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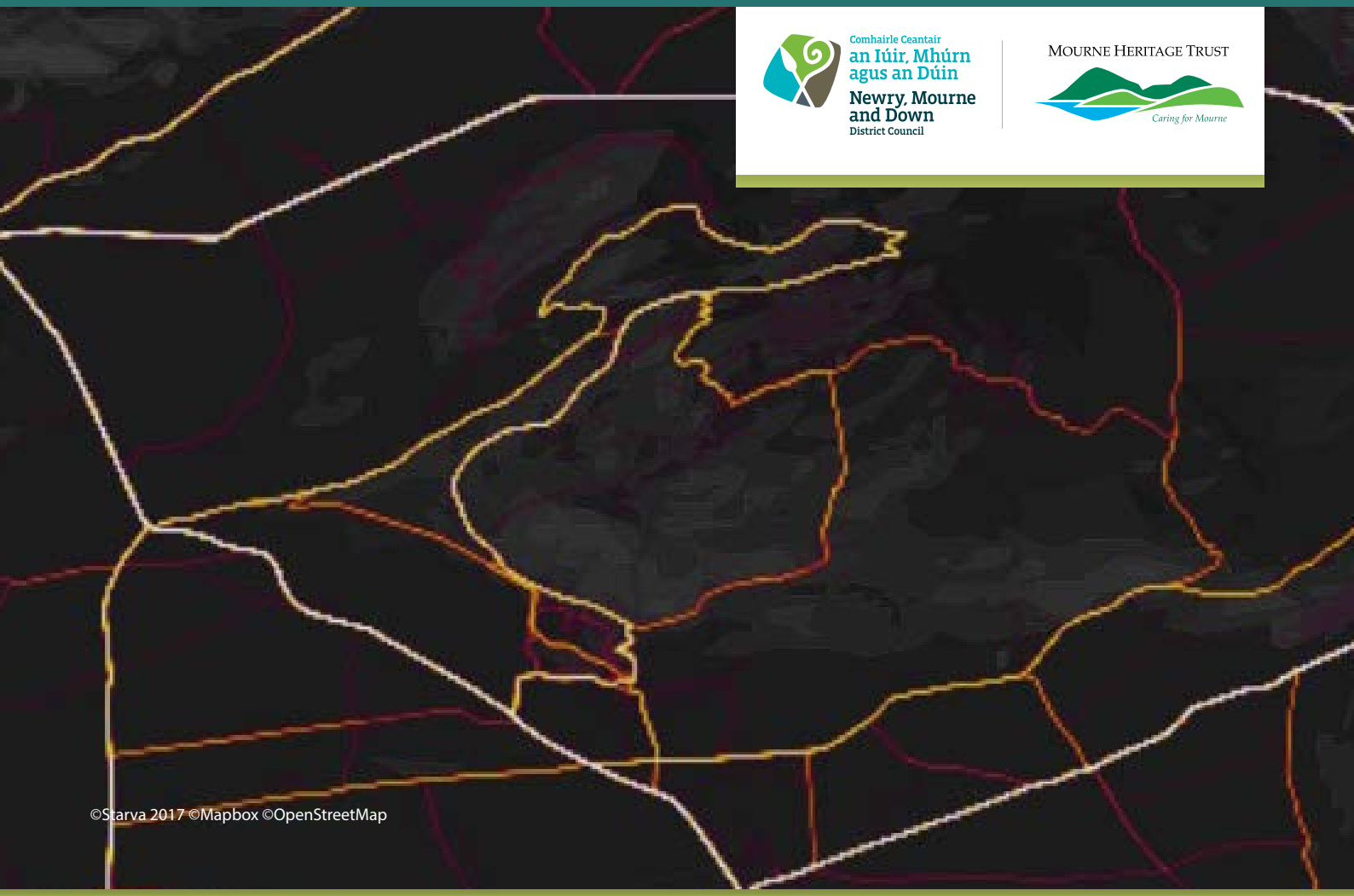
Condition Assessment



Comhairle Ceantair an Iúir, Mhúrn agus an Dúin
Newry, Mourne and Down District Council

Mourne Heritage Trust
Caring for Mourne

The ASCENT Site

Slieve Gullion Co Down, Northern Ireland

T1.1
Research on the Impact of Unregulated Access to Upland Sites

by Newry Mourne & Down District Council and Mourne Heritage Trust

ASCENT
Promoting Sustainable Access to Uplands & Natural Environments

Northern Periphery and Arctic Programme
2014–2020

EUROPEAN UNION
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Introduction and General Description

Rising some 576m above the surrounding countryside, the broad slopes of Slieve Gullion dominate the landscape of South Armagh. The mountain itself lies at the centre of a pronounced ring of hills – the Ring of Gullion. Together, these features are a testament to more violent times in this part of Ireland since they are both of volcanic origin. Both the mountain and its surrounding ring of hills represent the now much-eroded heart of a volcano that existed here around 60 million years ago.

