improved Grassland, 0.13km of Marshy Grassland and 0.07km of Unimproved Neutral Grassland, of *Negligible/Low Local Value*. There is the probability of loss of an unknown number of planted broadleaf trees and scrub situated in little bays adjacent to the existing forest track, plus scattered Scots Pine *Pinus sylvestris* growing in clearings and rides.

Impact Magnitude: **Medium**

Impact Significance: **Low**

Mitigation Possible: **Partial**

Temporary direct loss of habitat to track construction

The Environmental Statement states that topsoil removed during construction will be stored and used to reinstate the habitats on the uphill and downhill batters. In many places there will be insufficient turves to cover the re-graded slope, especially where dense conifer plantation has been removed. Re-seeding will take place using a Red Fescue *Festuca rubra*/Common Bent *Agrostis capillaris*/Heather *Calluna vulgaris* seed mix, but the final exact species composition of re-instated habitat will be unknown.

Impact Magnitude: **Medium**

Impact Significance: **Low**

Mitigation Possible: **Yes**

Permanent indirect impacts

It is considered that the construction of a new access track on habitats with wet soils or where it crosses watercourses may result in an alteration to both the surface water and groundwater regimes, with a strong possibility that the vegetation composition of nearby habitats would be altered.

Marshy Grassland, and small drainage runnels, although widespread vegetation communities and considered to be of *Low Local Value* within the study site, have an important role to play in regulation of water quality and quantity. Permanent alteration to the water regime in these flush habitats, which flow in to and out of the wet communities may therefore have a potentially adverse impact.

However, watercourses will be culverted or bridged as stated in the Environmental Statement, thereby alleviating impact on hydrologically sensitive communities.

Impact Magnitude: **Low**

Impact Significance: **Low**

Mitigation Possible: **Not required**

Temporary indirect impacts

Temporary, indirect impacts potentially include dust, pollution incidents and sudden variations in the hydrological regime, including silt-laden run-off. There is also the strong possibility that bare soil will be washed downslope during heavy rain while heavy plant is onsite.

Of these potential impacts, the vegetation types most at risk would be the wet habitats and the ones with restricted distribution within the site. This would include: Marshy Grassland, Unimproved Neutral Grassland and Dry Dwarf-shrub Heath of *Negligible/Low Local Value*.

The Environmental Statement states that run-off will be intercepted in roadside drainage channels and directed to silt-traps to remove suspended solids. Drains will be discharged to existing watercourses, with water being allowed to run over riparian vegetation to further remove sediment. Fuels will be retained within a bunded area in a temporary compound.

Impact Magnitude:	Low
Impact Significance:	Low
Mitigation Possible:	Not required

5.3 Flora

There will be a temporary loss of approximately 30-50 Juniper *Juniperus communis* bushes growing adjacent to the access track within the SSSI, plus a small number further along the existing forest track before the proposed access track deviates away from the existing track.

Impact Magnitude:	Medium
Impact Significance:	Moderate
Mitigation Possible:	Yes

The proposed access track does not lie adjacent to locations of any other significant plant species.

Impact Magnitude:	Negligible
Impact Significance:	Low
Mitigation Possible:	Not Required

Table 7-4: Summary of Evaluation, Impact Magnitude and Impact Significance.

(where a vegetation type may potentially experience more than one impact, the highest significance is taken)

Habitat type/NVC community	Conservation Value	Impact Magnitude	Impact Significance
Broadleaved Plantation Woodland	Low Local	Medium	Low
Coniferous Plantation Woodland	Negligible	Low	Low
Scattered Trees	Low Local	Medium	Low
Scrub	Low Local	Medium	Low
Unimproved Acid Grassland	Low Local	Negligible	Low
Unimproved Neutral Grassland	Negligible	Medium	Low
Marshy Grassland	Negligible	Low	Low
Poor Semi-improved Grassland.	Negligible	Medium	Low
Dry Acid Dwarf-shrub Heath	Low Local	Medium	Low
Dry Heath/Acid Grassland Mosaic	Low Local	Negligible	Low
Dry Heath/Neutral Grassland Mosaic	Negligible	Medium	Low
Running Water	Low Local	Low	Low
H10a	High Local	High	Moderate
H10c	High Local	High	Moderate
H12b	National	Negligible	Low
MG9	Negligible	Negligible	Low
U5	Low Local	Negligible	Low
H12/U5	High Local	Negligible	Low
Juniper <i>Juniperus communis</i>	Regional	High	High

6 MITIGATION MEASURES

Mitigation recommendations are provided where there is a moderate or high impact significance, to fulfil any legal requirements, or to employ “best practice” guidelines when undertaking activities which impact upon the environment.

