

# Atlantic Coast (Wester Ross) Project

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## Topic Paper:

### Coastal and Marine Nature Conservation

#### 1. Introduction

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This paper is one of a series which has been prepared to help inform the future use and development of the coast and inshore waters of Loch Broom, Little Loch Broom, the Summer Isles and Gruinard Bay. The paper represents the results of basic survey and evaluation work and should not be regarded as a policy document. It is however intended to help in the formulation of policy and to promote discussion. The Atlantic Coast project seeks to develop and test an integrated coastal zone plan for this area which can help in the evaluation of development proposals, guide investment, and minimise conflicts of interest. It aims to promote a balanced approach: one that can safeguard the area's core natural assets and sustain or enhance its productivity over the longer term.

The natural heritage issues set out in this topic paper reflect concerns raised in the project area. Some have scientific backing, while others are based on mainly anecdotal evidence from those involved in activities such as fisheries, natural history and angling.

#### 2. Background

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The project area has a long, varied and biologically rich coastline, with exposed open waters and rocky headlands to the west, and the long, fjordic sea lochs of Loch Broom and Little Loch Broom to the east. The wide range of marine and coastal habitats here supports a diverse flora and fauna, and some of the remoter locations are virtually undisturbed. Seabirds breed on remote cliffs and offshore islands, otters can be found on almost any part of the coast, seals haul out and breed on some of the remoter skerries, and rarities such as leatherback turtles and basking sharks have been recorded very occasionally. The seabed supports fragile communities of maerl, a coralline seaweed which forms an important habitat for many other species, and the underwater cliffs, caves and wrecks are alive with colourful sea anemones, soft corals and other species.

Here as throughout the West Coast, the coastal and marine flora and fauna have been a larder and source of income for local people for generations. The village of Ullapool was built to exploit the abundant shoals of herring. Crofters fished on a subsistence basis and used seaweed to fertilise their fields. Migrating salmon were netted in their thousands as they returned to the rivers to spawn. Otters were trapped for their pelts and seals were culled to reduce their impacts on fish stocks.

In recent years, pollution from the visiting klondyker ships, road building, the growth of tourism and the rapid establishment and expansion of the aquaculture industry have added new, indirect pressures to the local coastal and marine environment and its flora and fauna.

This long history of human exploitation, management and sometimes mismanagement, alongside changing environmental conditions, has shaped the marine and coastal environment as we see it today. Despite the remote location, there is little in the project area that can be considered 'untouched' by human activities.

### **3. Current situation**

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#### **3.1. Geology**

The area is of considerable interest geologically. Much of it is underlain by Lewisian gneisses, which are the oldest rocks in the British Isles at about 2700-2900 million years old. They can be recognised by their typical striped appearance, often with bands of pink or white alternating with dark green to black. In some areas it is possible to see tight folds marked by these colour bands, giving some idea of the intense deformation these rocks have undergone over the course of time. The gneisses are best exposed at the southern edge of Gruinard Bay where the landscape is typical of this rock type.

In much of the rest of the project area the gneisses have been overlain by sandstones and mudstones of the Torridonian group, which are much younger rocks, having been deposited 750-1000 million years ago. They are typically pinkish-brown in colour, and tend to form distinct slabs. Good examples can be seen at Aultbea, Cailleach Head and Rubha Dunan, all of which are designated as Sites of Special Scientific Interest for Torridonian geological features.

A third group of rocks, known as the Cambro-Ordovician Series, were deposited over the top of the Torridonian sandstones between 470 and 540 million years ago, and these include quartzite and limestone. Much of this series was eroded away by glaciers during the last ice age, but remnants can still be seen in the eastern part of the project area, inland of Ullapool.

The Cambro-Ordovician rocks are cut very sharply in the eastern part of the project area by a major fault, the Moine Thrust. This fault can be traced from the north coast of Scotland right down to Skye and is a major feature in Scottish geology; it is very well exposed at Knockan Crag, just north of Ullapool. The Moine Thrust cuts across Loch Broom towards the head of the loch, and forms the boundary between the Cambro-Ordovician rocks to the west and a fourth group of rocks, the Moine Series, to the east.