Slieve Gullion is one of the largest heathlands in Northern Ireland. The variety of heathland types reflects the different environmental conditions on the site, with the most extensive community dominated by heather. On the lower slopes, there is a natural transition from upland communities to lowland heaths and acid grasslands, down into a series of small wetlands. These 'basin fens' are very diverse and of high conservation value. Some of the lowland heath communities are especially important for Northern Ireland.

Slieve Gullion Forest Park is increasingly becoming known for its tourism potential and is currently a major visitor attraction in the region, receiving approximately 250,000 visitors per year. Slieve Gullion Forest Park is a key driver in the Newry, Mourne and Down Tourism Strategy and features heavily in the tourism experiences developed. There is one main path to the summit of Slieve Gullion, however there are several other routes to the top of the mountain.

A blacksmith named Culann lived at the foot of the mountain around 2,000 years ago at the time of the great saga of Táin Bó Cúailnge or Cattle Raid of Cooley, King Conchobar mac Nessa and the great Ulster warrior, Cú Chulainn;. Slieve Gullion or Sliabh Cuilinn means Culann's Mountain. The Ring of Gullion is alive with history, awash in scenic beauty and bursting with culture.

Location, Ownership and Management

Slieve Gullion lies in the heart of South Armagh along the border of counties Armagh and Louth, approximately 70km south of Belfast, 104km north of Dublin, 20km north of Dundalk, and 9km south of Newry.

Slieve Gullion is owned by Northern Ireland Forest Service – Department of Agriculture, Environment and Rural Affairs; three common lands; and nine private properties. Newry, Mourne and Down District Council manage significant areas within Slieve Gullion Forest park for recreation use.

Figure 1: North of Ireland with Slieve Gullion inside grey box

Geology

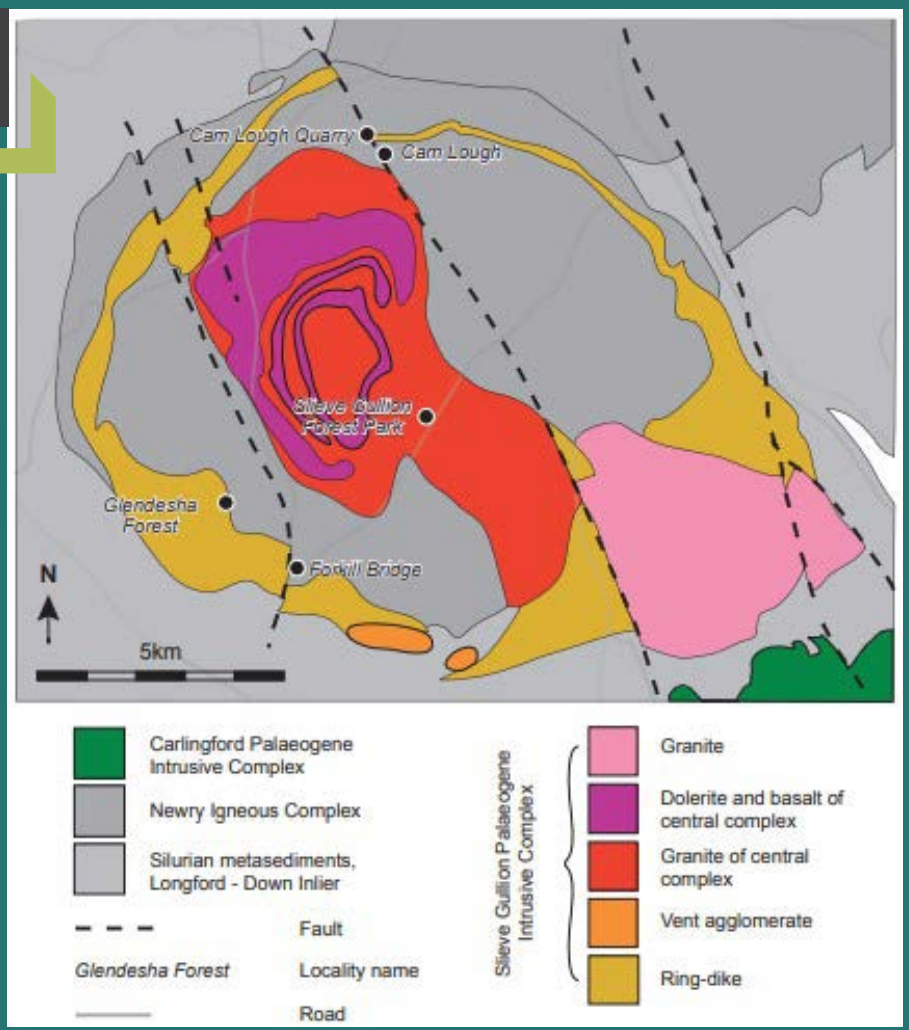
Both the Ring of Gullion and Slieve Gullion have their origins in volcanic activity that rocked this area around 60 million years ago. At that time, the European and North American continents were still joined together. However, as they began to drift apart, a process that eventually led to the creation of the North Atlantic ocean, large volumes of rock began to melt at depth. Some of this molten rock, or magma, cooled deep underground into rock, but some of it made the surface, where it erupted, sometimes explosively, through volcanoes.

