Ecological Baseline Survey

prepared for

Ballynultagh Commonage

as part of the Commonage Management Plan for SUAS

Final Report

9th December 2019

Faith Wilson BSc CEnv MCIEEM

Faith Wilson
ECOLOGICAL CONSULTANT

Faith Wilson Ecological Consultant BSc CEnv MCIEEM
Kestrel Ridge, Tigroney West, Avoca, Co. Wicklow

Ecological Baseline Survey

prepared for

Ballynultagh Commonage

as part of the Commonage Management Plan for SUAS

Table of Contents

Ecological Baseline Survey

prepared for

Ballynultagh Commonage

as part of the Commonage Management Plan for SUAS

1. Introduction

This small area of commonage (85 ha) extends from an elevation of 630m to the summit of Mullaghcleevaun East Top at 795m. The commonage adjoins the commonage of Carrigeenduff and is surrounded by open mountain lands as shown on **Figure 1** below.

Lands within the commonage are under the ownership of the state and are included within the boundaries of the Wicklow Mountains National Park.

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

The Lugaculleen Brook (also known as the Coultra Brook) rises within the commonage below Mullaghcleevaun East Top. This watercourse is a tributary of the Ballydonnell Brook, which enters the River Liffey upstream of Ballysmuttan Bridge. The River Liffey flows into Poulaphouca Reservoir – one of the main water supplies for Dublin City.

The commonage is underlain by Caledonian granite.

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 summit of Mullaghcleevaun East Top is covered in blanket peats of varying depths and some exposed rock.

The commonage is owned by National Parks and Wildlife Service. One local farmer has a right to graze on the commonage. He is Thomas Broe.

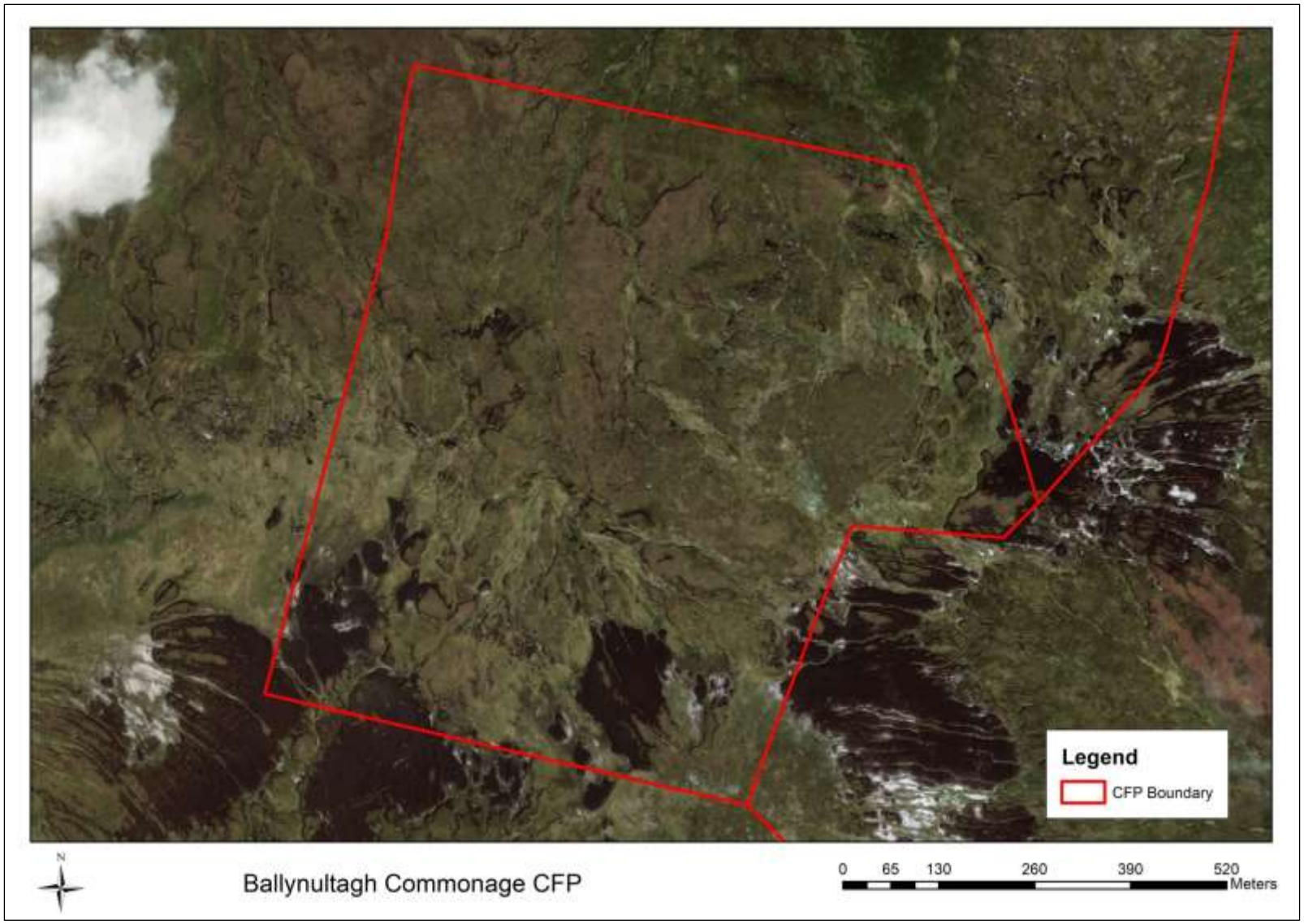

Figure 1. Ballynultagh Commonage.

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 maps from that survey in **Figure 2** below. This part of the commonage is included within section WI3c.

Figure 2. Commonage Framework Plan Map - (2001).

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

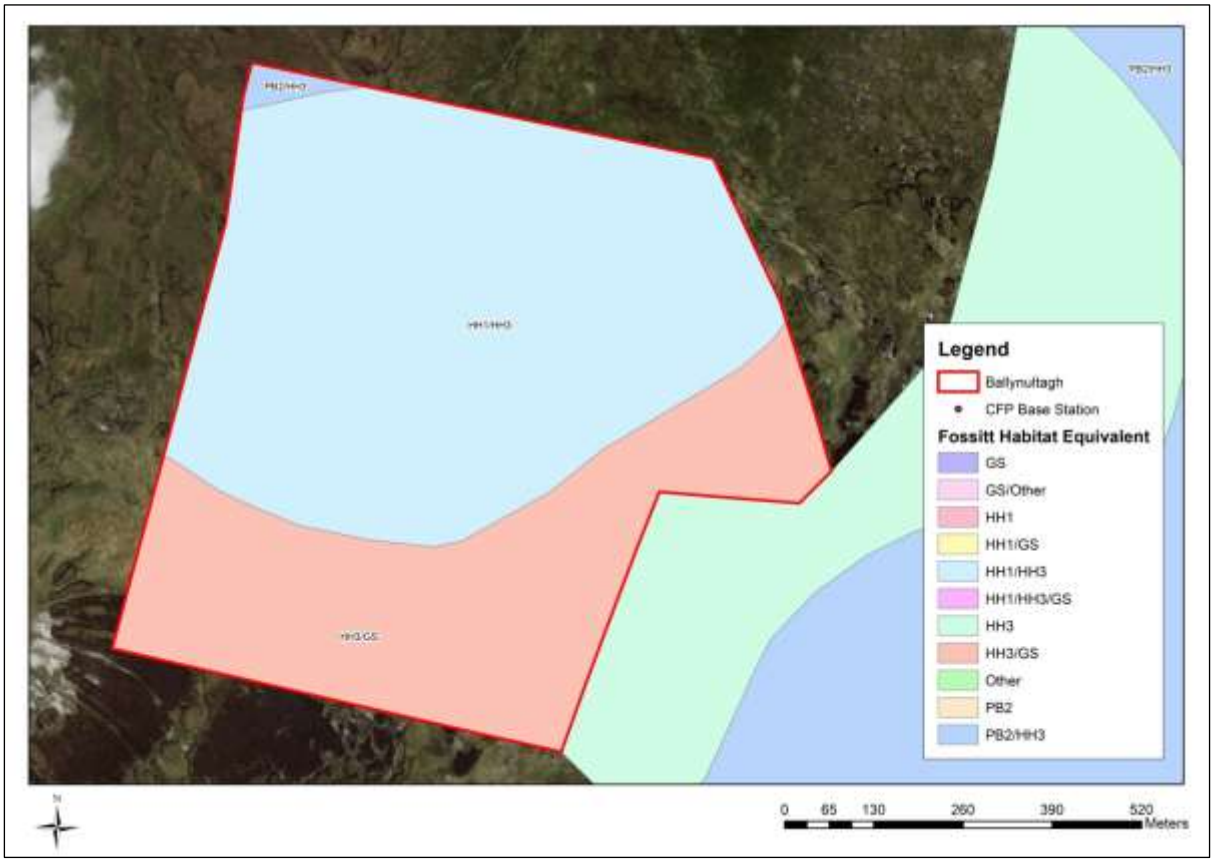

Figure 3. Commonage Framework Plan Habitat Map (2001).

