Appendix to Chapter 8: Biodiversity

Appendix 8.3: Terrestrial Habitats Survey Results & Impact Calculations

The data and descriptions in this appendix have informed the cumulative evaluations in the EIA Main Report.

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A8-3.1 Fieldwork

All habitat surveys undertaken for UWF Grid Connection followed best practice guidance (Smith *et al.*, 2011) and utilised the habitat classification presented in Fossitt (2000). All habitats within a 50-m buffer of work locations were surveyed and classified to level 3. All surveys were carried out in good weather. Habitat surveys of the UWF Grid Connection were undertaken in January 2019 and in May 2019. January is outside of the optimal survey season for flora, however, this survey was adequate for the biodiversity sensitivities occurring within the study area and also allowed for the identification of habitat classification to the appropriate resolution.

A8-3.2 Survey Results – Terrestrial Habitats within the study area

The study area comprised the UWF Grid Connection construction works areas along with a 50-m buffer from all UWF Grid Connection work locations. The area within the buffer is termed the 'survey corridor' hereafter. Nomenclature for vascular plants follows Parnell and Curtis (2012).

The habitats within the survey corridor of the UWF Grid Connection comprise a mosaic of agricultural grassland, commercial forestry plantations, peatlands, hedgerows, wet grassland, private roads and public roads.

Table 1: Habitats (non-linear) surveyed within the survey corridor of the UWF Grid Connection

Habitat Type	Area within Survey Corridor (ha)	Evaluation of Conservation Value
BL3	45.89	Local Importance (Lower Value)
ED1	0.12	Local Importance (Lower Value)
ED2	0.91	Local Importance (Lower Value)
ED3	0.45	Local Importance (Lower Value)
BL3/GA2	32.14	Local Importance (Lower Value)
GA1	110.38	Local Importance (Lower Value)
GA1/GS4	0.70	Local Importance (Lower Value)
BL3/GA2/BC4	2.27	Local Importance (Lower Value)
ED2/GA1	0.27	Local Importance (Lower Value)
GA1/WS1	0.72	Local Importance (Lower Value)
GA2	4.75	Local Importance (Lower Value)
GS4	40.13	Local Importance (Higher Value)
GS4/HH3	0.36	Local Importance (Higher Value)
FS1	0.45	Local Importance (Higher Value)
FS1/GS4	2.64	Local Importance (Higher Value)
PB4	0.15	Local Importance (Higher Value)
WD1	3.03	Local Importance (Higher Value)
WD2	5.92	Local Importance (Higher Value)
WD4	26.83	Local Importance (Lower Value)
WN5	1.95	Local Importance (Higher Value)
WS1	10.86	Local Importance (Higher Value)
WS5	5.05	Local Importance (Higher Value)
GA2/BL3	0.11	Local Importance (Lower Value)
GA2_WS3	0.08	Local Importance (Lower Value)
GS4/WD1	0.23	Local Importance (Higher Value)
HD1	0.04	Local Importance (Higher Value)
PB3	0.51	County Importance

Habitat Type	Area within Survey Corridor (ha)	Evaluation of Conservation Value
WD4/WS1	1.33	Local Importance (Lower Value)
WD5	0.92	Local Importance (Higher Value)
WN1	0.84	County Importance
WN6	0.17	Local Importance (Higher Value)
WS1/BL2	0.20	Local Importance (Higher Value)
WS1/WD2	0.16	Local Importance (Higher Value)
WS2	0.11	Local Importance (Higher Value)
WS1/GS4	3.13	Local Importance (Higher Value)

Table 2: Habitats (Linear) surveyed within the survey corridor of the UWF Grid Connection

Habitat Type	Length within Survey Corridor (m)	Evaluation
BL1	128.18	Local Importance (Lower Value)
BL2	5305.70	Local Importance (Lower Value)
FW2	373.25	International Importance
FW4	2220.60	Local Importance (Lower Value)
WL1	19109.05	Local Importance (Higher Value)
WL2	20137.77	Local Importance (Higher Value)
WS1	256.06	Local Importance (Higher Value)

Buildings and artificial surfaces (BL3)

This habitat type incorporates areas of built land in the Fossitt (2000) classification. It corresponds mostly to the R503 public road but also includes all buildings (domestic, agricultural, industrial and community) other than derelict stone buildings and ruins. Modern or intact buildings made of stone are included, as are derelict buildings made of bricks, cement blocks or mass concrete. It also includes areas of land that are covered with artificial surfaces of tarmac, cement, paving stones, etc. Within the context of the current development this classification includes built roads, buildings (including farm buildings) and paved access tracks. A mosaic of BL3 and Amenity grassland GA2 occurs widely along the UWF Grid Connection 110kV UGC route; this corresponds to dwellings and associated lawns and gardens.

Exposed sand gravel and till (ED1)

A very small area of this habitat was recorded corresponding to loose roadside sand and gravel.

Spoil and bare ground (ED2)

This habitat type was mainly recorded on unpaved forestry roads and farm tracks within the survey corridor. As the majority of the UWF Grid Connection will be laid in the existing public road, the portion of spoil and bare ground within the survey corridor is small.

Improved agricultural grassland (GA1)

Improved agricultural grassland is intensively managed or highly modified agricultural grassland that has been reseeded and/or regularly fertilised, and is now heavily grazed and or/used for silage making. The classification includes regularly reseeded monoculture grasslands and rye-grass leys that are planted as part of arable rotation. These differ significantly from areas of permanent grassland. Improved agricultural grassland is typically species poor. Sward quality varies depending on soil type, fertility, drainage and management.

Improved agricultural grasslands comprise the largest habitat area within the survey corridor. Improved agricultural grasslands occur at the Mountphilips Substation site and are located primarily in the eastern and western sections of the UWF Grid Connection 110kV UGC route with areas of this habitat located sporadically throughout the central sections where conifer plantations are more common. No arable rotation is present.

