



EST. 1983

**Ben Nevis Estate  
Environmental, Cultural and Social Background  
2020**

## Contents

1.0	General information .....	5
1.1	Location .....	5
1.2	Status.....	5
1.3	Tenure.....	10
1.4	Site Definition and Boundaries .....	10
1.5	Legal and Other Obligations.....	10
1.5.1	Tenure.....	10
1.5.2	Wayleaves.....	10
1.5.3	Rights of Way .....	10
1.5.4	Rights of Access.....	10
1.5.5	Listed buildings.....	10
1.5.6	Scheduled Ancient Monuments.....	10
1.5.7	Woodlands .....	10
1.6	Fixed Assets.....	11
1.7	Partnerships .....	11
1.7.1	The Nevis Partnership .....	11
1.7.1.1	The North Face Survey.....	13
1.7.2	Mid-west deer management group.....	13
1.7.3	The Ben Nevis Special Area of Conservation working group .....	14
1.7.4	Lochaber Biodiversity Action Group.....	14
2.0	Environmental Information .....	16
2.1	Wildness .....	16
2.2	Landscape.....	16
2.3	Natural Heritage (Physical) .....	17
2.3.1	Geology.....	17
2.3.2	Geomorphology .....	18
2.3.3	Soils .....	20
2.3.4	Climate.....	20
2.3.5	Hydrology .....	21
2.4	Natural Heritage (Biological) .....	21
2.4.1	Habitats.....	21
2.4.2	Habitat monitoring .....	25
2.4.2.1	Dwarf Heath Monitoring .....	25
2.4.2.2	Marked Seedlings .....	26
2.4.2.3	Tree Transects .....	27
2.4.2.4	Peatland .....	29
2.4.2.5	Montane woodland.....	30
2.4.3	Vascular Plants .....	31
2.4.4	Bryophytes.....	33
2.4.5	Lichens .....	36
2.4.6	Mammals .....	36
2.4.6.1	Water vole surveys on the Ben Nevis Estate .....	39
2.4.6.2	Bats.....	40
2.4.7	Birds .....	40
2.4.7.1	Upland breeding bird survey .....	42
2.4.8	Herptiles.....	44
2.4.9	Invertebrates .....	44
2.4.9.1	Mountain ringlet monitoring data .....	45
3.0	Cultural, Social and Economic Information .....	52
3.1	Archaeology and History .....	52
3.1.1	Prehistory to Post Medieval .....	52
3.1.2	Eighteenth and Nineteenth Centuries .....	53
3.1.3	Twentieth and Twenty-first Century Developments.....	54
3.2	Land Use.....	55
3.2.1	Agriculture .....	55
3.2.2	Forestry.....	56
3.2.3	Deer Management.....	56

3.2.4	Minerals .....	56
3.3	Recreation .....	56
3.3.1	Walking and Climbing .....	57
3.3.2	Stalking .....	61
3.3.3	Fishing .....	61
3.3.4	Natural and Cultural Heritage .....	61
3.4	Man-made Features on Ben Nevis Summit .....	62
3.5	Litter .....	62
3.6	Volunteering .....	62
3.7	Employment .....	63
4.0	Evaluation .....	64
4.1	Wildness .....	64
4.2	Landscape .....	64
4.3	Physical .....	65
4.4	Biological .....	65
4.4.1	Habitats .....	65
4.4.2	Plants .....	67
4.4.3	Lichens .....	68
4.4.4	Birds .....	68
4.4.5	Mammals .....	70
4.4.6	Invertebrates .....	70
4.5	Cultural, Social and Economic Aspects .....	71
4.5.1	Archaeology and History .....	71
4.5.2	Land Use .....	71
4.5.3	Recreation .....	72
4.5.4	Man-made Features on Ben Nevis .....	72
4.6	Summary of the Most Important and Significant Features of Ben Nevis Estate .....	74
4.7	Key Factors Influencing Management .....	77
4.7.1	Grazing Impacts .....	77
4.7.2	Visitor Impacts .....	78
4.8	Summary of Factors Influencing Management .....	79

## List of tables

Table 1.	Ben Nevis SAC European Priority Interest Habitats .....	23
Table 2.	Ben Nevis SAC European Interest Habitats .....	24
Table 3.	dwarf heath monitoring results .....	25
Table 4.	Mid-west deer management group dwarf heath monitoring results .....	25
Table 5.	mean height of marked seedlings (cohort 1) .....	26
Table 6.	mean height of marked seedlings (cohort 2) .....	27
Table 7.	Results of Meall Cumhann juniper survey 2019 .....	31
Table 8.	Vascular plant species on the Ben Nevis Estate .....	33
Table 9.	Moss species on the Ben Nevis Estate .....	34
Table 10.	Liverwort species on the Ben Nevis Estate .....	36
Table 11.	early on foot deer counts in Glen Nevis .....	37
Table 12.	Up to date deer counts on the Ben Nevis Estate .....	37
Table 14.	Deer cull records on the Ben Nevis Estate .....	37
Table 15.	Mammals on the Ben Nevis Estate .....	39
Table 16.	Birds on the Ben Nevis Estate .....	41
Table 17.	birds observed on the Ben Nevis Estate upland breeding bird survey .....	42
Table 18.	Herptiles on the Ben Nevis Estate .....	44
Table 19.	Butterflies on the Ben Nevis estate .....	45
Table 20.	Ben Nevis Estate mountain ringlet monitoring results .....	46

Table 21. Moths on the Ben Nevis Estate .....	50
Table 22. Diptera potentially present on the Ben Nevis Estate .....	51
Table 23. Coleoptera potentially present on the Ben Nevis Estate .....	51
Table 24. Calibration of Ben Nevis people counters .....	60

## List of figures

Figure 1. Ben Nevis Estate.....	7
Figure 2. Ben Nevis and Glen Coe National Scenic Area .....	8
Figure 3. Protected Areas on the Ben Nevis Estate.....	9
Figure 4. Dwarf heath browsing impacts 2019.....	26
Figure 5. Number of trees measured on transect B .....	27
Figure 6. Height of trees measured on transect B .....	28
Figure 7. Tree Transect B location.....	28
Figure 8. Peatland depth on the Ben Nevis Estate.....	29
Figure 9. Ben Nevis Estate montane woodland.....	30
Figure 10. 2019 water vole survey results.....	39
Figure 11. Ben Nevis Estate bat survey points .....	40
Figure 12. Upland and woodland bird species population trend 2010-2019 .....	43
Figure 13. Ben Nevis Estate upland breeding bird transect .....	43
Figure 14. Mountain ringlet transect locations .....	45
Figure 15. Ben Nevis bridge visitor numbers.....	58
Figure 16. Steall Gorge 2014 visitor count .....	59
Figure 17. Allt a' Mhuilinn 2013 visitor count .....	59

## Abbreviations

BNE – Ben Nevis Estate  
 BNSAC – Ben Nevis Special Area of Conservation  
 FTE – Full Time Equivalent  
 GCR – Geological Conservation Review Site  
 HLF – Heritage Lottery Fund  
 HLH – Highlife Highland  
 HS – Historic Scotland  
 JHE – Jahama Highland Estate  
 JMT – John Muir Trust  
 LMC- Lochaber Mountaineering Council  
 LMR – Lochaber Mountain Rescue  
 MCofS – Mountaineering Council of Scotland  
 MWDMG – Mid-west Deer Management group  
 NLP – The Nevis Landscape Partnership  
 NMRS – National Monuments Register of Scotland  
 NR – Nationally Rare  
 NS – Nationally Scarce  
 NSA – National Scenic Area  
 NSa – Nationally Scarce a  
 NSb – Nationally Scarce b  
 RDB – Red Data Book

SAC – Special Area of Conservation  
SMC – Scottish Mountaineering Club  
SMR – Site of Monuments Register  
SMS – Scottish Mountaineering Society  
SSSI – Site of Special Scientific Interest  
THC – The Highland Council

## 1.0 General information

### 1.1 Location

Ben Nevis Estate (BNE) is situated in the Western Highlands of Scotland to the south-east of the town of Fort William in Lochaber. The main access to Ben Nevis is on foot along the Mountain Track from The Highlife Highland's (HLH) Ben Nevis Visitor Centre Car Park (NN 123 729) which lies 2 km from Fort William on the Glen Nevis road. The eastern reaches of the estate can be accessed from the Upper Falls Car Park (NN 168 691), 10km from Fort William at the end of the Glen Nevis Road. The estate is within 100 miles of Glasgow and 66 miles of Inverness. Ben Nevis is the highest mountain in the United Kingdom and consequently attracts large numbers of visitors. The surrounding area is heavily dependent for its economic viability and employment on the tourism value of Ben Nevis and Glen Nevis.

The Estate, comprising 1761 ha (4158 acres), covers roughly the summit and southern slopes of the Ben itself and a string of other peaks to the east along with their southern slopes down to the Water of Nevis. The summits to the east are Carn Mor Dearg (1223m), Aonach Beag (1234 m), and Sgurr Choinnich Beag (963 m). See figure 1.

#### National Grid Reference

NN 167 713 (Ben Nevis Summit).

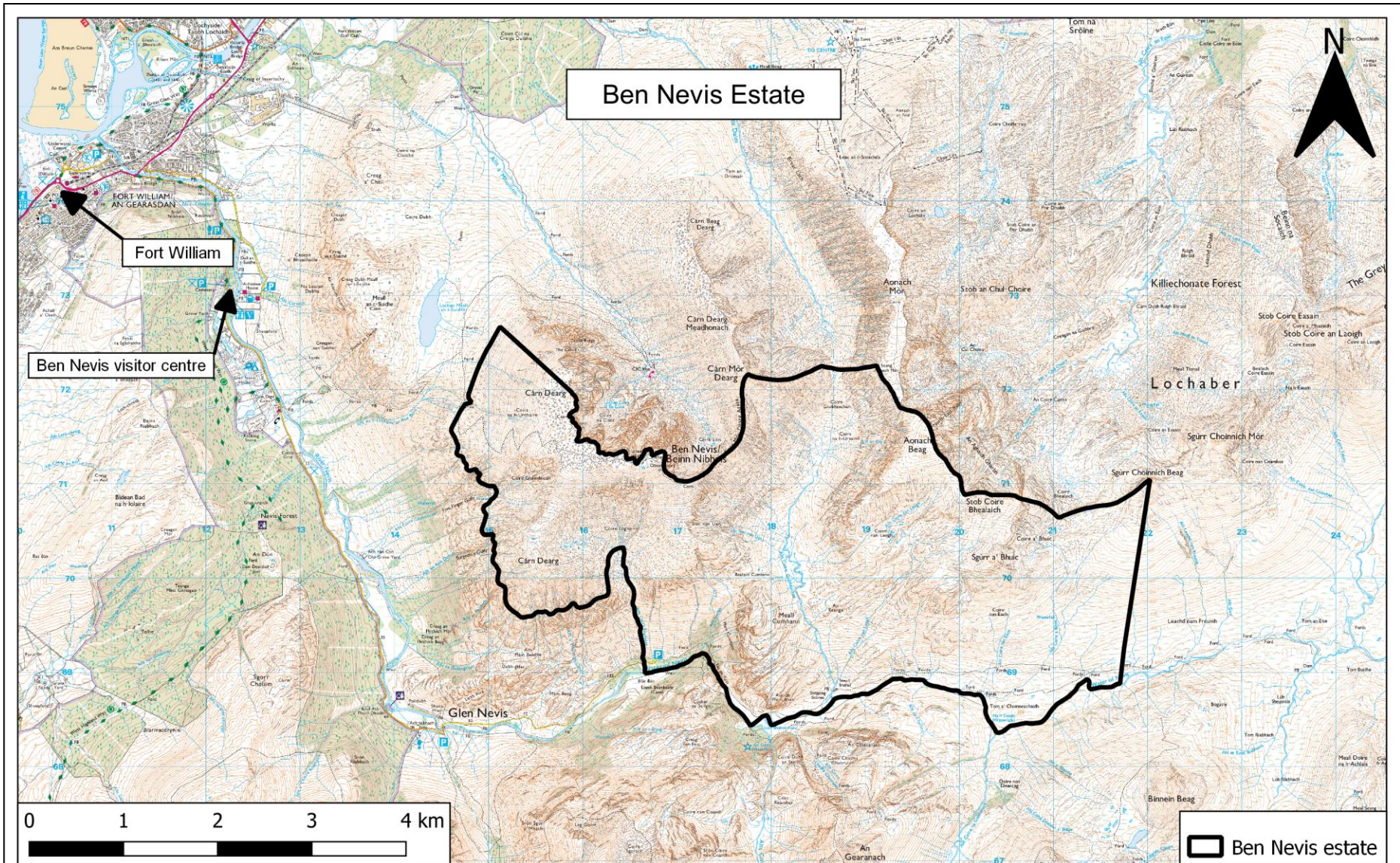
#### Map Coverage

1:50 000	Ordnance Survey	Landranger Series 41	Ben Nevis
1:25 000	Ordnance Survey	Explorer Series 392	Ben Nevis and Fort William
1:25 000	Harvey Map	Superwalker	Ben Nevis

### 1.2 Status

The BNE is situated within both the Ben Nevis and Glencoe National Scenic Area (NSA) (figure 2) and the Ben Nevis Special Area of Conversation (SAC). It also contains part of the designated Ben Nevis Site of Special Scientific Interest (SSSI) and part of a Geological Conservation Review Site (GCR) (figure 3).





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Figure 1. Ben Nevis Estate

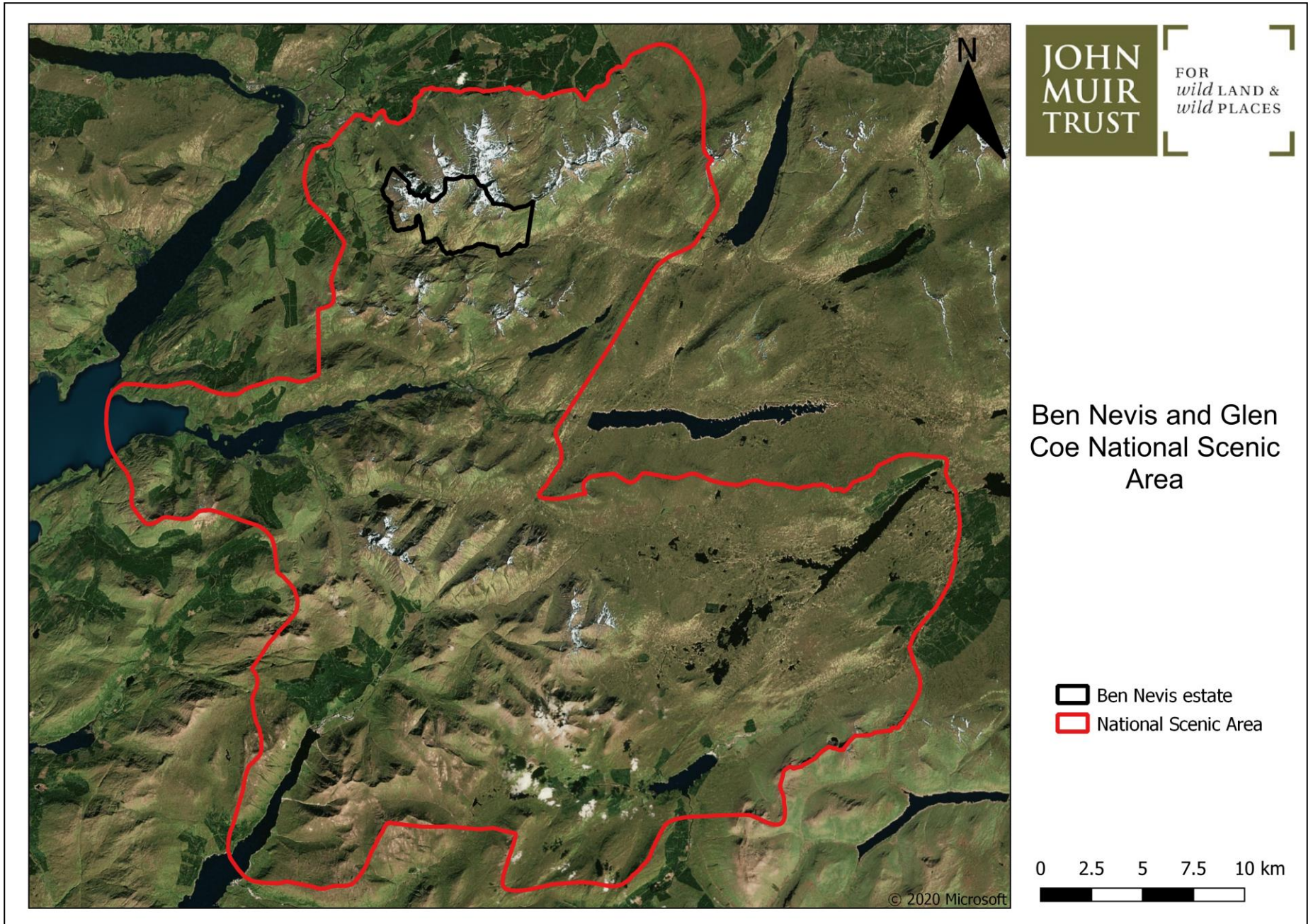
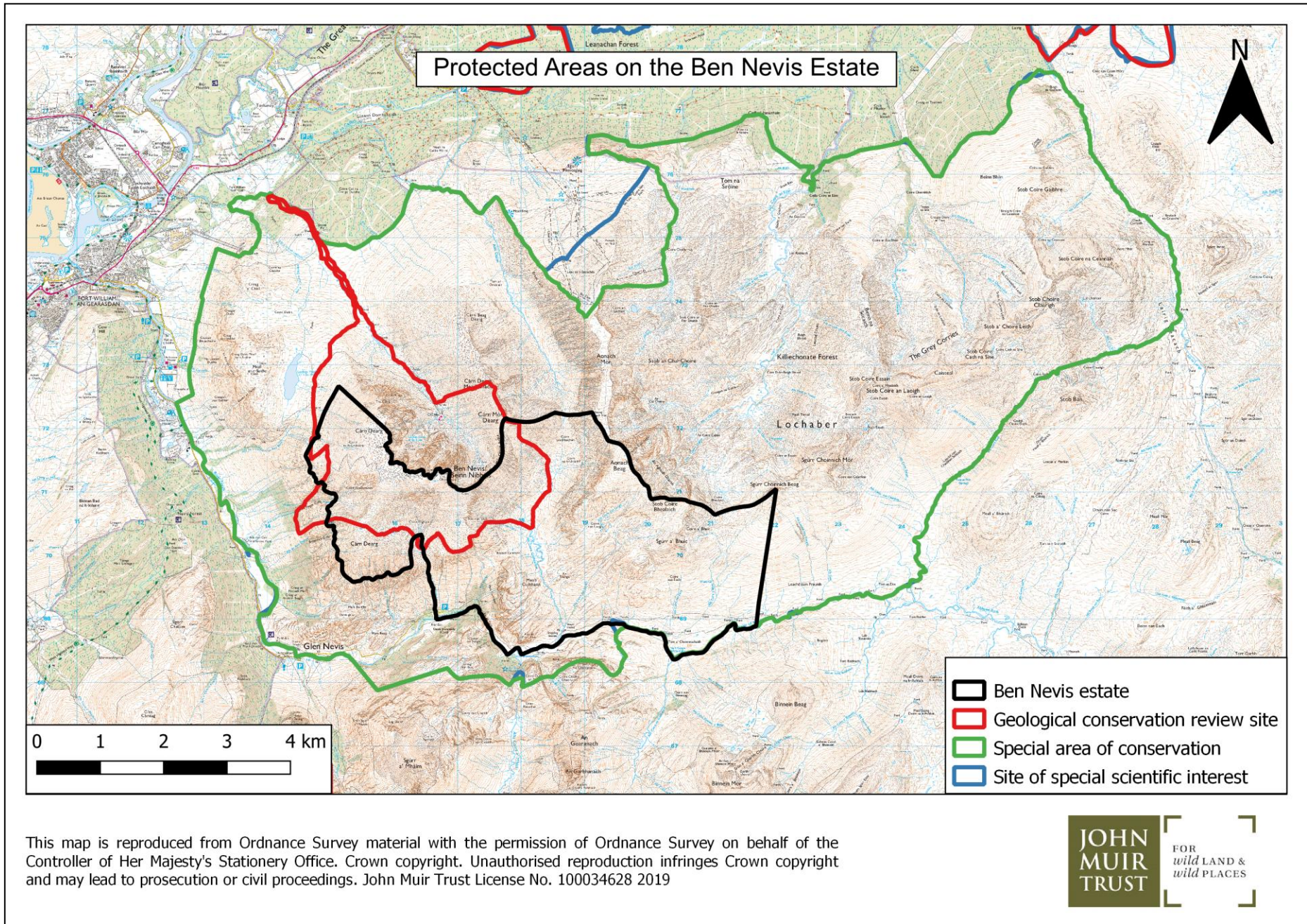


Figure 2. Ben Nevis and Glen Coe National Scenic Area





**Figure 3. Protected Areas on the Ben Nevis Estate**

### **1.3 Tenure**

The Trust acquired the BNE in June 2000 from Duncan Fairfax-Lucy. At the time of purchase, there was one agricultural tenant who had grazing rights in Upper Glen Nevis. This tenancy was renounced in 2003 and the sheep were removed in 2004.

### **1.4 Site Definition and Boundaries**

The property is surrounded by land owned by Jahama Highland Estates (JHE) and lies within the Nevis Landscape Partnerships (NLP) Area. The Lochaber Mountaineering Club (LMC) retains ownership of the 2m by 3m piece of land upon which the summit shelter sits and formerly the now removed Carn Dearg shelter.

### **1.5 Legal and Other Obligations**

#### **1.5.1 Tenure**

None.

#### **1.5.2 Wayleaves**

None.

#### **1.5.3 Rights of Way**

A Right of Way runs eastwards from the end of the Glen Nevis Road following the north side of the Water of Nevis.

#### **1.5.4 Rights of Access**

The Trust has an open pedestrian access policy to all its sites. With the implementation of the Land Reform (Scotland) Act 2003, Part 1 in 2005, there is a statutory right of access while taking part in activities covered by the Act. These rights only apply if they are exercised responsibly.

#### **1.5.5 Listed buildings**

None.

#### **1.5.6 Scheduled Ancient Monuments**

None.

#### **1.5.7 Woodlands**

The steep, craggy banks of Steall Gorge support the most significant area of woodland on the estate comprising birch, rowan, willow with hazel, alder and ash as well as other native species nearer the riverbank. The remaining remnant woodland is showing signs of regeneration, however progress is slow. Although most of the sheep were removed from Upper Glen Nevis in 2004, the deer population in the Glen appears to preclude regeneration. Further up Glen Nevis, scattered birch, willow and rowan cling to the sides of burns and in craggy areas. There are a small number of seedlings browsed to the

level of the surrounding vegetation which could be released with further reductions in grazing pressure. In total the BNE is home to 24ha of native woodland.

## **1.6 Fixed Assets**

None

## **1.7 Partnerships**

### **1.7.1 The Nevis Partnership**

The Nevis Partnership (NP), established in 2002, is a company limited by guarantee and a Scottish registered charity. The NP work with local, national, and international organisations, government bodies, and landowners to conserve and enhance the incredible landscape of Ben and Glen Nevis. The partnership consists of fifteen members that set the strategic direction of the partnership of which twelve have chosen to nominate directors to the board, JMT is one of these.