This assessment identified that parts of the wider commonage was damaged from recent burns and recommended that a destocking rate of 2.094% was required to allow recovery. The climatic hagging and erosion on the ridge was noted.

Ballynultagh is located within section WI3c. The majority of the area was assessed as undamaged U, but plateau and gully erosion was noted on the summit and this area was assessed as MU – moderate to undamaged – see **Figure 4**.

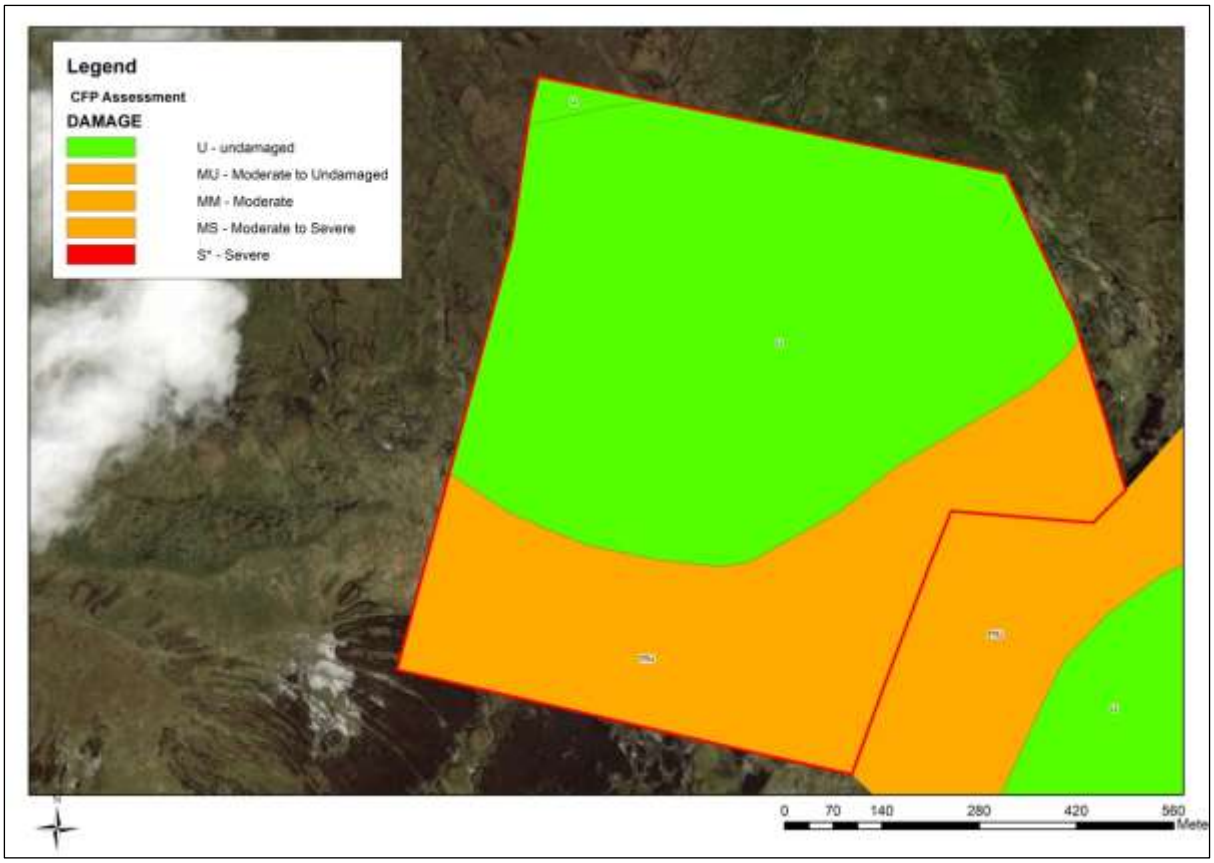

Figure 4. Commonage Framework Plan Damage Assessment.

2. Receiving Environment - 2019

2.1 Habitats Present

Under Fossitt's (2000) habitat classification scheme the dominant habitat within Ballynultagh commonage is that of **Dry Humid Acid Grassland GS3** found in a mosaic with **Montane Heath HH4** on the ridge and summit while below this are areas of **Upland Blanket Bog PB2** and **Eroding Blanket Bog PB5** with **Dry Heath HH1** on the peat hags.

The summit of Mullaghcleevaun East Top consists of peat substrate eroded to **gravel bed rock** (**ER1**) over 75% with scattered **eroding peat hags** (**PB5**). Peat hags 2m tall, 25% cover with vegetated tops and eroding bare peat flanks. Area is heavily deer and sheep grazed. Common Bent-grass (*Agrostis capillaris*), Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Mat-grass (*Nardus stricta*), Purple Moor-grass (*Molinia caerulea*), Soft Rush (*Juncus effusus*), Sheep's Fescue (*Festuca ovina*) and the moss *Polytrichum commune* remain on peat depths of <20cm. Vegetation on top of the peat hags consists of tightly cropped Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Crowberry (*Empetrum nigrum*), *Racomitrium lanuginosum,* Hare's tail cottongrass (*Eriophorum vaginatum*). There are numerous sheep tracks – the area is totally overgrazed and eroding. There is some trampling from walkers.

Plate 1. Looking across to the eroding slopes of Mullaghcleevaun from Mullaghcleevaun East Top.

Below the summit of Mullaghcleevaun East Top is an area of **Upland Blanket Bog PB2**. This area consists of Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Hare's tail cottongrass (*Eriophorum vaginatum*), Common cottongrass (*Eriophorum angustifolium*), Purple Moor-grass (*Molinia caerulea*), Heath Wood-rush (*Luzula multiflora*) and the mosses *Hypnum jutlandicum*, *Dicranum scoparium* and bog moss *Sphagnum subnitens*.

Plate 2. Blanket bog on the upper slopes of Mullaghcleevaun East Top.

This is blanket bog reverting to dry heath due to burning and overgrazing**.**

Below this there are large areas of exposed bare peat, peat hags, frequent outcropping granite rocks and patches of **Montane Heath HH4.** Within intact areas of Montane Heath there is abundant *Racomitrium lanuginosum*, with Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Crowberry (*Empetrum nigrum*), Hare's tail cottongrass (*Eriophorum vaginatum*), with Alpine Clubmoss (*Diphasiastrum alpinum*) and Heath Rush (*Juncus squarrosus*). Fir clubmoss (*Huperzia selago*) was also recorded.

In intact areas of Montane Heath Alpine Clubmoss (*Diphasiastrum alpinum*) and Fir clubmoss (*Huperzia selago*) are present along with the moss, *Racomitrium lanuginosum*. Other species present include, Ling heather (*Calluna vulgaris*), Crowberry (*Empetrum nigrum*) and Heath Rush (*Juncus squarrosus*). These areas essentially consist of eroded mountain bog which has revegetated with Montane Heath.

The proposed measures for the commonage are to target the expansion and restoration of Montane Heath into those eroded peat areas.

Plate 3. Areas of intact montane heath which have developed on eroded blanket bog.

Plate 4. Montane heath and acid grassland amidst exposed bare peat, peat hags and frequent outcropping granite bedrock.

Plate 5. Further downslope there are large areas of unvegetated eroding bog.

Plate 6. The col between Mullaghcleevaun East Top and Mullaghcleevaun with Montane Heath.

The col between Mullaghcleevaun East Top and Mullaghcleevaun is dominated by **Montane Heath HH4**. There is abundant *Racomitrium lanuginosum*, with Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Crowberry (*Empetrum nigrum*), Hare's tail cottongrass (*Eriophorum vaginatum*), with Alpine Clubmoss (*Diphasiastrum alpinum*) and Heath Rush (*Juncus squarrosus*).

