



## APPENDIX 6-1

*BOTANICAL STUDY*

## **Botanical Study Appendix 6-1**

Botanical Survey,  
Renewable Energy  
Development Curraglass,  
Co. Cork





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# 1. INTRODUCTION

## 1.1 Introduction

MKO were commissioned to undertake detailed botanical surveys to assess the habitats located at each of the turbine bases and other proposed infrastructure associated with the proposed development site. The detailed assessments focussed on the development footprint including the turbine bases, the proposed substation, borrow pits, temporary construction compound, new access roads and associated infrastructure. The detailed botanical surveys were undertaken on the 29<sup>th</sup> and 30<sup>th</sup> of July 2019, 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup> of January 2020, 25<sup>th</sup> of March and 26<sup>th</sup> of May 2020.

# 2. SURVEY METHODS

A 2mx2m relevé was taken at the location of each proposed turbine base and other ancillary areas of proposed site infrastructure. In some cases turbine bases were already in existence as a result of the previous wind farm that was constructed on the site. In such cases a species list was made with no requirement for a relevé to identify the habitat present.

A total of 10 relevés were undertaken within the proposed development footprint as shown on Figure 6-1-1. Additional relevés were also undertaken which have informed the Biodiversity chapter, however, these have not been described here as they are located outside of the proposed development footprint and will not be impacted by the proposed works.

Those relevés that were undertaken in peatland habitats followed guidelines set out in the following document:

- *Perrin, P.M, Martin, J.R., Barron, J.R., Roche & O' Hanrahan, B. (2014) Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service.*

All species were readily identifiable during the survey. Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

## 2.1 Statement of Authority

Field surveys were undertaken by Laoise Kelly (B.Sc. Env.) of MKO on the 29<sup>th</sup> and 30<sup>th</sup> of July 2019, 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup> of January 2020, 25<sup>th</sup> of March and 26<sup>th</sup> of May 2020. Laoise is an experienced ecologist with over five years professional experience. In addition to the below botanical data, the lands within the wider study area were also surveyed in detail in order to achieve a full assessment of the habitats within the site.



- Map Legend**
-  EIAR Site Boundary
  -  Relevé Locations



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Drawing Title  
 Relevé Locations

Project Title Curraglass Renewable Energy Development, Co. Cork	
Drawn By Laoise Kelly	Checked By John Hynes
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### 3. RESULTS

#### 3.1 Turbine 1

The proposed turbine will be located at an existing turbine base categorised as Recolonising Bare Ground (ED3). The species recorded in this habitat are provided in Table 3-1 below.

Table 3-1 Botanical Survey – Turbine 1, Relevé 1

Turbine 1	Grid reference: E108788 N063587	Date: 22/04/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Agrostis stolonifera</i>	Creeping Bent-grass	10
<i>Festuca rubra</i>	Red Fescue	1
<i>Cerastium fontanum</i>	Mouse-ear Chickweed	1
<i>Ulex galii</i>	Western gorse	5
<i>Juncus effusus</i>	Soft Rush	3
<i>Digitalis purpurea</i>	Foxglove	3
<b>Non-vascular Plants</b>		
<i>Philonotis fontana</i>		2
% Bare ground		75
Habitat Classification	Recolonising Bare Ground (ED3)	



*Plate 3-1 Recolonising bare ground (ED3) at Turbine 1.*

## 3.2 Turbine 2

Area dominated by conifer forestry with *Thuidium tamariscinum* ground flora. No table of vegetative composition provided here due to forestry dominated nature of the habitat within the proposed development footprint. Tree species comprised Sitka Spruce (*Picea sitchensis*) (Grid ref. E109462 N063558).



Plate 3-2 Example of conifer plantation recently felled at Turbine 2

### 3.3 Turbine 3

Area comprised an existing hard standing associated with previous turbine infrastructure. The new turbine will be located within the footprint of the existing hardstanding area. The dominant habitat was described as Recolonising Bare Ground (ED3). The species recorded in this habitat are described in Table 3-2.

