



## LANDSCAPE CHARACTER ASSESSMENT

### LOCHABER LANDSCAPE EVOLUTION AND INFLUENCES



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**Title Page Photographs**, clockwise from top left:

Blanket bog near Corrou Station, Rannoch Moor ©Lorne Gill/NatureScot

Sanna Bay, Ardnamurchan ©Lorne Gill/NatureScot

Ben Nevis ©NatureScot

Beasdale on the shores of Loch Nam Uamh. Arisaig ©Lorne Gill/NatureScot

This document provides information on how the landscape of the local authority area has evolved. It complements the Landscape Character Type descriptions of the 2019 dataset.

The original character assessment reports, part of a series of 30, mostly for a local authority area, included a “Background Chapter” on the formation of the landscape. These documents have been revised because feedback said they are useful, despite the fact that other sources of information are now readily available on the internet, unlike in the 1990’s when the first versions were produced.

The content of the chapters varied considerably between the reports, and it has been restructured into a more standard format: Introduction, Physical Influences and Human Influences for all areas; and Cultural Influences sections for the majority. Some content variation still remains as the documents have been revised rather than rewritten,

The information has been updated with input from the relevant Local Authorities. The historic and cultural aspects have been reviewed and updated by Historic Environment Scotland. Gaps in information have been filled where possible. Some reports have been combined where original LCA area coverage was very small.

The new documents include photographs. They do not include the maps or sketches from the original LCAs, but these are still available from the the [NatureScot Information Library](#). Additional information can be obtained from the websites of;

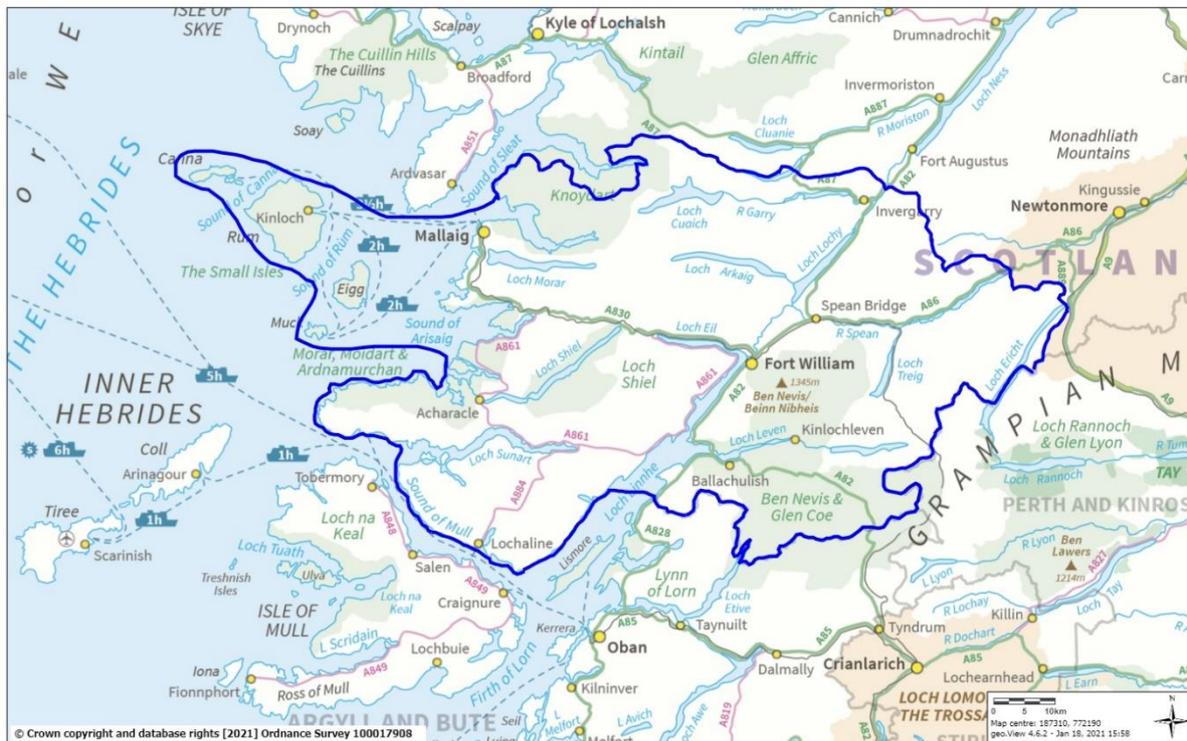
- [British Geological Survey](#) [www.bgs.ac.uk](http://www.bgs.ac.uk)
- [Historic Environment Scotland](#) (Historic Land use Assessment, Gardens and Designed Landscapes, historic features and their designations, etc). [www.historicenvironment.scot](http://www.historicenvironment.scot)
- NatureScot website especially [Landforms and Geology](#) (more specifically the “Landscape Fashioned by Geology” series) and [About Scotland’s Landscapes](#) soils; wild land; landscape character; designations etc.) [www.nature.scot](http://www.nature.scot)

The relevant local authority, which will have information on landscape policies, etc.

The content of this document was drawn from the background chapter information in the “NatureScot Review 97 – Lochaber landscape character assessment”, 1998, Environmental Resources Management, and “NatureScot Review 120 - Ben, Alder, Ardverikie and Creag Meagaidh Landscape Character Assessment”, 1999, Scottish Natural Heritage Landscape Group.

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# 1. INTRODUCTION



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*The area covered by this report*

Lochaber encompasses some of Scotland's most spectacular and awe-inspiring scenery. It includes the huge summits and steep, rocky glens around Ben Nevis and Glen Coe; the vast expanse of Rannoch Moor, ringed by distant hills; and the central rocky and rugged Western Highlands which is permeated by deep, meandering ribbon shaped lochs. Along the coast, intimate bays shelter white cottages from the Atlantic, while rocky, brown moors clothe the high basalt cliffs and granite glens of Ardnamurchan, Morvern and the Small Isles. It is a rich landscape, varying constantly with the climate and seasons, and changing in scale, tone and shape as one travels through it: Lochaber means 'mouth of lochs' and this describes the deep fjords reaching inland from the sea well.

Lochaber is an area that can be described by extremes. It has the UK's highest mountain (Ben Nevis, 1344m) and the deepest freshwater loch (Loch Morar up to 310m deep). It is the westerly entrance to the longest glen in Scotland, the Great Glen which stretches 104km, and it has the most westerly point in mainland Britain near Ardnamurchan lighthouse. There are approximately 70 Munros (mountains over 914m or 3000 feet) in Lochaber, just under a quarter of the total number across Scotland. The area contains some of the youngest volcanic landscapes in the UK and dramatic glacial carving.

The climate has a profound effect on the area and the experience of its landscape, which one minute may be bathed by sunlight, and the next dark with storm clouds and blurred by a grey mist of rain.

The landscape has been shaped over the years by a combination of natural forces and human activities. In the past, sudden changes brought about by war, land clearances and potato blight, as well as more gradual changes caused by new technologies, beliefs and political structures, have changed the patterns of land ownership and land use. The landscapes that have resulted are rich palimpsests which are accepted as characteristic of the region.

In the late 20<sup>th</sup> Century the pace of change increased more than ever, with the development of commercial forestry, the growth of tourism and the expansion of towns and villages. Such change has a complex impact on the landscape and on the way that it is perceived.

Lochaber's landscape is a vital natural resource, the value of which is reflected by the inclusion of over 1,600 square kilometres within National Scenic Areas. These are areas of 'outstanding scenic value in a national context'. These attributes, along with others such as the wild and remote character of some upland areas, characterise much of Lochaber's scenery, attracting millions of visitors each year and being fundamental to the economy of the area. The landscape is also a working environment, central to the lives of around 20,000 people, providing jobs, homes, schools and recreation. It is a rural area and, with a population density of about 4.3 people per kilometre squared, one of the least populated areas of Scotland. About 50% of the population live in Fort William, the largest town in the area, although this proportion was much less in the past.

## 2. PHYSICAL INFLUENCES

### Geology

Lochaber lies within an area which was subject to more intense, prolonged and persistent geological action than perhaps anywhere else on the British mainland. The geology is complex and includes faults, volcanic sills and intrusions. The surface has been scoured by millennia of wind, rain and ice.

The dramatic relief of Lochaber was initiated when the ancient Lapetus Ocean closed and the supercontinent of Pangaea formed 400 million years ago. The collision of two huge land masses metamorphosed and compressed ancient sediments into a range of mountains known as the Caledonides, which were as high as the Himalayas at that time. Deep volcanic upheaval introduced granite into the mountains. The area continued to develop as the land was uplifted and eroded several times. Volcanic activity produced lava which flowed across the surface, and parts of the area were covered by the sea. Around 160 million years ago Pangaea split to create the Atlantic Ocean and the continents of North America and Europe, although the land continued to be shaped by periodic earth movements, erosion and volcanic upheaval. The coming of the last Ice age, Devensian, around 2.4 million years ago initiated a spell of intense erosion by ice sheets and mountain glaciers. The last glaciers melted about 10,000 years ago at the start of the present interglacial. The most intense influences on the landscape evolution of Lochaber has been since the last glacial maximum, which retreated from 11500 years ago, this obliterated past ice evidence and shaped the landforms seen today.

These intense physical forces are, at present, in abeyance, although an occasional earth tremor can be felt. However, our perception of these processes is brief in the geological timescale, and Lochaber's landform will continue to change for millennia to come.

The area's geology is split along a fault line, visible from space, which is a dominating feature in the West Highlands, the Great Glen fault. The Great Glen follows the fault which can be traced further northwards through the Shetland Isles to the Arctic Islands of Svalbard and formed about 430 million years ago. Northwest of the Great Glen, the Moine Super group of metamorphosed sediment developed over three phases of orogeny (the mountain building phases of tectonic collision). In this area the most common rock is schist.

South east of the Great Glen the mountains are part of the much older Dalradian supergroup. They are more varied in type and complex in structure, including quartzites, marbles and slates but only experienced the Grampian Orogeny.

Two major episodes of volcanic activity have also shaped Lochaber. Eastern Lochaber was shaped by subduction of the ocean under the Caledonian mountain range (similar to the process currently occurring under the Andes). Ben Nevis and Glen Coe are both the remains of calderas (collapsed volcanic craters) formed at that time.

In Western Lochaber, younger volcanic rocks date from the formation of the North Atlantic rift. The different properties of magma in these periods meant that they are larger and erupted with less explosive activity, meaning intrusions of magma and metaphoric rock are visible. The breaking up of the supercontinents means that geological evidence of the Caledonides can also be found in Greenland and Canada.

The advance and retreat of ice sheets over the area has further shaped this area, creating the deep salt water lochs and ragged coastlines as well as deep fresh water lochs such as Loch Morar.

### **Geology and landform - sub-regions of Lochaber**

The different forces that have shaped the geology of Lochaber mean that there is a geological diversity uncommon in the British Isles and which has been a key factor in shaping the culture and economy of the area. Breaking the region down gives a better understanding as to how this diverse landscape came into being.

#### *Western Highlands*

To the north and west of the Great Glen the land is almost wholly underlain by Precambrian (Moinian) schists and granulites - metamorphic rocks created from ancient marine sediments deposited over 600 million years ago. These were strongly metamorphosed and folded during the formation of the Caledonides and, after extensive erosion, they were uplifted into a tableland. Erosive forces continued to lower and smooth the land; and rivers, generally following existing fault lines, dissected the plateau into numerous ridges and glens.

By about 50 million years ago, the groups of mountains and hills that are seen today had been formed. A period of extensive glacial erosion followed. The area became a major centre for ice accumulation around 2.4 million years ago. The land was submerged beneath a succession of huge ice sheets which breached and lowered existing glens and peaks, creating deep troughs which today form the only accessible links to the coast. By flattening some of the western-most peaks, the ice destroyed the existing watershed and moved it further east. The ice was thick enough to cross the Great Glen and enter Glen Roy and Glen Spean, joining the great ice flows that descended from Rannoch Moor. Some glens accumulated meltwater deposits or have been breached by the sea and today form steep sided lochs and fjords. The lochs are characteristically long and thin 'ribbon' lochs which highlight the lines of ancient ice-deepened faults. Loch Morar, the deepest freshwater loch in Scotland, descends to 310 metres below sea level; Loch Arkaig and Loch Quoich were both just under 100m deep but this has been altered by damming in the 1950s.

#### *Ardnamurchan, Morvern and the Small Isles*

The two peninsulas of Ardnamurchan and Morvern are striking in their contrast with the highland mass to their north east. Originally consisting of sedimentary rocks, which are still apparent in coal seams along Morven's southern coastline, their geology mostly stems from a relatively recent volcanic origin, around 60 million years ago. This lends the peninsulas an identity more strongly linked with the islands of the Small Isles than mainland Lochaber.

In Ardnamurchan, lava erupted through overlying basalt and schist from three volcanic centres (vents). The first vent is still evidenced by the peak of Ben Hiant, the final vent gave rise to the Great Eucrite, a distinct weathered ring of igneous rocks that can be seen from the air. Today the landscape is a chaotic, rock-strewn landscape divided by curving ridges of gabbro and dolerite that appear as ripples across the land.

Much of this western edge shows the remains of violent upwellings of magma and volcanic intrusions. Plains of lava sheets can still be seen in the stepped basalt landscape of Morvern,

parts of Ardnamurchan and the Small Isles and in the crofted basalt coast of the Small Isles. High basalt cliffs are the most distinctive element of such a landscape, created by differential erosion of successive lava flows or by exposure of volcanic sills. The top and base of lava flows are generally more easily weathered due to swifter cooling meaning more air bubbles. This, coupled with the impact of ice on the glens, leaves the basalt as isolated, stepped tablelands. The basic friable soils weathered from this now support a rich resource of agriculture and forestry.

This 'trap' landscape is repeated throughout the Small Isles, although each of the islands exhibits features peculiar to their own volcanic ancestry. For example Muck has striking shore platforms, and long ridges of resilient dolerite that run into the sea and stand six to nine metres above the wave cut platform. The much larger Eigg has sheer basalt cliffs and the distinctive, towering pitchstone peak of An Sgurr, derived from a lava-filled valley whose own rocks were more resistant to erosion than surrounding basalts. This pitchstone rock is some of the youngest volcanic rock in Scotland.

Canna possesses a typical terraced basalt plateau with dramatic sea cliffs on its north east edge. Beaches of weathered sandstone and shell-sand occur in patches around all of these islands.

Rum is quite different from the other three islands. It has a more mountainous landscape with high craggy peaks and saw tooth ridges in place of the basalt tablelands of the stepped basalt landscape. The island lies at the centre of a volcanic intrusion. Large tracts of sedimentary Torridonian Sandstone are punctured occasionally by igneous rocks on the north side of the island, evidence of a magma dome which formed and collapsed in an explosive manner towards the end of the areas volcanic period. This explosion is still apparent in the deposits left by pyroclastic flows between Ainshval and Sgurr Nan Gillean. The gabbro of Rum Cuillin is also a testament to this activity.

