

Ecological Baseline Survey
prepared for
Powerscourt Paddock Upland Farm
as part of the Commonage Management Plan for SUAS



Final Report

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1. Introduction

This upland farm extends from the lower slopes of Powerscourt Paddock townland at 360m west to the summit of Djouce Mountain, and north to include the Paddock Glen and Middle Hill as shown on **Figure 1** below. The slopes are known locally as Paddock Hill. Lands within the commonage are under the ownership of the state and are included within the boundaries of the Wicklow Mountains National Park.

The lands within the commonage are of international importance for the habitats and species they contain and hence are included within the boundaries of the Wicklow Mountains SAC and Wicklow Mountains SPA.



Plate 1. Looking north across the lower slopes of the commonage near the boundary with private plantation.

The Glen River rises within the site on the upper slopes of Djouce Mountain and flows through Paddock Glen north eastwards to join the River Dargle above the Powerscourt Waterfall. An unnamed watercourse rises from the col between Djouce Mountain and War Hill and forms the northern edge of the commonage at the foot of Middle Hill. This watercourse also joins the River Dargle upstream of the Powerscourt Waterfall.

A second small unnamed watercourse rises just at the eastern edge of the commonage and flows north through Paddock Lake (dry since Hurricane Charlie) and the Coillte owned plantations of Djouce Woods, joining the River Dargle downstream of Powerscourt Waterfall in the Powerscourt Deerpark.

The Paddock Brook rises on the slopes of Paddock Hill just at the edge of the commonage. This watercourse is a tributary of the Vartry River, which feeds the Vartry Reservoir and as such form part of the drinking water supply for North County Wicklow and Dublin.

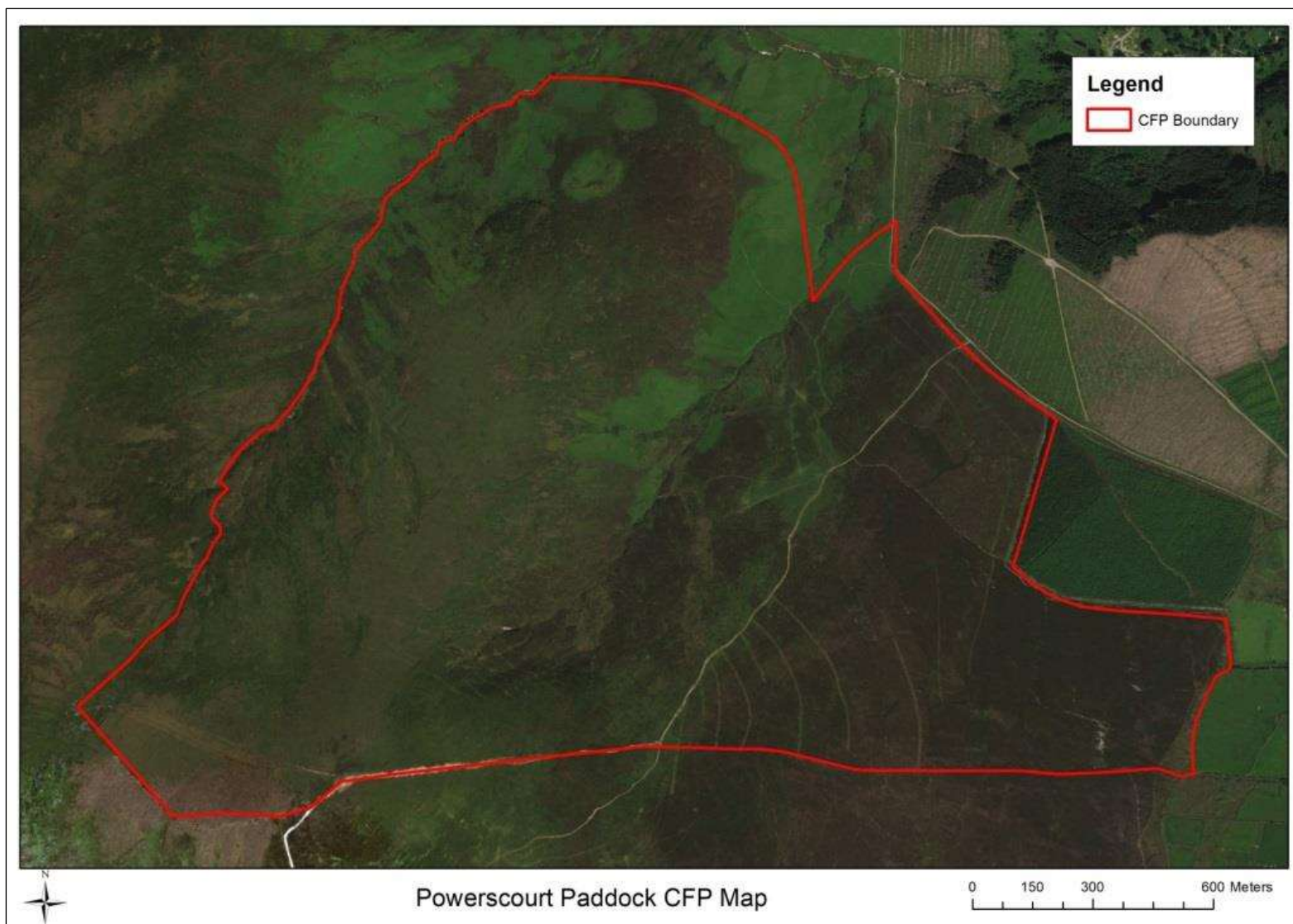


Figure 1. Powerscourt Paddock Upland Farm (Private Commonage).

This area is underlain by Ordovician metasediments (both schistose and granitic rocks) with the summit of Djouce culminating in a number of bare tors of schist. The remaining solid geology of the back of Djouce and War Hill is granitic with one notable feature being The Coffin Stone, which is a very large granite boulder set amongst a field of smaller glacial erratics on the north-west flanks of the mountain.

The soils of the lower slopes of the commonage are described as the Clonroche Association consisting of a fine loamy glacial drift with siliceous stones. The middle slopes of the commonage are described as the Borrisoleigh Association consisting of fine loamy soils over mudstone, shale or slate bedrock. The soils over the majority of the upper slopes of the commonage including Djouce Mountain and Middle Hill are shallow blanket peats of various depths over the underlying lithoskeletal acid igneous rocks.

The commonage, which formed part of the Powerscourt Estate, is owned by National Parks and Wildlife Service and the grazing is leased by Brian Mulligan as an upland farm. This commonage was assessed as part of the joint NPWS/Department of Agriculture commonage framework plans, which were drawn up in the early 2000s. This assessment identified that the commonage was generally undamaged but that some destocking (2.88%) was required to allow recovery in some affected areas. The habitats within the commonage were roughly classified as upland blanket bog, wet heath, dry heath or upland acid grassland or a mosaic of each. The areas of montane heath do not appear to have been identified.

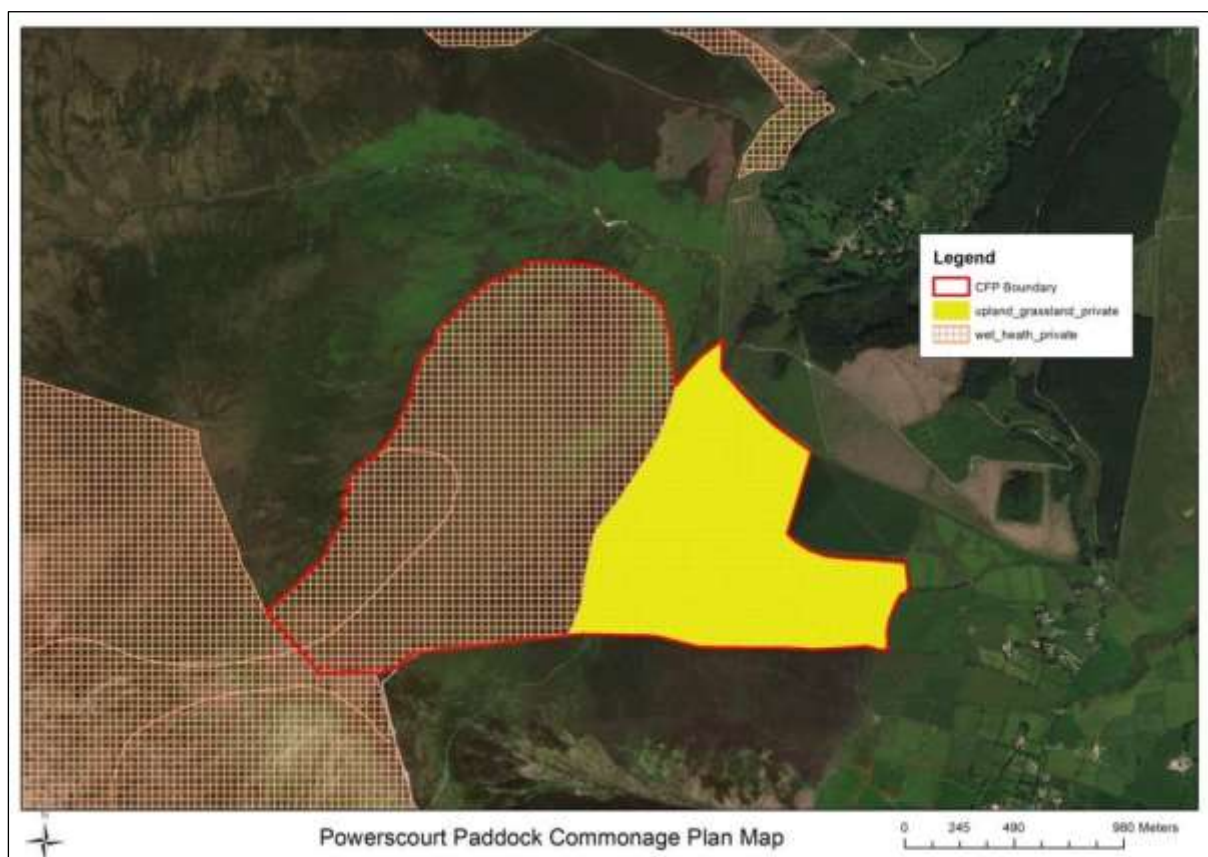


Figure 2. Commonage Framework Plan Map (2001).

