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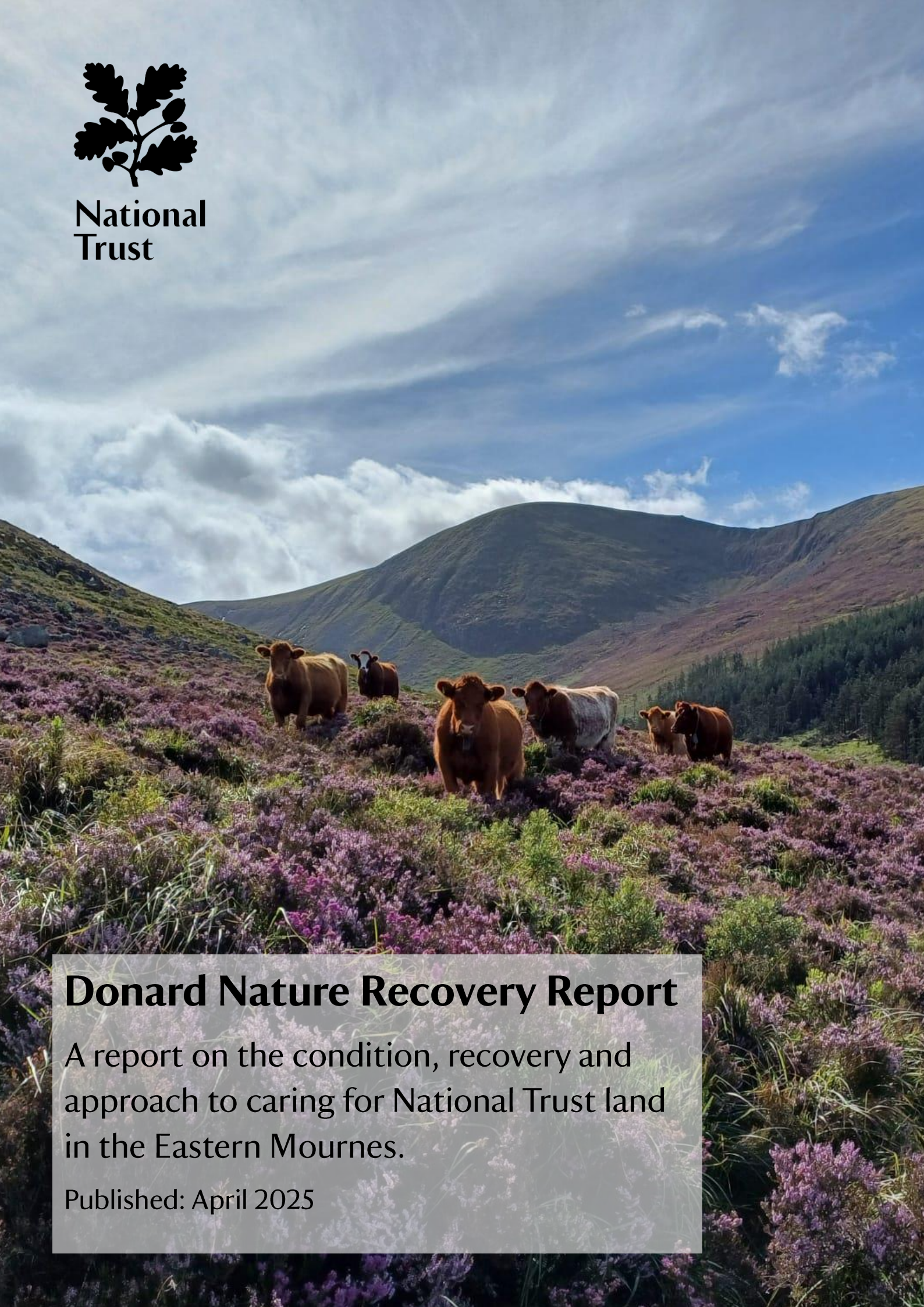

Donard Nature Recovery Report

A report on the condition, recovery and approach to caring for National Trust land in the Eastern Mournes.

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Photograph taken on Slievenamaddy looking towards Slieve Donard. Credit: Patrick Doran.

Contents

Executive Summary

The National Trust are responsible for managing 526ha of upland habitat in the Eastern Mournes Area of Special Scientific Interest (ASSI) / Special Area of Conservation (SAC). The site includes a variety of priority habitats, including wet and dry heath, blanket bog and montane heath.

In April 2021, a wildfire burnt an area of over 290ha in the Eastern Mournes ASSI/SAC, significantly impacting on the land under the National Trust's care. This event highlighted the fragility of the delicate habitats in this area, bringing attention to the need to monitor, maintain and restore them.

This report outlines the condition of the land and nature under the National Trust's care in the Mournes, looking particularly at how the land around Donard has been impacted by the 2021 wildfire and the efforts to promote recovery in the aftermath.

Context: Designations, threats and condition

The National Trust land in the Eastern Mournes is designated as a Special Area of Conservation due to its habitats – the blanket bog, dry heath, wet heath, montane heath and inland rock outcrop and scree. It has also been designated as an Area of Special Scientific Interest due to its importance for habitats, species (plants, alpine fungi and invertebrates) and earth science (tertiary igneous rocks, glacial erosion and depositional features).

However, the area faces a number of threats and pressures – most notably from grazing, recreation, burning, invasive species, land use changes, nitrogen deposition and climate change. As a result, in 2016, five of the six habitats surveyed in NIEA's Condition Assessment were found to be in unfavourable condition, with grazing pressure, recreation, erosion features and below target dwarf shrub coverage key reasons for these results.

As a nature conservation organisation, the National Trust is committed to restoring a healthy, beautiful natural environment. Our driving principle for the 526ha of land we care for around Slieve Donard, Slieve Commedagh and Bloody Bridge is to improve the condition of the habitats.

Action: National Trust in the Mournes

In 2019, the National Trust was able to employ the first dedicated rangers for the Mournes to undertake path maintenance and repair. Our team has grown since then, with the 2021 wildfire necessitating recruitment of staff who could focus on wildfire recovery. We now have a lead ranger, two path rangers and a wildfire recovery ranger, along with a project manager and project support officer for the Forever Mournes Partnership, who are aiming to enhance co-operation in the landscape of the Mournes. This group are supported by volunteers, the South Down portfolio team and the Regional Consultancy team.

A wide range of site management strategies have been put in place:

- Conservation grazing is used across the site. Nofence collars, along with the reintroduction of cattle, allow grazing intensity to be managed for different habitats, with virtual fences and enclosures used to create zones where livestock can or cannot graze. The primary target of this grazing is Purple Moor Grass (*Molinia caerulea*), which is inhibiting recovery of habitats destroyed in the 2021 wildfire due to its dominance in the landscape.

- Maintenance of paths encourages visitors to avoid desire lines and keeps most of the human activity within 50m of the path, protecting habitats from trampling. This is particularly important in light of the increased visitor numbers since the Covid-19 pandemic.
- A Wildfire Plan has been put in place to streamline the response between emergency services and the Trust in the event of a wildfire.
- Peatland restoration is taking place between Thomas and Millstone Mountain, including peat hagg reprofiling, gully blocking, and damming using timber dams and sheep wool rolls.
- A variety of monitoring programmes have been put in place, looking at habitats and species (see next section for details).

Results: Key findings of monitoring programmes

NIEA Condition Assessments and Wildfire Recovery Monitoring (2021-2024)

15 survey plots within the area impacted by the 2021 wildfire have been monitored. These plots were surveyed by NIEA in 2016, providing baseline data. Results show a quick recovery of grasses and more gradual recovery of dwarf shrubs, which in 2024 was recorded at 41% cover (compared to 53% in 2016, pre-wildfire). Monitoring of conservation grazing sites shows a reduction in sward height. It is hoped that the reduction in height will result in a more diverse mosaic heathland in years to come.

Peatland Monitoring – National Trust Peatland Monitoring Approach (2023-)

In 2023, a total of 270 peat probes were measured across Thomas and Millstone Mountain, finding an estimated 21ha of peat with a depth greater than 50cm and a greatest depth of 180cm. A Condition Assessment Survey found the habitat to be in unfavourable condition, with 65% grass cover (target <50%), dwarf shrub cover at 20.5% (target >33%) and erosion features in 22% of plots (target <2%).

Wildfire Regime Analysis by Pau Costa Foundation (2023)

This analysis looked at the impact of both management (strategic vs. business-as-usual) and climate change on wildfire impact. They found that with the current climate, strategic management would lead to decreased impacts of wildfire, with lower rate of spread and lower flame lengths. This compared to business-as-usual management, which would see variable rate of spread, with an increase in rate of spread in the Glen River Valley and slopes of Donard and Commedagh. Factoring in climate change, with no change in management strategies they found the impacts would be “devastating”, but, while still severe, could be reduced with adapted management.

Montane Heath Condition Assessment (2022)

This survey displayed that major changes to this habitat have taken place, and identified grazing pressure and trampling by hill walkers as key pressures. Nitrogen deposition was also identified as a key pressure, with levels well above critical for this habitat. This has led to reductions in some dwarf shrubs and woolly fringe moss, and an increase in grass and sedge cover. The key recommendation that emerged is to reduce pressure on the habitat that can be dealt with on site – i.e. from grazing and recreation.

Ammonia Monitoring (2023-)

Northern Ireland has the highest level of atmospheric nitrogen in the UK and Ireland. This excess nitrogen may lead to biodiversity loss, as it favours fast-growing species such as grasses, which outcompetes other species which favour more nutrient poor environments. All three sites monitored on Donard are below or just below the critical level for bryophytes and lichens but have recorded months where the threshold was exceeded. Concerningly, vegetation looks in worse state than might be expected given the nitrogen levels, suggesting that there are other sources of nitrogen input such as through rain or fog.

Invertebrate Surveys (2022 and 2024)

The 2022 survey recorded some rare beetles which had long gaps since their last records in Ireland. At Bloody Bridge, an important site for bees, the first record of Lathbury's nomad bee was made, along with records of the Dark-winged blood-bee and Gooden's nomad bee, which have red list statuses of Endangered and Critically Endangered respectively.

The 2024 survey aimed to look at the differences between areas affected by the 2021 wildfire and those unaffected. Rare and scarce species were recorded, including the water beetle and montane spider, showing the importance of this habitat. However, the findings show that the burnt area has had a collapse in both variety of species present (18 species in burnt area compared to 48 in unburnt area) and abundance of invertebrates (90% lower in burnt area than in unburnt area). This is likely to impact on other animals who feed on insects, including birds and common lizard.

Other

The Great Fuel Moisture Survey (2023) showed Mournes fuel moisture is moderate, but one sample from Slievenamaddy had low moisture, meaning this area is more at risk of ignition in a wildfire event.

Fixed Point Photography provides a visual of the landscape's recovery and allows for monitoring of vegetation regrowth and habitat restoration.

The Butterfly Survey (Single Species Transect) of Grayling Butterfly (2023-2024) showed fluctuating grayling activity and abundance. In 2023, graylings were observed sporadically, with numbers peaking at 5 in August (week 32) and minimal sightings otherwise. In 2024, the species appeared across more weeks, reaching a high of 9 sightings in July (week 30) and tapering off gradually through late summer.

Monitoring has also taken place through the following surveys, outlined in the report: Red Grouse Survey, GPS Collared Sheep and Livestock Counts, Breeding Bird Survey, National Plant Monitoring Scheme and Path Surveys.

Next steps:

The work of the National Trust in the Mournes since acquisition in 1992, but most notably since the wildfire in 2021, has been intended to protect and improve the important habitats present, and the species they support. The habitats are fragile, and it will take many years for the site to fully recover from the impacts of the wildfire. The threats and pressures facing these habitats and associated wildlife are increasingly evident, and we will continue to monitor the ecology of the area and act in accordance with the evidence we find. The National Trust are committed to taking action to protect this landscape; its nature, beauty and history, for everyone forever.

1. Introduction

The National Trust property within the Mourne Mountains, County Down, Northern Ireland, was acquired from the Annsley Estate. It is comprised of 526ha of upland habitats and includes Slieve Donard (Northern Ireland's highest peak), Slieve Commedagh, Thomas and Millstone Mountain, Shan Slieve and Slievenamaddy. It is found within the Eastern Mournes ASSI/SAC, with numerous designated habitats found across the property (fig. 1.1). The Trust's property within the Mournes supports a variety of habitats, including wet and dry heathland, blanket bog and montane heath (fig. 1.2). It also includes over a mile of coastline as part of the Mourne Path, including sites such as William's Harbour and Bloody Bridge

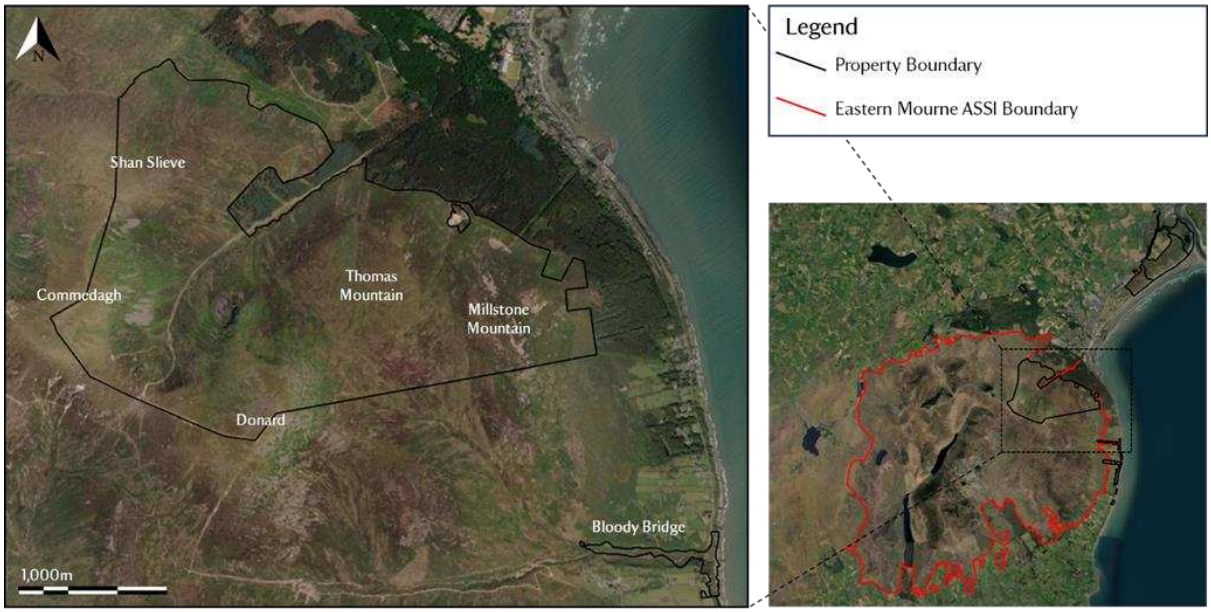


Figure 1.1: Site Map: National Trust Property Mournes.

From the 23rd to the 25th of April 2021, a wildfire saw an area of over 290ha burn within the Eastern Mourne ASSI, with over 200ha of this land being within the National Trust Property (fig. 1.3). The slopes of Thomas and Millstone Mountain, and lower slopes of Donard were worst impacted by this wildfire event. Following this event, this site has had significant investment to facilitate the recovery of habitats and nature, for everyone, forever. This was funded initially through DAERA's Challenge Fund and is currently funded through DAERA's Environment Fund Strategic Strand. This funding has created the opportunity to have a ranger team dedicated to caring for the site, alongside investment in surveys and monitoring, and capital investments to improve paths and habitats on site.

The aim of this report is to outline the conservation work which has been carried out across the National Trust land holding in the Mournes since acquisition in 1992. It focuses particularly on recent years, when there has been increased investment responding to the need for restoration and conservation in light of increasing visitor numbers and the impact of the 2021 wildfire.

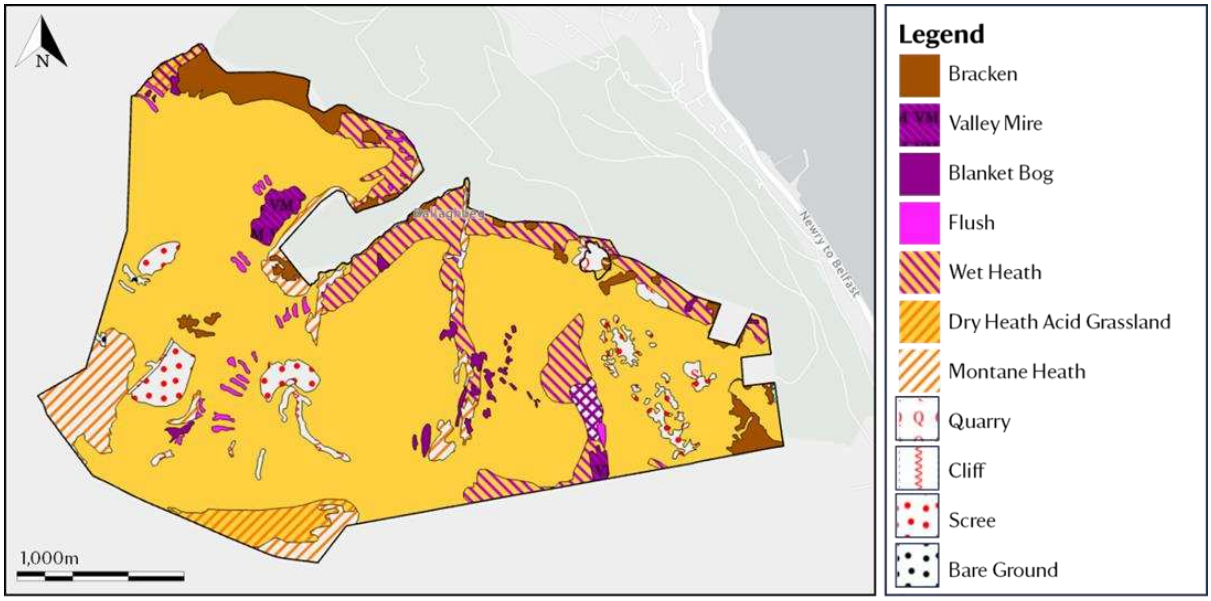


Figure 1.2: Phase I habitat Survey (Clip from habitat survey of SAC, undertaken by NIEA, 2016)

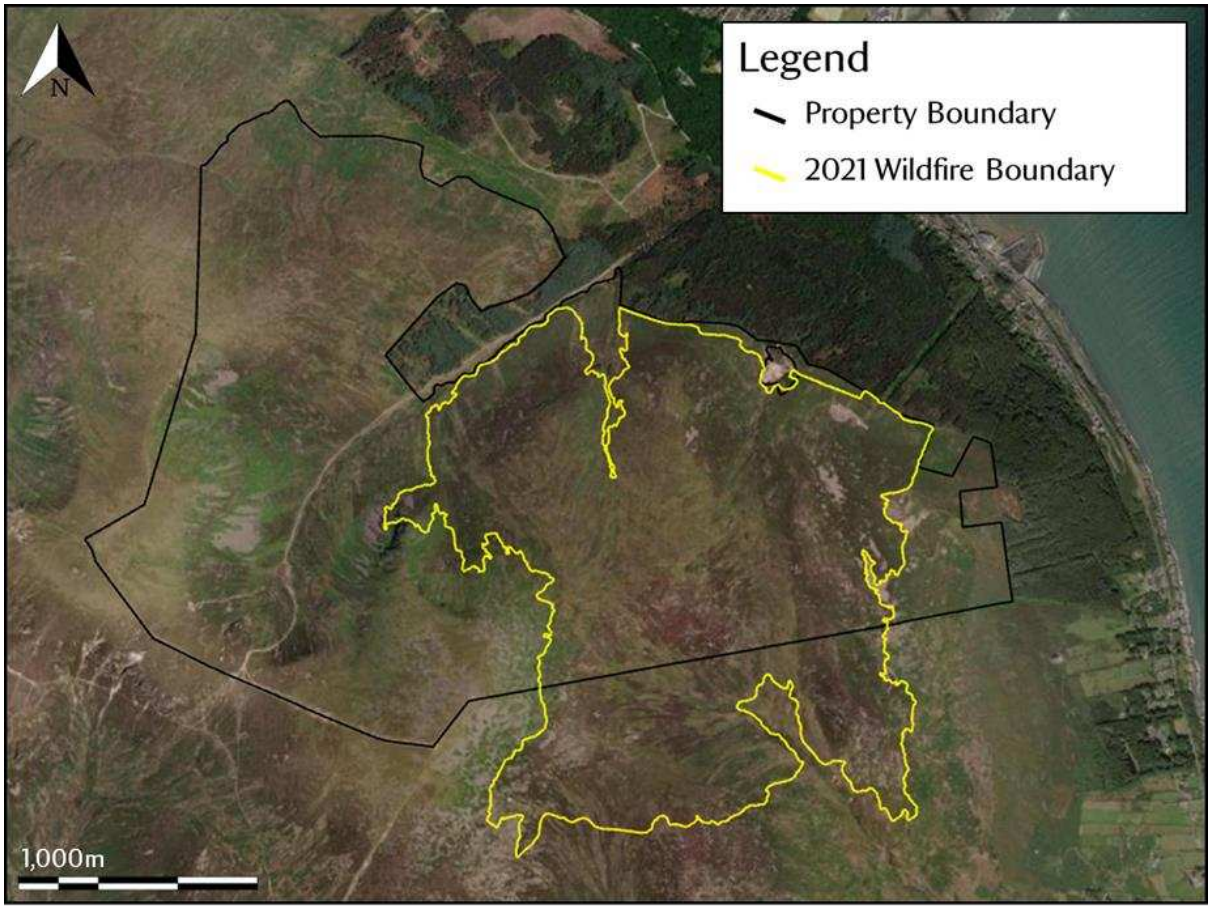


Figure 1.3: Map displaying the extent of the 2021 Wildfire, much of the area impacted fell within the National Trust land holding.

2. Site Designations and Importance

The National Trust land holding within the Mournes covers approximately 526Ha (1280 acres) of land within the Eastern Mourne Area of Special Scientific Interest (ASSI) and Special Area of Conservation (SAC). Additionally, the site falls within the Mourne Area of Outstanding Natural Beauty, and the Mourne, Gullion and Strangford UNESCO Geopark.

Since acquisition of the site in 1992, management priorities have continually changed in response to numerous factors, such as visitor pressure, designation, internal staffing resource, and events, such as wildfires of 2021.

2.1. Significance of Donard's habitats and species

The National Trust land holding within the Eastern Mournes is an important site for some nationally and internationally rare habitats and includes the highest summits in Northern Ireland. It is an intrinsic part of the Eastern Mournes Area of Special Scientific Interest (ASSI), which was designated in 1995, with this area subsequently being designated as Special Area of Conservation (SAC) in 2007. Many of the designation features for both the ASSI and SAC are similar and so are discussed below under the terminology utilised by the SAC.

Eastern Mournes Special Area of Conservation

The Eastern Mournes was designated as a Special Area of Conservation (SAC) due to the presence of habitats and species which are rare or threatened within a European context (EHS, 2007). These habitats and their characteristics are summarised below and in table 2.1.1.

Blanket bogs: Blanket bog occurs in the wettest parts of the UK as a mantle of peat which often clothes extensive areas of the landscape. Blanket bogs are characteristically wet underfoot and are usually dominated by carpets of bog-moss Sphagnum species, cotton-grasses and heathers. Active blanket bogs are those in which the peat is still able to accumulate because of the growth of the surface vegetation. In the far north and west of the UK, the surface often displays areas of dramatic patterning, consisting of variously shaped bog pools sometimes separated by quaking peat ridges. The UK and Ireland hold the largest areas of blanket bog in Europe.

European dry heaths: Dry heaths are found on free-draining and generally acidic soils such as sands or gravels which are poor in nutrients. They are dominated by dwarf-shrubs of the heather family, most commonly Ling heather. There are several types of heath which are distinguished by the plants they support, such as bell heather, bilberry, crowberry, bearberry and western gorse.

Northern Atlantic wet heaths with cross-leaved heath: These are heathlands of cool oceanic regions on mainly acidic, nutrient-poor, shallow peat or sandy soils with impeded drainage. They are often dominated by mixtures of cross-leaved heath, grasses, sedges and Sphagnum bog-mosses. These heathlands are found in both lowland and upland parts of the UK, although they are more extensive in the wetter north and west. The UK hosts the majority of this habitat in Europe.

Montane heath: (Alpine and boreal heath) are found on nutrient-poor, free-draining acidic soils. They generally form at high altitude and are dominated by dwarf shrubs of the heather family which have a short or flattened growth due to the harsh climate. The vegetation forms a carpet or mat of intertwined branches with abundant lichens of Cladonia species or woolly fringe-moss. Montane heath also includes acid grassland (alpine and boreal grassland) which occur in some of the most severe climatic conditions experienced in the UK. They form the most extensive plant

communities on acid soils at high altitude and characteristically cover summit plateaux and the tops of higher summits and ridges, often forming large, continuous tracts.

Inland Rock Outcrop & Scree: This category includes Siliceous rocky slopes with crevice-growing vegetation and acidic scree of the montane to snow levels. These are plant communities growing in the crevices or fissures of acid rocks such as some sandstones, shales, quartzite and granite. The habitat is important due to the occurrence of rare arctic-alpine plants, such as dwarf willow and Highland cudweed, and oceanic mosses and liverworts.