From the summit of Slieve Gullion the circular lines of hills making up the Ring of Gullion can be seen. The hills of the Ring are up to 300m high and follow the line of a circular fracture, or fault, in the Earth's crust. The rocks that make up these hills are dolerite, gabbro and felsite, all of which cooled from magma deep underground. However, some parts of the hills are made up of basalt, volcanic glass, volcanic tuffs and volcanic breccia and the existence of these are evidence of occasionally explosive volcanic activity at the surface here 60 million years ago.

The intricate relationships between the light and dark rocks have caused much debate amongst the scientific community about how these rocks – and indeed Slieve Gullion as a whole - came to be. It was thought that Slieve Gullion was made up of altered layers of lava that erupted from the volcanoes here around 60 million years ago. A more favoured explanation,however, suggests that the layers of dark basalt-like rock and light granite-like rock never erupted as lava at the surface.

The dark-coloured rock is called dolerite. Dolerite is an igneous rock that formed from the slow cooling of magma deep in the Earth's crust. Near-horizontal sheets of dolerites are interbanded by the other igneous rock, granophyre, which also formed from the cooling of magma deep underground. Together, they make up Slieve Gullion and they give it a somewhat stepped profile.

Figure 2: Geological map of the Slieve Gullion complex



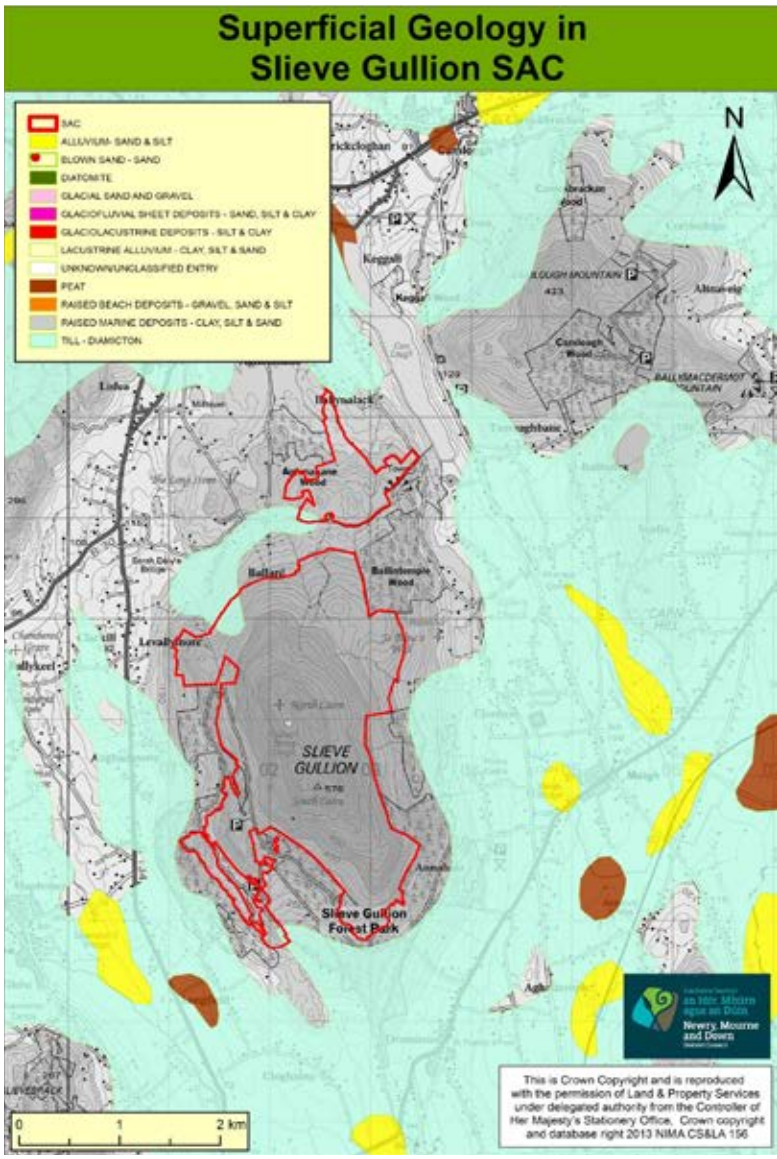
Soil

Soils within Northern Ireland are generally shale, with small areas of felsite and granite located in the east of the sub-catchment associated with the Slieve Gullion complex.

The craggy hills of the Ring of Gullion, with thin acidic soils overlying granitic rocks, have an extensive cover of heathland making up over 12% of the area. The soil depths on Slieve Gullion vary greatly and can be a few centimetres to well over a metre.

The best soils in the area are those of the glacial deposits which run in rounded ridges through the lowlands between Slieve Gullion and its ring dyke of hills. In these areas, farmland is divided into strips of rectangular fields, each strip originally worked as one farm. In the past, many farms would have grown some crops of oats and potatoes, but now grassland and cattle dominate.

Figure 3: Typical soil erosion on Slieve Gullion due to recreation pressure