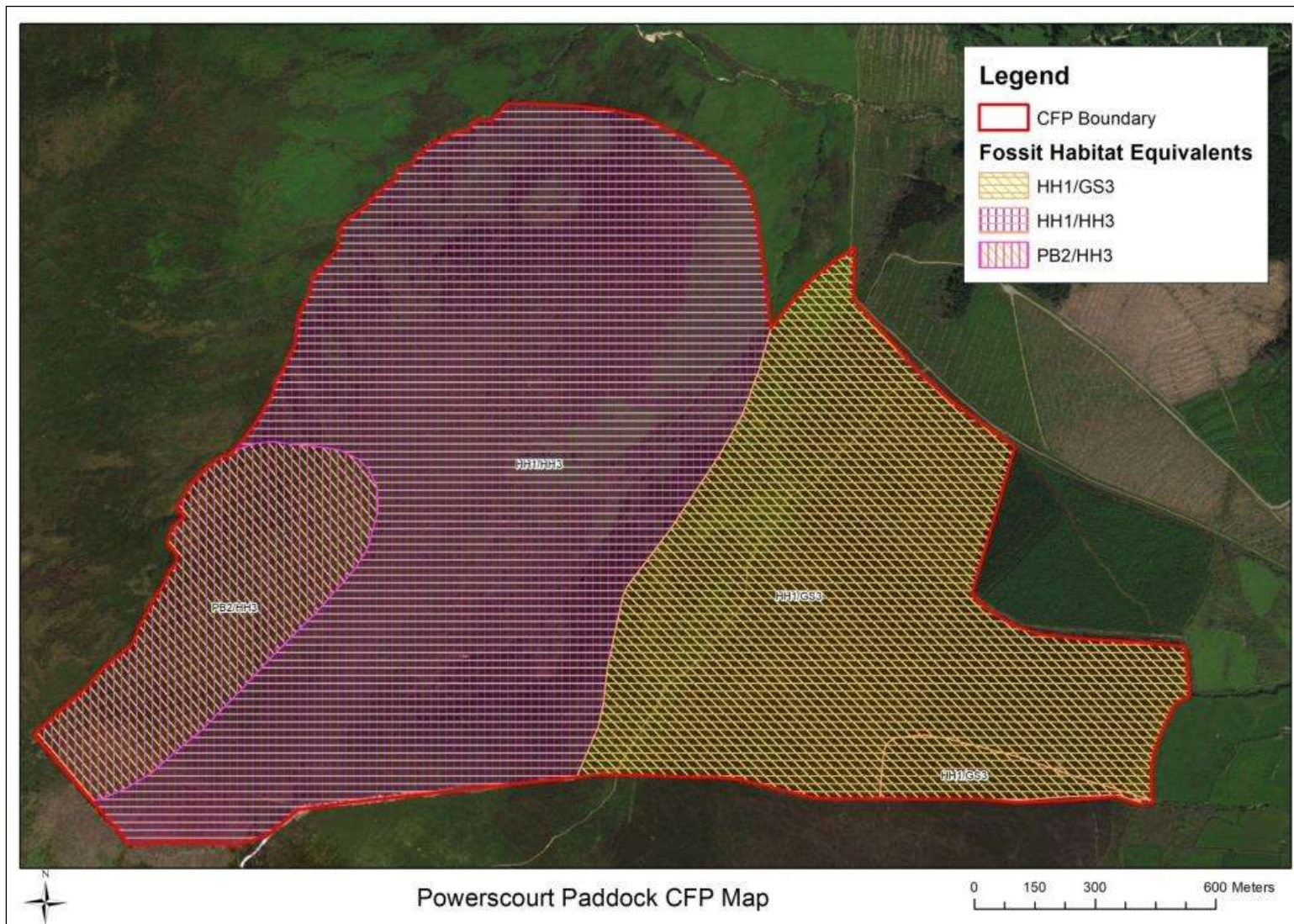


Figure 3. Commonage Framework Plan Indicative Habitat Map.

2. Receiving Environment - 2018

2.1 Habitats Present

Under Fossitt's (2000) habitat classification scheme the dominant habitat within the lower slopes of Powerscourt Paddock commonage is that of **Dry Heath HH1** (which corresponds to the Annex I habitat **4030 Dry Heath**). This habitat is dominated by ling heather (*Calluna vulgaris*) with occasional bell heather (*Erica cinerea*) and less frequently bilberry (*Vaccinium myrtillus*). This habitat is principally found on the lower slopes of the commonage on Paddock Hill.



Plate 2. The lower slopes of Paddock Hill are dominated by dry heath, which has been subject to various vegetation control measures in the recent past.

There has been no recent burning on the site as evidenced by the condition of the vegetation (large areas of tall dense leggy heather) and the National Parks and Wildlife Service history of site management files. In recent years there were various vegetation management trials conducted on the site – mainly through flailing areas of vegetation as part of a Red Grouse Management Plan¹.

Interspersed through the areas of dry heath, particularly on the slopes immediately either side of the Wicklow Way walking track and towards the Glen River, there are localised areas of **Acid Grassland (GS3)**. The open mosaic of acid grassland and dry heath is maintained in this location by grazing and trampling from walkers.

Small areas are damper/wetter on the southern slopes of the Glen River valley and here heath rush (*Juncus squarrosus*) and cross leaved heath (*Erica tetralix*) are common indicating **Wet Heath (HH3)** (which corresponds to the Annex I habitat **4010 Northern Atlantic Wet Heaths with *Erica tetralix***) with occasional localised flushes rich in sedges. The northern slopes of the valley are dominated by areas of **Wet Heath (HH3)** with occasional patches of localised rush dominated flushes. Sheep regularly forage and congregate in this sheltered part of the hill.

On the northern side of Middle Hill is an area of **Poor Fen and Flush (PF2)**. Flushed areas have several species of sedge (carnation sedge (*Carex panicea*), common sedge (*Carex nigra*), glaucous sedge

¹ Griffin, J. (2005). Grouse Management Plan. Wicklow Mountains National Park. National Parks and Wildlife Service. Department of Environment, Heritage and Local Government. Unpublished report.

(*Carex flacca*), star sedge (*Carex echinata*) and common yellow sedge (*Carex demissa*), along with species such as lesser spearwort (*Ranunculus flammula*), sharp flowered rush (*Juncus acutiflorus*), marsh lousewort (*Pedicularis palustris*), tormentil (*Potentilla erecta*), marsh violet (*Viola palustris*), marsh pennywort (*Hydrocotyle vulgaris*), bog cottons (*Eriophorum angustifolium*, *E. vaginatum*), bog pondweed (*Potamogeton polygonifolius*), Marsh St. John's-wort (*Hypericum elodes*) and Sphagnum mosses (*Sphagnum capillifolium* and *S. papillosum*). In some areas of Middle Hill rushes dominate flushed areas, which is more akin to the habitat **Wet Grassland (GS4)**.

The lower slopes of Middle Hill are dominated by **Dense Bracken (HD1)** in several locations. This is beginning to spread into the adjoining heath in places. The old lazy beds on Middle Hill near the Glen River are completely covered in bracken.

The Glen River is described as an **Eroding Upland River (FW1)** and has little in the way of any instream vegetation.

The underlying geology of the Djouce Mountain and the White Hill peaks is illustrated by the relatively lush growth of **Montane Heath (HH4)** (which corresponds to the Annex I habitat 4060 Alpine and Boreal heath) and upland acidic grassland on the sheltered, south-eastern flanks of Djouce and the significant areas of metamorphic rock at its summit and ridge to White Hill.

Areas of **Acid Grassland (GS3)**, often forming a mosaic with **Dry Heath (HH1)** and **Exposed Siliceous Rocks (ER1)**, are frequent in some areas. Species recorded here include ling heather, with occasional bell heather, scattered bilberry, heath bedstraw, sheep's fescue, common bent, tormentil, and sheep's sorrel (*Rumex acetosella*).



Plate 3. Looking down to the Glen River. Note the extensive slopes of bracken.

The upper slopes of the commonage on Djouce Mountain are dominated by **Montane Heath (HH4)** with frequent crowberry (*Empetrum nigrum*) growing through a sward of ling, heath rush (*Juncus squarrosus*), and heath bedstraw (*Galium saxatile*). Interspersed with this and on the ridge the montane heath forms a mosaic with areas of montane grassland with frequent mat grass (*Nardus stricta*), sheep's fescue (*Festuca ovina*) and the mosses *Rhytidiadelphus squarrosus*, *Polytrichum commune*, and *Dicranum* spp. The woolly hair moss (*Racomitrium lanuginosum*) is rare and alpine species which were historically recorded from Djouce such as fir clubmoss (*Huperzia selago*), stag's-horn clubmoss

(*Lycopodium clavatum*), and dwarf willow (*Salix herbacea*), which would be found on the shallow peats have declined or were not refound.



Plate 4. The track leading up towards Djouce Mountain dominated on either side by acid grassland/dry heath.



Plate 5. Looking down the walking track. The open areas of acid grassland are maintained by grazing and trampling.

The Wicklow Way walking route, which is extremely popular, passes through the commonage and the upper portions of rough track leading up Djouce is very eroded.

The schist tors on Djouce summit which are N-facing support a small area of habitat which corresponds to the Annex I Habitat **Siliceous Rocky Slope (8220)** below these is a very short turf

mixture of **Montane heath HH4** and **Dry-humid acid grassland GS3**. The alpine species dwarf willow is limited to the tors where browsing pressure is lessened.



Plate 6. The dry heath on the southern side of the commonage, adjacent to Glasnamullen Commonage, is bisected by the Wicklow Way walking track.



Plate 7. Erosion beginning on the Wicklow Way track as the slope increases.



Plate 8. The severely eroded track leading up to the summit of Djouce Mountain.



Plate 9. Sheep are favouring the sheltered valley on the northern side of the Glen River.



Plate 10. Bracken is invading the wet heath and dry heath habitats on the north western slopes of Middle Hill.

The Annex I habitats present within the commonage include:

- 4010 Northern Atlantic Wet Heaths with *Erica tetralix*
- 4030 Dry Heath
- 4060 Alpine and Boreal Heath
- 8220 Siliceous Rocky Slopes (along the eroded track and on the tors on Djouce Mountain)



Plate 11. Some flailed areas are beginning to slowly recover, whilst others shown no sign of recovery at all.



Plate 12. Areas of very dense leggy ling heather are frequent.



Plate 13. Several areas were flailed on the hill in 2015 and there have been mixed results in term of recovery and regeneration of the habitat.

2.2 Rare Plants

The ridge between White Hill and Djouce Mountain and the ridge towards War Hill were surveyed as part of The Montane Flora of County Wicklow², which was conducted in 2008 by Dr Tom Curtis and Faith Wilson. The results of the report for Djouce Mountain and War Hill are presented in full **Appendix 1**.

Of the montane specialist plant species previously recorded by Brunker in the Flora of County Wicklow (1950) from this area (these were *Lycopodium clavatum*, *Huperzia selago*, *Salix herbacea*, *Vaccinium vitis-idaea*, *Vaccinium myrtillus*, *Empetrum nigrum* and *Listera cordata*) only *Salix herbacea*, *Vaccinium vitis-idaea*, *V. myrtillus* and *Empetrum nigrum* were recorded in 2008. 4 of the 7 alpine plants noted from the area historically were re-located in 2008, the rarest being dwarf willow, several new populations of which were noted. There was an absence of club-mosses in the areas of montane heath and it was proposed that these have been lost as a result of trampling. No new populations of these montane species were recorded in 2018.

Other rare plant species recorded from the 10km squares in which this commonage is located (O11) include:

- Bog orchid (*Hammarbya paludosa*)
- Small white orchid (*Pseudorchis alba*)

Neither of these orchids is known from the Djouce Mountain area based on historic records. Other species recorded from the Powerscourt Waterfall area include Climbing corydalis (*Corydalis claviculata*) and Killarney Fern (*Trichomanes speciosum*) (Curtis & Wilson 2008).



Plate 14. Deer are a frequent grazer on the hills in the commonage.

² T.G.F Curtis and F. Wilson (2008). The Montane Flora of County Wicklow. A survey funded by the Heritage Council. Unpublished report.

2.3 Rare Fauna

The commonage is within the known range of Merlin (*Falco columbarius*), which breed outside the commonage in the Wicklow Mountains but hunt within it. There have been recent sightings of Merlin including in 2018 and 2016. A pair of Red Kite (*Milvus milvus*) was recorded during the site visit in November.

The Irish hare (*Lepus timidus* subsp. *hibernicus*) would be expected and large herds of deer (red/Sika hybrids) graze the commonage. The following species were recorded during this survey Common Frog (*Rana temporaria*), Fox (*Vulpes vulpes*), Snipe (*Gallinago gallinago*), Red Grouse (*Lagopus lagopus*) in the adjacent commonage, Wheatear (*Oenanthe oenanthe*), Meadow Pipit (*Anthus pratensis*) and Raven (*Corvus corax*). Common Lizard (*Zootoca vivipara*) and Snow Bunting (*Plectrophenax nivalis*) have also been recorded from here in previous years (pers. obs.). In the National Red Grouse Survey of Ireland this commonage was identified as being one of the few sites in Ireland where heather management for grouse was being implemented³ and indicative estimates of the population of Red Grouse within the Wicklow Mountains SPA is extracted below in **Table 1** from that survey.