Eastern Mournes Area of Special Scientific Interest

The Eastern Mournes SAC is underpinned by the Area of Special Scientific Interest (ASSI) designation due to its important habitats, species and earth science, such as the tertiary igneous rocks and glacial features which have shaped the landscape we see today. Many of the ASSI Selection Features correspond to SAC features onsite; table 2.1.1 outlines corresponding features.

Table 2.1.1: SAC and ASSI designation features for Eastern Mournes

Feature Type	SAC Feature & Significance	Corresponding ASSI Feature & Significance
Habitat	**European Dry Heath** European interest: one of the best areas in the UK	**Dry Heath** National interest
Habitat	**Northern Atlantic wet heaths with Cross Leaved Heather** European interest: one of the best areas in the UK	**Wet Heath** National interest
Habitat	**Active Blanket Bog** **European priority interest:** supports a significant presence	**Blanket Bog** National interest
Habitat	**Alpine & Boreal Heath** European interest: supports a significant presence	**Montane Heath** National interest
Habitat	**Siliceous rocky slopes with chasmophytic vegetation** **European priority interest:** supports a significant presence	**Inland Rock** National interest
Habitat	**Siliceous alpine and boreal grasslands**	
Habitat	No corresponding SAC features for these ASSI features	**Oligotrophic Lakes** National interest
Species		**Higher Plant Assemblage** National interest
Species		**Notable Assemblage of Alpine Fungi** National interest
Species		**Notable Invertebrates Assemblage of Specialist Montane Species** National interest
Earth Science		**Tertiary Igneous Rocks** National interest
Earth Science		**Pleistocene Glacial Erosion Features** National interest
Earth Science		**Pleistocene Glacial Deposition Features** National interest

Species Assemblage:

The species assemblage within the Eastern Mournes is notable for its higher plant assemblage, alongside notable fungi and invertebrates associated with the montane and alpine habitats onsite. Table 2.1.2 below outlines some of the NI Priority Species which have been recorded across the property in recent years. This is a non-exhaustive list and many other priority species also occur. Notable Invertebrates are outlined in section 5.9 below.

Table 2.1.2: Notable Priority Species Slieve Donard

Species Name	Scientific Name
Stiff Sedge	*Carex bigelowii*
Alpine Clubmoss	*Diphasiastrum alpinum*
Starry Saxifrage	*Saxifraga stellaris*
Juniper	*Juniperus communis*
Dwarf Willow	*Salix herbacea*
Skylark	*Alauda arvensis*
Meadow Pipit	*Anthus pratensis*
Red Grouse	*Lagopus lagopus*
Irish Hare	*Lepus timidus*
Grayling butterfly	*Hipparchia semele*
Small heath butterfly	*Coenonympha pamphilus*
Common Lizard	*Zootoca vivipara*

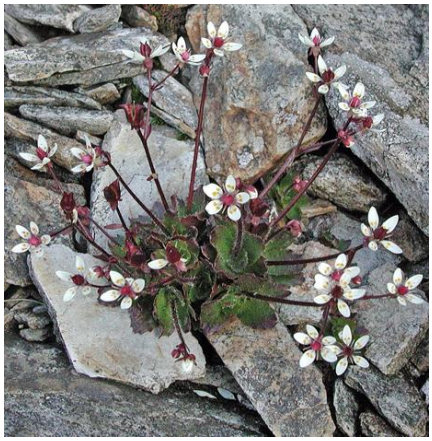


Figure 2.1.1 Starry Saxifrage (Source: UK Wildflowers, 2004)

Earth Science Features:

The National Trust property at Slieve Donard lies on the north-eastern edge of the Mourne Mountain range. It includes the northern side of Slieve Donard (852m), the highest peak in the Mournes and also the eastern slopes of the somewhat lower Slieve Commedagh (765m). The Mournes Mountains formed as a Tertiary plutonic granite intrusion into Silurian country rock which was thermally metamorphosed to hard hornfels near the contact with the granite. The mountains are steep-sided, but rounded, having been smoothed by ice during glaciation. There are many veins of rock intruded into the Mourne Mountain granite, but at Thomas Quarry there are unusual green veins of a rock called greisen that actually replaces the granite (Porter, 2025).

They include some crags and block screes, most notably Eagle Rock on the northern side of Slieve Donard. The Glen River flows north westwards towards Newcastle from a col between the two main peaks, in a small glaciated modified U-shaped trough. Two smaller streams flow northwards off the property. One of these flows through the short, but dramatic gorge of Black Stairs. The Mournes are undoubtedly an important geological site based on the Tertiary igneous rock which form the range and also geomorphologically due to glacial erosion and depositional features.

SAC Conservation Objectives

Following SAC designation, the Northern Ireland Environment Agency (NIEA) was required to develop Conservation Objectives and implement the necessary conservation measures which correspond to the ecological requirements of the protected habitat types and species, according

to Article 6.1 of the Habitats Directive. NIEA must also prevent any damaging activities that could significantly disturb those species and habitats (Article 6.2) and to protect the site from new potentially damaging plans and projects likely to have a significant effect on a Natura 2000 site (Article 6.3, 6.4).

Conservation Objectives have a role in:

- Conservation Planning and Management – guide management of sites, to maintain or restore the habitats and species in favourable condition
- Assessing Plans and Projects, as required under Article 6(3) of the Habitats Directive - Habitats Regulations Assessments (HRA) are required to assess proposed plans and projects in light of the site's conservation objectives.
- Monitoring and Reporting – Provide the basis for assessing the condition of a feature, the factors that affect it and the actions required.

The primary Conservation Objective for the Eastern Mournes SAC is to maintain (or restore where appropriate) the:

• European dry heaths

• Northern Atlantic wet heaths with Cross Leaved Heath

• Active blanket bogs

• Alpine and boreal heaths*

• Siliceous alpine and boreal grasslands

• Siliceous rocky slopes with chasmophytic vegetation

• Siliceous scree of the montane to snow levels to favourable condition.

* With regard to Montane heath, the Conservation objectives state "***Any loss or fragmentation of this habitat is unacceptable***". Therefore, it is incumbent on NT to ensure that we are effectively managing factors which are within our control; primarily grazing and visitor pressure.

For each SAC feature, there are a number of component objectives which are outlined within the Conservation Objectives document. These include a series of attributes, measures and targets which form the basis of Condition Assessment. The results of this will determine whether the feature is in favourable condition or not. The feature attributes and measures are found in the annex of the Conservation Objectives document (NIEA, Eastern Mourne SAC: Conservation Objectives, 2017).

Main threats, pressures & activities with impacts on Eastern Mournes SAC

The Conservation Objectives identifies both on-site and off-site activities that can potentially affect SAC/ASSI features. The list provided in Table 2.1.3 is not exhaustive, but deals with the most likely factors that are either affecting Eastern Mournes, or could affect it in the future (NIEA, Eastern Mourne SAC: Conservation Objectives, 2017).

Table 2.1.3: Main threats, pressures & activities with impacts on SAC (summarised from NIEA, 2017)

Threat / Pressure / Activity	Notes	Action
Grazing	Many of the mountain summits and lower slopes are heavily grazed by sheep. As a consequence, these heathland communities are degraded and in unfavourable condition.	Establish a sustainable stocking density within each management unit of the Eastern Mournes SAC and ensure that set grazing prescriptions are strictly adhered to.
Recreation	An increased interest in hill walking within the Northern Ireland population, together with increased tourist activity in the Newcastle area, is beginning to put real pressure on the footpaths and surrounding vegetation within the Eastern Mournes. Ideally, a sustainable level of recreational activity should be established to ensure that there is no adverse effect on the heathland communities	Ensure that all precautions are taken to minimise the impact of hill walking on upland paths throughout the Mourne Mountains. Footpath maintenance is of paramount importance and there is also a need to develop and promote paths in areas that are not highly sensitive to disturbance.
Burning	Burning of the vegetation has taken place occasionally, with some areas of past burning being identifiable. Excessive burning will lead to the deterioration of all heathland communities	Ensure that any burning within the SAC is carefully controlled and monitored.
Scrub / Bracken encroach-ment	There are many small pockets of bracken and some limited scrub development – mainly Ulex europaeus associated with areas of disturbance. Any further scrub or bracken encroachment into the heathland communities is undesirable.	Monitor further scrub/bracken encroachment (where it occurs) and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.
Change to surrounding land use	Any changes in local land-use e.g. agricultural intensification, drainage works and development may be detrimental to the SAC.	Reduce the risk of surrounding agricultural intensification by encouraging the adjacent owner/occupiers to enter into agri-environment schemes. Use Habitats Regulations Assessments (HRAs), through the planning process, to minimise any development risks adjacent to the SAC.
Nitrogen Deposition	Excess nitrogen deposition can favour the growth of competitive plants and lead to changes in ecosystem structure or function and to a reduction in biodiversity. Lower and upper critical loads have been calculated for habitats and species present on Eastern Mournes SAC.	Seek to maintain or where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant critical load
Climate Change	Northern Ireland faces changes to its climate over the next century. Indications are that we will face hotter, drier summers, warmer winters and more frequent extreme weather events	When developing SAC management plans, the likely future impacts of climate change should be considered and appropriate changes made.

Eastern Mournes SAC Conservation Management Plan

NIEA are working on the development of Conservation Management Plans (CMPs) for all SACs within the UK national site network. These aim to help identify the problems facing some of our most important ecosystems. Addressing the issues identified in the CMPs will have a positive impact on biodiversity, water and land management. The Eastern Mournes SAC CMP is currently being drafted by the Mourne Heritage Trust (MHT) through consultation with all landowners in the high Mournes; NI Water, Forest Service, NT and MHT. Through engagement with MHT, National Trust's Donard Management Plan is referenced and added as an Appendix within the CMP.

Site Condition Assessment (NIEA Common Standard Monitoring)

The Northern Ireland Environment Agency are responsible for monitoring the condition of the habitats within the Eastern Mourne ASSI/SAC. This monitoring determines whether the quality of the habitats onsite meet that of each designating habitat feature. The method used by NIEA aligns with Common Standards Monitoring and is known as a Condition Assessment Survey. NIEA undertake these surveys in approximately 6-year cycles. The Eastern Mournes ASSI has been surveyed in 2003, 2008 and 2016. The table below outlines which habitats were assessed as being in a favourable and unfavourable status during the 2016 survey (NIEA, 2016).

Table 2.1.4: 2016 Condition Assessment Summary Outcomes

Feature	Condition
European Dry Heath	Unfavourable
Northern Atlantic wet heaths with Cross Leaved Heather	Unfavourable
Active Blanket Bog	Unfavourable
Alpine & Boreal Heath	Unfavourable
Siliceous rocky slopes with chasmophytic vegetation	Favourable
Siliceous alpine and boreal grasslands	Unfavourable

Below is an extract from the NIEA 2016 Eastern Mourne Condition Assessment Report, outlining the failing factors for Dry and Wet Heath.

Dry Heath results:

This failed on six attributes:

1. Dwarf-shrub height: only 14% of heather was in the taller/more mature age-class (>35cm): the target is 25% or more
2. Bare Peat: the recorded 3% cover was just above the target of 2% cover
3. Dwarf-shrub cover: Dwarf-shrub cover was >75% in 40% of plots: the target is >75% in >75% of plots. The mean cover of dwarf-shrubs was 58%: the target is >75%.
4. Graminoid [grasses] cover: the mean cover of grasses was 36%: the target is <33%.
5. Management Grazing: signs of moderate or heavy grazing were present in 36% of plots: the target is <5%.
6. Erosion Features associated with human impacts: Man induced/enhanced erosion was local/occasional in 28% of plots and fairly frequent in 3%: the target is <2%.

Wet Heath results:

This failed on six attributes:

1. Dwarf-shrub height: only 8% of heather was in the taller/more mature age-class (> 35cm): the target is 25% or more
2. Bare Peat: the recorded 4.6% cover was higher than the target of 2% cover
3. Dwarf-shrub cover: at 49.5%, dwarf-shrub cover is marginally below the target of 50-75%. In contrast, graminoid [grass] cover marginally achieves the target (with a value of 49.5% compared to a threshold of less than 50%).
4. Mean Bryophyte [moss] Cover: the mean cover of byrophytes [moss] was 20.8%: the target is <25%.
5. Management Grazing: signs of moderate or heavy grazing were present in 13% of plots: the target is <5%.
6. Erosion Features associated with human impacts: Man induced/enhanced erosion was local/occasional in 43% of plots and fairly frequent in 2%: the target is less than 2%.

Notable Failing attributed for both Dry and Wet Heath, is the % cover of Dwarf Shrub, Grazing Pressure and Human Impacts and Erosion Feature.

Reports on the health / condition of Eastern Mournes ASSI/SAC and protected sites

Article 17 Habitats Directive reporting provides information on the habitat conservation status of Special Areas of Conservation (SACs). The latest UK Habitats Directive report was published in 2019 and provides separate reports on heath, blanket bog and rocky habitats. Each habitat report concurs with the pressure and threats outlined in the Eastern Mournes SAC Conservation Objectives and NIEA Condition Assessment reports. One of the main conservation measures is to reduce the impact of outdoor sports, leisure and recreational activities (JNCC, 2019).

Recent reports from the Office for Enviornmental Protection (OEP) note that current pressures on nature in Northern Ireland are unsustainable and urgent action is needed to protect and improve the environment. The OEP systematically assessed the drivers and pressures impacting upon nature and identified the relevant challenges associated with particular sectors of the economy (OEP, 2024). Of particular note to the Mournes, is reference to "medium evidence and high agreement (high confidence) of the impact of recreation and sporting activities, which includes tourism, related infrastructure, and instances of disturbance". Disturbance and damage caused by these activities are negatively impacting biodiversity across NI and "specific hotspots such as the Mourne Mountains" were cited. The report recognised the need for the monitoring and cumulative assessment of the impacts of resource exploitation and use. A key recommendation of the OEP's 2024 report is to **act urgently and effectively and to address the knowledge gaps** identified in the report related to interactions among multiple pressures, chemicals, species abundance, climate change, rural development, and the cumulative impacts of activities such as recreation and waste management.

The most recent OEP report highlights that **urgent action must be taken to better protect and restore NI's most precious places for nature** and makes recommendations to DAERA. These include the setting of legally-binding targets for restoring the condition of protected sites – support this with a plan to make sure the targets are met and reviewed regularly (OEP, 2025).

2.2. Built Heritage and History of Slieve Donard property

The Mournes and surrounding landscape has a rich history, with many notable features within the landscape from stone walls, and quarries to prehistoric features such as the remains of the cairn atop Slieve Donard. The area is steeped in history, with settlements dating as far back as 5,500 BC and we know Viking raiders, Gaelic lords, and Anglo-Normans were all active in the region.

The two cairns on the summit of Slieve Donard are both recorded prehistoric archaeological monuments. The south-west side of the summit of Slieve Donard is crowned by the 'Great Cairn' (c. 3,300-3,000 BC) which houses Ireland's highest passage tomb. Two hundred metres to the north-east is the Bronze Age 'Lesser Cairn' (c. 2,300-1950 BC), which overlooks Newcastle.

Slieve Donard takes its name from Saint Donard, a hermit who lived on the summit. Saint Domhanghart (known by his Anglicised name, Saint Donard) had removed himself from society, converted the cairns into a hermitage and oratory, and lived on the summit until his death in AD 506, later giving his name to the mountain.

In 1826, the Royal Engineers used the cairns to establish base stations on the summit for the Principal Triangulation of Ireland in advance of the Ordnance Survey six-inch-to-one-mile scale maps.

The original construction of the Mourne Wall was between 1904 and 1922. The Belfast Water Commissioners built it to enclose the water catchment in the Mournes. This work added changes to the structure of the Great Cairn.

Another notable feature onsite is the Icehouse which was constructed by the Annsley family in 1830. The Icehouse would have been filled with ice and used to store perishable foods and drinks. This feature had run into disrepair and was restored in 1997.

Figure 2.2.1: Donard Icehouse. Located in the Glen River Valley near the main access route to Slieve Donard (Source: Hearth, 2025).

There are 3 quarries onsite; Thomas, Millstone and Drinneevar Quarry. These quarries are all found in close proximity, and each provide great viewpoints over the town of Newcastle and Dundrum Bay. These quarries are now disused, but remnants of buildings used by workers and train lines which would have been used to transport granite to Newcastle harbour are still visible in these areas. Across Millstone Mountain the remnants of millstones which would have been carved onsite can still be found.

The heritage features onsite are fragile links to the past heritage of the area, and since acquisition of the site, restoration work on these features has included restoring the Icehouse and the Mourne Wall.

2.3. National Trust Management Plan and Vision

As a nature conservation organisation, making space for nature is at the core of our work. We are committed to restoring a healthy, beautiful natural environment. Our Land, Outdoors and Nature (LON) Programme is based on the Lawton principles of making sites Better, Bigger/More and Joined (Lawton, 2010). This provides a solid framework for us to deliver more for nature so that we play our part in the nature and climate crises.

Habitats of significance (type and area) on Donard land

NT land within the Mournes is rich and varied. The array of species is representative of the variety of habitats and altitudinal range (160 to 852 metres). Dry Heath is by far the dominant habitat, with Wet Heath and Blanket Bog in more localised areas. Upland Flushes, Fens & Swamps, Inland Rock Outcrop & Scree, Rivers (Glen River) and Montane Heath are also present. The latter habitat is one of the rarest and most threatened habitats in Northern Ireland; here it is restricted to the summits of Slieve Donard and Slieve Commedagh. The minor habitats occur in mosaic often within the dominant Upland Heathland. The only area of non-priority/designated habitat is the narrow access route leading from Newcastle.

National Trust ambition to Restore Nature

Given Donard is a designated site, our key management principle is make the site "Better", i.e. to improve habitat condition. NT invested in the mapping of priority habitats and drafting of Management Plans between 2017 and 2022. Management Plans for our designated sites have been written to ensure that our management delivers the SAC Conservation Objectives as outlined in the section above. The Donard Management Plan details our approach to management and monitoring and how monitoring data is then used to inform favourable management. The current Donard Management Plan has been issued with a five-year consent by NIEA (valid until 2028).

The National Trust's new strategy was launched in 2025, setting our direction and guiding our decisions for the next 10 years and beyond (National Trust, 2025). At its core are three ambitious goals for 2050: 1) to restore nature, 2) to end unequal access to nature, beauty and history, and 3) to inspire millions more people to care and take action.

3. National Trust Staff & Volunteer Resource

Prior to 2019, NT lands within the Mournes had a limited resource relying on a small, intermittent team between mid-1990s until early-2000s when funding had stopped. As the popularity for walking the Mourne Mountains started to increase and the condition of the main pathway and surrounding habitats deteriorated, NT launched a Mournes Path Repair project in January 2019. NT then applied to the Department of Agriculture, Environment, and Rural Affairs (DAERA) Challenge Fund in to support restoration work along the main pathway to Slieve Donard summit.

The main work that was carried out during this period included the rangers carrying out repair work, managing contractors to assist with difficult repairs and work alongside Mourne Heritage Trust.

After the impact of the Covid-19 pandemic, NT applied to the DAERA Environment Fund (EF) with a regional application, which included the continuation of the path restoration project and funding the two path rangers from 2021-2023. In April 2021, shortly after the regional EF project began (January 2021), the wildfire happene. After on the ground assessments it was evident that there was a need for staff that could focus on the impacts of wildfire and the recovery of the affected areas.

NT were able to recruit a Wildfire Recovery Lead Ranger and Wildfire Recovery Ranger to survey the areas immediately after the fire to assess the impact, and have since carried out continuous surveying of habitats and species, making it one of the most surveyed sites within NT NI. Details on surveys covered are found below in the Ecological Monitoring of the Mournes.

Shortly after the fire in April 2021, the DAERA Challenge Fund opened and NT applied for a wildfire recovery project, which included the two Wildfire Recovery Rangers, a Project Manager (PM) and a Project Support Coordinator (PSO). The PM and PSO roles provided vital co-ordination across NT and other stakeholders for the strategic planning and implementation of a Mournes Wildfire Restoration and Management Plan. These project roles helped ease the burden of the wildfire on the ranger team, ensuring this essential recovery work was properly resourced, and stakeholders, including the local community, were involved and bought in. Our existing teams were able to maintain the required focus and resource necessary to deliver existing planned 'Land Outdoor and Nature' workloads.

Since the wildfire in April 2021, there has been a continuous resource within the Mournes, which is still in place today, covered by a second regional DAERA Environment Fund (EF) and a Forever Mournes DAERA EF. The staff includes:

- A Lead Ranger that leads on Mournes EF works planning/team management. This includes leading NT Mourne projects of Wildfire Recovery and Donard path restoration. This role aims to improve upland habitat condition, increase wildfire resilience and mitigate recreational pressure/erosion. Key work includes priority habitat restoration/protection, conservation grazing management, linking with Mourne stakeholders' groups for nature conservation good practices in the uplands and potential of expanding the projects beyond National Trust boundaries (NI Water, Trustees land).
- Two Path Rangers that are specialised in upland path construction and maintenance. They carry out works to improve the main access route to Slieve Donard, including erosion control and habitat protection through mitigation of the recreational pressure.

- A Wildfire Recovery Ranger that carries out practical implementation of the Wildfire Recovery and resilience project which aims to improve wildfire resilience within NT Mournes, priority habitat protection, monitoring of habitats and species, grazing management and linking with stakeholders regarding good practices observed on site.
- Project Manager and Project Support Co-ordinator for the Forever Mournes project who drive and co-ordinate the deliverables and stakeholder engagement/development – they work collaboratively to implement the recommendations and actions arising from the various stakeholder engagements, feasibility studies, research, gap analysis and strategies developed during Phase One of the Mournes Community Renewal Through Nature project.

These staff are fully dedicated to the Mournes but are supported by the NT South Down team and NT regional consultancy team.

Volunteers are a massive support to the National Trust, and the Mournes has been greatly supported by volunteers over the past years. There is a range of volunteer opportunities, from working on the path, supporting habitat recovery, surveying, corporate days and Saturday volunteering groups. Table 3.1 highlights the number of hours that have been spent by volunteers since the beginning of the regional EF in 2021.

Table 3.1: Volunteer Hours

Time Period	Hours
2021-2022	180
2022-2023	757
2023-2024	662
2024-2025	565
Total	2,164

4. Overview of NT site management

The management of the site by the Ranger Team has changed over the years, influenced by the availability of funding and the requirement for dedicated staff such as that needed following the wildfire in 2021. The shifting staff and volunteer resources on the site is summarised above in Section 3.

This section aims to summarise the management onsite by addressing the actions taken by the Ranger Team on each of the relevant ASSI Habitat Features as outlined in Section 1 above. These management actions are laid out in the Management Plan for the site (National Trust, 2021).

4.1. Wet and Dry Heath

The primary habitat found across Trust lands within the Mournes is wet and dry heathland, and much of this habitat is rarely accessed by the public. The path network to the summit of Slieve Donard along the Glen River is the most heavily used and largely runs through this habitat. Most activity is within 50 metres of the path, however maintenance of the path network in this area aims to minimize damage to surrounding habitat and promote recovery by encouraging visitors to stay on paths.

Grazing is the main management tool but has been proven be an issue for many years because of complex rights, difficulty of fencing such a tortuous boundary and monitoring. The number of sheep on site varies greatly depending on the particular year and by month. Prior to the wildfire in 2021, the agreement with the tenant farmer was to graze 800 ewes and lambs from May to October. However, due to the lack of a boundary fence, neighbouring flocks of sheep are known to graze the property. Following the 2021 wildfire, numbers were reduced to around 400 (maximum) but exact numbers are near impossible to collate, although the ranger team make an effort to undertake counts during the grazing season to monitor numbers. GPS Collars (Digit-animal) have been fitted to a portion (initially 10% of the flock but now 25%) of the tenant farmer's flock since the wildfire, allowing the site team to determine grazing pressure across the site. This has provided key evidence and informed management, with grazing enclosures being introduced in certain areas on site in 2023.

On lower slopes there has been some bracken and scrub (gorse) control in the past. In recent years, with the introduction of target grazing using NoFence collars, the cattle grazing the site appear to be impacting stands of bracken by trampling these areas, as they tend to use these areas for rest and shade.

Apart from direct recreation pressure, and overgrazing, the most significant impact on site is that of wildfires, which are almost certainly started deliberately (NI Fire & Rescue assessment). A Wildfire Plan has been produced to streamline the response between emergency services and the Trust in the event of a wildfire. Following the 2021 wildfire, a significant amount of monitoring has been undertaken to determine the dynamics of wildfire across the land holding in an attempt to determine the need for fire breaks, access points, and control lines. A study undertaken by the Pau Costa foundation has provided much insight into the dynamics of wildfire (See Section 5 for more detail), and will inform future management.

4.2. Blanket Bog

Blanket Bog habitat across the Trust's land holding is largely situated away from recreational activity and thus the main issues relate to grazing pressure and wildfire. Prescribed grazing levels on blanket bog are much lower than on upland heath (0.3 LU/ha compared to 1 to 3 LU/ha), however regulating this is difficult in an open site. The implementation of monitoring across the blanket bog habitat onsite since 2022 allows the site team to determine the impacts of grazing on this habitat.

The impacts of wildfire on the blanket bog is potentially more damaging than on shallow peat habitats such as the wet and dry heath (peat <50cm deep) due to the possibility that the fire could ignite some of the deep peat causing a long slow burn.