Other partnership organisations are as follows:

- The Highland Council
- Mountaineering Scotland
- Lochaber Chamber of Commerce
- Sport Scotland
- Forest and Land Scotland (formerly Forestry Commission Scotland)
- Visit Scotland
- Friends of Nevis
- University of the Highlands and Islands
- Lochaber Geopark
- Fort William Mountain Festival
- Fort William, Inverlochy and Torlundy Community Council
- Glen Nevis Residents
- Scottish Natural Heritage (Advisory role)

In 2014 the NP began a large scale programme funded by the Heritage Lottery to deliver nineteen different projects over the course of five years in the form of the <http://www.nevislandscape.co.uk/> Nevis Landscape Partnership (NLP). The NLP Programme was a collective response to land management from local and national environmental organisations, charities and community groups who all share a common interest in securing a sustainable future for Ben Nevis and Glen Nevis. A unifying aim for the collective was to lever much needed investment into the area to ensure economic vitality, a healthy environment and a vibrant society. The programme began in 2014 and finished in March 2019. The Heritage Lottery Fund awarded NLP £3.9 million to deliver nineteen projects over five years. NLP staff and a range of local and national organisations, businesses and government bodies applied a collective approach to managing the landscape which helped to unlock social and financial resources that would otherwise not be available to the community. The programme funders and partners included:

- Heritage Lottery Fund
- Scottish Natural Heritage
- Highland Council

- Highlands and Islands Enterprise
- Sportscotland
- Forestry Commission Scotland
- John Muir Trust
- Ordnance Survey
- Friends of Nevis
- Jahama Highland Estates
- Scottish Rural Development Programme
- Lochaber Geopark
- British Geological Survey
- Highland Mountain Culture Association
- London Fieldworks
- Highlife Highland
- Lochaber Chamber of Commerce
- University of the Highlands and Islands
- SSE Sustainable Development Fund
- Highlands and Islands Enterprise
- Scottish Mountaineering Trust
- Visit Scotland

The nineteen projects were as follows,

- LP.A1 (2014) Ben Nevis path
- LP.A2 (2014-2018) Pinewood restoration
- LP.A3 (2015 onwards) Future forests
- LP.A4 (2014-2016) North Face survey
- LP.A5 and LP.B2 (2015-2017) Dun Deardail excavation, vitrification and outreach
- LP.A6 (2015 – 2017) Summit conservation
- LP.A7 (2014-2017) Sustainable futures: erosion and minimal impact
- LP.B1 (2015-2019) Community engagement
- LP.C1 (2015-2017) Polldubh paths
- LP.C2 (2015-2017) Riverside all-ability path and bridge
- LP.C3 (2016-2019) North Face path
- LP.C4 (2015) Geology map and guide
- LP.C5 (2014-2015) Outlandia
- LP.C6 (2015-2017) Sustainable futures: Interpretation, installation, information
- LP.C7 (2014-2017) Celebrating the wild
- LP.C8 (2014-2018) Ben Nevis film+
- LP.D1 (2015-2019) Nevis training programme

After the success for the NLP project it was agreed the NP would be rebranded the NLP going forward.

Following from the NLP project, the 2020-2040 Nevis strategy has been launched and aims to continue the positive work carried out by the NP over the last twenty years. Their vision going forward is as follows:

*“The Nevis landscape will be a place of contrasts; not only wild land, but also a land inhabited by those who work, live and visit the area. It will bring together both the local community and visitors whose passion for this beautiful landscape will create an interdependent relationship between the landscape and people that is thoughtful, sustainable and stable.*

*The Nevis landscape will be a mosaic of habitats complete with established native woodland. It will be a biodiverse area brimming with life; Ben Nevis and Glen Nevis will be iconic not only for the highest peak in Britain, but more importantly, for a healthy wild ecosystem, connected to neighbouring landscapes via wildlife corridors, and capable of mitigating the negative effects of climate change.*

*By collectively caring for our landscape, we will have learned to reduce our impact on nature and in the process secure not only the future of the area but also our own health and wellbeing.”*

### **1.7.1.1 The North Face Survey**

Of all the projects completed by the NLP, the North Face Survey is one which considered the most successful. Over a three-year period, the project consisted of geologists, botanist and professional mountain guides living on Ben Nevis during a period each August. Drawing from each area of expertise the North Face of Ben Nevis was extensively monitored for its geology and botany. As a result, significant areas of the north face of Ben Nevis, which extends to roughly 125Ha of rock and steep scree, have now been accessed for the first time by scientists. Alison Austin, the Ben Nevis Property Manager and geologist, was a member of the survey team.

Rather than employing heavy duty industrial access techniques (such as placing bolts in the rock) the survey team utilised specially designed climbing equipment which can be placed without damaging the rock. All safety equipment was removed after the survey with no physical or visual impact to the site. Many of the sites being accessed were either damp, ‘flush’ areas or along geological contacts. These locations often coincide with large fractures in the rock and as such are full of loose, wet rock. Climbers usually avoid such places. The team therefore used many of their more usual ‘guiding techniques’ but also had to develop some new approaches, especially with regard to 200 metre abseils. The team of mountaineers also brought an extensive and detailed knowledge of the mountain to the scientific survey. Thousands of days guiding clients on the north face of Ben Nevis gave the geologists and botanists insight into the mountain’s topography as well taking them safely to previously unrecorded areas. As a result of sharing expert knowledge across several disciplines a ‘blueprint’ has been provided for future remote surveys on challenging designated sites, which should reduce the planning work associated with such a potentially labour-intensive process.

Reports and films were produced for each year and can be viewed in the NLP website - <https://www.nevislandscape.co.uk> . Furthermore, a book titled “The North Face Survey – Discovering the hidden side of Ben Nevis” was published and can be purchased from their website

### **1.7.2 Mid-west deer management group**

The Mid-west deer management group (MWDMG) is a voluntary body that consists of

landowners and land managers within the MWDMG area. The group boundary is located to the east of Fort William and bounded to the north by the A86 from Spean Bridge to Laggan. The boundary follows the A889 to Dalwhinnie, along the north west shores of Loch Ericht and the eastern boundary of Camusericht Estate to the Bridge of Ericht. The southern boundary follows the River Gaur and around the Cruach march between Cruach Estate and Black Corries Estate. The southern boundary continues along the southern shores of the Blackwater reservoir and the southern boundaries of Caolasnacon and the Aonach Eagach ridge. The western boundary follows the River Coe, loops around the village of Glencoe before heading around Loch Leven to Callart and over the hills of Doire Ban, Sgorr Chalum and to Fort William.

The duties of the group are as follows:

- Deer management planning
- Deer population assessment (including deer counts and other sampling methods)
- habitat assessment
- deer culling
- Analysis of population performance
- Preventing damage by deer
- Protecting public safety

The JMT is an active member of the MWDMG. Other members are as follows:

- Ardverikie Estate Ltd
- Ben Alder Estate Ltd
- Corroul Lands Ltd
- Lord Pearson of Rannoch and the Rannoch Trust
- Hamish McCorquodale
- Jahama Highland Estates
- Scottish Ministers (Forest and Land Scotland)

### **1.7.3 The Ben Nevis Special Area of Conservation working group**

The Ben Nevis Special Area of Conservation (BNSAC) working group consists of landowners, land managers and stakeholders who are actively involved with the management of land within the BNSAC (See figure 3 for Ben Nevis SAC area). The aim of the group is to provide collaborative management of the designated features within the BNSAC, particularly with regards to deer and livestock management. The JMT are active members of the groups. Other members are as follows:

- The Nevis Landscape Partnership
- Jahama Highland Estates
- Forest and Land Scotland
- Forestry Scotland
- Scottish Natural Heritage
- Achintee Grazers

### **1.7.4 Lochaber Biodiversity Action Group**

The Lochaber Biodiversity Action Group (LBAG) aims to do the following:

- Raise awareness of the biodiversity of Lochaber
- Identify habitats and species which are considered important
- Suggest projects and actions that could be undertaken by individuals, communities and agencies throughout Lochaber

The John Muir Trust are active members in the LBAG. Other active members are as follows:

- Glenloy Wildlife
- Wild Lochaber
- Lochaber Natural History Society
- Scottish Natural Heritage
- Forest and Land Scotland
- Forestry Scotland
- Botanical Society of Britain and Ireland
- Lochaber Geopark
- Woodland Trust
- National Trust for Scotland
- Lochaber Environmental Group
- The Nevis Landscape Partnership

## **2.0 Environmental Information**

### **2.1 Wildness**

The human values we place on wild places are personal to the individual. They include emotional or spiritual factors which give a sense of freedom, solitude, a contrast with modern life, spiritual renewal, spiritual challenge and sometimes risk. Wild places provide the physical conditions for recreation, relaxation, contact with nature and essential peace and quiet.

Apart from their importance to human beings for physical and spiritual renewal, wild places are important as refuges for wildlife living in a natural or near natural environment. Wild places also provide a source of scientific and educational interest. There are also ethical values connected with caring for wild land and protecting it for its own sake.

In good or moderate weather, the long views down to the populated glen from Ben Nevis, the man-made structures on the summit of the Ben, the path and the number of people on the path may make an ascent of the Ben feel the least wild and remote part of the BNE. In bad conditions, however, the same walk on Ben Nevis can feel as wild as anywhere. Furthermore, on the plateau, away from the path and summit, there is very little evidence of human presence and it thus has a distinctly wild character. The path into Steall Meadows can feel wilder with restricted views, but the large number of people and the built path make it feel less wild and remote.

The north-east part of the BNE - including Coire Giubsachan, the isolated Coire nan Laogh, the summit of Aonach Beag and the ridge line towards Sgurr Coinneach Beag with views across to the Mamores and Grey Corries - gives a greater feeling of intimacy with the natural elements and a greater connection with a feeling of remoteness. There is much less evidence of human interference or presence here than from the summit of Ben Nevis where lower Glen Nevis and Fort William are visible.

### **2.2 Landscape**

The great variety of landform and scenery within the area is attributable in the main to the intricacy of geological structures and its glacial past. The great whaleback of Ben Nevis is a distinctive feature when viewed from any direction. It overlooks Fort William with steep cliffs on its northern flank descending as much as 700 metres in places. The southern flank of Ben Nevis in comparison encompasses a much gentler aspect. This contrast is a key landscape feature. The sinuous ridge of the Carn Mor Dearg arête, dropping eastwards from the summit of Ben Nevis before rising towards Aonach Beag and continuing towards the Grey Corries, is one of the finest that links some of the highest peaks in Scotland. Glen Nevis ranks among the most beautiful and striking highland glens. No other part of the country has greater relative relief. The lower reaches are pastoral, with an alder threaded rivers and woodland clothing the sides of the glen. The middle section, including Steall Gorge, exhibits 'Himalayan' character, while the upper glen is a lace of peaceful meadows, alpine in feeling and enhanced by the presence of the Steall Waterfall.



The gentler southern aspects of Ben Nevis are visible from the road in Glen Nevis, but the steep northern face and the summit are more difficult to view. The cliffs and summit are visible from Torlundy to the North, and from the Corpach Basin and Caledonian Canal to the east. However, they can only truly be viewed by those prepared to walk some distance uphill over rough terrain. Views of upper Glen Nevis and the An Steall waterfall can also only be accessed by walking.

The majority of hillside within the BNE is affected by human management, chiefly grazing by deer. In the past, there has also been sheep grazing. While sheep no longer graze the BNE, they do graze other parts of Glen Nevis. The impact of both sheep and deer on the woodland cover is a significant feature of the landscape and will be visible for some time to come.

The mountain track (formally known as the pony track or bridle path), which zigzags its way up the southern flank of Ben Nevis, is clearly visible from a long distance (10 to 15 miles or more), as is the eroded line of descent following the Red Burn. Further erosion lines cutting off the section of path that detours past Lochan Meall an t'Suidhe are also visible from afar. These routes will probably remain as intrusive features of the landscape regardless of future path maintenance.

## **2.3 Natural Heritage (Physical)**

### **2.3.1 Geology**

The BNE is situated south of the Great Glen Fault and to the north of the Highland Boundary Fault. This places it, geologically speaking, in the Grampian Highlands. The Grampian Highlands are largely composed of metamorphic rocks formed during the Caledonian Orogeny or mountain building episode of 460-430 million years ago. Ben Nevis itself is made up of intrusive and extrusive igneous rocks that make up the Ben Nevis Complex. The Ben Nevis Complex is Devonian in age and was intruded at the end of the Caledonian Orogeny around 420 million years ago.

The metamorphic rocks which surround Ben Nevis and make up the rest of The BNE belong to the Dalradian Supergroup. These Dalradian rocks started off as marine sediments deposited at the edge of a basin over 700 million years ago. These sediments mostly comprised clean sands, silts and lime rich layers. They were buried deeply over time and eventually turned into sedimentary rocks. They were then folded, heated and fractured during the Caledonian Orogeny when large tectonic plates collided with each other during the closure of the Iapetus Ocean. The great mountain chain created by this collision, known as the Caledonian Mountain Chain, may have been similar to the western Himalaya with peaks as high as 6000-8000 metres.

Layers of impure metamorphic limestone are found on Meall Cumhann and on the slopes of Aonach Beag. Surrounding these layers are mica schists. A band of fine-grained quartzite follows the shoulder of Sgurr a'Bhuic from the banks of the River Nevis up towards Sgurr Coinneach Beag.

There are some north-east / south-west trending porphyrite and felsite dykes of Devonian age emplaced within the Dalradian rocks.

The Ben Nevis Complex contains good examples of both Caledonian Granites and Old Red Sandstone lavas exposed at the same level through the possible process of cauldron subsidence. It is one of the few locations in Scotland and one of the first in the world where the feature of cauldron subsidence has been identified.

The cauldron consists of a granite body 7km wide within which sits a plug of andesite lava, 600m deep and 2km wide. Lava and some explosive agglomerate form the upper 600m of Ben Nevis. Granite and lava would not normally be juxtaposed in this way since lava is erupted from the surface and granite is formed at depth. The lower part of Ben Nevis is made up of two large intrusions of granite (the inner and outer granite) as well as two smaller intrusions of quartz diorite which are found along the boundary of the outer granite. These four different intrusive rocks are differentiated by their colour and size of their crystals.

By the time the igneous rocks of the Ben Nevis Complex began to form, some 425 million years ago, the Dalradian rocks were exposed at the earth's surface. After the andesite lava flows were erupted onto the surface of the land, a space was left in the magma chamber. The crust above the magma chamber cracked and subsided, squeezing lava up around edges of the subsiding block. This was repeated a number of times until the final surface block of lava dropped down into the magma chamber. This subsidence would have created an enormous volcanic crater. In the 400 million years since volcanism ceased, erosion has removed the top 2 or 3km of crust. All the original lava flows have since been eroded. Only those that subsided into the crater have been preserved as the top 600m of Ben Nevis.

Historically the above description of a caldera collapse was widely accepted. However, in recent years a team of geologists that surveyed Ben Nevis closely during the 2014-2017 NLP North face Survey project believe this is not the case. Using digital field mapping of both the steep north and south face of the mountain it was revealed that the volcanic rock of the top of the mountain consist largely of volcaniclastic debris flows and extensive block and ash flow deposits with minor air-fall tuff units. No evidence of andesite lava flows or a volcanic vent were observed. From their research it is believed that the volcanic detritus present on Ben Nevis originated from a volcanic centre situated within 25 kilometres in a north west direction of Ben Nevis. The rocks forming the summit region of the mountain have been re-interpreted as a large roof pendant or keel of the former late Silurian to Early Devonian volcanic land surface that once covered much of the SW Highlands of Scotland.

### **2.3.2 Geomorphology**

Ben Nevis is an immense and easily recognised whaleback mountain with steep cliffs dropping down to the Allt a'Mhuillinn on the north face and more gentle slopes on the southern and eastern flanks of the mountain. The landscape surrounding Ben Nevis has been shaped fairly recently in a geological context.

The natural processes responsible were mostly caused by a dramatic change in climate during the Quaternary Ice Age, which started 1.8 million years ago. Since then, the Highlands have been glaciated many times. Longer periods of cold (stadials) were interspersed by relatively shorter warm (interglacial) phases. We are at present in an interglacial phase, the Holocene that has lasted 10,000 years. The ice that engulfed Scotland encountered a land mass much the same as we see today, with dissected

mountains and valleys in the north-west where the BNE is located. Repeated glaciation modified the pre-Quaternary landscape by widening, deepening and straightening pre-glacial river valleys.

The greatest extent of the Scottish ice sheet occurred 22,000 to 18,000 years ago when almost the entire land surface lay under 2km thick ice. The maximum thickness of the ice dome was centred over Rannoch Moor to the south of Ben Nevis. Ice spread out radially, creating a pattern of deep narrow lochs and valleys. In the west, warm-based glaciers built up which had greater erosional power than the cold-based glaciers of the east. As a result, the west suffered much more deep erosion and glacial scouring. Selective linear erosion picked out north-west / south-east trending lines of weakness such as shear lines and dykes in basement rocks. The deep sea lochs of Loch Linnhe and Loch Eil to the west of Ben Nevis were gouged out in this way, as was Glen Nevis to form a distinctive U-shape. Smaller glaciers on the side valleys of Glen Nevis carved out the distinctive hanging valleys that can be seen on the flanks of the mountains within the BNE today. An Steall, which can be viewed from Steall Meadows, spills out from such a hanging valley.

In the Ben Nevis area, we mainly see products of the most recent glaciation from 22,000 to 13,000 years ago. Known as the Late Devensian, rapid warming 14,000 to 13,000 years ago resulted in the disappearance of ice over much of the country save perhaps some mountain glaciers in the north and west. Sudden climatic change 11,000 years ago led to the return of ice on high ground. This was known as the Loch Lomond Readvance or Stadial. Ice advancing across the Great Glen from the west and south dammed up lakes which gave rise to shorelines known as the parallel roads of Glen Roy, Glen Gloy and Glen Spean to the north of Ben Nevis. This period also gave the west its rugged outline as many peaks, such as Ben Nevis, remained above the surface of the ice cap to be shattered by intensive frost action. On the summit of Ben Nevis and upper slopes of Aonach Beag, there are fine examples of solifluction terraces, solifluction hummocks, patterned ground and frost-heaved stones as well as large areas of shattered rock scree.

Within Glen Nevis itself, there are excellent examples of *roche moutonnées*, formed when ice scraped over the rock to leave a steeper face where the rock was plucked by the ice descending on the downstream side. Glacial erratics are found throughout Glen Nevis. Water worn crags with distinct potholes are evident high on the south-west facing cliffs of Meall Cumhann where Steall Gorge opens out into the Meadows area. This is attributed to a stream cascading down the margin crevasse of a glacier.

De-glaciation, although rapid, was not smooth. There is evidence of a series of pulses of warmth and ice melt followed by standstills in the fluvio-glacial gravels deposited. Of note are two crescentic moraines which occur at the lip of the hanging valley of Allt Coire Giubhsachan.

The rapid increase in temperature following the end of the Loch Lomond Stadial 10,000 years ago, led to the rapid establishment of crowberry and juniper scrub with the subsequent expansion of mixed deciduous woodland comprising birch and hazel, followed by either oak and elm or pine and alder woods. These forests declined after 5000 years, partly as a result of the cooler wetter climate which favoured the growth of blanket peat, and partly as a result of human activities.

### 2.3.3 Soils

The MacAulay Institute covers the BNE in its 1:50 000 Soil Survey Map series (Sheet 41). A soil survey has not been carried out by the Trust.

The summit of Ben Nevis and Aonach Beag are indicated as bare rock and scree on the 1:250000 Soils Survey Map for Western Scotland. Where the lavas on Ben Nevis and the schists on Aonach Beag weather, the development of moss and lichen communities are creating pockets of humus and potential soil (regolith) in between the rocks. A recent survey of the lichens carried out on the summit plateau of Ben Nevis by John Douglas located several very small examples of lichen heath associated with soil development.

The upper part of the BNE is indicated to be sub-alpine soils with some peat and rankers on all slope angles. These are predominantly acid soils.

Lower on the mountain, down into Glen Nevis, there is a predominance of peaty podzols, peaty gleys and peats on hummocky valley and slope moraines. There are some humus iron podzols and brown forest soils with some gleys in Steall Gorge and the Meadows area where there is forest cover.

### 2.3.4 Climate

From 1883 to 1904, when a meteorological station was maintained on the summit, readings showed that the summit was extremely wet and cold with the mean monthly temperature at or below freezing for eight months of year and the warmest monthly average being five degrees centigrade. The average annual temperature at the summit between 1883 and 1903 was 0.3 C. The low temperatures reached on average in March reflected the strong maritime influence on this part of Scotland

The low summer temperature is partly the result of the persistent cloudiness which reduces annual sunshine to an average of only 750 hours (a mean of 969 hours). In the 21 years of summit observations, sunshine only reached the summit for one sixth of that time. Snow lay on average for 215 days of year on the summit which supported some of most persistent snowbeds in Scotland. In fact, the maximum snow depth was often not reached until April. In more recent years Ben Nevis has experienced significantly fewer days of severe cold, frost or snow and has a much reduced total depth of snow on the summit than those recorded 30 years ago.

Soils rarely dry out and the cool oceanic climate, similar to that found on Ben Lawers, is considerably more oceanic than that of the Cairngorms. There is a great range in climatic conditions from woodlands in Glen Nevis, which have a mild temperate climate, to the summit snowbeds where conditions are near Arctic.

In general terms:

- Strongest wind direction in the Ben Nevis area is south-west to west
- Wettest months are generally December and January and driest months are generally May and June
- Warmest months are July and August

- Most stable weather occurs in February, October and March with January being the worst month for gales
- Average annual rainfall is 4804mm, twice that of the Cairngorms
- Snowfall may occur all year round. Snow will start to lie on the summit from October and can last well into August, especially in sheltered north-facing corries.

The effect of local topography on winds was observed at the Summit Observatory on Ben Nevis (1884-1903). The most frequent wind direction recorded on the summit was northerly as north-westerly winds are deflected around Carn Mor Dearg and give rise to gusty northerlies at the summit. South-westerlies may be backed to a more southerly direction, while south-easterlies are accelerated up the relatively gradual slope. The strongest winds on the summit are from the south to south-east.

### **2.3.5 Hydrology**

The River Nevis is located to the south of Ben Nevis and Aonach Mor, draining its headwaters from the south-facing slopes of these mountains and the north-facing slopes of the Mamore range to the south. It flows in a westerly direction in its upper reaches before turning to flow in a north-westerly direction lower down. The upper reaches of the Water of Nevis flow through a relatively flat-bottomed glacially-carved valley at around 300m elevation before reaching the Steall Gorge where a deep channel has been carved by the river in this steep-sided gorge. The Water of Nevis exits the Gorge at around 150m elevation and here resumes a more gentle aspect again to flow along a flat-bottomed glacial valley for a further 12km. It then joins the River Lochy and subsequently empties into Loch Linnhe almost immediately after this confluence.

The Allt a'Mhuilinn, to the north of Ben Nevis, drains its headwaters from the steep north-east face of the Ben and the gentler western slopes of Carn Mor Dearg. It flows north-eastwards for almost 6km until it joins the River Lochy close to the Ben Nevis Distillery at Inverlochy, 1km upstream of the confluence of the River Nevis with the River Lochy.

The north-facing slopes of Aonach Beag and Sgurr Coinneach Beag, which form the north-eastern boundary of the estate, drain into north-facing corries. The two streams emanating from these corries, Allt Coire an Eoin and Allt Choille Rais, flow northwards, coalesce and then empty into the River Spean, which itself flows eastwards to join the River Lochy.

## **2.4 Natural Heritage (Biological)**

### **2.4.1 Habitats**

The BNE contains a rich variety of habitats. The limestone outcrops to the east of Ben Nevis contribute to this richness. In the long term, there is potential for both the rehabilitation of some habitats, particularly degraded native woodland and scrub, and for the development of a natural tree line at local altitudinal limits.