Table 1. Figures given below are crude estimates of the populations of Red Grouse in some protected areas of blanket bog throughout the country. These figures were derived using calculated suitability factors for each region (which are not site specific), the mean density of birds (adjusted using the correction factor*) and the total area of each SAC / SPA. (The Wicklow figures were thought to be an underestimate).

Area	Designation	Region	Suitability Factor	Each Region Mean Males \pm CL's	Total Males \pm CL's	Population Estimate (correction factor*) \pm CL's
Wicklow Mts.	SAC	E & S	0.27	1.22 0.96-1.49	45.5 36-55.7	96.4 76.4-113.3

Scarce species occur, such as Dotterel (*Charadrius morinellus*), which was recorded on Djouce Mountain in 2010 and Ring Ouzel (*Turdus torquatus*), which was recorded in 2011 (Source: www.irishbirding.com).

Downstream of the commonage the River Dargle supports Otter (*Lutra lutra*), Atlantic salmon (*Salmo salar*), Brown trout (*Salmo trutta*) and Kingfisher (*Alcedo atthis*), while the main channel of the Vartry River below the reservoir was a population of Freshwater Pearl Mussel (*Margaritifera margaritifera*). There have been no recent surveys of this population by National Parks and Wildlife Service, the population is known from historic records. Other fauna known from the Vartry River include Otter (*Lutra lutra*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Atlantic salmon (*Salmo salar*) and Brown trout (*Salmo trutta*).

2.4 Fisheries and Water Quality

The commonage is located within the Eastern River Basin District within the Ovoca-Vartry catchment (10) and includes two sub-catchments – the Dargle Sub Catchment (Dargle_SC_010) and the Vartry Sub Catchment (Vartry_SC_010).

Dargle Sub-catchment

Within the Dargle Sub-catchment the Glen River (IE_EA_10D010010 Powerscourt Paddock) rises within the commonage on the upper slopes of Djouce Mountain and flows through Paddock Glen

³ Cummins, S., Bleasdale, A., Douglas, C., Newton, S., O'Halloran, J. & Wilson, H.J. (2010). The status of Red Grouse in Ireland and the effects of land use, habitat and habitat quality on their distribution. Irish Wildlife Manuals, No. 50. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

north eastwards to join the River Dargle above the Powerscourt Waterfall. An unnamed watercourse (IE_EA_10D010010) rises from the col between Djouce Mountain and War Hill and forms the northern edge of the commonage at the foot of Middle Hill. This watercourse also joins the River Dargle upstream of the Powerscourt Waterfall.

A second small unnamed watercourse rises just at the eastern edge of the commonage and flows north through Paddock Lake (dry since Hurricane Charlie) and the Coillte owned plantations of Djouce Woods, joining the River Dargle downstream of Powerscourt Waterfall in the Powerscourt Deerpark.

Recent water quality monitoring on the River Dargle by the EPA/Wicklow County Council at Ballinagee Bridge downstream of the commonage indicates that the River at this location is assigned a Q value of 4.5, which has declined from the 1990s and early 2000s when Q values of 5 were recorded (see **Table 2** below). The Dargle and its tributaries within the commonage were deemed as being 'High Status' watercourses in 2007-2009 but this had been reduced to 'Good Status' by 2010 - 2012, and 2012 - 2015.

Table 2. Water Quality values for the River Dargle at Ballinagee Bridge (1990 - 2015).

Water Quality Monitoring Results								
1990	1994	1997	2000	2003	2006	2009	2012	2015
5.0	4.0	4.5	4.5	5.0	5.0	4.5	4.0	4.5

Downstream of the Powerscourt Waterfall the River Dargle supports Brown Trout (*Salmo trutta*), Sea Trout (*Salmo trutta morpha trutta*) and Atlantic Salmon (*Salmo salar*) and is a very important salmonid watercourse, holding the record for catches of sea trout on the east coast.

Vartry Sub-catchment

Within the Vartry Sub-catchment the Paddock Brook rises on the slopes of Paddock Hill just at the edge of the commonage. This watercourse is a tributary of the Vartry River, which feeds the Vartry Reservoir and as such form part of the drinking water supply for North County Wicklow and Dublin.

Recent water quality monitoring by the EPA/Wicklow County Council at Ballinastoe Bridge downstream of the commonage indicates that the Vartry at this location is assigned a Q value of 4-5, which has declined from the 1990s when Q values of 5 were recorded (see **Table 3** below). Both these water courses are deemed as being 'High Status' watercourses. The Vartry River supplies the main drinking water supply for North Wicklow and South Dublin and is impounded at the Vartry Reservoir where water extraction and treatment occurs at the plant operated by Irish Water. Water quality within this river and it's headwaters are therefore of utmost importance.

Table 3. Water Quality values for the Vartry River at Ballinastoe Bridge (1990 - 2015).

Water Quality Monitoring Results								
1990	1994	1997	2000	2003	2006	2009	2012	2015
5.0	4.5	5.0	4.5	4.0	4.5	4.0	4.5	4.5

The main channel of the River Vartry as a Salmonid Watercourse under the EU Freshwater Fish Directive. The Directive was transposed into Irish law in 1988 through the European Communities Regulation on Quality of Salmonid Waters (S.I. No. 293/1988). The Regulation designates waters in order to protect and improve "Salmonid Waters." Salmonid waters must be able to sustain Atlantic Salmon (*Salmo salar*), Trout (*Salmo trutta*), Char (*Salvelinus*) and Whitefish (*Coregonus*). The Vartry River is one of only 22 watercourses in Ireland designated under this legislation.

Under the Water Framework Directive the Vartry Reservoir Lower (waterbody) was deemed at risk of not achieving 'good' status by 2015 due to impoundments while the River Vartry itself, which is currently at good status is at risk of not achieving 'good' status by 2015 due to impoundments and water abstraction.

2.5 Recreation

The commonage provides access to the Wicklow uplands and is used by large numbers of hill walkers particularly at the weekends. A well-used and worn track (the route of the Wicklow Way) leads from Crone Wood in the Glencree valley above the Powerscourt Waterfall through Powerscourt Paddocks where it travels across the eastern flank of Djouce (Paddock Hill) forming the boundary between the two commonages (Powerscourt Paddock and Glasnamullen) in this section. The Wicklow Way then travels to the head of the Glasnamullen River in Mason's Glen (bypassing the summit of Djouce Mountain) to Fox Rock and then south along the ridge to White Hill and on to the car park on the R759 above Lugalla estate.

There are a number of other well-worn paths through the commonage including one along the edge of the private plantation leading east from the Wicklow Way and one heading north from the Wicklow Way towards the lower slopes of Middle Hill.

The tracks leading to the summit of Djouce from the Wicklow Way on both the north eastern and southern sides of the mountain are significantly eroded despite some attempts at intervention in the past by National Parks and Wildlife Service in collaboration with the Mountain Meitheal group. Parts of the slope here have been fenced off to allow recovery and there are notices explaining why this has been done.

3. 2018 Ecological Assessment

3.1 Field Survey

Following the background review and desktop research the site was visited in October and November 2018 when the extent of habitats present within the commonage and their affinities to either Fossitt (Level 3) or Annex I habitats or commonly named habitat types were mapped as shown on **Figures 4, 5 and 6** below and as described above.

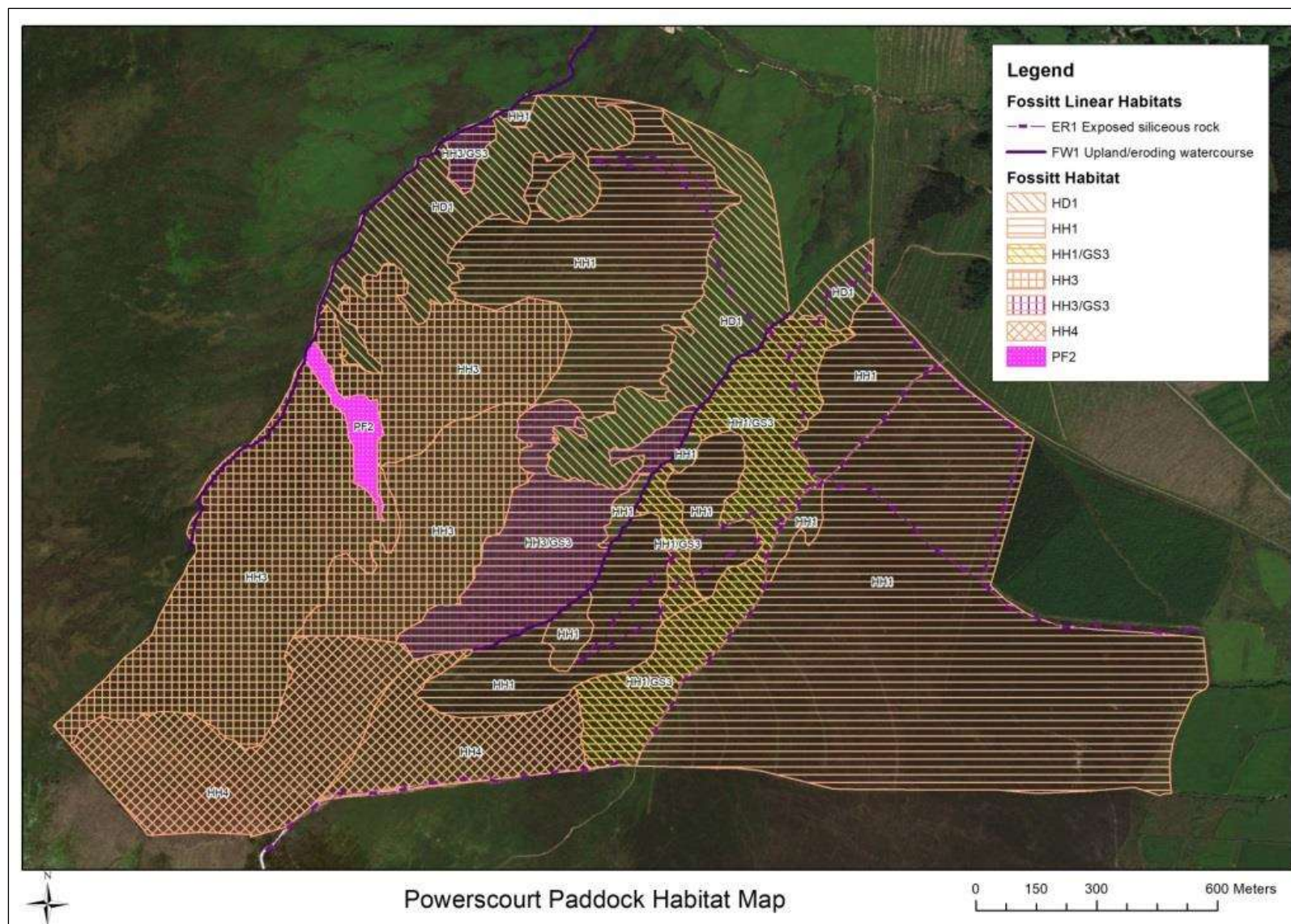


Figure 4. Habitats mapped to Level Three (Fossitt, 2000) within Powerscourt Paddock.