Following the establishment of peatland monitoring onsite in 2022 (see Section 5.4. for more details), it was found that the extent of peatland habitats onsite had been underestimated, likely due to the previous extent being based solely on vegetation surveys rather than a combination of peat probing and vegetation surveys. With an increased understanding of the extent of peat, and the condition of the blanket bog habitats onsite, a peatland restoration plan was produced and following the receipt of funding from the Starling Bank, and approval of consent from NIEA, peatland restoration began on the valley mire in the col between Thomas and Millstone Mountain in 2024.

The peatlands in this area are heavily degraded, with deep gullies, and haggs, which had been noted in National Trust Bio-surveys undertaken in the 1990s (Allen, Barker, Brash, & Foster, 2014). With an understanding of the condition of the habitats contemporarily, the following measures were proposed to be undertaken on the site and have been implemented since January 2024 (outside of the period when there may be ground nesting birds utilising these habitats).

Peat Hagg Reprofiling

Reprofiling of peat haggs has been carried out by undercutting the haggs and smoothing the overhanging surface vegetation to a gentler slope of no more than 30°. A 1-2m length of vegetation on top of the hagg is rolled back, cutting to a depth that ensures the vegetative root structure is intact and far enough back to enable the underlying peat to be reprofiled to the desired angle. The vegetation is then placed on the graded slope and compacted. Placing the surface vegetation of the hagg onto the bare peat creates a protective cover allowing the peat forming vegetation to re-establish. Where erosion is significant, as is the case in certain areas following the wildfire and subsequent erosion, geotextile netting has been utilised alongside the re-instated vegetation to stabilise the peat further.

Gully Blocking & Damming

Deep gullies within the peat are particularly prevalent within the valley mire habitat found between Millstone and Thomas Mountain. Small dams to pool the water have been created, reducing peat erosion and retaining water within the peatland system. Multiple dams have been installed along each gully, ensuring water flow is dispersed early, sediment transportation is minimised, and water retention maximised.

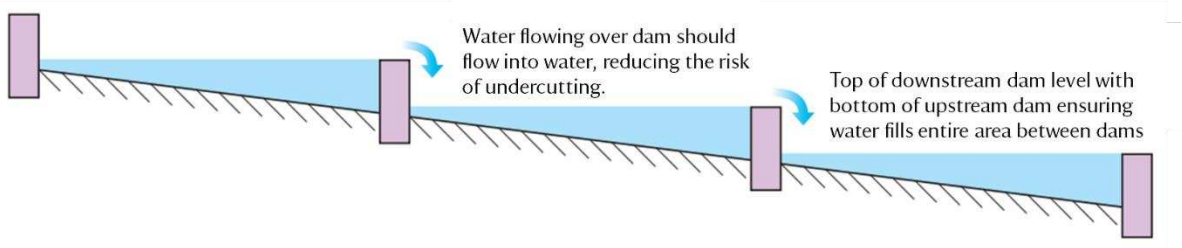


Figure 4.2.1: Principles of damming.

Dams are being constructed using timber and sheep wool rolls within the habitats being restored.

Timber Dams

Timber dams are slightly penetrable gully blocks that slow water flow, create pools and trap sediment. Sediment accumulation will slowly fill the pool which thereafter can be recolonised by vegetation.

Dams are being constructed using untreated timber (to avoid chemical leaching into the surrounding habitat) and are no more than 3 planks high. They are driven into the peat sufficiently

to prevent undercutting of the peat alongside being keyed into the sides to a depth of at least 30cm. The top planks have a notch to allow overflow, beneath which a timber or stone splash plate is placed to prevent undercutting. Timber dams are utilised where there is a sufficient peat depth within the gully to allow support posts to be anchored.

Sheep Wool Rolls

Coir rolls are often used to create dams to reduce water flow and trap sediment during peatland restoration works. However, these coir products are often costly, with long delivery times as they are often imported, being made from the husks and shells of coconuts. In recent years the use of sheep wool rolls has been implemented in numerous restoration projects across the UK and Ireland. These rolls have an outer hessian net/fibre which is filled with sheep wool. Utilising wool as an alternative to imported coir rolls has been beneficial in that it reduces the carbon emissions associated with importing material as the wool is locally sourced (the tenant farmer onsite provides wool for use in restoration) - this is in itself supporting local farmers. Additionally wool rolls have been noted as seed source, as the wool will have trapped seed. This is leading to natural colonisation of the rolls with flora (NatureScot, 2023).

The use of sheep wool within peatland restoration work is in its infancy, and continued monitoring is being undertaken on sites where this material has been used. An important consideration, prior to using wool rolls during restoration, is the possibility of contamination to water courses caused by either dung or chemicals within the fleece (i.e. sheep dip chemicals). Within the North Pennines AONB where the use of wool rolls has been trialled, all wool utilised was obtained from sheep which grazed the same parcel of land as that being restored, thus overcoming this issue (North Pennines AONB, 2023).

Wool Rolls have been installed on the peatland in areas where the peat is not deep enough for the installation of timber dams.

Grazing Exclosures

In 2023 grazing exclosures were erected across the site; three of these are in areas classified as peatland habitat. These exclosures will allow the site team to monitor peatland recovery in the absence of grazing and footfall. See figure 4.3.1 outlining exclosure locations.

4.3. Montane Heath

The montane heath within the National Trust land holding in the Mournes represents a significant portion of the Northern Ireland extent of this incredibly rare habitat which is restricted to elevations of over 600m. Based on monitoring undertaken through NIEA Condition Assessments in the past, alongside a montane heath survey of Donard and Commedagh in 2022 through ENF47, it is well known that these habitats are facing numerous threats, including visitor pressure and trampling, climate change, ammonia deposition, and of course similar to the other habitats onsite overgrazing poses a significant threat. In 2023, grazing exclosures (10x10m) were installed on the summit of both peaks in the Mournes, each of which are monitored to determine the impact of the removal of grazing and footfall from this habitat.

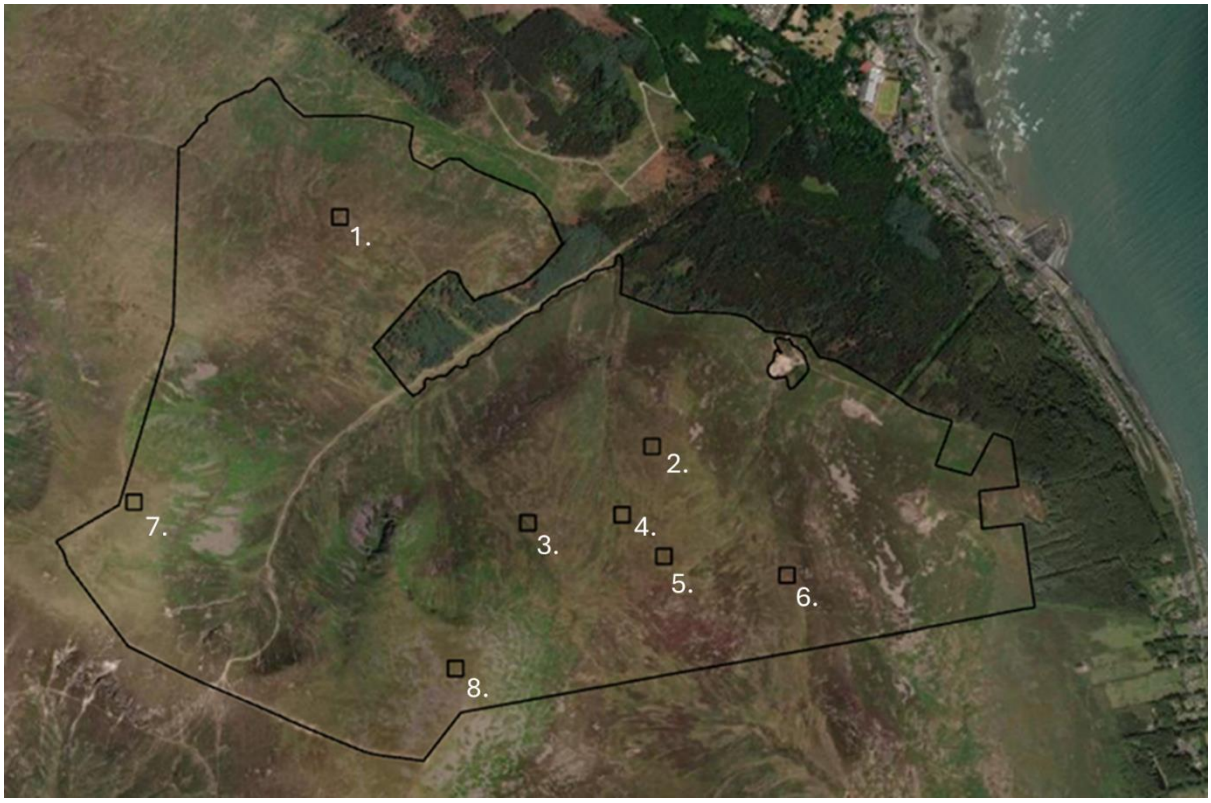


Figure 4.3.1: Grazing exclosures across Slieve Donard Property. Exclosures 1-3 Upland Wet and Dry Heath, 4-6 Blanket Bog, 7-8 Montane Heath.

4.4. Inland Rock

Inland rock and scree habitat is generally less easy to damage via grazing and recreational pressures. Nevertheless, vegetation, which is generally sparse but specialised, can be damaged. The two damaging activities highlighted in the SAC Conservation Objectives are quarrying (not allowed on NT land) and climbing or walking on scree. Parsley Fern is a key indicator of this habitat and there are few reliable recent records. Beech Fern appears to be surviving, but it is unclear whether records are from NT land. Active management of this habitat is limited, but more targeted monitoring of key species in these areas would prove beneficial.

4.5. Conservation Grazing

Grazing is a key consideration for the effective management and conservation of numerous ecosystems, habitats, and species (Baggio, et al., 2021; WallisDeVries, et al., 1998). The upland habitats we are familiar with in the UK and Ireland have been characterised by the impacts of grazing, which has been an integral part of the heritage of these landscapes for centuries. In the past, the uplands of the British Isles would have been dominated by woodland habitat, at least to an altitude of 600m where the tree line or Krumholtz is reached, where montane heathland would have succeeded. These woodlands likely varied between dense canopy woodland and more open woodland with an understory resembling heathland habitats which we see today. The clearance of trees in the uplands since the Neolithic period, alongside increased grazing pressure by

domesticated livestock has resulted in the landscapes and habitats we associate with the uplands today.

Grazing has been the key factor in the persistence of our upland heathlands, with livestock preventing the establishment of trees. The relationship between nature and grazing in our uplands is complex. O'Donoghue (2022) described the relationship as a goldilocks situation: grazing the landscape too intensively (too hot) or too extensively (too cold) will result in varying impacts on habitat condition. Achieving a grazing intensity that is 'just right' will be dependent upon the target ecological condition of the landscape. In upland habitats, where mosaics of wet, dry and montane heath occur alongside blanket bog and wetland habitats, managing the grazing intensity become even more complex as differing habitats may require varying stocking rates. In recent years, with the advent of virtual fencing technology, a method of managing grazing intensity in these landscapes has become a possibility.

Following the April 2021 wildfire within the Mournes, there was concern regarding the ability of the habitats impacted to naturally recover, with a notable increase in the abundance of Purple Moor Grass (*Molinia caerulea)*, which has been noted to outcompete heather seedlings and other heathland plants (Lunt et al., 2021).

Cattle have been reintroduced onto the National Trust's property within the Mourne Mountains in 2023 as part of the Wildfire Recovery Project. This is an ambitious project aiming to support the recovery of the habitats damaged during the 2021 wildfire which damaged a substantial area of sensitive and protected habitats, including wet and dry heath and blanket bog. Part of this project will involve the introduction of cattle to the property to undertake conservation grazing, notably with an aim to reduce *Molinia caerulea*, and in doing so facilitating the rejuvenation of heather species and these sensitive habitats.

4.5.1. Purple Moor Grass (*Molinia caerulea*) and Conservation Grazing

Molinia caerulea, commonly known as purple moor grass (and hereafter referred to as Molinia), is a deciduous perennial tussock forming grass species, which can inhibit the regeneration of heather (Taylor, et al., 2001). Molinia is a native species and a natural component of upland habitats. However, the species frequently dominates large areas, with a notable increase in the species predominance of habitats since the mid-20th Century (Chambers, et al., 2001). This increase coincides with a decline in condition of upland heaths, which has been associated with increased nitrogen deposition and rainfall (Sala, et al., 2000).

Molinia produces fresh growth in early spring. Young leaves are somewhat palatable, and livestock are known to graze the species at this growth stage. This fast-growing species can become rank by late spring, moving into the summer months, with mature leaves having a rough texture which is unpalatable to livestock and therefore avoided. Sheep being selective grazers are particularly noted to avoid the species. During the summer months and once mature, Molinia, particularly when dominating a habitat, supresses the growth of heather seedlings and other flora, and in the Mournes is inhibiting the recovery of the habitats damaged by the 2021 wildfire.

Studies have shown that appropriate conservation grazing can reduce the abundance of Molinia and promote the regeneration of dwarf shrub species. The seeds of heather species require light for germination - a condition removed by Molinia dominance. Additionally, dense Molina provides a cool, humid microclimate for bryophytes - this combination is particularly detrimental

to the germination of heather. Grazing with appropriate livestock at appropriate times can reduce the sward and disturb the soil, allowing the heather species within the seedbank a chance to germinate and establish.

The National Trust property within the Mournes has been grazed by sheep for at least the recent past, with a conacre agreement permitting the tenant farmer to graze 800 sheep prior to the fire in 2021, with numbers reduced to 400 while allowing the damaged habitats to recover. A proportion of the flock have been GPS collared since 2021 to better understand grazing habits and the areas where the sheep congregate. This data has definitively shown an avoidance for those areas where Molinia has become predominant post wildfire.

Considering the detrimental impacts to upland heathland habitats posed by Molinia, the primary aim of the conservation grazing within the Mournes is to suppress Molinia and to encourage the regeneration of more desirable habitats, particularly upland wet and dry heath.

4.5.2 NoFence Technology

Invisible fencing systems have frequently been employed for conservation grazing purposes in recent years, initially with products such as Boviguard. Boviguard is a system which required an induction cable to be buried along pasture boundaries, with collared livestock being notified by a sound warning upon approach to the boundary and an electric pulse upon crossing the boundary (Umstatter, et al., 2015). This approach allowed an alternative to traditional physical fencing, allowing the management of certain livestock species, while allowing others to freely roam a site. However, this product still required high levels of labour to establish and lay the cable along pasture boundaries. In more recent times, products like Boviguard have been superseded by virtual fencing technology, which requires no physical infrastructure, thus allowing more dynamic grazing patterns to be carried out across sites. Numerous virtual fence products are currently available on the market such as eShepherd, Vence, and NoFence.

NoFence, the first product to become available in the UK, is produced by a Norwegian company which has been developing technology of this kind since the 1990s. They produced the first virtual fencing systems available to farmers without the need for traditional fencing.

The NoFence systems consists of a solar powered GPS collar and a mobile app on a smart phone, which in combination allows the user to create virtual boundaries which will be relayed to the collars. Using the app, virtual fences or enclosures can be created with effectively no limit, allowing land managers to create areas where cattle can or cannot graze. Within pastures, exclusion zones can be created to ensure livestock avoid areas of sensitive habitat, or areas which may be dangerous to livestock (i.e. steep slopes, cliffs).

Using the mobile app virtual boundaries can be created to generate grazing enclosures or ‘pastures’. Collared livestock, once physically within the area occupied by the virtual pasture, can be assigned to the virtual pasture using the app.

The boundary of these virtual pastures unlike a traditional fence is not an exact line, but rather a buffer zone. If the livestock stay within the virtual boundary, they will not receive any stimulus from their collars at all. If the livestock enters the buffer zone, they will be initially notified with an audio warning These warnings use an increasing tonal scale, always starting with the lowest tone. The tone will only increase if the livestock continue towards the virtual boundary, with the audio

warning increasing in volume to a maximum of 78dB. Audio warnings are a minimum of 5 seconds and a maximum of 20 seconds in length. The duration of the sound is dependent on the animal's speed across the boundary. The increasing audio warning tone is emitted as 3 separate successive warnings, each separated by an electric pulse.

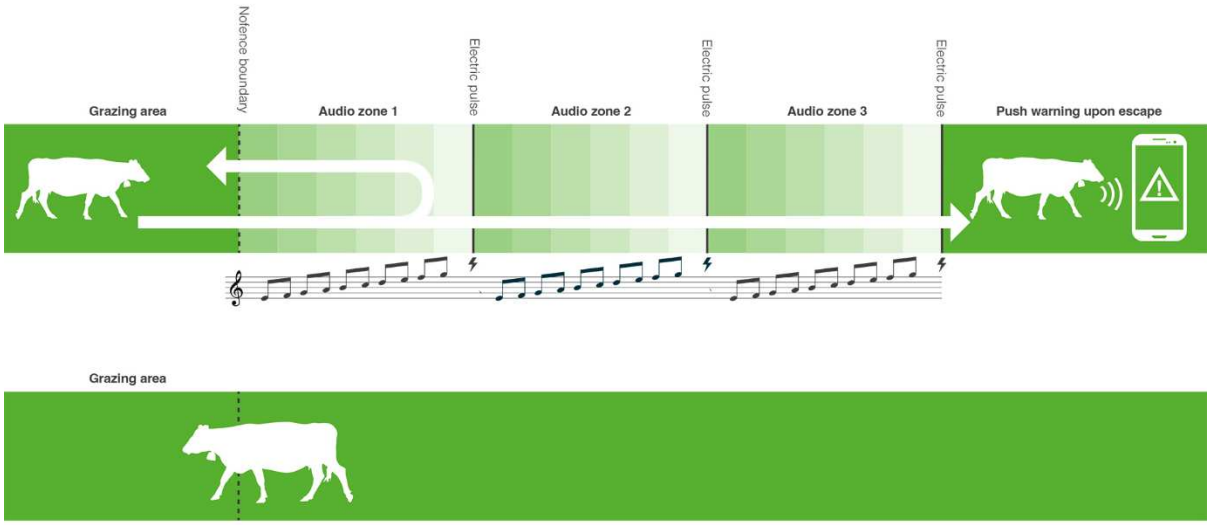


Figure 4.5.2: Nofence function pictogram

Upon crossing the virtual boundary, if the animal responds to the audio warning by turning around, the tone will decrease and stop. This system allows the livestock to learn how the technology works as there is a clear association between their reaction and the audio warning.

If the animal continues following the first audio warning, the animal will receive an electrical pulse in the neck region. The electrical pulse from the Nofence collar (Energy = 0.2 Joule per pulse; Voltage = 3 kV) is less powerful than that from a regular wire electric fence (6 Joule and 6-9 kV) (O'Donoghue, 2022). This was physically confirmed by the ranger team moving the collars along a virtual boundary and testing the electrical pulse before putting the collars on the livestock. Upon receiving the first electric pulse, if the animal continues in the same direction the same process with an increasing audio tone and electrical pulse will occur twice more until the animal has crossed all 3 warning zones. Any audio warning received will be reported to the user's mobile app. Additionally, any animal which crosses the 3rd warning zone will be reported as escaped and an additional notification will be sent to the mobile app. Having crossed all 3 warning zones, the animal will not be subject to any further audio warnings or electric pulses, and this process is deactivated until the animal is again registered within the virtual pasture. This allows the animal to return to the pasture without further warning, and thus acts a 'reward' for returning to the remainder of the herd/flock, had the animal escaped on its own. Escaped animals with deactivated collars enter trace mode, with GPS location of the animal continually being reported to the app.

An additional feature of the Nofence system are the shelter beacons. These beacons are used to disable the collars if collared livestock have access to indoor housing, preventing walls or other solid infrastructure from interfering with the collars ability to receive accurate GPS signals. Without these beacons, positional drift may occur, potentially leading to the collars emitting false audio warnings and electric pulses in the neck region.

The purpose of the Nofence collars is to alert livestock upon reaching a virtual pasture boundary, which they should not breach after an initial training period, allowing dynamic grazing management to be implemented across sites.

4.5.3 Animal Welfare and Training

Training the cattle with the Nofence collars was carried out in 3 phases. 2 of these stages were carried out on lowland pasture, while the final stage was carried out within the Mournes and acted as the first stage of the conservation grazing period.

1 -Training Stage 1 (Farm) – May 2023

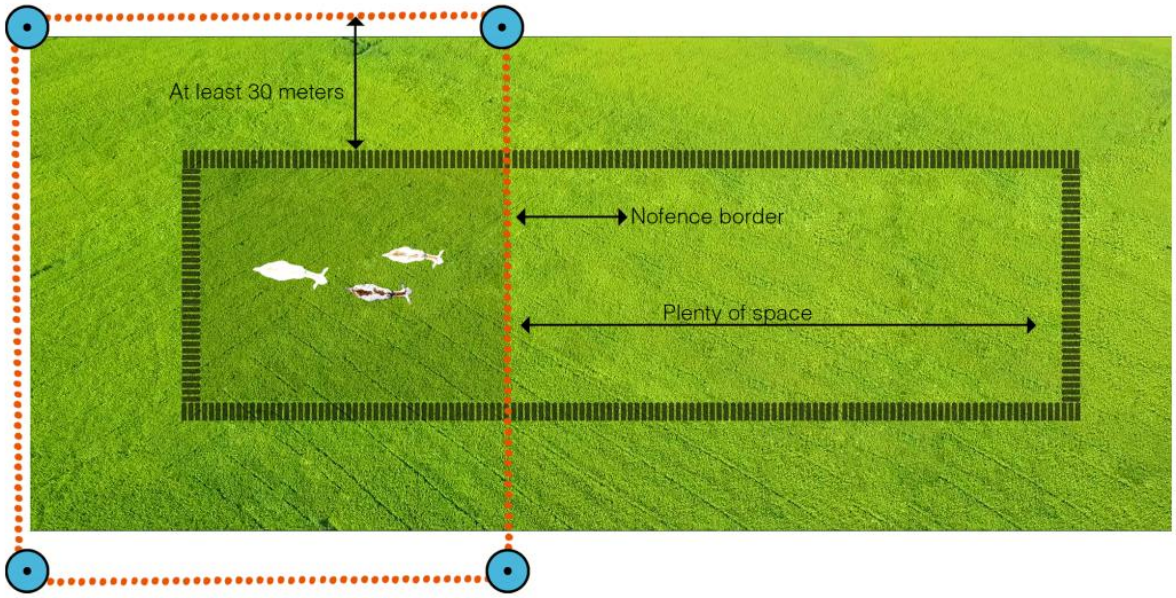


Figure 4.5.1: Nofence recommended training pasture design. This pasture design was implemented during training periods.

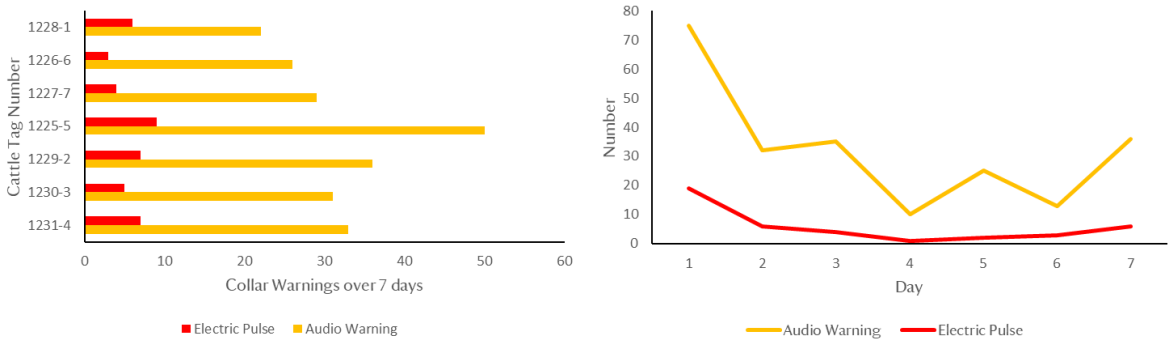


Figure 4.5.2: Number of audio warnings and electric pulses per day over the initial 7-day training period.

Collars were put on the livestock on the 1st of May 2023. To allow the cattle to acclimatise to wearing the collars they were not assigned to a pasture for 3 days, so no audio warnings of electric pulses could be emitted from the collars. The cattle first grazed a lowland pasture adjacent to the tenant famers yard, where they had access to housing (which had a shelter beacon within) and supplementary feed. After acclimatising to wearing the collars, they were assigned to

a virtual pasture within this field, with which they were now familiar. Training within this pasture was carried out following the recommendations of previous programmes where Nofence collars have been used alongside guidelines provided by Nofence (Wallington, 2021; Nofence, 2022). This field was small in size (<2ha) which is necessary while training to ensure the livestock encounter the virtual boundary on day one. The virtual pasture had its boundaries at least 30 metres away from the field's physical boundary on all sides apart from one which would be utilised for training (fig. 4.5.1). Having a singular virtual boundary (100m) to begin allows the cattle to retreat from the audio warning or electrical impulse without coming across another virtual boundary in the other direction, therefore consolidating their learning more effectively. Additionally, the field was large enough to allow an area of at least 50m between the virtual boundary and the physical boundary at the other end, thus allowing the animal a safe area to turn around and calm down.

During this first day of training, a total of 75 audio warnings and 19 electric pulses were emitted. The cattle did 'escape' or cross the virtual boundary but returned to the pasture thereafter in their own time. On subsequent days the number of audio warnings and electric pulses steadily decreased, with a slight raise in both on the final day of training, as the cattle began to test the boundary by grazing in this area (fig. 4.5.2). Hereafter the cattle were moved to their second training site.