Below this are large expanses of bare unvegetated eroding peat with numerous erosion gullies. From a distance it looks burnt, but it is completely unvegetated, erosion fields. This area must be re-vegetated to prevent continued erosion into the rivers below.

Further west towards Cleevaun Lough there is evidence of historic burning as can be seen in the condition of the sward which is uniform in height and becoming grass dominated.

Plate 7. Further west towards the cliffs above Cleevaun Lough - note grazing levels and erosion.

The lower slopes of the commonage consist of patches of **Upland Blanket Bog PB2** reverting to **Dry Heath HH1** due to burning and overgrazing. This area consists of Ling heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Hare's tail cottongrass (*Eriophorum vaginatum*), Common cottongrass (*Eriophorum angustifolium*), Purple Moor-grass (*Molinia caerulea*), Heath Wood-rush (*Luzula multiflora*) and the mosses *Hypnum jutlandicum*, *Dicranum scoparium* and bog moss *Sphagnum subnitens*.

A short sward of **Dry Heath HH1** is found on the steep slopes near Cleevaun Lough consisting of, Ling heather (*Calluna vulgaris*), Cross-leaved Heath *(Erica tetralix*), Bilberry (*Vaccinium myrtillus*), Purple Moor-grass (*Molinia caerulea*), Deergrass (*Trichophorum cespitosum*) and Tormentil (*Potentilla erecta*). Old burn indicated by uniform structure.

Uniform vegetation of Ling heather (*Calluna vulgaris*), Cross-leaved Heath *(Erica tetralix*), Bilberry (*Vaccinium myrtillus*) and Hare's tail cottongrass (*Eriophorum vaginatum*) with no moss present, indicates previous burning of the lower parts of the commonage. A small area, which escaped

burning contains of older Ling heather (*Calluna vulgaris*), Cross-leaved Heath *(Erica tetralix*) and Bilberry (*Vaccinium myrtillus*) along with Crowberry *(Empetrum nigrum*) and the moss *Racomitrium lanuginosum.*

Plate 8. Blanket bog damaged by burning overlooking Cleevaun Lough – note significant erosion in the vicinity of same.

Further east near where the watercourse rises in the site the slopes are dominated by **Eroding Blanket Bog PB5** with Ling heather (*Calluna vulgaris*), Cross-leaved Heath *(Erica tetralix*), Bilberry (*Vaccinium myrtillus*), Hare's tail cottongrass (*Eriophorum vaginatum*), Deergrass (*Trichophorum cespitosum*), Crowberry (*Empetrum nigrum*) and the bog moss *Sphagnum papillosum* within vegetated erosion gullies.

The commonage has been subject to various damaging activities in the past including illegal burning, over grazing, natural erosion and some trampling from walkers. A number of landslide events have been noted in the commonage and these were mapped by the Geological Survey of Ireland as shown on **Figure 9**. This area is at high risk of continued landslide events as shown on **Figure 10**.

Plate 9. Eroding blanket bog damaged by burning.

Plate 10. Eroding blanket bog and high grazing levels.

This area was historically managed for deer stalking and shooting of grouse. But, more recently grazing by sheep has escalated and large numbers of animals have been stocked here. In 30 years, there has been a very marked degradation in the vegetation cover on all of the peaks and ridges stretching from Sally Gap to Tonelagee and significant erosion has taken place resulting in much bare peat and the exposure of the underlying bedrock. This is now eroding away and is being mineralised. It would seem that the primary impetus to erosion has come from direct grazing by animals and from them using the remaining hags for shelter. The frequency of burning has also increased and the burning in 2007 was extremely extensive across an area of approximately 30km square. Hill walking has also increased in the area.

Plate 10. Grazing damage from sheep continue to impact the recovery of these areas.

The commonage has been subject to illegal and uncontrolled burns in the last twenty years as evidenced by the condition of the vegetation and the National Parks and Wildlife Service history of site management files as shown on **Figure 5.** These burns have been documented since the 1990s, occurring notably in 2007. There has been little opportunity for the recovery of the moss and lichen communities in the habitats in this commonage as a result of the intensity of these burns coupled with the ongoing presence of sheep and deer on these hills as their grazing pressure reduces the opportunity for the hill to recover and exacerbates erosion. Information provided by members of the adjacent Carrigeenduff Commonage reported a fire in 1977 that started in the adjoining forestry, escaped uncontrolled onto the hill and burnt the entire ridge. As it was a summer fire the peat itself

burnt and it was reported that it burned for several weeks, which would explain the severity of the peat erosion on the ridge.

The various stream and 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:

- 4030 Dry Heath
- 4060 Alpine and Boreal Heaths
- 7130 Blanket Bog (damaged)

The majority of the areas of upland blanket bog in this area are now so badly damaged from burning and over grazing that they often no longer correspond to the habitat **7130 Blanket Bog** and are best described as **Eroding Blanket Bog PB5**. Large areas of the habitat **4060 Alpine and Boreal Heaths** are also at risk of erosion and are damaged by burning and overgrazing. The areas of **4030 Dry Heath** have been also been burnt, which followed by inappropriate grazing means these areas are now dominated by unpalatable grasses in some places or are reverting to acid grassland with suebsequent losses of the Annex I habitat.

2.2 Rare Plants

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

Plate 31. Fir clubmoss (*Huperzia selago*) amidst montane heath on the summit of Mullaghcleevaun East Top.

Figure 5. Indicative burn history and extent on Ballynultagh as recorded by National Parks and Wildlife.

The Montane Flora of Wicklow Survey[1] conducted in 2009 reported that:

> 'Only 4 of the 10 alpine plants noted from the area were re-located and it is clear that species such as *Carex bigelowii* which was formerly recorded from the summit of Mullaghcleevaun has gone due to over-grazing and possibly trampling. The filmy fern, *Hymenophyllum wilsonii* is known from around Cleevaun Lough which was not visited whilst *Listera cordata*, as at other sites, could be located in season under the still intact areas of tall heather. *Saxifraga stellaris* was not located even though suitable habitat for it exists along the streams draining Mullaghcleevaun. *Salix herbacea* was previously known from East Top where it is probably gone due to erosion'.

These alpine species have been lost as a result of repeated burning and over grazing.

2.3 Rare Fauna

The commonage is within the known range of Merlin (*Falco columbarius*) and Kestrel (*Falco tinnunculus*) was recorded during the site surveys.

Large herds of deer (red/Sika hybrids) graze the commonage and their impacts are signficiant. Other faunal records recorded during this survey include Common Frog (*Rana temporaria*), Meadow Pipit (*Anthus pratensis*), skylark (*Alauda arvensis*), Stonechat (*Saxicola rubicola*) and Raven (*Corvus corax*). Cuckoo (*Cuculus canorus*) was heard and hunting Kestrel (*Falco tinnunculus*) was seen on the adjoining commonage at Carrigeenduff. Common Lizard (*Zootoca vivipara*), Red Grouse (*Lagopus lagopus*), and the Irish Hare (*Lepus timidus* subsp. *hibernicus*) would also be expected on this commonage.

Red Grouse were recorded during the present survey on the adjoining commonage at Carrigeenduff. Indicative estimates of the population of Red Grouse within the Wicklow Mountains SPA is extracted below in **Table 1** from the 2011 survey[2].

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 ± CL's	Total Males ± CL's	Population Estimate (correction factor*) ± 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*

2.4 Fisheries and Water Quality

The commonage is located within the Eastern River Basin District within the Liffey and Dublin Bay catchment (09) and the Liffey Sub-catchment (SC010).

The Lugaculleen Brook (also known as the Coultra Brook) rises within the commonage below Mullaghcleevaun East Top. This watercourse is a tributary of the Ballydonnell Brook, which enters the River Liffey upstream of Ballysmuttan Bridge.

---

[1] Curtis, T.G.F and F. Wilson (2009). The Montane Flora of County Wicklow. Unpublished report for The Heritage Council.

[2] 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.

Water sampling on the Liffey River at Oldbridge, just downstream of Lough Dan (and downstream of the commonage) indicates that the Avonmore River at this location is currently assigned a Q value of 4.