### *The Great Glen*

The massive strike-slip fault of the Great Glen cuts across Scotland between Inverness and Mull, and bisects Lochaber. After the fault was created, around 250 to 290 million years ago (or even earlier), the two halves moved first one way and then the other. Movements of up to 600 kilometres in one direction and 300 kilometres in the other have been suggested with possible minor shifts in post Jurassic and even post Tertiary times. Today the northern Highlands are displaced north east in relation to the rest of Scotland. The displacement is uncertain and estimated to be around 104 kilometres, but could range from tens to a few hundred kilometres. Occasional minor tremors demonstrate that these earth movements continue.

The shattered rocks along this fault have been scoured by ice and long, deep sea and freshwater lochs now occur along its length, mostly within the Settled Lochs landscape character type.



*The Rum Cuillin from Kilmory, Isle of Rum NNR ©Laurie Campbell/NatureScot*

Other smaller glaciated valleys radiate from the Great Glen along Loch Eil, Loch Arkaig, Glen Garry and Loch Leven, all following other smaller transverse fault lines, and with similar steep sides and flat bottoms. Glen Spean also extends to the east but follows a wide strath which expands into the Great Glen south to Fort William. Huge ice sheets extended from Rannoch Moor and across the Great Glen from the western Highlands. They exploited the weakness along these faults, and the gentle profile of these hills was created by this ice.

Large lakes developed behind ice dams in Glen Spean, Glen Roy and Glen Gloy. As the ice front retreated these lakes were progressively lowered and successive strandlines can be seen in the 'parallel roads' of the three glens, most notably in Glen Roy. The lakes finally came to occupy much of Glen Spean, and their sediments remained to form, with glacial moraines, the amorphous rolling landform and fertile soils of the broad forested strath landscape of this area.

The lack of islands in the lochs of the Great Glen and the steepness of the scree-covered flanking slopes testify to the efficiency of the ice in scouring this valley, leaving sides that are both too steep and too rocky for many active land uses, except for forestry.

On the east side of Glen More and along the glens around Ben Nevis, outcrops of limestone, sheltered from the excesses of the climate, support fields of hay, and oak, pine and birch woods.



*The parallel roads in Glen Roy ©Lorne Gill/NatureScot*

#### *Ben Nevis and the Granite Massif*

Much of Lochaber's highland scenery has been eroded into relatively low rounded hills, but several of high granite and lava summits east of the Great Glen stand proud of these lower hills and rivals the Cairngorms in scale. These form a series of ranges including Ben Nevis and Aonach Mor, Bidean nam Bian (including the Three Sisters) overlooking Glen Coe; and Ben Starbh and Ben Cruachan, north of the Pass of Brander in Argyll, overlooking Glen Etive. These ranges have been created by cauldron subsidence. Cauldron subsidence occurs where the pressure of molten rock upwelling underground is reduced causing subsidence of the overlying rocks, and the creation of a ring fracture. The plug of rock within this ring then subsided to be replaced by magma. This turned into granite and other hard igneous rocks which were more resilient to erosion than surrounding 'country rocks' and thus today stand high above them forming bare precipitous grey and pink rock faces, the Paps of Glen Coe and Sgurr a'Mhaim with their pale quartzite mountains look like snow in the sunshine. In the past the Etive complex dykes with mineralisation was mined for lead and gold.

#### *Rannoch Moor*

Rannoch Moor is a distinctive area of landscape that forms a hummocky expanse of blanket bog amidst the dramatic hills of the Grampians. Although underlain by some of the oldest granite in the area, it is encircled by buttresses of pale harder rocks such as quartzose mica schists, quartzites, and the volcanic rocks of Glen Coe. Thus a shallow upland basin, fashioned by deep weathering during the Tertiary period, has been scoured and deepened by accumulating ice to create an amphitheatre. The resulting ice cap was over one kilometre deep and spilled from the area of the current Moor, breaching watersheds and flowing along Glen Etive, Glen Coe and, via Glen Treig, into Glen Spean. This bowl of impermeable granite has created ideal conditions for the creation of thick peat, up to 6 metres in places. The surface

of Rannoch Moor is now covered by many small and irregularly shaped lochans separated by rocky knolls and hummocks of glacial debris formed by the melting of the last glaciers.

### *Ben Alder and Craig Meagaidh*

As with much of the adjoining highlands, the striking landform is underlain by metamorphosed sedimentary rocks, mostly Moinian schists, with a few small igneous intrusions which underlie many of the lower knolls. The landforms are highly varied; due to these different rock types, and the intensely folded and faulted nature of the area, followed by the impact of glacial erosion and the covering of glacial till which was deposited on lower land. This diversity led to Craig Meagaidh to be designated a SSSI for its geological features.

The grain of the landscape is north-east to south-west, following the trend which originated during the Caledonian mountain-building episode, or orogeny, of approximately 400 million years ago. Two major faults, the Laggan Fault and the Ericht-Laidon fault, run through the study area, sub-parallel to the Great Glen fault to the north. The upper River Spey continues the Laggan alignment to the north east. Today, the main lochs are located on these fault lines. A series of smaller faults and belts occurs almost throughout the area, mostly in the same direction, although the fault known as the Ossian Lineament runs at right angles, from the Ericht-Laidon fault across the north end of Loch Laggan. It is thought to be an early fault that pre-dates the Caledonian Orogeny, hence its different direction.

There are areas of pegmatite (very large grained granite) within the intrusions. These are obvious in outcrops along the A86 near Loch Laggan, and are distinguished from the large feldspar crystals by its pink colour. It contrasts with the smooth grey colour and even structure of the schists, which are also exposed along the road. The schists and granites are likely to have formed high mountains which were gradually weathered down to hills similar to what is seen today. These smaller hills were then further shaped during the ice ages by glaciers. Erosion was particularly active along the fault lines, and the deepened areas filled with water to form lochs like Loch Laggan in the valley floors after the glaciers melted.

### **Physical features in the landscape**

#### *Volcanics*

The last major spell of volcanic upheaval was approximately 55 million years ago, during the Alpine orogeny, when many of the landforms of Ardnamurchan, Morvern and the Small Isles were created. The high summits of Ben Nevis and Bidean nam Bian, overlooking Glen Coe, are also the result of much older volcanic activity, some 400 million years ago. The principal volcanic features are described below.

- Plateau basalts: Successive lava flows across the land created sheets of rock which were then differentially eroded to form a stepped landform of successive terraces rising to tabular shaped summits. This volcanic 'trap' landscape is particularly clear on Eigg with its precipitous An Sgurr, on the plateau of Sithean na Raplach on Morvern and on Ben Hiant on Ardnamurchan.
- Dykes: Dyke swarms occur as thin vertical sheets of lava. As magma was forced up to the earth's surface, it changed the character of the surrounding rocks through a process called 'contact metamorphism'. This created extremely hard metamorphic rocks. At the western end of Ardnamurchan they have resisted erosion and now form distinct ridges in the landscape. The Etive dyke swarm and Ossian's cave on Aonach Dubh are other well-known examples in the Lochaber area.

- **Calderas:** The ancient caldera that forms the basis of Glencoe is not only distinctive but renowned for being the first ancient caldera recognised in the geological record.
- **Outcrops:** Across Lochaber conspicuous outcrops of metamorphic or igneous rock, such as the red granite outcrops within River Nevis, stand out in the landscape, often giving rise to the peaks' traditional Gaelic names.

### *Glaciation*

The last major ice sheet began to develop about 29,000 years ago and had largely disappeared by some 13,000 years ago, although followed by a brief re-advance around 11,000-10,000 years ago. Relics of this glaciation are everywhere in Lochaber. A reservoir of ice accumulated over Rannoch Moor and over the hills west of the Great Glen. These ice sheets lowered hills and scoured glens, destroying existing landforms and drainage patterns and creating distinctive glacial features and forms. Some of the principal glacial features are described below:

- **Glacial troughs:** As glaciers passed along the narrow pre-glacial valleys they scoured them down and outwards creating a distinctive parabolic shape, known as a 'U' shaped valley. Every glen in Lochaber has been affected in this way and exhibits this profile to a greater or lesser extent, especially in its lower reaches due to the abrasive power of rocks picked up by the moving glacier. Burns that had once trickled into the pre-existing glens became stranded high above their over-deepened floors, and now flow from truncated hanging valleys, tumbling through deep ghylls or as waterfalls into the glen. Many of these have been traditionally used as passes through higher ridges such as Lairig Gartainor and Coire Gabhail between Beinn Fhada and Gearr Aonach.
- **Corries:** Vast concave hollows at the heads of glens, cut by glaciers, are wide spread in mountainous parts of Lochaber, at the head of glaciated valleys or sunk into the hills that overlook the glens. Fine examples can be seen in the Mamore Forest overlooking Glen Nevis, along Glen Coe and along Glen Tarbert. Where two or more corries developed around a single hill, they sometimes became separated by only a thin crest of rock known as an arête. Corries tend to be more frequent on north-east facing slopes of mountains, indicating that glacier development was influenced by snow blow from prevailing south-westerly winds. The dramatic ridges and corries throughout the area, such as those on Ben Alder, Creag Meagaidh and Beinn a'Chlachair, were all formed by ice grinding over the rocks.
- **Ribbon lochs:** In the Western Highlands, pre-glacial burns and rivers often followed fault lines, where previous earth movements had shattered the rocks, providing an easier passage. Subsequent glaciers were also channelled westwards cutting deeply down into these fault lines, where the hard glen walls provided greater resistance. Trapped meltwaters formed lochs which are characteristically long and thin and extremely deep, the deepest freshwater Loch in Britain, Loch Morar was formed in this manner, its floor is considerably below sea level. Where these lochs and glaciated glens are breached by the sea they form fjords such as Loch Linnhe and Loch Sunart. The steep scree covered sides and water in the base means that the land is often of little value except to forestry and hydroelectricity generation.
- **Moraines:** Glaciers retreated to leave deep layers of glacial till, sometimes piled into thick mounds of terminal moraine, such as near Spean Bridge, or deposited along the glen sides as lateral moraine. Smaller glacial deposits often flank the flat glen floors and corrie bases, such as Coire Adair. Found along many of the glaciated glens, they

constitute patches of hummocky glacial drift and support rough grazing; this is an extensive feature across Rannoch Moor and are found in partnership with small lochans, or kettleholes, often filled with water, giving rise to the 'cnocan and lochan' landscape. Moraines can be seen in the rolling landform north of Fort William and in Glen Dibidil on Rum.

- Meltwater landform: When the ice melted, vast quantities of rubble and till were washed into and deposited in the glens. These can be seen in the outwash terraces of Glen Spean and Glen Roy, the outwash deltas at Ballachulish and Corran (which also has a post glacial raised beach), and outwash spreads at Loch Morar and Loch Shiel (Kentra Moss nature reserve), around Acharacle.
- Erratics: These are a common feature in these areas, notable examples include those on Rum and Rannoch Moor. The granite erratics of Rannoch Moor illustrate the type of load once carried by the ice; indeed the whole of the Moor's surface is dotted with glacial debris and pitted with lochans filling ice-gouged hollows and kettleholes. The Kinlochlaggan Boulder Beds, thought to be remnants of prehistoric glaciations, are designated as a geological Site of Special Scientific Interest (SSSI) but are less easily discerned from the road through the area. These boulders, deposited by the ice, can be large in scale and are often unrepresentative of the local geology. On Rum the rocks are found nowhere else on the island.
- Many fine examples of glacial polishing can be seen in the glens of Lochaber, including ice-smoothed rock knolls termed roches moutonnées, such as those south of Kinloch Glen, and grooving on the rocks. Their shape and the striations caused by the ices indicate the direction the ice was travelling.

### *Coastal Features*

Sea lochs, chains of islands, narrow peninsulas, rocky outcrops, forested ridges and sheltered bays form a diverse and extensive coastline. The coastline bears testament not only to the forces that shaped the landscape but also the erosive influence of the North Atlantic.

The sea lochs Lochaber is named for, such as Loch Etive and Loch Linnhe, are long and deep fjords. They lead far inland so the distinction between coastal and inland landscapes are blurred.

The ragged fjord coastline means that a continuous road alongside is not possible and some peninsulas have limited road access, for example Ardnamurchan. The most westerly point in mainland Britain is found a few kilometres from Ardnamurchan Point lighthouse at Corrachadh Mor, the inaccessibility emphasising its extremity. These areas and the Small Isles are defined as much by their coastline and relationship to the sea as their landforms and the sea can dictate the timings of arrivals and departures from these places as well as the mode of transport.



*The indented coastline on the north shore of Loch nam Uamh ©Lorne Gill/NatureScot*

Raised beaches/shoreline platforms can be seen at places along the west coast and within Loch Linnhe. The main areas are on the north shore of Ardnamurchan, between Glen Drian and Ockle, and on the south coast at Glenborrodale. Other examples are on both shores of Loch Moidart, on the northwest coast of Eigg (accommodating the crofting township of Cleadale) and in Loch Linnhe, south of Corran. They comprise a flat coastal platform backed by a cliff line, often some distance from the present shoreline, created by geological changes. In this area they chronicle the growth and decay of ice sheets during the Quaternary Ice age, causing both sea level changes and isostatic rebound of the land once freed of the weight of ice.

Rocky beaches, often dotted with walls and peninsulas formed from dykes, ice smoothed rocks and sea caves such as Massacre and Cathedral caves on Eigg and Glendrian Caves on Ardnamurchan form due to the changes in resistance of the diverse geology.

The steep rocky coastline means that coastal habitats are limited and the narrow coast margins leave space for few sandy beaches, shingle being more common in the small bays. Rum has a few small sandy beaches, Rhu Point near Arisaig and Bay MacNeil on Ardnamurchan are also notable and accessible.

Machair, fertile and species diverse low lying grasslands found along the exposed coastline, is found at Sanna and around Ardnamuchan Point on as well as in places on Rum.

There is saltmarsh found at Kentra SSSI. Intertidal mud flats with fragmented saltmarsh is also found at Kinlochmoidart with its mosaic of land and water with sinuous creeks and pans of open water nestled in green vegetation. There are also limited salt marshes at the head of sea

lochs and firths where sheltered conditions allow the deposition and accumulation of fine sediments.



*Salt Marsh at Inverie ©NaturesScot*

### **Climate and weather**

The local climate of Lochaber can vary greatly. The main factors affecting this are related to the proximity to the sea and altitude, however the aspect of a place can have a significant local impact, especially at higher altitudes. The eastern edges of the Lochaber area, such as Craig Meagaidh Reserve, are in the Central Highlands giving it a climate midway between the oceanic climate of the West Highlands and the drier, more continental climate of the Cairngorms.

Within a small area there can be a wide range of local climatic conditions created in part by the difference in altitude from sea level to the 1345m summit of Ben Nevis. The local climate ranges from cool and wet on the lower ground to extremely cold and wet on the summits. The levels of exposure on the summit plateaux are extreme, with very severe winters. In east or north east facing corries and sheltered areas, the winter holds for longer and the snow melts late into the spring. Snowfall is highly variable: in some years snow patches remain on Ben Nevis for most of the year, and this has given rise to snow-bed plant communities with associated invertebrate species.