2 - Training stage 2 (Bryansford) – May 2023

Figure 4.5.3: A: Training stage 1 (Farm), B: Training stage 2 (Bryansford). Red dashed line represents the training boundary each training pasture. Note other virtual boundaries are along or beyond physical boundaries, therefore do not impact the grazing livestock. (Maps are screenshots from Nofence app).

The second training stage was undertaken at Bryansford field, National Trust land leased to the tenant farmer as part of the conacre agreement. Similar to the initial training period, the cattle were allowed to acclimatise to their surroundings and the collars were not assigned to a virtual pasture for 3 days. The virtual training boundary within this pasture was 260m in length, over twice the length of the initial training pasture, thus providing a larger area within which the cattle could learn how this technology operated.

During this training stage the cattle showed a clear understanding of how the Nofence system worked. On the first day of training a total of 28 audio warnings and 1 electric pulse was emitted. Over the entire training period at Bryansford, the daily number of electric pulses emitted was less than 2, with a notable two-day period with 0 electric pulses being emitted.

Figure 4.5.4: Number of audio warnings and electric pulses per day during the second training period

Following this training period, the cattle were assessed by a registered vet. During this check the health of the livestock was evaluated, alongside an evaluation of the collars on each animal. Following this assessment, the cattle were brought to Millstone Pasture, within the National Trust Mourne Property. This would be their final training period, while also acting as the initial conservation grazing period.

3 - Training stage 3 (Millstone Pasture, Mournes): July 2023

Millstone Pasture being the final training stage and first training stage on the mountain was traditionally fenced, meaning should the collars fail, the cattle would still be contained. When the cattle were let into this paddock, they were allowed to roam the entire 14ha area before the collars were switched on the following day. For training, Millstone Pasture was then divided into two with a virtual boundary down the middle. Figure 4.5.5 shows the virtual boundaries for both pastures within this training area. Millstone Pasture 1 (9.1Ha), was the initial area of the mountain grazed. The cattle had been wearing the collars for a month and interacted with the virtual boundary as expected with varying levels of audio warnings and consistently low pulses emitted (fig. 4.5.6).

Figure 4.5.5: Training stage 3 pastures.

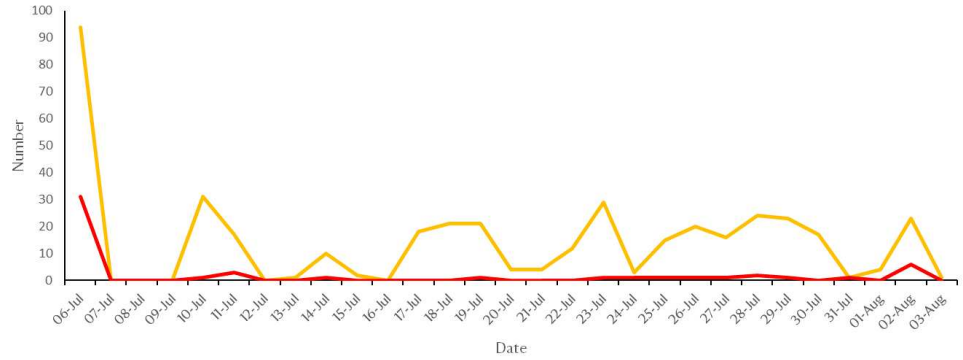


Figure 4.5.6: Number of audio warnings and electric pulses per day during the third training period

The cattle were moved to Millstone Pasture 2 (7.6Ha) on the 4th of July. When moved to the adjoining pasture and upon interacting with the virtual boundary, again we presume the cattle perceived the audio warning as that of the initial pasture as they decided to return to the initially grazed area, with all the stock moving through the boundary and 'escaping'. This led to high audio warnings and pulses emitted at this time. The collars were immediately turned off and turned on again the next day with an amended boundary which overlapped with the previous pasture.

4 - Grazing the Open Mountain: August 2023

The final training period within Millstone Pasture (1 & 2) ended on the 3rd of August 2023. This was to allow the cattle to adequately graze this area and reduce the cover of Molinia, rather than solely for the purpose of training the cattle.

Having grazed Millstone Pasture, the cattle were then moved to the open mountain in the area beneath Thomas Mountain and later the Glen River Valley. They grazed an area of 19Ha over the rest of the season. The pasture was expanded each time allowing the cattle access to fresh pasture, and the cattle were still allowed to return to previously grazed areas (fig. 4.5.7). This was decided as the Glen River provides the main access route up Donard, and due to worries regarding the impacts of walkers and dog worrying we afforded the cattle the option to return to a quieter area beneath Thomas Mountain.

\In 2024, a similar pattern of grazing was undertaken across these areas of the mountain, and the need for training was minimized as the livestock were familiar with the collars having undergone training the year prior.

The impacts of this conservation grazing project on the landscape is monitored by the ranger team, and the results of this monitoring are outlined in section 5.3. To date the results are promising, however it will take many years of continued grazing in these areas to restore these areas to a mosaic of heathlands and to reduce the cover of Molinia to an appropriate level.

The management of upland habitats of Britain and Ireland was not always dominated by extensive sheep grazing. In the past, traditional farming practices included the grazing of cattle in the uplands during the summer months, with the more productive lowlands being saved for hay production in the summer and a place for cattle to be brought for winter grazing. This practice of moving cattle between the uplands and lowlands is termed transhumance. There are different terms for transhumance practices across the UK and Ireland - in Wales it is known as Havod & Hendre, while here in Ireland it is often termed Booleying. Across the Mournes, and particularly the Western Mournes there are ruins of Booleying huts where those who herded the animals would have lived during the summer months.

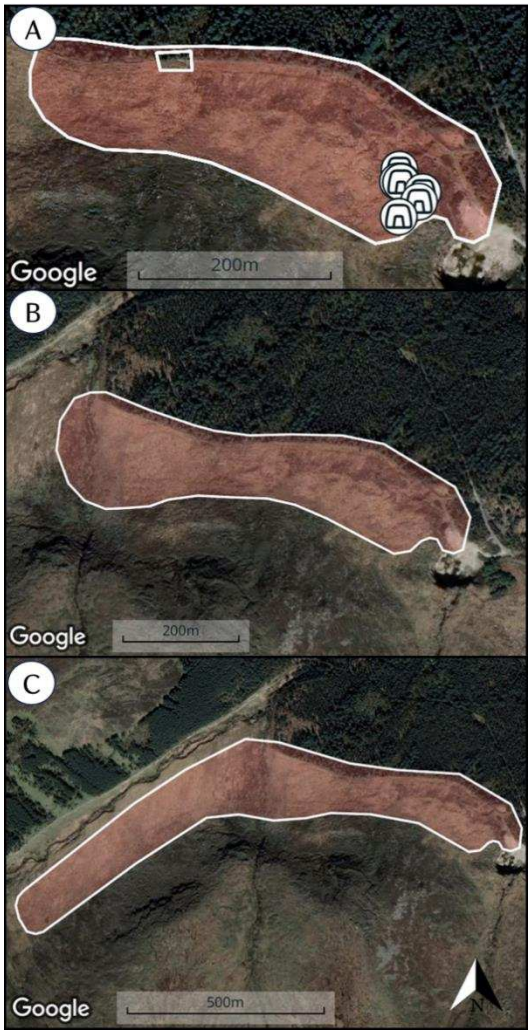


Figure 4.5.7: Pasture expansion where cattle grazed in the area beneath Thomas Mountain and later the Glen River Valley

4.6. Path Maintenance

The National Trust Mournes property includes the main Slieve Donard access path, running from Donard Glen to the summit, with the route accommodating over 100,000 visitors per annum. Prior to the re-introduction of a dedicated path team in January 2019, the path suffered severe erosion because of both water flow and increased visitor numbers. There was a loss of core integrity in key places with built path features becoming hugely eroded and redundant. To support the conservation of ASSI/SAC habitats, the path repair project has focused on erosion damage and improved visitor containment along the length of the recreation corridor, facilitating the huge increase in visitor numbers since the initial installation of the path infrastructure. The project further delivered habitat restoration within the recreation corridor.

Since January 2019, the team has consisted of two Mountain Rangers with specialist training in upland pathwork techniques, with both contractor and volunteer support. The path has been

constructed following path building and management techniques and guidance published by the Scotland based Upland Path Advisory Group (SHN, 2015).

DAERA funding for the path project has ensured project continuity, with the National Trust skillset in this area, which would otherwise have been lost, being retained by the organisation. Throughout the course of the project, continued collaboration with stakeholders has been maintained, both directly and through broader groups such as the Mourne Outdoor Recreation Forum and AONB Management Group. This has supported joined-up approaches to path repair and maintenance, habitat protection and restoration, and public and media engagement.

4.7. Wildfire Preparedness

Apart from direct recreation pressure and overgrazing, the most significant impact on site is that of wildfires, which are almost certainly started deliberately (NI Fire & Rescue Service assessment). Following the April 2021 wildfire and the receipt of funding through the DAERA Challenge Fund, more time and resources have been dedicated to increasing the wildfire resilience of the National Trust property in the Mournes.

Since the 2021 wildfire, through the DAERA Challenge Fund and the current regional DAERA Environment Fund there has been two Ranger Posts dedicated to Wildfire Recovery onsite. These roles, alongside undertaking a great amount of restoration and monitoring, have been working to increase wildfire resilience onsite. Alongside these positions, the Challenge Fund facilitated the acquisition of an Argocat and an amphibious trailer fitted with a fire suppression unit, which can be utilised by the site team to tackle small fires alongside the NI Fire & Rescue Service (NIFRS), or deployed to the NIFRS during large wildfire events.

In an effort to ensure the team was prepared for any future wildfire events, a Wildfire Plan has been produced to streamline the response between emergency services and NT in the event of a wildfire. These plans outline access routes to the site (appendix fig.1), equipment available, and individuals trained in the use of equipment, emergency contact information, and areas and habitats onsite with a fire risk classification.

To determine the potential impacts and dynamics of wildfire events, the Pau Costa Foundation undertook Wildfire Modelling in 2023. This is discussed in more detail in section 5.5. This work provided insight and is continually informing management onsite.

A strategic grazing regime has been introduced across the property to increase the resilience of the habitats onsite to future wildfire. Cattle grazing, when used as part of a mixed grazing regime to include sheep, creates a more structurally diverse habitat than that maintained by continuous sheep grazing. Cattle grazing reducing the fuel load of the dry course grasses and degenerate heathers (that is heather that is no longer actively growing). This mosaic of vegetation types includes patches of heathers and other dwarf shrubs species, areas of short grass and bare ground. This resulting ‘patchwork’ of habitats and reduced fuel load is much more resilient to wildfire events. Once the grazing regime has been established and the herd size is at capacity, tactical mob grazing will be employed across the property on areas identified within the Wildfire Plan as firebreaks. The reduction and management of fuel loads on these areas will be an ongoing priority throughout the grazing season.

The National Trust Bloody Bridge property sees high visitor numbers during periods of warm weather, with a corresponding increase in anti-social behaviour recorded. Small gorse fires are recorded on an almost annual basis as a result of this behaviour. Firebreaks have been cut and maintained along the 800m length of the site which have shown to be effective in minimising the spread of fire and extent of damage. As of April 2025, a small herd of Belted Galloway cattle have been introduced to the site to browse newly created firebreaks, keeping them free of scrub and maintaining the designated habitats of lowland scrub present here.

Ongoing peatland restoration onsite will also increase resilience of the site, as rewetting strategic areas will hinder the spread of wildfire, acting as a natural firebreak.

With the recent fires across the Mourne Mountains in April 2025, the NT Mournes team were able to act on the Wildfire Plan and assist the NIFRS to help tackle the fire that had started beyond our boundaries at Crossone. The team were able to use the Argocat and a 4x4 to transport firefighters and their equipment up less accessible tracks. This aided the NIFRS to extinguish the fire and prevent further habitat damage across the Mournes.

5. Ecological Monitoring in the Mournes

The levels of monitoring within the National Trust land holding has varied throughout the years since the site's acquisition in 1992. However, an increase in monitoring is notable since the 2021 wildfire, given the recruitment of two additional full time Ranger posts on the site focusing on wildfire recovery. In the years since the fire there has been a significant increase in our knowledge and understanding of the ecology and complex nature of the habitats and species onsite. The following section aims to summarise the monitoring and surveys undertaken onsite in recent years.

5.1. The Nature Monitoring Framework

As part of the National Trust's new strategy, and in an effort to quantify and standardise monitoring effort across sites, NT introduced a Nature Monitoring Framework in 2024. This framework allows all monitoring efforts onsite to be easily visualised and gaps identified. With increased monitoring efforts in the Mournes following the Wildfire, many aspects of the Nature Monitoring Framework have already been implemented. A summary table for the framework as related to the Mournes can be found within the appendix of this document (see Appendix fig.2).

5.2. NIEA Condition Assessments & Wildfire Recovery Monitoring

Following the 2021 wildfire and onset of the Wildfire Recovery Project, the newly appointed team began undertaking NIEA Common Standards Monitoring (CSM) Condition Assessment monitoring within the area impacted by the wildfire. This method has been undertaken by NIEA across the Eastern Mourne ASSI in the past, most recently in 2016. Within the area impacted by the wildfire there are 15 survey plots (see Appendix fig. 3 for 2024 NT survey results of plots).

The results of primary attributes recorded during the condition assessment survey in the wildfire area, are assessed in the graphs below in figure 5.2.1. For simplicity, % cover of species is assumed to have been 0% following the fire, and the 0% cover of bare ground assumed to be 100%.

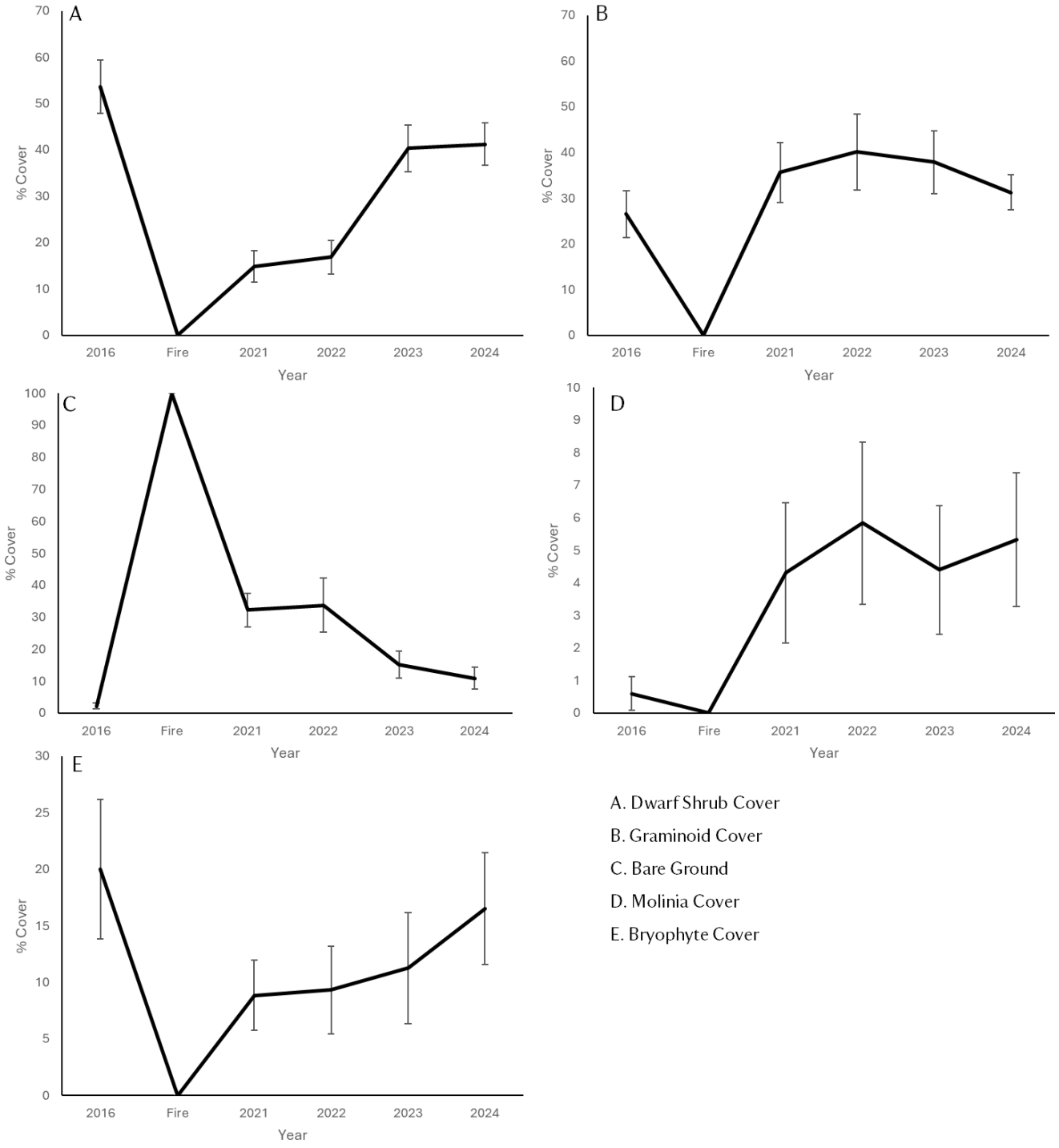


Figure 5.2.1: Results of 2016 NIEA Condition Assessments

The two primary components of the surveyed habitats are Dwarf Shrub (A) and Grasses (B) [graminoids species].

The survey results show a quick recovery of grasses, to a level higher than that pre-wildfire in the summer of 2021. Grass cover increases again in 2022, with a decrease in both 2023 and 2024 as

the habitat stabilises and dwarf shrub continue to recover. Dwarf shrub recovery has been more gradual, but interestingly after 3 years the dwarf shrub cover is approximately 41%, having been 53% pre wildfire in 2016.

5.3. Conservation Grazing Monitoring & Virtual Fencing using NoFence

To gain an understanding of the impacts of the conservation grazing project which began in 2023, the site team implemented a monitoring programme across the area which would be targeted for grazing. This involved the establishment of 37 plots across the area in a grid as outlined below in fig 5.3.1.

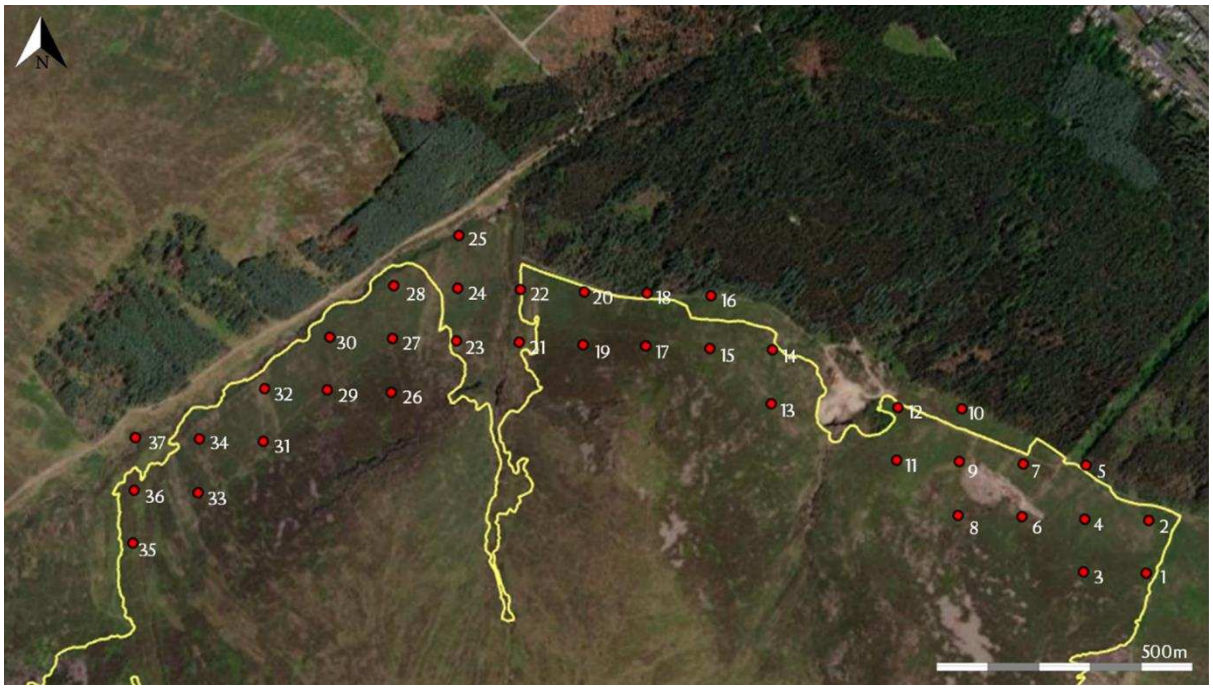


Figure 5.3.1: Plots used in conservation grazing monitoring.

These plots were monitored using NIEA Condition Assessment methodology, and monthly throughout the grazing season these plots are monitored to assess grazing impacts. This data is utilised alongside the expertise of the site team to inform decision making in regards movement between virtual pastures. The Condition Assessment survey results are not presented in this report; however, Fig 5.3.2 outlines the grazing impacts (sward height) pre and post grazing for each virtual pasture grazed during 2023 and 2024. These graphs outline the impact of the grazing on the sward with a reduction in sward height in these areas. In years to come, with continued conservation grazing and monitoring, it is hoped that a more diverse mosaic heathland will re-establish.

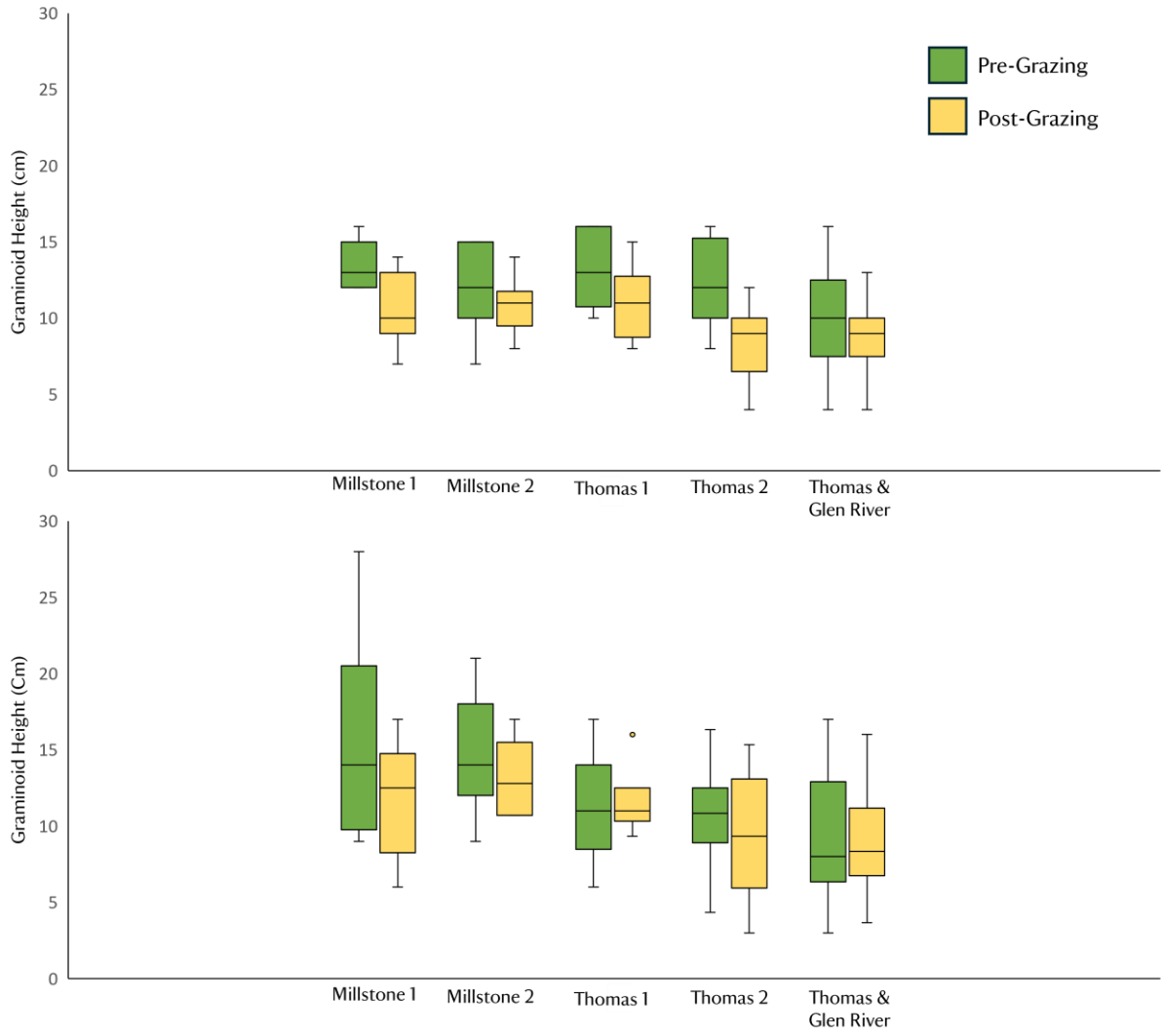


Figure 5.3.2: Graphs showing grazing impacts (sward height) pre and post grazing for each virtual pasture grazed during 2023 and 2024

5.4. Peatland Monitoring using the National Trust Peatland Monitoring Approach

In 2023 NT released its Peatland Monitoring Approach, a framework for consistent monitoring of peatland habitats across the Trusts landholding. The Peatland Monitoring Approach focuses on measuring the impacts of intervention across sites, encompassing, pre- and baseline surveys, and allowing for a tiered approach allowing for monitoring at a basic level using methods such as IUCN's Eyes on the Bog, to more innovative or detailed methods such as academic research (Appendix Fig. 4).