The only significant remnant of woodland in Steall Gorge is dominated by silver birch (*Betula pendula*). This woodland also contains downy birch (*Betula pubescens*), rowan (*Sorbus aucuparia*), goat willow (*Salix caprea*), ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*); with alder (*Alnus glutinosa*) close to the river. Aspen (*Populus tremula*), holly (*Ilex aquifolium*), wych elm (*Ulmus glabra*), oak (*Quercus petraea*) and Scots pine (*Pinus sylvestris*) also occur in lesser amounts. Woodland types are listed as oak - birch - wood sorrel and alder - ash - yellow pimpernel. On the south-facing slopes above the Water of Nevis in the upper reaches of Glen Nevis, there is little tree cover due to grazing pressure. However, in steep-sided burns and river gorges, a mixture of rowan, eared willow (*Salix aurita*), birch and holly has survived. On the open hillside, eared willow can be found.

A mosaic of *Erica* dominated wet heath and *Molinia* grassland is predominant above the woodland. This is interspersed with many other vegetation types including bracken and drier *Calluna* heath along with various grass and rush heaths. There are also areas of blanket bog and some small areas of herb rich grassland and base-enriched flushes. On the limestone and calcareous schist of Meall Cumhann, Coire Giubhsachan and Sgurr a'Bhuic, there is montane willow (*Salix lapponum*) scrub. Streams are numerous and support a variety of riparian habitats.

At higher altitudes, mossy grasslands predominate, which give way to montane *Racomitrium* heath and sedge heath. The summits of Ben Nevis and Aonach Beag support extensive lichen cover, patches of snowbed vegetation alpine lady fern and parsley fern, and some small areas of lichen heath. There is some localised degradation of the lichen habitat where braided path systems have developed on the summit scree of the Ben, but there is potential for the rehabilitation of some of these small areas.

In 2003, Ben and Alison Averis undertook a comprehensive survey of the vegetation of the BNE and prepared a report (*Vegetation Survey of the Ben Nevis Estate in Summer 2003*) in which they described and mapped the National Vegetation Classification (NVC) communities they found. A total of 115 types of vegetation were recorded.

8 Habitats are UKBAP species and are noted below in some cases they do not correlate exactly with the SAC Habitats

Ben Nevis SAC has been designated for 17 habitats of international importance as listed in Annex 1 of the EU Directive 92/43/EC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive"). Four of these are 'European Priority Interest Habitats' and are outlined in table 1 see below:

Habitat	Annex 1 Code	NVC Codes	UKBAP	Condition
Alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i> – high altitude plant communities associated with areas of water seepage	7240	M10, M11, M12, M34	Upland Flushes, Fens and Swamps	Favourable maintained (13 Sep 2013)
Blanket bogs - some of the flatter areas such as corrie floors and parts of ridges contain areas of upland blanket bog	7130	M17, M18, M19, M20, M25	Blanket Bog	Unfavourable No Change - management measures in place (19 May 2013)
Caledonian pinewood – native Scots pine is found in Glen Nevis	91C0	W18, W17, W4, W19	Native Pinewoods	Unfavourable Recovering (19 Jul 2013)
Species rich <i>Nardus</i> grassland is found on siliceous substrates in mountain areas	6230	CG10, CG11	Upland Calcareous Grasslands	Unfavourable Declining (6 Jun 2013)

**Table 1. Ben Nevis SAC European Priority Interest Habitats**

The other 13 habitats are of 'European interest' and are:

Habitat	Annex 1 Code	NVC Code	UKBAP	Condition
Alpine and sub-alpine calcareous grasslands	6170	CG12, CG13, CG14	Upland Calcareous Grasslands	Unfavourable No Change - management measures in place (11 Jul 2009)
Siliceous rocky slopes with chasmophytic vegetation	8220	U21	Inland Rock Outcrops and Scree	Favourable Maintained (30 Sep 2003)
Siliceous scree of the montane area to snow level	8110	U18, U21	Inland Rock Outcrops and Scree	Favourable Maintained (11 Jul 2009)
Alpine and boreal heath	4060	H13, H14, H15, H17, H19, H20, H22	Mountain Heaths and willow scrub	Unfavourable Recovering (11 May 2017)
Calcareous and calc-schist screes of montane to alpine levels	8120	OV38, OV40	Inland rock outcrop and scree	Favourable Maintained (28 Sep 2003)
Calcareous rocky slopes with chasmophytic vegetation	8210	OV39, OV40	Inland rock outcrop and scree	Favourable Maintained (30 Sep 2003)

Habitat	Annex 1 Code	NVC Code	UKBAP	Condition
European dry heaths	4030	H1,H2 ,H3, H4, H7,H8 ,H9, H10, H12,H 16, H18, H21	Upland Heathland	Unfavourable Recovering (8 May 2015)
Hydrophilous tall herb fringe communities of plains and of the montane area to alpine levels	6430	U17	Inland Rock and Scree	Favourable maintained (10 Jul 2014)
Northern Atlantic wet heath with <i>Erica tetralix</i>	4010	H5, M14, M15, M16	Upland Heathland	Unfavourable No Change - management measures in place (19 May 2013)
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	91A0	W10e, W11, W16b, W17	Upland Oakwood and Upland Birchwood	Favourable Maintained (13 Jan 2001)
Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorella uniflora</i>	3130		Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Favourable Maintained (5 Aug 2013)
Siliceous alpine and boreal grasslands	6150	U7,U8 ,U9,U 10, U11,U 12,U1 4	Upland Calcareous Grassland	Unfavourable Recovering (19 May 2013)
Sub-arctic <i>Salix spp.</i> scrub	4080	W20	Mountain Heaths and willow scrub	Favourable Recovered (25 Jul 2017)

**Table 2. Ben Nevis SAC European Interest Habitats**

The SAC covers a wider area than the BNE. There are no examples of oligotrophic to mesotrophic standing waters. There is also no Caledonian pinewood, but there is oak and birch woodland with Scots pine which qualifies for the Annex 1 Priority Habitat – Caledonian Forest. The estate has examples to a greater or lesser extent of all the other Annex 1 habitats listed above.



Vegetation monitoring transects were set up by JMT in 2008 on the BNE. These are being used to monitor grazing intensity and changes in vegetation to ensure that JMT's objectives of encouraging and facilitating natural processes are being delivered.

## 2.4.2 Habitat monitoring

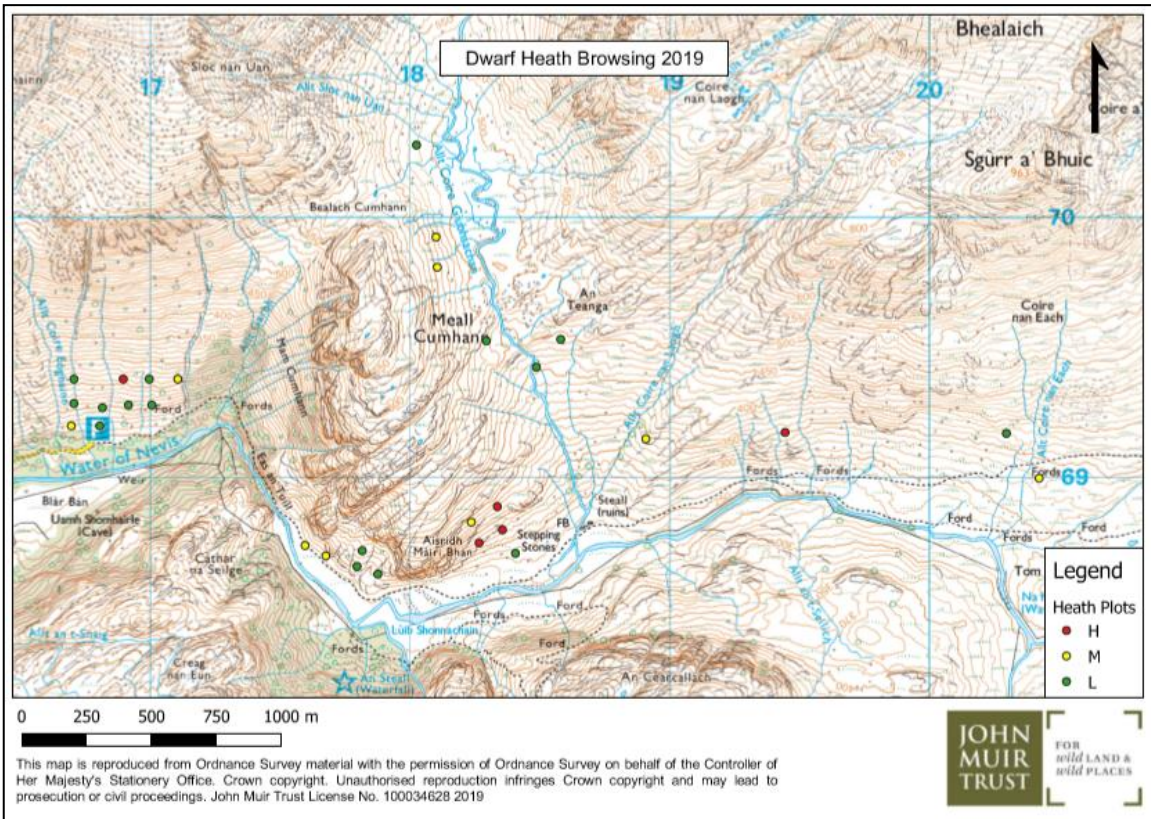
### 2.4.2.1 Dwarf Heath Monitoring

Nevis Dwarf Shrub Heath Plots	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
% plots with light browsing	86%	56%	77%	79%	61%	69%	76%	75%	85%	81%	18%	50%
% plots with medium browsing	10%	36%	16%	28%	27%	24%	17%	20%	9%	19%	68%	27%
% plots with heavy browsing	4%	8%	7%	5%	12%	7%	7%	5%	6%	0%	14%	22%
% plots with deer dung present	53%	40%	20%	23%	13%	23%	10%	30%	11%	30%	59%	33%
Mean Height of vegetation	12	14	14	14	14	16	18	14.8	16	14	12.05	16.58
Standard Deviation	4	4	4	6	6	7	7	5	7	6	5.5	5.2
Confidence limit (p=0.05)	0.92	0.94	0.90	1	1	1	1	1	1	1	1	1
% plots with heather present	55%	59%	64%	61%	60%	57%	54%	53%	51%	73%	80%	73%

**Table 3. dwarf heath monitoring results**

MWDMG dwarf heath polts	2018	2019
% with light browsing	0%	50%
% with medium browsing	40%	40%
% with heavy browsing	60%	10%
% with deer dug present	80%	60%
Mean heather height	15.6	16.5
% plots with heather present	100%	100%

**Table 4. Mid-west deer management group dwarf heath monitoring results**



**Figure 4. Dwarf heath browsing impacts 2019**

Across the BNE there are a total of 40 dwarf heath monitoring plots (figure 4). Thirty of which have been monitored since 2008 (Table 3). In 2018 a further 10 plots were included at the request of the MWDMG (Table 4). In general, there has been an increase in the quality of dwarf heath habitat condition, however, progress is slow.

#### 2.4.2.2 Marked Seedlings

Year	Mean height (cm)
2008	39.2
2009	43.48
2010	50.84
2011	53.84
2012	53.4
2013	52.52
2014	58.87
2015	59.84
2016	61.29
2017	62.33
2018	59.59
2019	57.7

**Table 5. mean height of marked seedlings (cohort 1)**

Year	Mean Height (cm)
2014	50.91
2015	51.49
2016	56.49
2017	52.58
2018	51.17
2019	54.2

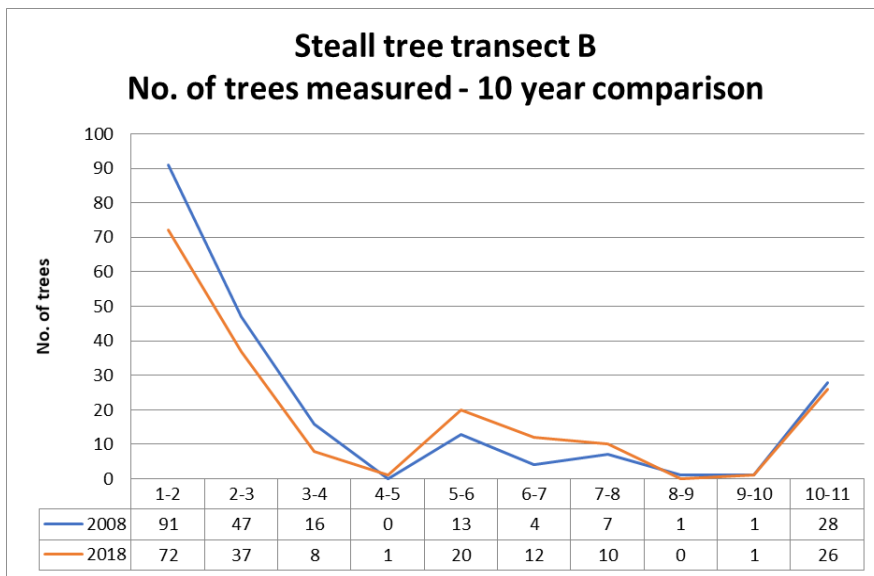
**Table 6. mean height of marked seedlings (cohort 2)**

In 2008 67 seedlings were tagged to be monitored for growth each year (Table 5) The seedlings consist of a mixture of species including birch, rowan and holly. Due to several factors, over half of these seedlings died and are no longer monitored. Currently there are 32 marked seedlings.

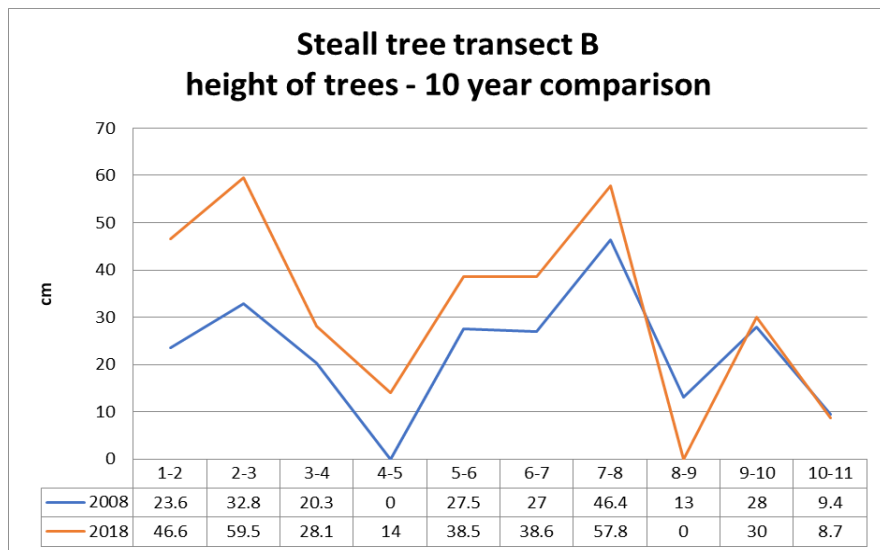
In response a further 98 seedlings were tagged in 2015 (Table 6). Of these, 85 remain. From both cohorts there is a total of 117 marked seedlings.

In general, there is an increase in seedling height since 2008 however growth rate is slow due to heavy browsing.

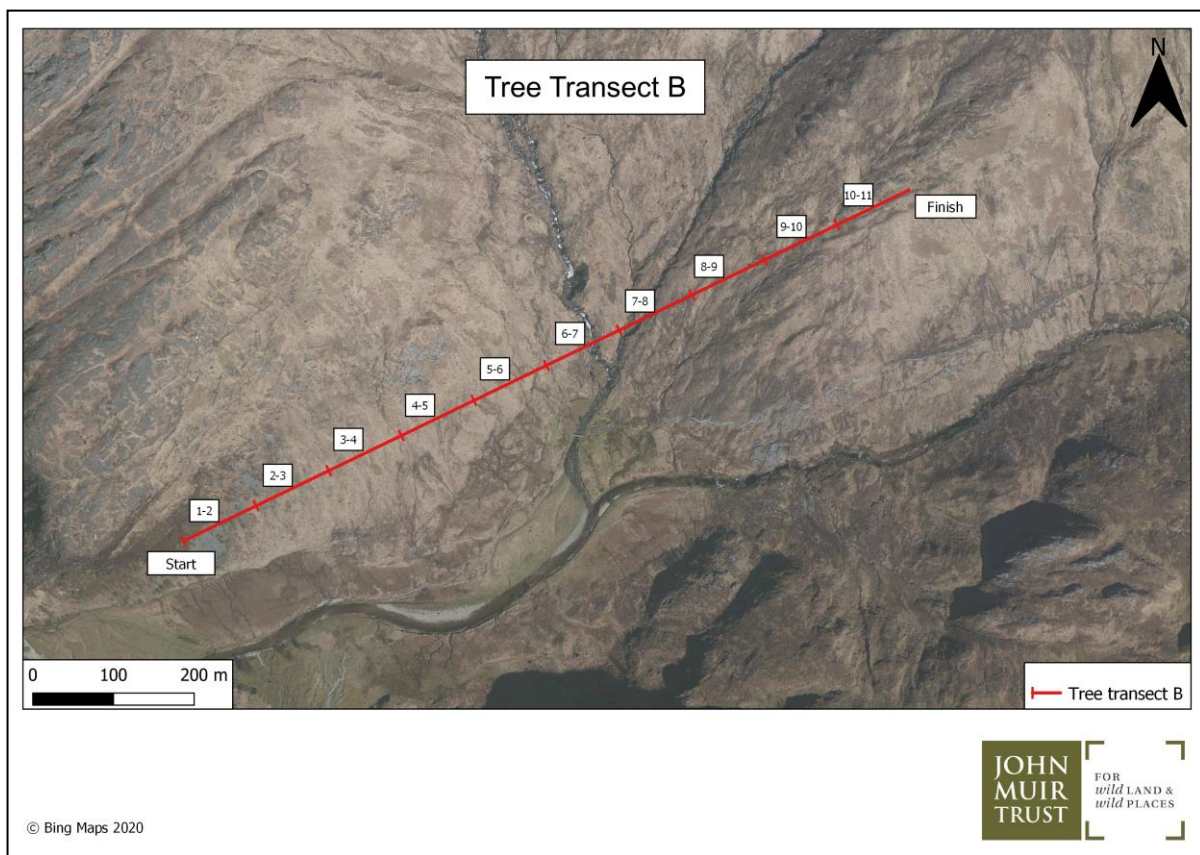
### 2.4.2.3 Tree Transects



**Figure 5. Number of trees measured on transect B**



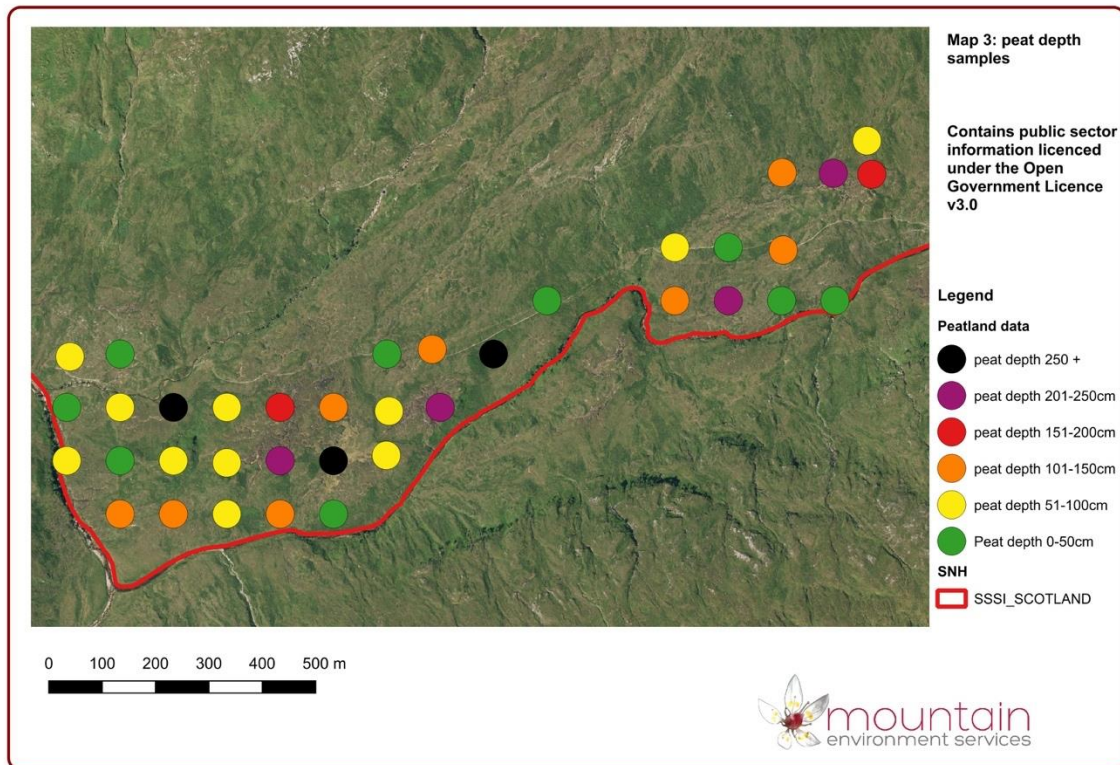
**Figure 6. Height of trees measured on transect B**



**Figure 7. Tree Transect B location**

Two 1km tree transects were established in 2008. Both were designed to measure woodland encroachment into open hillside. The location of Transect B is displayed in Figure 7. When analysing transect B over a ten year period the number of trees has decreased at the immediate woodland edge, however there is an increase of seedlings on the open hillside beyond this (Figure 5). In general there has been an increase in tree height across the transect B (Figure 6). There is currently no ten year data for transect A.

## 2.4.2.4 Peatland



**Figure 8. Peatland depth on the Ben Nevis Estate**

A peatland restoration feasibility study was completed in 2018. Across 40ha, the depth of peat was recorded (Figure 8). Several sample locations identified very significant peat depths of over 2.5 metres. From the study it was concluded that the condition of the blanket peat on the BNE was in recovering condition, however 1.2ha were identified as needing restoration. The intension is to apply for funding from the Scottish Government's peatland action fund to restore these areas.

## 2.4.2.5 Montane woodland

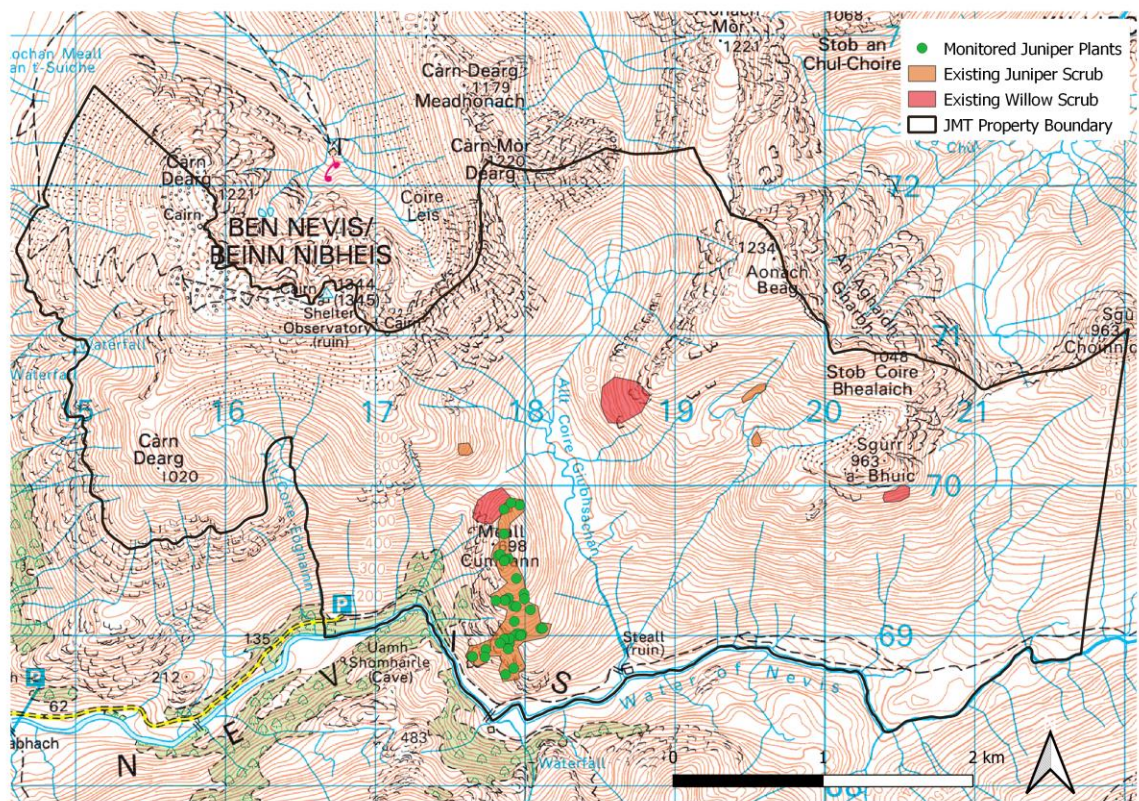


Figure 9. Ben Nevis Estate montane woodland

There are several key areas for *Salix lapponum* scrub and *Juniperus communis* scrub on the BNE.

