

Ecological Baseline Survey
prepared for
Corrasillagh Commonage
as part of the Commonage Management Plan for SUAS



Final Report

5th September 2019

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1. Introduction

This very large commonage (370ha) extends from an elevation of 140m in the Glenmalure Valley rising to the shoulder of Lugnaquilla at 810m. The commonage also includes the ridges and summit of Cloghernagh (800m) on its northern boundary, the shoulder of Lugnaquilla at the top of the valley at 810m, and the ridge between here and the summit of Corrigasleggaun at 794m on the southern side of the commonage as shown on **Figure 1** below. The townland boundary (which the commonage boundary follows) includes half of Kelly's Lough while the other half of the Lough is included in the boundary of the Wicklow Mountains National Park. The traditional access to Lugnaquilla from the Glenmalure Valley is via the 'Zig Zags' which is a track which was used to access to the mountains for hunting by the Parnell Estate. The route up the Zig Zags begins at the base of the commonage on the Dunne family farm beside the Carrawaystick Stream and crosses through the commonage.

The commonage is bounded to the south by Coillte conifer plantations on the slopes of Carrawaystick Mountain and Lobawn. The ridge and summit of Cloghernagh (800m) forms the northern boundary, and open mountain side is found to the west towards the summit of Lugnaquilla. The eastern boundary of the commonage are the enclosed fields of the Dunne farm at Corrasillagh.

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.

The Carrawaystick Stream or Kelly's Brook rises within the commonage and Lough Brook flows from Kelly's Lough to join this watercourse within the boundaries of the commonage. The stream then falls as the spectacular Carrawaystick Waterfall over the hanging valley of Glenmalure before joining the Avonbeg River, which is a tributary of the Avoca River.

The commonage is predominantly underlain by Caledonian granite and granodiorite, although a band of Ordovician dark blue-grey slate, phyllite & schist associated with the Maulin Formation occurs on the slopes of Cloghernagh Mountain.

The soils of the slopes of the commonage are described as the Carrigvahanagh association and consist of peat over lithoskeletal acid igneous rock, while the upper portions of the commonage near the ridge and summits is covered in blanket peats of varying depths.

The commonage is owned by the Dunne family and is currently grazed by 3 members of the Dunne family.

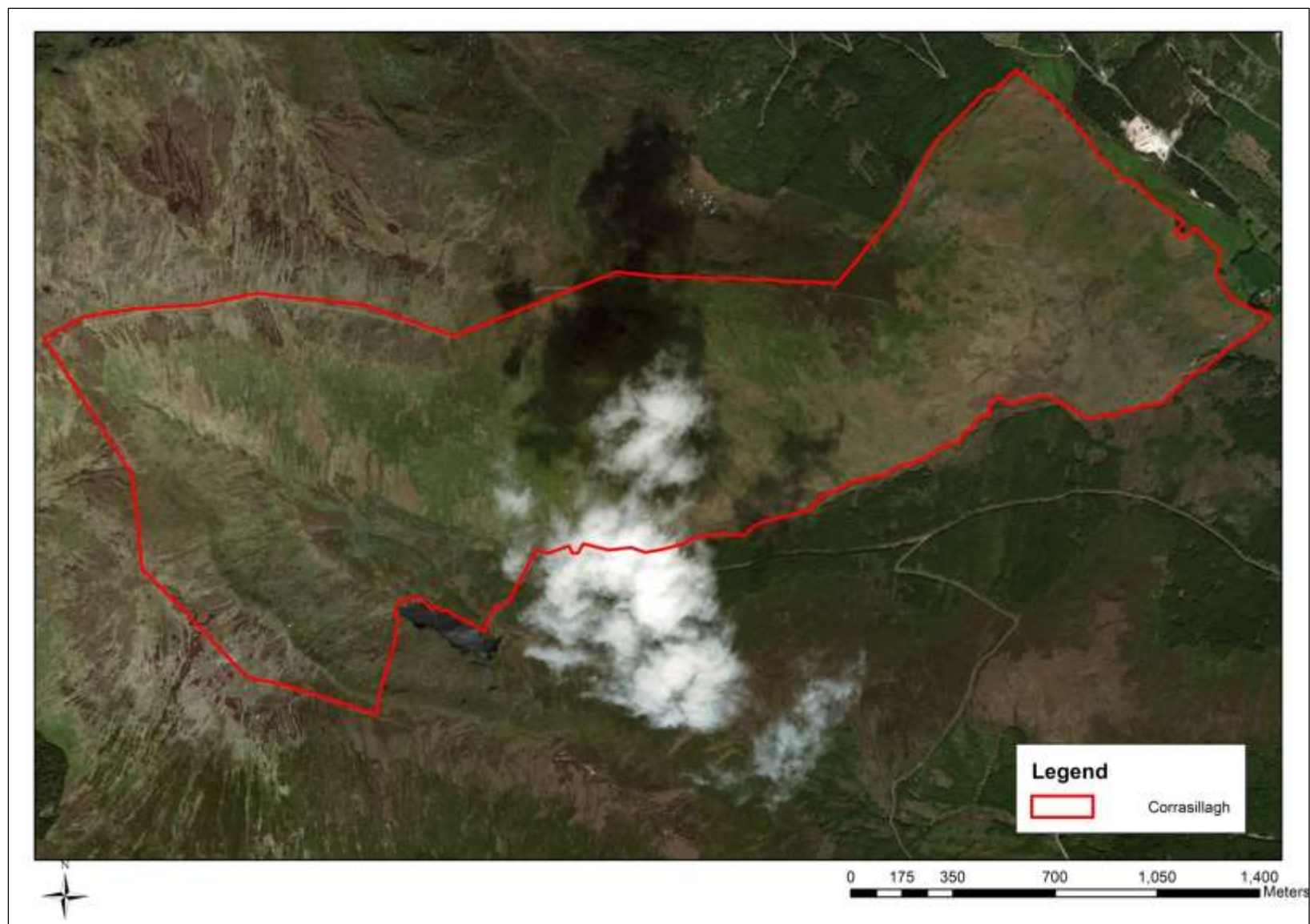


Figure 1. Corrasillagh Commonage.

This commonage was assessed as part of the joint NPWS/Department of Agriculture commonage framework plans, which were drawn up in the early 2000s as shown on the map from that survey in **Figure 2** below. The commonage was divided into two areas:

- WI7d – this area included all the lands above (and west of) the fenceline, which is still extant at the top of the zig zags.
- WI7g – this area included all the enclosed lands east and downslope of the fenceline which is still extant at the top of the zig zags.

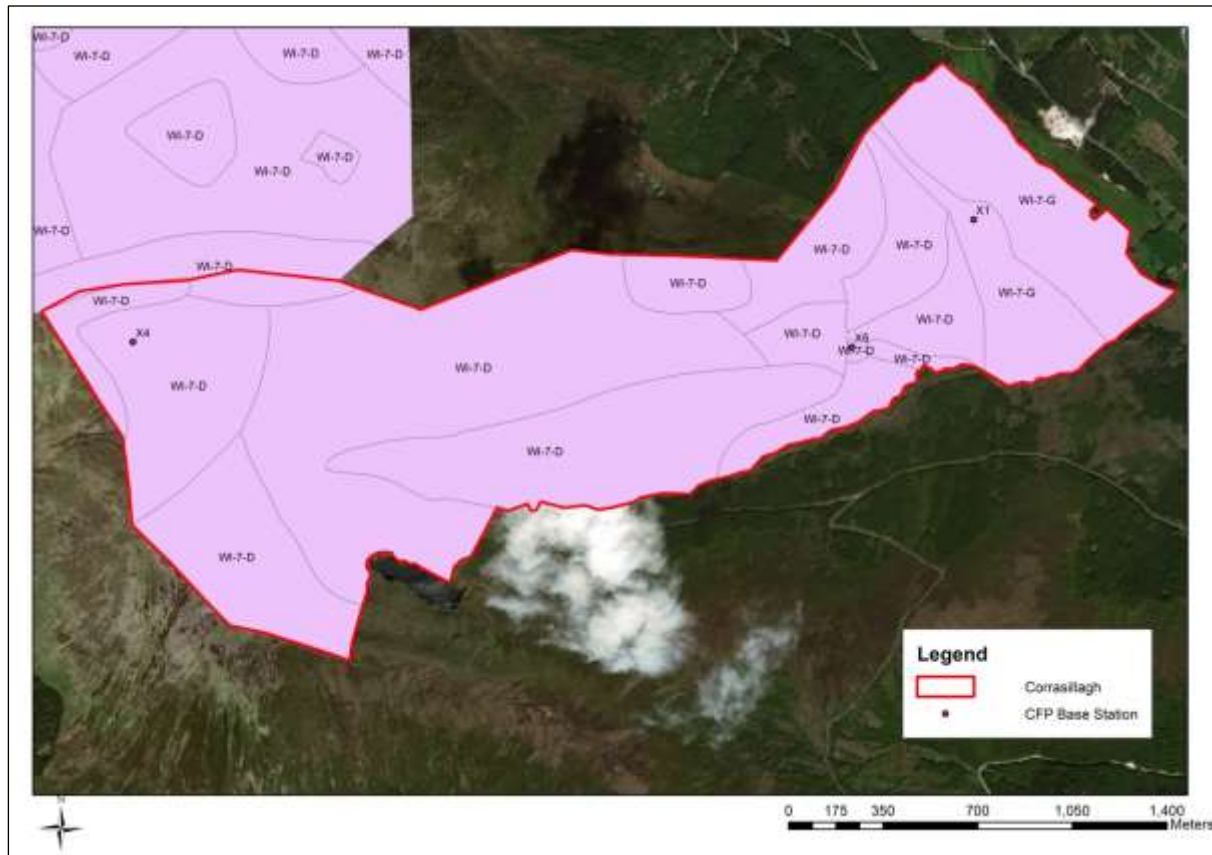


Figure 2. Commonage Framework Plan Map.

The habitats were roughly classified in the commonage framework plan as blanket bog, wet heath, dry heath, upland acid grassland, bare rock and scree, dense bracken, lake or a mosaic of each as shown on **Figure 3** below. The plateau, sheet and gully erosion on the summits and ridges was noted at that time.

This assessment identified that the commonage was generally undamaged with some localised damage as can be seen on **Figure 4** below.

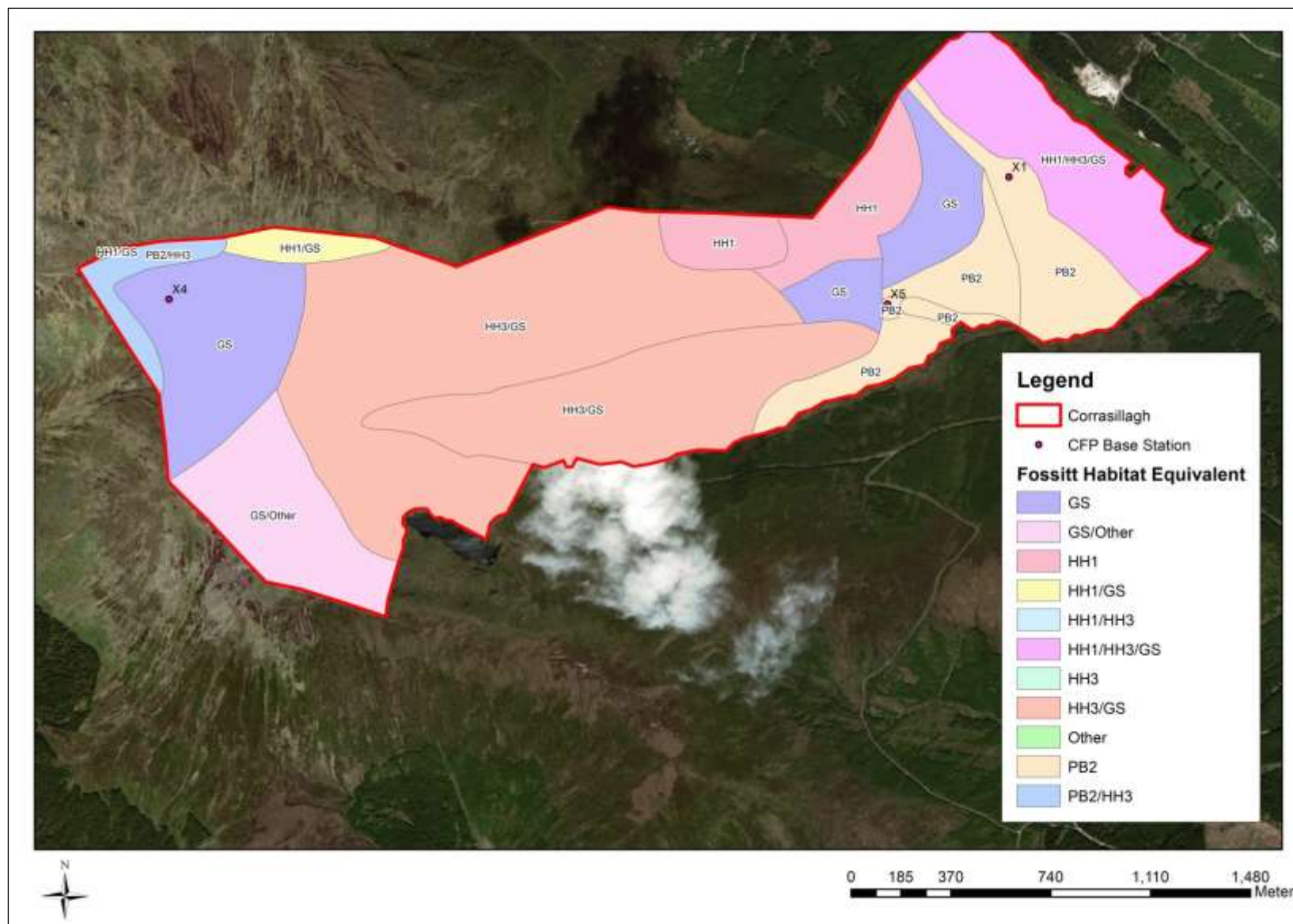


Figure 3. Commonage Framework Plan Habitat Map showing monitoring locations in each area.