Shortly after the release of the Peatland Monitoring Approach, NT announced the availability of funding from the Starling Bank for peatland restoration across NT sites. With an increased ranger resource in the Mournes, and with an appreciation of the condition of the peatlands on the Slieve Donard property from previous NIEA Condition Assessment Surveys and from NT Bio-

surveys, the team decided to apply for funding to undertake restoration of the peatland in the col between Thomas' and Millstone Mountain. Following the receipt of funding, the site team, using the peatland monitoring approach, undertook base a preliminary or baseline survey of the peatlands across the property.

Based on previous understanding of the extent of peatlands onsite, the site team undertook monitoring of peatland habitats which had been mapped during a Phase 1 habitat survey of the site, extending a buffer around these areas to determine whether the areas mapped were an underestimate. Level 3 of the Peatland Monitoring Approach was utilised to survey the site, in that Eyes on the Bog, the peatland code, and NIEA Condition Assessment (noted as Country Specific Monitoring) were installed or implemented onsite. Probing was undertaken on a 100x100m grid and Condition Assessment survey (22 plots) were assessed at a sample of locations across the surveyed area.

During the 2023 survey season, a total of 270 peat probes were measured across the site, with the greatest peat depth recorded at 180cm; this was found within the Valley Mire between Thomas and Millstone Mountain. Similar areas of deep peat were found across the site, however only in isolated pockets among shallower peat. Based on the probing survey of the site it is estimated that there are approximately 21 hectares of peat with a depth of greater than 50cm. A map of peat depth can be seen in Figure 5.4.1.

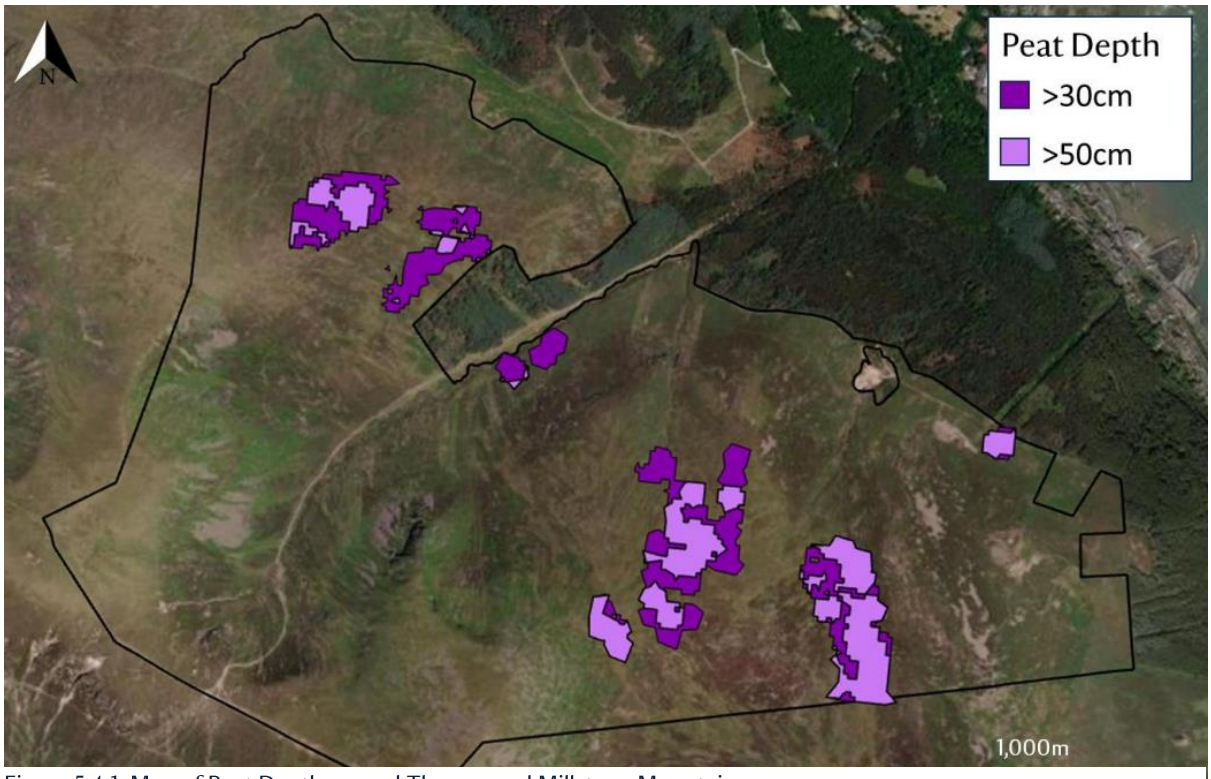


Figure 5.4.1: Map of Peat Depth around Thomas and Millstone Mountain

The results of the Condition Assessment survey found that peatland habitats across the property are in unfavourable Condition, failing on 7 attributes:

- **Dwarf Shrub Height**: Mean 12.2cm (Target 15-30cm)
- **Dwarf Shrub Cover**: Mean 20.5% (Target >33%)

- **Sphagnum Cover/Abundance**: Mean cover 20.5%, Sphagnum cover >25% in 27% of plots (target >25% in 66%)
- **Bare Peat**: Mean 3% bare peat (Target <2%)
- **Grass Cover**: Mean 65% (Target <50%)
- **Erosion Features**: Observed within 22% of plots. (Target <2% of Study Area)
- **Grazing Impacts**: observed at a rate of 'Frequent' or greater (DAFOR*) at 23% of plots (Target moderate or heavy grazing observed in <5% of plots).

*DAFOR relates to a standardised scale of frequency: Dominant, Abundant, Frequent, Occasional, Rare (DAFOR).

Within the surveyed plots, Ling Heather and Cross Leaved Heath were the most abundant species, with both species occurring together in all but one plot, where Ling Heather was absent. Bell Heather occurred frequently, however notably in lower abundance. Bog myrtle was recorded in two plots both of which were found on the western side of the property within the mire community found on the lower slopes of Shan Slieve.

The mean grass cover across the surveyed plots was 65% meaning the peatlands are in an unfavourable condition for this attribute. This mean figure is not notably skewed by outliers within the data set as many plots do have percentage cover of grass approximating to this mean.

Moss (bryophyte) cover varied greatly between plots, notably for many plots a large proportion (if not all) of moss cover was *Sphagnum* bog-moss species.

Within a 10m radius of each plot management attributes were measured using the DAFOR scale. The presence of dung was the only attribute measured as abundant within any plots, most attributes were recorded as rare within plots.

Eyes on the Bog

Eyes on the Bog (EoB) is an IUCN Peatland Programme initiative, which provides a scientifically robust, repeatable and affordable monitoring method for peatland hydrology. EoB is the basic requirement of the National Trust's Peatland Monitoring Approach. The method involves the installation of Rust Rods and Surface Level Markers (see fig. 5.4.2) which allow the monitoring of water table depth, and peat growth respectively. Rust rods are a painted metal bar which have one side exposed, when inserted in the peat, the exposed surface will rust only above the water table where exposed to oxygen. Surface level markers which allow the measurement of peat growth or reduction to be monitored. EoB will provide valuable information over a longer timescale on the peat growth/loss, and water table dynamics.

Figure 5.4.2: Eyes on the Bog equipment.

5.5. Wildfire Regime Analysis (The Pau Costa Foundation)

To gain an understanding of the dynamics of wildfire on NT's Donard property, the Pau Costa Foundation undertook wildfire regime analysis across the property and surrounding landscape in 2023. This modelling exercise saw the site and consultancy teams, gather site knowledge and available data on the site alongside mapping notable features (natural fire breaks: walls, rivers etc.), providing this information to Pau Costa to undertake analysis.

The primary results of this analysis are summarised in figures 5.5.1 and 5.5.2. In figure 5.5.1, A1 (Flame Length) and A2 (Rate of Spread) displays the results for a wildfire regime under the Current Climate with Business-as-Usual Management. This scenario outlines that any wildfire event would have short flame lengths and that the rate of spread would be variable, with a notable increase in the rate of spread in the area of the Glen River Valley, particularly the steep slopes of both Donard and Commedagh. In figure 5.5.1, B1 and B2 outline the impacts of a wildfire regime under strategic management of the site, and the impacts of a wildfire in this instance would be decreased with a much lower rate of spread and lower flame lengths.

In figure 5.5.2, C1 and C2 displays the impact of a wildfire under the impacts of Climate Change under a business-as-usual management scenario. Both the flame length and rate of spread in this instance would be devastating. D1 and D2 display the regime under the impact of Climate change with adapted management. Although the impacts are still severe in this scenario, they are reduced and outline the need for management onsite to incorporate wildfire mitigation measures i.e. firebreak management etc. (Canaletta, Ballart, Gracia, & Prat-Guitart, 2023).

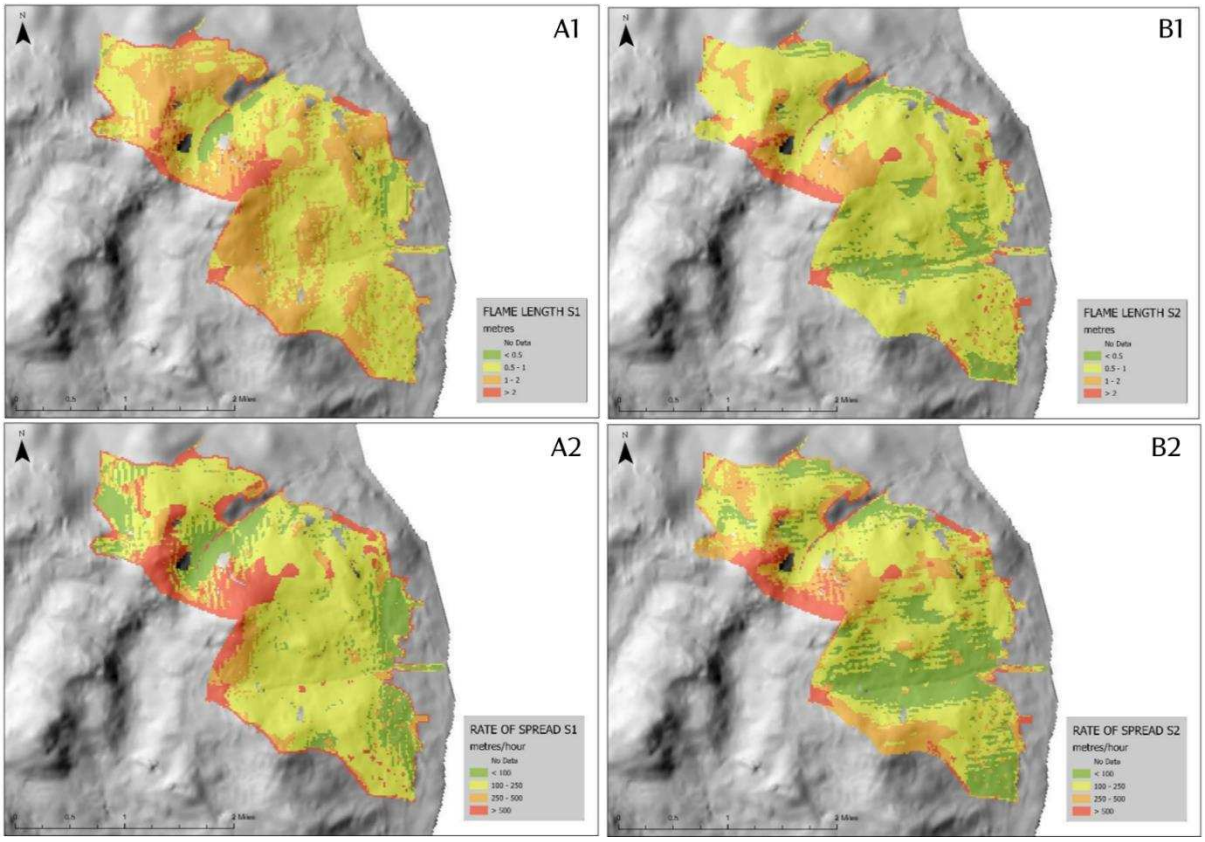


Figure 5.5.1: Analysis results for a wildfire regime under the current climate. A1 and A2 show the results with Business-as-Usual Management. B1 and B2 show the results with strategic management.

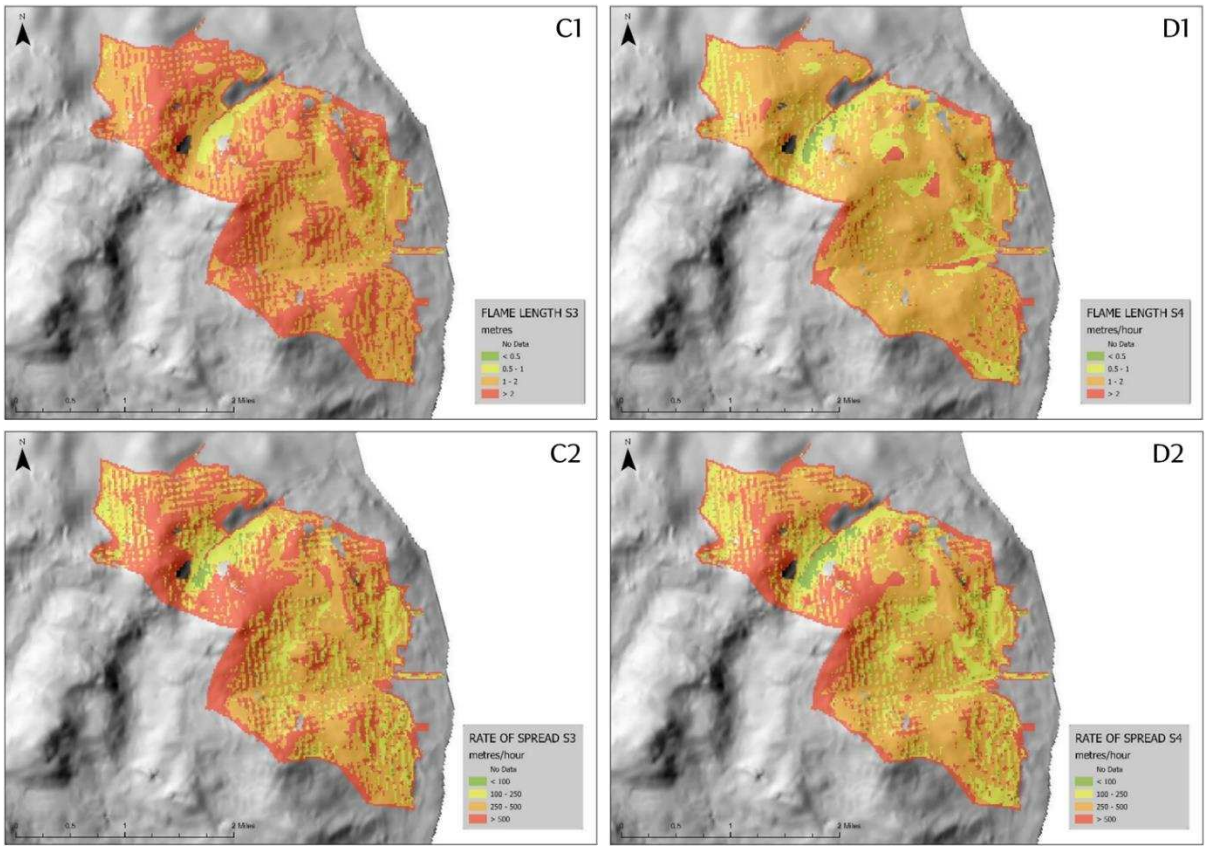


Figure 5.5.2: Analysis results for a wildfire regime under the impacts of climate change. C1 and C2 show the results with Business-as-Usual Management. D1 and D2 show the results with adapted management.

5.6. The Great Fuel Moisture Survey (University of Birmingham)

Figure 5.6.1: The Great Fuel Moisture Survey results.

In April 2023, the site undertook sampling to contribute to The Great Fuel Moisture Survey, which was being undertaken by researchers at the University of Birmingham. This involved the collection of Common Heather (*Calluna vulgaris*) from across the selected site. Within the National Trust site in the Mournes was the area surrounding Drinneevar Quarry and also the western flank of Glen River Valley - both areas which were unburned during the 2021 wildfire. In fig 5.6.1 above, the linear area sampled in the bottom left was likely sampled by Mourne Heritage Trust/NI Water. The results above are preliminary results, as this is ongoing research with more detailed findings to be published within peer reviewed literature. Notably, from the samples collected across the NT land within the Mournes Fuel Moisture is moderate at 0.81-1.1. However, in one sample behind the forestry on Slievenamaddy, the fuel moisture was low at 0.57-0.60, meaning this area of the site is likely more at risk to ignition during a wildfire event.

5.7. Montane Heath Condition Assessment

Montane heath is one of the rarest habitats in NI. NT's land in the Mournes (Slieve Donard and Slieve Commedagh) contain a significant proportion of the total resource. The condition of this habitat in the High Mournes is known to have been poor due to many factors both anthropogenic and environmental. These habitats had been surveyed in the past through various surveys, but a focused, contemporary survey of the habitat was not available to inform management. Through DAERA's Environment Fund (ENF47), a Montane Heath survey was undertaken, through the ecological consultancy 'Fieldfare Ecology' in September 2022.

This survey found that the major changes that have taken place over time in the montane heath vegetation at Slieve Donard and Slieve Commedagh display a consistent relationship with grazing pressure. Other factors, in addition to grazing, have contributed to these changes. Trampling by hill walkers is obvious, especially around the summit of Donard, and on the path to the cairn on Commedagh. As discussed above, the slow-growing nature of many of the more important montane heath species makes them particularly susceptible to physical damage. The impacts of grazing and recreation were clearly identified by the 2022 survey.

However, other less obvious factors may produce similar impacts. A reduction in woolly fringemoss (*Racomitrium lanuginosum*) and some dwarf-shrubs, accompanied by a rise in grass and sedge cover can be associated with the eutrophic impacts of atmospheric Nitrogen deposition. Climate change may also be a contributing factor to the decline in condition, and certainly represents a future threat.

Off-site pressures such as climate change and atmospheric nitrogen deposition, require measures at a much larger scale. In terms of mitigation, there is little that can be done to address these at a site level, other than to ensure that the habitat is as resilient as possible and to monitor site-specific ammonia levels (section 5.8).

Resilience depends upon habitat condition; the better the condition, the more resilient the habitat will be. The key recommendation from the montane heath condition assessment was to implement management measures to deal with the on-site pressures from grazing and recreation. The fenced exclosures on montane heath (see section 4.3) will provide evidence of recovery rates and can inform future management.

5.8. Ammonia (NH3) Monitoring

As of September 2023, the UK Centre for Ecology and Hydrology (UKCEH) have been undertaking monitoring of ammonia on the site at Slieve Donard. Ammonia (NH3) pollution is a notable threat to the habitats found across Slieve Donard. Northern Ireland suffers from the highest levels of atmospheric nitrogen (N) input in the UK and Ireland (Rowe et al. 2022). High levels of ammonia can have significant noticeable negative impacts on a range of nitrogen-sensitive species and habitats, such as those found on nutrient poor heathland habitats. Excess nitrogen favours the growth of fast-growing species such as grasses, which outcompete species which favour more nutrient poor environments. This leads leading to a change in the structure and function of these communities, which may result in biodiversity loss.

When CEH began this monitoring across the site, ammonia research had been carried out across a number of lowland habitats, but very few studies had been carried out in high altitude environments such as on Slieve Donard. There are 3 monitoring points across the site at different elevations (See fig. 5.8.1). These were first installed in September 2022 and have been monitored since this time (however there was a break in funding between the Challenge Fund and EFSS 41). Monitoring is carried out using ALPHA (Adapted Low-cost Passive High Absorption) Samplers (Tang et al. 2001) which are a passive cost-effective sampling technique which can monitor NH3 concentrations in the air without a power supply.

ALPHA Samplers are changed monthly (the 1st of each month) and sent to CEH for laboratory analysis. The team from CEH visited the site in March 2023 to undertake vegetation monitoring. At each of the 3 ALPHA locations, bryophytes (mosses) were sampled and brought back to the lab to determine the %Nitrogen (%N) within the sampled species.

The lowest average yearly NH3 concentration is near the summit at 0.63 µg m-3 (Site 3) and the highest is at Site 2, with 0.98 µg m-3. All three sites are below / just below the critical level of 1 µg m-3 for bryophytes and lichens (UN ECE, 2007). However, this threshold was exceeded at Site 1 for two months, and Site 2 for five months. During some months of sampling the results were considered unreliable due to wet membranes, which causes underestimation of monthly NH3 concentrations. The concentrations of NH3 are at their lowest between October 2022 and December 2022, coinciding with restrictions on application of manures and slurry.

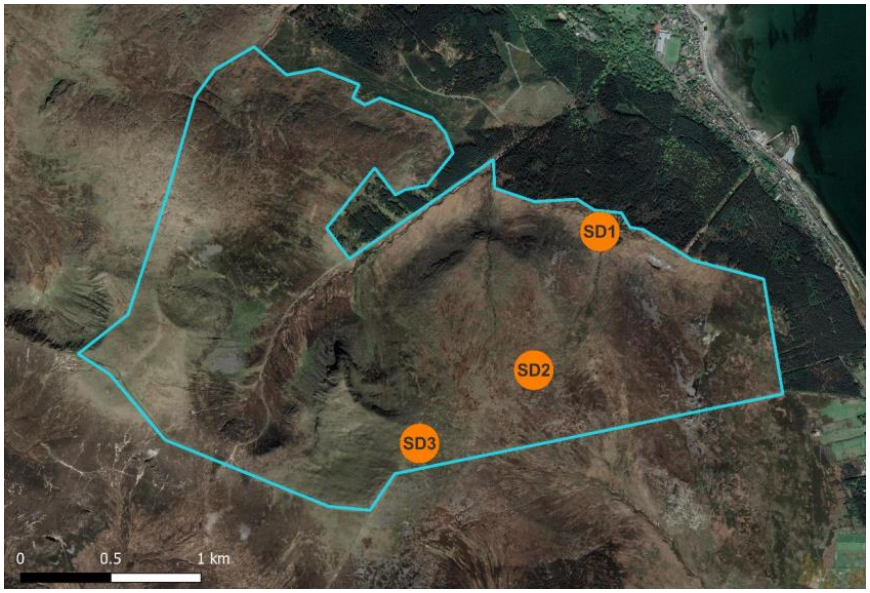


Figure 5.8.1: Ammonia monitoring sites on Slieve Donard.

Woolly fringemoss was the only species collected at all three sites. The %N indicator was lowest at the low-altitude site (Site 1) with 0.82%, slightly higher at Site 2 with 0.86% and the highest at the high-altitude site (Site 3) with 0.92%. Site 3 had the highest %N despite often having lowest average recorded NH3 air concentration of the 3 monitored sites. Although the site's annual average NH3 concentration was below the critical level of 1 µg m-3 for bryophytes and lichens, the vegetation at the site looked (visual assessment) more damaged than expected given the NH3 air concentration. This may point to other sources of atmospheric N input, in this case likely in the form of wet deposition as rain or fog, which is not currently monitored at Slieve Donard (CEH, 2024).

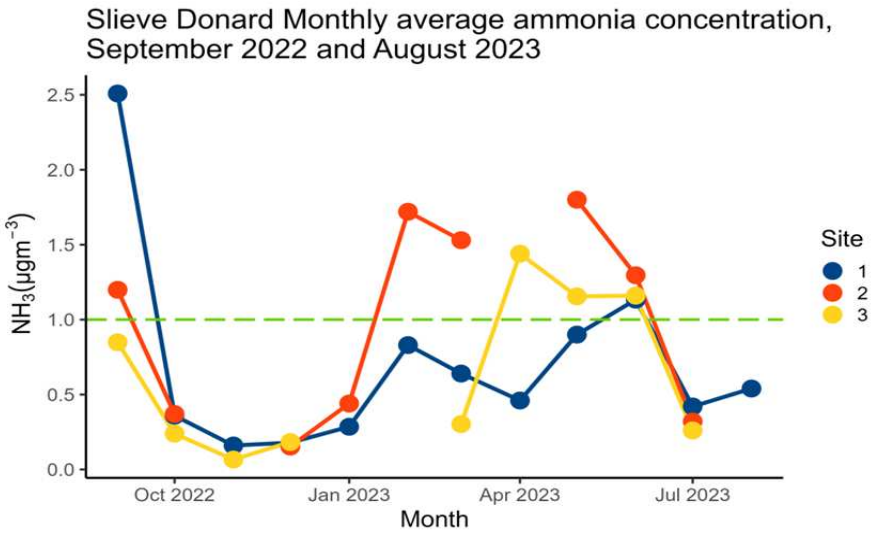


Figure 5.8.2: Ammonia monitoring results from Slieve Donard between September 2022 and August 2023

The NH3 data being gathered on Donard is providing invaluable scientific information across an elevational gradient which has not in the past been monitored. These results, particularly noting high NH3 concentrations during certain periods throughout the year, can allow us to infer potential damage impacts on vegetation onsite, as seen through the %N assessment of sampled bryophytes (mosses). However more data regarding weather patterns, particularly wind direction and speed could inform the potential source of NH3 in the surrounding landscape. Continued monitoring of ammonia onsite will contribute to our understanding of the impacts of this gas on vegetation and habitats, both onsite and nationally.