In contrast the coastal areas are mild with mild winters (temperatures between 7°C and 1°C) and cool summers unlikely to go above 20°C. The prevailing wind direction is south-westerly, bringing salt-laden moisture from the Atlantic to the coastal areas. This has a moderating effect on the temperature such that winter frosts tend to be less severe and of shorter duration by the coast compared with inland.

The area also has low sunlight, highest in May and June and with rainfall falling on about 181 days a year, mostly in the winter, the rainfall in Lochaber is the highest in the British Isles. There is considerable variation from the coastal figures of about 1600 mm per annum around Arisaig to over 3000 mm around Glen Finnan and Ben Nevis.

The predominantly cloudy conditions help to buffer the temperature, resulting in the relatively mild climate at lower altitudes. The western coastal fringes enjoy more hours of sunshine than around the mountain ranges to the east, which often retain cloud cover.

Inland, the combination of wet and cooler conditions, which suppress decomposition, and the generally acidic geology, has given rise to peaty soils and a profusion of lower plants such as mosses and liverworts. The extensive blanket bog habitat covering Rannoch Moor in eastern Lochaber is dependent on high rainfall and atmospheric humidity.

Current predictions on climate-change suggest that over the next few decades we will see a shift towards warmer, wetter and windier conditions in this area. Such changes could lead to a variety of effects on the natural heritage, including a decline of alpine habitats and an expansion of wet heath.

Sea level rise is not thought not be a major issue in this area, as the land itself is rising. However, our seas contain a number of species that are on the edge of their range and could be lost if sea temperatures rise

### **Soils**

After the ice ages, the thin soils that developed would originally have supported a mix of woodland that gradually petered out at an altitude of approximately 600-700 metres above sea level. The lower, more sheltered areas would have contained a mix of oak, pine, and birch with shrubs forming a mosaic of varying densities of stands and open spaces. At the time of maximum coverage, perhaps as much as sixty five percent of the land would have been wooded. The mixed woodland on the lower, northern shores of Loch Laggan may be a remnant of these areas, surviving on the steep slopes that are unsuitable for cultivation or settlement, and which are mostly inaccessible to grazing animals. A period of reduced grazing pressure in the past may have allowed the establishment of this woodland. Above the tree line, grass heaths, bogs and grasslands occurred. Natural rather than man-made montane grasslands, associated with late snow-cover, would also have been on the high plateaux of Ben Alder and Creag Meagaidh, and are still present today.

The interior of Lochaber is notable for the high levels of montane soils in the upland areas and immature soils present in steeper area. There is a prevalence of peaty podzols around these areas with more prevalent closer to the coast. Mineral gleys on the peninsulas and small isles are evidence of the volcanic past of Small Isles, Ardamurchan and Morven. The varied geology of the area also leads to some very localised soil type patterns. The stepped basalt landscape of Morvern, parts of Ardnamurchan and the Small Isles and in the crofted basalt coast of the Small Isles have evolved from the basalt steps a basic friable brown earth weathered which now support a rich resource of agriculture and forestry.

A thin outcrop of Dalradian limestone running into Appin and Ballachulish produces another band of brown earths with corresponding different vegetation linked to its lower acidity. Outwith these areas very little of the soil of Lochaber is considered suitable for anything but rough grazing and grass pasture (the lower end of capability classification 5 and 6). Forestry is limited to the valleys and loch sides as higher ground is mainly unsuitable, there are however remnants of test from the early days of nationalised forestry. Lower slopes soils grade from low nutrient status peaty gleys to flushed water gleys and forested brown earths with good nutrient status.

Peat is formed in waterlogged areas with a deficiency of nutrients and low oxygen areas, meaning that the plant matter decomposes much slower, in very wet climates, like Lochaber, peat can also grow on light slopes and plateaux if it is sufficient wet for sphagnum and similar bog mosses to grow.

Deforestation due to climatic and human influence about 6000 years ago led to the creation of blanket bog. In Rannoch Moor the resulting peat can be up to 6 metres deep due to the layer of impermeable granite underlying it and the rim of mountains surrounding and draining into it. When the West Highland Railway laid tracks across the moor the bog was so unstable that the track was laid on a floating bed of turf, brushwood and ash.

With frequent rainfall, mists and fogs the soluble nutrients in the soil are gradually flushed out to leave the ground waterlogged and infertile. Many species of Sphagnum are ideally suited to these conditions because they survive on very little nourishment. Gradually the mosses smother the ground with their colourful carpets and radically change the nature of the landscape and their environment. The normal organisms which break down dead plant material cannot survive in this soggy mat of plants, which is without air, very acidic and almost devoid of nutrients. Consequently layers of dead Sphagnum beneath the living surface do not decompose, but accumulate slowly, forming a new soil which we know as peat.

The accumulation process is very slow, perhaps no more than 1mm every year, but the process has been going on for some 3,000 to 7,000 years, with the result that in some places almost the entire original landscape is now hidden beneath a blanket of up to 6metres of peat bog. Rannoch Moor is classified as nationally, and recognised internationally, important carbon rich, deep peat and priority peatland habitat of high conservation value, as are areas around Blackwater reservoir and both exhibit the characteristic hummocks and hollows. There is less high quality peat land towards the coast where much of the upland areas are too steep.

### **Hydrology**

The area is notable for its large, deep lochs which occupy the various glens. Geographical focus of the area is Loch Linnhe, following the path of the Great Glen fault it marks the geographical split between the north and south of the fault with a physical boundary, reinforcing Fort William's past strategic importance.

Lochs Ericht and Laggan are amongst the largest in Scotland, and are extensive long, narrow areas of water that which reflect the deep, straight sides of the glaciated valleys they occupy. The original depth of Loch Ericht which reaches depths of was 156 metres where the ice was concentrated in the narrowest part of the valley. The loch overlies the Ericht-Laidon fault and follows the valley formed by the ice exploiting the fault line weakness. Loch Laggan and

Lochan na-h'Earba follow a similar pattern on different scales. Both Loch Laggan and Loch Ericht have been dammed for hydro-electricity generation. Loch Pattack is a rounded, open loch with indented edges formed in the wide basin of peaty bog in the heart of the area, another feature of glaciation. Rivers and burns flow from the high ground into these lochs. The largest, and most dramatic, is the River Pattack which connects, albeit circuitously (passing out of this area to the east, then returning), to both Loch Pattack and Loch Laggan.

Lochaber drainage patterns are split across the great east-west watershed of Scotland, 'Druim Alban', which is only 20 kilometres from the west coast at Rannoch Moor and is straddled by Craig Meaghaidh reserve. This watershed indicates whether the rivers will drain east or west.

The direction of drainage can have a marked effect on rivers in this area. Rivers draining westwards are steeper and more erosive but much more limited in volume as their catchments are smaller. Rivers draining eastwards have greater volume by the time they reach the sea, such as the small River Ba, draining into River Tummel and onto River Tay. The Ba is less than 5km from River Etive, draining West, they overlap in their east west journeys demonstrating how convoluted the watershed is at that point.

The shorter west draining rivers generally have high mountain catchments, like the Nevis with its source in the Mamores. They are often fast flowing in their upper reaches, and can frequently be in spate, as are the burns that feed it.



*Spean Gorge ©NatureScot*

Confluences of these rivers occur at point where the glaciated valleys meet and waterfalls are common. A particularly well know example is the Meeting of the Three Waters in Glen Coe, a waterfall that collects water from three burns as they join the River Coe.

Large boulders are common, showing the force of these rivers in flood and most carry a large gravel load due to unstable nature of the soil in the mountains feeding them. This means the rivers can stand out for the colour of their beds, such as the white quartzite in the Nevis.

There are a few occurrences of oligotrophic loch habitats (characterized by a low accumulation of dissolved nutrient salts, supporting but a sparse growth of algae and other organisms, and having a high oxygen content owing to the low organic content), for example Loch Morar and Loch Sheil with either low nutrient levels leading to poor but highly adapted biodiversity, and the River Strontian is designated a SSSI for its oligotrophic habitat.

A number of lochs and rivers have been modified to produce hydroelectric power, including Blackwater River, now controlled by release from Blackwater Reservoir and accompanied by a parade of pipes towards the pump house and generator.



*The Blackwater Reservoir ©Lorne Gill/NatureScot*

Lochs such as Loch Laggan have visible drawdown margins due to their part in harvesting; however the controlled rivers, like the Spean, are less likely to flash flood and are a decorous reminder of their natural state.

### 3. HUMAN INFLUENCES

#### History

The shapes and forms of the landscape are almost wholly the product of earth movements, volcanic activity and natural erosive forces. But the surface of the landscape, in supporting generations of people who have gleaned crops, meat, fuel, timber, minerals and shelter from it, has changed markedly from the land on which human beings first settled about 8,500 years ago. Through these millennia, societies evolved and learnt to make use of the resources at hand, causing widespread changes to the landscape over time. Sometimes this change to the landscape has been gradual, sometimes sudden or sporadic, mirroring the recurring social upheavals, caused by war, disease and famine, which are renowned in Highland and Scottish history.

Before human settlement, it is believed that Lochaber's landscape was likely to have been wooded up to the higher mountain slopes, to about 600 metres above sea level. Landscape change since this time, due to clearance by human settlers and climate change, has involved the gradual loss of this woodland, its replacement by moorland and, in the straths, farmland. More recent times have seen the development of towns and villages, communication routes, afforestation by non-native species of tree, the loss of old farming systems and the emergence of reservoirs and windfarms.

#### ***Mesolithic and Neolithic***

Pollen evidence suggests that at the end of the Ice Age, the landscape of Lochaber became well wooded with thick oak and ash woods in the glens and on the lower slopes, and birch, pine and juniper on the higher slopes, with only the mountain peaks free from trees. The scant evidence left from that period suggests that the earliest Mesolithic settlers settled on the coast and islands where they could live by fishing and hunter-gathering. Finds of microliths and small stone tools from this period have been found on the Isle of Rum as well as the remains of lightly built structures and this rare settlement site is now protected as a scheduled monument. However, remains from this period are not prominent landscape features and the only visible traces are mounds of waste known as 'shell middens', of which there are examples on the Isle of Rum and on the island of Risga in outer Loch Sunart, Ardnamurchan, with both being protected as Scheduled Monuments. Interestingly, bloodstone from Rum has been found at several settlement sites throughout the area, for example at Loch Doilean. It has been suggested that this reflects a social network of exchange extending around Rum through much of Lochaber

Pollen records indicate distinct changes in vegetation between 3,500 and 3,000 BC, when a decline in tree pollen suggests forest clearance and a simultaneous increase in grass and cereal pollens. It is thought that this reflects the presence of the first farming communities and this period is referred to as the Neolithic. These communities raised livestock and grew cereals.

The number of known Neolithic settlements is small and visible evidence of human activity in the landscape comes mainly from funerary and ritual monuments, in particular from a type of communal tomb known as a chambered cairn. Examples survive at Kilchoan, Swordle Bay and Cladh Chiarain on Ardnamurchan. These tombs would have been prominent features when built and would have had important relationships to the surrounding lands and

landscapes; for example, all the tombs on Ardnamurchan seem to be associated with coastal bays, which presumably may have hosted the settlements of their builders and their descendants.

### ***The Bronze Age and Iron Age***

During the Bronze Age it is typical in Scotland for evidence of settlements to survive at relatively high elevations, which is thought to reflect population growth and/or climatic changes. The traces of these settlements are identified as circular footings called hut circles, and there are some examples on Eigg and Canna; however, comparatively few of these settlements seem to have been identified in Lochaber and few Bronze Age artefacts have been found. Axe heads and dagger blades found by the River Lochy and Loch Doilean were exceptional finds, and, as with the Neolithic period, evidence of human activity is mainly confined to monuments relating to burial or ritual practices. The form and the architecture of the burial cairns changes, and so too did the burial practices associated with them, but they still tend to be found in coastal locations. These monuments still have an important link to the landscape with some clearly placed on high slopes to be prominent and with wide views. There are scheduled examples at Killundine in Morven and Resipole in Sunart. Standing stones and stone circles are also typical monuments dating to this period, of which there are relatively few in Lochaber, but there is a scheduled example at Branault in Ardnamurchan.

There are indications that the peat moorlands had begun to develop by around 1,500 BC. This was partly as a result of the high rainfall and may have also been accelerated by anthropological forest fires. In some places this peat can cover and preserve Bronze Age artefacts and structures and a famous example of this is scheduled at North Ballachulish Moss. Here a basin in the peat has been found to contain a timber and stone platform thought to relate to prehistoric ritual belief. There is also a concentration of burial mounds in the surrounding area. The famous Ballachulish Goddess, now in the National Museums of Scotland, was also found nearby preserved by the peat. This wooden statue, carved from alder, is thought to have stood upright, overlooking the mouth of Loch Leven around 600BC and perhaps represented a goddess or supernatural being. It certainly confirms that this part of the Lochaber landscape was viewed as a special place by the people who lived there.

The late Bronze Age and early Iron Age (from around 3,000 years ago) were distinguished by the building of stone-walled hillforts (or duns). This change in settlement pattern, with the creation of defended settlements may have been built partly in response to the wetter and colder climatic conditions that occurred around this time and the resulting pressure on resources.

The Iron Age came to Scotland around 600 BC and seems to have coincided with clearance of the native woods and the spread of moorland.

Lochaber has many circular forts, defended by stone and earth banks, known as duns, along the coasts of Morven, Ardnamurchan and the Small Islands, but also sometimes placed strategically in glens. These duns typically are placed on easily defended knolls, slopes or areas of the coast. The inhabitants would have kept watch over, and defended, important routes along the coasts and through the glens. Many crannogs (small lake dwellings) are also Iron Age and these remain as small, tree-crested islands.

### ***Medieval Lochaber***

The Romans invaded Scotland several times between 79 AD and 367 AD, but never settled Highland Scotland. Perhaps, and partly because of this, there is much continuity between the Iron Age and early Medieval period in Lochaber. It is thought that at least some of the duns, or forts, continued to be occupied, like Dun Deardail in Glen Nevis with its impressive vitrified ramparts and ditches.

A tribe we know as the Irish 'Scotti' are thought to have begun settling in western Scotland from about 500AD. Certainly, links across the Irish Sea were incredibly important during this period and there are likely to have been a number of tribes, or social groups, competing for the best land and control of the sea. An exceptionally rare and fine group of burial mounds likely to date to this period has been identified on Eigg at Laig Farm. They are positioned next to good farmland with splendid open views over the sea to Rum, and neatly illustrate the importance of both sea travel and control of the thin tracts of good farmland that characterise the area.