Climate

The analyses are based on 1km grid-point data sets which are derived from station data between 1971 and 2000.

Climate Variable	Value for Slieve Gullion SAC
Days of air frost	45 - 55 Days
Days of Ground Frost	110 - 145 Days
Mean daily maximum temperature	7 - 10.5 Celsius
Mean daily minimum temperature	3 - 4.6 Celsius
Mean temperature	5.2 - 7.6 Celsius
Days of rain = 1mm	180 - 190 Days
Rainfall mm	1300 - 1600 mm
Days of sleet/snow falling	40 - 70 Days
Days of snow lying	22 - 42 Days
Hours of sunshine	950 - 1150 hours

Land Use

Until the end of the 1600s, it is likely that the Ring of Gullion area was densely wooded; John Speede's map of 1610 shows extensive woodlands in the lowlands between Fathom, Camlough and Forkhill. This woodland was gradually cleared for farming and to support an increasing population with fuel and raw materials. Although today there are remnants of important semi-natural woodlands and mature parklands, the bulk of the AONB's woodland is recent upland conifer plantations. Many of the bogs that would have characterised the lowland areas have been drained to allow for agricultural improvement, though some important wetlands remain.

Ancient woodland sites include parts of the lands of Slieve Gullion Forest and Killeavy Castle. The Woodland Trust's 'Ancient Woodland Inventory' records that, of Forest Service's 1,403 hectares of land in the area, some 920 hectares are planted with a mixture of conifers and broadleaved trees.

Not all of the land owned by Forest Service is woodland. Forest Service manages its unplanted areas for nature conservation with Forest Nature Reserves on Slieve Gullion. Forest Service replants at least 5% of felled areas with mixed species broadleaved trees and leaves 10-20% open space to promote biodiversity, new or replanted forests no more than 75% of one species.

Farming is an important activity in the AONB, with an estimated 550 farms in the area. As with the rest of Northern Ireland, the number of part- and full-time farmers and agricultural workers is declining. According to local farming organisations, there are now fewer full-time farmers in the Ring of Gullion. A comparison with figures published at the time of designation of the AONB (in 1991) shows that there has been a reduction in sheep numbers and an increase in cattle in the area, however it is predominately sheep that are farmed on Slieve Gullion.