5.9. Invertebrate Surveys

In 2022, a survey of invertebrates was undertaken across the National Trust land holding within the Mournes and at Bloody Bridge (Mantell & Anderson, 2023). This survey covered a range of taxa and resulted in the discovery of some very rare species. A variety of terrestrial and water margin invertebrate groups were studied, including Coleoptera (beetles), Araneae (spiders), Apidae (bees), Isopoda (woodlice and allies), Diplopoda (millipedes), Chilopoda (Centipedes) and Mollusca (slugs and snails). We also covered elements of by-catch within the surveyor's taxonomic skill sets.

Some very rare beetles were recorded, which had long gaps since their last records. These included *Cyphalongi cornis,* which was previously only known from two 19th Century records in Ireland. The invertebrate assemblage in the Bloody Bridge valley revealed a number of interesting finds. It is an important site for bees, with not only the first Irish record of Lathbury's nomad bee, but also the Dark-winged blood-bee and Gooden's nomad bee which have red list statuses of Endangered and Critically Endangered respectively and appear in Bug life's list of invertebrates at risk of extinction. Analysis from this study highlighted the abundance of species associated with tall sward and scrub and short sward species that require very open sparsely vegetated ground. Recommendations from this study included scrub management at Bloody Bridge, and the continued restoration of a mosaic of habitats across the property.

To gain further insight into the invertebrate assemblage onsite, a subsequent invertebrate survey was undertaken in 2024 across the site, with the stated aims of assessing the differences in the invertebrate community between areas impacted by the 2021 wildfire and those areas which were unburned. The study also examined the invertebrate community present on an area of recently restored high altitude blanket bog and to conduct a more general survey to enhance knowledge of the specialised invertebrate communities in this part of the Mourne Mountains.

Two NI Priority Species were recorded during the 2024 study; small heath and grayling butterflies. It is likely that the abandoned granite quarries in the vicinity of Thomas's Mountain are important for grayling butterflies, which are less frequently seen away from rocky places. Wider surveying of the upper Glen River valley has identified a number of rare and scarce species which add to the knowledge of the importance of this part of the Eastern Mournes. Some of these occupy highly specialised niches such as the water beetle *Hydroporus longulus,* which occupies spring heads, and the rare montane spider *Mecynargus morulus,* which occupies moss and cavities under stones at high altitude. The rare Dor beetle, *Geoptrupes spiniger,* was also recorded for which there are just a handful of Irish records. The key conclusion from the Pantheon analysis is that the site supports a high quality assemblage of invertebrates within the 'scrub-heath and moorland' Specific Assemblage Type, which is particularly notable for its quality. The assemblage is considered important in an Irish context (RSK, 2025).

There is little prior evidence available about the impact of burning on invertebrate populations in upland habitats in Ireland. However, initial findings from the survey show clearly that the burnt area has seen a collapse in the numbers of species present (18 species present in the burnt area pitfalls compared to 48 in the unburnt area). Abundance of invertebrates based on numbers recorded fell dramatically by approximately 90% in the burnt area compared to the unburnt control. A change on this scale, three years after the initial burn, evidences a significant ongoing impact, likely impacting higher trophic levels, i.e. there are likely significant impacts on insect-eating species on site such as birds and common lizard.

This piece of work provides important insights into the effects of wildfire on invertebrate communities in this type of upland habitat, and those impacts appear to be severe and long-lasting. The evidence base about long-term effects of wildfire in Ireland is scant, and this study provides a valuable opportunity to study recovery times after a significant fire event (RSK, 2025). Management recommendations from this 2024 invertebrate survey are in line with our current Management Plan.

5.10. Red Grouse Survey

Red grouse (*Lagopus lagopus scotica*), is an endemic sub-species of Willow Grouse (*Lagopus lagopus*) commonly found in upland moors and peatland habitats with over 20% heather cover. They are surveyed to assess population trends and habitat quality, often using techniques like the callback method, where recorded calls elicit responses from territorial males. These surveys provide critical data for conservation, given the species' reliance on specific heathland conditions and its cultural significance in regions like Ireland.

In this study, four male red grouse were recorded within a 1 km² area (J3628) on a National Trust site in the Mourne Mountains, though the callback method confirmed only three as distinct individuals. This deviates from typical patterns, where males usually pair with one or occasionally two females, with some remaining unpaired despite nearby females. This could be explained by the 2021 wildfire affecting the surveyed region, which could have displaced males. The results suggest square J3628 (above the Black Stairs) represent the best red grouse habitat on the site. Compared to a 2021 survey with fewer grouse, this indicates a slight population rise. The long-term outlook for red grouse hinges on heathland habitat, it's maintenance and ongoing recovery.

5.11. GPS Collared Sheep, and Livestock Counts

We use GPS collars from Digitanimal to track approximately 100 of our 400 sheep. These collars allow us to monitor the movement of the sheep across the property. This data helps us understand grazing patterns and their impact on vegetation recovery. By analysing the movement and grazing behaviour, we can make informed decisions to manage grazing pressure.

To complement this data, we conduct a monthly grazer count on the mountain to see how many grazers are present. During this count, we record the number of sheep, cattle, and horses on the property. The results from the grazer count show seasonal variations, with higher numbers of grazers in the summer months and fewer in the winter. This additional data helps verify the accuracy of the GPS collar data and offers insights into grazing pressure throughout the year. By combining the GPS data with the monthly grazer counts, we can make more informed decisions about managing grazing pressure, promoting the regrowth of native plants, and preventing overgrazing. This integrated approach supports sustainable land management and enhances the overall health of the ecosystem.

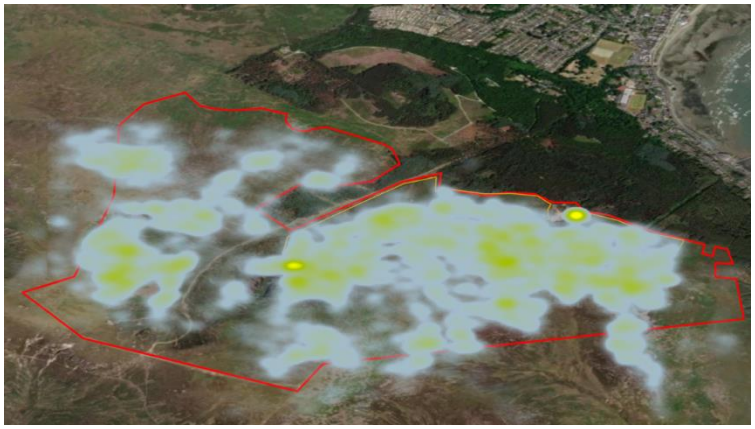


Fig. 5.11.1: 2022 heatmap showing the movement of the sheep.

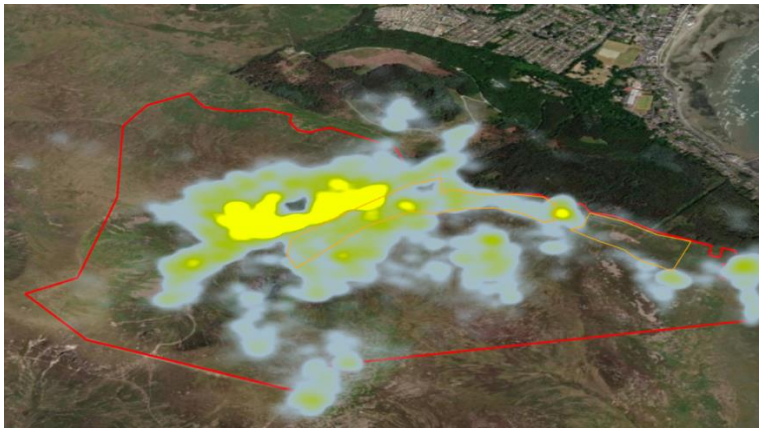


Fig. 5.11.2: 2024 heatmap showing the movement of the sheep.

From 2022 to 2024, sheep grazing patterns shifted notably, as shown in heatmaps depicted above. In 2022 (fig 5.11.1), sheep covered a broader part of the property with hotspots at the pot of Pulgar and Commedagh, western slope of Thomas Mountain and most of Millstone Mountain with high-density yellow spots indicating heavy grazing. By 2024 (fig 5.11.2), the sheep are focusing on the central regions of both sides of the Glen River, with reduced presence in the west and east. The eastern part may have offered improved grass quality, possibly due to natural regrowth following the 2021 wildfire. Other factors, such as weather variations (e.g., wetter conditions affecting terrain) could have contributed to the shift, making the more exposed parts of northwestern region less attractive. The sheep's movement reflects a response to resource availability and environmental conditions, with the Shan Slieve, Slievenamaddy and Slievenabrock becoming less viable and the forrested part along the Glen River becoming more attractive over time.

5.12. Fixed Point photography

Fixed point photography is an annual monitoring effort that we have introduced to help us understand and keep track of the recovery since the 2021 wildfire. By capturing images from the same location over time, it provides a visual record of the landscape's recovery. This method allows for the monitoring of vegetation regrowth and habitat restoration. It helps identify areas needing further intervention and supports the assessment of the effectiveness of recovery strategies. Additionally, it supports scientific research and informs adaptive management practices, ensuring the long-term health of these vital habitats.

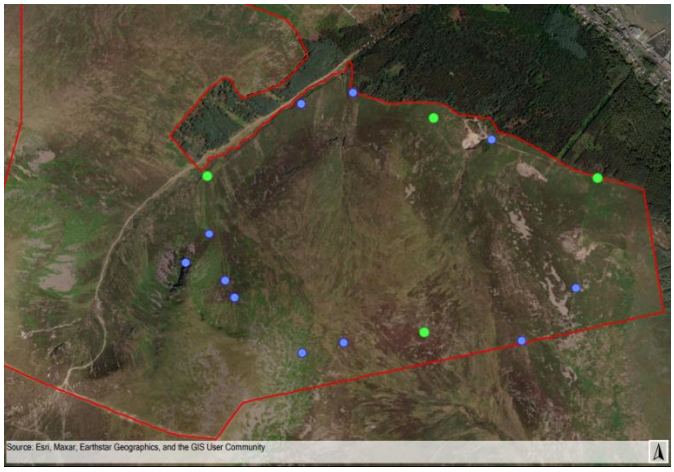


Fig 5.12.1: Shows position of our fixed-point photography sites. The following examples are taken from the points marked with green. North: Bottom of Thomas Mountain, East: Millstone pasture, South: Overlooking Thomas Mountain, West: From glen river facing Donard.

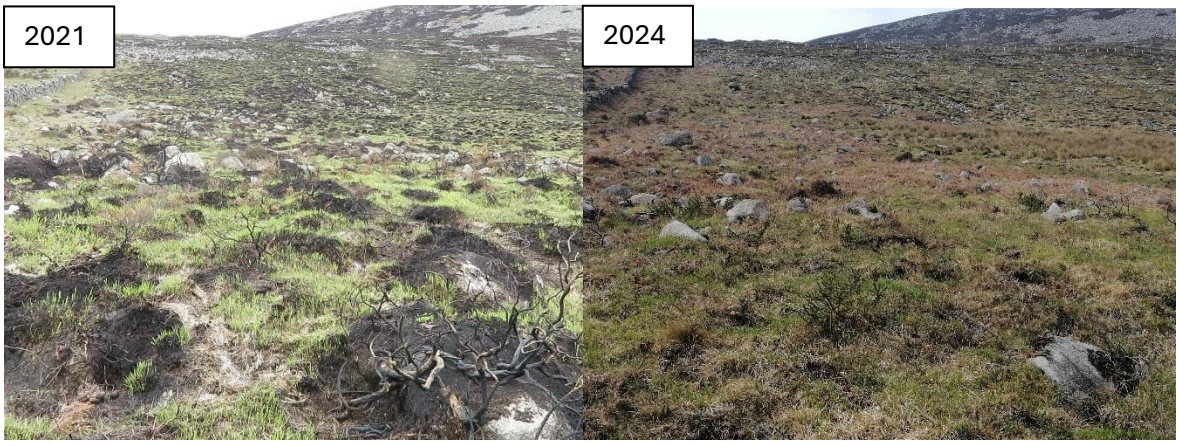


Fig 5.12.2: Millstone pasture, left side shows 2021 and right side shows 2024.

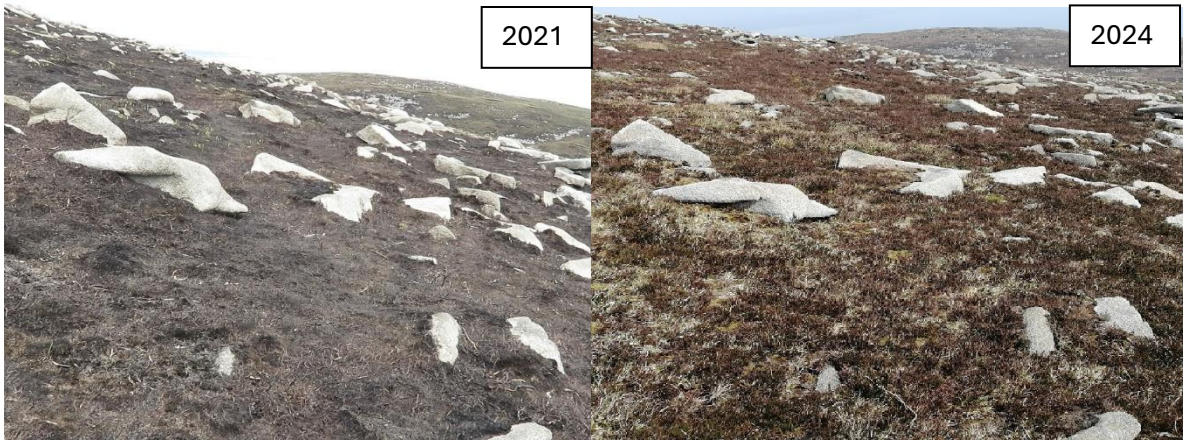


Fig 5.12.3: Overlooking Thomas Mountain, left side shows 2021 and right side shows 2024.

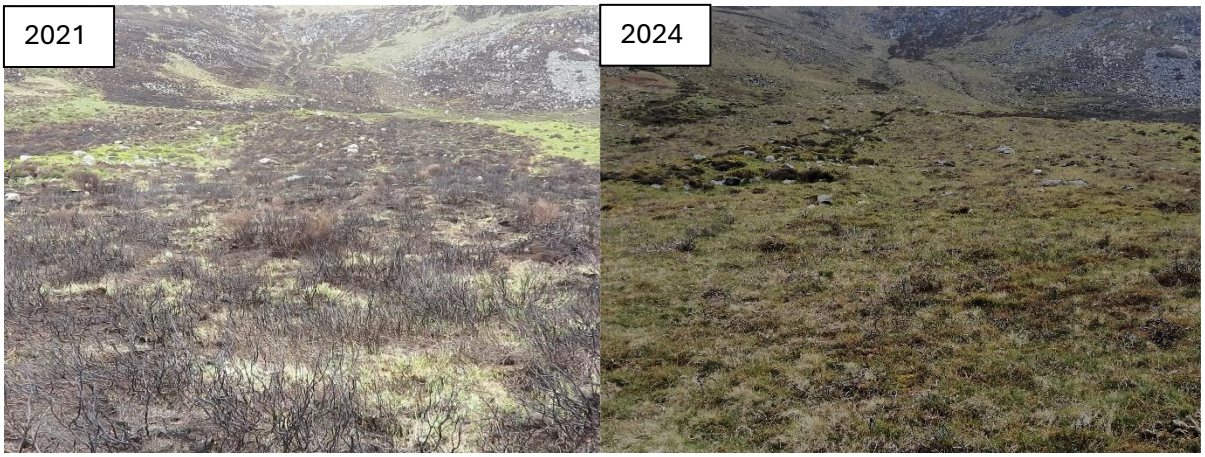


Fig 5.12.4: Glen River facing Donard, left side shows 2021 and right side shows 2024.

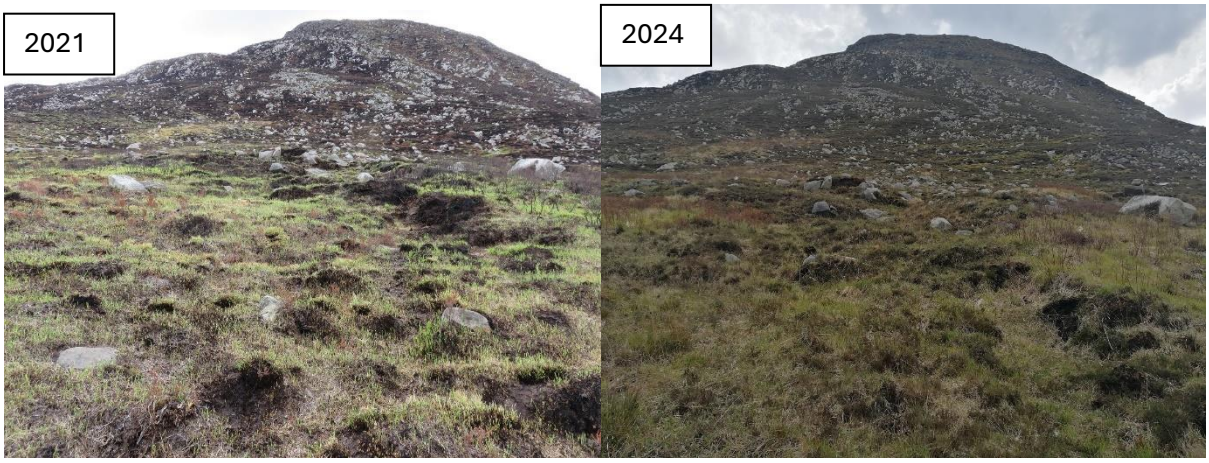


Fig 5.12.5: Bottom of Thomas Mountain, left side shows 2021 and right side shows 2024.

5.13. National Surveys and Monitoring

Breeding Bird Survey

In 2024, we initiated a breeding bird survey, focusing on two transects: one on Thomas Mountain which features an area that was affected by the 2021 wildfire, and another transect on Slievenamaddy on an area that was unaffected by the fire. These sites were surveyed twice, first in early May and then again in July.

The initial May transect on Thomas Mountain recorded a modest presence of birds, with 6 Skylarks and 8 Meadow Pipits. By July, the second visit showed a shift: Skylark numbers dropped to 2, while Meadow Pipits surged to 41, with other species still absent.

The May transect on Slievenamaddy showed a more diverse mix of 3 Skylarks, 26 Meadow Pipits, 1 Willow Warbler, 5 Wrens, 1 Raven, 1 Robin, and 1 Stonechat. By July there were no signs of Skylarks, Meadow Pipits declining to 10 sightings, and Raven sightings increasing to 7.

These surveys, set to occur annually, reveal seasonal shifts in bird populations, with distinct variations in species abundance and diversity between the two sites.

National Plant Monitoring Scheme

NPMS is run by a partnership of the Botanical Society of Britain and Ireland (BSBI), Centre for Ecology and Hydrology (CEH), Joint Nature Conservation Committee (JNCC) and Plantlife. The survey has been designed to monitor the abundance of sets of species within fixed plots (square or linear plots). The National Trust Property in the Mournes has three assigned squares which are monitored by the site team.

Within an allocated kilometre square, a minimum of 5 plots should be surveyed, although any number of plot surveys can be submitted.

It is recommended that surveyors complete 3 square plot surveys and 2 linear plot surveys per kilometre square, but the number and composition is up to you and will be influenced by the nature of your kilometre square.

Within the Mournes we monitor 2 kilometre square plots. Of the 10 plots surveyed within these squares, only 2 are linear plots.

Square plots = 5x5m

Linear plots = 1x25m

Plots should be surveyed twice per year, once in late spring or early summer and once in late summer.

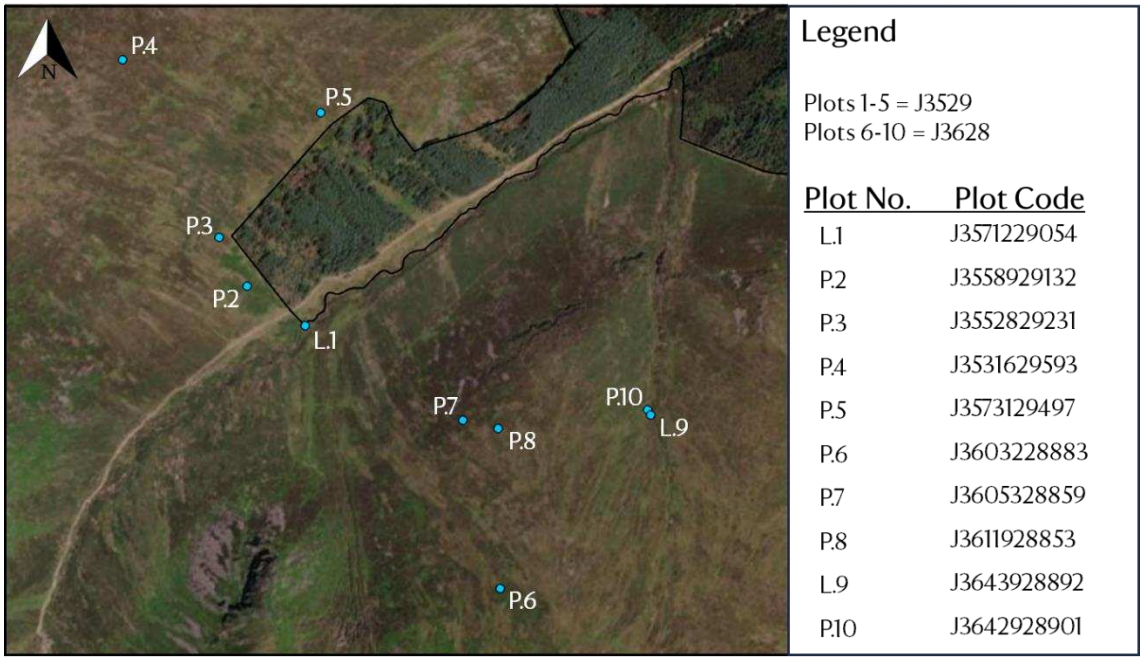


Figure 5.13.1: NPMS Plots within the Mournes. 10 survey plots those marked L are linear plots. The plot code is the ID for each code as they are entered into the NPMS database.

Butterfly Survey (Single Species Transect)

Figure 15.13.2: (Top Left) Grayling Resting with wings closed. (Top Right) Grayling with wings open on heather, the species does not often rest like this. (Bottom Right) Grayling Caterpillar.

The Grayling butterfly (*Hipparchia Semele*) is a medium butterfly with a wingspan of 55-60mm, within the Browns sub-family (*Satyrinae*). The Grayling has cryptic colouring, providing the species with excellent camouflage when at rest on bare ground, trees trunks or stones. The species keeps its wings closed when not in flight, with forewings tucked behind the hindwing, making the butterfly appear smaller. Within the Mournes, the species is most common within Thomas Quarry.

The grayling has one generation a year and is usually on the wing from early July into September. The butterfly spends most of its time basking on bare ground or rocks and spends little time nectaring, but is attracted to muddy puddles and sap from tree trunks. Spherical white eggs are laid singly on fine-leaved grasses, usually very small tussocks, growing in full sun and surrounded by bare ground. After 10–20 days, the eggs hatch and the small cream-coloured larvae feed on grass leaves at night, then spend the winter hibernating in grass tussocks. In spring, the feeding begins again, and larvae become fully grown in June. Pupation then usually takes place in a silk-lined cavity just below the surface of the ground.

Grayling require a warm microclimate and occur on a wide range of dry, well-drained soil types. Habitats are characterised by sparse vegetation, sheltered sunny spots and plenty of bare ground in open situations. Many colonies occur in coastal habitats such as sand dunes, saltmarsh, undercliffs, and clifftops. Inland colonies are found on lowland heathland, limestone pavement, scree, and brownfield sites such as old quarries, railway lines and derelict industrial areas. Less commonly, the Grayling still occurs on calcareous grassland or in open woodland on stony ground. The main foodplants include Sheep's-fescue, Red Fescue, Bristle Bent and Early Hair-grass. Coarser grasses such as Tufted Hair-grass (*Deschampsia cespitosa*) are occasionally used.

The Single Transect Butterfly Survey targeting the grayling species was initiated in 2023 and monitors a transect spanning the lower slopes of Thomas Mountain, Thomas's Quarry, Millstone Quarry, and Drinneever Quarry.