### Montane willow scrub:

1. **Meall Cumhann:** exposed limestone, base-rich soils with significant canopy of *Salix lapponum* and *Juniperus communis* especially on northerly slopes
2. **Coire Guibhsachan:** small patches of *Salix lapponum* in base-rich soils on west-facing slopes
3. **Sgurr a'Bhuic:** two patches of *Salix lapponum* scrub on cliff ledges. One is found on more acidic soils, the second on the more traditional habitat of base-rich soils. There are young *S. lapponum* plants found at the base of these cliffs, showing successful regeneration

### Juniper scrub:

1. **Meall Cumhann:** scattered *J. communis* across this area. Ongoing JMT monitoring of the juniper highlights high browsing, with around 35% of plants monitored showing signs of browsing and with less than 10% producing berries during the last survey (2019)
2. **Sloc nan Uan:** small amount of scattered *J. communis* on eastern facing slopes, close to the Bealach Cumhann

3. **Coire nan Laogh:** two small patches of *J. communis* growing on cliff ledges in the corrie

A montane woodland expansion project has been proposed across the various JMT properties. There are several possibilities for montane expansion on the BNE, these include small fenced exclosures, supplementary planting of willow and juniper in exclosures or inaccessibly crags and increase deer management to reduce browsing.

In 2019 an in-depth survey for the existing juniper scrub on Meall Cumhann took place. The results are outlined in table 7 below. Location of monitored plants is displayed on figure 9.

	No.	%
<b>Age</b>		
Seedling	0	0
Young	3	7
Mature	30	67
Old	12	27
Dead	0	0
<b>Health</b>		
Brown	15	33
Dark brown	10	22
Green and vigorous	20	44
<b>Berries</b>		
Yes	4	9
No	41	91
<b>Browsing</b>		
Yes	16	36
No	29	64

**Table 7. Results of Meall Cumhann juniper survey 2019**

In total, 45 plants were observed within a 0.79km<sup>2</sup> area on Meall Cumhann. In general, the results indicated an aging population with very few young plants and zero seedlings. Furthermore, only four plants were found to have berries. It is believed that browsing pressure is negatively influencing this juniper population. Increased deer management is required to reverse this.

### 2.4.3 Vascular Plants

The whole of the BNE is included within the Ben Nevis SSSI and the Ben Nevis SAC. The area is of international importance for its range of upland habitats and of national importance for the upland vascular plants, mosses, liverworts and lichens, along with the woodlands and their associated mosses and lichens.

A survey undertaken by Ben and Alison Averis in 2004, found 238 vascular plant species. Several species are nationally or locally uncommon in the British Isles. Of the recorded species of vascular plants, 12 are considered to be of national importance and 12 are included in the current *Vascular Plant Red Data List for Great Britain* (JNCC 2006).

Nationally rare (NR) species are known from less than 16 10x10 km squares in Britain and nationally scarce (NS) species are known from less than 100 10x10 km squares in Britain.

<b>Species</b>	<b>Common Name</b>	<b>Atlas Scarcity</b>	<b>RDB 2005 Status</b>	<b>UKBAP</b>
<i>Athyrium distentifolium</i>	Alpine lady fern	Nationally scarce		
<i>Carex saxatilis</i>	Russet sedge	Nationally scarce		
<i>Cerastium alpinum</i>	Alpine mouse ear	Nationally scarce	Vulnerable	
<i>Cerastium arcticum</i>	Arctic Mouse Ear		Near Threatened	UKBAP
<i>Cerastium cerastoides</i>	Starwort mouse ear	Nationally scarce		
<i>Cornus suecica</i>			Near Threatened	
<i>Euphrasia micrantha</i>			Data Deficient	
<i>Gnaphalium supinum</i>			Near Threatened	
<i>Hymenophyllum wilsonii</i>			Near Threatened	
<i>Luzula arcuata</i>	Curved wood rush	Nationally rare	Vulnerable	UKBAP
<i>Pinus sylvestris</i>	Scots pine	Nationally scarce		
<i>Poa alpina</i>	Glaucous meadow grass	Nationally scarce		UKBAP
<i>Poa glauca</i>	Alpine meadow grass	Nationally scarce	Vulnerable	
<i>Polystichum lonchitis</i>	Holly Fern		Vulnerable	UKBAP
<i>Salix lapponum</i>	Downy willow	Nationally scarce	Vulnerable	UKBAP
<i>Saxifraga hypnoides</i>			Vulnerable	
<i>Saxifraga nivalis</i>	Alpine saxifrage	Nationally scarce		
<i>Sibbaldia procumbens</i>	Sibbaldia	Nationally scarce	Vulnerable	
<i>Veronica alpina</i>	Alpine speedwell	Nationally scarce		



Species	Common Name	Atlas Scarcity	RDB 2005 Status	UKBAP
<i>Juniperus communis</i>	Juniper			UKBAP

**Table 8. Vascular plant species on the Ben Nevis Estate**

Most of the uncommon species are associated with either montane snowbed areas, base rich outcrops in the Dalradian rocks or in areas with base rich flushing.

#### 2.4.4 Bryophytes

A *Site Condition Monitoring Report of Bryophytes on Ben Nevis SSSI* for SNH in 2005 by Gordon Rothero indicated that within Ben Nevis SSSI there are 18 nationally rare species, 15 of which are RDB species, and numerous nationally scarce species (Rothero, 2006). A number of these nationally rare and scarce species are found on the BNE.

Rothero noted that the main bryophyte features of interest are:

- Areas of *Racomitrium* heath on the summits and ridges
- Springs and flushes, particularly those associated with springs from meltwater
- Assemblages of bryophytes on the calcareous outcrops
- Liverwort rich oceanic montane heath community in the screes
- Assemblages of Atlantic bryophytes in the rocky woodlands

The internationally important oceanic bryophyte element of the Scottish bryophyte flora is well represented in the woodlands of Glen Nevis where some 42 oceanic bryophytes have been recorded. The flora of the snowbed vegetation is typical of such sites in Scotland, but particularly noteworthy is the abundance of *Andreaea nivalis* on Ben Nevis and of *Andreaea blytii* on Aonach Beag.

In their 2004 survey, Ben and Alison Averis found 252 bryophyte species on the BNE. Of their recorded list, the mosses *Brachythecium glaciale* and *Andrea nivalis*, and the liverworts *Gymnomitrium apiculatum* and *Pleurocladula albescens* are nationally rare. A further 17 moss species and 24 liverwort species are nationally scarce; some are included in the current *Red Data List for Great Britain* (JNCC, 2006). The data below is from Ben and Alison Averis' 2004 survey.

Nationally rare (NR) species are known from less than 16 10x10 km squares in Britain and nationally scarce (NS) species are known from less than 100 10x10 km squares in Britain.

Moss	Common Name	Atlas Scarcity	RDB Status	UKBAP
<i>Andreaea blytii</i>	Blytt's rock-moss	Nationally rare	Near threatened	
<i>Andrea nivalis</i>	Snow rock-moss	Nationally rare	Near threatened	UKBAP

Moss	Common Name	Atlas Scarcity	RDB Status	UKBAP
<i>Brachythecium glaciale</i>	Snow feather moss	Nationally rare		
<i>Bartramia hallerana</i>	Hallers apple moss	Nationally scarce		
<i>Conostonium tetragonum</i>	Helmet moss	Nationally scarce		
<i>Dicranodontium uncinatum</i>	Curve-leaved bow moss	Nationally scarce		
<i>Dicranoweisia crispula</i>	Mountain pincushion	Nationally scarce		
<i>Encalypta ciliata</i>	Fringed Extinguisher moss	Nationally scarce		
<i>Kiaeria blytti</i>	Blytt's fork moss	Nationally scarce		
<i>Kiaeria falcata</i>	Sickle-leaved fork moss	Nationally scarce		
<i>Kiaeria glaciale</i>	Snow fork moss	Nationally scarce		
<i>Kiaeria starkei</i>	Starkes's fork moss	Nationally scarce		
<i>Oedipodium griffithianum</i>	Gouty-moss	Nationally scarce		
<i>Philonotis seriata</i>	Spiral apple-moss	Nationally scarce		
<i>Pohlia ludwigii</i>	Ludwigs thread-moss	Nationally scarce		
<i>Pohlia wahlenbergii glacialis</i>	Mountain thread-moss	Nationally scarce		
<i>Polytrichum sexangulare</i>	Northern haircap	Nationally scarce		
<i>Pterigynandrum filiforme</i>	Capillary wing-moss	Nationally scarce		
<i>Rhabdoweisia crenulata</i>	Greater streak-moss	Nationally scarce		
<i>Sphagnum affine</i>	Imbricate bog-moss	Nationally scarce		

**Table 9. Moss species on the Ben Nevis Estate**

Liverwort				UKBAP
<i>Gymnomitrium apiculatum</i>	Pointed frostwort	Nationally rare	Vulnerable	
<i>Pleurocladula albescens</i>	Snow threadwort	Nationally rare		

Liverwort				UKBAP
<i>Anastrophyllum donnianum</i>	Donn's notchwort	Nationally scarce		
<i>Anthelia juratzkana</i>	Scarce silverwort	Nationally scarce		
<i>Barbilophozia atlantica</i>	Atlantic pawwort	Nationally scarce		
<i>Bazzania pearsonii</i>	Arch-leaved Whipwort	Nationally scarce		
<i>Calyptogeia azurea</i>	Blue pouchwort	Nationally scarce		
<i>Diplophyllum taxifolium</i>	Alpine earwort	Nationally scarce		
<i>Jamesoniella autumnalis</i>	Autumn flapwort	Nationally scarce		
<i>Leptoscyphus cuneifolius</i>	Wedge flapwort	Nationally scarce		
<i>Lophozia opacifolia</i>	Alpine jagged notchwort	Nationally scarce		
<i>Marsupella adusta</i>	Scorched rustwort	Nationally scarce		
<i>Marsupella alpina</i>	Alpine rustwort	Nationally scarce		
<i>Marsupella boeckii</i>	Boeck's rustwort	Nationally scarce	Near Threatened	
<i>Marsupella brevissima</i>	Snow rustwort	Nationally scarce		
<i>Marsupella sphacelata</i>	Speckled rustwort	Nationally scarce		
<i>Mastigophora woodsi</i>	Woods whipwort	Nationally scarce		
<i>Moerkia blytii</i>	Alpine ruffwort	Nationally scarce		
<i>Nardia geoscyphus</i>	Earthcup flapwort	Nationally scarce		
<i>Plagiochila atlantica</i>	Western featherwort	Nationally scarce		
<i>Plagiochila carringtonii</i>	Carrington's featherwort	Nationally scarce		
<i>Scapania aequilobia</i>	Lesser rough earwort	Nationally scarce		
<i>Scapania nimbosa</i>	Cloud earwort	Nationally scarce		
<i>Scapania ornithopodioides</i>	Bird-foot earwort	Nationally scarce		

Liverwort				UKBAP
<i>Scapania uliginosa</i>	Marsh earwort	Nationally scarce		
<i>Tritomaria exsecta</i>	Cup notchwort	Nationally scarce		

**Table 10. Liverwort species on the Ben Nevis Estate**

### 2.4.5 Lichens

The summit plateau, a shattered scree field, has been colonised by an array of lichens with small pockets of bryophyte rich lichen heath. It contains internationally important assemblages of upland and montane lichens. It is likely that the plateau area supports one of the oldest climax communities in the British Isles. Several nationally rare species recorded during the NVC survey have their stronghold in the Nevis range including *Staurothele arctica* and *Stereocaulon tornense*.

A lichen survey of Ben Nevis summit by John Douglas in 2006 recorded 70 species of lichen on the plateau area plus two lichenicolous fungi. These species include 20 nationally scarce, eight nationally rare, two RDB near threatened, one RDB vulnerable and 11 species associated with late snow-lie.

Species recorded which are associated with late snow lie included *Ionaspis odora* (NS), *Lecidea paupercula* (NS), *Lecidea pycnocarpa* (NS), *Lepraria neglecta* (NS), *Micarea marginata* (NR), *Porpidia contraponenda* (NS), *Protothelenella corrosa* (NS), *Rhizocarpon anaperum* (NR), *Rhizocarpon lavatum*, *Stereocaulon tornense* (NR) and *Toninnia squalescens* (NR).

The cairn at sub-site 3 and the emergency shelter (sub-site 8) support nationally scarce crustose lichen, *Lecania subfuscula*, which requires high levels of nutrients and is often found close to bird colonies. Many large cairns and structures near the summit area are used as toilets by people and as such can accumulate high levels of nutrients.

Much of the scree on the paths, around cairns and around the summit area contain no lichens at all. The habitat just off the paths, however, has most available surfaces covered in lichen or bryophyte growth and seems to be in excellent condition.

It is not known what level of grazing by deer the plateau area receives, but it is likely that grazing pressure is limited due to the high elevation and regular disturbance by humans.

### 2.4.6 Mammals

The most numerous large mammal on the BNE is the red deer, *Cervus elaphus*. They are generally found in the upper part of Glen Nevis, in Coire Giubhsachan, around Meall Cumhann and in Coire nan Each to the west, and over most of the southern slopes of Ben Nevis. Ben and Alison Averis noted:

“The vegetation on the southern slopes of Sgurr Chòinnich Mór and Sgurr Chòinnich Beag is grazed quite hard and there are many sheep on the upper slopes. There may be a very big population of red deer. We saw a herd of over 40 hinds and calves in the glen of the Allt Daim (to the north of Coire Giubhsachan) on two occasions in June 2003. In mid-August 2003, we saw a herd of 112 stags in An Coire Calma, which is separated from Glen Nevis only by the 700 m watershed between Sgurr a’ Bhuic and Sgurr Chòinnich Beag.” (Averis and Averis, 2004).

Date	Surveyor	Location	Count
July 2004	KM	Below Sgurr a’ Bhuic	110 (mostly hinds)
May 2006	AD	Below Meall Cumhann	14
June 2006	DCS	Ben Nevis Estate	120 unclassified
July 2006	AD	Coire nan Each	76 (mostly hinds)
September 2006	AD	Red Burn	17 hinds, 5 calves

**Table 11. early on foot deer counts in Glen Nevis**

Year	Count estimate			
	Stags	Hinds	Calves	Total
2006	unclassified	unclassified	unclassified	120
2007	11	unclassified	unclassified	117
2008	8	unclassified	unclassified	102
2011	unclassified	unclassified	Unclassified	116
2017	20	77	34	132
2020	Spring 2020			

**Table 12. Up to date deer counts on the Ben Nevis Estate**

Year	Stag	Hind	Calf	Total
07/08	6	18	8	32
08/09	7	14	4	25
09/10	8	16	2	26
10/11	19	59	25	106
11/12	10	19	3	31
12/13	3	20	4	27
13/14	11	18	4	33
14/15	25	11	6	44
15/16	0	16	7	25
16/17	9	4	0	13
17/18	11	21	8	40
18/19	8	16	9	33
19/20	13	22	3	38

**Table 13. Deer cull records on the Ben Nevis Estate**

A pre 2006 study of grazing and trampling impacts by the MWDMG area indicated moderate impacts around Meall Cumbhann and the Red Burn and heavy impacts around the species rich grassland on Meall an t Suidhe.

SNH commissioned a report on Advisory Herbivore Impact Targets – Ben Nevis SAC in 2010. It compares the condition of notified habitats with a quality standard and notes that

condition is strongly influenced by past as well as present management. Several habitats in the SAC including some on JMT land are classed as unfavourable due to heavy grazing by deer.

Between 2008 and 2019 internal JMT habitat monitoring indicates an improvement in the general habitat quality however progress is slow. Many of the habitats originally classed as unfavourable are now considered improving. However, even with management in place, the Caledonian pinewood feature is considered unfavourable due to over grazing from livestock and red deer. This has since promoted revised management from both JMT and neighbouring properties

Evidence of fox (*Vulpes vulpes*) is regularly detected on the mountain tops and in the glen, but the population is unknown. Mountain hares (*Lepus timidus*) have been recorded on Ben Nevis, stoats (*Mustela erminia*) have been recently observed and weasels (*Mustela nivalis*) have been recorded in the past.

Feeding signs of red squirrel (*Sciurus vulgaris*) have been found in the Steall woodlands on the opposite bank of the River Nevis to the BNE. There have been some sightings about 1km west of JMT land in the woodland around Polldubh. It is possible they are present in Steall Gorge woodland in small numbers, but there is very little Scots pine to provide a food source. Pine martin (*Martes martes*) are present lower down in Glen Nevis and it is possible they are present on JMT land. Otter (*Lutra lutra*) and mink (*Mustela vison*) are present in lower Glen Nevis and may be present on the BNE. Since 2015, along the River Nevis mink have been monitored using mink rafts. As a result, presence was recorded, and trapping was implemented. Currently no mink have been successfully trapped. Badgers (*Meles meles*) are listed as present within Ben Nevis SSSI. It is unknown whether they are present on the BNE.

Of the smaller mammals, evidence for the presence of field voles (*Microtus agrestis*) has been frequently seen and water voles (*Arvicola terrestris*) have been recorded in the upper part of Glen Nevis (NN205684) (figure 10). Bats are present are monitored on an annual basis (see 2.4.6.2 Bats). Other small mammals likely to be present are shrews (species unknown) and moles (*Talpa europaea*). Further studies are needed.

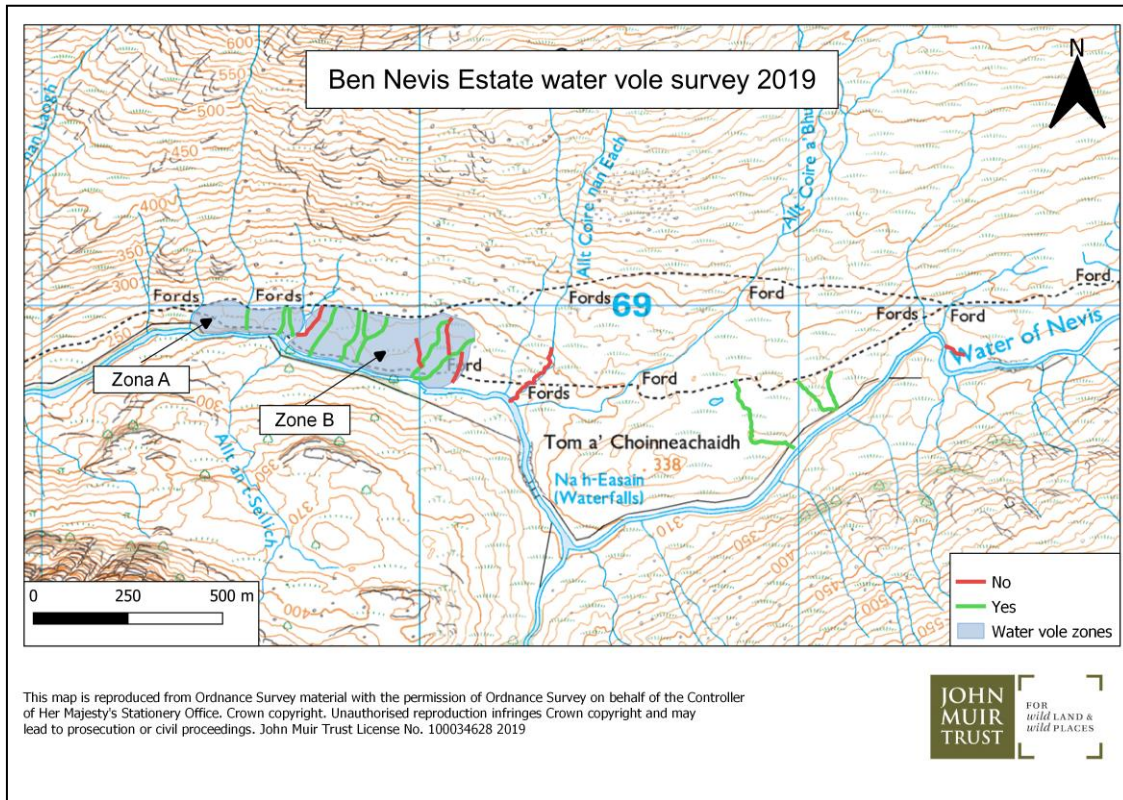
Species with special protection and of conservation concern recorded on the BNE are listed below.

Species	Common Name	Status	Protection	UKBAP
<i>Arvicola terrestris</i>	Water vole	Present	Schedule 5	UKBAP
<i>Felis silvestris</i>	Wildcat	unlikely	Schedule 5	UKBAP LBAP
<i>Lepus timidus</i>	Mountain hare	Present	Schedule 5 & 6	UKBAP LBAP
<i>Lutra lutra</i>	Otter	Likely	Schedule 5	UKBAP
<i>Martes martes</i>	Pine marten	Present	Schedule 5	UKBAP LBAP
<i>Meles meles</i>	Badger	Likely		

<i>Pipistrellus pipistrellus</i>	Pipistrelle bat	Present	Schedule 5	UKBAP
<i>Sciurus vulgaris</i>	Red squirrel	Likely	Schedule 5	UKBAP

**Table 14. Mammals on the Ben Nevis Estate**

**2.4.6.1 Water vole surveys on the Ben Nevis Estate**



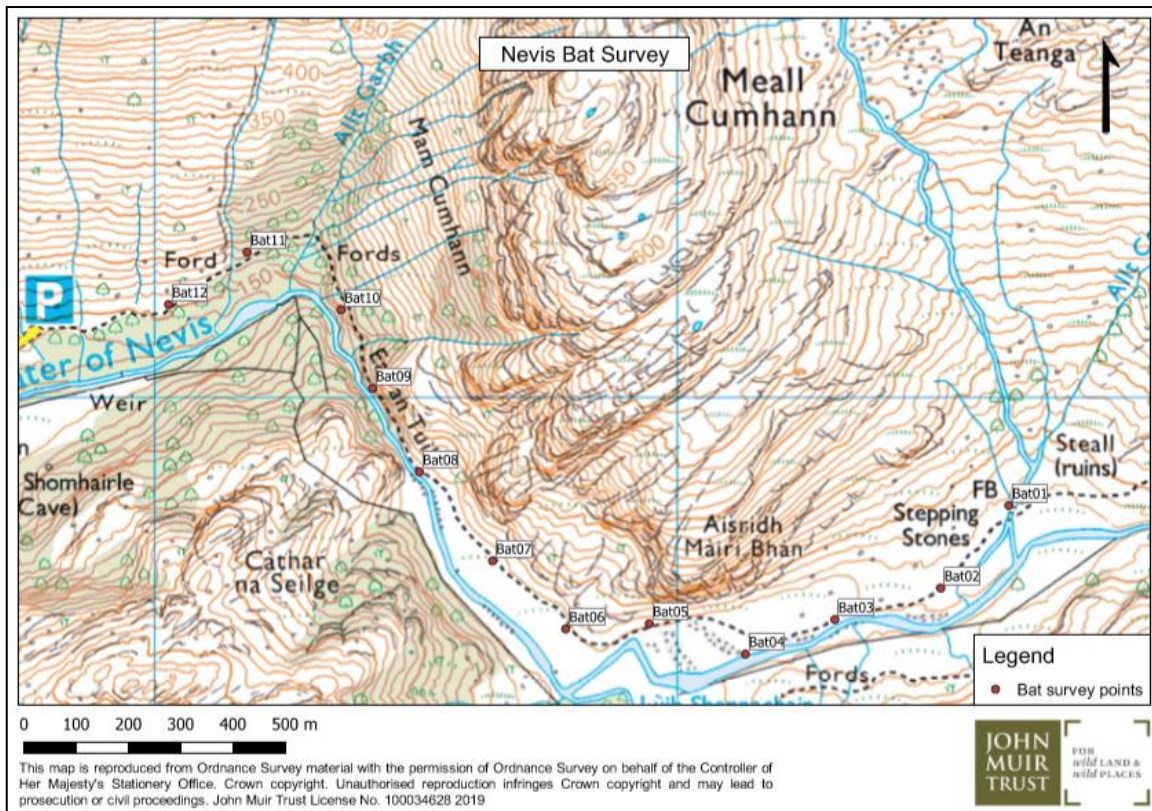
**Figure 10. 2019 water vole survey results**

As a priority species, Water vole surveying is performed annually on the BNE. The core water vole monitoring takes place to the east of the property where two internally designated water vole zones have been identified. Both areas consist of excellent water vole habitat.