Amenity grassland (GA2)

This grassland type is improved or species poor and is managed for purposes other than grass production. It includes amenity, recreational or landscaped grasslands but excludes farmland. Most amenity grasslands have been reseeded and are regularly mown to maintain very short swards. Within the survey corridor, amenity grassland is typically associated with lawns and other managed grassland areas in gardens, parks, and grassy sports fields. This habitat occurs as a mosaic with Built land (BL3) within the study corridor, and is associated with dwellings along the R503.

Wet grassland (GS4)

This type of grassland can be found on flat or sloping ground in upland and lowland areas. It occurs on wet or waterlogged mineral or organic soils that are poorly-drained. On sloping ground, wet grassland is mainly confined to clay-rich gleys and loams, or organic soils that are wet but not waterlogged. This category includes areas of poorly drained farmland that have not recently been improved, and seasonally-flooded alluvial grasslands. Agricultural pasture not managed in recent years within the study area was classified as wet grassland.

This habitat occurs in poorly drained shallow soils primarily in the upland areas along the mid-section of the route of the 110kV UGC but also at a variety of locations along the route where poor drainage was present. A small area of wet grassland also occurs at the Mountphilips Substation site. Species recorded within the wet grassland habitat were soft rush (*Juncus effusus*) and small sedges (*Carex* spp.) in addition to grasses such as Yorkshire fog (*Holcus lanatus*), creeping bent (*Agrostis stolonifera*) and tufted hair-grass (*Deschampsia caespitosa*). Wet grassland also occurs as a mosaic with Reed and large sedge swamps (FS1) and Wet heath (HH3) at locations within the study area.

Lowland Blanket Bog (PB3)

An area of Lowland blanket bog (PB3) occurs within the survey corridor at Reardnogy Beg, this habitat corresponds to EU Habitats Directive 92/43/EEC Annex I habitat to 'Blanket bogs (7130)'; however, this area of bog, which occurs outside of the footprint of works, was found to be in poor condition due to evidence of peat harvesting and substantial colonization by invasive Rhododendron. Plant species recorded within this habitat type were Heather *(Calluna vulgaris),* Purple moor-grass *(Molinia caerulea)* and Bilberry *(Vaccinium myrtillus)*.

Cutover Blanket Bog (PB4)

A small area (<1 ha) of this habitat is located adjacent to the route of the 110kV UGC at Knocknabansha. This habitat was recorded within the survey corridor and outside of the footprint of the proposed works. There is evidence of previous and ongoing turf cutting at this location along with ongoing drainage. The bog surface has been excavated c. 1 to 1.5 m below the adjoining peat banks leaving a flat area of peat that has been recolonised by abundant bog cotton. Green ribbed sedge is occasional. Deergrass, bog asphodel and purple moor grass are also frequently recorded with occasional ling heather and cross-leaved heath. No sphagnum was growing in this habitat and the dry surface is trafficked by excavators and tractors associated with peat extraction.

(Mixed) broadleaved woodland (WD1)

This category includes woodland areas with 75-100% cover of broadleaved trees, 0-25% cover of conifers. Trees may include native and non-native species. Plantations of broadleaved trees are included if the canopy height is greater than 5m or 4m in the case of wetland areas.

There are a number of small stands of (mixed) broadleaved woodland within the survey corridor along the route of the UWF Grid Connection 110kV UGC. These stands are located outside of the works area and adjacent to the public roads and domestic dwellings and on the edges of agricultural grassland fields. Species composition of these mixed broadleaved woodlands include birch (*Betula* spp.), ash (*Fraxinus excelsior*), willow (*Salix* spp.), rowan (*Sorbus aucuparia*) and sycamore (*Acer pseudoplatanus*).

Mixed broadleaved/conifer woodland (WD2)

This category includes woodland areas with mixed stands of broadleaved trees and conifers, where both types have a minimum cover of 25% and maximum of 75%. Trees may either be native or non-native species. This habitat type occurs at various locations along the entire length of the survey corridor. Deciduous species recorded were birch, ash, willow, rowan and sycamore and conifers were composed of a mix of larch (*Larix decidua*) and Sitka spruce (*Picea sitchensis*). This habitat which was recorded at numerous locations within the survey corridor does not occur with the works area.

Conifer plantation (WD4)

Conifer plantations are dense stands of planted conifers where the broadleaved component is less than 25% and the overriding interest is commercial timber production. Conifer plantations are characterized by even-ages stands of trees that are usually planted in regular rows, frequently within angular blocks. Species diversity is low and single species stands are common. The majority of planted conifers are non-native species such as Sitka spruce *(Picaea sitchensis)*, lodgepole pine (*Pinus contorta*), Norway spruce (*Picea abies*), and larches (*Larix* spp.).

Conifer plantation was frequently recorded within the survey corridor with the majority located throughout the central upland sections with some smaller plantations at various points throughout the corridor. Age classes of these plantations varied from first rotation to second rotation mature.

Riparian woodland (WN5)

This classification category includes wet woodlands of river margins and low islands that are subject to frequent flooding, or where water levels fluctuate as a result of tidal movement (lower reaches of rivers).

Riparian woodland comprises a small proportion of the survey corridor and was recorded at five locations. These areas of riparian woodland occur along watercourses within the survey corridor. This habitat is composed of mature willow species, hazel (*Corylus avellana*) and alder (*Alunus glutinosa*) with an understory of broadleaved herbs including nettle (*Urtica dioica*) and wood dock (*Rumex sanguineus*) together with a layer of ground ivy (*Glechoma hederacea*).