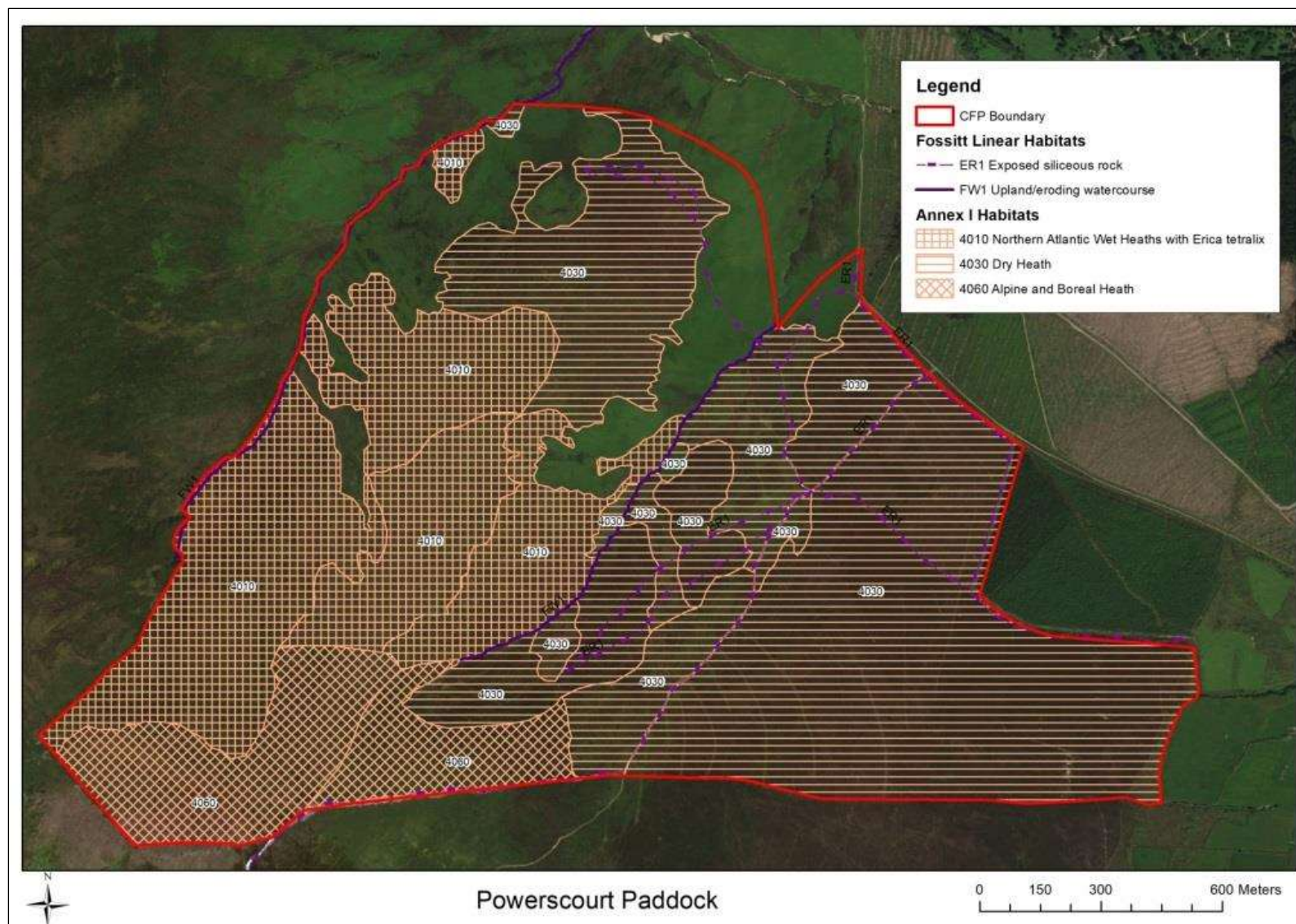


Figure 5. Habitats mapped according to their correspondence with Annex I habitats within Powerscourt Paddock.

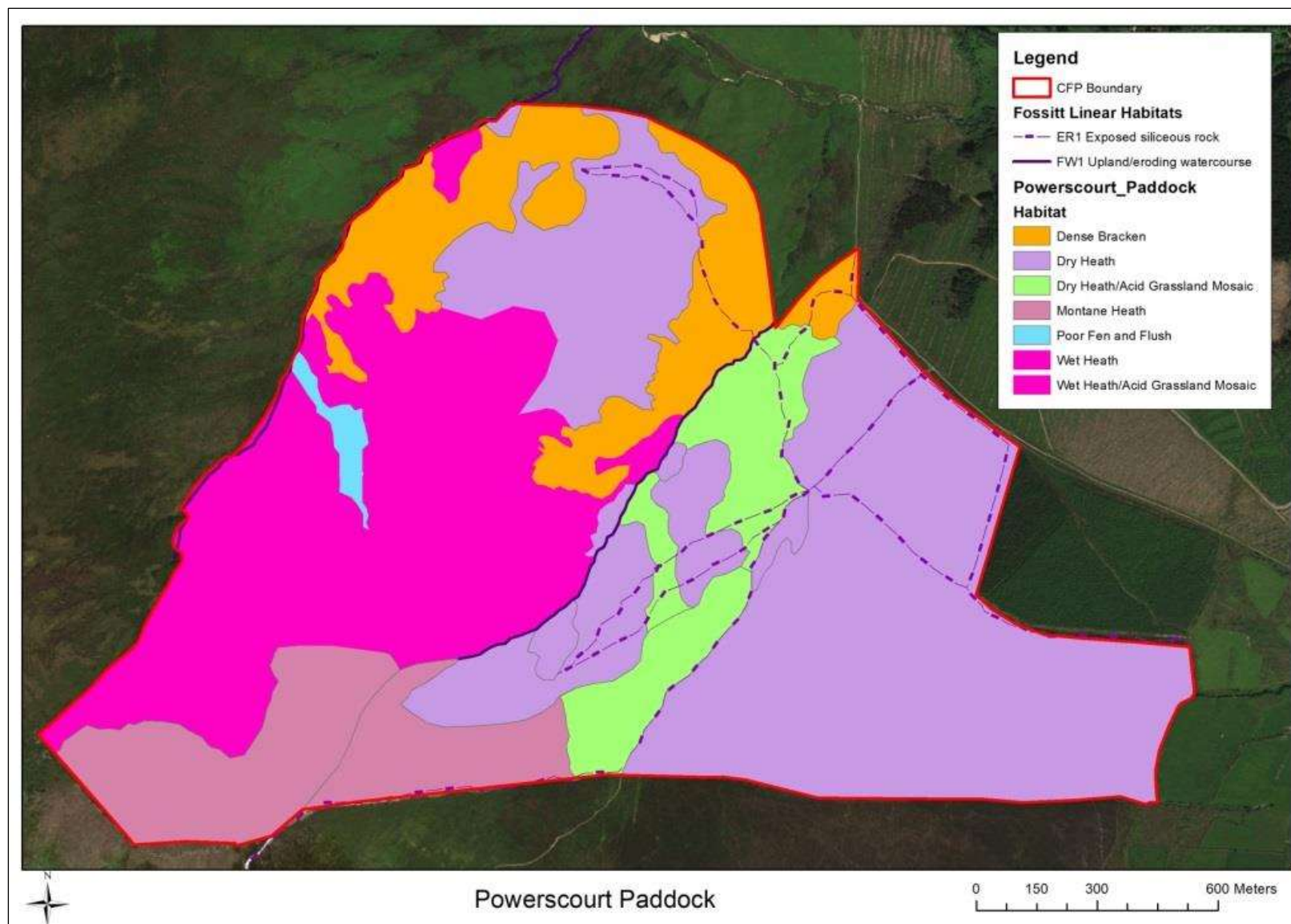


Figure 6. Habitats mapped using general vegetation descriptions.

3.2 Habitat Condition Assessments

A standardised protocol for assessing the habitat condition of those habitats listed under Annex I of the EU Habitats Directive was developed. Member states across the European Union must conduct monitoring of the habitats in their jurisdiction and report on the national condition of each habitat under Article 17 of the EU Habitats Directive on a six year basis.

The conservation status of a habitat is defined in Article 1 of the EU Habitats Directive as the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species.

The conservation status of a natural habitat will be taken as favourable when:

- its natural range and the areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The Overall Conservation Status Assessment for each habitat is listed as either:

- Favourable
- Unfavourable inadequate (change in management or policy is required to return the habitat to favourable status but there is no danger of extinction in the foreseeable future)
- Unfavourable bad (serious danger of becoming extinct, at least regionally)

There is also an 'Unknown' class which can be used where there is insufficient information available to allow an assessment.

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the EU Habitats Directive 92/43/EEC. **It is defined in positive terms such that a habitat type must be prospering and have good prospects of continuing to do so.**

There have been two rounds of monitoring of habitats in Ireland which date from the period 2001 – 2007 and 2007 – 2013. The habitats of relevance to the Wicklow Uplands were assessed at a national level in 2007 and 2013 as shown in **Table 4** below. There have been very few detailed assessments of the habitats in the Wicklow Mountains to date. In general the upland habitats of Ireland, when assessed at a national level are in very poor condition. The next round of monitoring results is due in 2019.

Table 4. Condition of upland habitats in Ireland (those habitats of relevance to the Wicklow uplands are shown).

Habitat	Area		Structure & Functions		Future Prospects		Overall Status	
	2007	2013	2007	2013	2007	2013	2007	2013
4010 Wet heaths	Unknown	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad
4030 Dry heaths	Favourable	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	Unfavourable – Bad
4060 Alpine and Boreal heaths	Unfavourable – Inadequate	Favourable	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	Unfavourable – Bad
6230 Nardus grasslands*	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad
7130 Blanket bogs (* if active bog),	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad	Unfavourable – Bad
8110 Siliceous screes	Unfavourable – Inadequate	Favourable	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate
8210 Calcareous rocky slopes	Unfavourable – Inadequate	Favourable	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate
8220 Siliceous rocky slopes	Unfavourable – Inadequate	Favourable	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate	Unfavourable – Inadequate

The main pressures, damaging activities and threats to the upland habitats which have been identified in the national assessments are presented below:

Wet Heath - There are ongoing losses in habitat Area due to afforestation and agricultural improvement. The quality of the habitat has been impacted by overgrazing and trampling, burning, invasive non-native species, drainage and erosion. Stock reductions implemented through commonage framework plans have led to an increase in height and cover of dwarf shrubs and reduction in extent of bare peat at many sites. Nevertheless, the Overall Status of this habitat is assessed as Bad due to the continued impact of the pressures listed above. The overall trend is considered to be stable due to the improvements resulting from stock reductions that balance out losses in Area.

Dry Heath - There have been ongoing losses in Area due to afforestation and agricultural improvement. Although the quality of the habitat has been impacted by overgrazing, burning, invasive non-native species and drainage, destocking brought about from the commonage framework plans has led to recovery in many upland areas. The Overall Status is assessed as Bad due to the impacts of the pressures listed. The overall trend is considered to be stable, the losses in Area balanced by the improvements in quality. The 2007 assessment was not underpinned by extensive survey and expert judgement was used to give an Overall Status of Inadequate. In light of current data it is likely that the 2007 assessment should have also been Bad.

Alpine & Sub-alpine Heath - Sheep grazing is widespread in uplands where alpine and subalpine heath occurs and, where levels of grazing are high, is problematic within this habitat. Hill walking is often concentrated on the ridges and summits where this habitat is found and can cause trampling and erosion of the habitat. Abandonment, scrub encroachment and decline in traditional farming methods are widely viewed to have negative effects on the conservation status of habitats in the Burren. For these reasons the Overall Status of this habitat is considered to be Bad. Conservation measures undertaken in the uplands and the Burren to address grazing problems have resulted in an improving trend. The 2007 assessment was not underpinned by extensive survey and expert judgement was used to give an Overall Status of Inadequate. In light of current data it is likely that the 2007 assessment should have also been Bad.

Species-rich Nardus Grassland - The Overall Status is assessed as Bad due to ongoing losses caused by forestry planting and agricultural improvement (fertilisation and re-seeding of the habitat) and also succession to heath and scrub. Due to ongoing losses to this habitat there is a declining trend for the habitat since the 2007 assessment.