Within these zones there are several stream which are closely monitored for water vole presence. Indicators such as feeding stations, burrows, run and latrines are searched for. The aim of the survey is to monitor presence. Figure 10 displays these streams with any sort of water vole presence observed in 2019.

In 2019, out with the designated zones, several other suitable habitats were surveyed for water vole presence. These are also displayed in figure 10.

## 2.4.6.2 Bats



**Figure 11. Ben Nevis Estate bat survey points**

Although not highest priority, a bat survey take place on an annual basis following the transect outline in figure 11 above. In general, the pipistrelle bat population is in good health and benefits for the woodland in the Steall area. Other species such as the daubenton and brown long-eared bat are less populous but are also regularly observed.

## 2.4.7 Birds

The diversity of montane and sub-montane habitats, together with the great altitudinal range, provides conditions suitable for an important community of upland breeding birds including several species with restricted breeding ranges in Britain. Species found on the SSSI include snow bunting, dotterel, merlin and golden eagle. Other species present on Ben Nevis SSSI include hen harrier and ptarmigan. Dotterel have been recorded breeding within 1km of the BNE on Aonach Mor.

From 2006 to 2008 an annual Common Bird Census was carried out in the woodland in Glen Nevis. From 2009 onward this was replaced by an annual Breeding Bird Survey. Another Breeding Bird survey was set up to record upland bird species present from Steall ruin up into Coire Guibhsachan and back down to the car park at the end of the Glen nevis road.

Breeding bird species with special protection and of conservation concern recorded on the BNE include:



Species	Common Name	Status	Protection	UKBAP
<i>Alauda arvensis</i>	Skylark	Breeding	BoCC in full Red list,	UKBAP LBAP
<i>Anthus pratensis</i>	Meadow pipit	Breeding	BoCC Amber List	LBAP
<i>Anthus trivialis</i>	Tree pipit	Breeding	BoCC Amber List	LBAP
<i>Aquila chrysaetos</i>	Golden eagle	Breeding	BoCC Amber List	LBAP
<i>Falco columbarius</i>	Merlin	Present	BoCC Amber List	LBAP
<i>Falco peregrinus</i>	Peregrine	Present	BoCC Amber List	LBAP
<i>Larus canus</i>	Common gull	Present	BoCC Amber List	LBAP
<i>Motacilla cinerea</i>	Grey wagtail	Breeding	BoCC Amber List	LBAP
<i>Muscicapa striata</i>	Spotted flycatcher	Breeding	BoCC Red List	
<i>Phoenicurus phoenicurus</i>	Redstart	Breeding	BoCC Amber List	LBAP
<i>Phylloscopus sibilatrix</i>	Wood warbler	Likely	BoCC Amber List	LBAP
<i>Phylloscopus trochilus</i>	Willow warbler	Breeding	BoCC Amber List	LBAP
<i>Plectrophenax nivalis</i>	Snow bunting	Breeding	BoCC Amber List	LBAP
<i>Regulus regulus</i>	Goldcrest	Present	BoCC Amber List	LBAP
<i>Saxicola torquata</i>	Stonechat	Breeding	BoCC Amber List	LBAP
<i>Turdus philomelos</i>	Song thrush	Breeding	BoCC Red List	UKBAP LBAP
<i>Turdus torquatus</i>	Ring ouzel	Breeding	BoCC Red List,	LBAP
<i>Turdus viscivorus</i>	Mistle thrush	Breeding	BoCC Amber List	

**Table 15. Birds with special protection on the Ben Nevis Estate**

The nature conservation status of a species is indicated in terms of being listed in one or more of the following:

- Annex 1 of the Birds Directive (1979/409/EEC)
- Schedule 1 of the Wildlife and Countryside Act 1981.
- A national 'priority' species in the Lochaber Biodiversity Action Plan.
- Birds of Conservation Concern ranked in priority lists Red and Amber.

### 2.4.7.1 Upland breeding bird survey

	2010	2011	2012	2013	2017	2018	2019
Meadow Pipit	28	43	58	30	16	38	34
Skylark	6	3					
Hooded crow	2						
Carrion crow				3	2		1
Raven	1	1	2		1	1	
Golden Eagle		1	2	3	1		
Wheatear	1	3	2	3	1	2	
Common sandpiper					1		1
Kestrel				1			
Buzzard				2		2	
Ringed Ouzel							1
Cuckoo	1				2	2	2
Grey wagtail							1
Great tit				1		1	1
Tree pipet					2	3	1
Chaffinch	2	1	4	4	10	2	12
Willow warbler		2		3	7		7
Blue tit			2	4			
Blackbird					1		
Wren						1	10
Coal tit							3
Siskin							1
Robin			2		1	2	1
<b>Woodland species total</b>	2	3	8	12	21	9	37
Upland species total	38	51	64	42	22	43	37

**Table 16. birds observed on the Ben Nevis Estate upland breeding bird survey**

Upland birds in orange and woodland birds in green. Cuckoo given its own class due to existing on the woodland and upland edge.

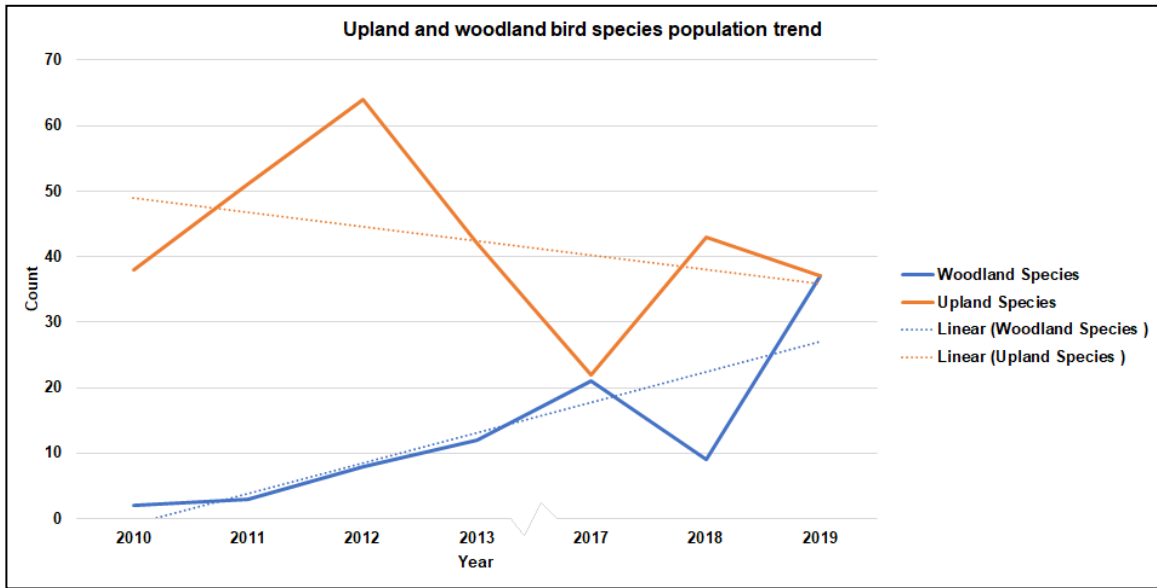


Figure 12. Upland and woodland bird species population trend 2010-2019

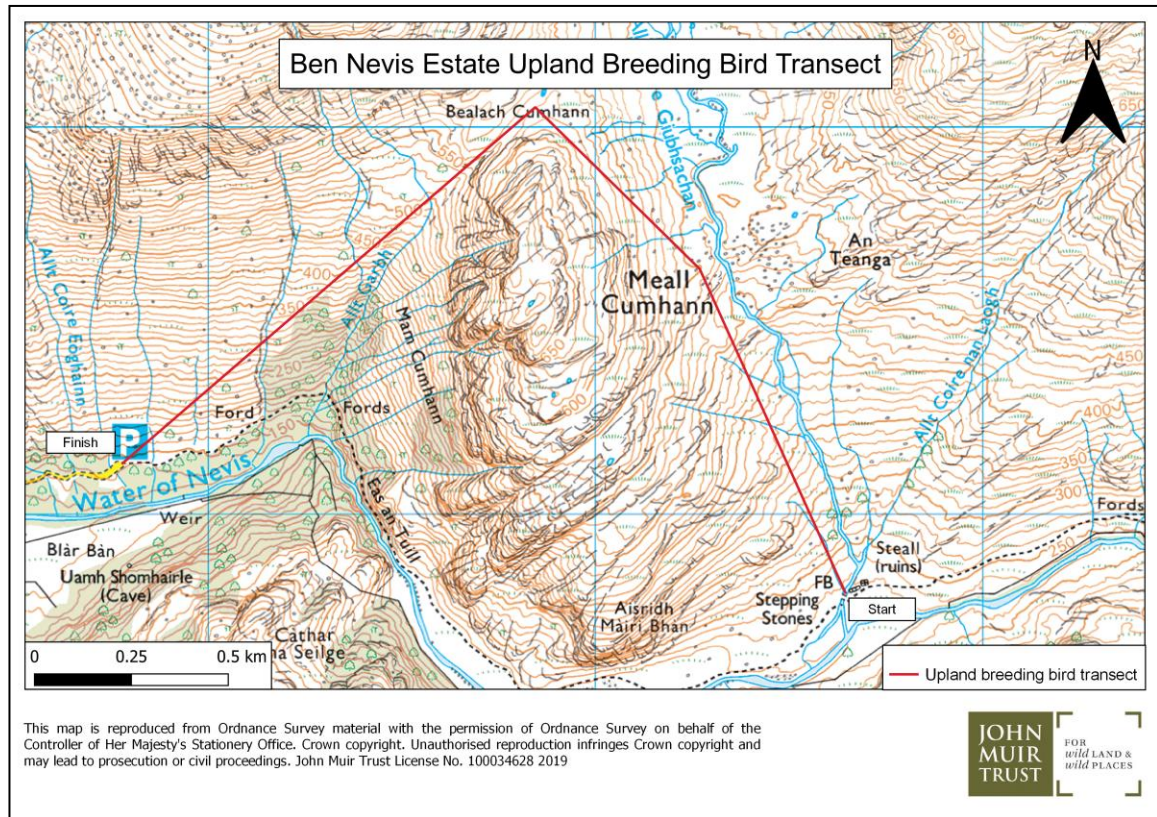


Figure 13. Ben Nevis Estate upland breeding bird transect

Complete data for the upland breeding bird survey is available from Table 16 above. Unfortunately, data for 2014-16 is unavailable. The transect line is detailed in Figure 13.

The transect is designed to take the surveyor from an upland moorland habitat to a deciduous woodland habitat. Given time, it is hoped that as the woodland edge expands more woodland bird species will be observed along the transect. Figure 12 demonstrates the current progression towards this trend with an increase in woodland bird species and decline in upland species.

#### 2.4.8 Herptiles

No specific survey of amphibians or reptiles has been carried out. These species are present on Glen Nevis Estate.

Species	Common Name	Status	Protection	UKBAP
<i>Rana temporaria</i>	Common frog			
<i>Bufo bufo</i>	Common toad			
<i>Lissotriton helveticus</i>	Palmate newt			
<i>Anguis fragilis</i>	Slow worm			LBAP
<i>Lacerta vivipara</i>	Common lizard			LBAP

**Table 17. Herptiles on the Ben Nevis Estate**

#### 2.4.9 Invertebrates

Other than Lepidoptera, little work has been done on the invertebrate fauna of Ben Nevis. A good range of butterflies including small pearl-bordered fritillary (*Boloria selene*), small heath (*Coenonympha pamphilus*), red admiral (*Vanessa atalanta*) and scotch argus (*Erebia aethiops*) is regular in most years. There is one definite record of chequered skipper (*Carterocephalus palaemon*) in 2004 in Steall Woodland. Attempts have been made to confirm this sighting in subsequent seasons. Mountain ringlet (*Erebia epiphron*) has been recorded up to 960m on Aonach Beag and Sgurr Coinneach Beag and a general mountain ringlet survey has been carried out yearly by JMT staff and volunteers since 2002. They have been recorded on most of the south-facing corries and slopes on the estate where vegetation is suitable. Species with special protection and of conservation concern recorded on BNE are in table 18 listed below.

Species	Common name	Presence	Protection	UKBAP
<i>Carterocephalus palaemon</i>	Chequered skipper	Present	Schedule 5	UK BAP
<i>Boloria euphrosyne</i>	Pearl-bordered fritillary	Possibly present	Schedule 5	UK BAP
<i>Erebia epiphron</i>	Mountain ringlet	Present	Schedule 5	UK BAP

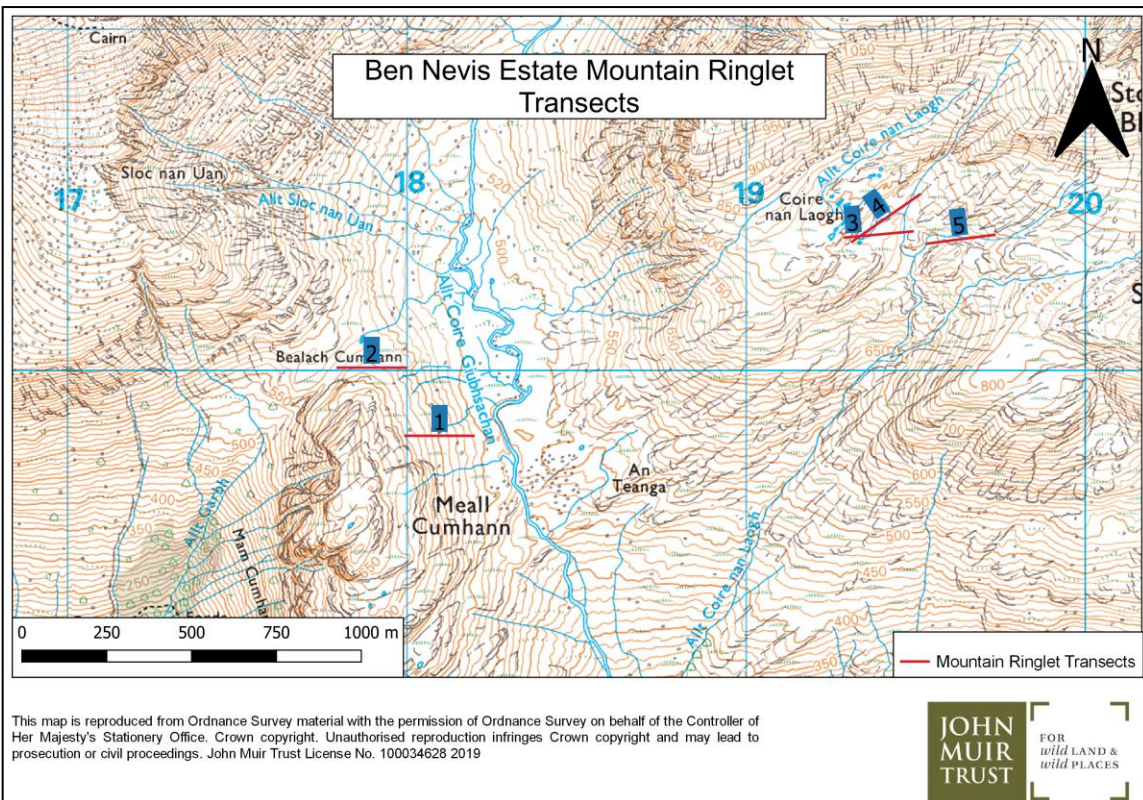
**Table 18. Butterflies on the Ben Nevis estate**

Timed counts for chequered skipper, pear bordered fritillary and argent and sable moth are to be carried out as a low priority if time allows.

There are a number of UK BAP moth species such as the argent and sable moth (*Rheumaptera hastate*) (NS) that may be present on the BNE. Further studies are needed. Moth trapping was carried out in Steall meadows in 2008 and 2009. Species recorded are listed below.

Nationally rare (NR) species are known from less than 16 10x10 km squares in Britain, also listed as RDB. Nationally scarce a (NSa) species are known from 16-30 10x10 km squares in Britain. Nationally scarce b (NSb) species are known from less than 100 10x10 km squares in Britain.

#### 2.4.9.1 Mountain ringlet monitoring data



**Figure 14. Mountain ringlet transect locations**

	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Total
<b>2009</b>	1	11	0	0	0	12
<b>2010</b>	0	2	0	0	0	2
<b>2012</b>	2	1	3	6	8	20
<b>2013</b>	1	3	3	3	4	14
<b>2014</b>	0	1	32	18	10	61
<b>2015</b>	33	1	12	11	6	63
<b>2016</b>	1	0	0	0	0	1
<b>2017</b>	0	0	0	0	1	1
<b>2018</b>	10	33	1	4	8	56
<b>2019</b>	6	0	1	0	4	11

**Table 19. Ben Nevis Estate mountain ringlet monitoring results**

In 2009 5x100m transects were set up to record and compare Mountain ringlet populations annually. Two are located in Coire guibhsachan and three in Coire nan Laogh (figure 14). Full results to data can be found in table 19 above.

Mountain ringlets are the UK's only true montane butterfly and as such can highly sensitive to changes in climate and land management. Reliant on mat-grass (*Nardus stricta*) as a food plant, factors such as encroaching woodland and invasion of bracken have the potential to suppress this habitat. The current overarching land management objective of increasing woodland cover may seem detrimental to the mountain ringlet. However, it is believed that bracken invasion poses a higher threat. It is hoped that increase woodland cover will suppress bracken from moving into higher altitudes if climate change causes drier and warmer summers. Both the chequered skipper and pearl-bordered fritillary are thought to benefit from natural regeneration of woodland due to the mosaic of habitats created. For this reason, neither species is routinely monitored.

Macro Moth	Common name	Number	Atlas Scarcity	UKBAP
<i>Euthrix potatoria</i>	Drinker	1640		
<i>Tetheella fluctuosa</i>	Satin Lutestring	1656	Local	
<i>Ochropacha duplaris</i>	Common Lutestring	1657	Common	
<i>Geometra papilionaria</i>	Large Emerald	1666	Common	
<i>Xanthorhoe designata</i>	Flame Carpet	1722	Common	
<i>Xanthorhoe montanata</i>	Silver-ground Carpet	1727	Common	
<i>Entephria caesiata</i>	Grey Mountain Carpet	1744	Common	

<i>Cosmorhoe ocellata</i>	Purple Bar	1752	Common	
<i>Eulithis populata</i>	Northern Spinach	1756	Common	
<i>Eulithis pyraliata</i>	Barred Straw	1758	Common	
<i>Chloroclysta siterata</i>	Red-green Carpet	1760	Common	
<i>Chloroclysta miata</i>	Autumn Green Carpet	1761	Local	
<i>Chloroclysta citrata</i>	Dark Marbled Carpet	1762	Common	
<i>Chloroclysta truncata</i>	Common Marbled Carpet	1764	Common	
<i>Thera firmata</i>	Pine Carpet	1767	Common	
<i>Thera obeliscata</i>	Grey Pine Carpet	1768	Common	
<i>Colostygia pectinataria</i>	Green Carpet	1776	Common	
<i>Hydriomena furcata</i>	July Highflyer	1777	Common	
<i>Coenocalpe lapidata</i>	Slender-striped Rufous	1780	Nationally Scarce a	
<i>Epirrita dilutata</i>	November Moth	1795	Common	
<i>Eupithecia goossensiata</i>	Ling Pug (sub.sp.)	1831	Local	
<i>Eupithecia nanata</i>	Narrow winged pug	1846		
<i>Gymnoscelis rufifasciata</i>	Double-striped Pug	1862	Common	
<i>Venusia cambrica</i>	Welsh Wave	1873	Local	
<i>Macaria notata</i>	Peacock Moth	1889	Local	
<i>Opisthograptis luteolata</i>	Brimstone Moth	1906	Common	
<i>Ennomos alniaria</i>	Canary-shouldered Thorn	1913	Common	
<i>Colotois pennaria</i>	Feathered Thorn	1923	Common	
<i>Biston betularia</i>	Peppered Moth	1931	Common	
<i>Alcis repandata repandata</i>	Mottled Beauty	1941		
<i>Entropies bistorta</i>	Engrailed	1947		

<i>Caberia pusaria</i>	Common White Wave	1955		
<i>Campaea margaritata</i>	Light Emerald	1961	Common	
<i>Laothoe populi</i>	Poplar Hawk-moth	1981	Common	
<i>Notodonta dromedarius</i>	Iron Prominent	2000	Common	
<i>Notodonta ziczac</i>	Pebble Prominent	2003	Common	
<i>Pheosia gnoma</i>	Lesser Swallow Prominent	2006	Common	
<i>Ptilodon capucina</i>	Coxcomb Prominent	2008		
<i>Ochropleura plecta</i>	Flame Shoulder	2102	Common	
<i>Noctua pronuba</i>	Large Yellow Underwing	2107		
<i>Noctua janthe</i>	Lesser Broad Bordered Yellow Underwing	2111		
<i>Eugnorisma glareosa</i>	Autumnal Rustic	2117	Common	
<i>Lycophotia porphyrea</i>	True Lover's Knot	2118	Common	
<i>Diarsia mendica</i>	Ingrailed Clay	2120	Common	
<i>Diarsia brunnea</i>	Purple Clay	2122	Common	
<i>Diarsia rubi</i>	Small Square-spot	2123	Common	
<i>Xestia ditrapezium</i>	Triple-spotted Clay	2127	Local	
<i>Xestia naja</i>	Dotted Clay	2130		
<i>Xestia sextrigata</i>	Six-striped Clay	2133		
<i>Xestia xanthographa</i>	Square-spot Clay	2134		
<i>Eurois occulta</i>	Great brocade	2137	Nationally Scarce b	
<i>Anaplectoides prasina</i>	Green Arches	2138	Common	
<i>Polia nebulosa</i>	Grey Arches	2150		
<i>Melanchra pisi</i>	Broom Moth	2163	Common	
<i>Hadena confuse</i>	Marbled Coronet	2171	Local	
<i>Cerapteryx graminis</i>	Antler Moth	2176	Common	



<i>Mythimna impura</i>	Smoky Wainscot	2198	Common	
<i>Brachylomia viminalis</i>	Minor Shoulder knot	2225		
<i>Aporophyla nigra</i>	Black Rustic	2232	Common	
<i>Xylena vetusta</i>	Red Sword-grass	2241	Local	
<i>Allophyes oxyacanthae</i>	Green-brindled Crescent	2245	Common	
<i>Blepharita adusta</i>	Dark Brocade	2250	Common	
<i>Agrochola lota</i>	Red-line Quaker	2263	Common	
<i>Agrochola macilenta</i>	Yellow-line Quaker	2264	Common	
<i>Xanthia togata</i>	Pink-barred Sallow	2273	Common	
<i>Xanthia icteritia</i>	The Sallow	2274	Common	
<i>Phlogophora meticulosa</i>	Angle Shades	2306	Common	
<i>Apamea monoglypha</i>	Dark Arches	2321		
<i>Apamea zeta</i>	Northern Arches	2324	Nationally Scarce a	
<i>Apamea crenata</i>	Clouded-bordered Brindle	2326	Common	
<i>Apamea remissa</i>	Dusky Brocade	2330	Common	
<i>Oligia fasciuncula</i>	Middle-barred Minor	2340	Common	
<i>Photodes minima</i>	Small Dotted Buff	2345		
<i>Chortodes pygmina</i>	Small Wainscot	2350	Common	
<i>Amphipoea lucens</i>	Large Ear	2357	Local	
<i>Hydraecia micacea</i>	Rosy Rustic	2361	Common	
<i>Celaena haworthii</i>	Haworth's Minor	2367	Local	
<i>Celaena leucostigma</i>	The Crescent	2368	Local	
<i>Diachrysia chrysitis</i>	Burnished Brass	2434	Common	
<i>Plusia festucae</i>	Gold Spot	2439		
<i>Plusia putnami</i>	Lempke's Gold Spot	2440	Local	

<i>Autographa pulchrina</i>	Beautiful Golden Y	2442	Common	
<i>Autographa bractea</i>	Gold Spangle	2444		
<i>Syngrapha interrogationalis</i>	Scarce Silver Y	2447	Local	
<i>Rivula sericealis</i>	Straw Dot	2474	Common	
<i>Schrankia costaestrigatis</i>	Pinion Streaked Snout	2484	Local	
<b>Pyral Moths</b>				
<i>Crambus pascuella</i>		1294	Common	
<i>Crambus perlella</i>		1302	Common	
<i>Agriphila straminella</i>		1304		
<i>Catoptria margaritella</i>		1314	Local	
<i>Scoparia ambigualis</i>		1334	Common	
<i>Nymphula stagnata</i>		1350		
<i>Udea uliginosalis</i>		1393	Nationally Scarce b	
<i>Pleuroptya ruralis</i>		1405		
<b>Other Micro Moths</b>				
<i>Argyresthia semifusca</i>		419		
<i>Ypsolopha parenthesella</i>		460		
<i>Pandemis ceransana</i>		970		
<i>Eana osseana</i>		1029		
<i>Acleris caledoniana</i>		1040		
<i>Bactra lancealana</i>		1111		
<i>Eucosma cana</i>		1201		

**Table 20. Moths on the Ben Nevis Estate**

Of dragonflies present on the BNE, there are no records beyond golden ringed dragonfly and common hawkker. Further studies are needed.