The Moine Series rocks all lie east of the Moine Thrust. They are geologically similar to the Lewisian gneisses but are less heavily striped, and tend to be silvery-grey and brown in colour. The Moine Series is about 1500-1000 million years old. In the project area, they are only visible around the head of Loch Broom.

Much of the present-day landscape is the result of glacial activity. During the last ice age, from 25,000 years to 10,000 years before present, ice sheets covered much of north-west Scotland. Both Loch Broom and Little Loch Broom occupy valleys deepened by glaciation, resulting in their classic fjord-like shape, and the steep sides and corries of the mountains are all direct results of glacial erosion. In lower-lying areas such as around Achiltibuie, the underlying rocks are largely obscured by glacial deposits.

### **3.2. Habitats**

A wide variety of marine and coastal habitats are found in the project area, including several of national and local conservation value.

Much of the coastline is rocky, with steep cliff sections in the more exposed areas such as Reiff, Greenstone Point and the Summer Isles. Shingle beaches can be found in several places, with a good example at Ardmair. There are only two significant sandy beaches in the area, at Mellon Udrigle and Gruinard, both with some sand dunes. Small areas of salt marsh are found at the head of Loch Broom and Little Loch Broom. Very good examples of sea cave habitat can be seen in areas where heavy wave surge conditions are the norm, such as around Tanera Beag and Priest Island.

In shallow water, beds of Horse Mussel are found in Loch Broom and little Loch Broom. These beds stabilise seabed sediments and provide an important habitat for colonisation by other species. Seagrass (*Zostera*) beds are concentrated mainly in the Gruinard Bay area. They are thought to be relatively small in size compared to, for example, the extensive beds found in Ireland or Orkney, but they are still of fundamental importance to species reliant on them as a habitat.

Open and exposed coasts support forests of kelp or 'cuvie', growing mainly on rocky substrates from the intertidal zone to 20m depth. This important habitat occurs extensively on this coastline and provides a three-dimensional living space for plants and animals as well as food and shelter for many fish and invertebrate species. Kelp forests are also an important producer of organic material, supplying the bottom of the food chain.

In areas of tidal flow such as the channels between islands in the Summer Isles, and alongside Gruinard Island, maerl beds form. Maerl is a collective name for several species of coralline red algae which grow as unattached branching nodules on the seabed. It provides an important habitat for many marine animals and plants living on or amongst the branches, or within the layers of dead maerl that accumulate below the living reef. The species which constitute maerl are among the slowest-growing species in the North Atlantic and so are highly vulnerable to mechanical damage as recovery rates can run to decades and even centuries.

In deeper water, extensive areas of mud provide a habitat for many burrowing and surface-dwelling species including sea pens and commercially important species such as the prawn or Norway Lobster (*Nephrops norvegicus*). This habitat is found throughout the project area.

Horse mussel beds, maerl beds, sea-grass beds and tidal rapids are all habitats listed as a priority for conservation under the UK Biodiversity Action Plan.

The open sea supports pelagic species of fish and plankton, and the wide variety of birds, seals, cetaceans and other species which feed on them.

### **3.3. Species**

The diverse habitats of the project area support many species of conservation interest.

#### **3.3.1. Plants**

Knotted wrack (*Ascophyllum nodosum* *ecad mackaii*) is a brown seaweed which is common on sheltered rocky coasts around Britain. However the very distinctive free-living *ecad mackaii* has a very limited distribution, found only in Scotland, Northern Ireland and the Irish Republic. The main British (and global) populations are confined to extremely sheltered shores in Scottish sea lochs, including Loch Broom and Little

Loch Broom. This form of the species is not protected in the UK, but is listed as a national priority in the UK Biodiversity Action Plan.

### **3.3.2. Invertebrates**

The area supports a diversity of invertebrate species, including several of considerable commercial importance as well as a number of species of conservation interest. Norway Lobster, edible crab, Velvet crab, Green crab, Lobster, Scallop and periwinkle are all fished commercially within the project area.