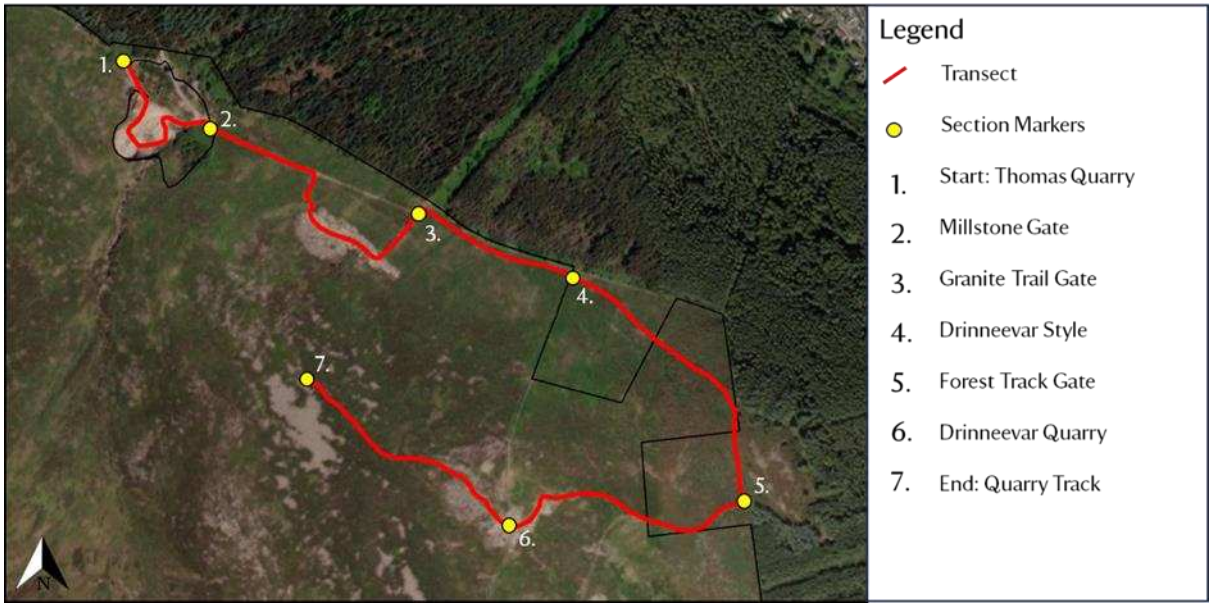


Figure 5.13.3: Single Transect Butterfly Survey locations.

In 2023, graylings were observed sporadically, with numbers peaking at 5 in week 32 and minimal sightings otherwise. In 2024, the species appeared across more weeks, reaching a high of 9 sightings in week 30 and tapering off gradually through late summer. These findings indicate fluctuating grayling activity and abundance, something to build on year by year to get a broader picture.

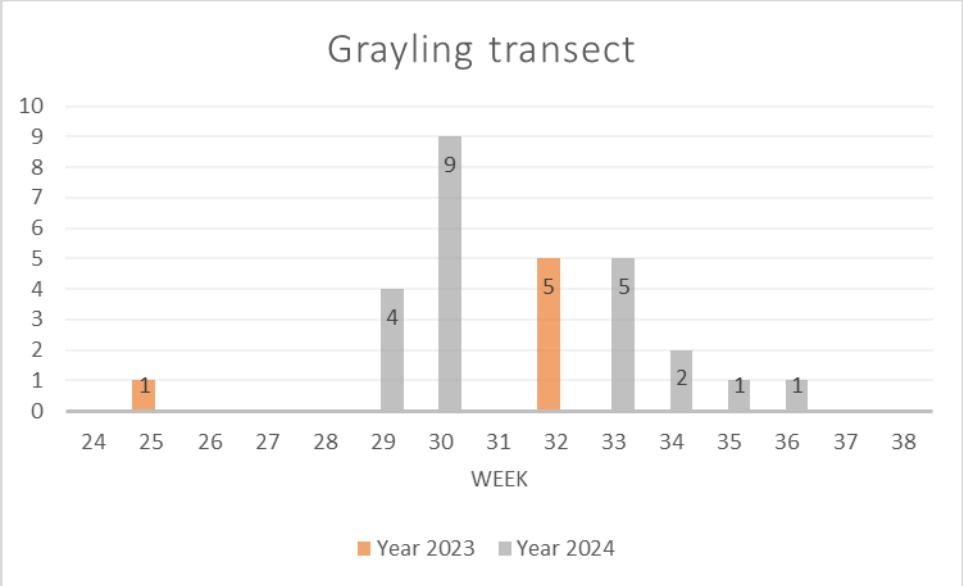


Figure 5.13.4: Grayling single species transect data from 2023 and 2024.

5.14. Path Surveys

The following section provides a timeline of path surveys, conducted in-house or by external contractors:

2019: Amber Path Survey of the main Slieve Donard access route compiled by National Trust to determine the scale of the path erosion problem within the Slieve Donard main recreational corridor and provide an indicative estimate of the cost of repair works required to accommodate visitor numbers. The data collected was directly used to undertake the initial strategic programme of works.

2021: Amber path survey of informal walking trails across National Trust managed land compiled by Walk the Talk surveyed four informal or less used trails identified across the property. These were the Drinneevar trail from Thomas' Quarry to Drinneevar Quarry, the Blackstairs and the Millstone routes as access for Thomas' Mountain and the Saddle to Slieve Commedagh summit. These surveys captured the condition of the paths at this time, providing a baseline for future survey work, and informing any future intervention.

2022: Survey of Slieve Donard/Slieve Commedagh Saddle habitat restoration within the recreation corridor compiled by Walk the Talk. Increased visitor numbers in this area are heavily impacting this immediate area with a marked increase in erosion patterns being recorded. This report identified areas for habitat restoration and associated visitor management around the Col of Slieve Donard, with the objective to set conditions conducive to self-recovery and manage the combined visitor and climactic pressures on the habitats in the long term.

2023: Amber Path Survey of main Slieve Donard access route compiled by National Trust to review and determine the extent and impact of repair works undertaken in the previous four years of the path repair project. This survey was further used to formulate and prioritise a programme of work going forward.

6. Recreation: Sustainable Access

Providing sustainable access to local communities and the wider public has always been a key aspect of the National Trust's ambition. Slieve Donard, the tallest mountain in Northern Ireland at 852m, is unsurprisingly a popular hike. The summit of Slieve Donard, which is in National Trust ownership, can be accessed by two main routes; from the town of Newcastle the Glen River Trail starts in Donard Park (Newry Mourne and Down District Council), passes through Donard Forest (NI Forest Service), before entering the National Trust property within the Glen River Valley. The second route to the summit, begins at Bloody Bridge where the Trust manages approximately 800m of path, and thereafter the trail runs through Trustee Land and is maintained by Mourne Heritage Trust.

Before Covid-19, the people counters that were located within the National Trust land boundary saw visitor numbers of circa 160k a year. Our surveys showed that recreation was impacting habitat quality along the main route to the summit of Slieve Donard and Slieve Commedagh, which is when the National Trust launched the Mournes Path restoration project in January 2019 with the focus on repairs and making the pathway more sustainable. The project got off to great start, supported by funding from DAERA Challenge Fund to bring in contractors to assist with the restoration. During the pandemic, visitor numbers increased and have not returned to their lower pre-Covid levels (see table 6.0). The site is used by a range of different users, including hikers, walking groups, runners (including running events) and mountain bikers. The impact of these users means that the path is in constant need of repair and maintenance.

Table 6.0: Counter data showing recreational visits to the NT property in the Mournes.

Area	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*
Bloody Bridge Valley	57,356	42,380	54,445	87,806	47,065	32,188	45,243
Glen River	99,461	97,815	38,545	76,648	337,641	93,822	105,766
Bloody Bridge	3,580	20,233	213,916	56,273	22,502	40,941	12,900
*Donard Saddle**						50,824	74,902
*Commedagh Saddle**						2,271	55,403
*Donard Summit** [Δ]						11,367	45,232
*Commedagh Summit **						2,455	152,048

**Counters installed in May 2023*
[Δ] Donard Summit counter stopped working in July 2024, results after this time were omitted from the data

The counter data does provide an estimate of the amount of people using the main pathways to access Slieve Donard and Slieve Commedagh, though it can count the same walker more than once if they pass multiple counters and does not capture data from other unofficial routes.

NT is committed to providing sustainable access. However, we have ongoing issues with people using the Mournes for recreation. These can be summarised as follows:

- Users not keeping to designated paths which can cause habitat degradation / loss.
- Dogs off leads flushing wildlife; this is of particular concern during the ground nesting bird season (1 March to end of August).
- Large groups, such as running events, encourages more people through the property and leads to people running or walking off the main path, causing verges to be destroyed.
- Dogs off leads and livestock worrying, leading to stress and death of farmers' livestock and loss of income. This is of particular concern during the lambing season.

Following an extensive period of minimal investment and intervention on the main Slieve Donard path, the Challenge Fund, awarded in 2018 for the Slieve Donard Path Restoration project, proposed the repair of erosion damage and improvements to visitor containment along the main Slieve Donard access path. This would allow conservation and restoration of the ASSI/SAC habitats present. The fund created the opportunity for two full time Mountain Rangers trained in upland pathwork techniques to be employed, supported from third party contractors and a dedicated volunteer programme.

Prior to the Slieve Donard Path Restoration Project initiating restoration work, an initial amber path survey of the main Slieve Donard route from Newcastle to the summit following the Glen River was compiled in May 2019 based on survey data collected in June 2018.

Following methodology outlined in "Upland Path Management: Standards for delivering path projects" by Upland Path Advisory Group, 2016 – Section 2, Condition (or Amber) surveys measure the condition of paths and path systems using a series of measurements. The measurements collected cover slope, width and other observed metrics, along with indices of path condition and assessment of factors; path condition, dynamism, drainage, roughness and erosion. Condition survey data are either numerical (e.g. metres of trampled vegetation) or coded, representing the type of vegetation or surface. This data is compiled in a database, which can be used for meaningful comparisons on the condition of the different path sections. These data sets have the potential to inform strategic programmes of path management and can be used to support funding applications and project monitoring.

Amber surveys provide:

- An assessment of the current path condition;
- An assessment of future management needs of the path surveys;
- An indicative estimate of the cost of repair works;
- A baseline for monitoring long-term path condition and change.

The initial survey results confirmed immediate intervention was required to arrest and reverse erosion caused by the steady increase in path users since the path was installed in the mid 1990s and early 2000s when visitor numbers were substantially lower, averaging 14,600 per annum (National Trust visitor counts data 1998-2000, analysis by H. Thurgate 2001).

From January 2019 through to March 2020, phases one and two of the Slieve Donard path project saw the completion of repair and rebuilding of 1.5km of the priority areas of the Glen River Path, greatly enhancing the visitor experience in terms of health and safety and directly

protecting NI Priority Habitats which were being extensively lost as a result of the noted footfall increase and climactically driven water damage. Under the guidance of the National Trust Mountain Rangers, this work was supported by third party contractor Matt McConway of Upland Access and specialised skilled path workers from Mourne Heritage Trust.

Commencing in October 2020, phase three of the path restoration project, again financed through the Challenge Fund, involved the intensive repairs of high priority sections of the path, where ongoing erosion risked major accidents. This ensured visitor access was managed to protect the surrounding habitat from further damage, and allowed damaged areas to recover. During this phase, 190 tonnes of stone was airlifted from the historic quarries at the foot of Slieve Donard to designated points along the path line to allow for extensive rebuilding of the stone pitched path in these sections.

From May 2021, the path restoration project entered a new phase, financed through the Environment Fund. Work continued to improve the path, simultaneously restoring path adjacent heath. 2021 also saw the compilation of an amber survey of the informal trials throughout the National Trust Slieve Donard property. This survey has provided a baseline for future survey work to be measured against to judge the need for intervention should visitor numbers continue to increase or remain stable at the high levels we see them at today.

A programme of continuous monitoring, implemented in the initial phases of the project, dictated where work should be directed to ensure newly restored sections of path remained in optimal condition while areas of increased erosion or damage were identified, with interventions made before the problem became critical. These path condition surveys are undertaken monthly, demonstrating a programme of continuous maintenance is essential for the upkeep of the upland trails, and preventing a relapse to pre-restoration levels of damage to surrounding heath.

Figure 6.1: A heavily eroded section of path on Slieve Donard illustrating the fragility of the shallow, friable soils under pressure from increased foot traffic and more frequent heavy rain events. Image taken August 2021.

Figure 6.2: The same section of path below the summit of Slieve Donard following reconstruction using stone transported to the work site by helicopter. Image taken September 2021 following construction.

A further amber survey was conducted in 2023 to measure progress, with results from the survey plotted against the metrics of the original survey undertaken in 2018. Measuring roughness, erosion and path condition on a scale of one to five with one being unfavourable and five being favourable, the metrics for each section from 1 to 13 clearly demonstrate the overall improvement to the recreation corridor in terms of both usability and ecological recovery. All targeted sections of the path had improved over the course of the five years between surveys. Sections three, four and seven have had minimal intervention throughout the project period and as such have not improved in roughness, erosion or condition to the same extent as those sections which did require interventions.

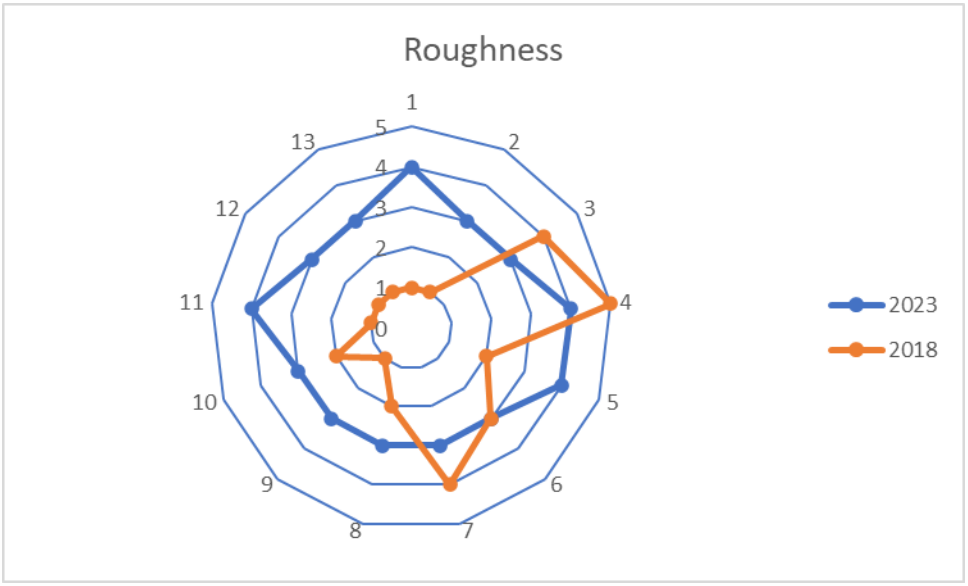
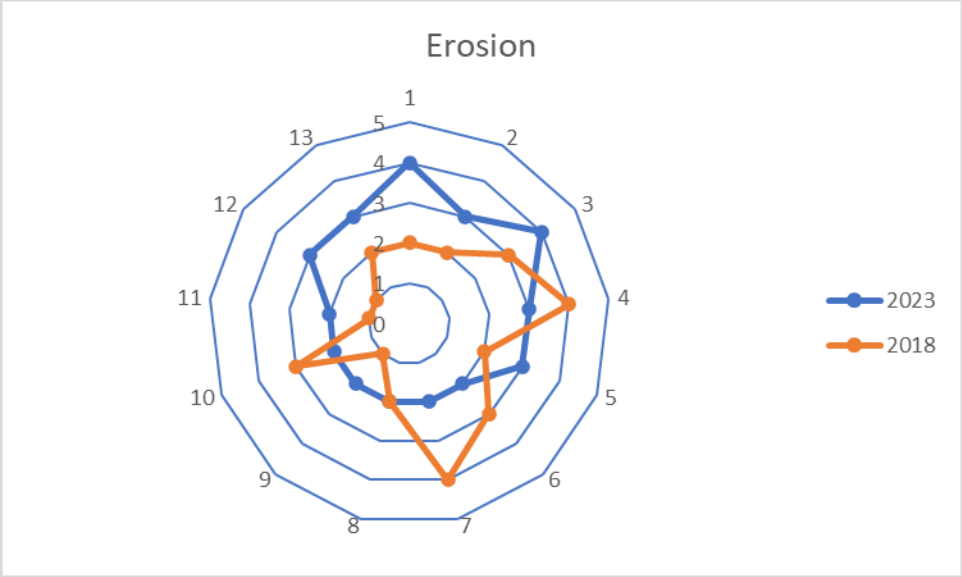
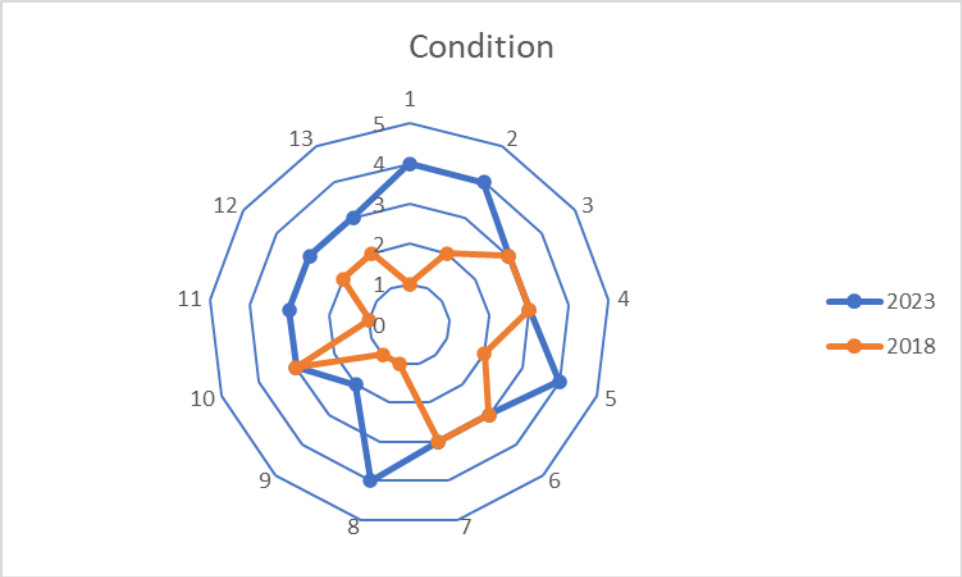


Figure 6.3: Results of 2023 survey plotted against metrics of the original survey data from 2018.





2023 saw the initiation of a heath restoration project on the Slieve Donard Slieve Commedagh saddle. Having degraded considerably through visitor and grazer pressures, a December 2022 survey of the area was completed by third party contractor Chris York of Walking the Talk. This survey identified areas of most concern and suggested models and techniques for restoration of the dry heath habitat present in this area to include visitor management as a tool for restoration. The work has been partially funded by Starling Bank to install geoCoir matting in heavily eroded areas which have first been planted with heather plugs and seeded with a specially formulated upland grass mix to encourage the regeneration of these areas. A long term monitoring programme has been established here based on the NIEA Habitat Condition Assessment alongside fixed point photography to capture the regeneration over the course of years.

7. Outreach, Engagement and Education

7.1 Wildfire Conferences

Since the 2021 wildfire, there has been a marked increase in the outreach and engagement work that has happened within the Mourne Mountains. The UK Wildfire Conference is a bi-annual conference held across the UK and focuses on sharing knowledge about wildfire. The National Trust attended the conference in 2022 in Belfast. The conference had a focus on how people play a role in creating, managing and solving the wildfire problem. The Lead Ranger presented at the conference, and as it was held locally and hosted by DAERA and the Northern Ireland Fire & Recuse Service, there was representation from local organisations such as Mourne Heritage Trust, Belfast Hills Partnership etc. The Mournes Lead Ranger also attended and presented at the 2024 Wildfire conference in Aberdeen, which explored the global perspective on wildfires and addressing challenges within the UK. The presentation was on 'Wildfire Recovery though conservation grazing: Building resilience in an upland habitat' which looked at the wildfire models from the Pau Costa Foundation report, the recovery work and monitoring and the introduction of new livestock to aid the recovery of the burn sites, with the aim to strategically encourage a more resilient landscape.

7.2 Mourne Site Visits

As the Mourne Mountains receive a significant amount of funding through DAERA and other government grants, there have been many visits from MLAs, local councillors and government departments. The purpose of these visits is mainly to highlight the work that has been carried out using government funds, and to show the recovery work after the wildfire. Below shows a list of some of the visits to the Mournes, both from external sources and internal.

- **April 2021**: Former DAERA Minister Poots visited the Mournes, along with Heather McLachlan, Director for Northern Ireland, Patrick Lynch, Countryside Manager and Marc Vinas, Area Ranger for Murlough and Mournes. The team highlighted the restoration work that had been carried out on the paths, which helps provide safe and sustainable access. The former Minster even helped with some repair work during his visit.
- **May 2021:** After the wildfire in April 2021, the former Finance Minister Conor Murphy, Former DAERA Minister Edwin Poots, Chris Hazzard MP and local councillors, visited the site to see the damage cause by the fire.
- **August 2021:** NT welcomed the former DAERA Minister Edwin Poots back to the wildfire site to highlight the work that was done to support the recovery.
- **March 2022:** National Trust central team, consisting of Patrick Begg, Outdoors & Natural Resources Director, Lizzy Carlyle, Head of Environmental Practices, and John Deakin, Head of Trees & Woodland carried out multiple site visits throughout Northern Ireland, including the Mournes.
- **July 2022:** Site visits for various political representatives and government, including separate visits from Former DAERA Minister Edwin Poots, DAERA Permanent Secretary Katrina Godfrey, and Former Finance Minister Conor Murphy, to the Mournes to see some of the ongoing wildfire recovery work
- **September 2022:** Patrick Brown MLA & Alliance councillors David Lee & Cadogan Enright met with Heather McLachlan, Patrick Lynch, Andrew Corkill on the Mournes, post wildfire work.

- **April 2023:** *Two years on from the wildfire key organisations with an interest in the area formalised the 'Forever Mournes' partnership by signing a Memorandum of Understanding on Thursday 20 April. The National Trust, Mourne Heritage Trust, the Woodland Trust and Northern Ireland Water committed to work together across their collective land holdings and interests and enhance cooperation, build resilience and protect this special landscape, with Northern Ireland Environment Agency, Newry Mourne & Down District Council and the Forest Service joining as Observers.*
- **May 2023:** NT Executive Team Visit to NI including the Mournes.
- **May 2023:** DAERA Countryside Management Branch Donard training day to see ongoing habitat restoration works and Nofence grazing trial.
- **November 2023:** Mournes Wildfire Recovery day at Tollymore Outdoor Centre that was attended by DAERA Farming with Nature Policy Branch, NIEA (Conservation, Designation & Protection Team, Habitat Survey Team and EFSS Client Officer), Mountaineering Ireland, MHT, Ulster Wildlife and NT volunteers. Highlighted the work to date on monitoring since the wildfire and the ongoing recovery work.
- **January 2024:** DAERA/NIEA Online training session following on from May 23 training day. Provided an update in relation to the ongoing habitat restoration works at Slieve Donard and update in relation to how the virtual fencing technology is working to date.
- **October 2024:** NT hosted a team of representatives from the Ulster Farmers' Union in the Mournes to discuss the Forever Mournes model and share knowledge of how this works.
- **November 2024:** DAERA meeting with Regional Director, Nature Conservation Adviser and Land Use & Farming Advisor to promote the DAERA Environment Fund, Wildfire recovery and Monitoring work undertaken within these projects.

7.3 Media Engagement

Alongside practical conservation measures and land management interventions, there is a recognition that engagement with stakeholders and recreational users of the landscape is vital in our efforts to manage this landscape.

Throughout the course of these projects, we have greatly increased our social media presence across multiple platforms, with a strategic plan to both increase public understanding of our work and illustrate the historic, ecological and cultural importance of the Mourne landscape.

We have promoted our work through digital and traditional media channels, taking the introduction of novel land management as opportunities to promote our restoration work.

- **April 2023**- BBC Radio Ulster Interviewed the site team regarding wildfire recovery and restoration plans for the future. This featured in a Mournes focused 'Countryside' Show.
- **June 2023**- UTV local news bulletin gave us the opportunity to speak about the introduction of the cattle grazing regime.
- **April 2024**- We recorded the National Trust Wild Tales podcast where we discussed the full remit of our wildfire recovery programme. For release mid-2025.
- **May 2024**- BBC Newsline, local television news bulletin, also broadcast on BBC Radio Ulster, promoting the Starling Bank funded peat restoration work in the context of wildfire recovery. This was accompanied by articles published in the local newspapers, the Down Recorder and the Mourne Observer.

- **June 2024-** Local radio station Cool FM broadcast a live flagship radio show from the summit of Slieve Donard. This gave us the opportunity to have our message broadcast to a wide audience far beyond our usual reach.
- **July 2024-** We featured in the seasonal magazine of Mountaineering Ireland, 'Mountain Log', with a detailed article on the full remit of our wildfire recovery strategy, including peat restoration, grazing management and path network maintenance.
- **July 2024-** Alongside RSPB, NI Water, Mourne Heritage Trust and the constituted farming group Mourne Conservation Graziers we recorded public information films communicating the importance of keeping dogs on leads in the uplands. This series of short films was promoted widely on social media throughout the grazing season and in the local print media.
- **January 2025-** National Trust 'Pub Walks & Planet Protection' podcast discussing the importance of deep peat and our peat restoration work on the Mournes.
- **January 2025-** BBC Countryfile filmed a segment on our peat restoration and the use of sheep fleece as a damming material as part of a programme dedicated to the Mourne Mountains. We were also able to use this opportunity to promote our partnership working with Mourne Heritage Trust, NI Water, Woodland Trust and observer partners under the Forever Mournes partnership.