The Ballydonnell Brook (and its smaller tributaries within the commonage) were deemed to be 'Moderate Status' watercourses in 2007 – 2009. They improved in water quality since then and were assessed as 'Good Status' watercourses in 2010 – 2012 and 2010 - 2015. Under the Water Framework Directive the watercourses within the commonage were deemed 'at risk' of not achieving 'good' status and are down for review.

2.5 Recreation/Amenity

The commonage provides hillwalking access to several popular walking routes in the Wicklow uplands including the summits of Carrigshouk Mountain and Mullaghcleevaun East Top, and the ridges south to Mullaghcleevaun, Barnacullia, Stoney Top and Tonelagee and north east to Duff Hill, Gravale and Conavalla.

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 6, 7** and **8** below and as described above.

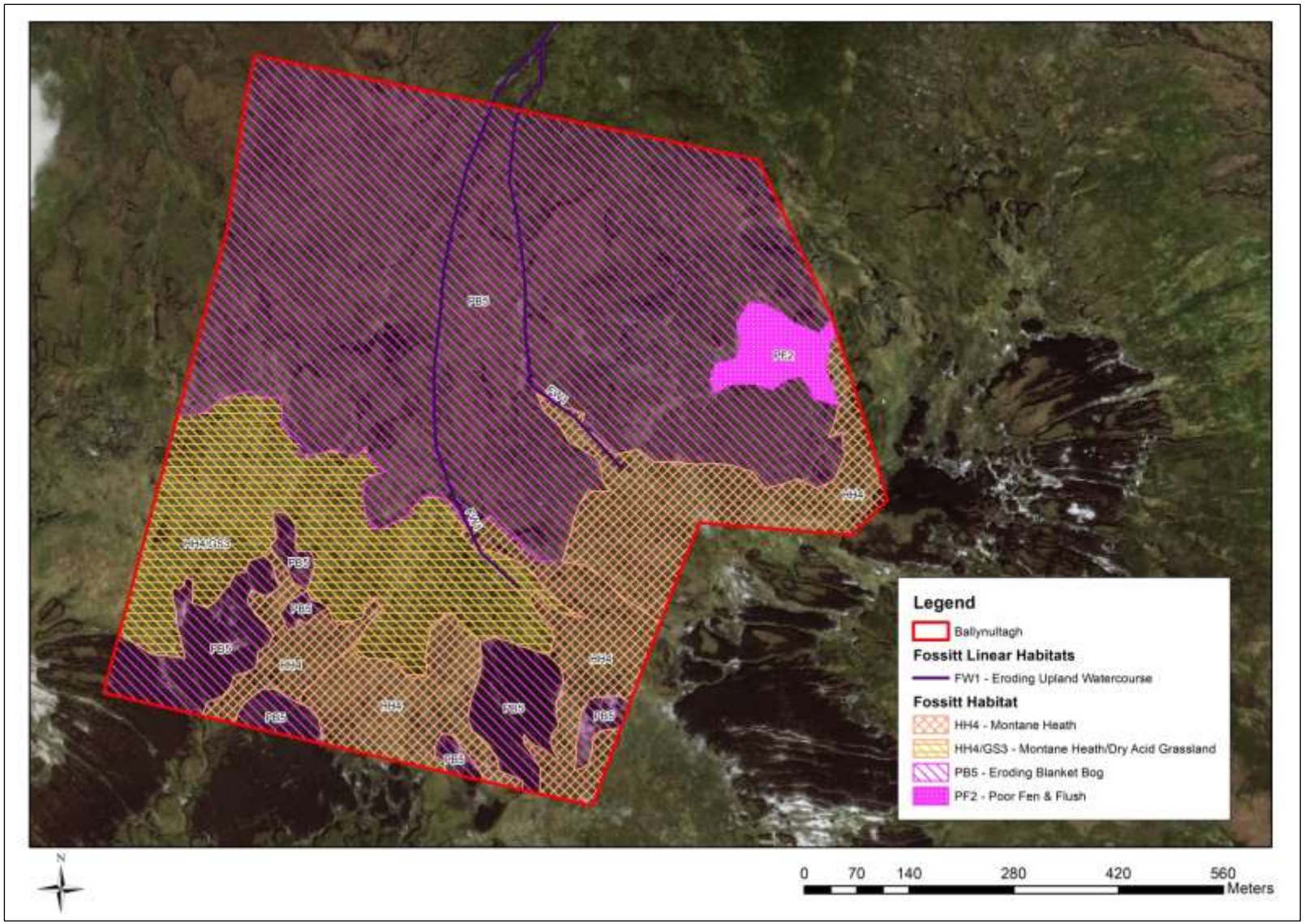

Figure 6. Habitats mapped to Level Three (Fossitt, 2000) within the Ballynultagh commonage.

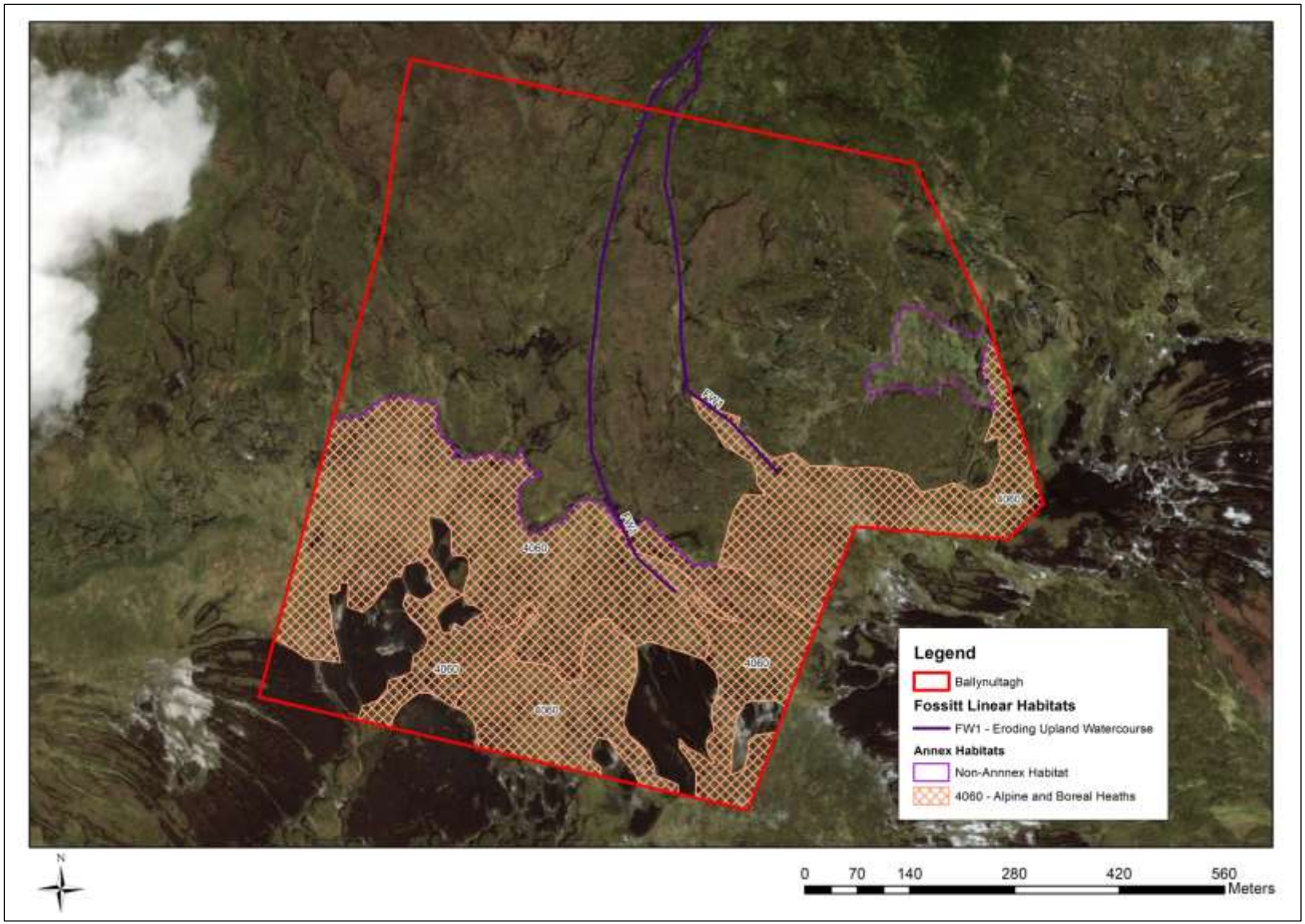

Figure 7. Habitats mapped according to their correspondence with Annex I habitats within the Ballynultagh commonage.