Natural Heritage

Annex 1 habitat European dry heath is extensive over the area and represents one of the largest expanses of this habitat in Northern Ireland outside the Mourne Mountains. The community is mostly of the Calluna vulgaris/Erica cinerea and Calluna vulgaris/Vaccinium myrtillus types, but includes Ulex gallii/Erica cinerea dry heath on the lower slopes. The area supports a number of other vegetation communities, including wet heath and blanket bog on the summit and upper slopes, wet and dry grassland communities, and transition mires and quaking bogs.

A number of notable species have been recorded. These include cowberry on the higher slopes, western gorse and the moss Sphagnum compactum in the lowland heath and Dioecious sedge and pale butterwort in the richer, flushed areas.

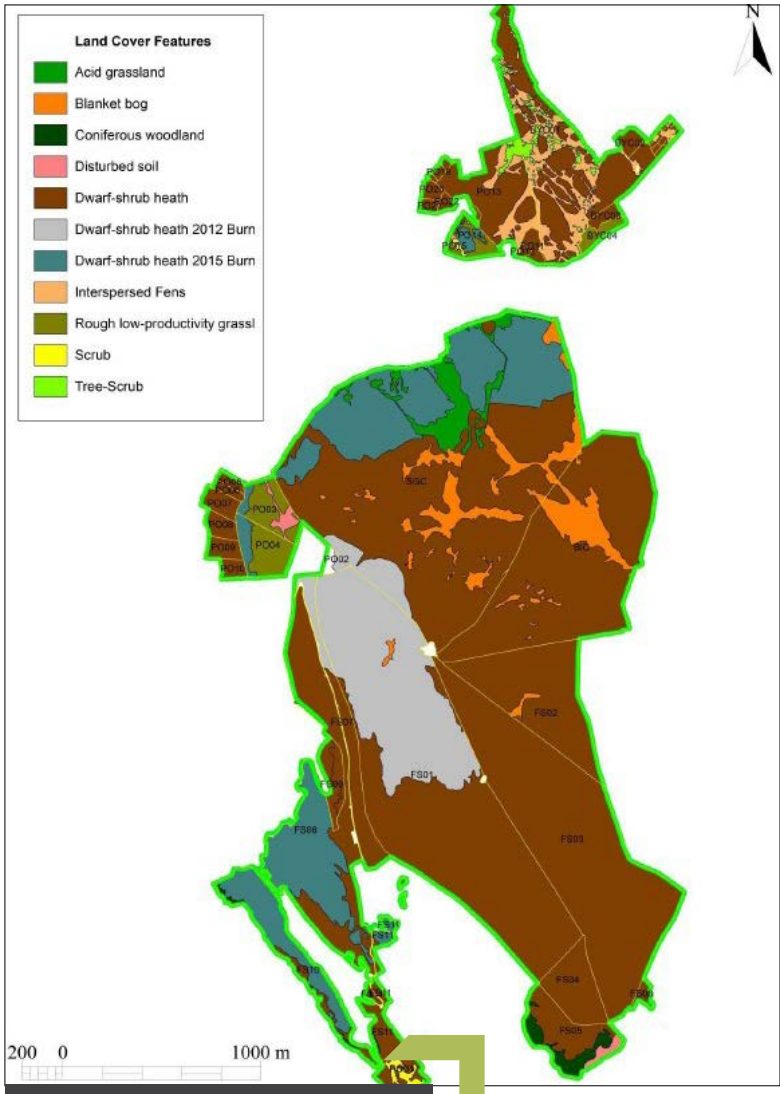


Figure 4: Slieve Gullion SAC land cover features area per Ownership Sub Unit.