Blanket Bog - The main threats to blanket bog include overgrazing and trampling, drainage, afforestation, mechanical peat-extraction, burning and windfarm and other infrastructural development. Reductions in sheep numbers on upland commonages over the last decade has had a major positive impact on overgrazed areas, however recovery is a slow process and restoration measures are required to prevent further erosion of blanket bog. The Overall Status of this habitat is assessed as Bad with an ongoing decline of extent and quality.

Siliceous Scree - This habitat that may be threatened by ecologically unsuitable grazing levels, recreational activities such as rock-climbing and invasive non-native species. The Overall Status is assessed as Inadequate, but with an improving trend. This trend is brought about by the implementation of the Commonage Framework Plans which address ecologically unsuitable grazing levels.

Calcareous Rocky Slopes - This habitat is threatened by ecologically unsuitable grazing levels, recreational activities such as rock climbing, quarrying and invasive non-native species. The Overall Status of this habitat is assessed as Inadequate with no major changes since 2007.

Siliceous Rocky Slopes - This habitat is threatened by ecologically unsuitable grazing levels, recreational activities such as rockclimbing, and invasive non-native species. For these reasons the Overall Status of this habitat is assessed as Inadequate with no major changes since 2007.

For a habitat to be deemed in Favourable Conservation Status an assessment is made on the following criteria:

- **Area** – there should be no decrease in the area of the habitat. For example areas of heathland habitat may have been lost to grassland as a result of overgrazing/animals congregating in one area or by the invasion of a species such as bracken.
- **Structure and Functions** - Structure and functions relates to the physical components of a habitat (“structure”) and the ecological processes that drive it (“functions”). For blanket bogs and associated habitats, these include a range of aspects such as soil chemistry, vegetation composition, hydrological regime, community diversity, habitat quality, species occurrence, indicators of local distinctiveness, disturbed ground, evidence of burning and negative species occurrence.
- **Future Prospects** - The impacts of pressures and threats on the habitat coupled with the general condition of the habitat are used to determine the Future Prospects (i.e. the long term viability of the habitat).
- **Overall Status** - For a “favourable” Overall Assessment for the habitat all parameters must be assessed as “favourable” (with one “unknown” acceptable); if any one of the parameters is assessed as “unfavourable - bad”, the Overall Assessment is also “bad”; any other combination would result in an “unfavourable - inadequate” Overall Assessment.

Under the SUAS project the habitats that correspond to the Annex I habitats have been assessed using the methodology outlined in Perrin *et al* (2014).

A number of monitoring stops were completed in each of the Annex I habitats present within the commonage (4010 Northern Atlantic Wet Heaths with *Erica tetralix*, 4030 Dry Heath and 4060 Alpine and Boreal Heath). The number of monitoring stops completed depended on the size of the habitat. These are detailed below.

For those habitats which are not Annex I habitats such as acid grassland or fens and flushes the habitat condition is based on best expert judgement or in some cases from the perspective of the hill farmer.

The results of these habitat condition assessments for the various parts of the commonage are presented on **Figure 7** below.

3.2.1 4010 Northern Atlantic Wet Heaths with *Erica tetralix*

A total of 4 monitoring stops were recorded within the **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** habitat within the commonage. The results of the four monitoring stops are presented below in **Table 3.2.1**.

Table 3.2.1. Monitoring criteria and failure rates for 4010 Northern Atlantic Wet Heaths with *Erica tetralix* (n = 4).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1. <i>Erica tetralix</i> present	20m radius	4	0	0
2. Cover of positive indicator species $\geq 50\%$	Relevé	4	0	0
3. Total cover of <i>Cladonia</i> species, <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses $\geq 10\%$	Relevé	4	0	0
4. Cover of ericoid species and <i>Empetrum nigrum</i> $\geq 15\%$	Relevé	4	0	0
5. Cover of dwarf shrub species $< 75\%$	Relevé	4	0	0
6. Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Ranunculus repens</i> collectively $< 1\%$	Relevé	4	1	25
7. Cover of non-native species $< 1\%$	Relevé	4	0	0
8. Cover of non-native species $< 1\%$	Local vicinity	4	0	0
9. Cover of scattered native trees and scrub $< 20\%$	Local vicinity	4	0	0
10. Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	4	0	0
11. Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	4	1	25
Vegetation structure				
12. Crushed, broken and/or pulled up <i>Sphagnum</i> species $< 10\%$ of <i>Sphagnum</i> cover	Relevé	4	0	0
13. Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively $< 33\%$	Relevé	4	0	0
14. No signs of burning into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	4	0	0
15. No signs of burning inside boundaries of sensitive areas ⁴	Local vicinity	4	0	0
Physical structure				
16 Cover of disturbed bare ground $< 10\%$	Relevé	4	0	0
17 Cover of disturbed bare ground $< 10\%$	Local vicinity	4	0	0
18 Area showing signs of drainage resulting from heavy trampling or tracking or ditches $< 10\%$	Local vicinity	4	0	0

Area

A review of the aerial photography from the 1990s and other data sources for the commonage including the commonage framework plan data indicate that there has been a reduction in the area of wet heath. It is thought that this is as a result of livestock congregating, grazing and associated trampling which has resulted in an increase of acid grassland/wet grassland habitats which now form a mosaic with the wet heath, notably on the northern side of the Glen River. For this reason the area of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** within the commonage was therefore assessed as **Unfavourable – Inadequate**.

Structure and Functions

In the assessment of structure and functions, 1 monitoring stop failed one criterion or more. Following a review of the ecological condition of this stop, expert judgement determined that this

⁴ Sensitive areas

- (a) Vegetation severely wind-clipped, mostly forming a mat less than 10 cm thick.
- (b) Areas where soils are thin and less than 5 cm deep.
- (c) Slopes greater than 1 in 3 (18°) and all the sides of gullies.
- (d) Ground with abundant, and/or an almost continuous carpet of *Sphagnum*, liverworts and/or lichens.
- (e) Pools, wet hollows, hags and erosion gullies, and within 5 – 10 m of the edge of watercourses.
- (f) Areas above 400 m in altitude.
- (g) Areas within 50 m of functioning drains.

stops failed on account of two criteria – a high density of soft rush (*Juncus effusus*) and common bent grass (*Agrostis capillaris*) on the slopes of Middle Hill where the wet heath was found in mosaic with wet grassland. This was deemed to be on account of sheep congregating in this area and grass and rushes beginning to take hold and as the habitat was mapped as a mosaic with wet grassland it was not deemed significant for the habitat to fail on that account. The structure and functions of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** were therefore generally assessed as **Favourable**.

The vegetation composition of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** was generally good with all monitoring stops passing. The cover of positive indicator species and the cover of *Cladonia* spp., *Sphagnum* spp. and pleurocarpous mosses were adequate at all monitoring stops. The cover of the negative indicator species *Agrostis capillaris* was excessive at one monitoring stop (12.5%).

The vegetation structure of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** was generally good with all monitoring stops passing.

Grazing by sheep and deer, along with associated impacts such as trampling and dunging, appears to be the most significant impact on the structure and functions of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** in the commonage.

The effects of this impact are apparent in the vegetation composition, vegetation structure and physical structure of this habitat. The lack of suitable areas of dry heath habitat elsewhere on the hill in conjunction with the natural tendency of sheep to congregate in one particular part of the hill (in the Glen River valley and adjoining the walking tracks) has resulted in losses of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** in this immediate area. This will require active management/ intervention through shepherding to ensure that the recovery in terms of vegetation composition of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** is ongoing.

Future prospects

The future prospects for the habitat are assessed as **Unfavourable – Inadequate** in the absence of active management by the commonage group. Through active shepherding and hunting the sheep out of the Glen River valley coupled with management of Dry Heath this scenario should improve.

Conservation Status Assessment

Overall the conservation status assessment for **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** habitat within the commonage is currently assessed as **Unfavourable – Inadequate**.

Active measures by the members of the commonage framework groups as set out in the management recommendations will assist in beginning to improve the conservation status of the habitats. However it should be recognised that it may take in some instances over twenty years for habitats to begin to recover depending on the severity of the former negative impacts such as a severe uncontrolled burn. More than one parameter may need to be addressed to see a move towards habitat recovery (e.g. restoration of hydrological condition, appropriate grazing levels (sheep/deer/sheep in combination with deer, reintroduction of seed material where a species has been lost/has declined to such an extent that seed production is low, etc.) and in some instances factors outside the site (and beyond the control of the commonage group) may be having a negative effect (such as the deposition of atmospheric nitrogen, drainage measures associated with adjacent forestry, etc.).

3.2.2 4030 Dry heath

A total of 8 monitoring stops were recorded within the **4030 Dry Heath** habitat within the commonage. The results of the eight monitoring stops are presented below in **Table 3.3.2**.

Table 3.2.2: Monitoring criteria and failure rates for 4030 Dry Heath ($n = 8$).

Criteria	Scale of assessment	No. of Assessments	No of Failures	Failure Rate (%)
Vegetation composition				
1. Number of bryophyte or non-crustose lichen species present, excluding <i>Campylopus</i> spp. and <i>Polytrichum</i> spp. ≥ 3	Relevé	8	6	75
2. Number of positive indicator species present ≥ 2 (Appendix VI)	Relevé	8	1	12.5
3. Siliceous heaths: cover of positive indicator species $\geq 50\%$ (Appendix VI)	Relevé	8	0	0
4. Proportion of dwarf shrub cover composed of <i>Myrica gale</i> , <i>Salix repens</i> , <i>Ulex gallii</i> collectively $< 50\%$	Relevé	8	0	0
5. Cover of the following weedy negative indicator species: <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Ranunculus repens</i> , large <i>Rumex</i> species (except <i>R. acetosa</i>), <i>Senecio jacobaea</i> , <i>Urtica dioica</i> collectively $< 1\%$	Relevé	8	0	0
6. Cover of non-native species $< 1\%$	Relevé	8	0	0
7. Cover of non-native species $< 1\%$	Local vicinity	8	0	0
8. Cover of scattered native trees and scrub $< 20\%$	Local vicinity	8	0	0
9. Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	8	0	0
10. Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	8	0	0
Vegetation structure				
11. Senescent proportion of <i>Calluna vulgaris</i> cover $< 50\%$	Relevé	8	0	0
12. Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of browsing collectively $< 33\%$ (Assess a minimum of 10 shoots distributed across the plot)	Relevé	8	0	0
13. No signs of burning inside boundaries of sensitive areas ⁵	Local vicinity	8	0	0
14. Outside boundaries of sensitive areas, all growth phases of <i>Calluna vulgaris</i> should occur throughout, with $\geq 10\%$ of cover in mature phase ⁶	Local vicinity	8	6	75
Physical structure				
15. Cover of disturbed bare ground $< 10\%$	Relevé	8	0	0
16. Cover of disturbed bare ground $< 10\%$	Local vicinity	8	0	0

⁵ Sensitive areas

(a) Areas where soils are thin and less than 5 cm deep.

(b) Hill slopes greater than 1 in 2 (26°), and all the sides of gullies.

(c) Ground with abundant, and/or an almost continuous carpet of *Sphagnum*, liverworts and/or lichens.

(d) Areas of H21 and H22 heath as defined by the NVC (Rodwell 1991a). These are heaths primarily composed of mixtures of *Calluna vulgaris* and *Vaccinium myrtillus* over a moist carpet of bryophytes that often has a high *Sphagnum* content. Within the provisional classification, these communities are comparable to DH4 and damper elements of DH6 respectively.

(e) Areas with noticeably uneven structure, at a spatial scale of around 1 m² or less. The unevenness (e.g. more commonly found in very old heather stands) will relate to distinct, often large, spreading dwarf-shrub bushes. The dwarf-shrub canopy will not be completely continuous, and some of its upper surface may be twice as high as other parts. Layering is likely to be present and may be common.

(f) Pools, wet hollows, hags and erosion gullies, and within 5 – 10 m of the edge of watercourses.