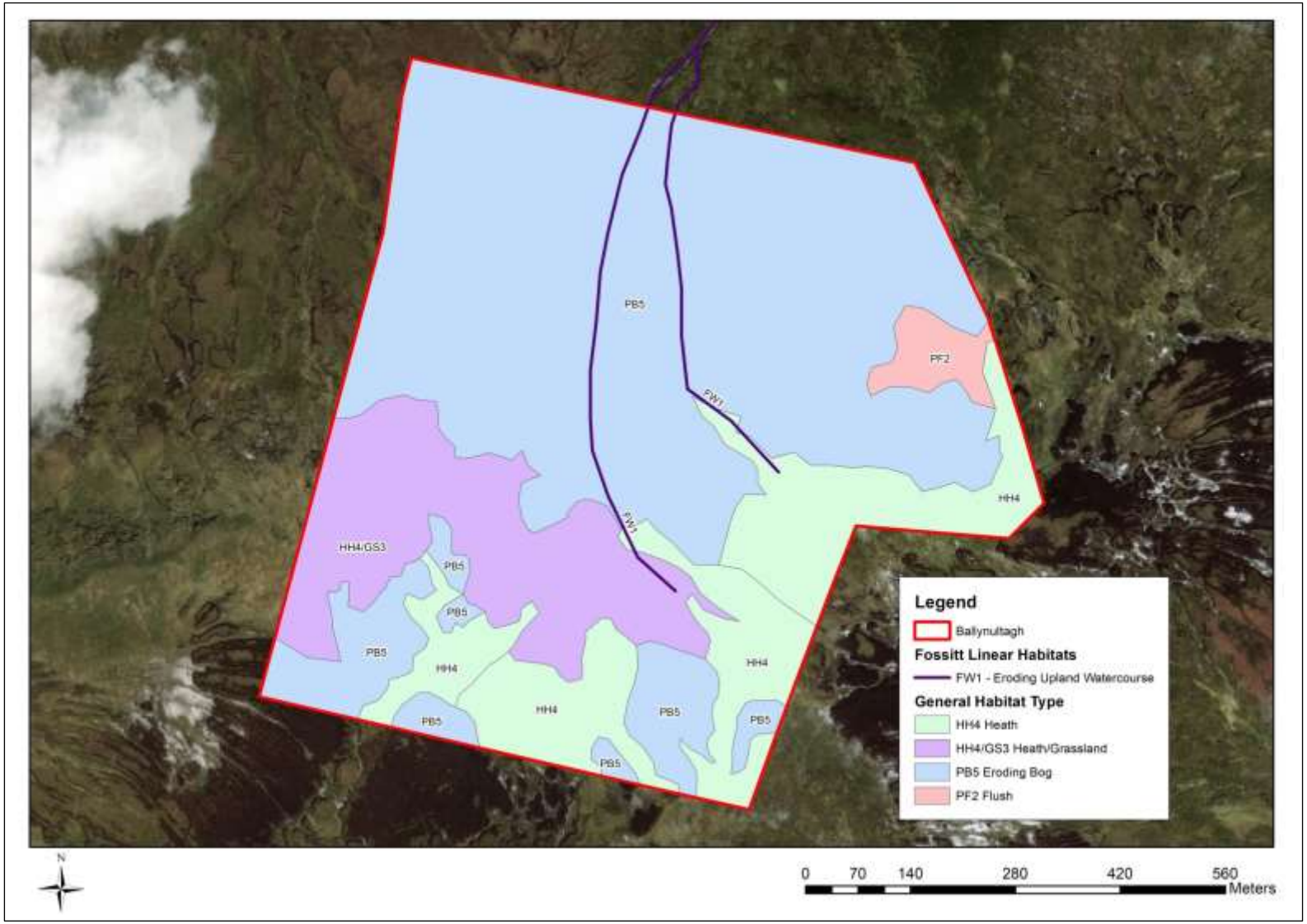

Figure 8. Habitats mapped using general vegetation descriptions.

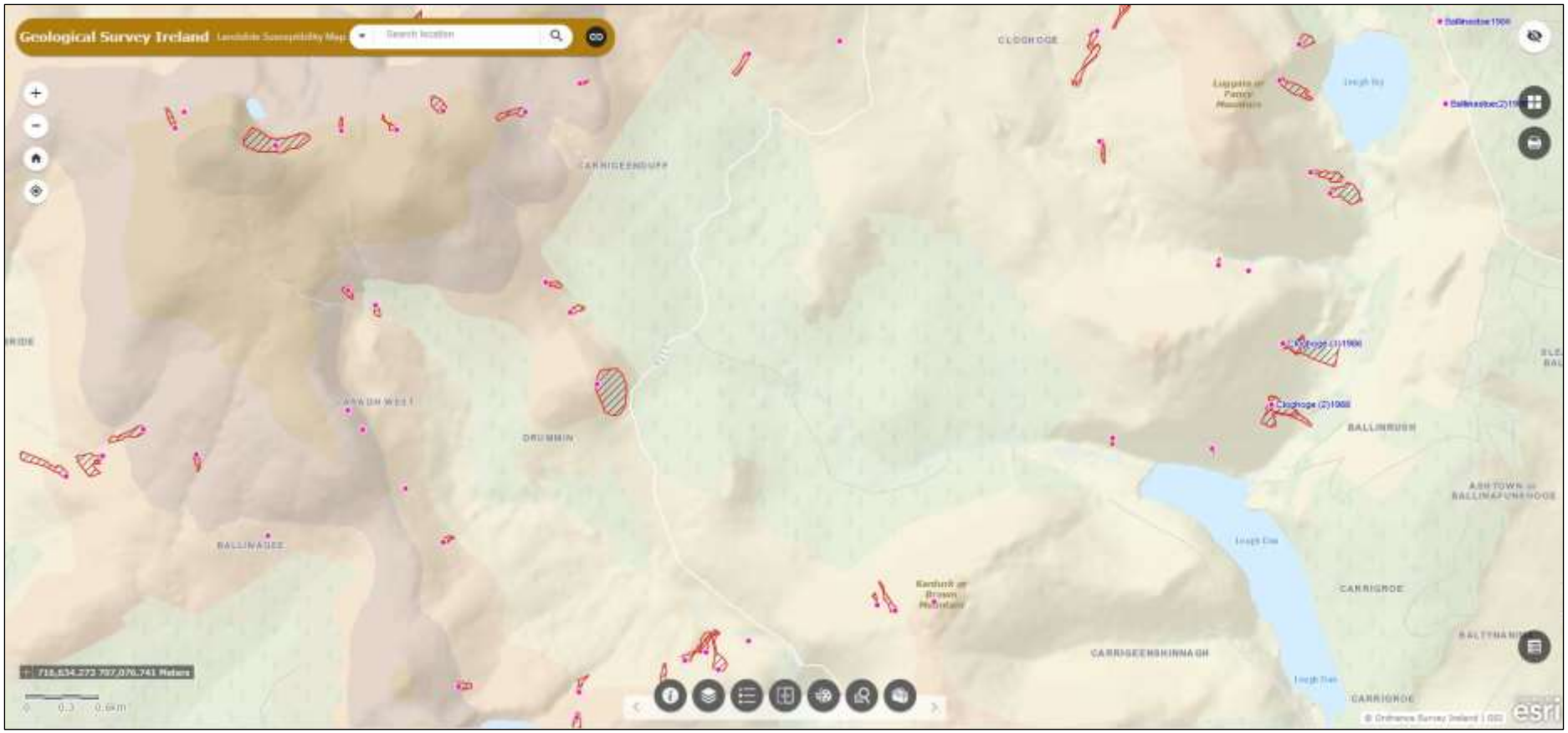

Figure 9. Landslide events recorded by the Geological Survey of Ireland on Ballynultagh Commonage.