6.1 Key General Recommendations

Potentially Damaging Operations

The construction of an access track through a Site of Special Scientific Interest may be classed by Scottish Natural Heritage as a Potentially Damaging Operation under the Wildlife and Countryside Act 1981. This is defined as any operation appearing to SNH to be likely to damage the flora, fauna or any special features for which the site is designated.

The 1981 Act stipulates in Section 28 (5) that:

“The owner or occupier of any land which has been notified under subsection (1)(b) [*i.e. the official SSSI notification*] shall not carry out, or cause or permit to be carried out, on that land any operation specified in the notification unless-

- (a) one of them has, after the commencement date, given the Council [*now SNH*] written notice of a proposal to carry out the operation specifying its nature and the land on which it is proposed to carry it out;
- (b) one of the conditions specified in subsection (6) is fulfilled.”

Subsection (6) states that written consent is required from SNH, that the works are carried out under the terms of the SSSI agreement and that three months have elapsed from the date of notification of SSSI status.

The implication of this is that it would be an offence to undertake any management works within the Craigs of Succoth SSSI until a formal letter has been sent to SNH requesting permission to undertake the works; detailing the type of Potentially Damaging Operation which is proposed (taken from the SSSI citation), the details of the operations to be undertaken, the timing of such operations, and the avoidance and mitigation measures proposed; and that a written letter of consent for the proposed works has been received from SNH.

The requirement for a geotechnical survey along the northern access route has already been agreed with Scottish Natural Heritage and would form part of any planning condition to which AMEC would be legally bound to comply with. In their formal response to the Scottish Executive on the 1st September 2003, SNH required that;

“1. No development shall commence on site until a geotechnical survey has been undertaken to establish the stability of the rock outcrops at Craigs of Succoth SSSI and the results of the survey submitted in writing to, and approved by, SNH.

2. No development shall commence on site until an ecological survey of the area where the access track will be widened across the Craigs of Succoth SSSI, has been

undertaken. The purpose of this survey will be to establish the detailed working corridor for the track construction in order to avoid any particular features of interest, and to inform appropriate methods for the handling of soil, turf and juniper and for their reinstatement when the work is completed. A working Method Statement will be prepared taking into account the results of the ecological survey and agreed in writing with SNH and Aberdeenshire Council prior to the commencement of works to widen the existing track. The agreed Method Statement will be implemented in full unless otherwise agreed in writing."

Environmental Management Plan

An Environment Management Plan is proposed for the site. The main aim of the Plan relative to vegetation will be to create positive habitat enhancement through restoration and creation. The Plan will focus on determining the most appropriate means of creating semi-natural habitats on areas which have been felled and re-instating vegetation within the SSSI so that there is no net reduction in area or quality of vegetation. The Plan will look at soil sampling, to determine the appropriate vegetation type for the soil, and provide detailed prescriptions for soil removal and storage, seeding, planting and long-term management.

Long term monitoring will take place as part of the Management Plan to assess the effectiveness of the proposals.

Ecological Watching Brief

An Ecological Watching Brief will be in place to ensure that due consideration is given to ecological requirements throughout the construction phase and operational phase. An Ecological Clerk of Works should be appointed to monitor on a regular basis the effects of construction activities. The Ecological Clerk of Works will be included in project progress meetings.

6.2 Direct Loss of Vegetation Types

6.2.1 General

The construction of access tracks and the laying of power cables will take place within as narrow a working corridor as practicable. Topsoil within the access track construction area, which would be permanently lost, will be lifted and stored prior to construction, as per the environmental statement.

With an unknown batter width both up- and down-slope of the new track, there is the strong possibility that the stored topsoil from the initial excavation will be insufficient to completely cover the newly exposed subsoils on the batter once construction is completed. Any compressed sub-soil will be scarified in the post-construction phase to encourage germination of the seedbank. The stored topsoil and associated seedbank, augmented by a Red Fescue *Festuca rubra*/Common Bent *Agrostis capillaris*/Heather *Calluna vulgaris* seed mix will then be spread over areas of bare or compressed soil.

Where the planted broadleaf tree species need to be removed for the new track, a similar species mix of local provenance should be replanted.

Where possible, the maturing single Scots Pines *Pinus sylvestris* should be left in rides and adjacent to the track.

Residual Significance: Neutral

6.2.2 Craigs of Succoth SSSI

Prior to works commencing within the SSSI, a detailed Method Statement and Restoration Plan will be produced and agreed with SNH.

Within the SSSI, prior to construction of the access track, cuttings of Juniper *Juniperus communis* will be taken and grown on, following the methodology set out in the Forestry Commission Information Note "Growing Juniper: Propagation and Establishment Practices" (Broome 2003).

A working corridor, 10m wide, will be fenced off with suitable temporary fencing along the 100m length of track within the SSSI boundary. Construction activities will not be allowed outwith this corridor of disturbance.