⁶ *Calluna vulgaris* growth phases

1. Pioneer < 10 cm

2. Building 10 – 30 cm

3. Mature > 30 cm

Area

A review of the aerial photography from the 1990s and other data sources for the commonage would indicate that there has been no significant change in the overall area of dry heath in the commonage. However there is a lack of detailed information on what the previous extent of acid grassland habitat in the commonage was (this forms a mosaic with dry heath in places) but based on the locations of where sheep were seen to favour the hill (in the sheltered slopes of the Glen River below Djouce Mountain) they would appear to be focusing their grazing efforts here thus resulting in a localised increase in grassland vs heath habitat. There is also a dominance of acid grassland over dry heath on the areas adjoining the Wicklow Way track – again associated with grazing pressure but also with trampling from walkers. For this reason the overall area of **4030 Dry Heath** within the commonage was therefore assessed as **Unfavourable – Inadequate**.

Structure and Functions

In the assessment of structure and functions, 6 monitoring stops failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that no changes should be made, resulting in an overall failure rate of 75%. The structure and functions of **4030 Dry Heath** were therefore assessed as **Unfavourable – Inadequate**.

The vegetation composition of **4030 Dry Heath** was often poor and 75% of the monitoring stops failed – the majority of them on account of lack of bryophytes or lichens and in one stop the dry heath was almost completely dominated by ling heather (lacking diversity of the other positive indicator species such as bilberry and bell heather). This is on account of a lack of grazing/burning which would encourage diversity within the sward. This has allowed the sward of ling to dominate outcompeting the other species and shading out the mosses and lichens below.

The vegetation structure of **4030 Dry Heath** was poor in many locations as there was a lack of diversity of ages of heather in many of the stops conducted with many being dominated by tall leggy heather.

In some parts of the commonage bracken (*Pteridium aquilinum*) is starting to dominate within the dry heath.

A lack of appropriate management (burning and appropriate grazing), along with more minor associated impacts such as trampling by recreational users, appears to be the most significant impact on the structure and functions of **4030 Dry Heath** in the commonage. The effects of this impact are apparent in the vegetation composition, vegetation structure and physical structure of this habitat.

The current condition of the commonage would indicate a lack of active management and appropriate grazing in the intervening period resulting in an overall poor condition of this habitat in many areas.

Future Prospects

The future prospects for the habitat **4030 Dry Heath** are assessed as **Unfavourable – Inadequate** in the absence of active management with measures such as active shepherding and hunting the sheep out of the Glen River valley coupled with the management of those areas of dry heath which are currently unmanaged and some further intervention and a recovery period for those areas that were previously flailed.

Conservation Status Assessment

Overall the conservation status assessment for the habitat **4030 Dry Heath** within the commonage is assessed as **Unfavourable – Inadequate**.

3.2.3 4060 Alpine and Boreal Heath

A total of 2 monitoring stops were recorded within the **4060 Alpine and Boreal Heath** habitat within the commonage. Only one of these passed as shown below in **Table 3.2.3**.

Table 3.2.3: Monitoring criteria and failure rates for 4060 Alpine and Boreal Heath ($n = 2$).

Criteria	Scale of assessment	No. of Assessments	No of Failures	Failure Rate (%)
Vegetation composition				
1. Number of bryophyte or non-crustose lichen species present ≥ 3	Relevé	2	1	50
2. Cover of positive indicator species $\geq 66\%$ (Appendix VI)	Relevé	2	0	0
3. Cover of dwarf shrubs $\geq 10\%$	Relevé	2	0	0
4. Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>A. vinealis</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> , <i>F. vivipara</i> , <i>Galium saxatile</i> , <i>Potentilla erecta</i> and <i>Poa</i> spp. (except <i>Poa alpina</i>) collectively $< 10\%$	Relevé	2	0	0
5. Cover of non-native species $< 1\%$	Relevé	2	0	0
Vegetation structure				
6. Live leaves of <i>Carex bigelowii</i> , <i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> , <i>F. vivipara</i> showing signs of grazing collectively $< 10\%$	Relevé	2	0	0
7. Last complete growing season's shoots of ericoids and <i>Empetrum nigrum</i> showing signs of browsing collectively $< 33\%$ (Assess a minimum of 10 shoots distributed across the plot)	Relevé	2	0	0
8. No signs of burning inside feature	Local vicinity	2	0	0
Physical structure				
9. Cover of disturbed bare ground $< 10\%$	Relevé	2	0	0
10. Cover of disturbed bare ground $< 10\%$	Local vicinity	2	0	0

Area

A review of the aerial photography from the 1990s and other data sources for the commonage indicate that there has been a loss in the overall area of montane heath in the commonage. This loss is mostly focused on either side of the walking track to Djouce Mountain arising from trampling from walkers, other trampling pressures (such as deer and sheep) and natural erosion. For this reason the area of **4060 Alpine and Boreal Heath** within the commonage was therefore assessed as **Unfavourable – Inadequate**.

Structure and Functions

In the assessment of structure and functions, 1 monitoring stop failed one criterion or more. Following a review of the ecological condition of those stops, expert judgement determined that no changes in the assessment should be made, resulting in an overall failure rate of 50%. The structure and functions of **4060 Alpine and Boreal Heath** were therefore assessed as **Unfavourable – Inadequate**. The vegetation composition of **4060 Alpine and Boreal Heath** was often poor on account of the lack of bryophytes or lichens and other key species. In many areas on the hill adjoining the walking tracks the vegetation structure of the habitat has been compromised from erosion resulting in exposure of the siliceous subsoil and bedrock beneath. Some of this activity is also likely to be on account of grazing animals and is compounded by natural erosion. The loss of several key indicator species of **4060 Alpine and Boreal Heath** (as documented by Curtis & Wilson, 2008) is also indicative of the poor condition of this habitat.

Future prospects

The future prospects for the habitat **4060 Alpine and Boreal Heath** are assessed as **Unfavourable – Inadequate** in the absence of active management by the commonage group.

Conservation Status Assessment

Overall the conservation status assessment for the habitat **4060 Alpine and Boreal Heath** within the commonage is assessed as **Unfavourable – Inadequate**.

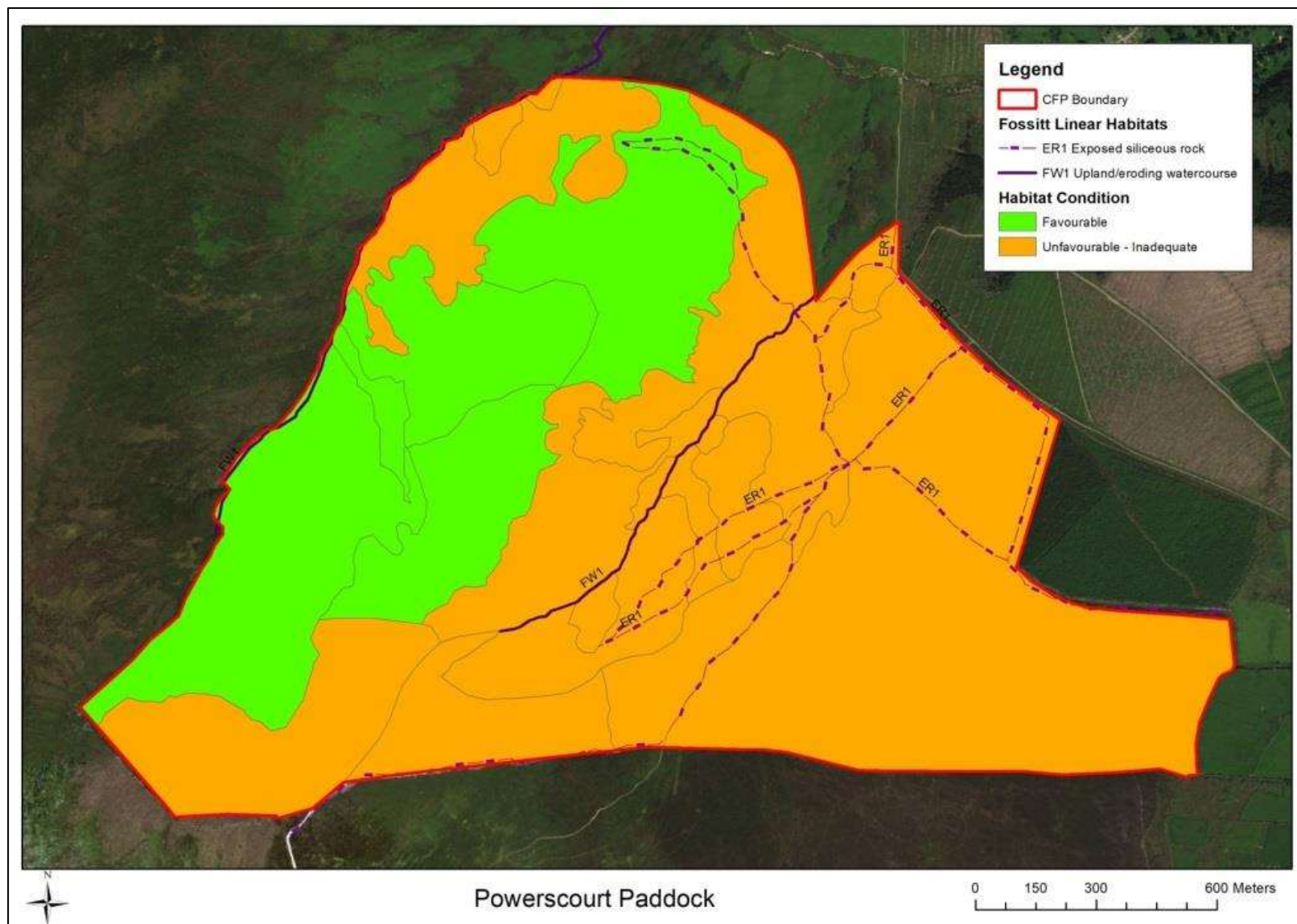


Figure 7. Habitat Condition Assessment for Powerscourt Paddock.

4. Management Recommendations for Powerscourt Paddock

This commonage is farmed by a single landowner but it is important that this commonage is managed in tandem with the Glasnamullen Commonage as sheep and deer move freely between both properties. The management plan prepared for both areas will be developed by the members and will utilise and be informed by the information provided in this report and assessment.

The management prescriptions in the plan need to address the impacts highlighted in this report if progress is to be made towards attaining **Favourable status** for the Annex I habitats present on the site – principally **4010 Northern Atlantic Wet Heaths with *Erica tetralix***, **4030 Dry Heath** and **4060 Alpine and Boreal Heath**. The major impacts to the habitats in this commonage arise predominantly from under grazing (and historical overgrazing on the ridge), lack of movement of sheep across the hill resulting in under-grazing in many areas, lack of burning, vegetation management of dry heath through flailing (which has been successful in some parts but not in others), and recreational access resulting in localised peat erosion.

The Commonage Management Plan drawn up in the early 2000s, found the commonage to generally be in an undamaged condition and recommended a minor destocking rate of 2.88%, however this was not implemented as only areas with a recommended destocking rate of >10% were destocked. In fact sheep numbers on the hill have declined since that time. Despite these historic reductions in sheep numbers the Annex I habitats present (**4060 Alpine and Boreal Heath**, **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** and **4030 Dry Heath**) are generally not currently attaining **Favourable status**.

Best expert judgement would indicate that this is on account of several factors. These include:

- a lack of sheep on the hills grazing the areas of **4030 Dry Heath**,
- a lack of vegetation management by flailing/burning,
- a lack of grazing by sheep at the appropriate time of year, and
- a lack of active management of the grazing whereby those sheep that are on the hill are congregating on one area of the hill and not grazing in others.

This has resulted in large parts of the hill where the habitat **4030 Dry Heath** has become dominated by tall leggy heather with a subsequent loss of species diversity and structure. There has been an attempt to address this through flailing, which has had mixed results. This area was historically managed as part of the Powerscourt Estate for deer stalking, and shooting of grouse. This would have involved the regular burning of ling heather to encourage new growth upon which the birds could feed.