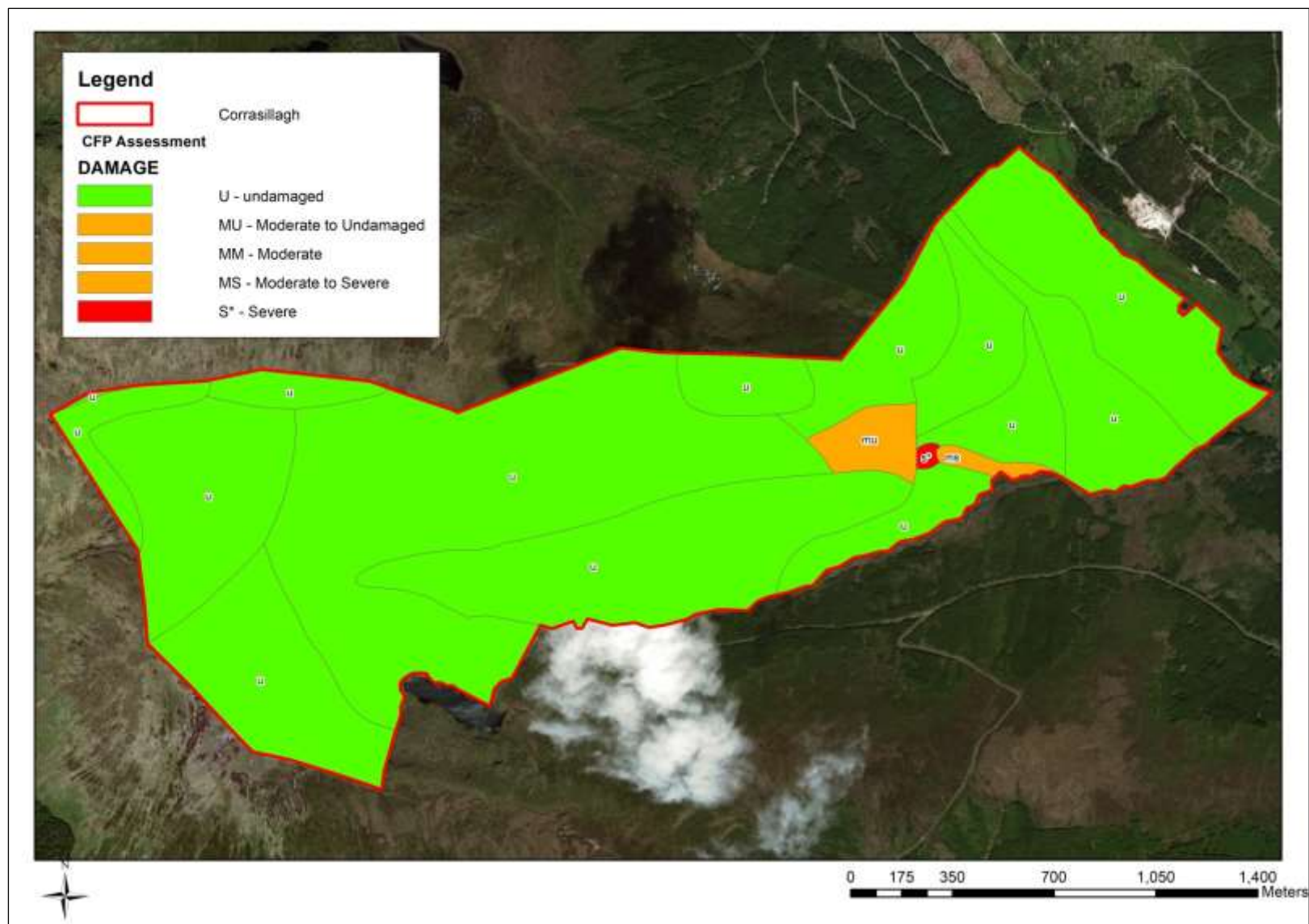


Figure 4. Commonage Framework Habitat Condition Assessment 2001.

2. Receiving Environment - 2019

2.1 Habitats Present

Under Fossitt's (2000) habitat classification scheme the dominant habitat within much of the Corrasillagh commonage is that of **Dry Heath HH1**, which in many locations forms a mosaic with either outcropping **Exposed Siliceous Rocks ER1** or **Dry Humid Acid Grassland GS3**. The balance between heath and grassland habitat is driven by grazing pressure on this commonage (there has been very few documented burns in recent decades). The summits and ridge between Cloghernagh Mountain, towards Lugnaquilla and in the vicinity of Kelly's Lough support areas of **Upland Blanket Bog PB2** and **Montane Heath HH4**. Areas of this habitat on the ridge are eroding and are mapped and described as **Eroding Blanket Bog PB5**. Along the Carrawaystick Stream are some areas of **Wet Heath HH3** and **Poor Fen and Flush PF2** while the peats in the valley bog at the top of Carrawaystick Waterfall may have been cut for turf in former years and are now best described as **Wet Heath HH3**. The slopes of the Glenmalure Valley either side of the Zig Zags are dominated by **Dense Bracken HD1** which overshadows the **Dry Acid Grassland GS3** and **Exposed Siliceous Rocks ER1** beneath.



Plate 1. Dry Humid Acid Grassland GS3 and scree slopes of Exposed Siliceous Rock ER1 becoming invaded by Dense Bracken HD1 on the slopes of the Glenmalure Valley. Sitka spruce is beginning to invade this area.

Either side of the Zig Zags the steep grassy slopes have numerous outcropping rocks and scree which have been invaded by **Bracken HD1** forming dense stands in some places. Between the **Exposed Siliceous Rock ER1** and scree are patches of heavily browsed **Dry Heath HH1**. The **Acid Grassland GS3** is dominated by Common Bent (*Agrostis canina*) and Sweet Vernal Grass (*Anthoxanthum odoratum*), Sheep's Fescue (*Festuca ovina*), Red Fescue (*Festuca rubra*), occasional Sheep's Sorrel (*Rumex acetosella*), Tormentil (*Potentilla erecta*), Common Cow-wheat (*Melampyrum pratense*)*, Wood Sorrell (*Oxalis acetosella*)*, Common Dog-violet (*Viola riviniana*)*, Foxglove (*Digitalis purpurea*)*, Heath

Bedstraw (*Galium saxatile*), Mat grass (*Nardus stricta*), Hard Fern (*Blechnum spicant*)*, and Broad Buckler-fern (*Dryopteris dilatata*). Several of these species (indicated by the asterisk) are indicative of former woodland extent. Scattered across the slopes are occasional Mountain Ash (*Sorbus aucuparia*), Hawthorn (*Crataegus monogyna*) and self-seeded Sitka Spruce (*Picea sitchensis*). Between scree and outcropping rocks are heavily browsed Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Hard Fern (*Blechnum spicant*) and Tormential (*Potentilla erecta*).

Along these slopes are a series of **flushes PF2** from which localised springs rise. These are dominated by Purple Moor-grass (*Molinia caerulea*), with the rushes (*Juncus effusus* and *Juncus articulatus*), Star Sedge (*Carex echinata*), Marsh Bedstraw (*Galium palustre*), Mat grass (*Nardus stricta*), Heath Rush (*Juncus squarrosus*), Deergrass (*Trichophorum cespitosum*) and the moss *Polytrichum commune*.

There is **Exposed Rock ER1** either side of the Carrawaystick Waterfall and exposed rock and disturbed soil mark the new course the river took following landslides on the cliffs above Kelly's Lough in September 2010 following torrential rains. This event caused extensive damage and flooding of a house, farmland and properties downstream. There are remnants of woodland in the form of isolated trees on the rocks beside the waterfall where the trees have escaped browsing pressure. This event is documented in the Geological Survey of Ireland landslide register as shown on **Figure 5** below and was also reported on various online forums.

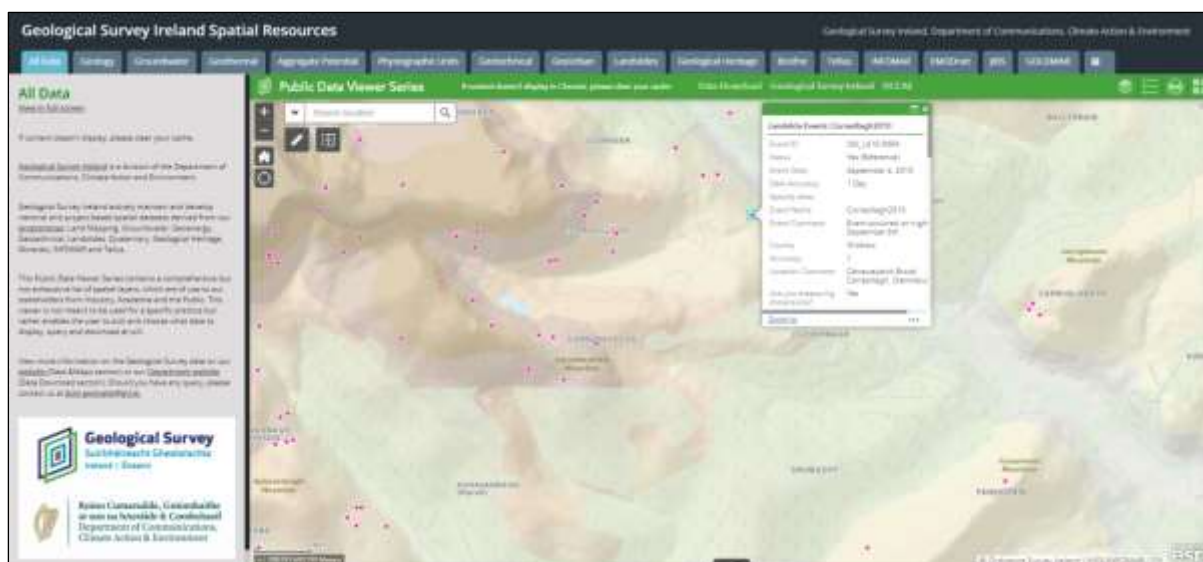
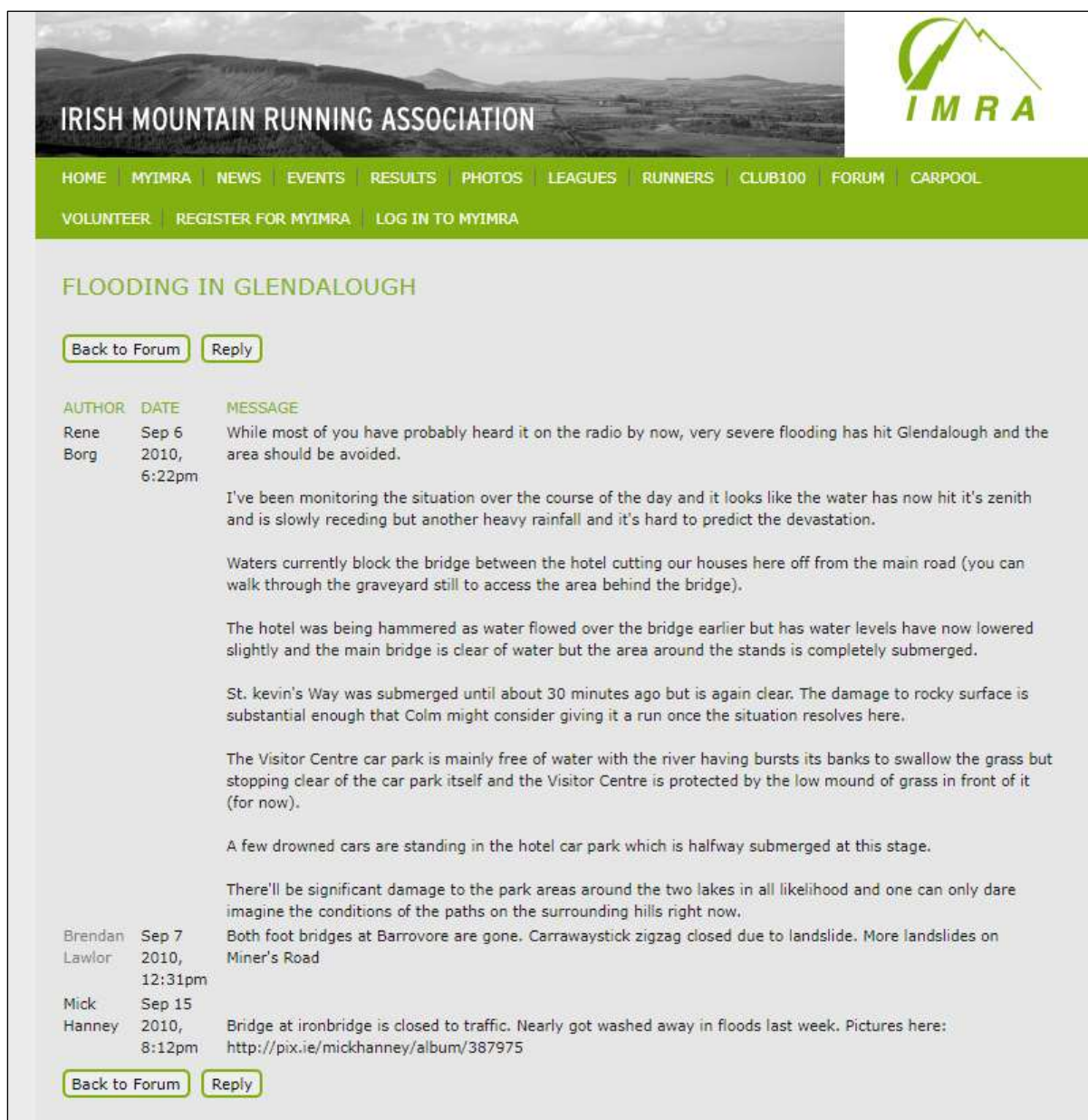


Figure 5. Landslide at Carrawaystick Waterfall – September 2010.

Above the 350m contour the slope declines and the shoulder of the hill here supports **Wet Heath HH3** dominated by Purple Moor-grass (*Molinia caerulea*) - which often forms dense tussocks for much of the area in the valley floor between the walking track to Cloghernagh and the river. Other species include; Deergrass (*Trichophorum cespitosum*), Heath Rush (*Juncus squarrosus*), and Soft Rush (*Juncus effusus*), while heavily browsed Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Tormential (*Potentilla erecta*) and Cross-leaved Heath (*Erica tetralix*) are restricted to the surface of the tussocks in many places. This area is also well used by deer and is overgrazed as a result.

The shoulder of Cloghernagh is known locally as Corrig na Greine and here **Dry Heath HH1** of Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*) and Bell Heather (*Erica cinerea*) is found between frequent outcropping rocky boulder and on shallow peats. The lower slopes are becoming encroached by **Bracken HD1**. A number of extant Mountain Ash (*Sorbus aucuparia*) are present in the shelter of this knoll. The track here is much eroded in parts and there are signs asking people to help prevent further erosion by staying on the trail.



The screenshot shows the IMRA website with a forum post about flooding in Glendalough. The header includes the IMRA logo and navigation links. The forum post is titled 'FLOODING IN GLENDALOUGH' and has two replies. The first reply is by Rene Borg on Sep 6, 2010, at 6:22pm. The second reply is by Brendan Lawlor on Sep 7, 2010, at 12:31pm. The third reply is by Mick Hanney on Sep 15, 2010, at 8:12pm.