Scrub (WS1)

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5m, or 4m in the case of wetland areas. Scrub frequently develops as a precursor to woodland and is often found in inaccessible locations, or on abandoned or marginal farmland. In the absence of grazing and mowing, scrub can expand to replace grassland or heath vegetation. Trees are included as components of scrub if their growth is stunted as a result to exposure, poor soils or waterlogging. If tall trees are present, these should have a scattered distribution and should not have a distinct canopy.

This habitat was recorded at numerous locations along the UWF Grid Connection survey corridor. The majority of these areas were dominated by willow scrub and well-established gorse (*Ulex europaeus*). Understorey botanical species diversity was typically poor. Small areas of scrub were also recoded forming a mosaic with Wet grassland (GS4), Conifer plantation (WD4), Improved agricultural grassland (GA1), Earth banks (BL2) and Mixed broadleaved/conifer woodland (WD2) within the study area.

Improved Agricultural Grassland (GA1)/Scrub (WS1) Mosaic

This habitat was recorded at locations where former grassland habitat had started to be colonised by bramble (*Rubus fructicosus agg.*) and willow scrub due to absence of grazing and/or mowing. It was recorded at one location outside of the works area in Kilcommon townland.

Stone walls and other stonework (BL1)

This habitat was recorded at two locations within the survey corridor for the UWF Grid Connection comprising of stone wall boundaries between dwellings and the public road.

Earth Banks (BL2)

Earth banks are a common type of field boundary in many parts of Ireland. Constructed from local materials such as peat, earth, gravel or stone, these narrow linear ridges are often bordered by drainage ditches.

There are a number of linear earth banks located primarily at the eastern end of the UWF Grid Connection and then sporadically throughout the remainder of the survey corridor. These banks are completely vegetated with common grass species and are typically species poor.

Eroding/Upland Rivers (FW1)

This habitat classifies natural watercourses in eroding conditions which are typically associated with the upland parts of river systems where gradients are steep and water flow is fast and turbulent. This habitat was mainly recorded as smaller streams in the upland areas of the UWF Grid Connection. However, larger watercourses such as the Bilboa, Newport and Clare Rivers were classified as upland/eroding watercourses within the survey corridor.

Drainage Ditches (FW4)

This habitat was frequently encountered within the survey corridor around the margins of agricultural grasslands and also within conifer forestry. Generally, these drains showed evidence of previous excavation but had subsequently revegetated. Water levels and flow rates within the drains were often low or absent.

Hedgerows (WL1)

Hedgerows are defined as linear strips of shrubs, often occasional trees that typically form field or property boundaries. Most hedgerows originate from planting and many occur on the raised banks of earth that are derived from the excavation of associated drainage ditches. Dimensions of hedgerows vary considerably, depending largely on management and composition and are taken as being mainly less than 5m high and 4m wide.

Many hedgerows within the survey corridor are well developed and maintained along field boundaries and roadside margins. Species composition varied due to factors such as age, management, geology, soils and exposure. Hedgerows within the study area commonly supported a high proportion of hawthorn (*Cratagegus monogyna*), blackthorn (*Prunus spinosa*), gorse (*Ulex europaeus*), holly and bramble, in addition to other native trees such as ash, hazel (*Corylus avellana*) and willow. Climbing plants such as ivy (*Hedera hibernica*) and honeysuckle (*Lonicera periclymenum*) were also recorded at a number of hedgerows along the route.

Hedgerows (WL1)/ Treelines (WL2)

This habitat was recorded occasionally where hedgerow habitat and treeline habitat were present intermittently along a field boundary.

Treelines (WL2)

A treeline is a narrow row or single line of trees that is greater than 5m in height and typically occurs along field or property boundaries. This category includes tree-lined roads or avenues, narrow shelter belts with no more than a single line of trees and overgrown hedgerows that are dominated by trees.

The species composition of this habitat recorded within the study area was ash, beech (*Fagus sylvatica*), horse chestnut (*Aesculus hippocastanum*), sycamore and some conifers, including mature Sitka spruce.

WN6 Wet Willow Alder-Ash (WN6)

A small area of this non-riparian woodland habitat (<0.17ha) located north of Newport Town occurs outside of the work area but within the survey corridor. The tree species recorded in this area of habitat are Hazel *(Corylus avellana),* Ash *(Fraxinus excelsior)* and Willows *(Salix spp.)* Plants in the understory of the woodland included Herb Robert *(Geranium robertianum),* Rough meadow-grass *(Poa trivialis),* and Wood sanicle *(Sanicula europaea).*This area of habitat is evaluated as being of Local Importance (Higher Value) due to its limited extent and young age of trees.

Oak-Birch-Holly Woodland (WN1)

A small area of Oak-birch-holly woodland located outside the works area but within the survey corridor at Scraggeen was found to correspond to the EU Habitats Directive 92/43/EEC habitat, 'Old sessile oak woods with Ilex and Blechnum, in the British Isles (91A0)'. The dominant tree species recorded were Sessile oak *(Qurecus petraea),* Birch *(Betula pubescens),* as well as Holly *(Ilex aquifolium)* and Hazel *(Corylus avellane)* in the shrub layer. The ground flora included Hard fern *(Blechnum spicant),* Bilberry *(Vaccinium myrtillus)* and Wood-rush *(Luzula sylvatica).* This are of woodland is evaluated as being of County Importance due to the presence of a limited area of woodland habitat listed in Annex I of the Habitats Directive.