Table 3-2 Botanical Survey – Turbine 3, Relevé 2

Turbine 3	Grid reference: E109462 N063558	Date: 30/07/2019
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Plantago lanceolata</i>	Ribwort plantain	3
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	3
<i>Poa annua</i>	Meadow grass	3
<i>Holcus lanatus</i>	Yorkshire Fog	5
<i>Cerastium fontanum</i>	Mouse-ear Chickweed	1
% Bare ground		80
Habitat Classification		Recolonising Bare Ground (ED3)

+ indicates presence, below 1% cover



Plate 3-3 Recolonising Bare Ground (ED3) at Turbine 3.

## 3.4 Turbine 4

Area comprised degraded Wet Heath (HH3) drained as a result of the existing adjacent road and conifer forestry. The species recorded in this habitat are described in Table 3.3.

Table 3.3 Botanical Survey – Turbine 4, Relevé 3

Turbine 4	Grid reference: E09035 N62572	Date: 30/07/2019
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Calluna vulgaris</i>	Ling Heather	30
<i>Potentilla erecta</i>	Tormentil	8
<i>Molinia caerulea</i>	Purple Moor-grass	60
<i>Ulex galii</i>	Western Gorse	5
<i>Erica tetralix</i>	Cross-leaved Heath	5
<i>Polygala serpyllifolia</i>	Heath Milkwort	+
<i>Trichophorum germanicum</i>	Deergrass	3
<b>Non-vascular Plants</b>		
<i>Rhytidiadelphus loreus</i>		20
<i>Sphagnum capillifolium</i>		10
Peat Depth		<0.5m
Habitat Classification		Wet Heath (HH3) (degraded)

+ indicates presence, below 1% cover



*Plate 3-4 Degraded Wet Heath (HH3) habitat located at Turbine 4*

### 3.5 Turbine 5

Area dominated by Sitka Spruce (*Picea sitchensis*). The forest floor was mostly bare and predominantly covered with pine needles with some small patches of *Thuidium tamariscinum* recorded throughout (Grid Ref. E108534 N062207).



Plate 3-5 Conifer Forestry (WD4) located at Turbine 5

## 3.6 Turbine 6

Area of degraded Wet Heath (HH3) associated with conifer forestry supporting species Sitka Spruce (*Picea sitchensis*), Lodgepole Pine (*Pinus contorta*) and Larch (*Larix europaeus*). The ground was heavily poached and there was evidence of deer and sheep grazing. Rocky outcrops existed throughout the wider area. The species recorded in this habitat are described in Table 3-4.

Table 3-4 - Botanical Survey - Turbine 6, Relevé 4

Turbine 6	Grid reference: E109031 N061960	Date: 25/03/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Ulex galii</i>	Western Gorse	45
<i>Calluna vulgaris</i>	Ling Heather	10
<i>Potentilla erecta</i>	Tormentil	+
<i>Erica tetralix</i>	Cross-leaved Heath	+
<i>Molinia caerulea</i>	Purple Moor-grass	60
<i>Trichophorum germanicum</i>	Deergrass	3
<i>Pedicularis sylvatica</i>	Lousewort	+
<i>Erica cinerea</i>	Bell Heather	+
<b>Non-vascular Plants</b>		
<i>Rhytidiadelphus loreus</i>		10
<i>Sphagnum capillifolium</i>		5
Peat Depth		0.2m
% Bare ground		10
Habitat Classification		Wet Heath (HH3) (degraded)

+ indicates presence, below 1% cover



*Plate 3-6 Degraded Wet Heath (HH3) at Turbine 6*

### 3.7 Turbine 7

Area of degraded Wet Heath (HH3) associated with forestry ride within Sitka Spruce (*Picea sitchensis*) forestry plantation. The species recorded in this habitat are described in Table 3-5.

Table 3-5 Botanical Survey – Turbine 7, Relevé 5

Turbine 7	Grid reference: E108955 N061538	Date: 25/03/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Molinia caerulea</i>	Purple Moor-grass	70
<i>Calluna vulgaris</i>	Ling Heather	25
<i>Potentilla erecta</i>	Tormentil	3
<i>Blechnum spicant</i>	Hard fern	5
<b>Non-vascular Plants</b>		
<i>Sphagnum cuspidatum</i>		5
<i>Sphagnum capillifolium</i>		5
<i>Rhytidiadelphus loreus</i>		20
Peat Depth		0.3m
Habitat Classification	Wet Heath (HH3) (degraded)	