There are some diptera and coleoptera species of interest listed in the SSSI statement as being present on Ben Nevis SSSI. These may be present on the BNE.

<b>Diptera</b>	<b>Scarcity</b>
<i>Dolichopus maculipennis</i>	<i>Red Data Book 2</i>
<i>Cheilosia sahbergi</i>	<i>Red Data Book 2</i>
<i>Calliphora alpine</i>	<i>Red Data Book 3</i>
<i>Platycheirus melanopsid</i>	<i>Red Data Book 3</i>
<i>Delia caledonica</i>	<i>Red Data Book K</i>
<i>Spilogona alpica</i>	<i>Red Data Book K</i>
<i>Spilogona triangulifera</i>	
<i>Pedicia lucidipennis</i>	

**Table 21. Diptera potentially present on the Ben Nevis Estate**

<b>Coleoptera</b>	<b>Scarcity</b>
<i>Eudectus whitei</i>	
<i>Malthodes mysticus</i>	
<i>Luperus longicornus</i>	

**Table 22. Coleoptera potentially present on the Ben Nevis Estate**

## 3.0 Cultural, Social and Economic Information

### 3.1 Archaeology and History

#### 3.1.1 Prehistory to Post Medieval

Glen Nevis has had a long, though not continuous, history of occupation. Most of the earliest settlements are lower down Glen Nevis and not on the BNE. Several sites, such as the Dun Deardail fort (NN 126701) and the Neolithic cairn at Glas Araich (NN125708), indicate some prehistoric presence in Glen Nevis close to the BNE, but there are no prehistoric sites on JMT land.

Between 2015 and 2017, the Nevis Landscape Partnership worked closely with Forestry Commission Scotland & AOC Archaeology to excavate Dun Deardail with the help of volunteers. Just under eight-hundred volunteers, including almost three-hundred school children, visited the site during the dig to learn about Dun Deardail. On the back of the project a book was produced which was titled “The Archaeology of Dun Deardail – An Iron Age hillfort in Glen Nevis” and can be purchased from the NLP website - <https://www.nevislandscape.co.uk>

The Sites and Monuments Register (SMR) and National Monuments Record of Scotland (NMRS) held by the Historic Scotland (HS) were consulted. Two SMR sites have been recorded on the BNE, namely a group of recessed platforms and the Summit Observatory.

**Site 1 NN16NE** (NMRS number) at NN 1670 6910 is a group of about 20 recessed platforms, much damaged by water and land slip situated immediately above the car park at the end of Glen Nevis road on the north side of the Water of Nevis. Lying between the 150m and 450m contours, they average 9.1m in diameter with the biggest being 11m. They are of massive construction, revetted on the front lip with large boulders sometimes in two courses and there is evidence of charcoal burning on some of them. These platforms may have been in use as late as the 18th century when many charcoal platforms were active in Lochaber and Argyll to feed the furnace at Bonawe in Argyll but may also be as old as the late 15<sup>th</sup>, early 16<sup>th</sup> century.

**Site 2 NN17SE** (NMRS number) at NN 1663 7122 is the Ben Nevis Summit Observatory.

The earliest written record of Glen Nevis can be found in the 1456 Charter. John of Islay, Lord of the Isles, granted the ‘land of Glenyve’ to Shomairle (Somerled or Samuel). The MacSorlie clan, descended from Shomairle, is associated with the Glen from this time onwards and was gradually assimilated into the Cameron clan. The home of the MacSorlie chief, Alexander Cameron, was the headquarters for Cameron of Locheil and MacDonnel of Keppoch during the siege of the garrison at Fort William, part of the Jacobite Rising of 1745.

A military survey of Scotland made by General Roy in the aftermath of the 1745 uprising is the earliest surviving map of Glen Nevis. It shows a string of settlements accompanied by extensive arable stretches along the River Nevis. All of these lie in the lower reaches of Glen Nevis out with the reaches of the BNE. The densest woodland noted on General Roy’s maps corresponds closely to the charcoal burning platforms recorded on the NMRS, but there is little woodland around the charcoal burning platforms on the BNE today.

Timothy Pont's survey of Scotland between 1565 and 1614 led to the publication in 1654 of the Scottish edition of maps by Bleau of Amsterdam. These maps for the first time showed Scotland's highest mountain as 'Bin Novesh'. The origin of the name 'Nevis' is uncertain. One suggestion is that the name is derived from 'neimheil' meaning poisonous or malicious. Most suggestions imply some sort of terrible nature.

### 3.1.2 Eighteenth and Nineteenth Centuries

In 1851, John, the 15<sup>th</sup> chief of the MacSorlie Camerons, sold the estate to Duncan Cameron of Fassifern. The lands later passed out of Clan Cameron hands. Eventually the estate was divided up with the higher ground, including the summit of Ben Nevis and Nevis Gorge, remaining in the hands of the Fairfax Lucy family.

A string of settlements and arable stretches in the lower part of Glen Nevis recorded in the mid 18<sup>th</sup> century had been replaced by the mid 19<sup>th</sup> century with settlements in the form of one or two isolated buildings further up the glen. This change of settlement pattern may reflect a change of land use and suggests that the old settlements had been cleared to make way for a sheep economy which required dispersed shepherd's houses. Steall, meaning ruin, was a large house with mortared stones. It has a conjoined enclosure, which were presumably sheep handling pens, with a small area of rig and furrow. It was occupied by 1870 and still in use just before World War II. It was noted in the 1841 census that "The people distinguished as Agricultural Labourers are principally shepherds and the glen is wholly under sheep and a few cattle. It is not suited for Agricultural purposes".

The riverine strip along lower Glen Nevis, which neighbours the BNE, is owned by Glen Nevis Estate. It was repurchased by the Cameron family in the mid 20<sup>th</sup> century. At present, this area is predominantly used for limited rough grazing of sheep and cattle in the form of seasonal lets to agricultural tenants. There is also some sporting interest.

The development of isolated buildings further up the glen includes the building named Steall (ruin) at NN 1865 6880 (see above) where a wooden footbridge crosses the Allt Coire Guibhsachan, and what is now the LMC Hut known as Tigh an Steall at Luib Shonnachain (out with BNE). Tigh an Steall, restored as a club hut, was occupied just before World War II when the residents served tea to visitors. Steall (ruin) was a large house with mortared stones and a conjoined enclosure, presumably sheep handling pens with a small area of rig and furrow which was occupied by 1870 and still in use just before World War II.

An old track runs above the present day path into Steall Meadows. It is 2m wide and consists of a revetment with up to five courses of masonry up to 0.7m high. This was the main access through the Glen in 1870 with yet another old path following a line of metal posts below the main path through Glen Nevis.

James Robertson, the botanist, made the first recorded ascent of Ben Nevis in 1771 for scientific purposes. This followed on from previous botanical excursions onto Ben Nevis, but not onto the summit itself. Ascents of mountains such as Ben Nevis were rare, but not unheard of, until the mid 18<sup>th</sup> century. John Keats on a grand tour of Scotland made an ascent of Ben Nevis in 1818, writing:

*"Read me a lesson, Muse, and speak it loud*

*Upon the top of Nevis blind in mist!  
I look into the Chasms and a Shroud  
Vaporous doth hide them; just so much I wist"*

In the late 1800's, the Scottish Meteorological Society (SMS) proposed siting a weather observatory on the summit of Ben Nevis. Clement Wragge, on hearing this, volunteered to make preliminary readings. He made the ascent every day in the summers of 1881 and 1882, taking readings at various heights. An appeal for funds was made by the SMS early in 1883 which successfully raised £4000. The Bridle Path was constructed with local labour in four months and the Observatory opened that year. It remained open for 21 years until 1904. One room was open over the summer to provide refreshments and an annex was added on by a Fort William hotelier sometime later which provided board and lodgings until the end of World War 1.

The 16 years beginning in 1880 saw the development of Ben Nevis as a climbing ground as Scottish mountaineering developed into an entity distinct in character and style from Alpinism. In 1894, Edward Whymper wrote of the north face of Ben Nevis, "*This great face is one of the finest pieces of crag in our country, and it has never been climbed, though every now and then adventurous ones go and look at it with wistful eyes.*" It was unknown to him at this point that the first route had been made in September 1892 by the Hopkinson family from the north of England. In 1894, the West Highland Railway opened and the Scottish Mountaineering Club (SMC) switched their Easter meet in 1895 to Fort William. By end of the 19<sup>th</sup> century, a number of summer and winter routes had been established on the Ben, establishing it in no uncertain terms as a major British climbing ground.

The advent of the West Highland Railway and the construction of the pony tack greatly increased the number of ascents and by the end of the nineteenth century, the first timed ascent of the Ben had been recorded. This led to a number of timed solo ascents which later evolved into what is now known as 'The Ben Race'. In 1898, the race gained a more competitive look when a local hotel proprietor offered a gold medal to the first man to finish.

### **3.1.3 Twentieth and Twenty-first Century Developments**

The Highland Council built the Ben Nevis Visitor Centre and car park at the start of the old bridle path in 1992 where a small car park had existed before. One of the first Ranger posts created in the Highland area was in Glen Nevis in 1980. The North Face car park at Torlundy was installed by the Forestry Commission in the 1990's Prior to this, anyone attempting to ascend Ben Nevis by the North face or Carn Mor Dearg arête reached it through the golf course which was the usual access described in a number of guidebooks. People counters were installed in 1991 on the Ben Nevis path and on Steall path by the ranger service but proved unreliable. New counters were installed in 2006.

In 2001, the BNE was purchased by JMT from the Fairfax Lucy family.

A secondary summit shelter, unfit for use and frequently buried in snow, was dismantled by the Trust in 2002. The Trust, in conjunction with the NP, removed two further shelters, the Carn Dearg shelter and Coire Leis shelter, on the grounds that their limited safety value was heavily outweighed by their negative visual intrusion on the landscape. Carn Dearg shelter was not in an especially hazardous area and they were both

frequently buried in winter. Coire Leis shelter was out with the BNE, but within the wider NP area.

In 2005, the NP agreed to remove the majority of the cairns on the summit. Of more than 100 cairns, the mountain management sub group of the NP (including representatives from Mountaineering Council of Scotland (MCS) and Lochaber Mountain Rescue (LMR)) agreed that 23 should remain in specific agreed locations. In 2006, JMT work parties removed around 20 cairns and rebuilt five of those that were to remain. In 2007 this work was completed by contractors. In the winter 2007/08 a number of complaints were received that the cairns were misleading in winter. As they followed the original path line they presented a meandering line on the summit when the path was covered in snow which may have led someone to descend following a line towards the cliffs on the north face. The MCofS and LMC representatives involved in the original planning agreed this and it was decided to relocate the cairns in a straight line following the winter bearing. Around half the cairns were then relocated during the summer of 2008.

JMT advocated the removal and relocation of the plaques and associated material that were present upon the mountain on the grounds that collectively they had a similar impact to litter. Like litter, the more that they are seen, the greater the perception is that it is acceptable to leave them on the mountain. In 2005, the NP agreed to the removal of memorials on the summit and this was completed by JMT staff and volunteers in 2006. The NP opened a site for contemplation in August 2006 in the woodland next to the BNVC as an alternative to placing cairns on the mountain. They also set up a virtual remembrance site upon which all existing plaques have been logged. New memorials can be added to this.

Presently, through the collaborative efforts of the NLP a number of carparking projects are being developed. Two rounds of funding have been granted through the Scottish Government's Rural Tourism Infrastructure Fund (RTIF). Both the Achintee and Lower falls parking will be developed to increase capacity. Furthermore, visitor information and infrastructure such as toilets will be developed to reduce visitor impact throughout Glen Nevis.

## **3.2 Land Use**

### **3.2.1 Agriculture**

There is no agricultural activity at present on the BNE. At the time of purchase, there was one agricultural tenant who had grazing rights in Upper Glen Nevis. The bulk of sheep were removed from this area in 2004, although an unknown number of feral individuals are seen on occasion. There is no current tenant.

Neighbouring land in the lower reaches of Glen Nevis, owned by Glen Nevis Estate, is predominantly used for limited rough grazing of sheep and cattle in the form of seasonal lets to agricultural tenants. Occasionally livestock stray onto the BNE. Both Sheep and Cattle from neighbouring properties are observed.

### **3.2.2 Forestry**

There is no commercial forestry, nor has there ever been, on the BNE. In the wider Glen Nevis area, the forest on the west side of the lower part of the glen was established by the Forestry Commission in the immediate post war period.

### **3.2.3 Deer Management**

There had been no significant deer control on the BNE since the purchase of the estate by JMT until 2006 and there was probably very little prior to this. After 2006, JMT aimed to substantially reduce the population of red deer on the BNE in line with its deer control policy in order to enable existing native woodland to regenerate without the use of fencing. The Deer Control Policy states that “*Deer will be controlled in order to achieve JMT’s objective of encouraging and facilitating natural processes and that deer control will not impede public access at any time.*” This work is started through the Wild Land Biodiversity Project 2006-2009 and is now embedded in the core work on the BNE

The MWDMG, of which JMT is a member, will be appraised of the JMT policy and kept informed of any culling programme. JMT will liaise with the MWDMG with a view to helping to deliver its and neighbours deer management objectives as described in the groups Deer Management Plan. See JMT Deer Management Policy and Ben Nevis Estate Deer Management Plan 2018-2023 for full details of deer management.

SNH commissioned a report on Advisory Herbivore Impact Targets – Ben Nevis SAC in 2010. Several habitats in the SAC including some on the BNE are classed as unfavourable due to heavy grazing by deer. Initially it was felt that the deer management in place was improving the certain habitats. However, In 2019 the Caledonian woodland feature was reviewed and has since moved back from “unfavourable recovering” in to “unfavourable due to grazing”. This will contribute to future decisions on our deer cull.

A SAC working group meet biannually to discuss management of the designated features within the Ben Nevis SAC. Deer management is a particular focus of the group and involves a collaborative effort between several Glen Nevis landowners and stakeholders.

### **3.2.4 Minerals**

There is no mineral extraction on the BNE.

### **3.3 Recreation**

Glen Nevis and Ben Nevis are important recreational areas with over 300,000 visitors annually participating in a wide range of outdoor activities including hill walking, sightseeing, winter climbing and rock climbing.



### 3.3.1 Walking and Climbing

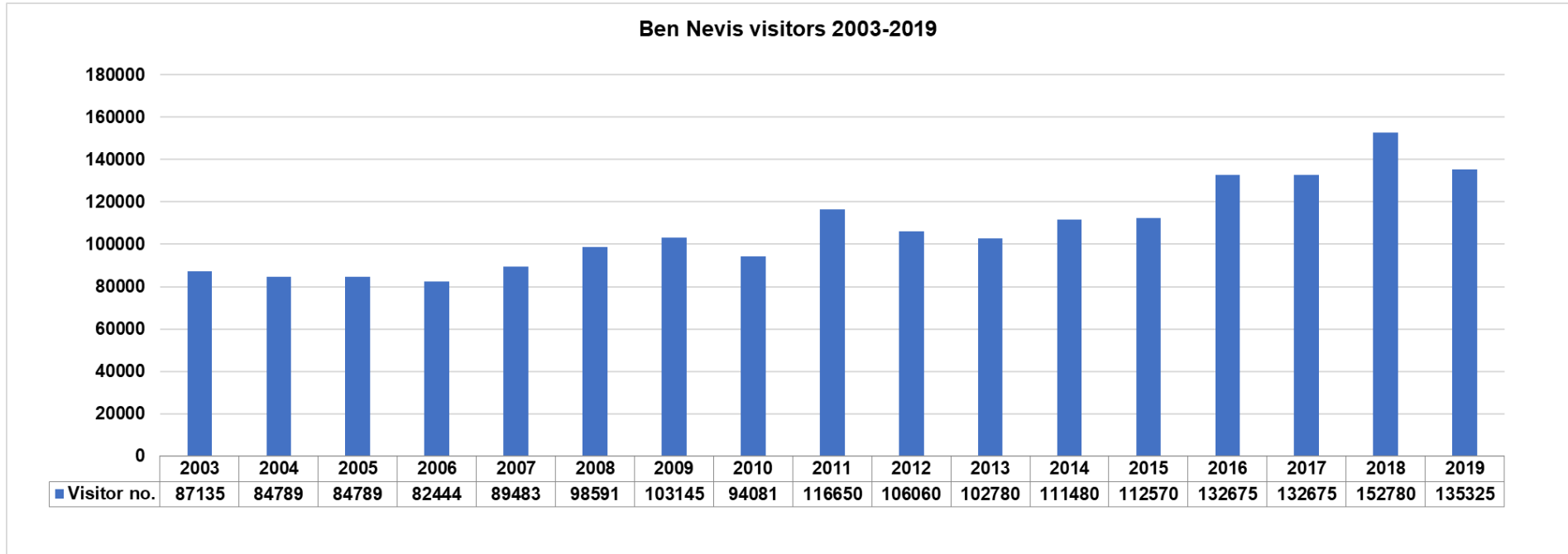
Ben Nevis is Britain's highest mountain and as such it attracts not only regular and keen hill walkers, but also many members of the public for whom this may be the only mountain they ever climb. It also attracts large groups who attempt to reach the summit to raise money for charity either as an individual summit or as part of a Three Peaks Challenge. It is extremely accessible, with the start of the mountain track being less than two miles from Fort William, a major tourism destination. In addition, many keen walkers attempt the summit via the Carn Mor Dearg arête which is a longer and more difficult ascent.

As with any mountain system, weather can change very rapidly and provides distinct hazards. Factors including fog, rain, snow and wind chill, combined with dangers such as falling, getting lost and hypothermia are all potential risks for both experienced walkers climbing to the summit and for the numerous visitors who use the mountain track, many of whom may be unaware of these hazards. A mountain safety leaflet is distributed to the Tourist Information Centre and local bed and breakfasts which gives safety information.

Glen Nevis is one of Scotland's main tourist venues and is an important economic asset to the Lochaber area. The *Nevis Area Recreation Survey (2001-2002)* estimated the number of recreationalists over one year at between 300,000 and 450,000. The main activity undertaken by 77% of recreationalists was a walk or run with the most popular lasting over three hours (41%) and a low level walk lasting one to three hours (16%).

New counters were installed in 2006 in Glen Nevis and on Ben Nevis. Most recent and up to date results are as follows.

## Ben Nevis bridge



**Figure 15. Ben Nevis bridge visitor numbers**

An increase in visitor numbers to Ben Nevis and Glen Nevis has been observed over last two decades. Unfortunately, it is not possible to generate an exact number of visitors but with certain assumptions a rough figure is possible. In general, it is accepted that most visitors reaching the Ben Nevis bridge will go onto summit the mountain. Possibly around 5% won't. Furthermore, when taking into consideration visits from the Allt a' Mhuilinn we start to gain a better understanding of overall number. On average, around 15000 individuals use the Allt a' Mhuilinn path each year, many of these individuals summit the Ben Nevis via the North Face (Figure 17). A conservative estimate will be around 5-10000 individuals summiting Ben Nevis via the North Face. From this, when taking 2019 as an example it can be assumed that around 135-140,000 individuals summited Ben Nevis.

Using the same method, 2018 is considered the current record visit year for Ben Nevis with around 150-155,000 visitors.