Flora and Fauna

Northern Ireland priority species at Slieve Gullion SAC-ASSI			
Barn Owl	*Tyto alba*	**Common Lizard**	*Zootoca vivipara*
Bullfinch	*Pyrrhula pyrrhula*	**Small Heath**	*Coenonympha pamphilus*
Corncrake	*Crex crex*	**Wall**	*Lasiommata megera*
Cuckoo	*Cuwculus canorus*	**Autumnal rustic**	*Eugnorisma glareosa*
Curlew	*Numenius arquata*	**Centre-barred Sallow**	*Atethmia centrago*
Dunlin	*Calidris alpina*	**Cinnabar**	*Tyria jacobaeae*
Dunnock	*Prunella modularis*	**Dark-barred Twin-spot Carpet**	*Xanthorhoe ferrugata*
Fieldfare	*Turdus pilaris*	**Double Dart**	*Graphiphora augur*
Goldeneye	*Bucephala clangula*	**Garden Tiger**	*Arctia caja*
Grasshopper Warbler	*Locustella naevia*	**Latticed Heath**	*Chiasmia clathrata*
Hen Harrier	*Circus cyaneus*	**Rosy Rustic**	*Hydraecia micacea*
House Sparrow	*Passer domesticus*	**Shaded Broad-bar**	*Scotopteryx chenopodiata*
Lapwing	*Vanellus vanellus*	**Small Square-spot**	*Diarsia rubi*
Pochard	*Aythya ferina*	**Narrow-bordered Bee**	*Hemaris tityus*
Red Grouse	*Lagopus lagopus*	**Beetle**	*Cyphon punctipennis*
Redshank	*Tringa totanus*	**Beetle**	*Pelophila borealis*
Redwing	*Turdus iliacus*	**Beetle**	*Hydroporus morio*
Reed Bunting	*Emberiza schoeniclus*	**Brown Snail**	*Zenobiella subrufescens*
Ring Ouzel	*Turdus torquatus*	**Chrysalis Snail**	*Leiostyla anglica*
Skylark	*Alauda arvensis*	**Heath Snail**	*Helicella itala*
Song Thrush	*Turdus philomelos*	**Moss Chrysalis Snail**	*Pupilla muscorum*
Spotted Flycatcher	*Muscicapa striata*	**Plted Snail**	*Spermodea Lamellata*
Starling	*Sturnus*	**Point Snail**	*Acicula fusca*
Swift	*Apus apus*	**Smooth ramshorn**	*Gyraulus laevis*
Tree Sparrow	*Passer montanus*	**Field Gentian**	*Gentianella campestr*
Tufted Duck	*Aythya fuligula*	**Parsley Fern**	*Cryptogramma crispa*
Whooper Swan	*Cygnus cygnus*	**Bedstraw**	*Galium uliginosum*
Wood Warbler	*Phylloscopus sibilatrix*	**Frog Orchid**	*Coeloglossum viride*
Yellow Wagtail	*Motacilla flava*	**Heath Cudweed**	*Gnaphalium sylvaticum*
Yellowhammer	*Emberiza citrinella*	**Wood Crane's-bill**	*Geranium sylvaticum*
Eurasian Red Squirrel	*Sciurus vulgaris*	**Funck's Rustwort-moss**	*Marsupella funckii*
Irish Hare	*Lepustimidus hibernicus*	**Green Hoar-moss**	**Hedwigia integrifolia**
Pine Marten	**Martes martes**		
WEur Hedgehog	**Erinaceus europaeus**		

Built and Cultural Heritage

South Armagh lies within a region long associated with an ancient frontier that is as old as the earliest records of human habitation in Ireland. It was along these roads and fields and over these hills and mountains, that Cúchulainn and the Red Branch Knights, the O'Neills and the O'Hanlons roamed, battled and died. This area reflects the mix of cultures from the Neolithic Era to the present day. It is an area which has always represented a frontier: from the ancient Iron Age defences of the Dorsey, through the Anglo-Norman Pale, and latterly to the modern border. It is alive with history, awash in scenic beauty and bursting with culture.

Slieve Gullion dominates the landscape of the area and plays a central role in many folk tales. Several link Fionn Mac Chumaill with the mountain, and one well known story involves the Cailleach Beara, who entices Fionn to swim in the magical lake on the summit of the mountain, only for him to emerge as an old and weak man.

The area was the last gaeltacht in Northern Ireland. In the 2001 Census, some 9-17% of people are recorded as being able to speak, read, write and understand Irish. Today, festivals, storytelling, publications, townland drama festivals, ceilidhs and dances all give expression to this heritage.

Dramatically situated on the southern end of the Slieve Gullion summit ridge, Slieve Gullion Passage Tomb is the highest surviving passage tomb in Ulster, with stunning views over the surrounding countryside. It consists of a circular cairn some 30m in diameter and up to 4m high, with a kerb of massive, but undecorated, stones around the perimeter. A slight indentation on the south-west side marks the entrance to a short, lintelled, passage which leads to the octagonal, originally corbelled, chamber.