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FLOODING IN GLENDALOUGH

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AUTHOR	DATE	MESSAGE
Rene Borg	Sep 6 2010, 6:22pm	<p>While most of you have probably heard it on the radio by now, very severe flooding has hit Glendalough and the area should be avoided.</p> <p>I've been monitoring the situation over the course of the day and it looks like the water has now hit it's zenith and is slowly receding but another heavy rainfall and it's hard to predict the devastation.</p> <p>Waters currently block the bridge between the hotel cutting our houses here off from the main road (you can walk through the graveyard still to access the area behind the bridge).</p> <p>The hotel was being hammered as water flowed over the bridge earlier but has water levels have now lowered slightly and the main bridge is clear of water but the area around the stands is completely submerged.</p> <p>St. Kevin's Way was submerged until about 30 minutes ago but is again clear. The damage to rocky surface is substantial enough that Colm might consider giving it a run once the situation resolves here.</p> <p>The Visitor Centre car park is mainly free of water with the river having bursts its banks to swallow the grass but stopping clear of the car park itself and the Visitor Centre is protected by the low mound of grass in front of it (for now).</p> <p>A few drowned cars are standing in the hotel car park which is halfway submerged at this stage.</p> <p>There'll be significant damage to the park areas around the two lakes in all likelihood and one can only dare imagine the conditions of the paths on the surrounding hills right now.</p>
Brendan Lawlor	Sep 7 2010, 12:31pm	<p>Both foot bridges at Barrovore are gone. Carrawaystick zigzag closed due to landslide. More landslides on Miner's Road</p>
Mick Hanney	Sep 15 2010, 8:12pm	<p>Bridge at ironbridge is closed to traffic. Nearly got washed away in floods last week. Pictures here: http://pix.ie/mickhanney/album/387975</p>

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Plate 2. Record of Flooding in September 2010.

In general the dry heath on the ridge to Cloghernagh was in good condition and all the monitoring stops here passed. There is evidence of a historic burn here which occurred in XXX but the burn must not have been very intense as the vegetation has now recovered. A review of the aerial photography from 2000 for this area shows the extent of the burn as can be seen on **Figure 6** below. The sward here is low growing and uniform and composed of Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Hare's tail cottongrass (*Eriophorum vaginatum*), Deergrass (*Trichophorum cespitosum*) and Green-ribbed Sedge (*Carex binervis*) with good moss cover. Elsewhere occurring sparsely within this habitat are Mat-grass (*Nardus stricta*), Wavy Hair-grass (*Deschampsia flexuosa*), Heath Bedstraw (*Galium saxatile*), Sheep's Fescue (*Festuca ovina*), and Sweet Vernal Grass (*Anthoxanthum odoratum*).

In the vicinity of Kelly's Lake **Dry Heath HH1** is found in mosaic with **Acid Grassland GS3** and **Exposed Rocks ER1**. Species recorded from the grassland here include; Viviparous Sheep's-fescue (*Festuca vivipara*), Common Bent (*Agrostis canina*), Sweet Vernal Grass (*Anthoxanthum odoratum*), Sheep's Fescue (*Festuca ovina*), Red Fescue (*Festuca rubra*), Mat-grass (*Nardus stricta*), Wavy Hair-grass (*Deschampsia flexuosa*), Heath Bedstraw (*Galium saxatile*), occasional Sheep's Sorrel (*Rumex acetosella*), Tormentil (*Potentilla erecta*), Deergrass (*Trichophorum cespitosum*), Heath Rush (*Juncus squarrosus*), and

Soft Rush (*Juncus effusus*), while heavily browsed Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*) and Bell Heather (*Erica cinerea*) are present.

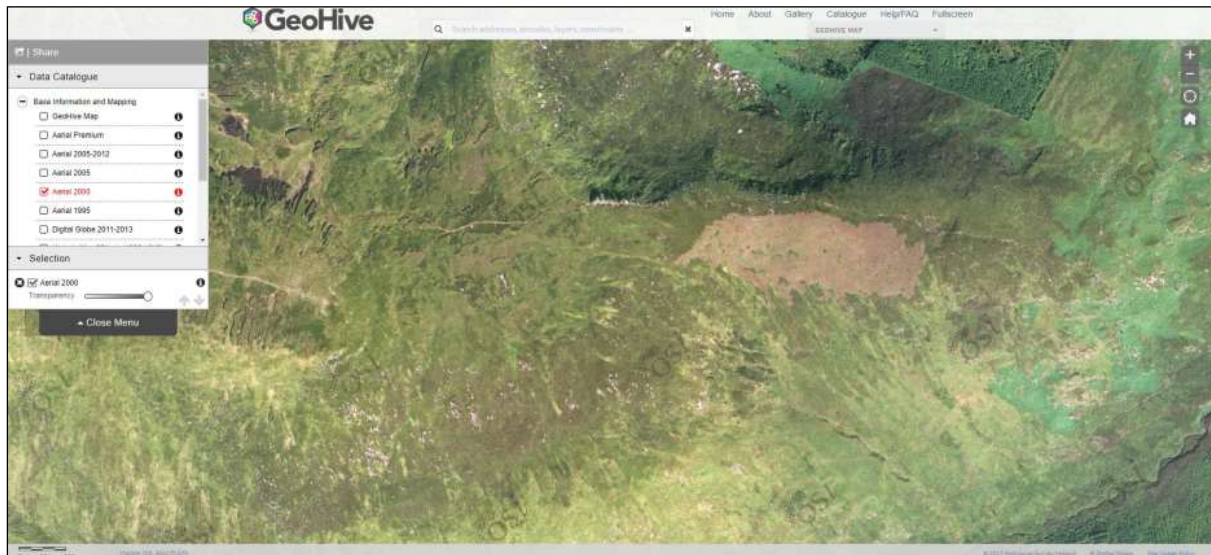


Figure 6. OSI 2000 aerial imagery showing extent of burn on Cloghernagh ridge.



Plate 3. Wet Heath HH3 on the valley floor between the walking track to Cloghernagh and the river.



Plate 4. Bracken invading areas of Dry Grassland and Dry Heath on Corrig Na Greine.



Plate 5. Track erosion on Corrig Na Greine.

The **Dry Heath HH1** on the lower slopes of the moraine and on the upper slopes of Cloghernagh Mountain amidst outcropping rocks were in better condition and less browsed than other parts of the commonage. This may be because stock has to watch their footing moving through the rougher ground and spend less time with their heads down browsing.

Pockets of **Upland Blanket Bog PB2** are found adjoining Kelly's Lough, on the slopes to the east and in the valley to the west and towards the river. There has been recent damage by quads in this area and some areas of very disturbed bare peat. Species recorded from the bog here include; Purple Moor-grass (*Molinia caerulea*), Crowberry (*Empetrum nigrum*), Cross-leaved Heath (*Erica tetralix*), Bilberry (*Vaccinium myrtillus*), Ling heather (*Calluna vulgaris*), Common cottongrass (*Eriophorum angustifolium*), Hare's tail cottongrass (*Eriophorum vaginatum*), Deergrass (*Trichophorum cespitosum*), Tormentil (*Potentilla erecta*), Star Sedge (*Carex echinata*), Bog Asphodel (*Narthecium ossifragum*), Lousewort (*Pedicularis sylvatica*), and in shallow pool's/lawns; Round-leaved Sundew (*Drosera rotundifolia*) and the bog mosses *Sphagnum capillifolium*, *Sphagnum papillosum* and *Sphagnum subnitens*.

An area of **Poor Fen and Flush PF2** is found at the foot of the cliffs by the lake. This area is dominated by Soft Rush (*Juncus effusus*), Jointed Rush (*Juncus articulatus*), Marsh Violet (*Viola palustris*), Bog Asphodel (*Narthecium ossifragum*), Marsh Pennywort (*Hydrocotyle vulgaris*), Marsh Thistle (*Cirsium palustre*), Sweet Vernal Grass (*Anthoxanthum odoratum*), Sheep's Sorrel (*Rumex acetosella*), Viviparous Sheep's-fescue (*Festuca vivipara*), Lesser Spearwort (*Ranunculus flammula*), Heath Rush (*Juncus squarrosus*) and the sedges ; Common sedge (*Carex nigra*), Star Sedge (*Carex echinata*), and Glaucous sedge (*Carex flacca*). Mat-grass (*Nardus stricta*) was found at the margins.

Areas of **Dry Heath HH1** at the base of the cliffs and surrounding the lake was generally in good condition but on the sheltered steep slopes above is heavily browsed and mostly restricted to those areas near outcropping rocks or out of reach of browsing animals above exposed crags. As a result these steep slopes are becoming dominated by species poor acid grassland which is heavily browsed (animals seem to favour these sheltered slopes) and there have been numerous landslips and landslides some of which have been very significant. Dominant species here include; Deergrass (*Trichophorum cespitosum*), with frequent Mat-grass (*Nardus stricta*), occasional Common Bent (*Agrostis canina*), Sheep's Fescue (*Festuca ovina*), Red Fescue (*Festuca rubra*), Wavy Hair-grass (*Deschampsia flexuosa*), Heath Bedstraw (*Galium saxatile*), Tormentil (*Potentilla erecta*), Star Sedge (*Carex echinata*), and Glaucous sedge (*Carex flacca*) with heavily browsed Bilberry (*Vaccinium myrtillus*) and Ling heather (*Calluna vulgaris*).

On **Siliceous Rocky Outcrops ER2**, which are north or north east facing, on the cliffs below Corrigasleggaun, and where localised hydrological conditions allow small seeps and mineral enrichment there are pockets of the Annex I habitat **8220 Siliceous Rocky Slope**. Species recorded here include; Starry Saxifrage (*Saxifraga stellaris*), which is an Arctic-alpine species of saxifrage with Pale Butterwort (*Pinguicula lusitanica*), Large flowered Butterwort (*Pinguicula grandiflora*) and the mosses *Sphagnum denticulatum*, *Sphagnum palustre*, *Sphagnum capillifolium* ssp. *rubellum*, *Dicranella palustris* and *Philonotis fontana* (which are all species of acidic springs/flushes). A monitoring stop conducted in this habitat failed. On exposed rocks surrounding these areas of seepage and out of browsing reach were Fir Clubmoss (*Huperzia selago*), Hard fern (*Blechnum spicant*), Woolly Hair Moss (*Racomitrium lanuginosum*), Polytrichum commune, Heath Bedstraw (*Galium saxatile*), Tormentil (*Potentilla erecta*), Bilberry (*Vaccinium myrtillus*), Bell Heather (*Erica cinerea*) and Ling Heather (*Calluna vulgaris*).

The ridge of Corrigasleggaun is dominated by **Upland Blanket Bog PB2**, which corresponds to the habitat **7130 Blanket Bog** as listed under Annex I of the EU Habitats Directive. In many locations this is eroding with large peat hags of **Eroded Blanket Bog PB5**. Some of the erosion here may have been exacerbated by historic peat cutting as parallel lines of old cutting could be seen in some locations which are unlikely to be natural.

Areas of shallow peats support **Montane Heath HH4**, which corresponds to the habitat **4060 Alpine and Boreal Heaths** as listed under Annex I of the EU Habitats Directive.



Plate 6. Old burn on Cloghernagh Ridge.



Plate 7. Unburnt areas near Loglassiebwee/Bollymeen Rock (where the Leolassier Stream rises).



Plate 8. Dry heath on the moraine and blanket bog in the hollows near Kelly's Lough.



Plate 9. Quad damage. Quads had travelled from here to the summit of Lugnaquilla.



Plate 10. Areas of disturbed peat colonised by rushes near Kelly's Lough.



Plate 11. Blanket bog at the base of the cliffs – damaged by recent landslides.



Plate 12. Siliceous Rocky Slope habitat as listed under Annex I of the EU Habitats Directive.



Plate 13. Starry Saxifrage (*Saxifraga stellaris*).



Plate 14. Closely browsed heath and grassland on the cliffs – see peat areas from landslides below that have revegetated with rushes.



Plate 15. Landslide on the cliffs - see large areas of disturbed and revegetated peat at the base (red arrows).



Plate 16. Eroding Blanket Bog on the crest of the ridge above the landslide.



Plate 17. Eroding Blanket Bog above the 2010 landslide.

Blanket Bog PB2 habitat was dominated by Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common cottongrass (*Eriophorum angustifolium*), Hare's tail cottongrass (*Eriophorum vaginatum*), Deergrass (*Trichophorum cespitosum*), Wavy Hair-grass (*Deschampsia flexuosa*), Crowberry (*Empetrum nigrum*), Purple Moor-grass (*Molinia caerulea*), Heath Rush (*Juncus squarrosus*), Tormential (*Potentilla erecta*), and the bog mosses *Sphagnum capillifolium*, *Sphagnum papillosum* and *Sphagnum subnitens*. Monitoring stops conducted within this Annex I habitat failed on account of grazing pressure.

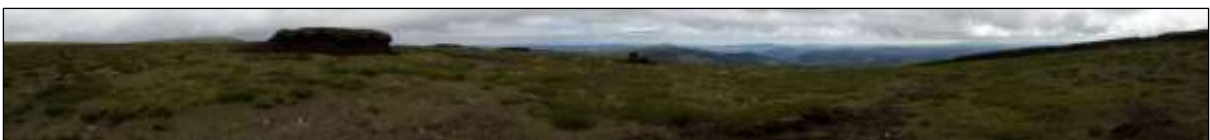


Plate 18. Alpine and Boreal heath containing *Diphasiastrum alpinum*, *Festuca ovina*, *Calluna vulgaris* and *Racomitrium lanuginosum* on the Corrigasleggaun Ridge.

Areas of **Montane Heath HH4**, which were intact are often grassy with Sheep's Fescue (*Festuca ovina*), Velvet Bent (*Agrostis canina*), Common Bent (*Agrostis capillaris*) and Common cottongrass (*Eriophorum angustifolium*), amidst Crowberry (*Empetrum nigrum*), Bilberry (*Vaccinium myrtillus*), Ling heather (*Calluna vulgaris*), and the mosses *Racomitrium lanuginosum* and *Polytrichum commune*.



Plate 19. Blanket bog and eroding blanket bog on the Corrigasleggaun Ridge.

Areas of this habitat were found on the Cloghernagh Ridge and the Corrigasleggaun Ridge. These areas support good populations of clubmosses including Alpine Clubmoss (*Diphasiastrum alpinum*), Fir Clubmoss (*Huperzia selago*) and Stag's-horn Clubmoss (*Lycopodium clavatum*). Monitoring stops conducted within this Annex I habitat failed on account of grazing pressure. There are some localised areas of disturbed and bare peats in this habitat and the habitat is subject to trampling pressure from walkers.

These clubmosses were previously recorded by the botanist Frank Winder in 2001 as follows:
From the ...

'high ridge that links Cloghernagh with the summit of Lugnaquilla, which is taken by walkers ascending Lug from any point on the Glenmalure side. This ridge has lost all of its peat cover and has a thin covering of moss and grass with some rushes and *Galium saxatile*. There is a well-defined track along its top. All along the north side of this ridge, which slopes down into the Baravore Valley, there are numerous patches of *Diphasiastrum alpinum*, many of them extensive. In addition, just west of the summit of Cloghernagh and just feet from the track, there is at least one patch of the even rarer *Lycopodium clavatum*. All along these slopes there is the commoner *Huperzia selago*, so that

there is the very unusual situation that one can see these three lycopodia close together. Erosion of the peat cover, which one sometimes deplores, seems to suit the lycopodia’.

Dry Acid Grassland GS3 is found on the steep slopes at the head of the commonage below the confluence of the Corrigasleggaun ridge and the Cloghernagh – Lugnaquilla ridge. This grassland was examined in order to see if it corresponds to the priority habitat **6230 Species-rich *Nardus* grassland** as listed under Annex of the EU Habitats Directive.