The arrival of Irish missionaries in Western Scotland, such as St. Columba, in the 6<sup>th</sup> Century led to the introduction and spread of Christianity, at which point the area starts to enter the documentary record for the first time. Islands were favoured as the locations for monasteries and the sense of separation they provided seems to have been important to the early Christians. A cross is thought to mark the site of monastic settlement at Keill on Canna, which is connected to St Columba and the Monastery of Iona. A little to the west at Sgorr nam Bannaomha is a cashel, the remains of a drystone enclosure around several small buildings. This even more remote site was possibly a retreat from the main monastic site at Keill, but its name translates to the Headland of the Holy Women, which could suggest different associations. Early churches on the mainland are likely to have been first established along important routeways and may underlie medieval and later foundations, such as Cille Choirill Church near Roybridge in Glen Spean.

Knowledge of early medieval secular settlement in Lochaber is scant. Archaeological excavation at Loch Doilean has shown that small flat platforms terraced into the hill and sometimes mistaken for charcoal burning platforms were occupied by round timber structures dated to the 11<sup>th</sup> and 12<sup>th</sup> Centuries AD. We have much to learn about how widespread these settlements were, and the economy of their occupants.

Vikings were active along the coast during the eighth and ninth centuries. In 2011, a Viking ship burial, probably dating from the 10<sup>th</sup> Century, was unearthed at Port an Eilean Mhoir on Ardnamurchan. The burial was in the vicinity of earlier cairns, including the chambered cairn at Swordle. This emphasises how burial cairns from many thousands of years earlier remained important landscape features.

A well-established settlement pattern had developed by 1100, still mostly on the coast and along the glens, with scattered villages, known as clachans, held by joint tenants. Their locations can still be identified by the presence of low footings in some of the Highland glens. Others are likely to underlie surviving settlements and farms. The development of this Highland society accompanied a further phase of deforestation in Scotland, between AD 800 and 1100. Cutting and burning extended cultivation and pasture along the straths and glens

and into the foothills, and foraging by cattle and pigs, further eroded the woodland edge, impeding regeneration.

The area's great medieval rulers built and defended stone castles at strategic points controlling the mouths of glens and sea lochs. They often used the site of earlier forts or duns and a great example is Castle Tioram, which guards the entrance to Loch Moidart. The medieval Scottish kings never really succeeded in bringing the west of Scotland firmly into their orbit of feudal control. Their principal way of doing this elsewhere in Scotland was by giving lands to their supporters who exerted control on their behalf from mottes or castles. There is an example of a motte at Keppoch in Glen Spean, but they are very rare in the western Highlands, which reflects that many parts of the Highlands lay beyond the direct influence of the lowland government.

Inverlochy survives as one of the most important castles in the area and in part dates from the 1200's, when it was built by the 'Red' Comyns, lords of Badenoch and Lochaber. It was built to control access to and from the Great Glen and passed into Royal control early in the 14<sup>th</sup> Century. The struggle between the kings of Scotland and the Lords of the Isles is well illustrated by the first Battle of Inverlochy, the site of which is designated as a nationally important Historic Battlefield. The battle was the culmination of six years of effort by King James I to bring the Highlands fully under his control and reduce the extensive power of Alexander of Islay, Lord of the Isles. The King's forces were attacked at Inverlochy Castle and Alexander's forces inflicted one of the most serious defeats ever suffered by a Royal army in the Highlands. After he lost this battle, James I was forced to make use of Alexander's power as Lord of the Isles to control the region, rather than continue to attempt to break the lordship's hold on the region and this control endured until the mid-18<sup>th</sup> Century.

Other castles, like Tioram, were seats of the Gaelic lords, and Morvern has the 15<sup>th</sup> Century Glensanda, seat of the Macleans of Kingairloch, the 14<sup>th</sup> Century Ardtornish, stronghold of the Lords of the Isles, and Kinlochaline, the seat of the MacInnes. The castles are testament to the power and wealth of Highland chiefs and their clans, and their fortifications indicate the rivalry and feuding endemic to the area.

These feuds have been inextricably linked to the places where they took place by names and folk tales. One instance is the grisly-named Massacre Cave on Eigg where, in 1577, a group of Macleods from Skye landed on the island as part of a feud with the Macdonalds. The entire population of the island hid in the cave for three days and the Macleods were unable to find them. However, as they sailed away, they spotted a lookout and were able to follow his footsteps in the snow, which led them to the cave. The Macleods built a huge fire and the smoke killed 395 people trapped inside the cave. Later, other Macdonalds were to exact equally bloody and ruthless revenge on the Macleods. The historic battle of Mulroy in Glen Spean is known as the last clan battle in Scotland and was fought in 1688. The battlefield is designated in recognition of its National Importance.

The pattern of settlement that developed from this period is likely to have been a scattering of small villages, or ferm touns, around which the intensively cultivated or in-bye land was concentrated. Beyond this was the less intensive out-bye land and the communal grazings. The sites of four ferm touns are located on the Creag Meagaidh National Nature Reserve. As population increased, the arrangement of ferm touns probably became more regular. Transhumance, by using high summer grazings based around shielings, was common and

examples of these structures can be found preserved as low footings, always beside good pasture and a source of water, in upland glens. It is important to understand that the economy of these settlements, and the rulers they supported, extended throughout the landscape. It included the townships and their cultivated land and the summer pastures, but it also included hunting. Elements of these activities can survive throughout the landscape and need to be understood as part of a wide system. Perhaps because of its remoteness there is a good survival of a range of these monuments preserved on Rum, where there are townships and shielings, but also deer traps, comprising systems of dykes that funnelled the animals for efficient hunting.

By late medieval times highland society had become arranged into a rigid family structure of clans, with each clan ruled by a Highland chief. The Highland chiefs tried to maintain as many people as possible on their lands in order to maximise their fighting force and reinforce their territories.

Exploitation of Lochaber's forests continued slowly but surely throughout the medieval period, into the 17th Century and beyond. It was cut for domestic fuel and to deny refuge for wolves and outlaws, and charcoal was manufactured widely to provide fuel for iron smelting. By the 15th Century, the straths and glen bottoms were almost bare of trees. In the 17th Century, Lochaber provided an important source of timber for shipbuilding; pine trees for ship masts were cut and exported from Ardgour and the shores of Loch Arkaig. The proverb 'B'e sin fiodh a chur do Loch Abar' – equivalent to 'sending wood to Lochaber' - indicates that it was abundant and important to the economy in the area.

#### *The Jacobite Rebellions*

Following the Union of the English and Scottish Crowns in 1603, attempts by the English Parliament to control Scotland, struggles over Royal succession and religion led to much conflict. Battles were fought across the Highlands, many in Lochaber, such as the second Battle of Inverlochy between Loyalists and Covenanters in 1645. The battlefield is designated as nationally important. Divisions between the Crown and supporters of a Jacobite succession emerged in 1688 with historic feuds amplified by alliances to either the exiled Stuarts or the Crown. These differences led to the massacre of the MacDonalds by the Campbells in Glen Coe in 1692. During the troubles many castles were burned and the fighting laid substantial areas of farmland to waste. These disputes and atrocities are deeply embedded in perceptions of the area and find physical expression in memorials, but also other less formal monuments, such as the Henderson Stone, or Clach Eanruig, near Glencoe.

A 17<sup>th</sup> Century description of Lochaber summarises the advantages and disadvantages of the locality: "*Lochaber enjoys pastures and woods, does not lack veins of iron, is not particularly fertile for corn, but yields to scarcely any in fish-bearing lochs and rivers ...*";

The early 18<sup>th</sup> Century saw further change to the Highland landscape with the increasing power of British commerce. Cattle rearing proved to be profitable for chiefs and this encouraged a switch from traditional mixed farming to specialised livestock rearing. Early transport routes in the area developed as droving roads to move cattle to markets further south and improved communication between settlements were established. Local industrial enterprises responded to a more flexible approach to economic development. An 'iron mill' was already established at Achnacarry in the late 17<sup>th</sup> Century, and coppiced woods became

established to provide fuel for the iron industry in England and local smelting. Stone quarries and lead mines, still visible at Strontian, were also developed from the 18<sup>th</sup> Century. All such speculative ventures further reduced the Highland's remaining native woodlands but are now interesting historic monuments in their own right and recognised as nationally important.



*The Glenfinnan monument at Dail an Tuir ©Lorne Gill/NatureScot*

Perceived as a remote and inhospitable place with a different language and culture, Lochaber was left largely to its own devices by central governments. However, the adherence of some clan chiefs to the cause of the deposed Stuarts made it a target for the Hanoverian British government in the late 17<sup>th</sup> and early 18<sup>th</sup> Centuries. The Jacobite rebellions of 1689, 1715 and 1719, either began in, or were confined to, the Highlands. These resulted in the government building several garrisons, including Fort William, where soldiers were positioned to police rebellious clansmen. A network of military roads, replacing the rough drovers' tracks, was initiated by General Wade and extended by Major Caulfield. These allowed rapid movement of troops and more effective policing. These roads can still be seen in Lochaber, north of Fort William along the Great Glen, and on the south west edge of the Mamore Forest, through Kinlochleven and around Rannoch Moor. The latter now forms part of the route of the West Highland Way. The road constructed along Loch Laggan linking Speyside and Lochaber forms the basis of what is now the A86 trunk road but was the direct route between Fort William on the west coast and Ruthven barracks near Kingussie, establishing its strategic importance. Today, the most noticeable differences between Loch Laggan and Loch Eribri is that the latter is not a transport route. The land surrounding this area is remote and mountainous, with no through or connecting routes other than the A86.

The fourth and final Jacobean rebellion was led by Prince Charles Edward Stuart in 1745, landing at Loch nan Uamh and raising an army in the Highlands. Finally defeated at Culloden,

the reassertion of control by the British government led to the suppression of the Highland clan system and set in train large scale changes in land ownership and use, which in turn radically changed the appearance of the landscape

### ***The Highland Clearances and Agricultural Improvements***

During the second half of the 18th Century, overpopulation had increased the size of the old clachans which could now barely be sustained by the land. Farming techniques were improving rapidly in the more fertile lowland areas and Highland landowners recognised a need for more commercial development in order to avoid ruin. Enforced recruitment for Highland regiments led to some depopulation between 1756 and 1763, and rapid agricultural change in the late 18th and early 19th Century led to the removal of many thousands of people from the land to make way for commercial sheep farming. Laggan parish records show the number of sheep in the area increasing to 20,000 in 1790, by 1840 the flock had doubled to 40,000. The grazing of sheep probably prevented the regeneration of existing woodland.

These 'Highland Clearances' form an emotive event in Scottish history, especially in localities still raw from the demise of their hopes for the return of a Catholic monarch. They resulted in the emigration of over 40,000 people by 1808, many leaving in ships from Fort William. Often people were relocated to another part of the estate to continue fishing, farming or kelp gathering. The remains of the abandoned townships, fields and shielings are extensive and important in Lochaber; for instance in Ardnamurchan and Morvern. The Highland Clearances were not a single event but occurred over 150 years with a number of drivers behind them, from the Dukes of Argyll's decision to auction their leases in 1710 onwards, through changes in land ownership in the aftermath of the Jacobite rebellions. Comparable tenancy changes occurred across Europe, mostly earlier, with the advent of the agricultural revolution and the advent of the industrial age but in this area they occurred against a culture already in disarray.

The effect on the landscape was profound, first by making way for extensive sheep grazing, and secondly, by creating the crofting system. Crofts were established as small farm holdings, generally in groups, whose tenants were obliged to take on occupations in addition to farming, including fishing and kelp farming. Crofters were an important workforce which land owners could draw from when necessary. Crofting patterns varied across the Highlands, but in the west, and still apparent in many parts of Lochaber, usually took the form of farmed strips extending back from a road or loch edge, with a single cottage located within each.

By the 1820s crofts had been established along much of the accessible parts of the west coast of Lochaber and on sheltered parts the Small Isles. Sometimes townships grew where crofts proliferated or where a few groups became amalgamated. For example, on the forfeited Lochiel Estate, small tenants were removed from Glen Dessary and the shores of Loch Arkaig. Resettlement took place on crofts lotted out on the shores of Loch Linnhe at Banavie and Corpach. Other crofting townships were widespread in Lochaber, including Caol, Lochybridge, Achintore, Ardour, Strontian, Acharacle, Roybridge and Spean Bridge. At the same time, burning of forests and the proliferation of sheep and deer were further eroding the upland forests and preventing their regeneration. Peat accumulated and heather, bracken and deergrass spread.

### ***The 19<sup>th</sup> Century***

Increased exploitation of the Highlands' natural resources led to a need for improved access and communication. The military road system was extended during the 18th Century and was followed by an infrastructure building programme driven by economic requirements. The early 19th Century saw the building of Telford's 60-mile Caledonian Canal which created many jobs for local crofters and helped to establish crofting townships in the Great Glen. The eight locks of Neptune's Staircase at Banavie form one of the best known features of the canal.

Land management in Lochaber in the 19th Century can be characterised as one almost entirely focused on the development of extensive sheep farming (although cattle remained a feature). This was followed by the gradual development of deer forests, particularly in the last quarter of the century, when large tracts of land were given over to game shooting and estates were sold and reorganised into large sporting estates.

In 1846, potato blight caused starvation amongst crofters and decimated many remote rural communities. Thousands of people emigrated abroad, leaving deserted settlements such as Auliston in Morvern and Swordle in Ardnamurchan. Between 1800 and 1920 the population halved in Lochaber.



*Ruined croft houses at Ru Arisaig ©Lorne Gill/NatureScot*

Some of the remaining crofts were amalgamated into larger farming units but crofting survived on the relatively fertile ground of the islands and loch edges. The living conditions of the people displaced from these areas became the source of concern in philanthropic circles in Britain and a Royal Commission in 1895 was appointed to restore smallholders to the land they were removed from. The Crofters' Holdings (Scotland) Act, 1886 created legal definitions of crofting

parish and crofter, granted security of tenure to crofters and produced the first Crofters Commission, a land court which ruled on disputes between landlords and crofters.

The 19<sup>th</sup> Century also saw the rise of sporting estates and the expansion of deer forests at a time when sheep farming was becoming less profitable. By 1844 Ben Alder and Ardverikie estates were let for deer forest. Sheep numbers were reduced, access tracks constructed, and trees were planted to provide shelter, in a reversal of the deforestation that had prevailed until then. The arrival of the railway brought with it affluent visitors with an interest in deer stalking. Newly prosperous industrialists, such as the Bullough family brought the existing estates and created grand houses such as Kinloch castle and shooting lodges. These became centres of local employment for crofters.

The railway also brought the first influx of tourists intent on exploring scenery written about, especially by the romantic poets, and glimpsed through paintings and, increasingly, photographs. Many hotels were built at rail terminals to accommodate them. The Light Railways Act in 1896 allowed completion of the West Highland Railway from Fort William to the coast, and Mallaig grew to support the quay and serve the expanding steamer traffic to and from the islands. The Caledonian Canal began to lose its original, purely industrial purpose and became a tourist attraction following a cruise down it by Queen Victoria in 1873.