The earliest documented investigation of Slieve Gullion Passage Tomb dates to 1789, when the chamber was opened by locals searching for the old lady or Cailleach Beara, but only a few human bones were found. Not surprisingly, excavation in 1961 revealed that the chamber had been badly disturbed and the only small finds were a few pieces of worked flint, a single scraper and an arrowhead. Two of the stone basins, commonly found in passage tombs, were also discovered below modern fill in the chamber and a third (now housed in Armagh County Museum) was recovered from the outer end of the passage.

Figure 5: Volunteers helping take care of Slieve Gullion Passage Tomb in 2017

Excavation of Slieve Gullion Passage Tomb also revealed that a small cairn of stones, about 12m in diameter, had subsequently been added to the northern side of the tomb. Although no burials or structural features were uncovered by the excavation, it seems reasonable to interpret this as a Bronze Age addition. A small round cairn on the northern end of the summit ridge was also excavated in 1961, revealing two small cist graves and fragments of distinctive Early Bronze Age pottery

Recreation

Recreation in south Armagh has increased in the last decade and Slieve Gullion has shouldered the majority of the increase, and continues to see annual rise. Slieve Gullion Forest Park is a destination for all kinds of activities, including walking, hiking, running, dog walking, cycling, orienteering, geocaching and driving. There are also play parks. There has been some motorised activity on the summit path on Slieve Gullion, which has caused significant damage. Visitors on the Slieve Gullion path have increased from 4,000 in 2011 to 30,000 in 2016. Slieve Gullion is a relatively easy mountain to climb, and, coupled with the forest drive, which allows people to drive to an elevation of 350m, it is anticipated that visitor numbers will continue to increase.

Research into use/events

Challenges past, present and future

Climate change is the greatest challenge facing the world today (DEFRA, 2007). Many habitats in the Ring of Gullion are on the edge of their natural range, which means that they are vulnerable to any changes in the climate. For instance, droughts during the summer could negatively impact on wet grassland, blanket bogs, and the range of species that are found only in this environment. Fires in dried grassland would further compound these problems, destroying the homes of ground nesting birds, among other issues. Non-native invasive species could potentially flourish in these altered climate conditions and out-compete native species.

Climate change may also have an impact on the many built or man-made features in the heritage landscape. Wetter winters have the potential to cause higher levels of path erosion, while hotter summers may result in an increase in wildfires, damaging the beauty of sites and resulting in a reduced number of people visiting the area for recreational purposes.

Issue	Likely Cause	Scale
Grazing	Sustainable stocking densities not established for the different site ownership units.	Within the boundaries of designated area
	Fencing infrastructure in bad condition	
Burning	Lack of control and monitoring of burning throughout the site.	Slieve Gullion SAC
	Lack of liaison with landowners.	
	Lack of establishment of procedures throughout the site to prevent big wildfire events.	
Scrub/Bracken encroachment	Abandoned	Disturbance areas in several private ownerships.
	Undergrazing (scrub) / Overgrazing (Bracken)	
	Disturbance by fire	
Erosion	Areas of upland heath affected by 2012 Wildfire	Losing of peat areas in upper slopes
Fly-tipping	Landowner bad practices	North of the SAC
Recreation impact	Path use intensification / Lack of maintenance	Erosion of main path areas
		Marcation and section increase
		Heathland erosion
Changes in land use	Agriculture intensification	Surroundings of the site
Nitrogen deposition	Industrial intensification	Growth of competitive plants

Cause	Consequence	Potential Impacts
Increased mean temperatures	Longer growing season (Burt & Holden 2010)	Increased growth of grasses and other heath species and a gradual change towards a lowland heathland structure (Carey 2013).
		Temperature is often a limiting factor for insect and microbial performance. Warmer temperatures are likely to result in increased herbivory and faster nutrient cycling, leading to changes in vegetation.
Hotter summers	Potential for increased visitor numbers	An increase in unmanaged access could lead to more erosion on access routes, an increased risk of wildfires (Albertson et al 2010), and increased disturbance of ground nesting birds.
	Increased risk of wildfire	Changes to community composition and increased erosion and loss of peat.
Wetter winters	Increased surface runoff	Spring burning as a management option may become increasingly difficult.
Storm events	Increased rainfall intensity	Greater erosion, particularly affecting footpaths and bare peat areas.

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