A8-3.2.1 Habitats Directive 92/43/EEC Annex I Habitat Assessments

A small area of Oak-birch-holly woodland (WN1 - 0.84ha) occurs outside of the work area but within the survey corridor at Scraggeen. This area of woodland located outside of the works area was found to correspond to the EU Habitats Directive 92/43/EEC habitat, 'Old sessile oak woods with Ilex and Blechnum, in the British Isles (91A0)'. The presence of all four species deemed as indicative of this habitat type listed by *Perrin et al.* (2008) were present as well as a canopy dominated by Sessile Oak *(Quercus petraea**).*** **Therefore, this habitat meets the criteria presented in Perrin *et al* (2008) to be classified as the Annex I habitat, 'Old sessile oak woods with Ilex and Blechnum, in the British Isles (91A0)'.**

An area of Lowland blanket bog (PB3 – 0.51Ha) occurs outside of the work area but within the survey corridor at Reardnogy Beg, this habitat corresponds to EU Habitats Directive 92/43/EEC Annex I habitat to 'Blanket bogs (7130)'; however, this area of bog, which occurs outside of the footprint of works, was found to be in poor condition due to evidence of peat harvesting and substantial colonization by invasive Rhododendron. Due to the effects of peat harvesting, drainage and invasive species, this habitat does not correspond to the active peat-forming priority blanket bog Annex I habitat (7130). **This area does however correspond to the non-priority habitat Blanket bog (7130).**

A8-3.2.2 Rare/Protected Plant Species

Small White orchid (*Pseudorchis albida*)

Desktop reviews indicated that Small White orchid (*Pseudorchis albida*) has been recorded within the R86 and R96 10km squares[1]. The BSBI database holds a record in tetrad (2 * 2 km square) R86P (BSBI database http://bsbi.org/maps?taxonid=2cd4p9h.c3v, accessed 27/09/2019). The NBDC database shows a record from June 2009 in the the Silvermines Mountains at Knockanroe in the monad (1 * 1 km square) R8469 (https://maps.biodiversityireland.ie/Map/Terrestrial/Species/44170, accessed 27/09/2019).

This species is listed in Schedule A of the Flora (Protection) Order, 2015 and is classed as Vulnerable in the Red Data List of Vascular Plants (Wyse Jackson *et al.*, 2016). **This species was not recorded during the habitat surveys for the project**. The desktop data indicates that the historic locations for this plant are c. 7 km north of the UWF Grid Connection. The habitats occurring within the UWF Grid Connection survey area are evaluated as not suitable for this species which generally requires well-drained hill pastures, mountain grasslands and hill pastures; the majority of habitats occurring within the survey corridor consist of poorly drained wet grassland and improved agricultural grassland, both of which are unsuitable habitats for this species.

Killarney Fern (*Trichomanes speciosum*)

The desktop review also showed that Killarney Fern (*Trichomanes speciosum*) has historically been recorded in the R75 hectad (10km square). This species is listed in Schedule A of the Flora (Protection) Order, 2015 and is classed as Least Concern in the Red Data List of Vascular Plants (Wyse Jackson *et al.*, 2016). No recent records exist for the species within 10km squares through which the UWF Grid Connection will pass. **This species was not recorded during the habitat survey**.

Bog Rosemary (*Andromeda polifolia*)

Bog Rosemary (*Andromeda polifolia*) was recorded incidentally at Bleanbeg Bog (during surveys for the previous 2018 grid connection application) in April 2017. This species is classed as Least Concern in the Red Data List of Vascular Plants (Wyse Jackson *et al.*, 2016). The species was previously unrecorded for the hectad R76 in either BSBI or NBDC databases. The plant was located c. 2.3km north of the current UWF Grid Connection 110kV UGC project.

A8-3.2.2.1 Plant Species List

A full Botanical list of species recorded during habitat surveys for UWF Grid Connection is herein presented. Species recorded during habitat surveys for Other Elements is also included.

Table 3: List of plant species recorded during habitat surveys

Common Name	Scientific Name
Alder	*Alunus glutinosa*
Annual meadow grass	*Poa annua*
Ash	*Fraxinus excelsior*
Beech	*Fagus sylvatica*
Bell heather	*Erica cinerea*
Bilberry	*Vaccinium myrtillus*

[1] The 10km grid squares are detailed in Appendix 8.1

Common Name	Scientific Name
Birch	*Betula spp.*
Blackthorn	*Prunus spinosa*
Bog asphodel	*Narthecium ossifragum*
Bog cotton	*Eriophorum angustifolium*
Bracken	*Pteridium aquilinum*
Bramble	*Rubus fructicosus agg.*
Broadleaf plantain	*Plantago major*
Broad-leaved dock	*Rumex obtusifolius*
Brooklime	*Veronica beccabunga*
Carination sedge	*Carex panicea*
Cat's ear	*Hypochaeris radicata*
Cock's foot grass	*Dactylis glomerata*
Common bent	*Agrostis capillaris*
Common chickweed	*Stellaria media*
Common hogweed	*Heracleum sphondylium*
Common mouse-ear	*Cerastium fontanum*
Common Reed	*Phragmites australis*
Common sorrel	*Rumex acetosa*
Cow parsley	*Anthriscus sylvestris*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Cross-leaved Heath	*Erica tetralix*
Daisy	*Bellis perennis*
Dandelion	*Taraxacum agg.*
Deergrass	*Trichophorum cespitosum*
Devil's bit scabious	*Succisa pratensis*
Downy birch	*Betula pubescens*
Eared willow	Salix aurita
Early purple orchid	*Orchis mascula*
Elder	*Sambucus nigra*
Escallonia	*Escallonia macrantha*
European larch	*Larix decidua*
False oat grass	*Arrhenatherum elatius*
Field horse tail	*Equisetum arvense*
Flea sedge	*Carex pulicaris*
Foxglove	*Digitalis purpurea*
Gorse	*Ulex europaeus*