Species recorded here include Sheep’s Fescue (*Festuca ovina*), Sweet vernal-grass (*Anthoxanthum odoratum*), Heath-grass (*Danthonia decumbens*), Heath Bedstraw (*Galium saxatile*), Heath Rush (*Juncus squarrosus*), occasional Mat Grass (*Nardus stricta*), Purple Moor-grass (*Molinia caerulea*), Heath Wood-rush (*Luzula multiflora*), Tormentil (*Potentilla erecta*), Common Bent-grass (*Agrostis capillaris*) and the moss *Rhytidiadelphus squarrosus*. The habitat did not contain sufficient richness of species to qualify as the priority habitat **6230 Species-rich *Nardus* grassland** and is best described as Species-poor *Nardus* grassland.



Plate 20. Blanket bog and eroding blanket bog in the col between Corrigasleggaun and the Cloghernagh – Lugnaquilla ridge.

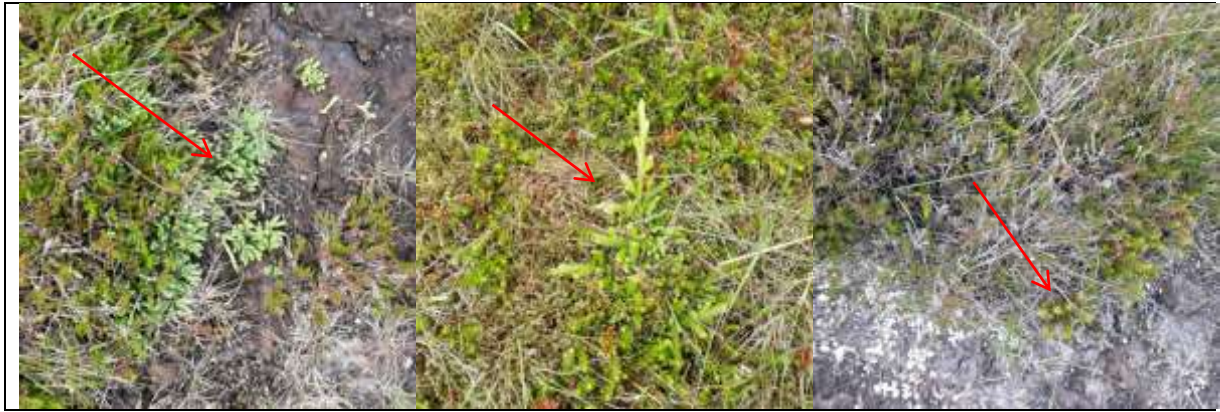


Plate 21. Clubmosses amidst Montane Heath on the Corrigasleggaun Ridge. Alpine Clubmoss (*Diphasiastrum alpinum*), Stag's-horn Clubmoss (*Lycopodium clavatum*) and Fir Clubmoss (*Huperzia selago*) L - R.

The grassland on the lower slopes of the Carrawaystick Valley are mostly species poor acid grassland and are heavily grazed. There is occasional Ling heather (*Calluna vulgaris*) and Bilberry (*Vaccinium myrtillus*) through the sward but these are generally very heavily browsed. There has been a series of landslips, soil creep and landslides along these slopes.

Where significant areas of peat/soil were exposed following landslides they have been colonised by monodominant swathes of Deergrass (*Trichophorum cespitosum*), or Mat Grass (*Nardus stricta*), neither of which are palatable to sheep.



Plate 22. Montane heath between areas of eroding blanket bog on the ridge of Corrigasleggaun.



Plate 23. Man-made cuttings on the blanket bog on the Corrigasleggaun Ridge.



Plate 24. Eroding blanket bog in the Carrawaystick Valley.



Plate 25. Erosion and trampling from hillwalkers on the Cloghernagh Ridge.



Plate 26. Soil creep, landslips and erosion on the slopes below the Cloghernagh Ridge.

The commonage has been subject to various damaging activities in the past including over grazing, natural erosion, some trampling from walkers and occasional burning. A number of landslide events have been noted in the commonage (including a major one in September 2010) and these were mapped by the Geological Survey of Ireland as shown on **Figure 11**. The commonage is at high risk of continued landslide events as shown on **Figure 12**. These types of events are likely to increase with increased storms, torrential rainfall events, snow loading and cracking and drying of peat associated with climate change.

This area was historically managed for deer stalking and shooting of grouse. However since that time grazing by sheep and deer has escalated. This overgrazing is reflected in the condition of the habitats and the numbers of landslides, soil creep and erosion events. It would seem that the primary impetus to erosion has come from grazing by animals and on the slopes at the rear of Kelly's Lough from them favouring these areas for shelter. The ongoing presence of sheep and deer on these hills and their grazing pressure reduces the opportunity for the hill to recover and exacerbates erosion. Hill walking has also increased in the area.



Figure 7. Burn extent on Cloghernagh as seen on the OSI 2000 aerial photography.

The Carrawaystick Stream and associated watercourses, which rise within the commonage are described as **Eroding Upland Rivers FW1** and have little in the way of any instream vegetation beyond mosses.

The Annex I habitats present within the commonage include:

- 4010 Northern Atlantic Wet Heaths with *Erica tetralix*
- 4030 Dry Heath
- 4060 Alpine and Boreal Heaths
- 7130 Blanket Bog
- *6130 Species Rich *Nardus* Grassland – this habitat will require further studies and investigations

2.2 Rare Plants

Alpine species previously recorded from here include; *Lycopodium clavatum*, *Diphasiastrum alpinum*, *Huperzia selago*, *Saxifraga stellaris*, *Vaccinium vitis-idaea*, *Vaccinium myrtillus*, *Empetrum nigrum*, and *Carex bigelowii*. The clubmosses *Lycopodium clavatum*, *Diphasiastrum alpinum*, and *Huperzia selago* are species listed under Annex V of the EU Habitats Directive.



Plate 31. Fir clubmoss (*Huperzia selago*) on the cliffs at the back of Kelly's Lough.

2.3 Rare Fauna

The commonage is within the known range of Merlin (*Falco columbarius*) and Peregrine Falcon (*Falco peregrinus*) both of which are qualifying interests of the Wicklow Mountains SPA. Peregrine was recorded during the site surveys.

The Irish Hare (*Lepus timidus* subsp. *hibernicus*) was recorded and herds of deer (red/Sika hybrids)

graze the commonage – they were frequently observed from the cliffs at the back of Kelly’s Lough. Other faunal records recorded during this survey include Kestrel (*Falco tinnunculus*), Common Frog (*Rana temporaria*), Red Grouse (*Lagopus lagopus*), Snipe (*Gallinago gallinago*), Meadow Pipit (*Anthus pratensis*), Skylark (*Alauda arvensis*), Stonechat (*Saxicola rubicola*) and Raven (*Corvus corax*). Curlew (*Numenius arquata*) was seen. Dipper (*Cinclus cinclus*) was recorded from the Carrawaystick Stream. Common Lizard (*Zootoca vivipara*) would also be expected.

Red Grouse were recorded during the present survey. Indicative estimates of the population of Red Grouse within the Wicklow Mountains SPA is extracted below in **Table 1** from the 2011 survey¹.

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

Species such as Otter (*Lutra lutra*) and Kingfisher (*Alcedo atthis*) may occur on the Avonbeg and are known from the Avonmore River further downstream in the catchment.

2.4 Fisheries and Water Quality

The commonage is located within the Eastern River Basin District within the Ovoca - Vartry catchment (010) and the Avonbeg Sub-catchment (SC020).

The Carrawaystick Stream or Kelly’s Brook rises within the commonage and Lough Brook flows from Kelly’s Lough to join this watercourse within the boundaries of the commonage. The stream then falls as the spectacular Carrawaystick Waterfall over the hanging valley of Glenmalure before joining Avonbeg River, which is a tributary of the Avoca River.

The latest water sampling on the Avonbeg River at Drumgoff Bridge, just downstream of the commonage indicates that the Avonbeg River at this location is currently assigned a Q value of 4 (Good Status). Monitoring upstream of the commonage on the Avonbeg River at Barravore Ford has recorded a Q value of 4-5 (High Status), which indicates that there has been a deterioration in water quality in the river between these two locations.

The Avonbeg River (and its tributaries within the commonage) were deemed to be ‘Good Status’ watercourses in 2007 – 2009. They dis-improved in water quality since then and in 2010 – 2012 and in 2010 – 2015 were assessed as ‘Moderate Status’ watercourses. Under the Water Framework Directive the watercourses within the commonage were deemed ‘At Risk’ of not achieving ‘Good’ status.

The Avonmore River has populations of Brown Trout (*Salmo trutta*), Sea Trout (*Salmo trutta trutta*) and Atlantic Salmon (*Salmo salar*). Water quality in the Avoca River downstream of the White Bridge has improved sufficiently that these species can now make it upstream of the Avoca Mines.

¹ 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.

Bird species such as Kingfisher (*Alcedo atthis*), which is a species listed under Annex I of the EU Birds Directive, Dipper (*Cinclus cinclus*), and grey wagtail (*Motacilla cinerea*) occur on the Avonmore River as does Goosander (*Mergus merganser*). Dipper was seen on the Carrawaystick Stream during the surveys.

There are historic records of the Freshwater Pearl Mussel (*Margaritifera margaritifera*) from the Avonmore River.

2.5 Recreation/Amenity

The commonage provides hillwalking access to one of the most popular walking routes in the Wicklow Uplands – the ascent/descent of Lugnaquilla via the Cloghernagh ridge or Corrigasleggaun and Carrawaystick Mountains, and access to Kelly's Lake.

3. 2019 Ecological Assessment

3.1 Field Survey

Following the background review and desktop research the site was visited in June and July 2019 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 8, 9 and 10** below and as described above.

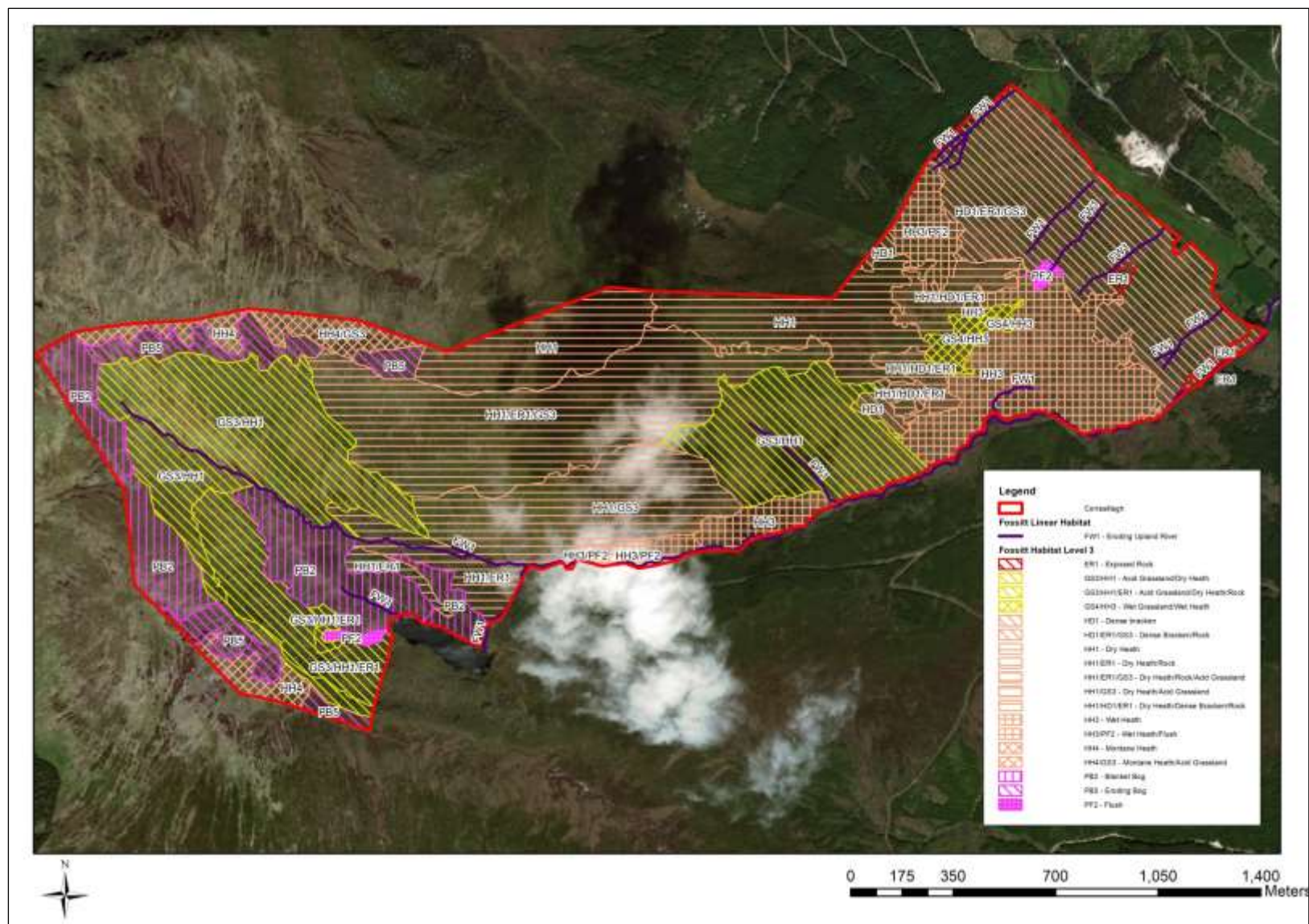


Figure 8. Habitats mapped to Level Three (Fossitt, 2000) within the Corrasillagh commonage.