A review of the aerial photographs of the commonage as presented in **Appendix 2** would indicate that the commonage suffered a large uncontrolled burn as can be seen in the OSI imagery from 1995, the remains of which are still evident in the OSI imagery from 2000.

This must have opened the hill up considerably as a large number of tracks (assumed to be created by sheep) can be seen criss crossing the commonage in the OSI imagery from 2005.

The active management of the dry heath for red grouse can be seen in the imagery from 2008 and 2009 and there does not appear to be any significant change in the areas cut between 2009 and 2013 based on the imagery available on Google Earth. In 2016 the flailing of four doughnuts on the commonage as demonstration areas for burning can be clearly seen.

These were examined in 2018. Interestingly it was only the upper side of one of these doughnuts that had recovered well in 2018 following the flailing in 2016. Further investigations of aerial imagery as seen on **Plate 15** below showed that the area that had recovered best was on an area that had been mown/flailed prior to 2016 as indicated by the blue outline. The area to the north which had been previously unmanaged and was then flailed in 2016 resulted in a very dense amount of thatch and

this seems to have had a negative impact on the successful regrowth and regeneration of the dry heath.



Plate 15. Regeneration of flailed dry heath was investigated in doughnuts prepared for a demonstration burning in February 2016. Heath had regenerated successfully in 2018 on the south western side of the doughnut as indicated with the red arrow, with less success on the north eastern side. This would appear to have been driven by the effects of a previous historic cut (outlined in blue).

The natural gathering of sheep in the shelter of the Glen River Valley has resulted in a decline in the areas of **4010 Northern Atlantic Wet Heaths with *Erica tetralix***, through grazing favouring the development of dry acid grassland/wet grassland.

Encroachment of bracken into heath and grassland areas also needs to be managed.

The erosion on the Wicklow Way walking track needs to be urgently addressed as it is further compounding the loss of the habitat **4060 Alpine and Boreal Heath**, which historically may have been damaged through overgrazing.

The deer population in the area is also in need of appropriate management.

4.1 General Management Measures

Information on the principles of the management measures that can be utilised as recommended in the Natural England Upland Management Handbook and other best practice guidance from Scotland, are presented in detail in **Appendix 3**. This guidance has been modified for the Irish situation.

Cutting/flailing

Given that cutting/flailing has been implemented with mixed success at Powerscourt Paddock information from the Natural England Upland Management Handbook is provided in **Appendix 3** to inform same. A number of the recommendations outlined in this should be considered including the removal of cut flailed heather where it is suppressing natural regeneration. The other observation made was that the sheep are at times congregating in the flailed areas (possibly for a number of reasons including their proximity to the enclosed farm fields below, shelter, ease of access, unfavourable grazing condition of other parts of the hill, etc.). This would further reduce the successful regeneration of heather in these areas as new growth is browsed out. Active shepherding of the sheep out of these areas and into other parts of the hill will be required.

Burning

Burning may also be required in Powerscourt Paddock and so information from the Natural England Upland Management Handbook is provided in **Appendix 3** to inform same.

The various parts of the commonage requiring specific management are mapped on **Figure 8** and summarised in **Table 5**.

4.2 Measures for the Annex I Habitat 4060 Dry Heath

Several measures are required. In some areas such as the Glen River valley and along the walking tracks, sheep are habitually congregating, resulting in the loss of Dry Heath habitat in favour of acid grassland. Other areas are completely undergrazed and hence avoided by sheep. It is recognised that this has resulted in areas that are simply inaccessible for sheep and these areas can only be recovered through heather management – either flailing or controlled burning.

There is also a tendency for sheep to gather and graze at the bottom of the commonage near the improved enclosed fields and this alters the local ecology here even further through dunging, trampling, etc. in favour of acid grassland. As noted above they are also congregating in the flailed areas near the bottom of the commonage further browsing out regeneration.

It is recommended that some areas of controlled burning is conducted in those areas where the worst of the tall inaccessible heather is. These areas will then regenerate and encourage the movement of sheep to these areas for grazing. They should be located at some distance from where sheep are currently congregating to encourage this.

Overall **4060 Dry Heath** dominates much of the commonage. In some areas it exists as a pure stand of the habitat (c.134.35 ha) whereas in other areas it forms part of a mosaic with dry acid grassland GS3 (c. 22 ha). As set out above it is recommended that a patchwork of widely scattered, small areas across the commonage (i.e. long narrow strips up to 30 m wide and covering about 0.5-1.0 ha) are burnt. These should be located away from areas that the sheep currently congregate in and away from the watercourses on the commonage.

In the absence of having detailed information on how many years it takes for the heather to reach the desired height on Powerscourt Paddock, we cannot define the average figure for the area to be burnt/flailed each year but using a conservative estimate of ten years an indicative area would be in the order of 13 hectares.

The burning needs to be combined with active shepherding and other measures such as the use of sheep licks to draw animals into certain areas and move them away from those currently favoured.

4.3 Measures for Annex I Habitat 4010 Northern Atlantic Wet Heaths with *Erica tetralix*

Overall **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** accounts for c.20% of the commonage. In some areas it exists as a pure stand of the habitat (c.64.92 ha) whereas in other areas it forms part of a mosaic with wet grassland GS4/dry acid grassland GS3 (c. 16.7 ha). The main challenge for managing the **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** habitat is in protecting those areas currently in good condition by avoiding burning them and by ensuring that they do not become further degraded by sheep congregating in them. This will require active shepherding and moving the animals out of Glen River valley to other areas of the hill as they become more accessible to sheep.

4.4 Measures for the Habitat 4060 Alpine and Boreal Heath

The erosion of peat is a major impact for the habitat **4060 Alpine and Boreal Heath** as this provides the underlying structure on which the habitat relies. The areas of severe erosion such as along the Wicklow Way path will require active restoration measures for this habitat to begin to move towards **Favourable status**.

Some work was done on this in 2006 by Mountain Meitheal volunteers in conjunction with National Parks and Wildlife Service. These measures do not appear to have been terribly successful as evidenced in the photos supplied. The seed mix used would not be that of native upland grass species. Future measures should be discussed with Mountaineering Ireland who may be able to provide some best practice information and advice.

Some measures that could be considered could include temporary fencing and signage to encourage walkers to choose an alternative route, the stabilisation of bare eroded peat with geotextiles or heather brush, the seeding of bare peat with *Sphagnum* propagules and other track repairs. Any temporary fencing erected will need flight diverters to be added to reduce potential collision risk by red grouse which use the commonage.

4.5 Measures for Bracken Control

Consideration should be given to some control of bracken particularly on the slopes of the Glen River and on the southern slopes of the unnamed watercourse where it is beginning to spread into the dry heath habitats on Middle Hill. Information and recommendations for bracken control from the Natural England Upland Management Handbook is provided in **Appendix 3** to inform same.

4.6 Upland Gully Woodland

Consideration could be given to the establishment of upland gully woodland along the Glen River (and in the bracken slopes nearby as recommended above) and the protection of any existing trees along this watercourse. Such woodland would further act as protection measure for water quality within this stream and the River Dargle below as well as adding to the biodiversity of the uplands. Suitable species would include mountain ash (*Sorbus aucuparia*), willows (*Salix cinerea*), holly (*Ilex aquifolium*), birch (*Betula pubescens*) and ultimately oak (*Quercus petraea*), Scot's pine (*Pinus sylvestris*) and aspen (*Populus tremula*). Any trees would require protection from grazing animals including sheep and deer.

4.7 Monitoring

Continued monitoring is required to determine what affect active shepherding of stock on the hill coupled with some limited burning would have bearing in mind that there may be a considerable delay between changes in livestock levels and a response in the vegetation.

4.8 Appropriate Assessment

Once the plan is agreed with the commonage group it will need to be agreed with National Parks and Wildlife and undergo appropriate assessment before being implemented.

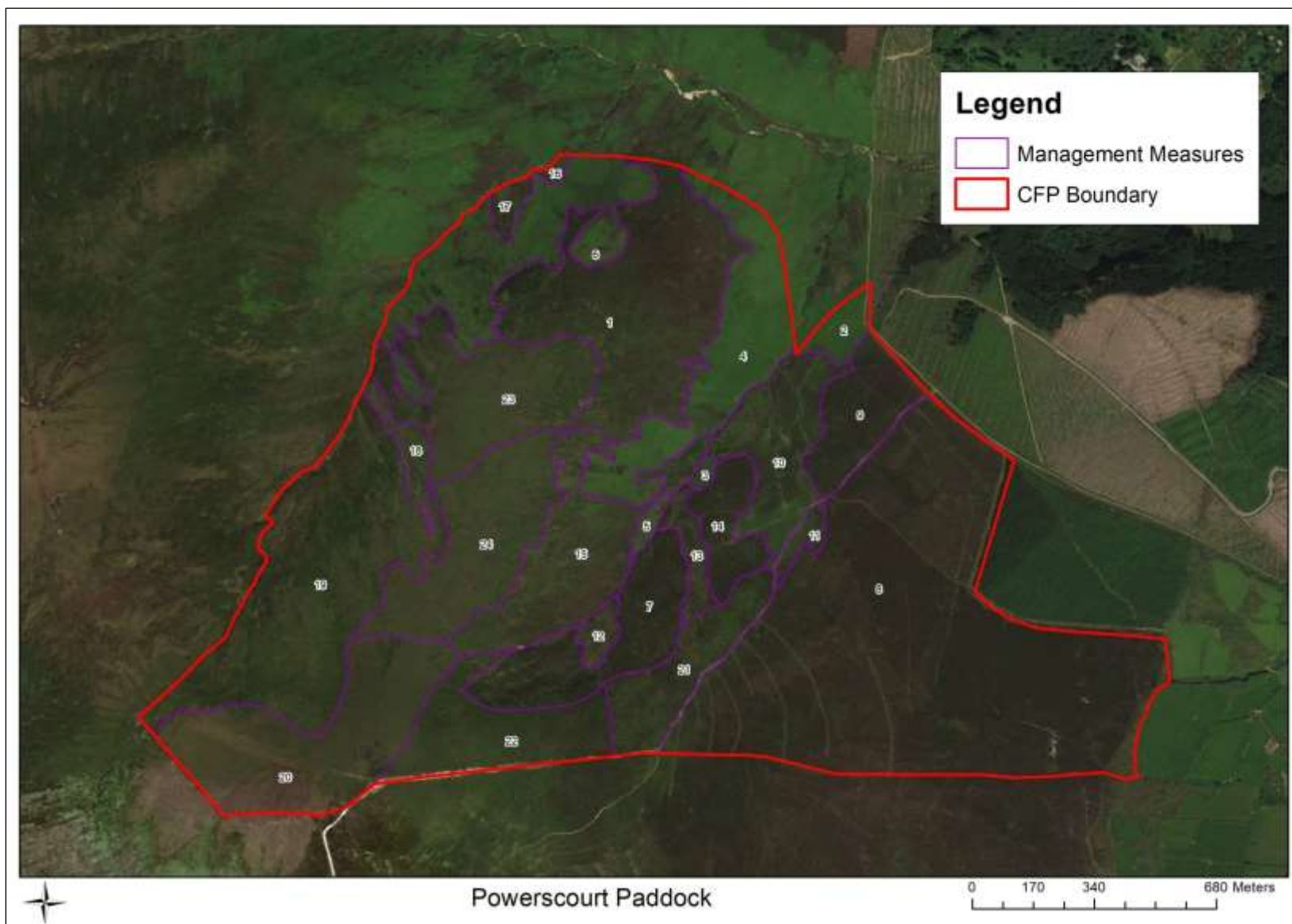


Figure 8. Management measures for Powerscourt Paddock.

Table 5. Habitats present on Powerscourt Paddock and Management Recommendations.