Common Name	Scientific Name
Great woodrush	*Luzula sylvatica*
Greater bird's-foot-trefoil	*Lotus pedunculatus*
Green-ribbed sedge	*Carex binervis*
Grey willow	*Salix cinerea*
Ground Ivy	*Glechoma hederacea*
Hard fern	*Blechnum spicant*
Hard Rush	*Juncus inflexus*
Hart's-tongue Fern	*Phyllitis scolopendrium*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Heath bedstraw	*Galium saxatile*
Heath milkwort	*Polygala serpyllifolia*
Heath rush	*Juncus squarrosus*
Heath spotted orchid	*Dactylorhiza maculata*
Heath woodrush	*Luzula multiflora agg.*
Hemlock water dropwort	*Oenanthe crocata*
Holly	*Ilex aquifolium*
Honeysuckle	*Lonicera periclymenum*
Horse chestnut	*Aesculus hippocastanum*
Iris sp	*Iris sp.*
Ivy	*Hedera hibernica*
Lesser spearwort	*Ranunculus flammula*
Lesser stitchwort	*Stellaria graminea*
Ling heather	*Calluna vulgaris*
Lodgepole pine	*Pinus contorta*
Lousewort	*Pedicularis sylvatica*
Marsh bedstraw	*Galium palustre*
Marsh foxtail	*Alopecurus geniculatus*
Marsh ragwort	*Senecio aquaticus*
Marsh thistle	*Cirsium palustre*
Mat-grass	*Nardus stricta*
Meadow buttercup	*Ranunculus acris*
Meadow fox-tail	*Alopecurus pratensis*
Nettle	*Urtica dioica*
Norway spruce	*Picea abies*
Oval sedge	*Carex ovalis*
Pedunculate oak	*Quercus robur*

Common Name	Scientific Name
Perennial rye grass	*Lolium perenne*
Pineappleweed	*Matricaria discoidea*
Pondweed sp	*Potamogeton sp*
Purple Moor-grass	*Molinia caerulea*
Ragwort	*Senecio jacobaea*
Rowan	*Sorbus aucuparia*
Sharp flowered rush	*Juncus acutiflorus*
Shepherd's-purse	*Capsella bursa-pastoris*
Sitka spruce	*Picea sitchensis*
Snowberry	*Symphoricarpos albus*
Soft rush	*Juncus effusus*
Sweet vernal grass	*Anthoxanthum odoratum*
Sycamore	*Acer pseudoplatanus*
Tormentil	*Potentilla erecta*
Tufted hair-grass	*Deschampsia caespitosa*
Velvet bent	*Agrositis canina*
Vetch spp.	*Vicia spp.*
Wavy hair grass	*Deschampsia flexuosa*
White clover	*Trifolium repens*
Wild angelica	*Angelica sylvestris*
Willow spp.	*Salix spp.*
Wood dock	*Rumex sanguineus*
Wych elm	*Ulmus glabra*
Yellow iris	*Iris pseudacorus*
Yorkshire fog	*Holcus lanatus*

A8-3.2.3 Habitat Survey Results – Other Elements *(for cumulative evaluations)*

The results of the habitat surveys for the Other Elements are included here for ease of reference. The results are used in the cumulative evaluations within the EIAR Main Report. Further details on these results are available in the Reference Documents which accompany the planning application – see Biodiversity Appendix 8.1 in the Revised EIAR for UWF Related Works (2019), Biodiversity Appendix 8.1 in the EIAR for UWF Replacement Forestry (2018), and Ecological Impact Assessments for Upperchurch Windfarm in the 2013 EIS and Response to Further Information.

UWF Related Works

The habitats within the survey corridor of the UWF Related Works comprise a mosaic of agricultural grassland, commercial forestry plantations, peatlands, heath, earth banks, wet grassland, acid grasslands, private roads and public roads.

Table 4: Habitats (non-linear) surveyed within the UWF Related Works study area

Habitat Type	Area within UWF Related Works Survey Corridor (ha)	Evaluation of Conservation Value
BL3	5.12	Local Importance (Lower Value)
ED2	1.74	Local Importance (Lower Value)
ED3	0.63	Local Importance (Lower Value)
GA1	113.38	Local Importance (Lower Value)
GA1/GS4	1.70	Local Importance (Higher Value)
GA1/WS1	0.42	Local Importance (Higher Value)
GA2	0.27	Local Importance (Lower Value)
GS2	0.14	Local Importance (Higher Value)
GS3	1.58	Local Importance (Higher Value)
GS4	11.95	Local Importance (Higher Value)
GS4/WS1	0.49	Local Importance (Higher Value)
HH1/GS4	0.11	Local Importance (Higher Value)
HH3	2.32	Local Importance (Higher Value)
GS3/HH3	2.81	Local Importance (Higher Value)
PB2	2.03	County Importance
PB2/GS4	0.13	Local Importance (Higher Value)
PB4	0.10	Local Importance (Higher Value)
WD1	0.15	Local Importance (Higher Value)
WD4	42.45	Local Importance (Lower Value)
WL2	0.09	Local Importance (Higher Value)
WS1	1.68	Local Importance (Higher Value)
WS2	0.78	Local Importance (Higher Value)
WS2/GS4	0.43	Local Importance (Higher Value)

Table 5: Habitats (linear) surveyed within the UWF Related Works study area.

Habitat Type	Length within UWF Related Works Survey Corridor (m)	Evaluation of Conservation Value
BL2	10429.54	Local importance (Lower value)
BL3	156.40	Local importance (Lower value)
FW1	693.78	County Importance; Local Importance (Higher Value)
FW2	433.92	Local Importance (Higher Value)

Habitat Type	Length within UWF Related Works Survey Corridor (m)	Evaluation of Conservation Value
FW4	2800.05	Local importance (Lower value)
GS2	159.93	Local importance (Lower value)
WL1	702.00	Local Importance (Higher Value)
WL1/WL2	187.63	Local Importance (Higher Value)
WL2	721.43	Local Importance (Higher Value)

Protected Habitats - UWF Related Works:

Wet heath (HH3) habitat identified during the habitat survey at Foilnaman (Turbine 21) was assessed for correspondence to the habitat 'Northern Atlantic wet heaths with *Erica tetralix* (4010) again using the methodology outlined by Perrin *et al.*, (2014). The habitat did not meet the required criteria to be classified as Annex I quality habitat, primarily due to the absence of *Erica tetralix* within 20 m of the relevé.