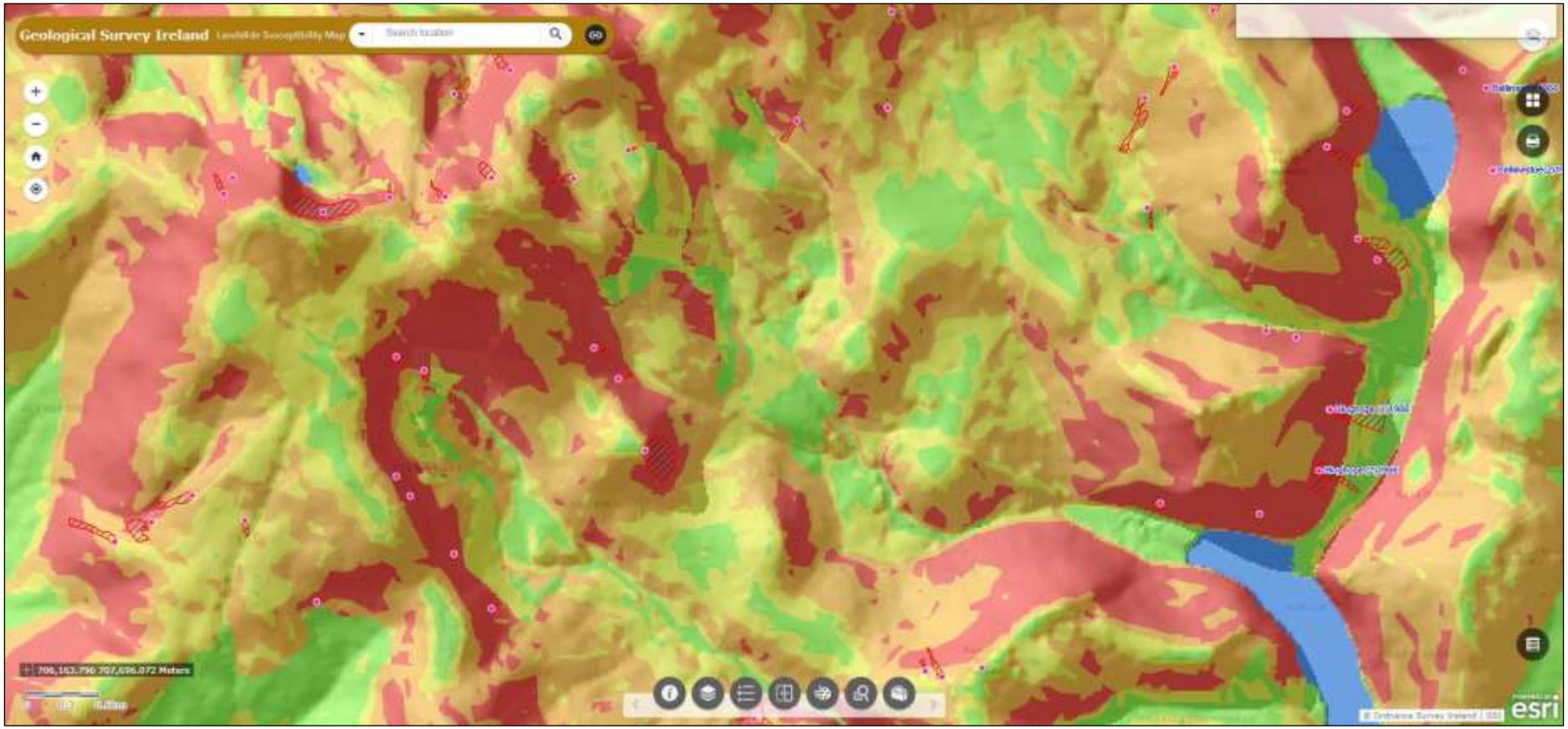

Figure 10. Landslide susceptibility mapping prepared by the Geological Survey of Ireland.

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 rock-climbing, 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 (4060 Alpine and Boreal Heath and 7130 Blanket Bog). The number of monitoring stops completed depended on the size of the habitat. These are detailed below.

For those habitats which are not Annex I habitats such as acid grassland or damaged blanket bog 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 11** below.

3.2.1 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 3.2.1**.

Table 3.2.1: 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 ≥ 66% (Appendix VI)	Relevé	2	0	0
3. Cover of dwarf shrubs ≥ 10%	Relevé	2	1	50
4. Cover of the following negative indicator species: *Agrostis capillaris, A. vinealis, Anthoxanthum odoratum, Deschampsia flexuosa, Festuca ovina, F. vivipara, Galium saxatile, Potentilla erecta* and *Poa* spp. (except *Poa alpina*) collectively < 10%	Relevé	2	0	0
5. Cover of non-native species < 1%	Relevé	2	0	0
Vegetation structure				
6. Live leaves of *Carex bigelowii, Deschampsia flexuosa, Festuca ovina, F. vivipara* showing signs of grazing collectively <10%	Relevé	2	0	0
7. Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33% (Assess a minimum of 10 shoots distributed across the plot)	Relevé	2	1	50
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	1	50

Area

A review of the aerial photography from the 1990s and other data sources for the commonage indicate that there has been a loss in the overall area of montane heath in the commonage. This loss is in the vicinity of the summit of Mullaghcleevaun East Top and the col between it and Mullaghcleevaun arising from burning, 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%. The structure and functions of **4060 Alpine and Boreal Heath** were therefore assessed as **Unfavourable – Bad**. The vegetation composition of **4060 Alpine and Boreal Heath** was often poor on account of overgrazing and the impact of historic burns.

Gazing pressure within the commonage was high and the vegetation structure of the habitat has been compromised from erosion resulting in exposure of soil and in some locations the siliceous subsoil and granite bedrock beneath. Much of this activity has been exacerbated by the presence of grazing animals and is further compounded by natural erosion. There are localised impacts from walking tracks on the summit of Mullaghcleevaun East Top. The loss of several key indicator species of **4060 Alpine and Boreal Heath** (as documented by Curtis & Wilson, 2008) is also indicative of the poor condition of this habitat.

Future Prospects

The future prospects for the habitat **4060 Alpine and Boreal Heath** are assessed as **Unfavourable – 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 assessed as **Unfavourable – Bad**.

Plate 34. Areas of eroding montane heath.

3.2.2 7130 Blanket Bog

A total of 2 monitoring stops were recorded within the small areas of **7130 Blanket Bog** habitat within the commonage. The results of the 2 monitoring stops are presented below in **Table 3.2.2**. The areas of eroding and cutover bog were not assessed as part of this assessment.

Table 3.2.2: 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	2	100
2. Cover of bryophyte or lichen species, excluding *Sphagnum fallax* ≥ 10%	Relevé	2	2	100
3. Cover of each of the following species: *Calluna vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum* individually < 75%	Relevé	2	0	0
4. Cover of the following negative indicator species: *Agrostis capillaris, Holcus lanatus, Phragmites australis, Pteridium aquilinum, Ranunculus repens* 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 *Sphagnum* species < 10% of *Sphagnum* cover	Local vicinity	2	1	50
9. Last complete growing season's shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing collectively < 33% (Assess a minimum of 10 shoots distributed across the plot)	Relevé	2	1	50
10. No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Relevé	2	1	50
11. No signs of burning inside boundaries of sensitive areas[3]	Local vicinity	2	1	50
Physical structure				
12. Cover of disturbed bare ground < 10%	Relevé	2	1	50
13. Cover of disturbed bare ground < 10%	Local vicinity	2	1	50
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[4] < 5%	Local vicinity	2	1	50

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 in the commonage, which would have resulted in localised losses of blanket bog habitat (see **Figure 9**). The field surveys confirmed that erosion is ongoing in these areas as evidenced by the extensive areas of bare peat, gullies, and erosion of the peat surface on the ridge. The situation has worsened since the Montane Flora of Wicklow Survey in 2008 (pers. obs). For this reason the overall area of **7130 Blanket Bog** within the commonage was therefore assessed as **Unfavourable – Bad** as large areas of habitat are being eroded.

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 should be made, resulting in an overall failure rate of 100%. The structure and functions of **7130 Blanket Bog** were therefore assessed as **Unfavourable – Bad**.

The vegetation composition of **7130 Blanket Bog** was often poor and both monitoring stops failed on account of lack of indicator species, lack of bryophytes or lichens. This is on account of the intensity, and severity of the burns experienced by the habitat coupled with grazing pressure from sheep (and deer).

The vegetation structure of **7130 Blanket Bog** was failed on account of grazing pressure and historic burning. The physical structure of the bog with significant areas of bare eroding peat and eroding gullies also caused stops to fail.