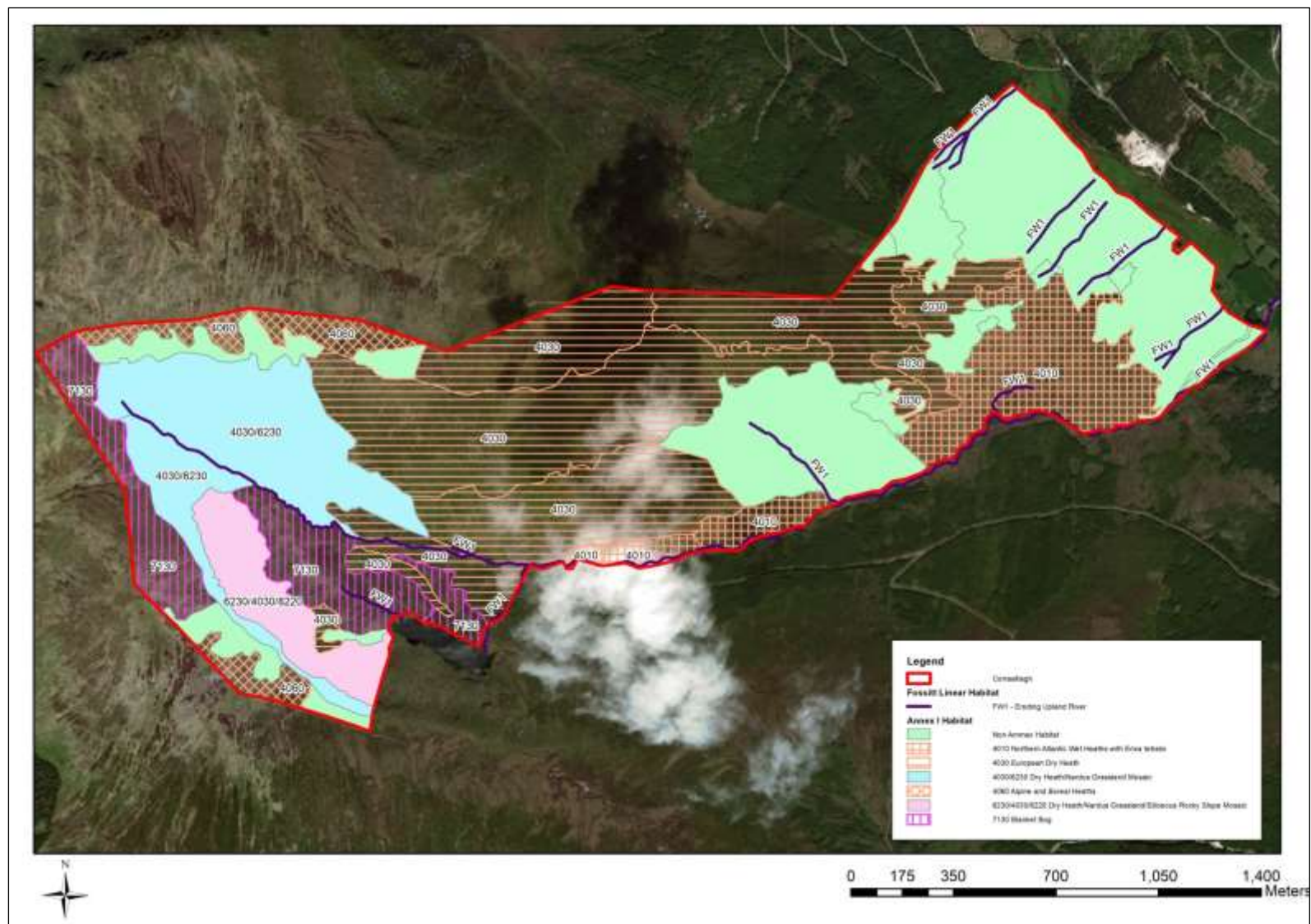


Figure 9. Habitats mapped according to their correspondence with Annex I habitats within the Corrasillagh commonage.

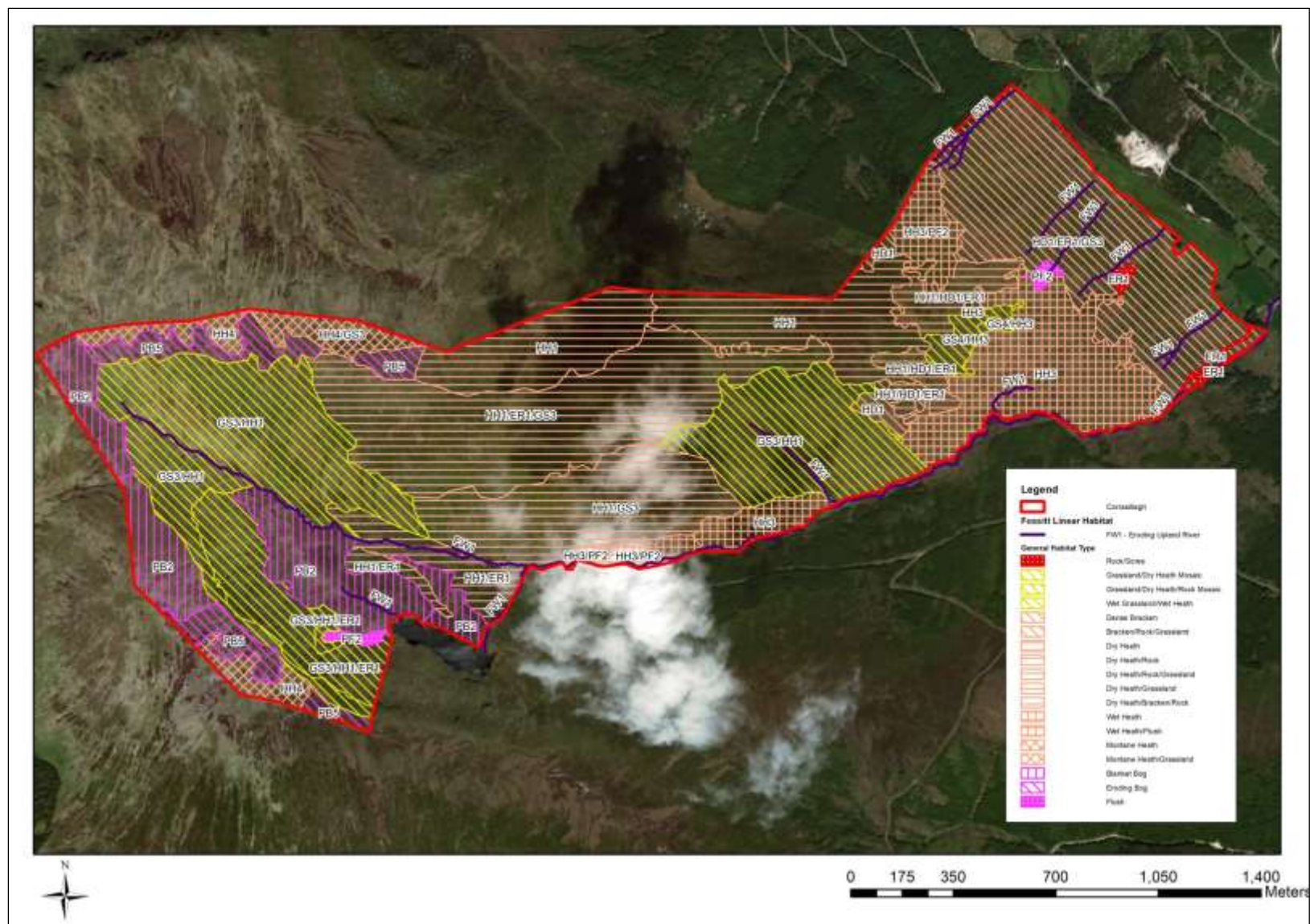


Figure 10. Habitats mapped using general vegetation descriptions.

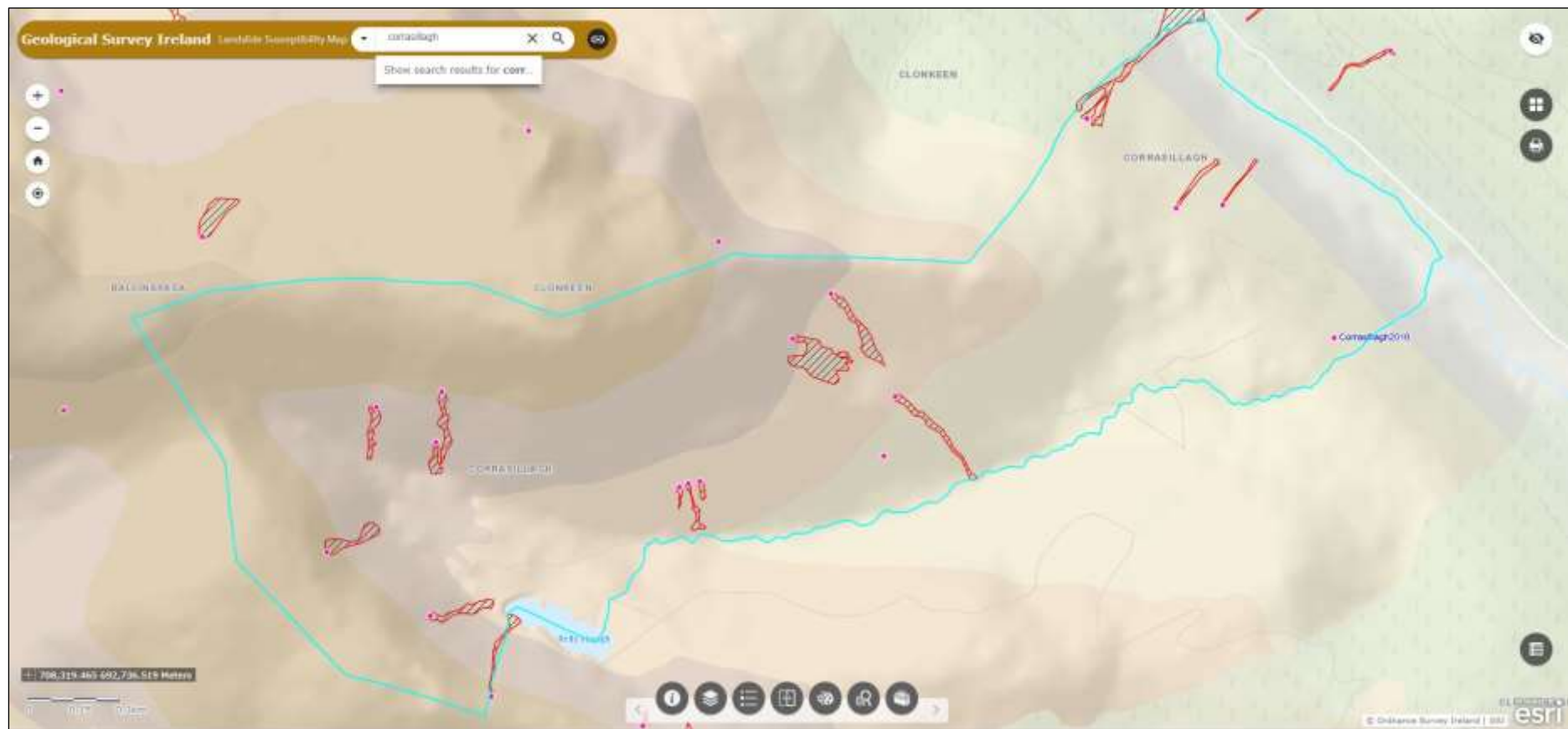


Figure 11. Landslide events recorded by the Geological Survey of Ireland on Corrasillagh Commonage.

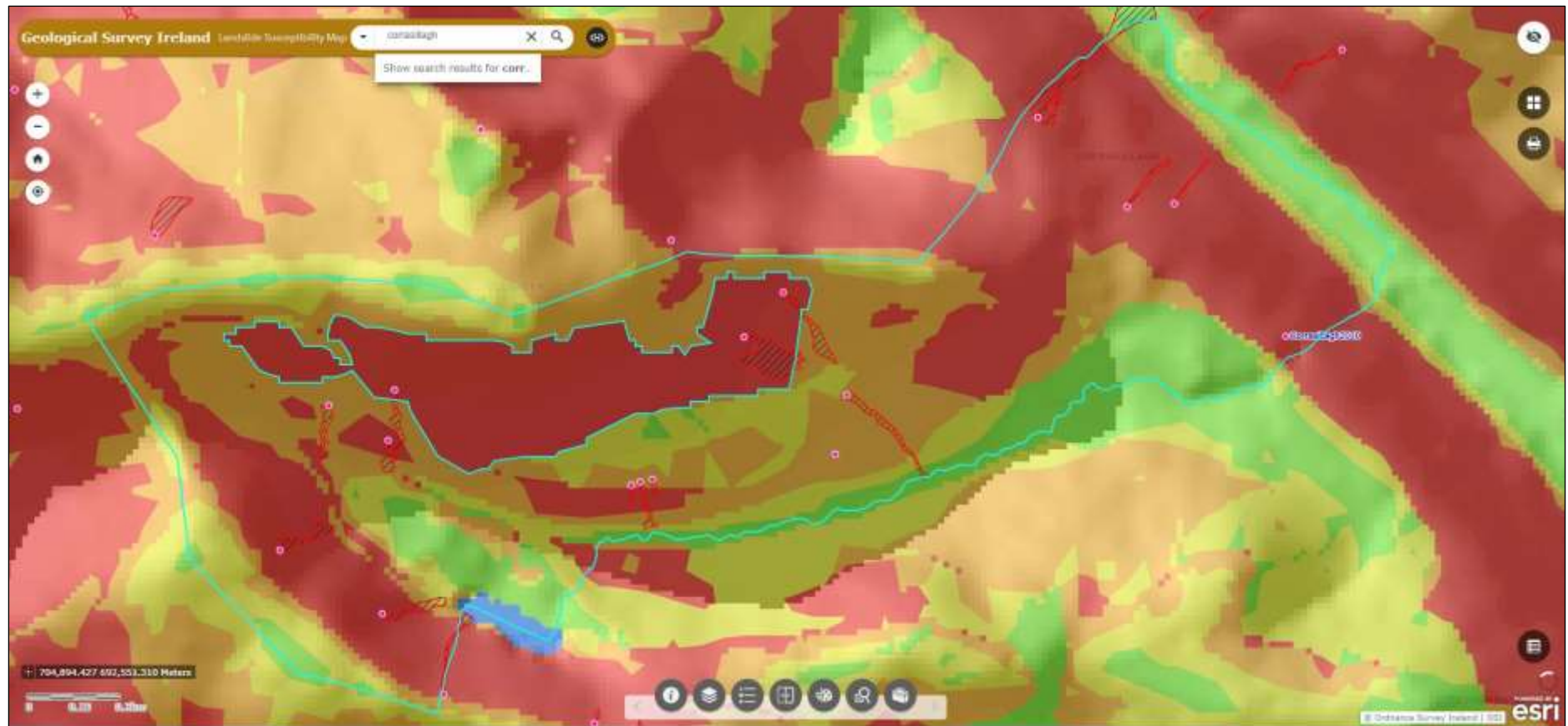


Figure 12. Landslide susceptibility mapping prepared by the Geological Survey of Ireland.

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 2** 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 2. 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 most recent 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 European Dry Heaths, 4060 Alpine and Boreal Heath, 6230 Species-rich *Nardus* Grassland, 7130 Blanket Bog and 8220 Siliceous Rocky Slope). 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, mosaics of habitat, areas of dense bracken 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 13** below.

3.2.1 4010 Northern Atlantic Wet Heaths with *Erica tetralix*

A total of 6 monitoring stops were recorded within the **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** habitat within the commonage. The results of the 6 monitoring stops conducted 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 = 6).

Criteria	Scale of assessment	Number of assessments	Number of failures	Failure rate (%)
Vegetation composition				
1. <i>Erica tetralix</i> present	20m radius	6	0	0
2. Cover of positive indicator species $\geq 50\%$	Relevé	6	3	50
3. Total cover of <i>Cladonia</i> species, <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses $\geq 10\%$	Relevé	6	3	50
4. Cover of ericoid species and <i>Empetrum nigrum</i> $\geq 15\%$	Relevé	6	0	0
5. Cover of dwarf shrub species $< 75\%$	Relevé	6	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	6	0	0
7. Cover of non-native species $< 1\%$	Relevé	6	0	0
8. Cover of non-native species $< 1\%$	Local vicinity	6	0	0
9. Cover of scattered native trees and scrub $< 20\%$	Local vicinity	6	0	0
10. Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	6	0	0
11. Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	6	0	0
Vegetation structure				
12. Crushed, broken and/or pulled up <i>Sphagnum</i> species $< 10\%$ of <i>Sphagnum</i> cover	Relevé	6	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	6	3	50
14. No signs of burning into the moss, liverwort or lichen layer, or exposure of peat surface due to burning	Local vicinity	6	0	0
15. No signs of burning inside boundaries of sensitive areas ²	Local vicinity	6		
Physical structure				
16 Cover of disturbed bare ground $< 10\%$	Relevé	6	0	0
17 Cover of disturbed bare ground $< 10\%$	Local vicinity	6	0	0
18 Area showing signs of drainage resulting from heavy trampling or tracking or ditches $< 10\%$	Local vicinity	6	2	33
			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 no significant reduction in the area of wet heath. For these reasons the overall area of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** within the commonage was therefore assessed as **Favourable**.