The dry-humid acid grassland (GS3)/wet heath (HH3) mosaic habitat identified during the habitat survey at Shevry (around Turbine 2 and the borrow pit) was assessed for correspondence to the Annex habitats 'Northern Atlantic wet heaths with *Erica tetralix* (4010)' and the priority habitat 'Species-rich *Nardus* grasslands (6230)'. This habitat did not meet the criteria presented in Perrin *et al.*, (2014) or O'Neill *et al.*, (2013) to be classified as Annex I quality habitat.

UWF Replacement Forestry

The habitats within the UWF Replacement Forestry lands comprise of improved and wet grassland with earth banks, drainage ditches and streams dividing the fields. An area of scrub and conifer plantation is concentrated on the steep sides of a small glen through which the stream flows. Additional habitats are described herein that occur within the Best Practice survey buffer however it is not proposed that these are planted with forestry. Results are included for completeness.

Table 6: Habitats (non-linear) surveyed within the UWF Replacement Forestry study area

Habitat Type	Area within UWF Replacement Forestry lands (ha)	Evaluation of Conservation Value
BL3	0.000001	Local Importance (Lower Value)
ED3	0.45	Local Importance (Lower Value)
GA1	8.92	Local Importance (Lower Value)
GS4	1.77	Local Importance (Lower Value)
WD1	0.18	Local Importance (Higher Value)
WD4	0.57	Local Importance (Lower Value)
WS1	0.59	Local Importance (Higher Value)

Table 7: Habitats (linear) surveyed within the UWF Replacement Forestry study area

Habitat Type	Length within UWF Replacement Forestry lands (m)	Evaluation of Conservation Value
BL2	748.86	Local importance (Lower value)
BL3	228.66	Local importance (Lower value)
FW1	489.44	National Importance; Local Importance (Higher Value)
FW4	314.32	Local importance (Lower value)
WL1	44.62	Local Importance (Higher Value)
WL2	89.50	Local Importance (Higher Value)

UWF Other Activities

The habitats along the Haul Route Activities locations mainly comprise of public road with associated margin vegetation often comprising grassy verges, ornamental planting, hedgerows and treelines and scrub.

Table 8: Habitats (non-linear) surveyed within 50m of Haul Route Activities

Habitat Type	Area within UWF Other Activities Survey Corridor (ha)	Evaluation of Conservation Value
BC4	0.2	Local Importance (Lower Value)
BL3	8.2	Local Importance (Lower Value)
ED2	0.2	Local Importance (Lower Value)
FW1	0.4	County Importance; Local Importance (Higher Value)
GA1	13.0	Local Importance (Lower Value)
GA2	1.7	Local Importance (Lower Value)
GS2	3.9	Local Importance (Lower Value)
GS4	1.1	Local Importance (Lower Value)
HH1	0.4	Local Importance (Lower Value)
WD1	5.1	Local Importance (Higher Value)
WD4	0.3	Local Importance (Lower Value)
WL2	0.2	Local Importance (Higher Value)
WS1	1.3	Local Importance (Higher Value)
WS2	0.3	Local Importance (Lower Value)

Table 9: Habitats (linear) surveyed within 50m of Haul Route Activities

Habitat Type	Length within UWF Other Activities Survey Corridor (m)	Evaluation of Conservation Value
BL1	207.57	Local importance (Lower value)
BL2	29.61	Local importance (Lower value)
ED2	57.22	Local importance (Lower value)
GS2	1617.89	Local importance (Lower value)
FW1	277.06	County Importance; Local Importance (Higher Value)
FW4	16.17	Local importance (Lower value)
HD1	111.88	Local importance (Lower value)
WL1	1761.73	Local Importance (Higher Value)
WL2	268.91	Local Importance (Higher Value)

Table 10: Habitats recorded at each pole at the Overhead Line Activities

*Angle Mast (AM), Intermediate Tower (INT), Intermediate Pole (IMP)

Structure number	Structure type*	Habitats at Pole location
1	AM	BL3
2	INT	GA1
3	AM	GA1
4	INT	GA1, HL1
5	AM	WS1
6	INT	GA1
7	INT	GA1
8	INT	GA1

Structure number	Structure type*	Habitats at Pole location
9	INT	GA1
10	INT	GA1
11	AM	GA1, WL1
12	IMP	GA1
13	INT	GA1
14	INT	GA1
15	INT	GA1
16	INT	GA1
17	INT	GA1, WL1
18	INT	WS1
19	AM	GA2
20	IMP	GS4
21	AM	GS4
22	IMP	BL3, WS1
23	AM	BL3 (and standing water)
24	AM	GA1
25	IMP	GA1, WL1
26	INT	GA1
27	IMP	GA1
28	IMP	GA1
29	IMP	GA1
30	IMP	GA1
31	IMP	GA1
32	AM	GA1, WL1, FW4
33	IMP	GA1
34	IMP	GA1, WL1, FW4
35	IMP	GA1, WL1, FW4
36	IMP	GA1, WL1
37	IMP	GA1, WL1
38	IMP	GA1, WL1
39	IMP	GA1
40	AM	GA1, WS1
41	IMP	GA1
42	IMP	GA1, WL1, WS1
43	IMP	GA1, WS1
44	IMP	GA1, HL2
45	IMP	GA1
46	IMP	GS4
47	IMP	GS4
48	AM	WS1
49	AM	WS1
50	IMP	WS1
51	IMP	GA1
52	IMP	GA1