Several invertebrates listed as national priorities are found in the project area, including the fan shell *Atrina fragilis*, the giant sea pen *Funiculina quadrangularis*, which is susceptible to damage from fishing gear, and the native oyster *Ostrea edulis*. Gaping file shell *Limaria hians* is found in the tide-swept narrows in Loch Broom and in Little Loch Broom. This species anchors itself to the substrate by creating a nest of strong threads called byssus threads. In areas of abundant shells the threads may bind together to create a mat over the seabed, providing a substrate for species such as kelp to establish. It is known from relatively few sites in the west of Scotland. Several species of mollusc not common in sealochs have also been found in Little Loch Broom: a sea snail *Acteon tornatilis*, a seaslug *Colpodaspis pusilla* and a sea-hare *Akera bullata*.

### **3.3.3. Fish**

The current commercial fishery within the project area focuses on shellfish. However this was not the case in the past, when the village of Ullapool was founded to take advantage of the vast shoals of herring moving seasonally through the inshore waters. Until recent years, there were active commercial and sport fisheries in the project area, targeting herring, cod, whiting, hake, mackerel, skate, salmon, sea trout and other species. Today there is no commercial fishery for any of these species within the project area, and the quantity and diversity of species caught on sea angling trips have decreased drastically. All commercial marine fish, plus common skate and the rare basking shark are listed as priority species in the UK Biodiversity Action Plan. Basking Shark is protected under the Wildlife and Countryside Act, and is listed as globally *Vulnerable* in the IUCN Red List. Common Skate is listed as globally *Endangered* by IUCN, while Cod and Haddock are listed as *Vulnerable*.

Little Loch Broom and Gruinard Bay are closed to mobile fishing gear from October to March to protect herring spawning grounds. To date however there is little sign of recovery in either this or other once-commercial species. A number of factors have played a part in the decline of these species, including over-fishing and fluctuations in climate, sea-temperatures and currents.

Salmon and sea trout are not listed as national priorities in the UK Biodiversity Action Plan, but were highlighted as local priorities in the Wester Ross Biodiversity Action Plan. They are discussed in more detail in the Sport Angling topic paper. Wester Ross Fisheries Trust and West Sutherland Fisheries Trust, whose borders meet within the project area, are active in the field of wild salmonid conservation and restoration. Though their main focus of activity is in their species' freshwater phase, they are active in developing agreements with the salmon farming sector and regularly monitor populations and impacts in estuarine and other inshore salmonid habitats and raise awareness of wider marine impacts

Changes in the abundance of so-called 'bait-fish' (juvenile and small-sized fish) which form much of the diet of many commercial fish species, has been suggested as a possible factor in the decline, or failure to recover, of many of the species mentioned above. Some important bait fish species such as sand-eels are fished commercially for

use in fishmeal and fertiliser, although this activity does not take place in the project area.

#### **3.3.4. Reptiles**

The Leatherback Turtle has been recorded in the project area. This species is protected under UK and international law, and is a rare but regular visitor to Scottish waters. A large proportion of this species' diet is made up of jellyfish. Consequently it is highly vulnerable to marine pollution such as plastic bags which can be mistaken for prey and eaten.

#### **3.3.5. Birds**

The project area provides good breeding habitat for seabirds. Fulmars, herring gulls, great black-backed gulls, storm petrels, great skuas, kittiwakes, puffins, guillemots, razorbills, black guillemots, cormorants, shags, eider duck and common and arctic terns all breed in the area in the period from May to August. The Summer Isles provide good breeding habitats for many of these species. Priest Island supports an internationally important breeding population of Storm Petrels, and is now designated as a Special Protection Area (SPA) for that species.

Gruinard Island is locally renowned for white-tailed eagles, which can often be seen perched or in flight in the area. A pair of white-tailed eagles breed in the vicinity. The white-tailed eagle is protected under the Wildlife and Countryside Act.

Red-throated, black-throated and great northern divers are all seen frequently on the sea lochs, which provide important feeding habitat. Gruinard Bay is of particular importance for wintering divers. All diver species are protected under the Wildlife and Countryside Act and Annex 1 of the Birds Directive.

The Summer Isles support a breeding population of greylag geese, comprising 0.5% of the British population. Barnacle geese winter on Priest Island.