8. Links to Forever Mournes

The National Trust, Mourne Heritage Trust, Northern Ireland (NI) Water and the Woodland Trust NI have been working collaboratively following the April 2021 wildfire. This collaboration evolved in April 2023 when the partnership known as 'Forever Mournes' was formed with these four organisations as core members, alongside Forest Service (NI), Newry Mourne & Down District Council and NIEA as observers. Forever Mournes aims to capture the genuine enthusiasm amongst these organisations to enhance co-operation in the landscape of the Mournes that is under their care, and to deliver progress for its long-term management. In total the land area is in the region of 23,000 acres, incorporating six Areas of Special Scientific Interest (ASSI) and one Special Area of Conservation (SAC).

Forever Mournes secured funding through the Department of Agriculture, Environment and Rural Affairs (DAERA) Environment Fund (2023-2028) which has enabled us to work together to develop the following:

- Car park & visitor facilities review (High Mournes)
- Accessibility audit (Forest Parks & Nature Reserve)
- Forever Mournes joint website
- Skills strategy
- Detailed interpretation masterplan
- Historical satellite analysis
- Climate change study

Forever Mournes also continue to seek other fundraising opportunities so we can deliver a range of further works that are required.

9. Conclusion: Continued Restoration and a View to the Future

The National Trust Slieve Donard Property within the Eastern Mournes is a nationally and internationally important site for nature conservation, being designated as an ASSI and SAC. Many of the habitats onsite are of European interest, being much less common elsewhere across the continent. In a Northern Irish context, the site encompasses the two highest peaks; Slieve Donard and Commedagh. The montane heath on these summits has a very limited extent in the region, and thus the site is nationally important.

The wildfire of April 2021 drastically impacted the habitats onsite, and subsequently the way we, the National Trust, manage the site. In the last 4 years, DAERA, through the Challenge Fund, Environment Fund and Environment Fund Strategic Strand, has provided funding to support the National Trust in our efforts to restore those habitats impacted by the wildfire. Through this funding, there is currently a team of four dedicated Rangers, who are supported by passionate volunteers, students and NT Regional staff. The Ranger Team maintains the path network onsite, ensuring visitors have safe passage to the summits of Slieve Donard along the Glen River Trail. The path network, not only provides a clear route for visitors, but also protects the fragile habitats which would be adversely impacted by such heavy footfall.

In recent years, a notable amount of monitoring and surveying has been carried out across the site, to track recovery post wildfire. This has varied from botanical monitoring using the NIEA Condition Assessment Methodology, to Ariel Drone Surveys which provides invaluable spatial information, to Ammonia Monitoring in an effort to assess the impacts of air pollution, and Wildfire Modelling which has provided insight into the dynamics of burns onsite. These are but a few examples of the ongoing monitoring onsite. This monitoring is undertaken or led by the rangers, and where necessary supported by external contractors with the relevant expertise.

Table 2.1.4: 2016 Condition Assessment Summary Outcomes

Feature	Condition
European Dry Heath	Unfavourable
Northern Atlantic wet heaths with Cross Leaved Heather	Unfavourable
Active Blanket Bog	Unfavourable
Alpine & Boreal Heath	Unfavourable
Siliceous rocky slopes with chasmophytic vegetation	Favourable
Siliceous alpine and boreal grasslands	Unfavourable

The extensive monitoring which has been undertaken onsite is continually informing site management, ensuring that the conservation interventions onsite are always backed by a sound ecological understanding of the habitats and species present. One such example is the currently ongoing peatland restoration project onsite (funded through the Starling Bank), the need for which was identified through detailed monitoring, using the National Trust's Peatland Monitoring Approach. Continuous monitoring of the areas under restoration will allow us to track progress as these habitats recover.

The introduction of cattle to the property in 2023 has been another important step in the recovery of the site post wildfire. The Luing cattle which are onsite during the summer months graze the now dominant Purple Moor Grass, and in doing so opening up the sward for the regeneration of heather. Continued monitoring of this project is providing valuable information on the impacts of these conservation grazing 'heroes'. The return of cattle to these upland habitats has also proved to be a return in ways to the tradition of booleying, a transhumance practice where cattle are grazed in the Mournes for the summer months.

Following the wildfire, the need for more strategic collaboration between stakeholders in the Mournes was identified. This resulted in the formation of the Forever Mournes partnership (funded through DAERA), which is paving the way forward for the Mournes. Work has included, for example, supporting the upgrading and standardization of interpretation across the Mournes.

The work which has been undertaken in the Mournes since acquisition in 1992, but maybe most notable since the wildfire in 2021, is a testament to how dedicated the National Trust staff, volunteers, adjoining stakeholders and local community are to this site which overlooks the town of Newcastle. The habitats onsite are fragile, and it will take many years for the site to fully recover from the impacts of the wildfire. The management of habitats is continually informed through ongoing monitoring, and conservation works are then tailored through our increasing knowledge and understanding of the site. The threats and pressures facing these habitats and associated wildlife are increasingly evident. Moving forward, there will be a continued need for a ranger presence onsite, and the importance of a collaborative partnership between stakeholders will be increasingly important. The National Trust, with a continued commitment to the Slieve Donard Property and the wider Mournes, will continue to protect this landscape; its nature, beauty and history, for everyone forever.

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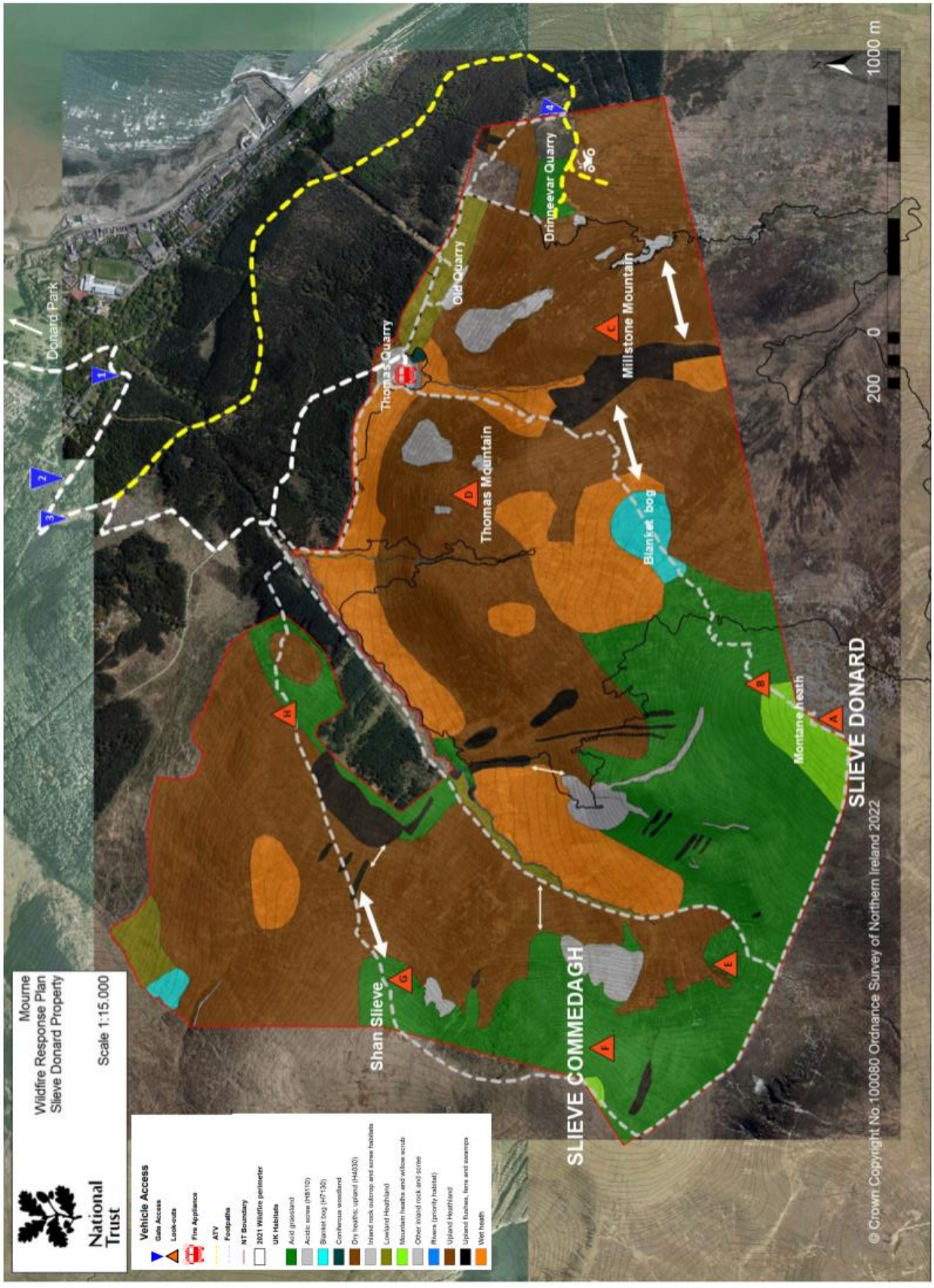
Appendix

Appendix fig.1 – Mourne Wildfire Response Plan Slieve Donard Property



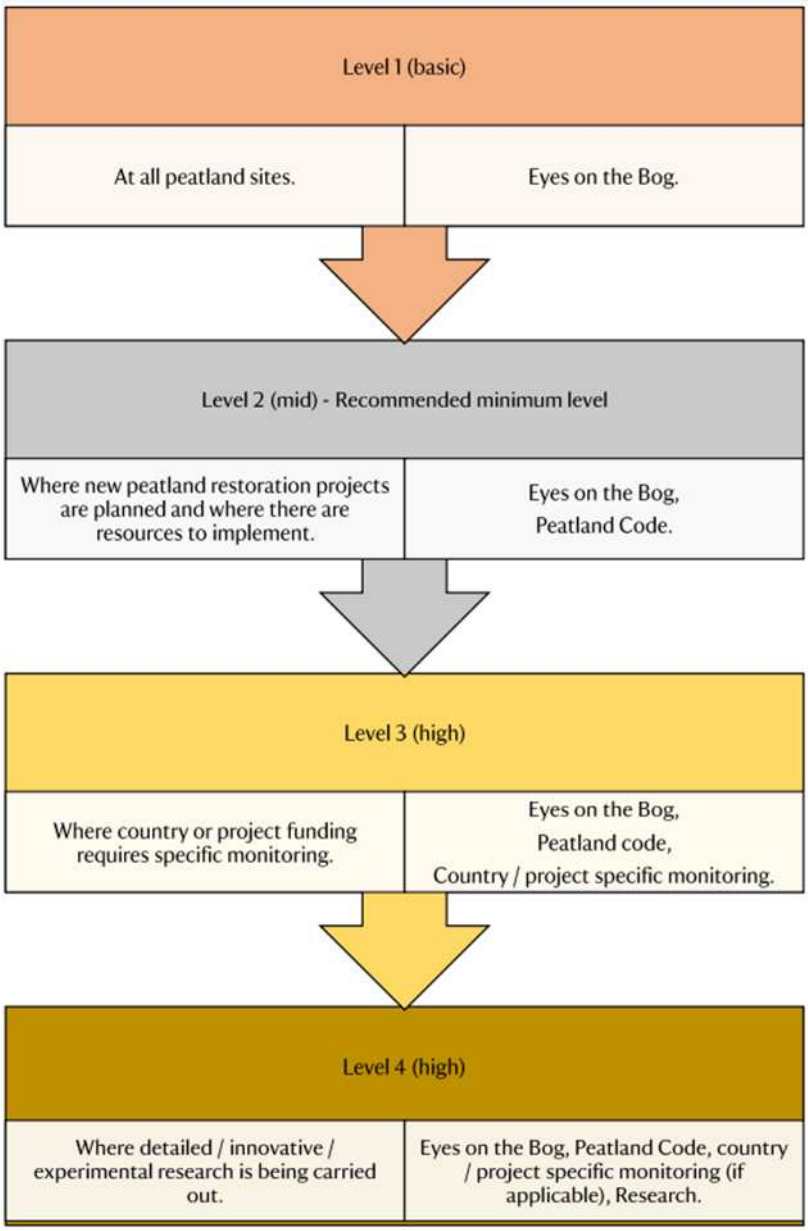
Appendix fig.2 – NT Nature Monitoring Framework as it relates to the Mournes

Feature	Detail	Survey	Comment
Landscape		Biosurvey	underetaken in 1992 and 2012
		Ariel Surveys	Undertaken in 2022 to record recovery of site following 2021 wildfire
		Wildfire Modelling	Undertaken in 2023 to determine areas prone to future wildfire in future under climate change events
		UKHab Survey	NT GIS Browser (Mapped Remotely)
Environmental	Air Quality	Ammonia Monitoring	3 sites in Mournes, since 2022 in collaboration with CEH
	Fuel Moisture	UK Fuel Moisture Survey	Undertaken in 2023 to determine areas prone to future wildfire
	Ascent Project	Recreational Impact study	Research on the Impact of Unregulated Access to Upland Sites (2019)
Habitat	Condition Assessment	NIEA CA	Wildfire Recovery Monitoring on NIEA CA fixed Points (Data available from 2002 NIEA, and 2021 Wildfire NT)
			Conservation Grazing lower slopes of Millstone and Thomas Mountain Monitored since 2023
			Grazing Monitoirng 8 areas across property monitored since 2023
		UKhHab Survey	NT GIS Browser (Mapped Remotely)
Peatlands	Peatland Monitoring Approach		
	Level 1	Eyes on the Bog	Commenced in 2022
	Level 2	Peatland Code	Monitoring Undertaken in 2023
	Level 3	Site Specific Monitoring (Condition Assessment)	Monitoring Undertaken in 2024
	Level 4	Research (Hydrology Study)	NA
Botanical		NPMS	Undertaken since 2015, with 3 squares monitored on the properety twice annually
Mammals	Irish Hare	Casual Recording	Data submitted to CEDAR
Birds		BBS	No square assigned to property, monitoring occuring since wildfire
		Red Grouse Survey	Survey undertaken in 2022 and 2024
Pollinators	General	PoMS FIIT Counts	
	Butterflies	UKBMS	Greyling single species transect established for this rare species transect runs through Thomas Quarry a stronghold for the species
	Invertebrate survey	Specialist Methods	Undertaken by external consultants in 2022 with follow up survey in 2024 planned
Fungi		Specialist Survey (Waxcaps)	TBC
Species Recording	Casual Recording	Irecord (preferred database)	passive monitoring of species when on site should be recorded using the Irecord App. To date over 500 species have been recorded, 36 of which are NI priority species.

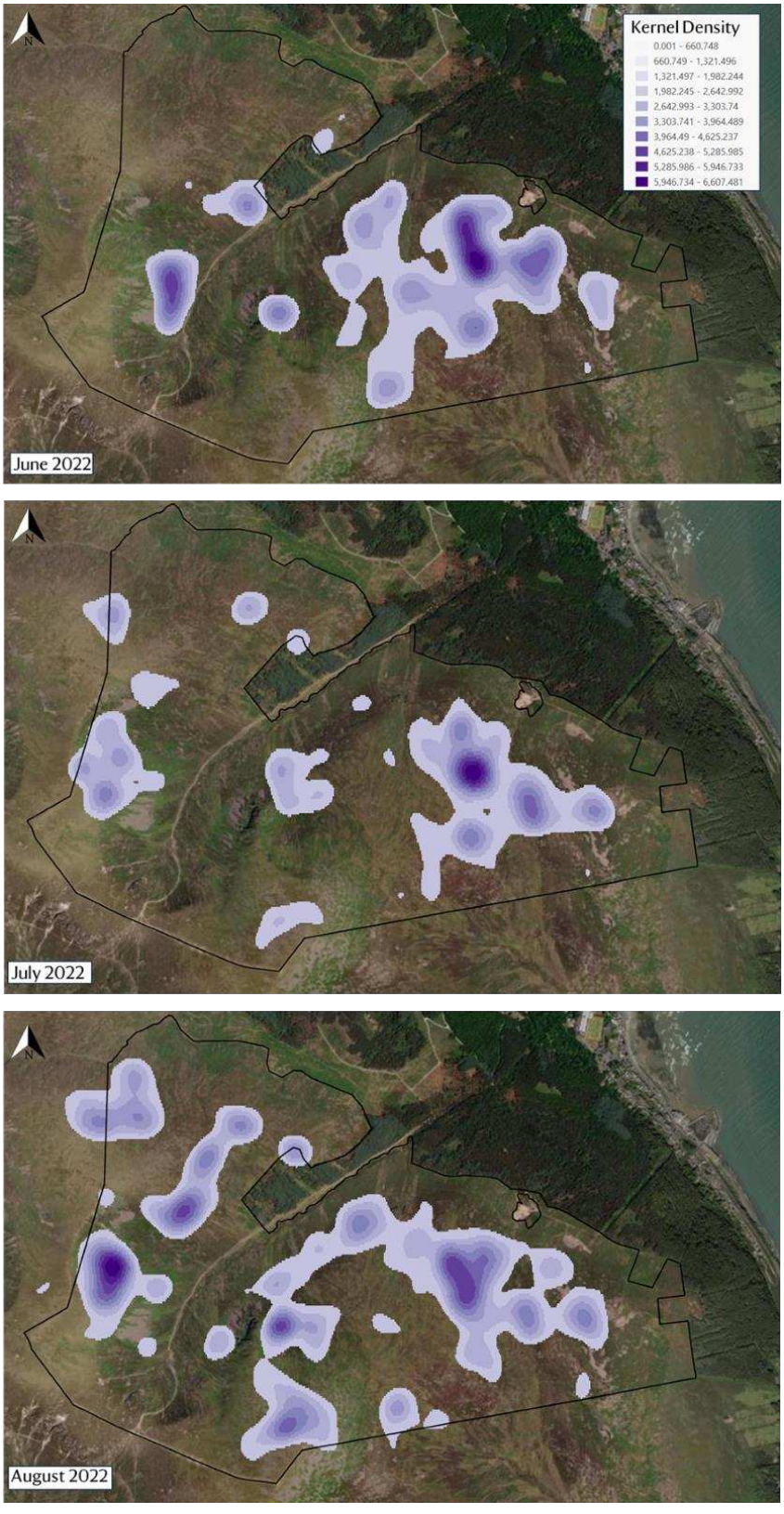
Appendix fig. 3 - Table summarising the NIEA Condition Assessments 2016 and NT survey results for 2024 for the same sites.

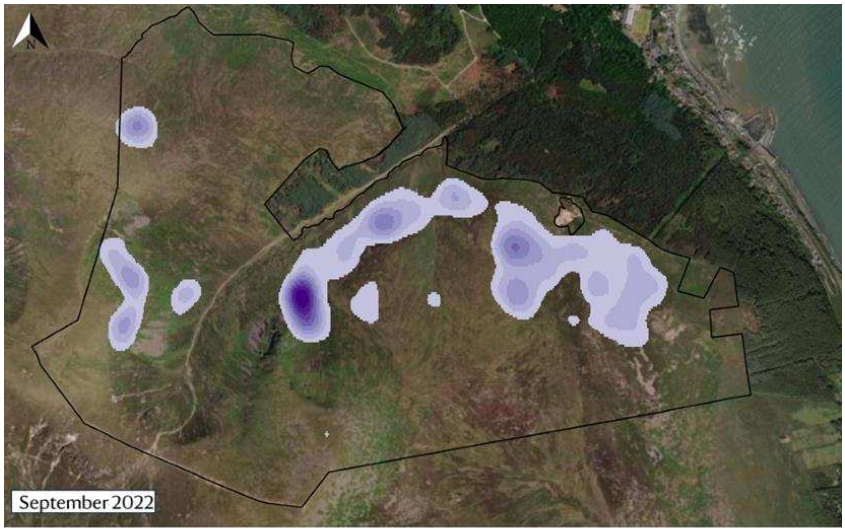
Attribute	Target	2016 (NIEA CA)	2024 (NT Site Survey)
Extent			
*Area of habitat	Maintain area	Favourable	Impacted by 2021 Wildfire
Community diversity	Maintain community diversity	Favourable	Impacted by 2021 Wildfire
Vegetation Structure			
Dwarf Shrub Height (cm)	15-35cm	19cm	12cm
*Bare Peat (or ground covered by algal mats)	<2%	1.3%	7%
Vegetation Composition (Positive Indicators)			
*Ericacious Cover %	Greater then 75% cover across 75% of plots	Ericoid cover >75% across 34% of plots. Mean Cover of 54%	Ericoid cover >75% across 16% of plots. Mean Cover of 46%
*Ericoid Diversity	at least 2 present across 90% of plots	At least 2 Present in 81% of Plots	at least 2 Present in 100% of Plots
*Graminoid % Cover	<33%	38%	11%
Frequency and Cover of Bryphytes and Bushy Lichens	>5% in non Blanket Bog Plots	18%	6.50%
*Cover of Sphagnum (Blanket Bog Only)	>25	28.80%	19%
Vegetration Composition (Negative Indicators)			
*Frequency and Cover of Tree Encroachment (DAFOR)	<5%	<1%	<1%
*Gorse Cover %	<5%	<1%	<1%
*Bracken Cover %	<10%	<2%	<2%
Cover of Agricultural Grasses and Weeds	no more than rare 2%	Absent	Absent
Management Grazing	Signs of overgrazing no more than 5%	Unfavourable	Unfavourable
Management Burning	Signs of burning covering no more than 5%	No Evidence	2021 Wildfire
Frequency and Cover of Erosion Features (DAFOR)	Signs of erosion associated with human impact <2%	Signs of Erosion noted in 2/26 plots (7%)	Signs of Erosion noted in 4/26 plots (14%)

Appendix fig. 4 – National Trust Peatland Monitoring Approach



Appendix fig. 5 – Heat maps of the collared sheep onsite in the Mournes during the 2022 grazing season. These heat maps display monthly preferred locations of the flock. It is clear that during different seasons the sheep prefer different areas onsite.

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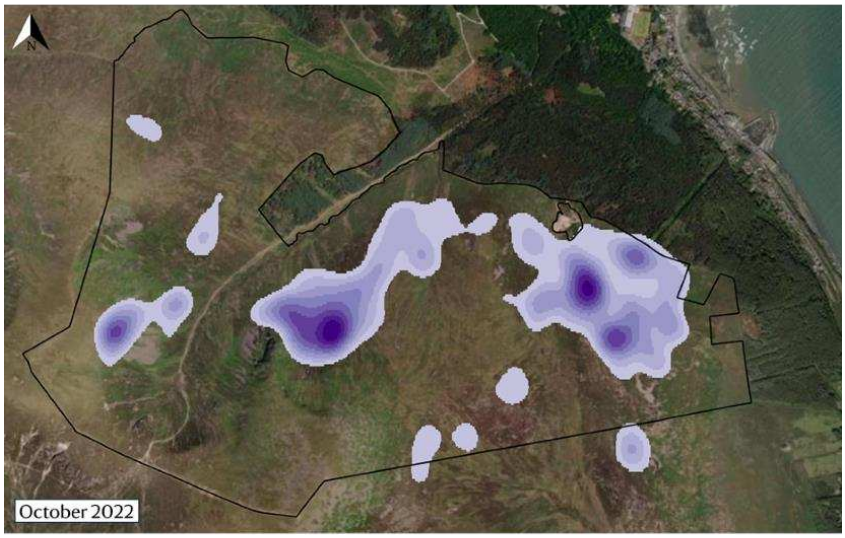
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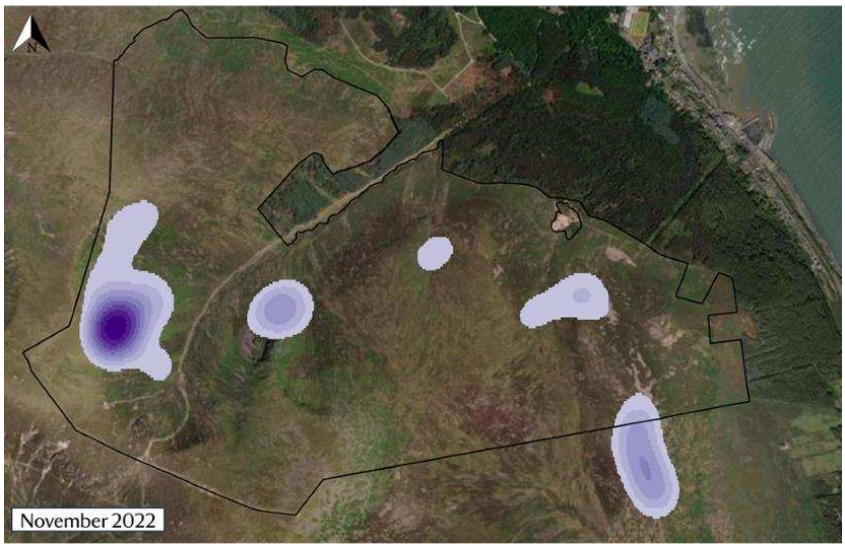
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November 2022

Fire ravaging Mournes: 21st - 24th April 2021

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

An Roinn Talmhaíochta, Comhshaoil agus Gnóthaí Tuaithe

Depairtment o' Fairmin, Environment an' Kintra Matthers

Projects Funded by DAERA in the Mournes:

Mourne Path Repair, Challenge Fund, Oct 2019- Mar 2020

Mourne Path Repair, Challenge Fund, Oct 2020-Mar 2021

Nature Recovery and Sustainable Access, Environment Fund, Apr 2021 - Mar 2023

Wildfire Recovery, Challenge Fund, Sep 2021 - Mar 2023

Mournes Community Renewal (Phase 2), Environment Fund Strategic Strand, Aug 2023 – Mar 2025

Nature Recovery and Sustainable Access, Environment Fund Strategic Strand, Apr 2023 - Mar 2025

National Trust