Structure number	Structure type*	Habitats at Pole location
53	IMP	WS1
54	IMP	WS4
55	IMP	WS4
56	IMP	WS4
57	IMP	GM1
58	AM	WS1
59	IMP	WS1
60	IMP	WS1
61	IMP	WS4
62	IMP	WN6
63	IMP	WN6
64	IMP	HD1/burnt
65	IMP	WS1
66	IMP	PB4
67	IMP	WS1, WL2
68	IMP	WS1
69	IMP	GA1, WL2
70	IMP	GA1
71	IMP	GA1
72	IMP	GA1, FW4
73	IMP	GA1, WS1
74	IMP	GA1, WS1
75	IMP	GA1
76	IMP	GA1
77	IMP	GA1
78	AM	WS4
79	IMP	GA1
80	IMP	GA1, HL2
81	IMP	GA1
82	IMP	WS1
83	IMP	WS1
84	IMP	WS1
85	IMP	GA1
86	IMP	GA1
87	IMP	GS4
88	IMP	WS1
89	IMP	GA1, FW4
90	AM	WS1, WL1

A8-3.3 Impact Calculations - Habitats

A8-3.3.1 Impact Calculations – UWF Grid Connection

The following tables detail the total areas present, with the UWF Grid Connection study area, of those habitats evaluated as of Local Importance (Higher Value) or above, as per the Best Practice guidance referenced in Chapter 8. The respective proportion of the overall study area covered by each habitat, in addition to the total area of permanent land use change (or habitat loss) and what proportion of the study area and the UWF Grid Connection footprint that represents is also presented. Habitats located within the Zone of Influence (ZOI), which is defined as those habitats occurring within the UWF Grid Connection footprint have been carried forward as key receptors for further evaluation. Calculations of habitat areas within the zone of influence of the Other Elements is also presented below.

Table 11: Impact calculations for habitats greater than Local Importance (Higher Value) in the UWF Grid Connection study area

Habitat Type	Evaluation	Total Area Present (ha)	Percentage of Overall Study Area (%)	Area of Habitat Permanently Lost (ha)	Proportion of Study Area Habitat Lost (%)	Area of Habitat within Works Footprint (ha)	Area of Habitat within ZOI (ha)	Carried Forward as Key Receptor
GS4	Local Importance (Higher Value)	40.13	13.09	0.81	45.7	1.88	1.88	Yes
GS4/HH3	Local Importance (Higher Value)	0.36	0.12	0.00	0.00	0.00	0.00	No
GS4/WS1	Local Importance (Higher Value)	1.48	0.48	0.00	0.00	0.00	0.00	No
PB3	County Importance	0.51	0.17	0.00	0.00	0.00	0.00	No
PB4	Local Importance (Higher Value)	0.15	0.05	0.00	0.00	0.00	0.00	No
FS1	Local Importance (Higher Value)	0.45	0.15	0.00	0.00	0.00	0.00	No
FS1/GS4	Local Importance (Higher Value)	2.64	0.86	0.00	0.00	0.00	0.00	No
WD1	Local Importance (Higher Value)	3.03	0.99	0.00	0.00	0.00	0.00	No
WD2	Local Importance (Higher Value)	5.92	1.93	0.00	0.00	0.00	0.00	No
WN5	Local Importance (Higher Value)	1.95	0.64	0.00	0.00	0.00	0.00	No
WS1	Local Importance (Higher Value)	10.86	3.54	0.00	0.00	0.00	0.00	No
WS5	Local Importance (Higher Value)	5.05	1.65	0.00	0.00	0.00	0.00	No
GS4/WD1	Local Importance (Higher Value)	0.23	0.07	0.00	0.00	0.00	0.00	No
GS4/WS1	Local Importance (Higher Value)	1.48	0.48	0.00	0.00	0.00	0.00	No
HD1	Local Importance (Higher Value)	0.04	0.01	0.00	0.00	0.00	0.00	No

WD5	Local Importance (Higher Value)	0.92	0.30	0.00	0.00	0.00	0.00	No
WN1	County Importance	0.84	0.28	0.00	0.00	0.00	0.00	No
WN6	Local Importance (Higher Value)	0.17	0.05	0.00	0.00	0.00	0.00	No
WS1/WD2	Local Importance (Higher Value)	0.16	0.05	0.00	0.00	0.00	0.00	No
WS1/BL2	Local Importance (Higher Value)	0.20	0.06	0.00	0.00	0.00	0.00	No
WS2	Local Importance (Higher Value)	0.11	0.04	0.00	0.00	0.00	0.00	No
	Total	**76.68**	**24.01%**	**0.81**	**45.7**	**1.88ha**	**1.88ha**	

Table 12: Impact calculations for permanent hedgerow and tree removal required for UWF Grid Connection

Project Element	UWF Grid Connection
Permanent Hedgerow Removal (m)	40
Permanent Mature Tree Removal	1
Permanent Immature Tree Removal	28

A8-3.3.2 Impact Calculations – Other Elements *(for the cumulative evaluations)*

Table 13: Impact calculations for habitats greater than Local Importance (Higher Value) in the UWF Related Works study area