Turves of topsoil from the working corridor will be taken and stored, to be replaced after construction. If there are insufficient turves to cover the new landform the subsoil should be scarified and sown with a Red Fescue *Festuca rubra*/Common Bent *Agrostis capillaris*/Heather *Calluna vulgaris* seed mix. The turves should be replaced adjacent to undisturbed vegetation, the sown seed mixture should be adjacent to the access track.

The Juniper cuttings should be planted out after the construction and soil restoration works have been completed as *per* the recommendations in Broome (2003).

Residual Significance: Neutral

6.3 Indirect Impacts on Vegetation Types

Indirect impacts on vegetation types of *Moderate Impact Significance*, including Dry Dwarf-shrub Heath, will be minimised. The following is proposed:

- Reference will be made to Pollution Prevention Guidelines issued by the Scottish Environment Protection Agency (SEPA), particularly the following:
 - PPG1: General guide to the prevention of water pollution
 - PPG5: Works in, near or liable to affect watercourses
- Felling operations will follow the current Forestry Commission Best Practice Guidelines, especially the Forests and Water guidance.
- Alterations to the hydrological regimes feeding the watercourses will be avoided by culverting small burns and drainage ditches in order to maintain the integrity of the watercourses running through the site.

Residual Significance: Negligible

7 REFERENCES

- AMEC Wind Energy, 2003.** *Clashindarroch Wind Farm Environmental Statement, Volume 2.* AMEC Project Investments Ltd, Hexham.
- Anon. 2000.** *North East Scotland Biodiversity Partnership Local Biodiversity Action Plan.* North East Scotland Biodiversity Partnership, Aberdeen.
- Broome, A., 2003.** *Growing Juniper: Propagation and Establishment Practices.* Forestry Commission Information Note. Forestry Commission, Edinburgh.
- Ratcliffe, D. A. ed. 1977.** *A Nature Conservation Review.* Cambridge University Press, Cambridge.
- Rodwell J.S (ed.) 1991-1995** *British Plant Communities Volumes 1-5.* Cambridge University Press, Cambridge.
- Stace, C. 1991** *New Flora of the British Isles.* Cambridge University Press, Cambridge.
- UK Biodiversity Group 1999.** *Tranche 2 Action Plans – Volume VI: Terrestrial and freshwater species and habitats.* HMSO, London.
- UK Biodiversity Steering Group 1995.** *Biodiversity: The UK Steering Group Report – Volume II: Action Plans.* HMSO, London
- Wigginton, M.J. 1999** *British Red Data Books; 1 Vascular plants, 3rd edition.* JNCC, Peterborough.

8 APPENDICES

8.1 Target Notes

TN1: NH 45172 37716

Open grassy area adjacent to the track, predominantly Tufted Hair-grass *Deschampsia cespitosa* with Red Fescue *Festuca rubra* and Yorkshire Fog *Holcus lanatus*. Planted with Scots Pine *Pinus sylvestris* around the edges of the clearing, and scattered across the grass sward. Has drainage ditches and stumps and brush. Some broadleaf tree species have been planted recently.

TN2: NH 44379 37641

A clearing in the forest ride. Ground flora dominated by Heather *Calluna vulgaris*, with occasional Tufted Hair-grass *Deschampsia cespitosa* and scattered Scots Pine *Pinus sylvestris* and Juniper *Juniperus communis*. A few damp ditches drain downslope to the north, with Tormentil *Potentilla erecta*, Hard Fern *Blechnum spicant*, Wood Anemone *Anemone nemorosa*, Marsh Thistle *Cirsium palustre*, Green-ribbed Sedge *Carex binervis* and *Sphagnum* moss spp. There is no obvious sign of the spring marked on the OS map, although the effects of a spring are present.

TN3: NH 43335 35990

Forest track beyond the SSSI – Dry Heath/Acid Grassland Mosaic with scattered Juniper *Juniperus communis* above the track, Tufted Hair-grass *Deschampsia cespitosa* with Common Bent *Agrostis capillaris* and occasional Juniper *Juniperus communis* below the track.

TN4: NH 43447 35811

Dry Burn (*sic*) – the major watercourse within the study site, arising from the plantation below Rose Cairn. The burn has incised a deep channel down to the Water of Succoth, lying just outwith the study site. The banks are dominated by patches of Tufted Hair-grass *Deschampsia cespitosa* and patches of Heather *Calluna vulgaris* dominated dry heath. *Juncus* dominated Marshy Grassland lines the bottom of the drainage channel.

TN5: NH 43096 36052

Craigs of Succoth Site of Special Scientific Interest. A series of craggy rock outcrops, with rocky faces up to 4m high, well vegetated with heath vegetation and herbaceous plant species. The rock outcrops form a narrow band running southwest to northeast.

Spring Sandwort *Minuartia verna* and Northern Bedstraw *Galium boreale* were recorded among the rocky ledges.

Detail of the vegetation within the SSSI is provided in the NVC sub-community descriptions.