Structure and Functions

In the assessment of structure and functions, 3 of 6 monitoring stops passed. The structure and functions of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** were therefore generally assessed as **Unfavourable – Inadequate**.

² 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.

The vegetation composition of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** failed on three stops on account of lack of positive indicators, mosses and lichens.

The vegetation structure of **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** failed on three stops on account of browsing pressure and trampling.

The monitoring stops that failed were conducted in the large area of Wet Heath at the top of the slope above the zig zags. This area is heavily grazed by both deer and sheep and subject to flushing with changes in hydrology.

Future Prospects

The future prospects for the habitat are assessed as **Unfavourable – Inadequate** in the absence of active management of the commonage. There will need to be active shepherding of sheep, trespassing sheep and disturbance to deer to move browsers out of damaged areas. Deer numbers will also need to be controlled.

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

3.2.2 4030 Dry Heath

A total of 11 monitoring stops were recorded within the **4030 Dry heath** habitat within the commonage. The results of the monitoring stops are presented below in **Table 3.2.2**.

Table 3.2.2: Monitoring criteria and failure rates for 4030 Dry heath ($n = 11$).

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	11	1	9.09
2. Number of positive indicator species present ≥ 2 (Appendix VI)	Relevé	11	2	18.18
3. Siliceous heaths: cover of positive indicator species $\geq 50\%$ (Appendix VI)	Relevé	11	0	0.00
4. Proportion of dwarf shrub cover composed of <i>Myrica gale</i> , <i>Salix repens</i> , <i>Ulex gallii</i> collectively $< 50\%$	Relevé	11	0	0.00
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	11	0	0.00
6. Cover of non-native species $< 1\%$	Relevé	11	0	0.00
7. Cover of non-native species $< 1\%$	Local vicinity	11	0	0.00
8. Cover of scattered native trees and scrub $< 20\%$	Local vicinity	11	0	0.00
9. Cover of <i>Pteridium aquilinum</i> $< 10\%$	Local vicinity	11	0	0.00
10. Cover of <i>Juncus effusus</i> $< 10\%$	Local vicinity	11	0	0.00
Vegetation structure				
11. Senescent proportion of <i>Calluna vulgaris</i> cover $< 50\%$	Relevé	11	1	9.09
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	11	4	36.36

Criteria	Scale of assessment	No. of Assessments	No of Failures	Failure Rate (%)
13. No signs of burning inside boundaries of sensitive areas ³	Local vicinity	11	0	0.00
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 ⁴	Local vicinity	11	1	9.09
Physical structure				
15. Cover of disturbed bare ground < 10%	Relevé	11	0	0.00
16. Cover of disturbed bare ground < 10%	Local vicinity	11	0	0.00

Dry heath is found across much of the slopes of the commonage, particularly on the Cloghernagh ridge, in the vicinity of Kelly's Lough, often surrounding outcropping boulders, and in a mosaic with dry acid grassland and bracken. On much of the slopes dry heath is being lost following overgrazing to species poor grassland dominated by Mat grass or Deer grass. Some areas of dry heath occur on the edge of eroding peat hags - these areas were not generally assessed as part of this assessment.

Area

A review of the aerial photography from the 1990s and other data sources for the commonage indicate that there has been a probable loss in the overall area of dry heath in the commonage.

The Commonage Framework Plan mapped much of the slopes of the Carrawaystick Valley as wet heath/acid grassland mosaic but grazing intensity in much of this area has meant that large areas here are now dominated by acid grassland with remnants of dry heath in the form of bilberry and ling. Areas of dry heath have been further lost through landslips and soil creep. The commonage has a very 'grassy' appearance and this is as a result of grazing pressure.

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, 5 of the 11 monitoring stops failed. 3 stops failed on only one criterion, which related to browsing pressure. 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 45%. The structure and functions of **4030 Dry heath** across the majority of the commonage was therefore assessed as **Unfavourable – Inadequate**.

³ 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.

⁴ *Calluna vulgaris* growth phases

1. Pioneer < 10 cm

2. Building 10 – 30 cm

3. Mature > 30 cm



Plate 32. Uniform dry heath on Cloghernagh following burning.



Plate 33. Loss of heath on the slopes from grazing pressure leaves them increasingly vulnerable to erosion and landslips.

The vegetation composition of **4030 Dry heath** was poor and 2 of the monitoring stops failed on account of lack of bryophytes or lichens or positive indicator species. The vegetation structure of **4030 Dry heath** was generally poor with many areas showing signs of damage from overgrazing and grassland beginning to dominate. On the slopes at the back of Kelly's Lough and above Carrawaystick Stream there are a series of landslides and landslips which are indicative of the long term effect of this overgrazing – this area was assessed as **Unfavourable – Bad** as a result.

In some parts of the commonage bracken (*Pteridium aquilinum*) is also starting to invade from the lower slopes particularly around Corrig na Greine.

A lack of appropriate grazing 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.

Future Prospects

The future prospects for the habitat are assessed as **Unfavourable – Bad** unless the hill is destocked and deer are controlled allowing the hill to recover.

Conservation Status Assessment

Overall the conservation status assessment for dry heath habitat within the commonage is assessed as **Unfavourable – Bad**.

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. Neither 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	0	0
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	2	100
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	2	100
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 likely loss in the overall area of montane heath in the commonage. This loss is on the ridges arising from grazing (from deer and sheep), minor trampling from walkers, 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, both monitoring stops 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 100% but this is on account of browsing pressure. The structure and functions of **4060 Alpine and Boreal Heath** were therefore assessed as **Unfavourable – Inadequate** as opposed to **Unfavourable - Bad**. The vegetation composition of **4060 Alpine and Boreal Heath** was good but the failures were on account of browsing pressure.

In many areas on the ridges grazing and trampling pressure was high and the vegetation structure of the habitat has been compromised resulting in localised exposure of the peat and in some locations the subsoil beneath. Much of this activity is being compounded by natural erosion and slow recovery which is impacted by browsing. There are localised impacts from walking tracks on the ridges.

Future Prospects

The future prospects for the habitat **4060 Alpine and Boreal Heath** are assessed as **Unfavourable – Bad** in the absence of active management of the erosion of peat by the commonage group given projected increased rainfall and storm events associated with climate change which will increase and exacerbate natural erosion.

Conservation Status Assessment

Overall the conservation status assessment for the habitat **4060 Alpine and Boreal Heath** within the commonage is generally assessed as **Unfavourable – Inadequate** as browsing pressure can be reduced.

3.2.4 7130 Blanket Bog

A total of 2 monitoring stops were recorded within the **7130 Blanket Bog** habitat within the commonage. The results of the 2 monitoring stops are presented below in **Table 3.2.4**. The areas of eroding and cutover bog were not assessed as part of this assessment. A monitoring stop conducted lower down on the Corrigasleggaun ridge within Wicklow Mountains National Park passed – this is not included in this assessment.

Table 3.2.4: Monitoring criteria and failure rates for 7130 Blanket Bog ($n = 2$).

Criteria	Scale of Assessment	No. of Assessments	No of Failures	Failure Rate (%)
Vegetation composition				
1. Number of positive indicator species present ≥ 7 (Appendix VI)	20m radius	2	0	0
2. Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> $\geq 10\%$	Relevé	2	0	0
3. Cover of each of the following species: <i>Calluna vulgaris</i> , <i>Eleocharis multicaulis</i> , <i>Eriophorum vaginatum</i> , <i>Molinia caerulea</i> , <i>Schoenus nigricans</i> , <i>Trichophorum germanicum</i> individually $< 75\%$	Relevé	2	0	0
4. Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> collectively $< 1\%$	Relevé	2	0	0
5. Cover of non-native species $< 1\%$	Relevé	2	0	0
6. Cover of non-native species $< 1\%$	Local vicinity	2	0	0
7. Cover of scattered native trees and scrub $< 10\%$	Local vicinity	2	0	0
Vegetation structure				
8. Crushed, broken and/or pulled up <i>Sphagnum</i> species $< 10\%$ of <i>Sphagnum</i> cover	Local vicinity	2	0	0

Criteria	Scale of Assessment	No. of Assessments	No of Failures	Failure Rate (%)
9. Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively < 33% (Assess a minimum of 10 shoots distributed across the plot)	Relevé	2	2	0
10. No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Relevé	2	0	0
11. No signs of burning inside boundaries of sensitive areas ⁵	Local vicinity	2	0	0
Physical structure				
12. Cover of disturbed bare ground < 10%	Relevé	2	0	0
13. Cover of disturbed bare ground < 10%	Local vicinity	2	0	0
14. Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting < 10%	Local vicinity	2	0	0
15. Cover of erosion gullies and eroded areas within the greater bog mosaic ⁶ < 5%	Local vicinity	2	2	0

Area

A review of the aerial photography from the 1990s and other data sources for the commonage indicate that there has been no significant change in the overall area of blanket bog in the commonage since designation. However the landslide data gathered by the Geological Survey of Ireland indicates that there have been slips and landslides arising from the Corrigasleggaun ridge, which would have resulted in localised losses of blanket bog habitat (see **Figure 11**). The field surveys confirmed that erosion is ongoing in these areas as evidenced by the localised areas of bare peat, gullies, and erosion of the peat surface on the ridge. There also appears to have been a loss of blanket bog within the valley floor below the ridge adjoining Kelly's Lough (arising from the landslide event in 2010). For this reason the overall area of **7130 Blanket Bog** within the commonage was therefore assessed as **Unfavourable – Inadequate** as areas of habitat are very vulnerable to being eroded.

Structure and Functions

In the assessment of structure and functions, 2 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 100% however this is on account of grazing pressure and localised erosion. The structure and functions of **7130 Blanket Bog** were therefore assessed as **Unfavourable – Inadequate**.

The vegetation composition of **7130 Blanket Bog** was often relatively good and both of the monitoring stops failed on account of browsing pressure. This is on account of intensity of grazing pressure from sheep (and deer) on the ridge.

The vegetation structure of **7130 Blanket Bog** was failed in both stops on account of grazing pressure. The physical structure of adjoining area of eroding bog with localised areas of bare and eroding peat, and eroding gullies linked to landslides below caused both stops to fail although areas of blanket bog which were assessed were intact as they are compromised by these conditions.

⁵ Sensitive areas

(a) Slopes greater than 1 in 3 (18°), and all the sides of gullies.

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

(c) Patterned areas i.e. with pools, wet hollows, hags and erosion gullies.

(d) Areas within 5-10 m of watercourses.

(e) Areas above 400 m in altitude.

(f) Areas within 50 m of functioning drains.

⁶ The greater bog mosaic incorporates the Annex I Blanket bog itself and associated vegetation types and non-vegetation cover types that appear to have been derived from former blanket bog, including, but not limited to, HW2, bare peat, loose rock, gravel and running water.



Plate 34. From reading the topography of the landslide, coupled with local descriptions of the event and its aftermath, it would appear that large areas of blanket bog were destroyed during the landslide event of 2010 and were washed into Kelly's Lake. This photo shows the depth of peat that was potentially eroded by this event.

A history of grazing pressure from sheep and deer, along with natural erosion and exposure, appears to be the most significant impact on the structure and functions of **7130 Blanket Bog** in the commonage. The effects of these impacts are apparent in the vegetation composition, vegetation structure and physical structure of this habitat. The valley bogs at the base of the cliffs adjoining Kelly's Lough appear to have been impacted by landslide and erosion events above which resulted in areas of bare peat which have been colonised by rushes – these are clearly visible when viewed from above. There is also some localised damage by quads in this area.

There is some damage trampling from walkers but in light of that caused by inappropriate grazing and erosion events it is minor in nature.

Future Prospects

The future prospects for the habitat are assessed as **Unfavourable – Bad** in the absence of active management to begin habitat restoration on the ridges to stop the peat here further eroding.

Conservation Status Assessment

Overall the conservation status assessment for blanket bog habitat within the commonage is assessed as **Unfavourable – Inadequate**.

3.2.5 6230 Species-rich *Nardus* Grassland

A more detailed survey and assessment of the areas of grassland in the commonage is required to determine the affinity or otherwise of this habitat to the priority habitat 6230 Species-rich *Nardus* grassland. The requirements of this work is outside the scope of the SUAS project and ideally would be conducted when grazing levels on the hill have been reduced and the vegetation and some of the positive indicator species necessary for the identification of the habitat have an opportunity to recover. The initial observations of this survey are that some areas of the hill are more akin to Species-poor *Nardus* grassland.

A monitoring stop was conducted in the most likely looking area of grassland where grazing pressure was low. This was at the head of the valley below the confluence of the Corrigasleggaun ridge and the Cloghernagh – Lugnaquilla ridge. This grassland was examined in order to see if it corresponds to the priority habitat **6230 Species-rich *Nardus* grassland** as listed under Annex of the EU Habitats Directive. The result of that assessment is presented below in **Table 3.2.5**.

Table 3.2.5 Monitoring criteria and failure rates for 6230 Species-rich *Nardus* Grassland ($n = 1$).

	Criteria	Scale of Assessment	No. of Assessments
Vegetation composition			1
1	Number of high quality and general indicator species ≥ 7	Relevé	Y
2	2b UG1e/UG2e: Number of high quality species present ≥ 1 (Appendix VI)	Relevé	Y
3	Species richness ≥ 25 species	Relevé	F
4	Cover of non-native species $\leq 1\%$	Relevé	Y
5	Cover of the following negative indicator species: <i>Arrhenatherum elatius</i> , <i>Bellis perennis</i> , <i>Cirsium arvense</i> , <i>Cirsium vulgare</i> , <i>Dactylis glomerata</i> , <i>Eriophorum angustifolium</i> , <i>Eriophorum vaginatum</i> , <i>Holcus lanatus</i> , <i>Juncus effusus</i> , <i>Lolium perenne</i> , <i>Narthecium ossifragum</i> , <i>Ranunculus repens</i> , <i>Rumex crispus</i> , <i>Rumex obtusifolius</i> , <i>Senecio jacobaea</i> , <i>Trifolium repens</i> , <i>Urtica dioica</i> , individually $\leq 10\%$	Relevé	Y
6	Cover of the above negative indicator species collectively $\leq 20\%$	Relevé	Y
7	Cover of <i>Sphagnum</i> species $\leq 10\%$	Local vicinity	Y
8	Cover of <i>Polytrichum</i> species $\leq 25\%$	Local vicinity	Y
9	Cover of scrub, bracken and heath $\leq 5\%$	Local vicinity	Y
Vegetation structure			
10	Forb component of forb : graminoid ratio 20-90%	Local vicinity	Y
11	Proportion of the sward between 5-50 cm tall $\geq 25\%$	Relevé	Y
12	Litter cover $\leq 20\%$	Relevé	Y
13	No signs of burning inside boundaries of sensitive areas†	Local vicinity	Y
Physical structure			
14	Cover of disturbed bare ground $\leq 10\%$	Relevé	Y
15	Area of the habitat showing signs of serious grazing or disturbance <20m ²	Local vicinity	Y

Although passing in terms of high quality and general indicator species ≥ 7 and the presence of *Danthonia decumbens* this stop failed on account of lack of general species richness (only 15 species were recorded).