Habitat Type	Evaluation	Total Area Present (ha)	Percentage of Overall Study Area (%)	Area of Habitat Permanently Lost (ha)	Proportion of Study Area Habitat Lost (%)
GA1/GS4	Local Importance (Higher Value)	1.70	0.9%	0.000	0.000
GA1/WS1	Local Importance (Higher Value)	0.42	0.2%	0.000	0.000
GS2	Local Importance (Higher Value)	0.14	0.07%	0.000	0.000
GS3	Local Importance (Higher Value)	1.58	0.8%	0.000	0.000
GS3/HH3	Local Importance (Higher Value)	2.81	1.5%	0.000	0.000
GS4	Local Importance (Higher Value)	11.95	6.3%	0.07	0.6%
GS4/WS1	Local Importance (Higher Value)	0.49	0.3%	0.000	0.000
HH1/GS4	Local Importance (Higher Value)	0.11	0.06%	0.000	0.000
HH3	Local Importance (Higher Value)	2.32	1.2%	0.000	0.000
PB2	County Importance	2.03	1.07%	0.01	0.5%
PB2/GS4	Local Importance (Higher Value)	0.13	0.07%	0.000	0.000
PB4	Local Importance (Higher Value)	0.10	0.05%	0.000	0.000
WD1	Local Importance (Higher Value)	0.15	0.08%	0.000	0.000
WL2	Local Importance (Higher Value)	0.09	0.05%	0.000	0.000
WS1	Local Importance (Higher Value)	1.68	0.9%	0.004	0.2%
WS2	Local Importance (Higher Value)	0.78	0.4%	0.000	0.000
WS2/GS4	Local Importance (Higher Value)	0.43	0.2%	0.000	0.000
	Total	**26.91**	**14.15%**	**0.174**	**1.3%**

Table 14: Impact calculations for hedgerow/tree removal associated with UWF Related Works

Project Element	UWF Related Works
Permanent Hedgerow Removal (m)	170
Permanent Mature Tree Removal	1
Permanent Immature Tree Removal	3

Table 15: Impact calculations for habitats greater than Local Importance (Higher Value) in the UWF Replacement Forestry study area

Habitat Type	Evaluation	Total Area Present (ha)	Percentage of Overall Study Area (%)	Area of Habitat Permanently Lost (ha)	Proportion of Study Area Habitat Lost (%)
GS4	Local Importance (Higher Value)	0.85	7.3	0.44	51%
WS1	Local Importance (Higher Value)	0.59	5.10%	0.01	1.7%
	Total	**0.77**	**6.66**	**0.00**	**0.00**

Table 16: Impact calculations for hedgerow/tree removal associated with UWF Replacement Forestry

Project Element	UWF Replacement Forestry
Permanent Hedgerow Removal (m)	0
Permanent Mature Tree Removal	0
Permanent Immature Tree Removal	0

Upperchurch Windfarm: Tables 13-22 and 13-23 from the EIS, see Volume F8: Reference Documents, summarising the total habitat loss, are herein re-produced for completeness.

Plate 1: Tables 13-22 and 13-23 from the Upperchurch Windfarm EIS

TABLE 13-22: TABLE SUMMARISING HABITAT LOSS AS A RESULT OF THE PROPOSED DEVELOPMENT.

Habitat	Selection as key ecological receptor	Total area of habitat (ha) within the study area.	Percentage of total habitat within the study area (%)	Area of habitat to be lost (ha).	Percentage of total habitat loss (%)
Improved Agricultural Grassland (GA1)	Yes	228.34	42.53	5.98	1.11
Wet Grassland (GS4)	Yes	19.94	3.71	0.5	0.09
Mosaic of Improved Grassland (GA1) & Wet Grassland (GS4)	Yes	11.44	2.13	0.3	0.06
Mosaic Wet Heath (HH3) & Upland Blanket Bog (PB3)	Yes	15.54	2.89	0.01	0.002
Acid Grassland (GS3)	Yes	20.34	4.68	0.57	0.11
Mosiac Upland Blanket Bog (PB3) & Acidic Grassland (GS3)	Yes	3.16	3.79	0.45	0.08
Upland Blanket Bog (PB2)	Yes	25.13	0.59	0	0
Coniferous Plantation (WD4)	No	202.2	37.66	1.18	0.22
Spoil and Bare Ground (ED2)	No	4.3	0.80	0.66	0.12
Buildings and Artificial Surfaces (BL3)	No	4.2	0.78	-	-
Neutral Grassland (GS1)	Yes	2.25	0.42	0	0.00
Total (ha) (excluding FW1, FW4, WL1 and WL2)		**536.84 ha**	**100%**	**9.65Ha**	**1.79%**

TABLE 13-23: SUMMARISING LINEAR LENGTH OF HABITAT LOST AS A RESULT OF THE PROPOSED DEVELOPMENT.

Habitat	Selection as key ecological receptor	Total linear length of habitat (meters) within the study area.	Percentage of total habitat within the study area (%)	Area of habitat to be lost (m).	Percentage of total habitat loss (%)
Eroding/Upland River (FW1)	Yes	1486.88	-	0	-
Drainage Ditches (FW4)	Yes	1258.5	-	48.1	-
Hedgerow (WL1)	Yes	24968.69	-	980.77	-
Treelines (WL2)	Yes	668.73	-	-	-

Table 17: Impact calculations for hedgerow and tree removal associated with Upperchurch Windfarm

Project Element	Upperchurch Windfarm
Permanent Hedgerow Removal (m)	980
Permanent Mature Tree Removal	24
Permanent Immature Tree Removal	0

Table 18: Impact calculations for habitats greater than Local Importance (Higher Value) in the UWF Other Activities study area

Habitat Type	Evaluation	Total Area Present (ha)	Percentage of Overall Study Area (%)	Area of Habitat Permanently Lost (ha)	Proportion of Study Area Habitat Lost (%)
FW1	County Importance; Local Importance (Higher Value)	0.39	1.1	0.000	0.000
WD1	Local Importance (Higher Value)	5.15	14.2	0.000	0.000
WL2	Local Importance (Higher Value)	0.2	0.5	0.000	0.000
WS1	Local Importance (Higher Value)	1.3	3.6	0.000	0.000
Total		**7.05**	**19.39**	**0.00**	**0.00**

Table 19: Impact calculations for hedgerow and tree removal associated with UWF Other Activities

Project Element	UWF Other Activities
Permanent Hedgerow Removal (m)	0
Permanent Mature Tree Removal	0
Permanent Immature Tree Removal	0