*Taigh na Slataich, Slatlach House, Loch Shiel ©Lorne Gill/NatureScot*

The shooting lodges built were often constructed in ornate styles, for example, the turreted gate lodge at Kinlochlaggan. Ornamental planting was carried out around these buildings was carried out, and remains to this day. A number of designed gardens were also created (or re-created) during these times. Achnacarry, near the mouth of Loch Arkaig, is seat of the Clan Cameron. Built in the early to mid-19th Century to replace the castle and grounds destroyed

following the 1745 rising, it occupies some 90 hectares, including parkland and woodland as well as a woodland garden and terraced garden. Ardtornish House in Morvern, at the head of Loch Aline lies within a small area of woodland garden and lawns. A lasting legacy of the gardens and policy woodlands planted are thickets of eye catching and invasive rhododendron.

### ***The 20th Century***

A steady increase in sheep and decline in cattle has occurred since the flock masters of the Southern Uplands began using the Highlands for grazing in 1790. The damage to woodlands by grazing and burning and the felling of native timbers continued into the 18th Century. But tree planting for both ornamental and commercial reasons was beginning in many parts of Scotland.

Afforestation increased with the establishment of the Office of Woods in 1909, followed by the Forestry Commission in 1919. Forestry was seen as a means of diversifying the Scottish rural economy, and marginal hill land throughout the Lochaber was considered suitable for the purpose. Most of the region's extensive conifer forests, mainly sitka spruce and larch, were planted between 1909 and the late 1970s bringing sweeping changes to the landscapes of Lochaber.

Industrial development remained very limited although electro-metallurgical industries made a strong start at Kinlochleven in the early 1900s. The presence of large water bodies in the area led to the development of several hydro-electric schemes. The first, completed in 1907, allowed the aluminium industry to flourish in the small village of Kinlochleven. The Kinlochleven Hydro-Electric Scheme was built by the British Aluminium Company between 1905 and 1909. It draws water from the Blackwater Reservoir, which is fed from Rannoch Moor. The demand for aluminium during the First World War brought an expansion of the scheme; 500 British soldiers and 1200 German prisoners-of-war constructed a 5-mile (8-km) long pipeline to bring more water from Loch Eilde Mor to the power-house adjacent to the site of the former Kinlochleven Smelter. Remains of the prisoners' camp survives and are protected as a scheduled monument.

In the 1920s a second hydro-electric scheme was set up by the British Aluminium Company at Fort William. In 1934, the British Aluminium Company completed the dam at Rough Burn and the lower parts of the glen of the Spean were flooded, causing a dramatic change to the landscape. In 1943 the Hydro-Electric Development Act was passed, and the North Scotland Hydro-Electric Board was set up to develop the hydro-electric potential of the Highlands. The first turbine station opened in 1948 in Morar. In the 1950s Loch Quoich was the scene of a dramatic change in the landscape. The waters of the loch were dammed, raising the level by 100 feet to accommodate a hydro-electric scheme. Landscape features were often lost during the creation of these reservoirs, such as the Glen Quoich Lodge. Today dams, overhead cables and turbine stations may be seen throughout much of the Highlands.

By the mid-20<sup>th</sup> Century tourism in the Highlands was beginning to increase again. At this time new roads were built and car ferry services introduced to serve the islands. As services improved there was a redistribution of population with a movement away from small glens and islands to small towns and key villages. In the 1970s the Ballachulish ferry, once linking Argyll with Inverness-shire, was replaced by a bridge.

Later in the 20<sup>th</sup> Century saw further landscape change. From the 1980s an increase in subsidies, such as grants provided by the Woodland Grant Scheme, led to an increase in deciduous planting, although the overall proportion of broadleaf species remains relatively low. Quarrying for building materials has also had an impact on the landscape; for example the granite superquarry at Glensanda, Morvern.



*Glensanda granite quarry ©NatureScot*

In 1966 an experimental fish farm was set up by Unilever, at Lochailort, to breed salmon and sea trout commercially. A number of fish farms have since been developed, changing the character of some lochside landscapes.

The landscape is gradually being made more accessible through initiatives such as the opening of the West Highland Way in 1980 by the Countryside Commission. The pathway follows old coach roads, military roads and drover's tracks. An increase in numbers of visitors following it has meant erosion along these can now be seen. The Land Reform Act 2003 Act gave everyone the right to access Scotland's land and inland waters, even without an owner's prior consent, provided such access is taken responsibly and subject to certain exclusions relating to the character of land. Although some conflict around wild camping has been experienced, this freedom has been attractive to visitors and allows for the better provision of long distance paths.

The last half of the 20<sup>th</sup> Century showed a very modest increase in the urban population. There has been an increase in households and the space requirement associated with these. It is inevitable that proposals for the development of light industry and tourist facilities should take place and these continue to increase. Many people still practise crofting and are part farmer,

part fisherman, but today tourism is the principal source of additional revenue. Today, there are increasing pressures from new development and road widening schemes associated with tourism and other forms of economic development, especially renewable energy.

From the late 1990's onwards the renewable potential of the area has been further exploited through the installation of wind turbines. This has been limited compared to many areas, in part by the inaccessible nature of many areas but more over due to the protected status of much of the area. There are no large wind farms: however single, mainly domestic sized wind turbines are present, especially along the coast and as part of community led projects on the islands. This may change as suitable land elsewhere is used.

Forestry in the Lochaber area continues to evolve, although the total area is low it is concentrated in valley floors and lower land meaning it is noticeable in its proximity to settlements and roads. It has not been as profitable or as extensive as in other areas and much forestry management in the area is shifting to a focus on recreation and restructuring to create a more mixed woodland with broadleaf as well as conifers. There is also natural regeneration occurring in places such as Craig Meagaidh where grazing pressures were reduced to allow woodland regeneration.

Changes in land ownership still shape the Lochaber and especially the Small Isles. The 2003 Land Reform Act, and subsequent versions, also provided for rights of community acquisition. Consequently community buyout schemes are increasingly changing the way that remote areas are managed. Eigg was one of the earliest Scottish community land buyouts in 1997; this self-governance and partnership with the Scottish Wildlife trust means that conservation is an important part of the community's land management. The world's first renewable energy grid is now powering the island. Ardnamurchan and Rum have also taken the route of community asset ownership. Part of the self-governance of these areas is the importance of attracting and sustaining a viable population. As well as renewable energy schemes, new crofts, social and affordable housing and community facilities are now visible in these areas.

Canna is held by the National Trust for Scotland and has been run as a hill farm using traditional agricultural methods with the objective of enhancing nature conservation since 1938. The cliffs hold internationally important communities of a number of seabird species and landscape change is limited by its management.

### ***Archaeological Sites***

Lochaber contains fewer known archaeological sites compared to the more densely settled lands of Argyll to the south. The severe relief and exposure of upland areas deterred permanent settlement of its mountainous interior, and, while glens provided more shelter and richer soils, dense woodland may have hindered the occupation and use of the interior. However, many areas possess important archaeological sites of prehistoric date, and 17<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> Century archaeology is also rich over much of the area. This extends across the landscape where the broader pattern of land use is reflected in shielings, deer traps and enclosures.

It is on the Small Isles and the mainland coast and glens that most archaeological sites are concentrated, ranging from prehistoric carved stones to forts, duns and settlements to early Christian crosses. The principal types of monuments are:

- Funerary and ritual monuments from the Neolithic and Bronze Age;
- Hut circles, duns and forts from the Iron Age and early medieval period;
- Early Christian crosses, carved stones and religious sites;
- Castles and churches from the medieval period;
- Abandoned and cleared settlements, field systems and enclosures from post medieval times.

Many burial cairns of the Neolithic and Bronze Age periods may have been largely lost or denuded through agricultural practices, forestry and peat growth. However, they may still survive below ground and many survive today as mounds or with chambers visible, for example near Rahoy in Morvern. Standing stones also dating from this time are rare; examples occur near Branault in Ardnamurchan. Duns and forts are structures that can have a wide range of dates, from the Iron Age to the early medieval periods. Duns and forts often survive as visible landscape features, occupying rounded knolls encircled by stony banks and sometimes associated with clumps of trees. Examples occur at An Dun in Glen Nevis and Dun Channa on Canna.

Another type of settlement, often in use from the Iron Age which survives today is the crannog (a partially or wholly artificial island), which was built from wooden palisades within lochs. These structures are still visible on Loch Arkaig, Loch Treig (and Loch nan Eala, Arisaig). Crannogs are often visible as stony islets topped with a central crown of vegetation. Recent work in the Western Isles has shown that some of these structures can have much earlier, Neolithic, origins

Abandoned settlements from post medieval times can appear as groups of low mounds and uneven ground, as well as ruins of stone buildings. Most common in Canna, Ardnamurchan, Morvern, Sunart and along Loch Shiel, they existed as part of a wider pattern of landuse, which also survives in visible cultivation remains (rig-and-furrow and lazy beds), enclosures, sheilings and other types of site.

## **Landcover**

### **Overview**

Although Lochaber is known for its wildness, all but the mountain tops are influenced by humans. Various types of vegetation are closely related to local topography and microclimate and are make significant in contributions to the landscape character types of the area, closely related to local topography and microclimate. Rough grassland occurs throughout the area, often associated with heather and bracken. The vegetation of the upper slope, for example of Ben Alder, changes to montane grassland, a rarer, more specialised mix of species that are suited to the harsh conditions of the tops. This grassland, as a thin covering, reveals the intricacies of the underlying landform.

Despite the history of cultivation, grazing and clearance, natural and semi-natural landcover such as broadleaf woodland, moorland and bog persist throughout the region. These occur in areas which have been difficult to cultivate, usually due to topography or drainage, and are of great value for nature conservation, supporting the rich variety of wildlife native to the area.

### ***Woodland and Forest***

The original natural woodland, which re-colonised all but the high summits and bogs of Lochaber after the last Ice Age, has now largely disappeared. Over the last 4,000 years settlers have gradually removed it to provide land for cultivation and grazing, and for timber. By the Middle Ages, lowland woods were small and scattered and heavily managed as coppice, and large woods yielded timber for shipbuilding and other construction. By the 1500's about 5% of tree cover was left. By 1750, the distribution of native woodland in Lochaber was quite similar to that of today. In the 18th Century, charcoal manufacturing depleted oak woods further and natural regeneration was prevented by the dramatic increases in sheep numbers. Today many of the remaining semi-natural woods continue to be heavily grazed by sheep and deer and, where regeneration occurs, birch and alder have replaced oak and pine.

Woodland is a prominent feature in the otherwise open landscape of the study area, in part because of its height and contrast to the open heather moorland and in part because it is concentrated in the valley floors and lower slopes where it is closer to transport routes and settlement. It is a particularly important component of the area around Loch Laggan where it is both extensive and varied. Woodland occurs in various forms - for example as semi-natural woodland (containing birch, oak, rowan, aspen, holly) on the northern shores of Loch Laggan in Creag Meagaidh National Nature Reserve (NNR); as areas of birch on higher ground near Loch Laggan and in Ardverikie; and as mature alder at the mouth of the Allt Coire Ardair near Aberarder on Laggan. Most of the native woodland is dominated by downy birch, but some areas of ancient woodland include representative species such as oak, hazel and aspen. Rowan and willow are common amongst the birch. There are also coniferous plantation forests, which occur either as extensive areas or in smaller, separate blocks. The amount of broadleaved woodland varies which creates a very different experience in each glen.



*Native birchwood regeneration, Coire Ardair. ©Lorne Gill/NatureScot*

In the west of Lochaber in particular, small Atlantic oak and birch temperate rainforest ecosystems, rich in bryophytes, are scattered along the steeper loch and coastal edges; good examples may be seen along the shores of Loch Sunart, Loch Moidart or at Glen Beasdale, where much has been managed as coppice in the past. Other native broad leaves include alder woods and ash and hazel woods, notable at the mouth of Glen Roy, and birch wood which develops quickly where grazing pressure is low and may be seen on many of the steeper glens, often mixed with oak on the lower slopes. Hazel is abundant on the basalt slopes of Eigg and Rum. Elsewhere remnant Caledonian pinewood stands occur, in more inaccessible areas of Loch Shiel, Loch Leven, Glen Garry, Glen Nevis and Cona Glen.

Remnant pinewood stands are recognisable by the variation of species and age within them, including birch, rowan, alder, juniper and salex species. Planted stands tend to be more uniform in structure. The makeup depends on the characteristics of the site, including the aspect. Scots pine woodland is more likely on the north side of valleys as they are less demanding than broadleaves. The understory of pinewoods is distinctive with heather, wavy haired grass and shade and acid tolerant plants like the blueberry and mosses providing texture and seasonal differences. In wetter areas the trees are more stunted and form a bog woodland.

On the Small Isles there are remnants of sessile oak and birch woodland, both marshy and otherwise, and alpine willow within the Glen Garry hills.

Native woodlands support a distinctive range of wildlife including nationally important species like the Red Squirrel, Black Grouse and rarer insects like the chequered skipper.

At the higher altitudes there are sparse areas of montane shrub, smaller trees and shrubs, many stunted, which can extend the tree line significantly. Traditionally unmanaged due to their lack of commercial importance, they are now recognised as a valuable asset. Some of the earliest restoration work was done on Craig Meagaidh reserve where grazing was heavily managed, sheep removed, and deer culled or removed.

Policy woodlands, such as those at Rum Castle, comprise a mix of native and ornamental broadleaves and conifers. Usually associated with the big houses, they are not abundant in Lochaber, but can have a strong local influence by virtue of huge, prominent trees such as sequoias, cedars and copper beeches. Invasive exotic species such as *Rhododendron ponticum* have spread into the surrounding countryside and require management in many areas.

Despite continued grazing, pressures on Lochaber's native woods are to some extent being compensated for by incentives for increased planting and management. Current woodland grants and incentives include the Woodland Improvement Grant for sustainable management and species management, and grants for improving public access for existing forestry. Woodland creation grants are generally higher for broadleaf woodland and targeted areas.

### ***Moorland and Heathland***

Heather moorland types are the most extensive land cover in Lochaber and are maintained by grazing and game management. Extensive areas of this semi-natural habitat are found in

the western Highlands, where moorland grasses and heather are broken by rocky outcrops and upland lochs. Heather is one of the most recognisable plants within this habitat and the changing colours through late summer and autumn are considered an iconic Highland image. Mat grass, blaeberreries, mosses and flowering plants such as milkworts add winter and spring changes to this.

### ***Bogs and Peatland***

Extensive blanket bog covers Rannoch Moor in eastern Lochaber, dependent on high rainfall and atmospheric humidity, which slows decomposition, encouraging peat formation and water retention which, in turn, encourages decomposition to stay slow.



*Rannoch Moor (SSSI) ©NatureScot*

Blanket bog is one of Scotland's most common semi natural habitats despite its scarcity at a global scale. As well as supporting bryophytes like sphagnum mosses, bogs are also known for supporting upland breeding birds, whose presence and sounds can be piercing in the open landscape. Raised bogs, by contrast, tend to be on the lowlands where poorly draining basins of boulder clay were left behind after the glaciers retreated. They are not as common in the western Highlands and islands as elsewhere. However, a magnificent example of raised bog occurs around Kenra Bay on the west coast.