3.2.6 Acid Grassland

Large areas of acid grassland on the hill, have been damaged as a result of inappropriate grazing and the grass species which are becoming to dominate in many locations are mat grass and deer grass, which are unpalatable to sheep.

The condition of this grassland habitat although not assessed using any formal assessment technique as it does not correspond to the Annex habitat would be assessed as **Unfavourable - Inadequate**. The invasion of large areas of this habitat on the lower slopes of the commonage by bracken also needs to be addressed.

The results of these assessments are presented on Figure 13 below. Active measures by the members of the commonage framework group as set out in the management recommendations will assist in beginning to improve the conservation status of the habitats within Corrasillagh.

A combination of parameters will need to be addressed to see a move towards habitat recovery (e.g. appropriate grazing levels (sheep/deer/sheep in combination with deer), stabilisation of eroding peats through gully blocking on the ridge, measures to address trampling from hill walkers, uncontrolled access by quads, control of bracken, etc.

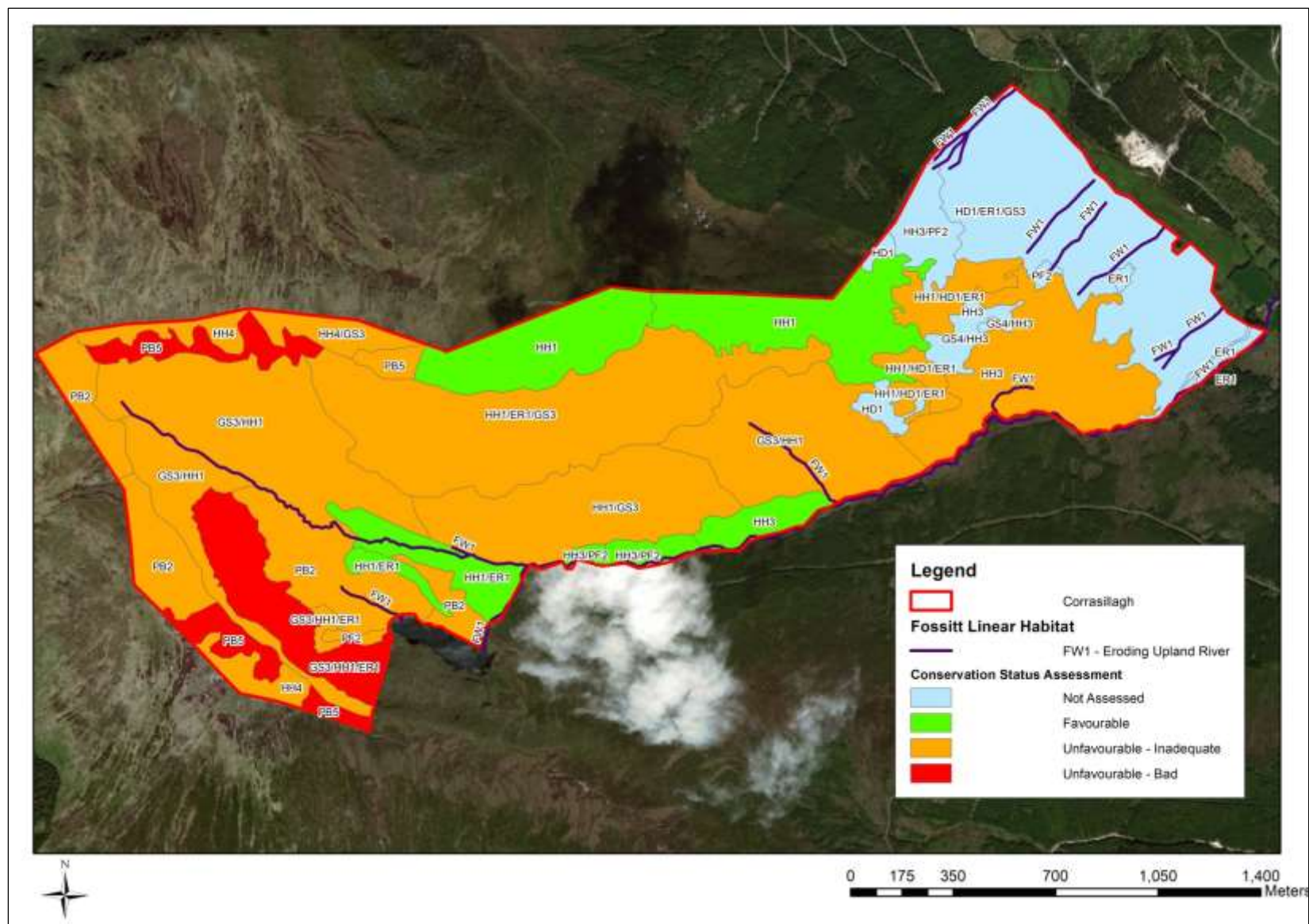


Figure 13. Habitat Condition Assessment for the Annex I habitats within Corrasillagh Commonage.

4. Management Recommendations for Corrasillagh

4.1 General Management Measures

A Commonage Management group has been established for the commonage and a management plan will be developed by the members, which 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 Blanket Bog, Dry Heath, Wet Heath and Alpine and Boreal Heath in the long term as well as protection of the existing acid grassland resource.

The major impacts arise from a legacy of inappropriate grazing (from sheep and also from deer), erosion of peat along the summits and ridges (impacting on upland blanket bog and montane heath) with subsequent severe landslides and damage and losses to acid grassland/dry heath/blanket bog habitat below, invasion of grassland by dense bracken, and localised trampling impacts from walkers and illegal quad activity. Overgrazing is also contributing to erosion not only on the ridges and summits and the cliffs behind Kelly's Lough but also on the slopes of the commonage above the Carrawaystick Stream.

These impacts coupled with natural exposure, increased rainfall and storm events and clear felling in the uplands pose a serious risk of flooding to the houses, farms and inhabitants of the Glenmalure valley below.

The levels of livestock grazing (by sheep) were initially assessed through the Commonage Framework Management Plan drawn up in the early 2000s. The CFP recommended a very minor reduction in stock (1.26%) with the majority of the commonage assessed as undamaged apart from a small area – see **Figure 4** above. It is unlikely that this destocking occurred as only sites with a recommended destocking rate >10% nationally were destocked. However even if this destocking had taken place an increasing deer population in the area would have negated any destocking effects.

Given the condition of the hill, which is currently over grazed for the most part and the legacy of landslides and erosion, which are visible to the eye, I would recommend that the hill is destocked to allow the vegetation some chance to recover. This needs to be done in conjunction with active deer management and shepherding trespassing stock from adjoining commonages to encourage these animals to graze elsewhere. This will reduce grazing pressure from domestic animals and allow the habitats here to begin to recover.

The impacts of grazing deer on the hill are harder to resolve. In order to determine the grazing impact of deer in these areas it is recommended that a number of exclosures are erected, which would allow changes in vegetation to be monitored. These will require the erection of flight diverters on the fences to reduce collision risk for grouse on the site. Counts of deer and a mark-up of their indicative locations on the hill should also be made during the shepherding sessions to develop an understanding of deer populations in the area.

The Corrigasleggaun ridge should be the focus of specific measures by the project as it is vulnerable to ongoing severe peat erosion and landslides. These areas will require measures to stabilise eroding peat, block eroding peat gullies and implement active habitat restoration measures. These should be designed to aid and speed up the recovery of the damaged habitat, which would then also reduce the levels of peat erosion and the risk of further landslide events as documented by the Geological Survey of Ireland (see **Figure 12**).

Areas of dry heath on the lower slopes of the Cloghernagh Ridge near Corrig na Greine are becoming invaded by bracken which will need to be controlled. Dense bracken on the lower slopes of the

commonage below the 35m contour are harder to resolve – grazing by cattle could be an option here given that the land is fenced and enclosed.

There is a small number of self-sown Sitka spruce on the lower slopes of the commonage in the vicinity of the zig zags in the areas of acid grassland/dry heath and these should be removed.

Consideration should be given to the expansion of the existing stands of mountain ash, downy birch and hawthorn within these slopes with the addition of willows, aspen, whitebeam, Scots pine, oak and holly to create small stands of native upland woodland along the Carrawaystick Stream. The establishment of native woodland within the enclosed slopes of the commonage below the 350m contour on the lands either side of the zig zags could also be considered. Funding is available from the Forest Service under the Native Woodland Scheme to cover the costs of deer fencing, establishment and management/tending.

The grants currently available for the establishment for native woodland are presented below. GPC9 would be the appropriate Grant and Premium Category for the lower slopes of Corrasillagh below the 350m contour and on localised areas on Corrig Na Greine. This area amounts to c.49 hectares.

Grant Rates (€/ha)

Grant/Premium Category (GPC)	1st Grant (€/ha)	2nd Grant (€/ha)	Additional fencing allocation (IS436)	Alternative fencing allocation (Non IS436)	Total Grant available (€/ha)
GPC 9 – Native Woodland Establishment (oak-birch-holly-hazel woodland)	4215	1405	600	450	6220
GPC 10 – Native Woodland Establishment (alder-oak woodland)	3960	1320	600	450	5880

Premium Rate (€/ha)

Grant/Premium Category (GPC)	Annual premium <10ha (€/ha)	Annual premium >10ha (€/ha)	Premium duration (years)
GPC 9 – Native Woodland Establishment	665	680	15
GPC 10 – Native Woodland Establishment	665	680	15

The establishment of upland woodland on these slopes could help to buffer the impacts of combined grazing pressures, deal with bracken encroachment, and act as a protection forest for the houses in the valley below as well as water quality in the Avonbeg River. Species used must be of certified Irish

genetic provenance to ensure continuity of genetic diversity and minimise the risk of introduction of tree diseases as has occurred with stock originating from continental and UK sources.

The creation and restoration of upland gully woodlands consisting of native broadleaf species located along fast flowing upland streams and surrounding steep sided valleys provide a number of benefits – these include:

- Creating shelter and shade for livestock
- Reducing soil erosion
- Improving water quality
- Mitigating downstream flood risk
- Supporting woodland and upland birds
- Increasing habitat and species diversity
- Storing carbon
- Increasing resilience of the landscape in the face of climate change
- Enhancing the landscape
- Enhancing visitor experience and well-being
- Providing an evidence base for the future

The various parts of the commonage requiring specific management are mapped on **Figure 14** and summarised in **Table 4**. Further information and best practice guidance on each of the management measures recommended are outlined below.

Detailed 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 2**. This guidance has been modified for the Irish situation.

4.2 Measures for Damaged and Eroding Bog

4.2.1 Measures for Damaged Blanket Bog

The areas of bare peat and eroding areas of blanket bog on the ridges within the commonage will require a number of measures including the exclusion of grazing animals to allow the vegetation to recover, stabilisation of the peat and eroding areas through the introduction of seed sources and other techniques and ongoing elimination of burning.

Information on the restoration of hydrology in blanket bog from the Natural England Upland Management Handbook and from the Moors for the Future project are presented in **Appendix 2**.

4.2.2 Eroding Bog on the Ridges and Summits

The areas of bare and eroding peat on the ridge and summits of the commonage are of urgent concern and are at continued risk of erosion and landslide. These areas will require destocking, restoration of hydrological function, stabilisation of the peat and revegetation. There must be no further burning of these habitats.



Plate 35. Eroding peat gullies in Blanket Bog on the ridge.

Upland blanket bog in good habitat condition should have a diversity of species present (more than seven indicator species), contain both dry- and wet-loving species, and be *Sphagnum*-rich with an abundance of hummock-forming *Sphagnum* moss and Woolly hair moss (*Racomitrium lanuginosum*). Areas of bare peat should be rare and the water table should be high such that peat tears and hollows are filled with *Sphagnum* mosses.

Stabilisation of peat through blocking of erosion gullies is highly recommended as these have often been where the significant landslide events have begun.

Removal of Sheep from the Ridge

The Moors for the Future project in the UK has identified that in some instances removing sheep completely from restoration areas was a key component for success.

‘In April 2003 a 31km fence was erected around a 25.5km² area of Bleaklow to prevent fresh young growth being eaten. This was funded via an ESA stock exclusion payment where the farming tenant was paid to keep sheep off the site. The fence is not a permanent structure and will be removed when it is deemed the moors are in favourable condition’.

The removal of sheep from the summits, ridges and damaged areas of the commonage is recommended. The removal of trespassing sheep from other adjoining lands and commonages may be achievable through active shepherding and by encouraging sheep off the summits and ridges and out of the commonage. Sheep belonging to the commonage could be encouraged to graze on the lower slopes either side of the zig zags to see if they have any impacts on the bracken here but it is recognised that the farm may not have sufficient grazing to enable the removal of sheep from above the 350m contour for a minimum of 2-3 years to allow recovery. Additional fodder could be purchased with funding from the SUAS project to allow this to happen.

Assessment of Deer Grazing Impacts

In order to determine the grazing impact of deer (and other browsers) on the ridge and implications for the recovery of the habitat it is recommended that a minimum of two deer exclosures are erected within the commonage; one on the ridge and one in the area of wet heath at the top of the zig zags where deer tend to congregate.

Stabilisation of Bare Peat

The Moors for the Future project in the UK has identified that the most important factor in revegetating damaged areas of blanket bog is the initial stabilisation of the areas of bare and eroding peat⁷. **It is critical that there is no burning on this commonage which would result in additional damage and losses of habitat.** This needs to be followed up by revegetation of those areas of bare peat on the bog surface. The surface of the bog needs to be revegetated to prevent further loss of peat and reduce erosion. The aim here is to restore montane blanket bog to a sward dominated by *Sphagnum* mosses, ling heather, crowberry, bog cottons, clubmosses and woolly hair moss (*Racomitrium lanuginosum*).

This should be achievable through natural reseeding and recolonising once browsing pressure is reduced however it might be desirable to introduce heather seed to those areas of blanket bog on the valley floor upstream of Kelly’s Lough where the adjoining areas are more grass dominated. Other SUAS project sites such as Powerscourt Paddock and Glasnamullen, which can be accessed by machines, could be used as donor sites for heather bales and heather brash. Best practice guidance on cutting, baling and collecting heather brash is available from the Moors for the Future project guidance documents⁸.

⁷ <http://www.moorsforthefuture.org.uk/repairing-bare-peat>

⁸ Moors for the Future. Heather Cutting – Factsheet. Available online from <http://www.moorsforthefuture.org.uk/factsheets>.

Increasing diversity

Some moorland plants may come into the sward through material present on the site (such as heather, mosses and lichens from the heather brash, cotton-grasses and wavy hair grass by seed and vegetative expansion). These can be facilitated by the addition of lime and fertiliser, which increases flowering and vegetative expansion. However, many other moorland species (e.g. bilberry, crowberry, cross-leaved heath) are much slower colonisers. These species, which are significant structural species, growing at different depths in the peat, need further interventions in order to colonise. These can be added as plug plants, grown by micro-propagation from material collected locally.