[3] 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, haggs 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.

[4] 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.

A history of uncontrolled burns, coupled with 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 worst affected areas were those on the summits and ridge between Mullaghcleevaun East Top and Mullaghcleevaun where a legacy of burning, inappropriate grazing, exposure and natural erosion has resulted in large areas of damaged and eroding blanket bog with remnant peat hags some 2m above surrounding areas. This area was assessed as **Unfavourable – Bad.**

Whilst the CFP recommended reductions in stock this would not have been implemented as only areas with a destocking rate of >10% were actually destocked. The current condition of the habitat in much of the commonage is overall in very poor condition and has further declined since that assessment in 2001. There is some damage from walkers but in light of that caused by burning and inappropriate grazing 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 to stop the peat further eroding.

Conservation Status Assessment
Overall the conservation status assessment for blanket bog habitat within the commonage is assessed as **Unfavourable – Bad.**

The results of these assessments are presented on Figure 11 below. Active measures by the members of the commonage framework groups as set out in the management recommendations will assist in beginning to improve the conservation status of the habitats within Ballynultagh. However it should be recognised that it may take in some instances over twenty to thirty years for habitats to begin to recover following uncontrolled burning coupled with the effects of grazing and natural erosion and will require active measures to reverse this.

A combination of parameters will need to be addressed to see a move towards habitat recovery (e.g. restoration of vegetation on areas of eroding peat, appropriate grazing levels (sheep/deer/sheep in combination with deer), reintroduction of seed material where a species has been lost/has declined to such an extent that seed production is low, etc.) and in some instances factors outside the site (and beyond the control of the commonage group) may be having a negative effect (such as natural erosion, the deposition of atmospheric nitrogen, etc.).

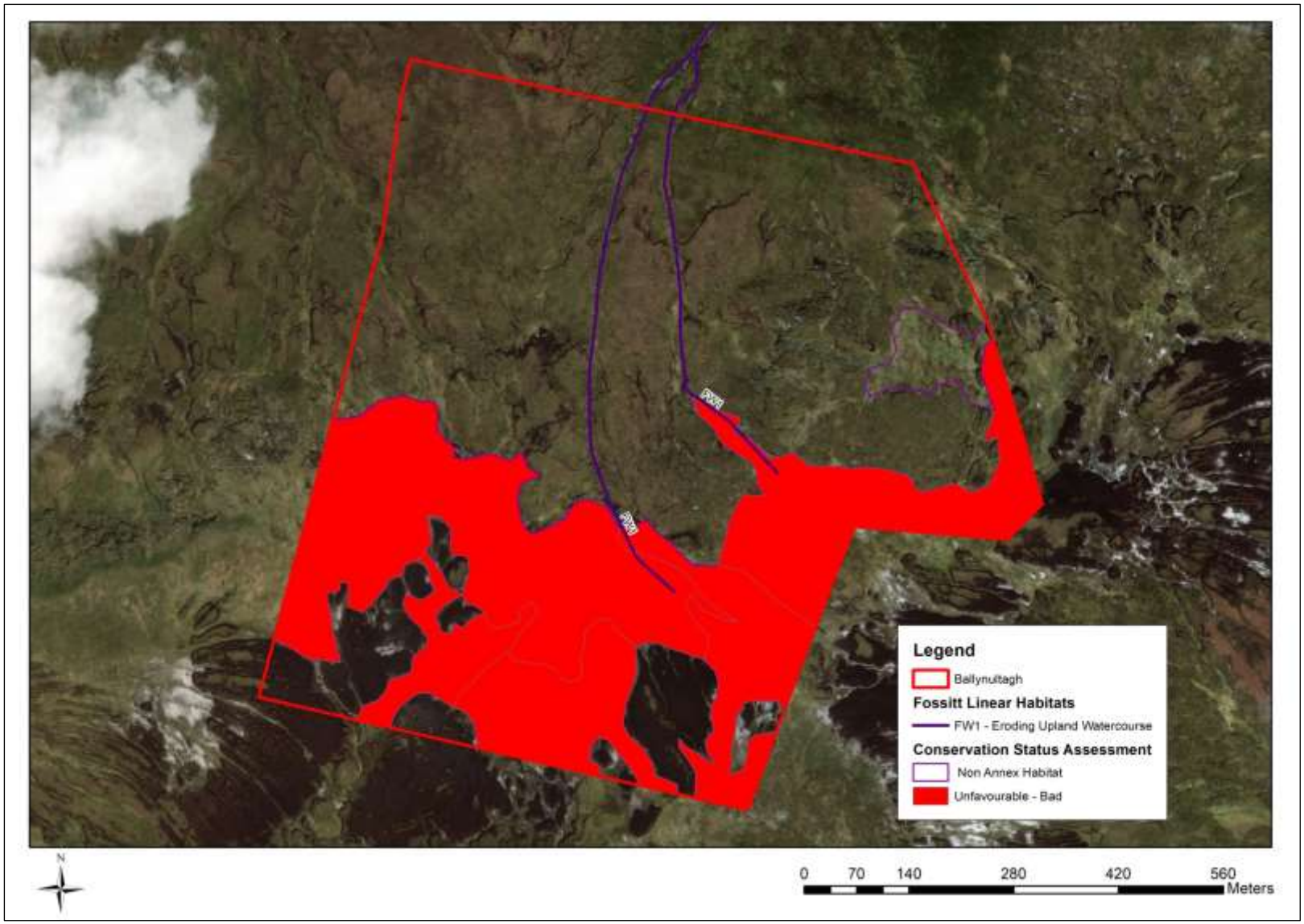

Figure 11. Habitat Condition Assessment for the Annex I habitats within Ballynultagh Commonage.

4. Management Recommendations for Ballynultagh

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 severely damaged Blanket Bog and Alpine and Boreal Heath in the long term as well as protection of the existing acid grassland resource/areas of dry heath.

The major impacts arise from a legacy of decades of uncontrolled burning resulting in extensive areas of peat erosion along the summits and ridges (impacting on upland blanket bog and montane heath) with subsequent severe peat erosion, damage and losses. Inappropriate grazing (from sheep and also from deer) which has not allowed burnt areas to recover is also contributing to erosion on the ridges and summits coupled with natural exposure and erosion following burning activities.

The levels of livestock grazing (by sheep) were initially assessed through the Commonage Management Plan drawn up in the early 2000s. The CFP recommended minor reductions in stock but this destocking would not have occurred. Continued grazing and burning, coupled with trespass from other commonages and an increasing deer population in the area have negated any destocking effects. The Commonage Management Plan also clearly set out that uncontrolled burning would not be allowed, which has clearly been flagrantly ignored since then with frequent burning on the lower slopes of the commonage. As a result the majority of the habitat areas within the commonage are currently assessed as being in **Bad Status.**

There must be no further burning on this commonage and the hill must be destocked until these habitats recover.

The summit of Mullaghcleevaun East Top and the ridge and col between it and Mullaghcleevaun is in very poor ecological condition and these areas should be the focus of specific measures by the project as they are vulnerable to ongoing severe peat erosion and landslides. These areas of eroding blanket bog and montane heath should have all sheep and other grazing animals (such as deer) removed from them by completely destocking this portion of the hill, shepherding animals off the ridges and by 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 in this area are harder to resolve. In order to determine the grazing impact of deer in these areas it is recommended that an exclosure is erected, which would allow changes in vegetation to be monitored. This 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 most damaged areas on the summit, ridge and col will require urgent measures to stabilise eroding peat 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 10**).

The various parts of the commonage requiring specific management are mapped on **Figure 12** 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 blanket bog within the commonage will require a number of measures including elimination of burning, 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.

Information on the restoration of hydrology and vegetation 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 in the col and on the ridge and summit 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.

The object here would be to stabilise the eroding peat and see it revegetated to ultimately form areas of montane heath habitat.

Removal of Sheep

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 summit, col, ridge and damaged areas of the commonage is required. The removal of trespassing sheep from other commonages may be achievable through active shepherding and encouraging sheep off the summits and ridges and to use the lower slopes of the commonage.

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 deer exclosure is erected. This could be done collaboratively with the neighbouring commonage group on Carrigeenduff.