At first glance bogs and peatland can appear uniform, but a closer examination reveals a wealth of colour. The Sphagnum bog mosses themselves range from deep red, bright greens, oranges and gingery brown. Dotted through this soft carpet greens and pinks of heaths and heathers (*Erica* and *Calluna*), bright splashes of yellow and orange from the bog asphodel (*Narthecium ossifragum*) or the white rose-like flower of the cloudberry (*Rubus chamaemorus*) with its scarlet or orange fruit. The sweet-scented bog myrtle (*Myrica gale*) is also reputed to be a moderately effective repellent for the ubiquitous midge. Perhaps the most intriguing

adaptation to life on the bog is the carnivorous plant. Several species, including sundew species, have developed the ability to trap and eat small insects as a means of supplementing their meagre diet. As the summer draws to a close, the boglands stand out most distinctively from the rest of the landscape. The leaves of both the common bog-cotton and, in particular, the deer grass (*Scirpus cespitosus*) turn the sward to a brilliant russet which seems to glow in the low winter light.

Peat removal and planting coniferous plantations from early twentieth century onwards on bog land has occurred but less in the Lochaber area than in more densely populated areas. This is no longer recommended practice but replanting does occur, in private woodlands mainly.

### ***Coastal Habitats and Machair***

Machair is a feature of many of the Small Isles, and pockets are found on the western shore of the mainland south of Mallaig, and on the Ardnamurchan coast. This habitat comprises grass and herb turf which overlies fine shell sand that has been blown in from the beach. The landscape is highly fertile and clearly delineated by abrupt changes in land use, from grazing on the machair to more marginal but improved farmland further inland. Machair is defined ecologically by its highly calcareous substrate, the oceanic climate, rainfall of around 1500mm a year, high winds and regular storms, salt spray and traditional management of stock husbandry and cultivation. The plants that characterise the machair are not unusually rare themselves, rather it is the diversity of flowering plants that makes machair so special. A typical one square metre patch of machair can contain up to 45 species.

Dune systems are not extensive along the West Coast of the Highlands but Ardnamurchan has some of the better examples.



Sanna Bay, Ardnamurchan. ©Lorne Gill/NatureScot

Sanna Bay displays some good habitat zonation from beach to dune slack and beyond to damp machair, fen and dry grassland. It also possesses a machair lochan increasing the diversity of plant life found here. In spring and summer, the dunes are a riot of colour. Camusdarach is part of the Silvery Sands of Morar: a series of white sand beaches stretching along the river Morar as it enters the sea. It was made famous as a film set for the film *Local Hero* (Ben's beach) and is on the list of Scottish Natural Heritage's most beautiful beaches in Scotland. These beaches also stretch inland with dunes and machair grassland behind the sheltered sand. There are also more exposed shingle beaches like Borrodale, especially on the west coasts of the islands.

Loch Moidart is a shallow sea loch with mudflats and salt marsh. The woodland and salt marsh give the area an intimate sense of enclosure and disconnection from the outside world.

Kentra Bay SSSI is one of the largest expanses of saltmarsh in Lochaber on the north eastern end of Ardnamurchan and contains tidal flats and salt marsh. The salt marsh's distinctive grass and rush species such as glasswort, flat sedge and sea rush, along the tidal flats support over-wintering populations of waders and wildfowl.

### ***Montane Habitats***

Montane habitats are more prevalent inland, the large mountain ranges dominating the landscape with their sparse vegetation. Pockets of alpine vegetation occur sporadically across the highest areas of Lochaber. They are at the edge of their range, making them nationally rare, and are notable for species such as alpine saxifrages and alpine ladies mantle. Even this vegetation is less common on the peaks of some of the highest mountains like Ben Nevis, Aonach Mor and Bidean Nam Bian. These are sparsely vegetated with little other than bryophytes, notably woolly fringe moss, amongst the exposed rocky terrain which contains semi-permanent snow beds and scree snow beds. In exposed areas this habitat may be found at lower altitudes.

### **Land Use**

Over the twentieth century grazing by stock animals has declined but new land uses have evolved. Key within these new uses are recreational uses, commercial forestry and reservoirs for hydro-electric power. Modern day changes to the landscape, since the late 20th Century, have been relatively minor. The construction and enlargement of existing rural housing, the felling and replanting of areas of commercial forestry, and the re-alignment and widening of the A86 are the major changes. There is little pressure for built development in rural area at present: current policy around this is still restrictive but settlements have expanded and continue to expand.

### ***Communications and transport***

The physiography of Lochaber, with its high hills, steep ridges, long ribbon lochs and offshore islands makes communications difficult.

### ***Roads***

Almost without exception, roads through Lochaber follow the glen floors and loch shores such as the Great Glen for north-south access or the steep glens and ribbon lochs to reach the west coast. This is where topographic constraints are less and where the main settlements lie. The

rail connections to Lochaber focus south, due to the demand for access from Victorian and Edwardian holiday makers. This means the only practical connections to Inverness, the Highland regions administrative centre, is by the A82. This single carriageway road struggles under the demand by forestry and tourism. The oldest, unimproved minor roads closely follow every turn and rise in the landform and most of the minor roads are single-track with passing places. Many of these roads wind their way through narrow gorges and along steep slopes, often reinforcing the shape of the landform that they traverse. Along minor road 'cul-de-sac' glens such as Glen Roy and Glen Nevis, congestion can be a problem during peak seasons, and the traffic affects the character and experience of the landscape.

More recently constructed and modified roads use engineering structures such as cuttings, embankments and stone or metal bridges, to circumvent the more severe changes in relief. Some more recent road improvements, such as the Morar bypass, have been undertaken to high technical standards, but also at the cost of considerable landscape change. Even relatively minor road improvements, such as straightening dangerous sections, the introduction of mini-roundabouts, new bridges, signage to slow traffic, white lines, kerbs, lighting and visibility splays which meet the standards of current legislation, have contributed to the homogenisation of local landscape character, particularly of the loch shore and adjacent hillsides. The steep nature of the topography here leads to minor landslips, often affecting the manipulated road areas. The impact of these can be disproportionate to motorists due to the scarcity of roads and the long detours they often result in.

The A830, often referred to as the Road to the Isles as it connects Fort William to Mallaig and the ferry port, was renowned for at one time for being the only single track trunk road in Europe. The road's upgrade was completed in 2009. With new cycle paths and bridges the driveability and safety of this road continues to improve. Replacing the traditional stone bridges with modern ones is essential for the safety of these roads although the new bridges and roads are less in keeping with the local landscape.

### *Rail*

The West Highland railway follows the lowland glens and coast, except where it crosses the expanse of Rannoch Moor, where a major feat of engineering created a route across the bog. The isolated stations at Rannoch and Corrour are a key entry point for walkers to the mountains and can emphasise the remote feeling of the moor, although they have direct connections to London, Glasgow and Edinburgh, including a sleeper service which terminates at Fort William.

The railway between Mallaig and Fort William is a visitor attraction in itself with demand not only for trips on the steam train but also viewing the train as it travels over the viaduct, this has led to congestion and parking issues near the viaduct, especially when the train is due to pass.

### *Canals*

One of the most impressive engineering features of the Lochaber landscape is the Caledonian Canal with its many locks, most notably the cascading series at Neptune's Staircase in Banavie, with 8 locks in total. The canal is now rarely used for industry but is an important route for leisure craft. The Great Glen Canoe Trail also uses the canal, lochs and rivers to

navigate between Fort William and Inverness. Extensions to marinas such as Corpach are planned to accommodate the increasing traffic along the canal.



*Glenfinnan railway viaduct, ©Lorne Gill/NatureScot*

### *Ferries*

Travel by ferries between the Small Isles and the more remote peninsulas are a way of life for the residents and an exciting part of the journey for visitors. Mallaig, Lochaline and Fort William are the ports linking the Small Isles, Ardgour, Ardnamurchan, Knoydart and Morven. These act as a focus of activity, particularly in the summer months. Even on the mainland ferries can be faster trips than following the winding roads to Morven and Ardnamurchan.

In north west Lochaber, new built development will largely affect land along the A830, particularly where it terminates at Mallaig, where major port redevelopment is proposed together with new housing to increase the facilities for larger boats, including cruise ship and freight as well as larger leisure marina capacity. Corpach boat yard builds barges for the aquaculture industry, the raw materials for which will mainly be brought and removed by sea.

### *Renewable energy*

The Highlands have an abundance of the natural resources required from energy generation. Although solar is unlikely to become widespread across the area, hydro-electric and wind generation are already established across Lochaber with their associated infrastructure. Much of the area has natural heritage considerations, including National Scenic Areas and areas of wild land which limit their siting. This, and transport limitations, mean that much of the area has not been utilised to the same level as other areas.

In 2008 the Isle of Eigg became the first fully renewable electricity grid in the world in 2008 based on hydroelectric generators, photovoltaic array and 4 small turbines. This meant that the island became independent of diesel generators and imported fuel, has 24hr energy and it has provided a blueprint for the other small isles which are following suit.

#### *Wind energy*

There are currently few large wind farm projects within Lochaber. Individual turbines, supplying immediate electricity needs, have been built, such as at the schools on Eigg and on Muck. These are concentrated on the coast and islands and are now a relatively common sight. The largest windfarms in the area are in the north-east above the Great Glen; Beinneum and Millennium near Fort Augustus, with 32 and 26 turbines respectively.

#### *Hydro-electricity schemes*

Generation of hydro-electricity involves the construction of large scale dams across glens and straths, as well as the small scale harnessing of mountain burns and rivers. A number of large scale schemes have been built in Lochaber, since the Second World War. Hydroelectric power from the dams at Loch Laggan and Loch Treig (outwith the area) is fed to the aluminium smelter at Fort William, 24 kilometres away. The aluminium smelter works at Kinlochleven, which closed in 2000, was also linked to its own hydro-electric power (HEP) station, fed by Blackwater Reservoir. The electricity generated is used at Fort William Smelter with excess now sold to the national grid. Other large-scale schemes at Lochs Garry, Quoich, Ceannacroic and Loyne are all part of Great Glen Hydro scheme which has an annual output equivalent to the average consumption of the Highland Council Households. Hydro schemes operated by Alcan Smelting and Power UK are noticeable for the large straight pipelines which descend to the smelters. All schemes bring substantial structures into the landscape such as the turbine halls and prominent dams across the loch outfalls. The large draw-down margins leave a bare rocky fringe along the steeper banks and an amorphous muddy edge along shallower sides. Loch Laggan has a draw-down which can be extensive, particularly in late summer and autumn.

No large-scale schemes have been built since 1962 but the planned Coire Glas hydroelectric scheme is a large 1500mw pumped storage scheme near Loch Lochy. Smaller schemes, like the River Pattack Hydro scheme and the micro scheme at Craig Meagaidh, have become more widespread. They provide power to a small group of households with any excess being sold to the grid. These schemes are mainly run-of-river with little storage or water required. They have increased in frequency and can have a cumulative impact if seen repeatedly within a view or journey, but individually have a much lower impact.

#### *Electricity Transmission*

The existing steel tower line between Fort Augustus and Fort William through Invergarry, Laggan and to west of Spean Bridge was recently upgraded to allow for the greater capacity needed for renewable electricity transmission. The hydroelectric schemes require transmission lines from them and the route from Kinlochleven is particularly obvious.

#### *Tourism*

The use of the land for country sports and recreation begun in the 19th Century and has continued to the present. It is felt that tourism in the area began in the 1830's with the advent of regular swift Steamboats. The "Lochiel Arms Hotel" (later Banavie Hotel) was built beside

the Caledonian Canal for Tourists and the railways made the journey from the industrial central belt and England faster and easier.

Tourism is now one of the key contributors to the economy of Lochaber, contributing about 30% of the areas' GDP. International and domestic tourists are attracted to the area for:

- the famous tourist nodes such as Ben Nevis, Glen Coe, Rannoch Moor, Road to the Isles, Glenfinnan and Ardnamurchan Point;
- skiing facilities on Aonach Mor and in Glen Coe during the winter, and the gondola in the summer;
- its tranquillity, remoteness and spectacular, wild scenery;
- facilities for cyclists, walkers, climbers, canoeists and sailors, which aid the enjoyment of a broad range of landscapes;
- the experience of short distance ferry travel across some lochs and from the mainland to the islands;
- the many ancient and historic monuments and other properties provide destination points for trips; and
- visiting sites used by film and television series filmed or set in the area.

Visitor numbers continue to grow in Lochaber, bringing renewed pressures on the countryside. Increased road traffic is causing congestion at peak times and adding to pressure for road improvements. In addition, a number of themed attraction centres have been developed in villages in Lochaber to provide improved visitor facilities and to strengthen the identity and independence of local communities.

Achnacarry estate was the training grounds for the Royal Commandos and you can still find evidence of their time here. The Commando Memorial, with its backdrop of Ben Nevis and surrounding mountains is a well-known scenic location, attracting many visitors. The area around Loch Arkaig is stunning and offers some spectacular walks. The Eas Chia-aig falls and the witches' pool are a great photo opportunity and featured in Michael Caton-Jones's 1995 film "*Rob Roy*".

Several recent initiatives have included the improvement of routes into more inaccessible areas of countryside and work to increase the range of tourist facilities within towns and villages and along the main highways.

### *Skiing*

Skiing facilities are used almost throughout the year; the gondola at Aonach Mor carries more summer visitors than skiers. Walkers, mountain bikers and less energetic visitors can access the mountain all year round. Infrastructure, such as the gondola, chairlifts and ski centres, are prominent structures within the mountain scenery. They allow easy access to magnificent panoramic views. However, such facilities focus pressure on the vulnerable montane landscape; the chairlifts at Aonach Mor are closed during the summer in order to reduce erosion to the sensitive hilltop vegetation, and to allow recovery time from the winter ski season. The area is also well known for ice climbing within the UK.

In recent years snowfall has become more irregular and this unpredictability can have an impact on the attraction of the area.

### *Walking*

In recent times there has been a significant increase in hill walking in Lochaber, necessitating improved footpaths and other facilities for walkers; where these are not provided, considerable erosion has occurred, such as in Glen Coe. This presents problems particularly at honeypot sites. These problems are most marked at Ben Nevis, which is subject to wear and tear from an estimated 100,000 ascents per year. Significant restoration has occurred here with stone paths repairing severely damaged areas. Erosion has also occurred along the stalkers' paths in the Mamore Forest, in the hills around Glen Coe and in Knoydart.

There are fewer low-level, short walks in Lochaber; however forest trails and lochside walks open up more of Lochaber's landscape.

Long distance foot paths such as the West Highland Way and the Great Glen Way attract large numbers of walkers into more remote areas

### *Mountain Biking*

The use of mountain bikes has increased in recent years. Most cyclists keep to recognised cycle tracks and this limits damage to particular routes; for example, along the West Highland Way and Great Glen Way which are very popular with cyclists. However, other paths, especially hill tracks, are also used, both by cyclists and by trial bikers, leading to footpath erosion. The gondolas at Aonach Mor have opened up the hill to downhill riders which can have adverse impacts on the montane environment. The area around the base of Aonach Mor has a number of trails developed through forestry and moorland and hosts competitions.