Sphagnum Moss Reintroduction

The most important group of species to re-introduce into the gully areas on the ridges once the erosion is reduced are *Sphagnum* mosses, both biologically and structurally. In order to get *Sphagnum* to establish, there must be adequate surface water for most of the year.

Sphagnum could be reintroduced to damaged areas on the commonage by the use of cultivated propagules (such as 'Beedamoss⁹'), *Sphagnum* plugs or by gathering *Sphagnum* from blanket bog on other parts of the nearby mountain ranges/commonages, which are undamaged.

Track Repairs

The condition of the walking tracks within the commonage should be assessed and the one up Corrig Na Greine towards Cloghernagh is in particular need of repair.

Further detailed information on these measures is presented in **Appendix 2**.

4.3 Measures for the Annex I Habitat 4060 Dry Heath

Measures for areas of overgrazed heather

The most critical measure that is required for the recovery of dry heath is a reduction in browsing pressure and no burning.

Stock need to be excluded from much of the commonage to allow the vegetation to recover. It was noted that sheep were congregating on the sheltered slopes at the back of Kelly's Lough with very significant impacts arising from same – it is here that the worst of the landslides are occurring.

This grazing pressure will prevent the recovery of habitat in this area and will result in the further loss of dry heath habitat and risk of erosion. Much of the grassland on these slopes is Mat grass (*Nardus stricta*), which is unpalatable to sheep.

Bracken invasion of dry heath

The areas of heath in the vicinity of Corrig Na Greine are being invaded by bracken. It is recommended that these areas are targeted for bracken control over the areas of dense bracken further downslope.

⁹ <http://www.beadamoss.co.uk/page19.html>



Plate 36. Mat grass on the slopes above Kelly's Lough.



Plate 37. Slips on the slopes behind Kelly's Lough.

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

The best area of the habitat **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** is found on the lower slopes of the south side of Cloghernagh.

The main challenge for managing the **4010 Northern Atlantic Wet Heaths with *Erica tetralix*** habitat is in restoring those areas at the top of the zig zags which have been damaged by and degraded by sheep and deer congregating in them. This will require active shepherding, controlling deer and hunting out trespassing sheep from adjoining commonages.

4.5 Control of ATVs

Damage by an ATV was noted in the vicinity of Kelly's Lough and this machine traversed across the commonage up onto the slopes of Cloghernagh and towards Lugnaquilla. This machine appears to have gained access from the adjacent Coillte plantation. Consultation and collaboration with Coillte regarding same is required to try and deter and discourage this activity. Reinstatement of the fence line (with provision of a stile for walkers) along the eastern end of Kelly's Lough on the Wicklow Mountains National Park lands may act as a deterrent to this activity.

4.6 Measures for Bracken Control

Areas of dense bracken occur within the commonage. Urgent consideration should be given to the control of bracken within the commonage where it is encroaching into areas of dry heath. Information and recommendations for bracken control from the Natural England Upland Management Handbook is provided in **Appendix 2** to inform same. Other areas could be planted with native woodland (such as the east facing slopes of Carrigshouk Mountain and adjoining the Inchavore Brook). Bracken was also beginning to encroach into the commonage from along the Duff Brook.

4.7 Upland Gully Woodland

Consideration should be given to the establishment of upland gully woodland on the lower slopes of the commonage (below the 350m contour) and extension of this habitat and the protection of any existing trees along watercourses in the site. Such woodland would further act as a protection forest for the communities in the Glenmalure Valley below in the same way that permanent forests are retained and managed to protect villages from avalanche risk in the Alps and other mountainous regions. These woodlands would also protect water quality within these streams and the Avonbeg River below the commonage as well as adding to the biodiversity of the uplands. Suitable species would include mountain ash (*Sorbus aucuparia*), willows (*Salix cinerea*), holly (*Ilex aquifolium*), whitebeam (*Sorbus aria*), birch (*Betula pubescens*) and ultimately oak (*Quercus petraea*), Scot's pine (*Pinus sylvestris*) and aspen (*Populus tremula*). Any trees and areas of natural regeneration will require protection from grazing animals including sheep and deer.

4.8 Track Repairs

The track on the Cloghernagh Ridge is in need of repair particularly on the section through Corrig Na Greine. Repair works similar to those used elsewhere within Wicklow Mountains National Park should be considered and discussed with Mountaineering Ireland and National Parks and Wildlife Service.

4.9 Sheep Trespass

Sheep (and goat) trespass on the hill from adjoining commonages is a potential threat to the recovery of habitats and will require management and ongoing monitoring.

4.10 Deer

Consideration should be given to deer management in the area in collaboration with other landowners/parties (Coillte/NPWS), the erection of exclosures within the commonage will give an indication of how significant grazing pressures are from same. Recording of deer numbers and locations on the hill will be required during active shepherding. This will assist in developing a deer management plan for the area.

4.11 Monitoring

Continued monitoring is required to determine how the vegetation recovers following over grazing and infrequent historic burning, the stabilisation and revegetation of eroding peat, the successes or otherwise of bracken control, the establishment and protection of upland woodland and what affect active shepherding of stock on the commonage has bearing in mind that there may be a considerable delay between changes in livestock levels and a response in the vegetation.

4.12 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.

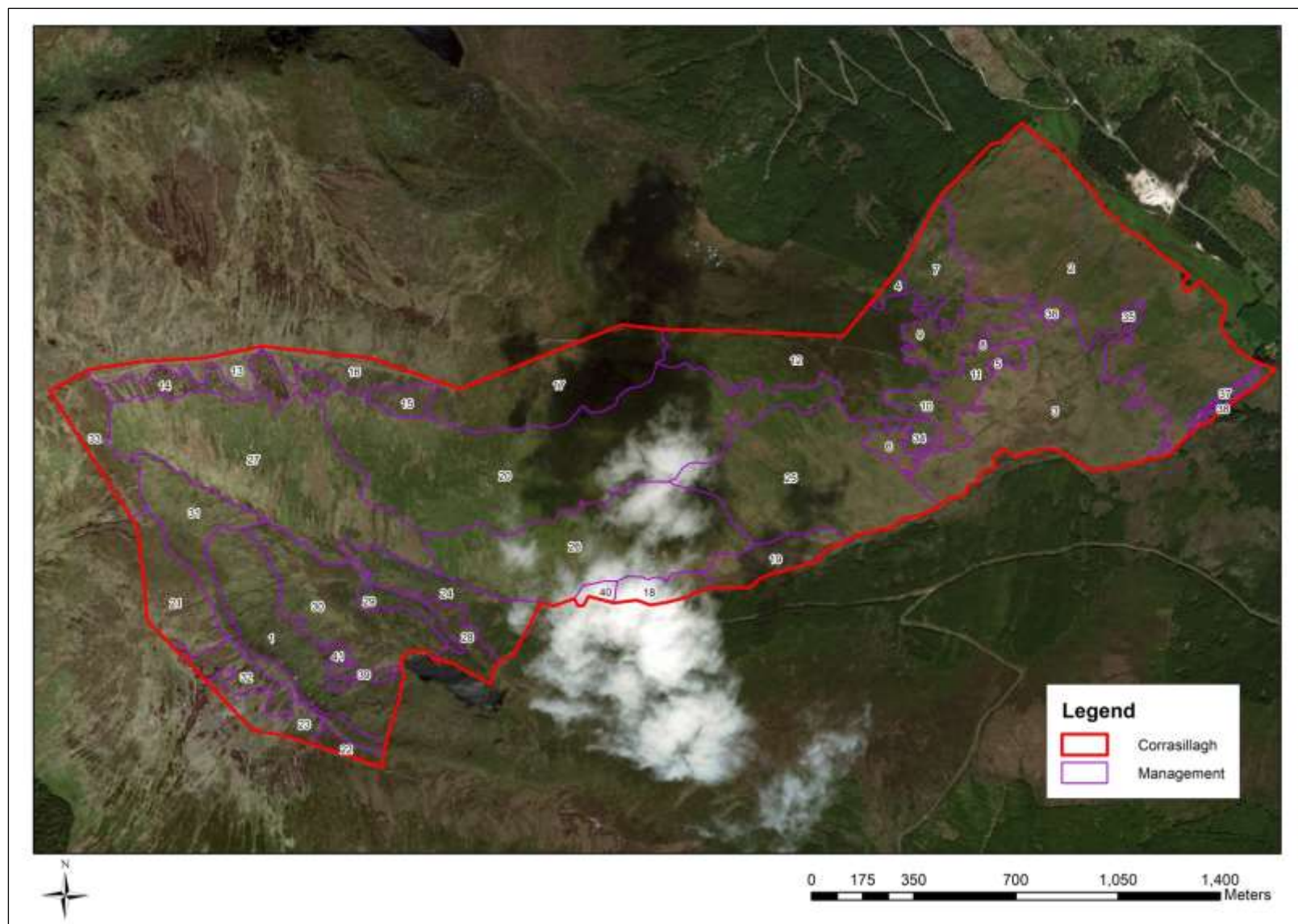


Figure 17. Management measures for Corrasillagh.

Table 4. Habitats present on Corrasillagh and Management Recommendations.

Id	Annex I Code	Fossitt Code	Area (m2)	Area (Ha)	Conservation Status Assessment	Management Prescription
1	6230/4030/8220	GS3/HH1/ER1	152973	15.30	Unfavourable - Bad	Destock Shepherd out trespassing sheep and deer Allow vegetation to recover and slopes to stabilise Peat restoration works higher on the ridge should also assist in reducing landslip risk
2		HD1/ER1/GS3	486222	48.62		Bracken Control Several options - see what impact sheep have, graze with cattle, spray bracken Remove self-seeded Sitka spruce Enter into the Native Woodland Scheme as a Protection Forest for the farm and valley Minor repairs to Zig Zags track - ongoing...
3	4010	HH3	274357	27.44	Unfavourable - Inadequate	Reduction in deer numbers Reduction in grazing pressure
4		HD1	6798	0.68		Control bracken
5		GS4/HH3	2461	0.25		
6		HD1	19268	1.93		Control bracken
7		HH3/PF2	59515	5.95		Reduction of browsing pressure from deer and sheep will aid this area
8		HH3	2139	0.21		Reduction of browsing pressure from deer and sheep will aid this area
9	4030	HH1/HD1/ER1	58978	5.90	Unfavourable - Inadequate	Control bracken Track repair works
10	4030	HH1/HD1/ER1	25951	2.60	Unfavourable - Inadequate	Control bracken
11		GS4/HH3	32833	3.28		
12	4030	HH1	196186	19.62	Favourable	Track repair works
13	4060	HH4	36452	3.65	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
14		PB5	59836	5.98	Unfavourable - Bad	Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
15		PB5	19399	1.94	Unfavourable - Inadequate	Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
16	4060	HH4/GS3	46484	4.65	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover

17	4030	HH1	163751	16.38	Favourable	Track repair works Destock/reduce grazing pressure to allow vegetation to continue to recover
18	4010	HH3/PF2	26464	2.65	Favourable	
19	4010	HH3	48288	4.83	Favourable	
20	4030	HH1/ER1/GS3	489178	48.92	Unfavourable - Inadequate	Reduction of browsing pressure from deer and sheep will aid this area
21	7130	PB2	77712	7.77	Unfavourable - Inadequate	Track repair works
22		PB5	12504	1.25	Unfavourable - Bad	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
23	4060	HH4	35534	3.55	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
24	4030	HH1/ER1	79394	7.94	Favourable	
25		GS3/HH1	260561	26.06	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover
26	4030	HH1/GS3	269969	27.00	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover
27	4030/6230	GS3/HH1	327416	32.74	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover Quad Damage
28	7130	PB2	30909	3.09	Unfavourable - Inadequate	Quad Damage
29	4030	HH1/ER1	19914	1.99	Favourable	
30	7130	PB2	137842	13.78	Unfavourable - Inadequate	Quad Damage
31	4030/6230	GS3/HH1	111777	11.18	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow vegetation to recover
32		PB5	38178	3.82	Unfavourable - Bad	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
33	7130	PB2	57105	5.71	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
34	4030	HH1/HD1/ER1	12580	1.26	Unfavourable - Inadequate	Control bracken
35		ER1	4906	0.49		
36		PF2	5549	0.55		
37		ER1	3128	0.31		
38		ER1	3352	0.34		

39		PF2	7525	0.75	Unfavourable - Inadequate	
40	4010	HH3/PF2	7766	0.78	Favourable	
41	4030	GS3/HH1/ER1	9264	0.93	Unfavourable - Inadequate	

5. Appendix 1. Historic Imagery of the Corrasillagh Commonage



Plate 1. OSI Aerial photography 1995.



Plate 2. OSI Aerial photography 2000.



Plate 3. OSI Aerial photography 2005.



Plate 4. OSI Aerial photography 2005 - 2012.

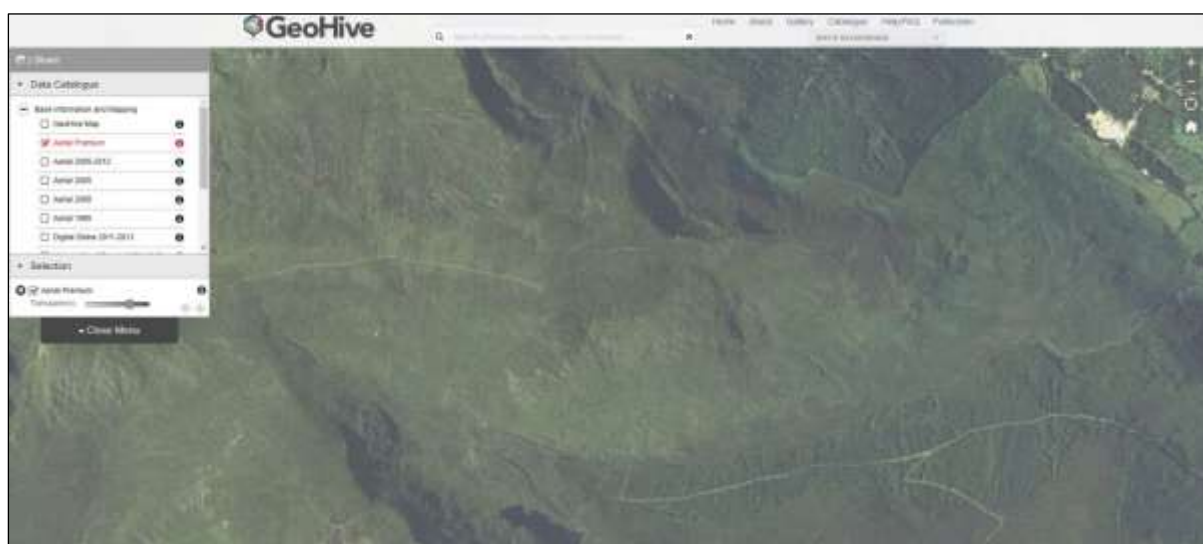


Plate 5. OSI Aerial Premium Photography.



Plate 6. Google Maps.