Plate 3-7 Forestry ride categorised as degraded Wet Heath (HH3), Turbine 7

### 3.8 Substation and Battery Storage

Area comprised Sitka Spruce (*Picea sitchensis*) Conifer Plantation (WD4) adjacent to the existing substation. The forestry is mature and the forest floor heavily shaded with occasional patches of *Thuidium tamariscinum* moss and boulders present as shown in Plate 3-8



Plate 3-8-Location of substation and battery storage compound within Conifer Plantation (WD4)

### 3.9 Meteorological Mast

The location of the proposed meteorological mast comprised degraded wet heath that had been drained as a result of the road and forestry plantation. The species within this habitat are recorded in Table 3-6 below.

Table 3-6 Botanical Survey – Meteorological Mast, Relevé 6

Anemometry Mast	Grid reference: E109138 N062848	Date: 25/03/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Molinia caerulea</i>	Purple Moor-grass	50
<i>Calluna vulgaris</i>	Ling Heather	30
<i>Potentilla erecta</i>	Tormentil	3
<i>Polygala serpyllifolia</i>	Milkwort	+
<i>Erica cinerea</i>	Bell Heather	1
<i>Erica tetralix</i>	Cross-leaved Heath	2
<i>Juncus effusus</i>	Soft Rush	3
<i>Blechnum spicant</i>	Hard fern	1
<i>Alnus glutinosa</i>	Alder	10
<b>Non-vascular Plants</b>		
<i>Rhytidiadelphus loreus</i>		20
<i>Sphagnum capillifolium</i>		10
<i>Thuidium tamariscinum</i>		10
<i>Polytrichum commune</i>		15
Peat Depth		0.2m
Habitat Classification	Wet Heath (HH3) (degraded)	



Plate 3-9 Location of proposed meteorological mast.

### 3.10 Borrow Pits

It is proposed to develop 2 No. on-site borrow pits as part of the Proposed Development. Borrow Pit 1 is located approximately 70 metres northeast of Turbine No. 3 and measures approximately 7184.8 metres square. This borrow pit is located in an area categorised as Recolonising Bare Ground (ED3), Exposed Siliceous Rock (ER1), and Conifer Plantation (WD4) as shown below.



Plate 3-10 Borrow Pit near Turbine 3

Borrow Pit 2 is located further south within the site, approximately 180 metres north of Turbine No. 6, and measures approximately 2518 meters square (Grid Ref: E109002 N06211). This borrow pit is located in Conifer Plantation (WD4) as shown below. No table of vegetative composition is provided here due to the forestry dominated nature of the habitat within the proposed development footprint.



Plate 3-11 Conifer Plantation (WD4) in which Borrow Pit 2 will be constructed

### 3.11 Temporary Construction Compound

The proposed temporary construction compound is predominantly located at a hardstanding area associated with a previous turbine and was categorised as Recolonising Bare Ground (ED3). The area to the east of this has been cut away and comprised degraded Wet Heath (HH3). The degraded heath habitat was being encroached by wet grassland species *Juncus* and was heavily poached by sheep grazing. A Relevé was taken within the footprint of the proposed compound as shown in Table 3-7 below.

Table 3-7 Botanical Survey – Temporary Construction Compound Relevé 7

Construction Compound	Grid reference: E108950 N063478	Date: 25/03/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Agrostis stolonifera</i>	Creeping Bent-grass	15
<i>Digitalis purpurea</i>	Foxglove	10
<i>Juncus effusus</i>	Soft Rush	8
<b>Non-Vascular Plants</b>		
<i>Philonotis fontana</i>		5
% Bare ground		65
Habitat Classification		Recolonising Bare Ground (ED3)



Plate 3-12 Temporary Construction Compound Relevé 7

### 3.12 Proposed New Road Near Turbine 2

The proposed new road realignment near Turbine 2 will go through existing Conifer Plantation (WD4) that has been recently felled and replanted. The species recorded within the footprint of the proposed road realignment are described in

Table 3-8 below.