## Steall Gorge

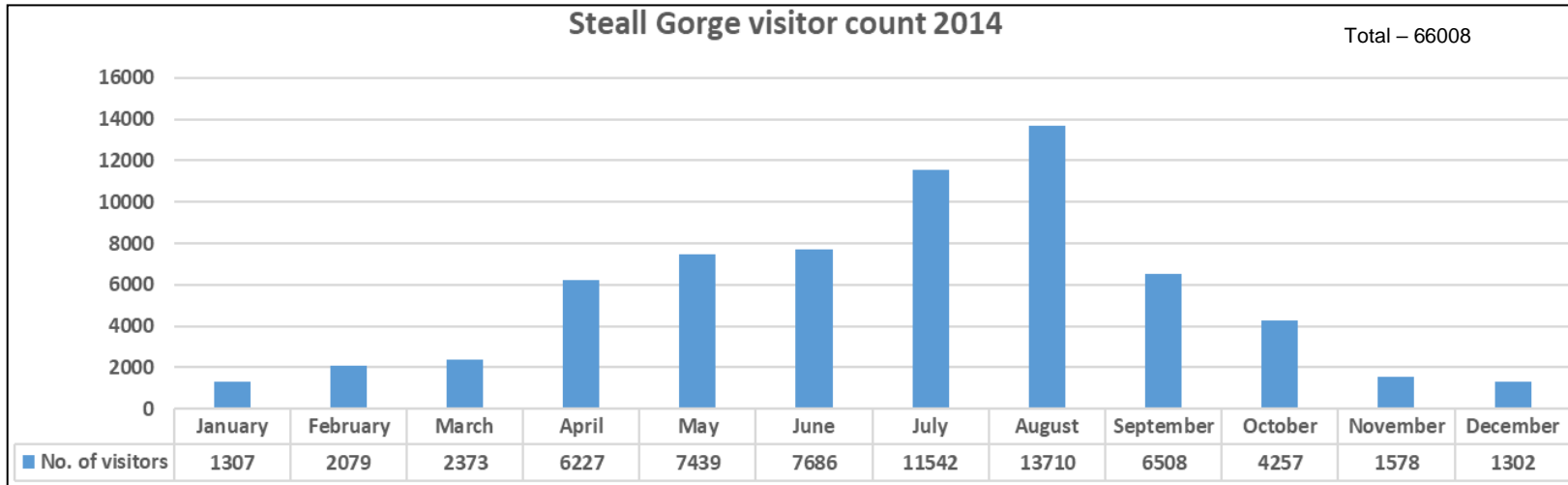


Figure 16. Steall Gorge 2014 visitor count

## Allt A' Mhuilinn

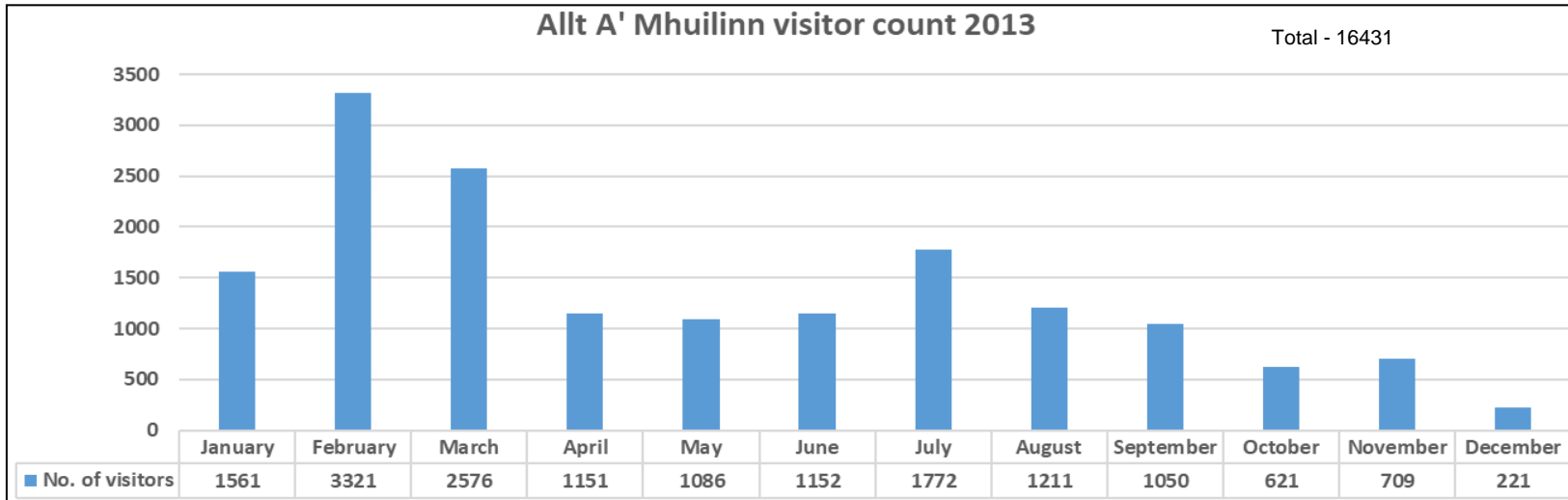


Figure 17. Allt a' Mhuilinn 2013 visitor count

Both the Steall Gorge and Allt a' Mhuilinn counts are the most complete records to date.

During summer 2010 THC Rangers carried out calibration of their people counters on Ben Nevis and in Glen Nevis to get a more accurate calibration for the counters. Previous to this all counts for Ben Nevis And Glen Nevis were calibrated by 50% (halved) as it was assumed the majority ascended and descend or travelled out and back by the same route. This assumption was almost correct and calibration (see below) has provided confirmation and a more accurate calibration of 0.452 for the Ben path at the aluminium bridge and 0.46 for the path to Steall.

Data for Allt a'Mhuilinn and Chapmans Wood has not been altered from raw data, as there were not enough visitors to allow calibration. It may be likely that the visitor calibration factor is around 0.5, with most visitors returning by the same route.

From 2017 the cohort of people counters in Glen Nevis are being managed by JMT and NLP.

Counter	Ben Nevis Aluminium Bridge (0.452)	Youth Hostel Path (0.70)	Allt a'Mhuilinn (1)	Chapmans Wood (1)	Steall Gorge (0.46)
October 09	5507	2515	1535	524	4086
November 09	1164	599	908	660	1109
December 09	812	529	1623	1234	805
January 10	631	427	2083	1365	1128
February 10	1002	710	4123	2757	1651
March 10	1563	893	4107	3128	1884
April 10	4285	2465	2704	2137	4549
May 10	13212	6003	1557	1197	6556
June 10	17992	8559	1864	1591	5937
July 10	16945	8205	1426	1134	7871
August 10	19899	9215	2368	1870	9785
September 10	11653	6142	1702	1551	4648
TOTAL	94665	46262	26000	19148	54141

**Table 23. Calibration of Ben Nevis people counters**

Visitors on Ben Nevis have created erosion around the corners of the zigzags and there are large amounts of food litter and human waste on and around the summit. The Summit Shelter in particular attracts food scraps. Human waste is found under rocks, by cairns, behind low walls, by the path side and in and around the summit ruins. Evidence of human activity (and possibly animal remains) in the form of ashes and memorials have collected in the area around the Peace Cairn. The majority of visitors, estimated 95%, stay on the main path when ascending and descending the mountain.

The popularity of the summit detracts from the wild land quality of the area for some. Charity group ascents are popular and may make up to 20,000 of the number of ascents recorded in any one year. As such, they do not significantly increase the number of people already on the summit. However, large scale events will not be encouraged by JMT.

The other main destination for tourists in Glen Nevis is Steall Meadows. In 2014, 66008 visitors walked the mile long path to this open area at the top end of Nevis Gorge (figure

16). The path follows this dramatic geological feature to the open meadows area with spectacular views of An Steall Waterfall. The walk is recommended in many guide books and has been recommended by the local Tourist Information in the past as an easy walk. The route is narrow and has steep drops to one side. The path in Steall Meadows area leading to the wire bridge was becoming braided where it crosses the wetter low lying areas so, in 2005; the NP rebuilt this stretch of path in order to protect the meadow habitat.

The wire bridge at Steall spans the water of Nevis from the BNE to land owned by JHE. It was built by LMC to provide them with access to the LMC Club Hut. In 2006, Bidwells (Factor for JHE) commissioned an engineering report on the bridge jointly with JMT and as a result, some structural and cosmetic maintenance was agreed. JMT and JHE represented by Bidwells take shared responsibility for maintenance and repair of this bridge. It is surveyed by appropriately qualified engineer annually. In 2010 part of the footwire of this bridge failed causing a number of people on the bridge to fall. It was discovered that a high number of people were on the bridge at the same time. New signs were installed to highlight that no more than 2 persons should use the bridge at any one time and repairs were carried out.

Hillwalkers also use the Steall Path as access to the Mamores to the south of the BNE, onto Aonach Beag and across to the Grey Corries. There are a number of routes to the summit of Aonach Beag and there are desire lines that follow these access routes. These are generally in good condition, and even on a busy summer day, they are not particularly crowded.

The north face of Ben Nevis holds some of the most challenging and inspiring summer and winter climbing in the UK and many people visit the area to attempt these climbs. On a good winter weekend, popular routes are very busy with climbers queuing at the bottom of routes alongside local guides and instructors who also take their clients up the north face of the Ben. The mountaineering fraternity holds strong views on cairns, markers and abseil posts on the Ben. JMT endeavours to consult all interested parties when issues arise regarding these matters.

### **3.3.2 Stalking**

See **3.4.3 Deer management, 2.4.5 Mammals**, JMT Deer Management Policy and Ben Nevis Estate Deer Management Plan 2018-2023

### **3.3.3 Fishing**

There are no formal agreements related to fishing in the Water of Nevis where it forms one of the boundaries of the BNE, although there are some small brown trout in the river here. The lower falls (NN 145 683) prevents Atlantic salmon and sea trout from making their way upstream.

### **3.3.4 Natural and Cultural Heritage**

There are some visitors to the BNE who are motivated by different aspects of the natural or cultural heritage of the area. Botanical and geological groups make visits, as do those interested in the history of the meteorological station on Ben Nevis.

### **3.4 Man-made Features on Ben Nevis Summit**

There are a number of man-made features on the summit of Ben Nevis. All that remains of the Summit Observatory on Ben Nevis are the ruined walls and part of the old wooden floor of the building. A plaque which highlights the history of the Observatory is mounted on the remains of the Observatory below the present day Summit Shelter. A metal cage that was used to protect weather instruments also remains.

The Summit Shelter (NN 166712), which is the property of LMC, was built on top of the remains of the former Ben Nevis Observatory. On the summit, a trig point is raised above the height of winter snows making it stand out above the flat plateau. Nearby, a plinth, originally built to hold a circular viewfinder for identifying surrounding hills, has fallen into disrepair and no longer serves any purpose.

Immediately prior to the Trust purchasing Ben Nevis, the Peace Cairn on the summit of Ben Nevis was relocated and restored by the Peace Cairn Trust. This particular cairn attracts plaques, memorials, photographs, toys, ashes and other artefacts from all over the UK. Although these have been cleared, catalogued and stored, it is likely that this practice will continue and their removal will be an ongoing activity.

On the summit there is more evidence of human intrusion on the landscape in the form of cairns built alongside the path with over 100 cairns recorded in 2004. Further to this, an abseil post and navigation marker exist above Coire Leis, the purpose of which is redundant now that most climbers use crampons and can descend the coire. An aluminium pole marks the top of Number 4 gully.

### **3.5 Litter**

Litter, food remains and human waste continue to accumulate around the summit, especially behind and within the ruined Observatory walls, and along the side of the mountain track.

### **3.6 Volunteering**

There is willingness, locally and nationally, by people to volunteer their time, experience and labour as a contribution to JMT in its management of Ben Nevis. People derive considerable satisfaction from feeling that they have helped conserve aspects of the mountain for future generations to enjoy. The JMT holds a number of volunteer events for members to take part in conservation management activities. JMT also works closely with the NLP staff to organise events for local people to participate in. More recently NLP volunteer opportunities have been directly advertised to the JMT members with good uptake. The JMT and the NLP work parties have dismantled cairns on the summit of Ben Nevis and removed litter and memorials, path maintenance, habitat/species monitoring, invasive species removal and tree planting.

### 3.7 Employment

In February 2006, a Nevis Conservation Officer was appointed, funded jointly by NP, JMT and external funders. This position was responsible for wildlife survey and monitoring, educational events, visitor interaction and management, footpath maintenance, leading work parties and raising awareness of JMT in the local area. The population of Fort William and its immediate surroundings is around 12,000 and there are nine Primary Schools within this area. There is huge potential for ongoing contact with this population and these schools. In March 2007, a Wildland Ranger/Conservator (shared with Schiehallion) was appointed to carry out deer control and wildlife monitoring on the estate. This post continued until 2009. From 2010 until 2014 there was 1.5 Nevis Conservation Officers on the Estate responsible for the same actions as above including some deer control. Additional deer control is carried out by a contractor. From 2015-2017 there was a part time BNE Manager (0.6 FTE) who took on some of the previous responsibilities of the JMT Area Manager (post discontinued) assisted by a part-time seasonal Ranger for 6 months in the summer (0.6FTE). Deer control was carried out by contract stalkers. From 2018-2020 the Ranger position was made full time. From 2020 the Ranger position has progressed to a Conservation Officer and is now permanent with the JMT. Currently there are 1.6 FTE working on the BNE.

In the wider region, the presence of Ben Nevis contributes both directly and indirectly to employment in a number of areas. Mountain guides (although the climbing areas are out with the BNE), Ben Nevis Visitor Centre staff are all employed in the immediate vicinity and are directly connected with Ben Nevis. The NLP host several staff, however due to the end phasing out HLF this has recently reduced. Bars, restaurants and cafes, bunkhouses, bed and breakfasts, guest houses, hotels and outdoor equipment shops all benefit from their location next to the highest mountain in the UK. The presence of Ben Nevis and the climbing associated with the mountain are major features of the Fort William Mountain Festival and a key part of the Outdoor Capital of the UK marketing strategy for the area.

## **4.0 Evaluation**

### **4.1 Wildness**

The quality of wildness is a perception of the visitor that is based on their knowledge of natural and ecological processes and their experience of wild areas in other parts of the world. Parts of the estate, such as the Mountain Track and Steall Gorge Path, may not feel particularly wild with built paths and high numbers of visitors. However, away from the paths or if weather conditions deteriorate, as is common in this area, many will have some level of wilderness experience, even if that person is used to areas less influenced by recent human management.

The north-eastern parts of the Estate, including the rocky rugged slopes and the ridge leading eastwards from Ben Nevis towards Aonach Beag and beyond, feel the most wild with no direct view of habitation. Here on these rocky tops, there are lower visitor numbers and less evidence of recent human management. Management should be directed to conserve and develop the wild feeling in this area and to prevent the less 'wild' areas from losing the wild qualities they have retained. A presumption against further path building or the enhancement of paths, apart from essential maintenance, is accepted by the estate.

### **4.2 Landscape**

The mountain of Ben Nevis is clearly very significant on an international level as the highest mountain in the UK. The distinctive whaleback shape is a local emblem for many organisations. The fine mountain ridge snaking eastwards over mountain tops and the mountain peaks in the north-eastern part of the estate are of local significance. The deep-wooded Steall Gorge, where it opens out into an alpine-like meadow with steep cliffs and the striking An Steall Waterfall, is an extremely popular place to visit for the views.

Closer inspection of this landscape shows that many of the features, especially on the lower slopes including the open hillsides which allow long views of the glen and up to the mountain tops, are largely influenced by man and have been managed in some way for decades. A history of sheep grazing and the retention of a high deer population to support sporting interests in neighbouring areas both indicate that the landscape we see today is partly a result of man's activities and not, therefore, an unmodified wild landscape. However, most of the estate has little obvious evidence of these past activities.

Areas of landscape on the summits and in the wooded gorge are probably more natural and JMT should encourage the enhancement and expansion of these natural and semi-natural habitats. Future management for woodland regeneration will not detract from the present landscape interests; it will enhance the landscape. The mountain tops, as near a natural environment as anywhere in the UK, will remain open with long views over the surrounding mountains. The landscape of the lower slopes will become enhanced with scattered woodland as a result of nature being allowed to be the guiding force in habitat regeneration.



### 4.3 Physical

The BNE is important geologically as one of the first places in the world where caldera collapse structures were identified. The area displays a wide range of glacial depositional and periglacial features of local significance. Part of the SSSI interest stems from the height of the mountain which gives rise to alpine and snowbed communities and the base rich flushes from limestone areas.

Physical features such as height and shape are not threatened. Geological exposures and geomorphological features are unlikely to be damaged by hill users or future management regimes.

### 4.4 Biological

#### 4.4.1 Habitats

There are 111 different types of vegetation on the BNE. A number of these are important habitats listed for the Ben Nevis SSSI and SAC. Several of the plant communities on the BNE, principally species rich grassland and calcicolous communities, require a moderate level of grazing to maintain them in favourable condition.

The species rich *Nardus* grassland below Meall Cumhann is of value for nature conservation as small areas of this habitat add substantially to species diversity. The habitat here is probably derived from heath or woodland (ash, oak and birch) as a result of grazing. It continues to be preferentially grazed by deer because of its high nutrient content and is consequently enriched by dung and urine. The grassland may revert to scrub, woodland or heath if grazing animals are excluded. There is some threat from encroaching bracken.

Montane acid grasslands (siliceous alpine and boreal grasslands, including late lie snowbeds) occur on the summit plateau, the Carn Mor Dearg arête and on the ridge leading towards Aonach Beag. These are some of the few near natural habitats remaining in the UK. The flora includes several uncommon vascular plants, bryophytes and lichens and is usually lightly grazed by deer in summer. Different aspects of this habitat can be vulnerable to nutrient inputs and physical damage such as trampling from high numbers of visitors, dunging and urination by grazing animals and acid deposition. Trampling damage is restricted to the Mountain Track on Ben Nevis used by most visitors and the descent line along the Red Burn. The montane grasslands are also potentially threatened by climate change.

Alpine and sub-alpine calcareous grasslands on lime rich soils are some of the most important for rare arctic alpine plants. These grasslands are maintained by a combination of exposure and grazing, but overgrazing is the most serious threat to this habitat as this can alter the species composition. Only a little remains on ledges largely inaccessible to grazing animals on Aonach Beag and Meall Cumhann.

Acidic scree on frost-shattered summits, like other forms of snowbed, is also a near natural type of vegetation hardly affected by management, although deer may graze the fronds and grazing may keep screes unstable and prevent succession. Calcareous and siliceous rocky slopes with chasmophytic vegetation (plants in crevices on base rich and acidic rock) are plant communities that colonise crack fissured cliffs. They are found on the summits and on the slopes dropping down into Coire Guibhsachan and on Aonach Beag. These may be damaged by climbers, but this is unlikely on the BNE where the main threat is most likely to be climate change.

Alpine boreal heath is found extensively over all the summits on the BNE. These near natural high-altitude lichen rich heaths are fragile and susceptible to heavy and moderate grazing as well as human trampling. Intensive grazing may weaken dwarf scrub and lead to their eventual disappearance. Human trampling may cause a little localised damage where footpaths cross the tops.

Wet heath is widespread on the BNE on the valley sides and floor. It is important for nature conservation as there is so much in the West Highlands and so little anywhere else in the world. Very little of this habitat in Scotland is natural, although it has always occupied wet open boggy glades when the upland landscape was well wooded. There would once have been woodland where much of the wet heath exists at present. Grazing seems necessary to maintain the structure and floristic diversity. Without grazing, these heaths could potentially return to woodland, but it may be a slow process as without grazing, *Molinia* has a tendency to grow too tall and dense to allow tree seedlings to compete. However, actively regenerating native woodland on areas of wet heath is a scarce habitat in the Scottish uplands due to the widespread browsing impacts of red deer and domestic livestock.

Dry heath typically occurs on free-draining acid soils with low nutrient levels. A semi natural habitat, it is often derived from woodland or scrub and in the absence of grazing, most of this habitat would become colonised by trees.

30 heath plots monitoring grazing levels were established in 2008 on the BNE and are monitored annually.

*Salix* scrub, at high altitude, is a very rare habitat in the UK. Stands of *Salix* scrub survive on ungrazed ledges or on lightly grazed steep rocky slopes on Aonach Beag and Meall Cumhann. The biggest threat to this habitat is overgrazing and it is difficult to manage and conserve as many populations are small and consist of only one sex. Currently a montane woodland project is being developed to enhance the current population (see section 2.4.2.5 Montane woodland for more information)

European blanket bogs are found primarily in the UK. They can be found on BNE in small patches in Coire Guibhsachan. As it is rare globally, blanket bog is one of the most important types of British upland vegetation. These mires are lightly grazed by deer and, until recently, were grazed by sheep, although they are generally not a favoured foraging habitat. Trees do not grow readily on the waterlogged peat. However, high grazing can convert blanket bog to other types of mire, so for the purpose of nature conservation, grazing should be kept at a low intensity. Currently a peatland restoration project is being developed to reduce the erosion and restore the degraded peatland on the BNE (See section 2.4.2.4 Peatland for more information)

The high altitude plant communities associated with areas of water seepage, like the Red Burn on Ben Nevis, are a type of flush mire that occurs at high altitude and are one of the few remaining natural plant assemblages in UK. They are maintained by the harsh climate and are threatened by climate change. Light trampling may maintain an open sward. The habitat is maintained by climate rather than management and most are subject to only light grazing.

Caledonian forest is represented by Scots pine in oak and birch woodland in the Steall Gorge and would benefit from reduced grazing to allow woodland regeneration. Similarly, old sessile oak woods with holly (part of a mosaic of woodland types) and western oak woods, also in the Gorge, would also benefit from a reduction in grazing.

In 2006 two tree transects were established on the estate. Initially they were monitored annually. From 2011 they will be monitored every 3-5 years. See section **2.4.2.3 Tree transects** for more recent results.

In 2008 67 tree seedlings were tagged on the estate in the vicinity of the heath plots. Due to mortality a further 98 tree seedlings were tagged in 2014. They are monitored annually for growth and grazing impact, see section **2.4.2.2 Marked seedlings** for recent results. From both 2008 and 2014, a total of 165 tree seedlings were tagged, presently 117 are still alive.

#### **4.4.2 Plants**

Those species that are associated with alpine and sub-alpine calcareous grasslands or siliceous alpine and boreal grasslands, including *Luzula arcuata*, may be affected by changes in grazing management (*JNCC Annex 1 Habitat Accounts*, 2006). Other montane species may be adversely affected by visitor pressure on the summits.

Many of the scarce, rare or Red Data Book vascular plants associated with alpine habitats are unlikely to be significantly affected by changes in grazing regimes. However, species contributing to floristic diversity in *Nardus* grasslands may be affected by changes in grazing management. For example, decreased grazing may have a detrimental effect on some species in this habitat.

Where there is a build up of fine base material below broken crags on the summit plateau of Ben Nevis, then snowbed vegetation occurs. Some nationally rare and nationally scarce bryophytes are present including the Red Data Book listed vulnerable moss, *Hygrohypnum molle*, the liverwort, *Gymnomitrium apiculatum*, and the near threatened *Andrea nivalis*, as well as more common snowbed species such as *Marsupella bravissima* and *Kiaeria starkei*. These high altitude species, particularly those associated with areas of late snow lie, are unlikely to be affected by any changes in deer management on the BNE.

In general, grazing across the site seems light and this should encourage the recovery of dwarf shrub heath and the bryophytes that are a feature of this heath. They are, however, slow to recover and spread, so changes in the extent of this element of the bryophyte flora will take a long time. The huge numbers of people that climb Ben Nevis every year do not tend to go anywhere near the sensitive bryophyte communities so human trampling is not a huge issue.

Some rare and scarce oceanic species associated with western woodlands will benefit from increased woodland cover creating increased habitat for these particular species. However, this may take a long time.

#### **4.4.3 Lichens**

The majority of rare and scarce lichen species are associated with either the summit plateau or the gorge woodlands. Threats to the summit plateau lichen communities include acid precipitation, litter human or vegetation, eutrophication, creation of new paths, path widening or braiding and climate change. The hyper-oceanic climatic regime and habitat continuity, which may have existed for the last 50,000 years, have helped to create a climax community of lichens which is of international importance and should be protected for generations of people to enjoy.

The main threat to many of the Estate's nationally scarce and rare species is climate change which may allow other more competitive and common upland species to dominate. Other threats to snowbed lichen communities include airborne acid pollution. Pollutants can build up on snowbeds which can affect lichens within and below them as the snow melts.

Litter, in the form of banana skins and used tissue paper, contains nutrients which leach into the immediate surroundings and can cause localised incidents of eutrophication. Many large cairns and structures near the summit area are used as toilets by people and can accumulate high levels of nutrients. These locations support the nationally scarce crustose lichen, *Lecania subfuscula*, which requires high levels of nutrients and is often found close to bird colonies.