#### **3.3.6. Mammals**

Like much of the west coast of the Highlands, the coastline of the project area supports a good population of otters. These live in 'holts' on or near the coast and forage in the intertidal and sub-tidal area to a depth of eight to ten metres. Otters are sensitive to pollution and are occasionally caught in creels, but since targeted persecution of otters has been halted the species has recovered well. This is a protected species under the Wildlife and Countryside Act, and is a national priority in the UK Biodiversity Action Plan. It is also protected at the European level under the EU Habitats Directive.

Both Common (Harbour) Seal and Grey Seal are found in the project area. Common seal populations declined drastically in the late 1980s due to a viral epidemic, but have since shown good recovery. Grey Seal numbers have increased since the late 1970s when the issuing of licenses for commercial hunting and large-scale control was stopped. Numbers of both species have increased in the project area, and there is some concern in certain sectors (aquaculture, commercial fisheries and salmon/sea trout angling) that the increased populations are having negative impacts on wild fish populations and on fish cages, and may be preventing recovery of some depleted populations. However, the seals are a popular feature of the area, and seal haul-outs are regularly visited by cruise boats. Both species are protected under the EU Habitats Directive.

Groups of Harbour Porpoise are regularly seen in the project area, and Minke Whale

Killer Whale, Atlantic White-sided Dolphin, Bottle-nosed Dolphin and White-beaked Dolphin have all been recorded in the vicinity. All whales, dolphins and porpoises are protected under the Wildlife and Countryside Act and under the EU Habitats Directive. As such it is an offence to capture, kill or deliberately disturb these species. They are known to be sensitive to disturbance by boat traffic, and by seal-scaring devices on fish farms.

Introduced mink have not yet been recorded in the project area. Mink have spread rapidly in parts of the west coast south of the project area, and have caused severe problems for ground-nesting birds such as terns and waders. Priest Island is free of rats, which also prey on the eggs and young of ground-nesting birds. The RSPB carries out regular monitoring for signs of rats or mink on the island.

### **3.4. Protected areas**

There are eight designated areas within and adjacent to the project area:

1 SAC	Little Gruinard River, designated for salmon.
1 SPA	Priest Island, designated for storm petrels.
4 SSSIs	Aultbea, designated for Torridonian geological features; Cailleach Head, designated for Torridonian features; An Teallach, designated for Upland habitats and Quaternary geology; Rubha Dunan designated for Fen habitat; Stoer and Torridon for geological features.
2 NSAs	Assynt-Coigach; Wester Ross.

Priest Island belongs to the RSPB, and is actively managed to maintain the conservation value of the site. Management activities focus mainly on the storm petrel population and the nationally important coastal heath habitat found there. Regular monitoring of breeding birds is carried out.

### **3.5. Wester Ross Biodiversity Action Plan (BAP)**

The Wester Ross Biodiversity Action Plan was completed in March 2004. It was prepared by the Wester Ross Biodiversity Group, with members representing a wide range of sectors and interests. The plan highlights habitats and species of both national and local importance, identifies the main issues facing these habitats and species locally, and makes recommendations for action for their conservation and management in Wester Ross.

The project area supports ten national priority habitat types, as well as five listed as local priority in the Wester Ross BAP. Thirty-one national priority species are found in the area, and a further twenty locally important species occur.

### **3.6. Wester Ross Marine Reserve Partnership**

The Scoraig-based Wester Ross Marine Reserve Partnership has proposed that Little Loch Broom and Annat Bay be designated a marine reserve. It proposes that creel fishing should be allowed to continue in the area, but trawling and finfish farming should not be permitted. The proposal is still in the early stages, and the partnership is working towards a marine audit for the proposed reserve area.

## **4. Value of this sector**

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The project area is a popular tourist destination, and the spectacular scenery and abundance of wildlife are important elements of the area's attraction both for tourists and locals.

There are three businesses based in the area which make a living from providing wildlife cruises among the islands. Also, many local livelihoods depend on a productive, functional marine ecosystem and an unpolluted environment, including the fishing and aquaculture industries.

However, the importance of natural heritage and the natural environment cannot be linked solely to its economic value. Britain is an island nation, and its coastal and marine environments have an intrinsic value which is difficult to quantify.

## **5. Key issues and priorities**

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This section seeks to identify the core assets, main issues, and current priorities for nature conservation in the project area.