Table 3-8 Botanical Survey – New Road Realignment, Relevé 8

Turbine 7	Grid reference: E109500 N063478	Date: 29/07/2019
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<i>Picea sitchensis</i>	Sitka Spruce	10
<i>Digitalis purpurea</i>	Foxglove	3
<i>Juncus effusus</i>	Soft Rush	10
<i>Juncus bulbosus</i>	Bulbous Rush	10
<i>Holcus lanatus</i>	Yorkshire Fog	5
<i>Potentilla erecta</i>	Tormentil	3
<b>Non-vascular Plants</b>		
% Bare ground		60
Habitat Classification		Conifer Plantation (WD4)



Plate 3-13 Recently felled and replanted Conifer Forestry (WD4) within new road realignment

### 3.13 Proposed Road Widening at Site Entry

It is proposed to widen the existing access road at the entry to the site. The access track is bordered by Oak-Birch-Holly Woodland (WN1). A 20m x 20m relevé was conducted in one area to the north and one to the south of the existing access road. The results of these relevés are shown in Table 3-9 and Table 3-10

Table 3-9 Botanical Survey – South of site entrance Relevé 9

Site Entrance - South	Grid reference: E110315 N063730	Date: 26/05/2020
Species	Common Name	% Cover
<b>Vascular Plants</b>		
<b>Canopy</b>		
<i>Fraxinus excelsior</i>	Ash	80
<i>Fagus sylvatica</i>	Beech	5
<b>Understory</b>		
<i>Coryllus avellana</i>	Hazel	50
<i>Ilex aquifolium</i>	Holly	10
<i>Sorbus aucuparia</i>	Rowan	10
<i>Salix spp.</i>	Willow	30
<b>Dwarf Shrubs</b>		
<i>Vaccinium myrtillus</i>	Bilberry	30
<i>Fuschia magellanica</i>	Fuschia	3
<b>Ground Flora</b>		
<i>Luzula sylvatica</i>	Great Woodrush	3
<i>Blechnum spicant</i>	Hard Fern	2
<i>Oxalis acetosella</i>	Wood sorrel	5
<i>Digitalis purpurea</i>	Foxglove	5
<i>Rubus fruticosus agg.</i>	Bramble	5
<i>Pteridium aquilinum</i>	Bracken	8
<i>Geranium robertianum</i>	Herb Robert	1
<i>Juncus effusus</i>	Soft rush	1
<i>Agrostis stolonifera</i>	Creeping Bent-grass	8

Non-vascular Plants		
<i>Rhytidiadelphus loreus</i>		40
<i>Isoetecium myuroides</i>		40
<i>Polytrichum commune</i>		5
% Bare Ground		10
Habitat Classification	Oak-Birch-Holly Woodland (WN1)	



Plate 3-14 Sessile Oak- Hazel Woodland to south of the site entrance, Relevé 9

Table 3-10 Botanical Survey – North of site entrance, Relevé 10

Site Entrance - North	Grid Reference: E110381 N0640165	Date: 26/05/2020
Species	Common Name	% Cover
<b>Canopy</b>		
<i>Quercus petraea</i>	Oak	5
<i>Betula pubescens</i>	Birch	15
<i>Coryllus avellana</i>	Hazel	50
<b>Understory</b>		

<i>Ilex aquifolium</i>	Holly	5
<i>Sorbus aucuparia</i>	Rowan	5
<i>Salix spp.</i>	Willow	20
<b>Dwarf Shrubs</b>		
<i>Vaccinium myrtillus</i>	Bilberry	30
<b>Ground Flora</b>		
<i>Luzula sylvatica</i>	Great Woodrush	5
<i>Blechnum spicant</i>	Hard Fern	3
<i>Oxalis acetosella</i>	Wood sorrel	3
<i>Digitalis purpurea</i>	Foxglove	3
<i>Pteridium aquilinum</i>	Bracken	5
<i>Geranium robertianum</i>	Herb Robert	+
<i>Euphorbia amygdaloides</i>	Wood Spurge	+
<b>Non-vascular Plants</b>		
<i>Rhytidiadelphus loreus</i>		40
<i>Polytrichum commune</i>		5
<i>Isoetes macrospora</i>		60
<i>Thuidium tamariscinum</i>		20
<i>Polytrichastrum formosum</i>		3
% Bare Ground		5
Habitat Classification	Oak-Birch-Holly Woodland (WN1)	



*Plate 3-15 Sessile Oak-Bilberry Woodland to north of the site entrance, Relevé 10*