Much of the scree habitat on the paths, around the cairns and around the summit area is unable to support any lichens at all as it is in a state of constant flux, being trodden on, turned over and scrubbed together. The habitat off the paths, however, has most available surfaces covered in lichen or bryophyte growth and seems to be in excellent condition. This is due to the lack of trampling by people. It would be worthwhile monitoring the width of paths, as they are liable to become wider with increased visitor pressure. The creation of new paths should be resisted. Shortcut routes used and created by hill runners should be monitored and organisers of such events encouraged to reduce the use of shortcuts and to restrict numbers of runners.

Rare and scarce lichens associated with the gorge woodlands are often indicators of ancient woodlands. As the woodland regenerates and develops, there will be increased habitat for these rare ancient woodland indicators to colonise.

#### **4.4.4 Birds**

The density of breeding birds on moorland is largely proportional to the food available. Insects, which make up the major proportion of this food, are likely to increase if grazing is reduced and habitat is enhanced. With woodland regeneration some habitat may be lost to open moorland birds. In the immediate to medium term (10 to 50 years), moorland bird populations may remain stable with an increase in the quality and availability of food in the smaller area. In the longer term (100 plus years), we may see fewer of the moorland species such as meadow pipit and skylark.

Skylark are found in suitable upland grassy areas, generally in open habitats and will not benefit from increased woodland cover. Meadow pipit and stonechat are found breeding on the upland moorland and heathland of the estate; they too are unlikely to benefit in the long term from increased woodland.

Merlin and peregrine falcon are birds of mountain and moorland. If populations of small moorland birds stay steady as the woodland regenerates, these species will not suffer.

Hen harrier are present on Ben Nevis SSSI, but unrecorded on the BNE. They could benefit from the developing woodland, particularly as natural regeneration can be patchy leaving spaces for birds to nest in which should lead to an increased number of small birds available as prey items.

Despite its name, the common gull is not at all common in some inland areas. As it breeds in the open near lochs, marshes and bogs on moorland, it is unlikely to benefit from increased woodland.

As far as woodland development is concerned, bird species presently on the Red List and the UK BAP Priority Species list which are present in Glen Nevis woodland that would benefit from increased woodland cover are song thrush and spotted flycatcher. On the Amber List, species which may benefit are tree pipit, redstart, mistle thrush, willow warbler and grey wagtail. Willow warblers breed at their highest densities in woodland scrub, either along the edges of woods or by clearings. They will benefit from increased woodland cover to start with, but may disappear from areas where the woodland matures, although they may continue to move out with the new edges. Other species that should breed eventually are wood warbler and lesser redpoll which breed in birch forests, young conifers, alder wood and heaths and feed on birch and alder. Dunnock and potentially bullfinch and starling may also increase, but may take some time. JMT would benefit from continued woodland bird recording in the form of a Breeding Bird Census to record species presence, status, distribution and changes in populations with reduced grazing and woodland regeneration. This information will be passed onto national bodies where appropriate.

Snow bunting is a scarce breeding species in the UK. Found only in Scotland, they nest in crevices on rocky mountain tops near snowfields and are unlikely to be adversely affected by the proposed changes in management. Ring ouzel breed in upland areas on the BNE around crags, gullies and boulders and are also unlikely to be adversely affected by management changes in the short term. Dotterel are present on the summit of Aonach Mor within a kilometre of the BNE. They may be present on the Estate and are unlikely to be adversely affected by management. Ptarmigan are likely to be breeding on Aonach Beag and are seen at close quarters on many neighbouring mountains; they too are unlikely to be adversely affected by management.

Golden eagles are occasionally viewed displaying above the BNE. Various locations within the Ben Nevis area are known historical nesting sites. Up until recently it was assumed no Golden Eagles were nesting on the BNE, however in 2019 a breeding pair were observed leading to the successful fledging of twins. Historically, Golden eagles have struggled to produce in the Nevis area, however, the current deer management technique of leaving carcasses on the hill has created more success. Furthermore. It is also assumed at a reduction in grazing on the BNE has promoted the population growth a food species such as mountain hare.

White-tailed sea eagles are frequently observed displaying above the Fort William town area around 7 kms west of the BNE. Despite their name, White tailed sea eagles are not limited to coastal areas and historically they would compete with golden eagles for inland territories. It is assumed, with the rapid white-tailed sea eagle population increase, that they will make an appearance on the BNE in the future.

#### **4.4.5 Mammals**

There is currently very little monitoring and/or recording carried out for mammals on the Estate.

Deer numbers were extremely high however deer populations are being reduced by JMT to allow natural regeneration. Ongoing informal deer counts will be part of the Estate's work programme.

Water vole (a UK BAP Priority Species) are monitored annually at a very basic level to ensure the population is thriving. They should not be affected by changes in management to allow woodland development in the Glen.

There are signs of otter, another UK BAP species, in lower Glen Nevis. Any signs of this species on BNE will be recorded. They should not be adversely affected by management for woodland regeneration and may in fact benefit by any increases in riparian woodland in areas currently bereft of such a key component of the natural nutrient cycle. Alders and other native trees are important in maintaining a healthy freshwater habitat for salmon, trout and other fish. Alder trees fix nitrogen from the atmosphere and accumulate other nutrients from the soil. These nutrients are then slowly released into rivers, either when invertebrates feeding on the trees fall into the stream or when the trees shed their leaves. The leaves slowly decay and are eaten by in-stream invertebrates and this naturally maintains the productivity of the river.

Red squirrel, a UK BAP species, will benefit from increased woodland cover especially with regards to Scots pine which is at present scattered amongst the Gorge woodland. Signs of red squirrel are found very close to the BNE. Monitoring of the Glen Nevis red squirrel population was completed in 2018. A capture and release method was used to gain an understanding of the health, sex and age of the population. Based on the findings, modelling suggests a small, health and male dominant population.

Pipistrelle bats are present and a survey is carried out in Glen Nevis annually. They should not be affected by changes in management to allow woodland development in the Glen.

#### **4.4.6 Invertebrates**

The chequered skipper is primarily a species of woodland edge and scrub. It occurs in areas of lightly grazed or ungrazed grassland, scrub and marsh around open broad-leaved woodland. These areas are dominated by the larval food plant, purple moor-grass. Nectaring occurs in glades with bluebells and bugle. Current factors causing its loss or decline nationally are inappropriate grazing management of wood pasture and

the loss of open areas within woodland. Reduced grazing and increased woodland cover will probably favour this species. Pearl-bordered fritillary, a woodland edge species, may occur with increased woodland cover and edge habitats. Very little is known about the presence of these species on the BNE, although they are present in other parts of Lochaber. Further studies are needed.

The mountain ringlet may be affected by changes in grazing. Most known colonies exist in areas that are grazed to some extent by deer and sheep. However, there is little information on the grazing levels preferred by this butterfly and its management requirements are not yet fully understood. Larvae are known to feed on *Nardus stricta*. Monitoring of the resident population will be needed to gauge its response to habitat changes due to a reduction in grazing.

Little is known about other invertebrate species on the Estate and it is a subject area that would benefit from increased monitoring and recording of lepidoptera (especially for argent and sable moth), odonata, coleoptera, diptera, hemiptera, neuroptera, hymenoptera, arachnids, molluscs and annelids as changes in these populations reflect habitat health.

## **4.5 Cultural, Social and Economic Aspects**

### **4.5.1 Archaeology and History**

There are two Site and Monument Register sites located on the BNE, the charcoal burning platforms and the Ben Nevis Summit Observatory. It is important that the charcoal burning platforms are monitored to assess any impact arising from future woodland regeneration. The Summit Observatory and Bridle Path (constructed to access the Observatory) are important indicators of the changing culture, interests and scientific research of the 1800s. Any structure associated with the observation and recording of mountain weather and conditions is significant. The Trust recognises that the ruined Observatory is of great historical interest and advocates its protection from further critical or potentially dangerous decay.

In addition, the old shepherd's path into Glen Nevis and the ruined shepherd's house with its associated agricultural evidence are important signposts to the long history of human involvement on this land. They too should be monitored and prevented from further critical or potentially dangerous decay.

### **4.5.2 Land Use**

There is clear evidence of past habitation from the 1800s onwards on the BNE. This habitation is mostly associated with sheep farming in the mid 1800s. Prior to this, habitation and the associated field systems were concentrated away from the BNE on the lower reaches of Glen Nevis. Stock grazing continued until recent times with a grazing tenancy being let for Upper Glen Nevis until 2003.

There has been no deer management on the BNE in recent years and deer management on neighbouring estates takes place primarily in the form of recreational deer stalking. The high deer and sheep numbers on the land in the recent past are

largely responsible for the landscape we see today. Deer management has an important influence on the present landscape and a reduction in deer numbers is essential to encourage other natural processes to prevail.

### **4.5.3 Recreation**

The use of the mountain for recreational purposes started in the late 1800s with the advent of the railway and the emergence of the tourist. As far as the Trust is aware, there are at present no recognised criteria for assessing recreational importance. To facilitate the consideration of this aspect, the “*distance travelled with intention*” value has been developed by JMT. This is simply: How far do people travel to Ben Nevis with the intention of carrying out an activity? For example, it is known that people travel from the south of England with the intention of walking up Ben Nevis and also 120,000 people attempt to reach the summit of Ben Nevis every year. It is unlikely that people travel great distances to walk along Glen Nevis, but they may do so as part of a wider trip to the area. Therefore, walking up Ben Nevis can be considered as nationally important and low level walks (such as that to Steall) as locally important. A number of large groups summit Ben Nevis as part of the Three Peaks Events. Every year, 500 participants in the Ben Nevis Race run up and down the mountain / large numbers descend the line of the Red Burn and cut across Corner Two which contributes to high erosion along the Red Burn and at this corner.

Ice climbing on the northern cliffs of Ben Nevis is out with the BNE, but many climbs finish on the summit and climbers descend over the estate. This area is internationally renowned as the birth place of ice climbing and the steep cliffs have had a considerable influence on the development of mountaineering in the UK. The sport is becoming increasingly popular as developments in the equipment used make the experience easier and safer.

Recreational activities on the mountain may increase in the future, although there is evidence from elsewhere that the rapid increase during the 1980s and 1990s has levelled off. However, in order to maintain the feeling of a ‘wild place’, the negative impacts of these activities need to be managed in a way that is sympathetic to the mountain so that visitors’ experience of the wild qualities of the area is not compromised. This will be closely related to the development and management of tourism provision in the wider area delivered through the Nevis Partnership.

### **4.5.4 Man-made Features on Ben Nevis**

JMT endeavours to liaise with all interested parties to reach decisions regarding retaining, replacing or removing such structures. This is done through direct consultation with groups and individuals, via the mechanism of the NP and by publications such as those of the MCofS and JMT’s own members Journal.

The Summit Shelter sits upon the remains of the Summit Observatory. The Trust recognises its value as a refuge in extreme conditions. The summit trig point is an obvious attraction to many who visit the summit. The Trust recognises its significance and value, but would wish to improve its overall appearance and therefore advocates the demolition and removal of the summit view finder plinth, which has fallen into disrepair, from the summit.



The Peace Cairn has local significance and JMT recognises its symbolic value and its place in universal aspirations for world peace. However, it is also a focal point that attracts further unwanted plaques and memorials. Ideally, JMT believes that a more appropriate site for this structure would be in Glen Nevis, a location that would be accessible to everyone. At present, JMT has agreed that the Peace Cairn shall remain on the summit.

Many cairns on Ben Nevis have been built for no purpose other than for personal satisfaction and may dangerously be mistaken for way markers. They also give a cluttered appearance to the landscape. The saxicolous lichens and bryophytes surviving on the broken rocky ground of the summit plateau are a recognised feature of the Special Area of Conservation designation for Ben Nevis. Cairn building damages this habitat.

In the interest of maintaining wild land qualities, there is always a presumption against the addition of way markers to any area of wild land. JMT advocates an attitude of self-reliance, exploration and discovery in wild land. Way markers have a negative impact on all three of these qualities and on the overall aesthetic sense of wildness. As with memorials the more that are seen the greater the perception that it is acceptable to move stones and build cairns.

However, given that Ben Nevis is unique in its attraction for a wide range of users JMT entered into an agreement with the NP in 2005 to retain and rebuild 23 specific cairns on the summit plateau. All extraneous cairns (over 100 were recorded in 2004) are being removed on a rolling program with the rocks being returned to the scree or used to redefine the path.

Through its endorsement of the *Nevis Strategy*, the Trust has agreed to "limiting provision of way marking cairns to a minimum number of strategic locations on the summit section of the Ben path (across the plateau) where required, assisting less-experienced users in adverse conditions". In detail, the Trust recognises that certain way marking cairns may be of historical significance and therefore favours the demolition of all cairns of no historical significance and does not advocate the erection of any new ones. Given the negative intrusion of way marking poles on the landscape and the widely accepted uncertainty over their safety value, it was also agreed, through consultation with all interested parties, to remove the remains of way marking poles.

The Trust also advocates the removal of the aluminium marker flag at No. 4 Gully on the grounds that the 'labelling' of physical features in mountainous terrain is highly inappropriate and goes against its policy of avoiding the introduction of man-made artefacts and encouraging a spirit of self-reliance. The aluminium sign at the Coire Leis abseil point is redundant since the abseil route is no longer recommended. The Trust intends to remove this sign along with the markers on the eastern slopes leading down to the top of Coire Leis. JMT will consult appropriate bodies including MCofS and Lochaber Mountain Rescue to Team to establish the best way to proceed with these aims.

#### 4.6 Summary of the Most Important and Significant Features of Ben Nevis Estate

	Internationally Recognised As Important	Nationally Recognised As Important	Locally Characteristic and Significant
<b>Wildness</b>		Ben Nevis Plateau away from summit Nevis gorge Eastern Ben Nevis Estate	
<b>Landscape</b>	Ben Nevis highest mountain in Britain	Ben Nevis and Glencoe NSA	
<b>Geology</b>	Caldera collapse structures	Caledonian igneous	
<b>Geomorphology</b>		Scree	Glacial landscape features Cliffs, Waterslide, Steall gorge, coires, moraines, hanging valleys, roche moutonnees
<b>Habitats and Communities</b>	<p><b>Ben Nevis SAC</b> EU Habitats Directive Annex 1 Priority habitats</p> <ul style="list-style-type: none"> <li>• Species rich Nardus grassland, on siliceous substrates in mountain areas CG10 and CG11</li> <li>• Blanket bogs M17, M18, M19, M20, M25</li> <li>• Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i> M10, M11, M12, M34</li> <li>• Caledonian forest W18,W17,W4,W19</li> </ul>	<p><b>Ben Nevis SSSI</b> Upland habitats Upland flora Upland fauna Geology</p> <p>Siliceous alpine and boreal grasslands and snowbed communities U7, U8, U11, U12, U13b, U14, U18 Alpine calcareous grasslands CG12, CG13, CG14 Alpine and subalpine heaths H18c, H20 Dry heath H10 Sub-arctic willow scrub W20 Northern atlantic wet heaths M15 Species rich nardus grassland CG10 Eutrophic tall herbs U17 Blanket bog (active) M17 Alpine pioneer formations M12, M11a Alderwoods W7 Old oakwoods with <i>Ilex</i> and <i>Blechnum</i> W11, W17a</p>	
<b>Vascular Plants</b>		<p><b>Ben Nevis SSSI</b> <u>Vulnerable &amp; Nationally rare</u> <i>Luzula arcuata</i> Vulnerable &amp; Nationally Scarce <i>Cerastium alpinum</i> <i>Poa glauca</i> <i>Salix lapponum</i> <i>Sibbaldia procumbens</i> <u>Vulnerable</u> (RDB 2005) <i>Polystichum lonchitis</i> <i>Saxifraga hypnoides</i> <u>Near Threatened</u> (RDB 2005) <i>Cerastium arcticum</i></p>	

	Internationally Recognised As Important	Nationally Recognised As Important	Locally Characteristic and Significant
		<i>Cornus suecica</i> <i>Gnaphalium supinum</i> <i>Hymenophyllum wilsonii</i> <u>Nationally scarce</u> (16-100 10x10km <sup>2</sup> ) <i>Athyrium distentifolium</i> <i>Carex saxatilis</i> <i>Cerastium cerastoides</i> <i>Pinus sylvestris</i> <i>Poa alpina</i> <i>Saxifraga nivalis</i> <i>Veronica alpina</i> <u>BAP Priority Species</u> <i>Juniperus communis</i>	
<b>Mosses and Liverworts</b>		<u>Nationally scarce</u> (16-100 10x10km <sup>2</sup> ) <u>Nationally rare</u> (<16 10x10 km <sup>2</sup> ) See Appendix x	
<b>Lichens</b>		<u>Nationally scarce</u> (16-100 10x10km <sup>2</sup> ) <u>Nationally rare</u> (<16 10x10 km <sup>2</sup> ) see Appendix x	
<b>Mammals</b>		Schedule 5 species wildcat and pine marten UKBAP – red squirrel, pipistrelle bat, water vole, otter	LBAP badger, mountain hare,
<b>Reptiles and Amphibians</b>			
<b>Birds</b>	Birds associated with montane heaths and grasslands	Ring Ouzel BoCC Red List Skylark BoCC Red List Snow bunting BoCC Amber List Meadow pipit BoCC Amber List Willow warbler BoCC Amber List Common gull BoCC Amber List	Dotterel, merlin, hen harrier, Golden Plover Wood warbler LBAP  From SSSI Statement Golden eagle, ptarmigan, golden plover, buzzard
<b>Invertebrates</b>		Chequered skipper Sched 5 UKBAP  From SSI statement <b>Diptera</b> <i>Dolichopus maculipennis</i> RDB2 <i>Cheilosia sahbergi</i> RDB2 <i>Calliphora alpina</i> RDB3 <i>Platycheirus melanopsid</i> RDB3 <i>Delia caledonica</i> RDB-K <i>Spilogona alpica</i> RDB-K	Mountain ringlet LBAP  From SSI Statement <b>Coleoptera</b> <i>Eudectus whitei</i> <i>Malthodes mysticus</i> <i>Luperus longicornus</i> <b>Diptera</b> <i>Spilogona triangulifera</i> <i>Pedicia lucidipennis</i>
<b>Archaeology</b>		Charcoal burning platforms	
<b>History/Culture</b>		Meteorological Station	Ruined shepherds houses Old stalkers/shepherds path

	<b>Internationally Recognised As Important</b>	<b>Nationally Recognised As Important</b>	<b>Locally Characteristic and Significant</b>
<b>Land Use</b>		Deer Management	
<b>Recreation</b>	<ul style="list-style-type: none"> <li>• Birth of ice climbing</li> <li>• Snow and ice climbing (not on BNE)</li> </ul>	Hill walking Rock climbing (Not on BNE)	Ben Nevis Race 3 Peaks Events Low level walks
<b>Employment</b>			Local tourism providers B&B, hotels, bunkhouses Mountaineering instructors Nature tourism including guided walks

## 4.7 Key Factors Influencing Management

There are two key factors influencing the immediate management of the BNE:

- Grazing and browsing impacts
- Visitor impacts

### 4.7.1 Grazing Impacts

The most important influence on the management of the BNE is the control of grazing animal populations - specifically native red deer. Their grazing habits are currently preventing significant woodland regeneration from occurring.

Transects, Heath Plots and marked tree seedlings have been established on the BNE to record and monitor the impact of browsing and the extent of vegetation change. The results from annual monitoring as well as results from SNH surveys of impact on the SAC guide decisions on the size of the annual deer cull.

Problems include the movement and numbers of transient deer in and out of the BNE which occurs over high mountain cols between neighbouring estates. A key aspect of JMT's *Deer Management Strategy* is to engage as an active member of the MWDMG.. It is expected that concerns of the neighbouring estates will continue be voiced with regard to JMT's approach to deer management and its perceived knock on effects. JMT will encourage an understanding and acceptance of the legitimacy of JMT's objectives and management. In order to meet its objectives, JMT must take a determined approach to reducing deer numbers, as identified in the JMT Deer Control Policy. It is essential to maintain a strong stance, otherwise the long term objectives for natural woodland regeneration may never be realised.

In the long term, having a dynamic deer population will make deer control more difficult as the woodland cover extends and culling will have to be done in a woodland environment. However, it is possible to achieve this effectively as evidenced by elsewhere in the world. Woodland cover is rarely total, and naturally occurring open spaces provide glades where control can be focused. Woodland management may also have to be used to further this objective.

In April 2007, JMT started a Five year Biodiversity Project to address grazing pressure from deer and sheep. Deer Control is now carried out as part of our core work on the estate.

## 4.7.2 Visitor Impacts

The importance of the area for the enjoyment of visitors and the contribution these visitors make to the local economy cannot be over emphasised. The appeal and accessibility to visitors of Ben Nevis (as the highest mountain in the UK) and Steall Gorge, particularly with the maintained paths, means that a large number of people are attracted to the area. This provides an essential source of income to many households in the Lochaber area.

The current number of visitors to Ben Nevis, and the activities in which they take part, is not seen to conflict greatly with JMT's conservation aims. As the majority of visitors remain on the main mountain track, there is little disturbance that has a detrimental effect on the rare montane habitats on the summit or on breeding birds. Ongoing observation and informal records of visitor behaviour should be kept to ensure this remains the case.

The NP Visitor Survey and numbers from the counters on paths in Glen Nevis should inform future visitor management provision, both in terms of physical management and for developing themes for essential information and interpretation – particularly responsible access, conservation, and the natural and cultural heritage.

Visitor impacts on the BNE are often determined by decisions made by the landowners that control car parking and access to the BNE. Physical management of these visitor impacts should include a strategic plan to provide opportunities in Glen Nevis to manage the distribution of these visitors. This should be taken forward in conjunction with the NP.

The car park and visitor centre run by HLH and The HLH staff are essential components of visitor management for Ben Nevis. In part they guide visitor behaviour in the mountain. They also affect the impact these visitors have on the estate's habitats and species. Co-operation with HLH staff and other NP members is essential to achieve the sustainability of the long term objectives for visitor management.

## **4.8 Summary of Factors Influencing Management**

### **Internal Factors**

- Size, topography and access to the area
- Succession of plant species / changes in vegetation structure
- Soil erosion caused by visitors and natural processes
- Changes in populations of large herbivores - deer and sheep
- Recreational activities
- Undesirable activities such as littering, cairn building, defecating, etc.

### **External Factors**

- Increased visitor numbers
- Promotion of the area
- Development of access paths by NLP and neighbouring landowners
- Car park management and development by THC and FLS
- Populations of large herbivores on neighbouring land and red deer mobility
- Climate change
- Atmospheric pollution

### **Factors Arising from Legislation**

- Implementation of Land Reform Act (Part 1) Scottish Outdoor Access Code
- Nature Conservation Act (Scotland) 2004
- SSSI Agreement with SNH
- Ben Nevis and Glencoe NSA
- Ben Nevis SAC
- Path management agreement with NP and HLF
- The legal obligation JMT has to protect the Health and Safety of employees
- Grant aid conditions HLF, Tubney Trust, Esmee Fairbairn Foundation, Peter De Haan

### **Physical Conditions or Restraints**

- Much of upper Glen Nevis is only accessible on foot through a narrow gorge
- Management may be hampered during the winter months either by water logging, snow or frozen conditions

### **Available Resources**

- JMT receives much of its funding from its members, but also receives donations, legacies and grants
- Money for woodland restoration may be available from Government agencies
- 1 JMT Nevis Conservation Officer on site
- 0.6 JMT Nevis Property Manager on site
- Contract Stalkers on site when needed
- JMT Head of Land to advise on monitoring needs and methods
- There is a variety of skilled personnel available in the local area to carry out contract work on the BNE
- There is a network of volunteers within the JMT membership and out with to assist with various management tasks