### **5.1. Assets**

- Good environmental conditions, rich marine biodiversity and clean waters;
- Healthy populations of species with 'tourist appeal' such as otters and seals, rich marine diversity and good water clarity attract divers;
- A number of areas which remain relatively undisturbed by active fishing gear;
- Rare species with 'tourist appeal', such as white-tailed sea eagle and black-throated diver.

### **5.2. Issues**

The Wester Ross Biodiversity Action Plan identified a number of issues for biodiversity conservation in Wester Ross, many of which are relevant within the project area. Many of these were raised again alongside other issues at public meetings held during the early stages of this project.

#### ***Lack of species and habitat information***

- Lack of information on the abundance and distribution of marine and coastal species and habitats within the project area.
- Lack of clear understanding of the causes, scale and significance of the changes observed in the marine environment in recent years.

#### ***Fishing-related issues***

- Decrease in populations of commercially fished species (eg: herring, cod, haddock); also sandeels (fished for fuel and animal and fishfarm feed, though not within the project area), with impacts on the bird, mammal and larger fish species that depend on them;
- Decrease in populations of species fished for sport, in particular common skate.
- Damage caused to seabed habitats, including the spawning grounds for local fish species such as cod, haddock and plaice, from mobile fishing gear (trawling and dredging);

- 'Ghost fishing' by lost creels and nets, which if made of robust, non-biodegradable materials can continue to catch and kill fish, prawns and other species for many years after their loss.

#### ***Aquaculture-related issues***

- Impacts of fish farming on salmon and sea-trout populations through elevated ambient levels of sea-lice and through the genetic effects of escapes on native populations. This is of especial concern with respect to the Little Gruinard River SAC, and also has a knock-on effect for the freshwater pearl mussel;
- Concern that new species such as cod and halibut will become widely farmed before a full assessment of the potential impact has been made;
- Impacts of seal-scarers on cetacean populations;
- Algal blooms can cause problems for both finfish and shellfish farms but the underlying causes of the apparent increase in frequency of blooms are poorly understood.

#### ***Recreation and tourism***

- There is a need for better interpretation, possibly in the form of sea-life centres or dive facilities, as well as awareness-raising to avoid disturbance to wildlife;
- Damage to fragile benthic communities through anchoring;
- Increase in the use of motorised boats (eg rigid inflatable etc);

#### ***Pollution threats***

- The wreck of the 'Jambo' on the Summer Isles in 2003 highlighted the potential for environmental damage from vessels running aground. There is considerable marine traffic in the Minches, and the potential for damaging pollution events, which could involve oil, diesel or other toxic cargoes if ships run aground, is high.
- Impacts of sewage outflows in inhabited areas.
- Other forms of marine pollution such as plastics, coming from coastal and marine users and more distant sources.

#### ***Introduced species***

- It is probable that mink may spread to the area in the coming years, if they are not already here, which gives cause for concern for ground-nesting bird populations. Rats are not present on Priest Island, but may be on other islands. Their introduction would be disastrous for the breeding storm petrel population as well as for other ground-nesting species.

### **5.3. Priorities**

- In the project area, one of the highest priorities is to build up a better understanding of the distribution, status, requirements and sensitivity of species and habitats, to enable better management decisions to be made.
- Raise awareness and understanding of natural heritage within the different user sectors.
- Promote an ethos of nature conservation as being a necessary and beneficial strand to be considered in all that people do in the marine and coastal environment.



## **6. Development opportunities**

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A number of projects and actions have been proposed, through meetings relating to this project and through the Wester Ross Biodiversity Action Plan.

- Encourage further research to build up a better understanding of the distribution, status, requirements and sensitivity of species and habitats, to enable better management decisions to be made;
- Establish a marine nature reserve or network of reserves;
- Encourage the use of by-catch and fish waste in production of fish farm feed;
- Production of aquaculture framework plans - ensure they address the potential impacts on species such as Atlantic salmon, sea trout and fresh water pearl mussel with regard to siting new fish farms;
- Encourage synchronised finfish farm production within management areas, and re-locate finfish farms away from the mouths of rivers;
- Support and promote environmentally sensitive tourism; produce codes of practice for wildlife watching facilities;
- Identify and map fragile habitats such as maerl beds and seagrass, and make information available to boat users.
- Support and develop Ullapool Fish Week as a means of raising awareness and understanding of local marine resources;

## **7. Conclusions and recommendations**

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The sea has traditionally been seen as inexhaustible, and the project area has historically depended very heavily on the exploitation of the sea. Today we are seeing clear signs that the marine environment is not as robust as had been thought. There is clearly a need for effective protection, conservation and restoration of our marine and coastal natural heritage.