Stabilisation of Bare Peat

The Moors for the Future project in the UK has identified that the most important factor in re-vegetating damaged areas of blanket bog is the initial stabilisation of the areas of bare and eroding peat[5]. **It is critical that there is no more burning or grazing on this commonage to allow the vegetation to recover.** 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 heath/montane blanket bog to a sward dominated by *Sphagnum* mosses, ling heather, crowberry, bog cottons, clubmosses and woolly hair moss (*Racomitrium lanuginosum*).

National Parks and Wildlife Service could consider partnering with the project to assist with some of the logistics for the habitat restoration such as the helicopter flights to bring jute matting or similar

[5] http://www.moorsforthefuture.org.uk/repairing-bare-peat

onto the ridge and summit, with its erection, the collection of seed material and spreading of same delivered by the commonage groups.

Increasing diversity
Some moorland plants may come into the sward through material present in unburnt areas 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. As documented in the Wicklow Montane Flora Study only 4 of the 10 alpine plants noted historically from the area were re-located.

Sphagnum Moss Reintroduction
The most important group of species to re-introduce on deeper peats on the ridge 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 'Beedamoss[6]'), *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 track should be monitored and may be in need of repair.

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

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

4.4 Deer
Consideration should be given to deer management in the area in collaboration with other landowners/parties (Coillte/NPWS), the erection of exclosures on the ridge in collaboration with the adjoining commonage group 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.

4.5 Monitoring
Continued monitoring is required to determine how the vegetation recovers following historic burning, the stabilisation and revegetation of eroding peat, 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.

4.6 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.

[6] http://www.beadamoss.co.uk/page19.html

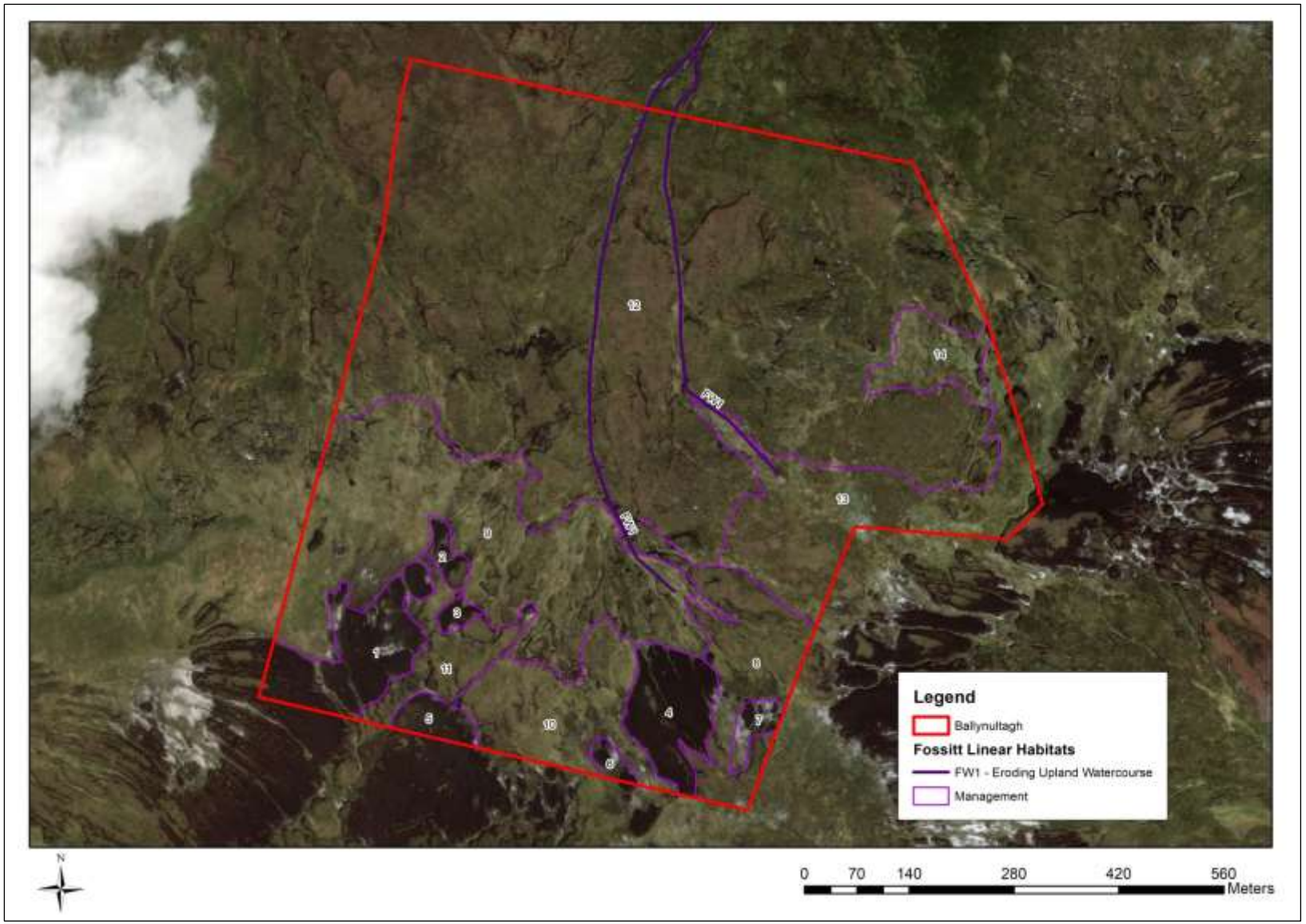

Figure 20. Management Recommendations for Ballynultagh.

Table 4. Management Recommendations for Ballynultagh.

Area	Recommendation
All	No further burning
All	Destock the hill of grazing animals and allow the habitats to recover
All	Control deer
All	Shepherd out trespassing sheep
8, 9, 12	Restoration measures for eroding bog
1, 2, 3, 4, 5, 6, 7	Restoration measures for areas of bare peat
8, 9, 10, 11, 13	Restoration measures for areas of montane heath
10	Erect deer exclosures to determine effects of deer and trespassing sheep

5. Appendix 1. Historic Imagery of the Ballynultagh Commonage

Plate 1. OSI Aerial photography 1995.

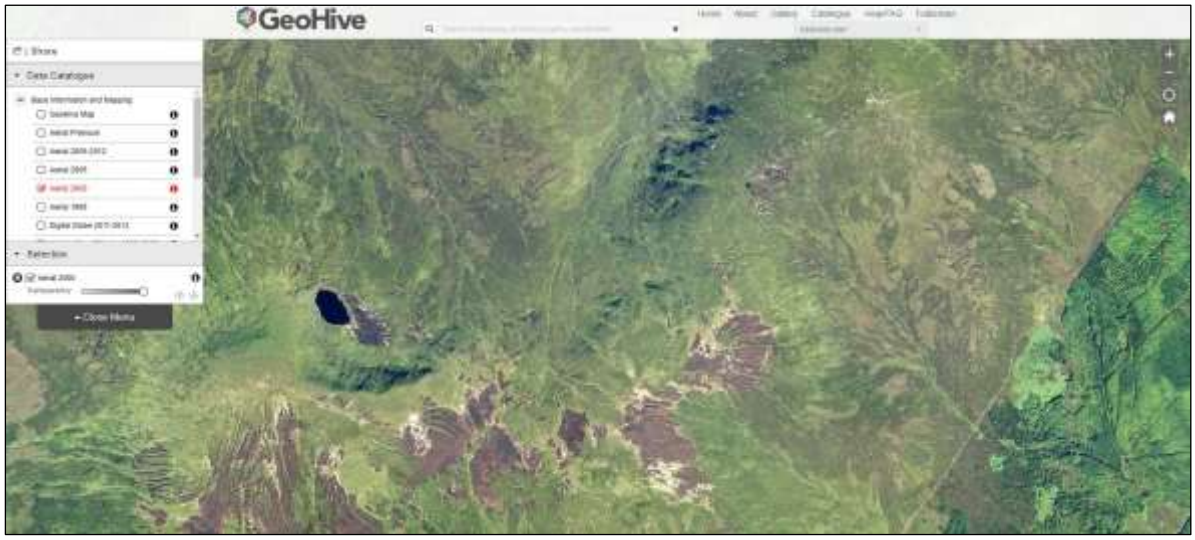

Plate 2. OSI Aerial photography 2000.

Plate 3. OSI Aerial photography 2005.

Plate 4. OSI Aerial photography 2005 - 2012.

Plate 5. May 2009 (Source: Google Earth Image).