### *Water Sports*

Water sports are popular on the Caledonian Canal, Loch Eil and Loch Oich where the South Laggan water sports centre is based. Water sports take place on a smaller scale along the west coast, mainly based at Arisaig and Mallaig. The Great Glen Canoe Trail is promoted using the lochs, rivers and canal between Fort William and Inverness, facilities have been built along the canal to help accommodate this.

### *Tourist Accommodation*

Camping and caravan sites along the coast south of Mallaig, along Loch Leven and Loch Linnhe are visible especially in contrast to the character of loch shore and coastal landscapes. Smaller sites can be less obvious but larger scale caravan sites around Fort William have developed a wide range of facilities on site, often with permanent caravans and other structures, including cabins.

Crofters have rights, such as being allowed to keep up to three caravans between April to September to accommodate rural workers and tourists.

Despite the increase in provision district experiences a shortfall of campsite spaces, and accommodation as a whole, during peak summer months, especially around Fort William and Glen Nevis. Partly as a result "Wild camping" in remote areas is widespread and can cause issues at key scenic locations spots with traffic issues on narrow roads, poor waste disposal and, more recently, increased numbers of camper vans in laybys and parking areas. The use of mountaineering bothies has also increased with some popular ones struggling with the number of visitors and issues such as waste disposal.

### *Industry*

Industry in the Lochaber area is limited. The Kinlochleven aluminium smelter was opened in 1909 and built alongside the Kinlochleven hydro-electric scheme. The village itself was formed from the merging of two hamlets as the work force swelled to over 800 people, with company housing and electricity which was uncommon in the area at that time. The community declined after the closure of the smelter in 2000, but community land transfer means that it is now managed by a community trust and the focus is on employment through tourism including an ice climbing centre and it is situated on the West Highland Way, a popular long distance route for which accommodation is in demand. Fort William smelter opened in the 1920's and is still in operation.



*Kinlochleven ©NatureScot*

Small scale food and drink production, such as the microbrewery at Glen Spean and whisky production at Ben Nevis Distillery employ small numbers, but have limited impact on the landscape, despite the distinctive shape of the distillery. A wood mill at Corpach services the forestry industry.

### *Mineral extraction*

Sand, gravel and hard rock suitable for aggregate production represent Lochaber's main mineral resource. While most quarries supply a largely local market, Glensanda in Kingairloch on the shores of Loch Linnhe is the UK's only 'super quarry' and exports aggregate throughout the UK and abroad. Several mineral extraction quarries are located in Lochaber. Sand and gravel extraction is concentrated in the Great Glen; at Creag Aoil at Torlundy it is combined with limestone extraction. Other sites include aggregates at Invergarry and Banavie, and silica sand at Lochaline. Disused sites are also visible, including sand and gravel at Brackletter, lead

at Corrantee and Fee Donald mines (both of which are protected as Scheduled Monuments), and slate at Ballachulish, where slate was quarried from the 17<sup>th</sup> Century until 1955, which now houses information about the Lochaber geopark and visitor facilities. Aggregate extraction near Mallaig is associated with a recent harbour development project.

Quarries can be substantial features in the landscape. Their impact is often disproportionate to their size, with relatively small works and open rock faces being visible over large areas; for example river gravel quarrying in Glen Coe. Glensanda is also highly visible across the sea (especially from lighting during 24 hour operations) and as a skyline feature from landward views in Morvern, the obviously man made finger lagoons for wash-off extends the impact further up valley. However, the complex landform of the Lochaber area and its extensive tracts of forest often provide effective screening, for instance, the works at Torlundy.

#### *Waste management*

Plastic pollution at sea and from other places has led to issues on beaches in the small isles with plastic debris, often nets and bottles, from sea vessels are washing ashore. Littering around key tourist attractions has been an issue, especially with increased numbers in recent years.

#### *Agriculture*

Much of the agricultural land of Lochaber is marginal farmland, with traditional croftlands along the glen floors and coastal areas. The region has been subjected to far-reaching agricultural changes in the past, particularly around two hundred years ago when people were cleared from the land, hill sheep were introduced, and enclosed in-bye farming and cultivation expanded. Recent changes in agricultural practices have affected landscape character; for example silage production in favour of hay has reduced the number of hay meadows with their characteristic rich flora and insect life, and a decrease in mixed cropping and arable production has reduced bird numbers.

Crofting is a social system in which small-scale food production plays a defining role. Crofting is characterised by its common working communities, or “townships”. Individual crofts are typically established on a few hectares of in-bye for better quality forage, arable and vegetable production. Each township manages poorer quality hill ground as common grazing for cattle and sheep.

Land use in rural Lochaber is constrained by climate, soils and topography. Agriculturally, virtually all of the land in the Highlands and Islands is classified as Severely Disadvantaged in terms of Less Favoured Area Directive. Thus many crofters have sought to diversify their income with alternative full-time jobs, mostly away from the land, such as self-catering accommodation, crofts and other types of rural enterprise.

However, sheep and cattle rearing still form the main basis for the agricultural economy of Lochaber. There has been a move towards sheep ranching, where shepherds have been moved off the land and into settlements, to live away from the ground they farm. Technical innovations and modernisation of farming practice have also had quite profound effects on the landscape. New silos, barns and other farm buildings, using cheap, efficient and easy to construct materials, often contrast with the vernacular styles of older buildings. Other elements of modern farming, such as black plastic silage bags, discarded redundant machinery and

fertiliser bags, also have marked local effects on the landscape. Overgrazing, especially by sheep, can impact on woodland regeneration and healthy moorland habitats. In Craig Meagaidh National Nature Reserve it was removed to allow vegetation regeneration. Reduced stocking levels are becoming more widespread with agricultural subsidies less focussed on numbers of sheep but sustainable practice.

Agriculture in Lochaber is heavily dependent on financial assistance. In the past, encouragement of agricultural development and rural communities did not consider the associated effects on the landscape. For example, the European Rural Enterprise Programme resulted in several projects for rural diversification which, although beneficial for production, had adverse effects on landscape resources, for example tree-felling to build self-catering accommodation.

Under the Scottish Rural Development Programme (SRDP) there are a number of ways that crofting and diversification can be enhanced by grants. Many of these now have a requirement for demonstrating sustainability.

Muck and Canna are shaped by the requirement for pasture and hay fields and the conservation focussed approach to farming on these islands encourages higher biodiversity than many areas. Grazing includes traditional breeds of sheep, cattle and ponies which further protect the pasture land. The generally smaller size and lighter weight of the traditional native breeds makes them well-suited to conservation grazing.



*Pasture on Canna ©NatureScot*

Croft creation has occurred to attract new residents to the islands and remoter peninsulas, this has included twenty-one crofts on Eigg and Rum reinstating crofts since 2008 which had been cleared by the landowners in the late 19 Century.

Despite its challenges, crofting is important to the Highlands and Islands. At March 2002 around 10% of the population of the Highlands and Islands. Crofting households represented around 30% those in the rural areas of the Highlands, which includes Lochaber area.

Game, especially deer is very present in this area and many areas are now trying to manage it not only for income but to prevent overgrazing in woodland. Craig Meagaidh is a good example of number-control allowing better regeneration, as well providing an income for the Nature Reserve. Many estates still carry out muirburn to keep the moorland short for grouse shooting and course fishing is a valuable attraction on many Lochaber rivers with huts and tracks common on these rivers.

### *Forestry*

A feature of the Lochaber area is the contrast between the spectacular mountain features and the forest and woodland nestled into it. After centuries of deforestation the amount of wooded area in Lochaber is now increasing and has been through the 20<sup>th</sup> Century. Much of this increase has been through conifers planted throughout the 20<sup>th</sup> Century. Commercial forests in Lochaber are in both public and private ownership. The majority of the large forest estates are under state ownership, managed and operated by the government agency Forestry and Land Scotland. These are concentrated along the Great Glen, between the Appin Peninsula and Loch Lochy and along the glens that radiate from it, particularly Glen Garry and Glen Spean. Forest Enterprise also managed other large outlying forests to the west, on Lochs Shiel and Sunart and on the fertile basalt peninsula of Morvern. Much of the timber produced supplies a sawmill at Corpach. Prior to 1988, privately owned commercial forest cover was about equal in proportion to state-owned forest.

Private forestry in Lochaber covers a wider area than state forests, and they tend to be more evenly distributed and in areas of more remote countryside. These are often on the large private estates such as in Knoydart; along Loch Arkaig and Glen Etive; and on the Ardnamurchan Peninsula. Private forestry also affects prominent areas of landscape, such as Loch Eil, Glen Coe, Loch Sunart and Glen Spean.

Many forests have been restructured to address the geometric blocks characteristic of plantings prior to the mid-1980s. Varying the species and age mix and the edge shape of forests has improved greater spatial and structural diversity, creating a more natural outline that reflects the scale and shape of land relief, and a more diverse mix of colours and textures. Mixed woodland is increasing as the industry moves away from the tradition monoculture, in part due to new threats from disease. Initiatives using traditional land management techniques, such as grazing by Highland cattle, have been introduced across the Lochaber area. These complement the restructuring to produce a more natural woodland structure

After the First World War forest planting was encouraged, and it expanded under continuing tax incentives until the late 1980s. It was the purchase of Creag Meagaidh reserve for afforestation that led to the campaign to establish the area as a National Nature Reserve in 1985-6, to conserve the natural gradation of vegetation types from lochside to mountain

summit. Woodland expansion and restoration are now key activities for public forestry land and there are considerable grants for private forestry to do this, there is also an increase in the proportion of forest being managed as continuous cover forest with selective felling and successive generations regenerating under the main canopy.

#### Woodland Regeneration

Forestry in Lochaber is also recognising the value of tourism and recreation to its estate. The International mountain bike world tournaments are run on the Nevis range, state owned forestry land, bringing significant income to both the estate and area. Many forest estates now provide car parking, trails, viewpoints and access to long distance paths or Munros as part of attracting recreational users alongside forestry operation.

#### *Aquaculture*

Over the last three decades fish farms have become significant man-made features in the sheltered sea lochs and some freshwater lochs. Every large loch west of the Great Glen, apart from Loch Morar, now contains one or more of the characteristic floating cages. Seawater salmon farms are the most common type of production, although there are also trout and shellfish operations within Lochaber. A typical seawater salmon farm comprises several circular or square cages of varying sizes, moored off-shore. They are usually located in sheltered loch shore sites where they are often highly visible, particularly from coastal and loch-side roads, and may be prominent structures in views. There can also be associated floating feed barges, and access roads, shore bases, onshore jetties, storage, feed-handling facilities and on-shore feeding stations.

As well as fish farming, recreational and river fishing is common in the area for both trout and Salmon. Arkaig (loch and river) and River Lochyare are both well known for fishing and the latter is reputed to be the most productive in Lochaber. The rivers of Lochaber are also important spawning grounds for sea trout, salmon and arctic char.

#### *Settlement*

The population mostly lives in glens, loch edges and coastal areas. Over half of Lochaber's population is located in and around Fort William. Aside from Fort William, settlements in Lochaber are small, with populations of under 1,000 and mostly less than 500.

Settlement originally developed in a scattered form on the edges of glens and lochs. Development of crofting in the 18<sup>th</sup> Century dictated the current settlement pattern. Crofts generally adopt a linear pattern of fields along the hillside with an individual dwelling in each. Some have amalgamated into clustered townships; for example, at Strontian, Roybridge and Inverroy. Others were developed as townships initially; for example at Banavie.

Settlement shape is largely dictated by relief and the availability of fertile soils. In glens and along the coast settlements tend to be spatially confined within the glen floor or around a coastal inlet, leading to a linear pattern, especially on the edges of the settlement. Villages traditionally acquired a strong sense of identity through a clearly defined edge. A traditional settlement pattern of crofts often extends outwith the village core and is particularly apparent along loch edges where individual white cottages stand out amidst a bright green field below the steeper slopes. Settlement around Kentra Moss, at Acharacle, is less contained and more widely spaced. The construction of many new houses in recent years has changed the shape,

character and setting of many existing settlements as well as outlying areas of countryside. Recent growth has seen modern building styles laid out in homogenous estates, yet the villages often retain a compact shape around their older core.

Fort William, the largest settlement in Lochaber, includes a collection of distinct communities as well as the main urban and commercial town centre. Corpach & Banavie, Caol, Inverlochy and Upper Achintore and the Plantation each have their own identity. 'Green wedges' physically separate these communities and help to sustain the identity of the town as a whole within its wider setting. Little of Fort William predates the 18<sup>th</sup> Century as the dwellings of Maryburgh, the settlement around the garrison of Fort William, were required to be made of burnable material so they could be removed in times of unrest. This occurred in 1746. The decline in the Fort itself has meant that it is no longer the focus of the town – it is now surrounded by a supermarket car park.

Lochaber's traditional crofting communities have established a precedent for new residential development in rural areas. However, the crofts, often sited to maximise opportunities for shelter and cultivation, have a strong and attractive relationship with their land. The key visual relationship is between the siting of dwellings and the width, length and orientation of plots.

While crofting continues on the Small Isles and the west coast, the character of most crofts has changed substantially over recent years: most crofters now work in nearby villages, or live away from their croft land altogether. Others have used the land to provide alternative income, setting up small business premises or running caravan parks and holiday chalets. Some have also subdivided their plots for new housing. Vernacular buildings have frequently become derelict, and sit adjacent to modern replacements. Many crofts have been vacated or neglected by absentee landlords.

New housing has been built on the small islands in recent years to attract new residents. These are focussed on existing settlements and dwellings such as Port Mor and Gallanach on Muck and Cleadale on Eigg. Building new housing and community facilities has been considered important to attracting and retaining viable population sizes. The main change has been from a local, Gaelic speaking, population to one attracted from all over the UK.

Crofting housing continues to be built. These commonly take a modern approach to local vernacular, one and a half storey and timber framed are prevalent. Kit housing is a popular way of coping with the challenges of building in remoter areas and are producing a modern crofting vernacular of their own.

### *Castles and Designed Landscapes*

Castles are a feature of this area of Scotland and reflect the war-torn aspect of its history. They occur mostly in the mountain glens and are indicative of the former power of the clans. There are many impressive examples, such as Castle Tioram at Loch Moidart, Inverlochy Castle north of Fort William, Invergarry Castle, Mingary Castle in Kilchoan and Ardtornish Castle in Lochaline. Historic designed landscapes are sometimes associated with these buildings, such as at Achnacarry, or with other notable properties such as at Ardtornish House (about 5 kilometres south of Ardtornish Castle), Arisaig House, Corrour Lodge and Eilean Shona.