Conservation in Europe relies heavily on the targeted protection of selected species and habitats, which can be very effective. However, in the sea the situation is very complex. Many species are highly mobile, or have mobile life stages. As most of them are under the surface we can't see them easily to assess their status or distribution. As a result, we know remarkably little about our seas, even in inshore areas such as the project area. There is an urgent need for more and better information on the status and distribution of species and habitats, to inform targeted conservation measures, to allow effective regulation of activities that may affect the integrity of marine and coastal ecosystems, and to assess the potential for restoration.

While this applies at a national scale, it is no less relevant in the project area. The project needs to flag up that due to lack of information about the marine environment, developers will still have to assess the likely impacts of their proposals. The project and subsequent plan can only point out the most sensitive sites which we know about – the rest remains an unknown.

The Atlantic Coast Project provides a significant opportunity to identify information gaps, support research efforts, and feed the results into a plan for the effective long-term management of the area.

## **8. Comments and additional information**

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Information in this paper was gathered from published documents, agency records, and local individuals and organisations. If any of the information in the paper appears incorrect or if there are significant elements missing, please contact the Atlantic Coast Project Officer at the address below:

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## 9. Appendices

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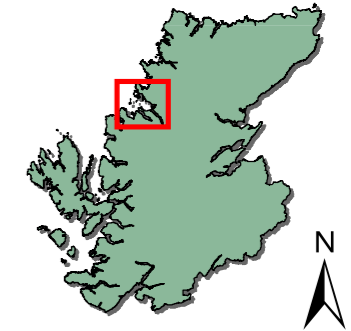
### **Appendix 1:** BAP species and habitats

**Appendix 2:** Summary of all research and survey information available on the marine and coastal natural heritage in the project area.

<b>Year</b>	<b>Survey</b>
1965-70	DAFS Scottish littoral sediment survey
1970-80	SMBA/MBA Great Britain littoral survey
1978	Smith Wester Ross littoral mollusc survey
1979	Smith West Sutherland and Coigach littoral mollusc survey
1988	Seasearch Loch Broom and Little Loch Broom survey
1989	Seasearch Gruinard Bay, Loch Ewe and Loch Gairloch survey
1991	UMBSM Lochs Laxford, Inchard, Broom & Little Loch Broom survey
1994	MNCR West Mainland Scotland lagoon survey
1995	Loch Broom ROV survey
1996	SNH Summer Isles ROV survey
1996	SNH/MCS Seasearch Summer Isles survey
2001	FRS Inshore Survey

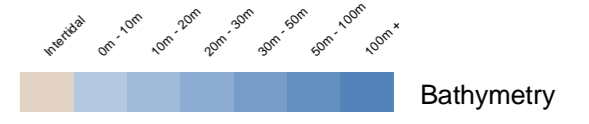
# Atlantic Coast (Wester Ross) Project

## Natural Heritage



### Legend

- |                                |  |                            |                               |
|--------------------------------|--|----------------------------|-------------------------------|
| <b>Topic: Natural Heritage</b> |  | <b>Topic: Project Area</b> |                               |
|                                | Special Protection Area                        |                            | Project Area Seaward Boundary |
|                                | Special Area of Conservation                   |                            |                               |
|                                | National Scenic Area                           | <b>Topic: Map Base</b>     |                               |
|                                | Biological Site of Special Scientific Interest |                            | Settlement                    |
|                                | Geological Site of Special Scientific Interest |                            | Main Peak                     |
|                                | Mixed Site of Special Scientific Interest      |                            | Trunk Road                    |
|                                |  |                            | A Road                        |
|                                |  |                            | B Road                        |
|                                |  |                            | Other                         |



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