Id	Annex I Code	Annex I Description	Fossitt Code	Habitat	Area (m)	Area (Ha)	Conservation Status	Management Measure
1	4030	Dry Heath	HH1	Dry heath	274984	27.50	Favourable	Ensure no burning Monitor grazing and sheep movements to keep in good condition.
2			HD1	Dense Bracken	22404	2.24	Unfavourable - Inadequate	Bracken Control
3	4030	Dry Heath	HH1	Dry heath	4421	0.44	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
4			HD1	Dense Bracken	156617	15.66	Unfavourable - Inadequate	Bracken Control
5	4030	Dry Heath	HH1	Dry heath	7629	0.76	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
6			HD1	Dense bracken	168820	16.88	Unfavourable - Inadequate	
7	4030	Dry Heath	HH1	Dry heath	118500	11.85	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
8	4030	Dry Heath	HH1	Dry heath	780057	78.01	Unfavourable - Inadequate	Controlled burning of some areas of tall leggy heather further up the slopes away from the bottoms Raking/removal of vegetation from flailed areas where regeneration has failed Trial excluding sheep through fencing from some flailed areas to see what regeneration is like in the absence of grazing (provide flight diverters for grouse on any fencing used) Trial flailing using various methods – working up, down or across the direction of slope Flailing at different heights Flailing with different machines – mulching/shredding as opposed to simply cutting once Controlled burn within previously flailed area
9	4030	Dry Heath	HH1	Dry heath	75370	7.54	Unfavourable - Inadequate	Raking/removal of vegetation from flailed areas where regeneration has failed Trial excluding sheep through fencing from some flailed areas to see what regeneration is like in the absence of grazing (provide flight diverters for grouse on any fencing used)
10	4030		HH1/GS3	Dry heath/Acid grassland Mosaic	108668	10.87	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
11	4030	Dry Heath	HH1	Dry heath	12710	1.27	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
12	4030	Dry Heath	HH1	Dry heath	14557	1.46	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
13	4030		HH1/GS3	Dry heath/Acid grassland Mosaic	25364	2.54	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.

Id	Annex I Code	Annex I Description	Fossitt Code	Habitat	Area (m)	Area (Ha)	Conservation Status	Management Measure
14	4030	Dry Heath	HH1	Dry heath	51253	5.13	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
15	4010	Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH3/GS3	Wet heath/ Acid grassland Mosaic	153800	15.38	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
16	4030	Dry Heath	HH1	Dry heath	3972	0.40	Unfavourable - Inadequate	Monitor bracken and control as required.
17	4010	Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH3/GS3	Wet heath/ Acid grassland Mosaic	13116	1.31	Unfavourable - Inadequate	Monitor bracken and control as required.
18			PF2	Poor fen and flush	23319	2.33	Favourable	Monitor sheep movements and ensure area remains in good condition
19	4010	Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH3	Wet heath	323042	32.30	Favourable	Ensure no burning Monitor grazing and sheep movements to keep in good condition.
20	4060	Alpine and Boreal Heath	HH4	Montane heath	211035	21.10	Unfavourable - Inadequate	Monitor erosion along the walking track and remediate.
21	4030		HH1/GS3	Dry heath/ Acid grassland Mosaic	86773	8.68	Unfavourable - Inadequate	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate. Monitor erosion along the walking track.
22	4060	Alpine and Boreal Heath	HH4	Montane heath	117239	11.72	Unfavourable - Inadequate	Monitor erosion along the walking track and remediate.
23	4010	Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH3	Wet heath	166822	16.68	Favourable	Ensure no burning Monitor grazing and sheep movements to keep in good condition.
24	4010	Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH3	Wet heath	159313	15.93	Favourable	Ensure no burning Monitor grazing and sheep movements to keep in good condition.

5. Appendix12. Historic Imagery of the Powerscourt Paddock Commonage



Plate 1. OSI Aerial photography 1995. The rough extent of the burn is indicated in red.



Plate 2. OSI Aerial photography 2000. The rough extent of the burn is indicated in red.

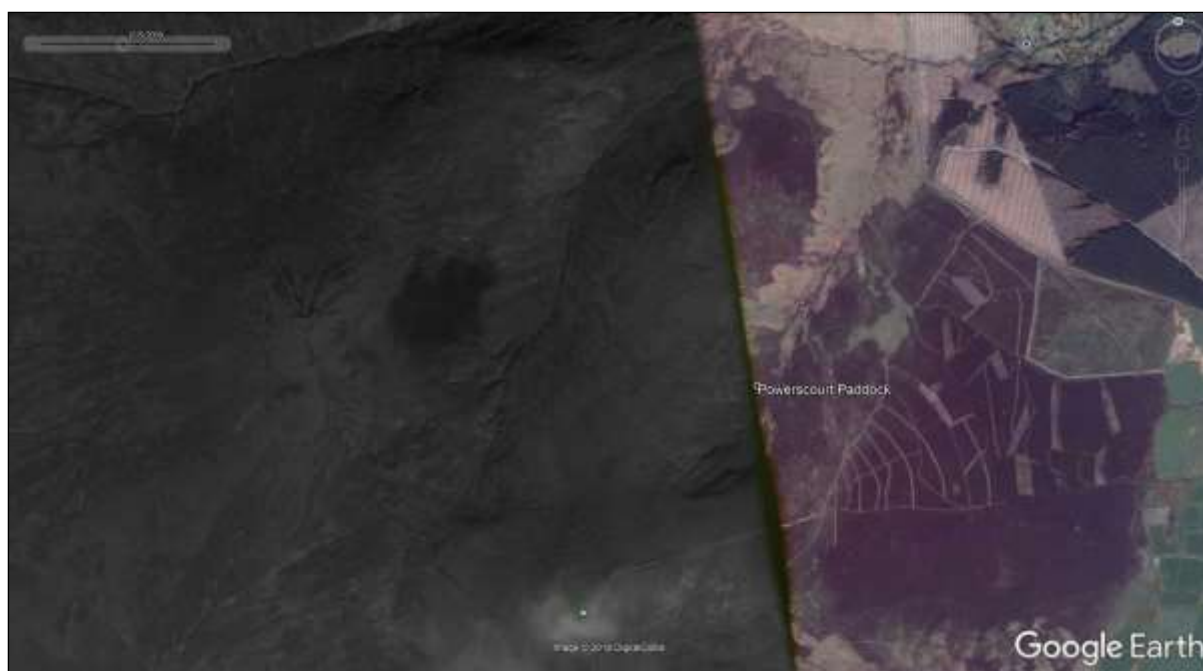


Plate 5. October 2009 (Source: Google Image). (No significant changes are evident).



Plate 6. May 2013 (Source: Google Image). (No significant changes are evident).



Plate 7. July 2013 (Source: Google Image). (No significant changes are evident, but the extent of bracken is clearly visible along the Glen River).



Plate 8. April 2015 (Source: Google Image). Previous cutting is becoming less apparent.

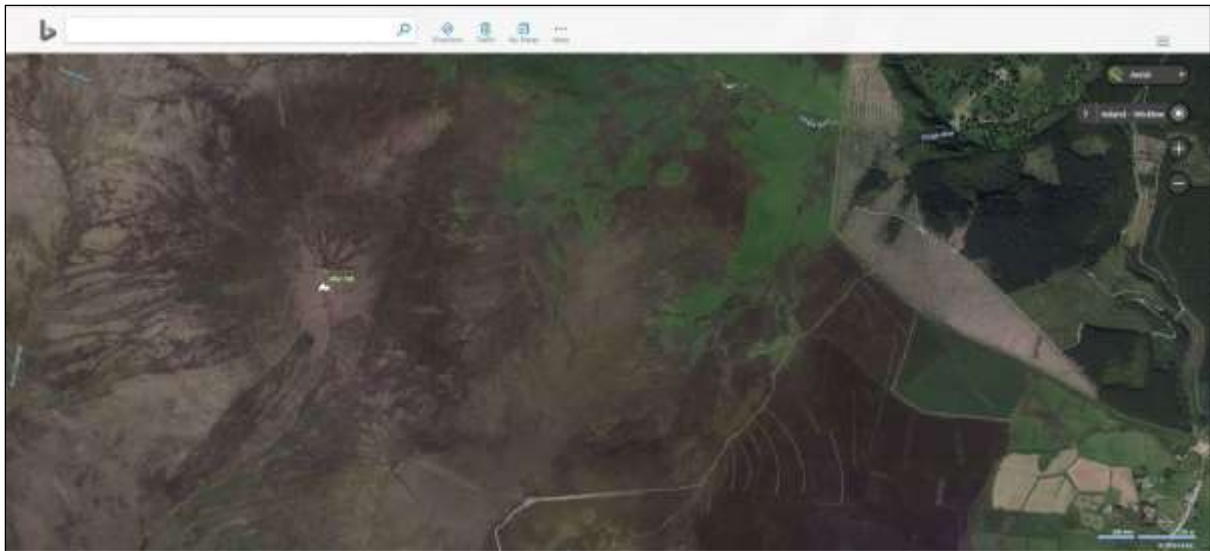


Plate 9. Bing Imagery (Undated).

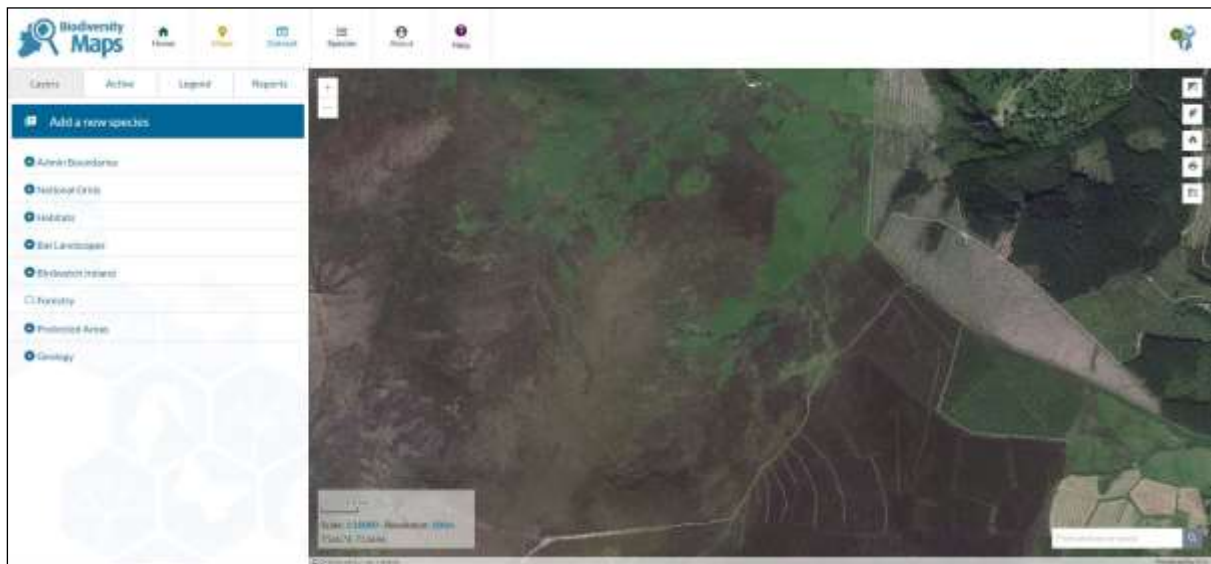


Plate 10. National Biodiversity Data Centre (Undated – looks like Bing Imagery).



Plate 11. June 2016 (Source: Google Image). The doughnuts prepared for a burning demonstration in 2016 and the access track to same can be easily seen.



Plate 12. July 2016 (Source: Google Image). The doughnuts prepared for a burning demonstration in 2016 and the access track to same can be easily seen.



Plate 13. January 2017. The recently flailed areas created by Brian Merrigan are clearly visible.