### *Vernacular Buildings*

Vernacular architecture develops in response to both physical and cultural influences. The vernacular crofters' cottages, which may be seen throughout Lochaber, are modest, typically one or one-and-a-half stories and rectangular in plan. Their local stone rubble construction is sometimes visible, although they are often whitewashed. A pitched roof is traditionally constructed from local materials, such as slate from Ballachulish. Chimneys are sturdily built and positioned at either end of the building, and doorways and windows are typically situated on the front elevation. 'Black houses', the precursor of the stone croft cottages, are simple drystone dwellings of single-storey construction with a central chimney and thatched with heather or marram grass, not slate; however these are rarely seen today, examples preserved such as Croft 6, crofting museum, on Eigg, still exhibit high levels of modernisation and bear little resemblance to their original structure, the stones generally reused or the original cottage included in a modernised building. Traditionally houses would have been made of turf and wood, however as the landownership system evolved a stone house was often a requirement of tenants on receiving their new lease.

### *Sporting Estate architecture*

The baronial style of buildings is a distinctive feature of Victorian sporting estates, and around the train stations and transport hubs of the 19<sup>th</sup> Century. Mostly built from granite they are unmistakably associated with Highland estates. Ben Alder lodge is remotely located, and glimpsed only by those travelling into the heart of the area. In contrast, Ardverikie can be seen from the A86 across Loch Laggan, and provides a focal point in the wooded landscape. The estate cottages near the trunk road at Kinlochlaggan also contribute to this particular experience, especially the turreted gate lodge next to the River Pattack which is a distinctive landmark feature. Most workers cottages are occasional traditional estate buildings, one and a half storey with significant symmetry in their design.

## 4. CULTURAL INFLUENCES AND PERCEPTION

### **Natural and cultural heritage designations and values**

Lochaber contains many important ecological habitats and cultural and historic sites. This wealth of heritage resources is reflected by the number of environmental designations, each varying according to its objectives and to the degree and type of protection it affords, but all concerned essentially with conserving and enhancing the resource. Of these, some are statutorily designated under Scottish, UK or European legislation; non-statutory, designations are protected by local planning policy. Other policy areas include Wild Land Areas, which are not a designation but provide an indication of areas whose semi natural state shows little human influence.

### ***National Scenic Areas***

Areas which are considered to be of 'outstanding scenic value in a national context' are designated as National Scenic Areas (NSAs). In Lochaber NSAs encompass:

- Ben Nevis and Glen Coe: this 90,334 hectares NSA covers the mountain range including Ben Nevis, the Mamores, Glen Coe and Glen Etive, as well as the western part of Rannoch moor and Ben Starav. The southern boundary is partly outside Lochaber area and Blackwater reservoir is excluded from its boundaries. The special qualities include the mountain grandeur and the individual qualities of the glens and lochs;
- Loch Shiel: a small NSA (13,045 hectares) encompassing the loch and its enclosing hills. The loch's inaccessibility and enclosed nature mean that it feels remote despite the visitor facilities and busy road at the eastern end. The native woodlands are diverse and include areas of Atlantic oak woodland.
- Morar, Moidart and Ardnamurchan: This follows the coast between South Morar and Ardnamurchan (17,220 hectares). It showcases the diversity of the coastal landscape in this area from the rocky coastline of Ardnamurchan, the sandy bay and salt marshes of Kentra and the steep wooded slopes of Loch Moidart. It is an introverted landscape where views are limited and constantly changing. Loch Ailort and Loch nan Uamh are more open with views out to the Small isles from a wooded but rocky shore.
- Knoydart: This NSA covers the northern part of Morar as well as Loch Nevis, Loch Houran and the inaccessible Knoydart peninsula itself. It is focussed on the dramatic contrasts between the remote and rugged mountains and the penetrating sea lochs. This is one of the remotest places on mainland Britain, geographically and because of the journey to arrive here; and it hints at more journeys ahead with the Inner Hebrides visible from the coast.
- The Small Isles: Rum, Eigg, Muck, Canna and Sanday. Their different characters are linked by the sea and their views back to the mainland. Rum is rugged and volcanic whereas the basalt soils on Eigg give a more agricultural vista framed by a ridge of cliffs to the north, and the towering Sgurr of Eigg. Muck is lower still and its pastoral platform is green and domestic in contrast. Canna is higher with a coastline of caves and arches with Sanday linked by a ridge. This is a crofting area with population focussed on the harbours.

### ***Other designations***

Special Landscape Areas designated by the Highland Council include many of the areas between the NSAs showing the high regard these landscapes are held in.

There are also other types of statutory nature conservation designations in Lochaber. In some areas these are layered and demonstrate the high quality and diversity of the environment and species within the area. There are six Special Protection Area (SPA) in Lochaber: Rum for seabirds and golden eagles; Canna and Sanday for Seabirds; Moidart and Ardgour and Glen Etive and Glen Fyne for Golden Eagles; Ben Alder and Creag Meagaidh, for breeding dotterel. This highlights the value of the landscapes here supporting a range of protected and iconic species. Clash Moss on Loch Shiel is designated a Ramsar Site for its high quality blanket bog.

The six National Nature Reserves, Creag Meagaidh, Glen Roy, Glen Coe, Glasdrum Wood, Ariundle Oakwood and Rum are mostly accessible to visitors and are high quality representatives of Lochaber landscapes.

Geological Conservation Review Sites include Glen Roy and the Parallel Roads, Ben Alder and Ardnamurchan. These are areas of rocks, minerals and landforms of national interest and are covered also by Lochaber Geopark.

Lochaber Geopark helps to recognise the significance of the geological and geomorphological features of the area and also promotes that heritage. This includes the igneous and glacial features discussed under the geology section earlier from the volcanic centre of Rum to the cultural significance of Glen Roy Parallel Roads.

Most of the sea around Lochaber and the Small isles is designated a Special Area of Conservation (SAC) for its value as a habitat for Harbour Porpoise. Within that area other values are highlighted such as subtidal sandbanks, freshwater pearl mussels and otters, as well as coastal habitats of value

Terrestrial SACs such as Ben Nevis and Ben Alder, and Aonach Beag are designated for the alpine and upland habitats they contain, and Rannoch Moor for the blanket bog, and aquatic environments within. This is complemented by 49 Sites of Special Scientific Interest designated for a range of flora, fauna and geology and landforms across the area.

### ***Wild Land Areas***

Lochaber is renowned for its wild and rugged landscape and there is a large proportion of Scotland's wildest landscapes within the area. Scotland's Wild Land Areas (WLAs) are areas with semi-natural landscapes that show minimal signs of human influence. These are not statutory designations but these are considered nationally important and current Scottish Planning Policy requires that development proposals within them must 'demonstrate that any significant effects on these qualities can be substantially overcome'. Six WLAs are at least partially within Lochaber.

The Rannoch – Nevis – Mamores – Alder WLA is the 3rd largest in Scotland at 1180 km<sup>2</sup> and stretches towards the Cairngorms, separated only by the Drumochter Pass. It is also adjacent to the smaller Braeroy, Glenshirra – Creag Meagaidh WLA. On the other side of the Great Glen lie Moidart – Ardgour and Kinlochhourn-Knoydart-Morar WLAs. Rum WLA covers over half of the island, excepting the more settled area around Kinloch and Kilmory. It is unique in having no public road access as the ferry from the mainland is for foot passenger only

### **Cultural Designations**

Areas of cultural or historic importance are also designated. Sites of national importance are protected as Scheduled Monuments and legally protected. Scheduled Monuments and their settings are also protected by the planning and other regulatory systems. Two sites in Lochaber are included in the Inventory of Gardens and Designed Landscapes. These are the mid-19<sup>th</sup> Century parks and gardens at Achnacarry, the ancestral home of the Camerons of Lochiel; and Ardtornish gardens in Morven, designed between the later 19<sup>th</sup> Century and early 20<sup>th</sup> Century but developed since then. Two historic battlefields at Inverlochy and one at Mulroy in Glen Spean are included on the Inventory of Historic Battlefields, and thus given special consideration in the planning process.

Non-designated designed landscapes include the Glen Lochan Woodland planted with North American trees by Lord Strathcona, one of the builders of the Canadian Pacific Railway in the 1890's to comfort his homesick Canadian wife.

Examples of architecture illustrating part of the history of Lochaber are also identified, from the early 20<sup>th</sup> Century arts and crafts workers cottages and aluminium smelter built by the British Aluminium Company in Kinlochleven to castles and cottages, brochs and other ancient sites illustrating the lives of the people from the thousands of years they have inhabited Lochaber.

### **Cultural influences – perceptions**

The perceptions of Lochaber have changed through the centuries. The high places were once seen as grim and forbidding, striking terror into early travellers such as the 18<sup>th</sup> Century travel writer Thomas Pennant. In Georgian and Victorian times, a more romantic view was promoted by artists and writers such as J.M.W. Turner and Sir Walter Scott. This period also saw an awakening of scientific interest, including early botanical exploration, with the construction of the Ben Nevis observatory and the birth of the sport of mountaineering. Nowadays, mountains form a common cultural thread extending from 'Monarch of the Glen' to the poetry of Sorley Maclean. For many people, mountains and moorland possess a remote and natural quality, making them distinctive in character and define Scotland itself.

### **Lochaber in the Arts**

The painter Joseph Mallord William Turner painted Lochaber during the early 19<sup>th</sup> Century, initially as a series of illustrations for Sir Walter Scott's poetical works, sketching Glen Coe, Fort William and Ben Nevis. His links to the popular Scott and his own fame as a landscape painter meant that his paintings, and the books they were printed in, reached a wide audience who had seen little of the area until this point.

The Highland craze of the Victorian era, encouraged by Queen Victoria's choice of holiday destination at Balmoral, was fuelled by Turner and other artists. These included Sir Edwin Landseer, the painter of "Monarch of the Glen", John Knox, a noted painter of landscapes, and Horatio McCulloch, a Glaswegian artist who painted Inverlochy Castle and Glen Coe. The improved accessibility of Lochaber with the introduction of first the steamers and later the train meant that these works inspired the first influx of tourists to the area. Into the 20<sup>th</sup> century Sir William Gillies painted in Ardnamurchan and Morar using the dramatic landscape and changing weather as his subjects.

Poetry by Alice MacDonell of Keppoch about Scottish history and the area around her own ancestral home helped to evoke the feeling of dramatic landscape. Publication of her work, such as 'Lochaber for Ever' (1898), in periodicals meant they reached a wider audience.

*'In all thy moods I love thee, In sunshine and in storm; Lochaber of the towering bens, Outlined in rugged form.'*

Keats wrote a *Sonnet from Ben Nevis* around 1818 on a tour of Scotland, as well as a humorous dialogue about a portly lady's ascent which may strike a chord with less prepared climbers. The anonymous Ben Nevis poems, reputed to have been left in The Ben Nevis Hotel in the late 19<sup>th</sup> Century, discuss the weather in colourful detail.

Gaelic poets in the area include Dr John MacLachlan, the author of '*Dìreadh a-mach ri Beinn Shianta*', a poem about the Ardnamurchan Clearances unusual for its outspoken criticism of the landlords. Also Alasdair mac Mhaighstir, a schoolmaster in the area and a firm Jacobite supporter during the 1745 rising, wrote poetry about the uprising and English rule in traditional Gaelic Bardic style.

Authors of novels and prose written about Lochaber include Robert Louis Stevenson, who had a harsh review of Rannoch Moor in "*Kidnapped*": 'a wearier looking desert a man never saw'. Ian and Peter Fleming spent time here as children. Ian Fleming refers to the area with links to James Bond in his childhood. 'Night Falls on Ardnamurchan' by Alasdair Maclean describes the struggles of crofting life during the 20<sup>th</sup> Century in his autobiographical book.

In more recent years Lochaber has been in the backdrop of many well know films and many locations have a steady stream of visitors acknowledging this. Rannoch Moor and Glen Coe



Corroeur Station on Rannoch Moor. ©Lorne Gill/NatureScot

have starred in films as diverse as James Bond's *Skyfall* (2012), *Monty Python and the Holy Grail* (1975), *Trainspotting* (1995), and *The Eagle* (2010).

Harry Potter fans flock to the viaduct at Glenfinnan to see the route of the Hogwarts Express, as well as the sites of major Quidditch matches at Loch Shiel and in Glen Nevis. Further west, Camusdarach Beach on Morar was one of the scenes for the film *Local Hero* (1983). Recent films such as *Mary Queen of Scots* and *Outlaw King* keep the interest in the romanticised history of the area alive as *Braveheart* (1995) and *Rob Roy* (1995) did previously.

### **Gaelic in the Lochaber landscape**

A distinctive feature of Lochaber is the prominence of the Gaelic language. The Scottish census shows that in 1881 90% of the respondents indicated they habitually spoke Gaelic. Ardnamurchan and Lochaber had a higher level of Gaelic speakers than the rest of Scotland until the Second World War. There has been a substantial decrease, to less than 20%. That has been slowed in some parts of Lochaber, especially in younger age groups, due to the introduction of Gaelic education in the area. In recent years there has been a growing interest in Gaelic culture, with an increased popularity of Gaelic literature, prose, television and contemporary music. The promotion of Gaelic as an intrinsic cultural characteristic of the region has been adopted by the Gael and visitor alike. Ironically some may see the strong traditional culture as a reaction against the increase in incomers; however, it is this cultural strength that is itself an attraction for visitors.

The native language has many descriptive words for landscape features, suggesting a respect for the character and grandeur of the surroundings. The language is one tangible link, not only to the cultural heritage, but also by its richness to the land itself.

The place names within Lochaber reflect the diversity of the landscape as well as referring to its history. There are many types of hill, from the rolling upland moors of *monadh*, precipitous ridges referred to as *aonach*, as well as *beinn* (or ben) which refers to the looming heads of mountains, such as Ben Nevis. *Sgurr* (pinnacle), *torr* (conical hill) and meall, (rounded hill), are described and suffixed with *garbh*, (rough), *mor* or *beag* (large or small). Distinctive peaks like Buchaille Etive Mor become obvious when translated as the 'big shepherd of Etive', because it guards the entrance to the glen. The area's varied and distinctive geology is reflected in the variety of colours mentioned for the mountains, *dubh* (black), *fionn* or *geal* (white), *dearg* (red), *gorm* (blue) or *liath* (blue grey). The granite cliffs could also be described as *breac* (speckled) or *riabhach* (brindled).

References to Prince Charles Edward Stuart are common along the coast, with *Torr a'Phrionnsa* referring to a hill he reputedly rested at on his way to Glen Finnan, as are references to the legend of Ossian. In the heart of Lochaber *An Gaerasdan*, The Garrison, indicates Fort William's past as one of the hubs for the British Army in the Highlands Fort William is often referred to at The Garrison by people living as far away as Oban.

The Isle of Muck's unusual name is said to originate from the Gaelic *Muc Mhara* or sea pig. This is a generic name for whales and dolphins, mostly due to its shape resembling the back of a cetacean emerging out of the sea, but also the abundance of whales and dolphins feeding around the islands in the summer months

There is also a smattering of Norse place names in Lochaber, a reminder of Viking incursions along the West Coast. *Alladale* (Ali's valley) and *Scarmodale* (short valley), suggest a level of permanence to settlement in those areas.