

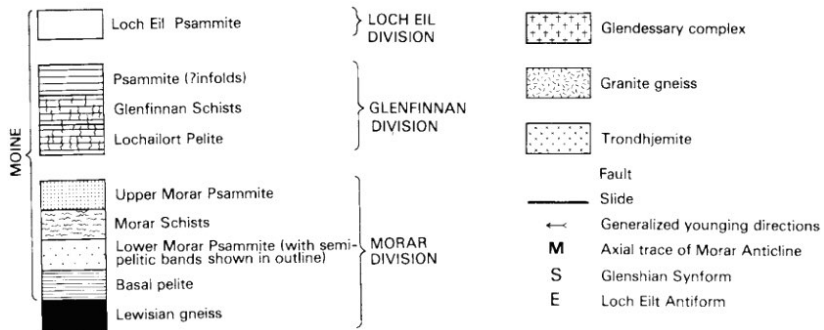
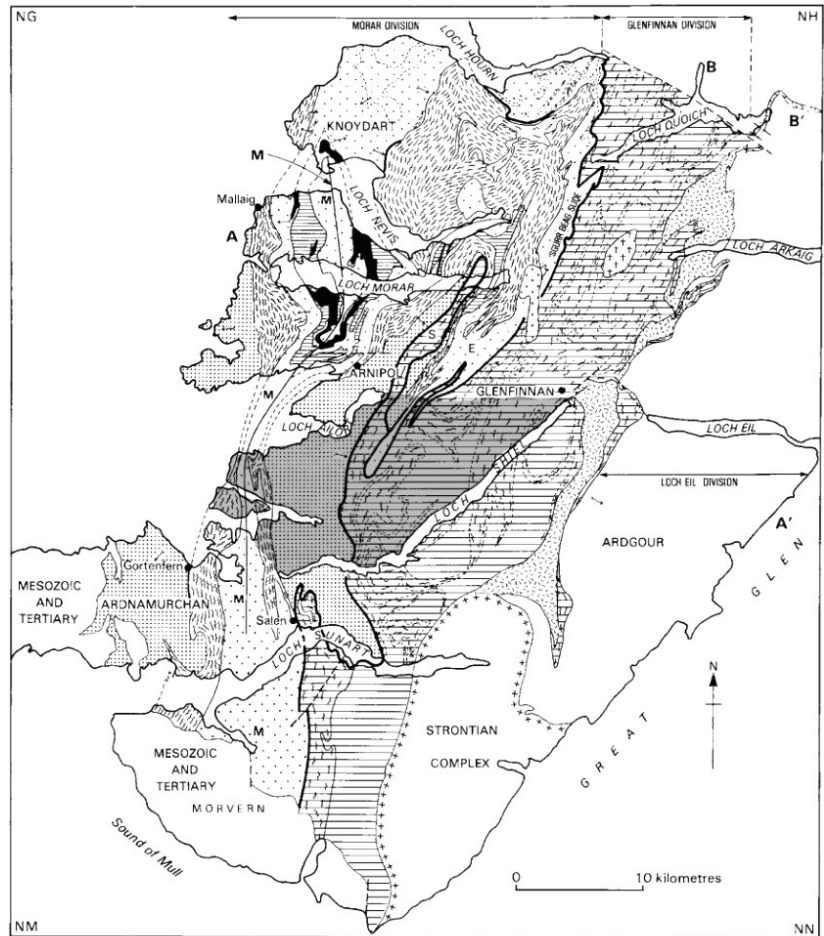


7. ENVIRONMENTAL AUDIT

7.1 Geology

7.2 Moidart is situated in the North-West Highlands with typically glaciated and complex landscape of ancient metamorphic and volcanic rocks and mountain summits between 2,000 and 3,000 ft (or 500 and 900 m). The district contains habitats characteristic of the Highlands of Scotland along their western Atlantic coastlands.

7.3 The distinctive character of its geological foundation is reflected in the London Science Museum's choice of an exposed rock face at the west end of Loch Eilt (NM 790827) as one of the finest exemplars of rock formation to tell 'The Story of the Earth'. A cast was taken of the rock face in the 1980s and an international audience in London educated on the complex geology of Moidart and Arisaig. The caption reads: 'The Morar striped and Pelitic Schists of the Moine series demonstrate a folding and crystallising of sandstones, siltstones and mudstones deposited in a large offshore river delta c. 7-800 million years ago. These were folded and metamorphosed c. 500 million years ago during the early Caledonian mountain building episode, producing hairpin or isoclinal folds by high compression in a plastic state. This process is evidenced in microcosm, for example, by crystalline mica and index mineral in the conspicuous white quartz vein. Finally, processes of uplift and erosion c. 400 million years ago and during the last Ice Age have produced the geology and underlying landforms we see today.'





#### 7.4 Habitat information

- 7.5 Moidart has nutrient-poor soil types, partly because of the hard rock base and partly because of climate. Land surfaces are subject to constant erosion and leaching by exposure to high rainfall and strong winds. With their exposure to oceanic weather conditions, these are areas characterised by a wet climate, i.e., at least 200 wet days annually, and relatively cool summers and mild winters. In meteorological records, Western Inverness-shire has the highest annual rainfall in the British Isles, reaching 200 inches in Glen Quoich and at the head of the River Garry, as well as on Ben Nevis. The mean average rainfall in Glenfinnan (c. 1984-2008) is about 160 inches or 3,316 mm. On present trends, winters are predicted to be even wetter in the next ten years and this has serious implications for deer welfare.
- 7.6 Moidart is quintessentially a part of the country classified as 'rough grazing'. Where the soil is deep it is usually pure acidic peat. Peat was, and is, a local source of fuel, and it is recognised and defined as 'carbon-rich soil' and a natural heritage feature of national importance. The significance of this for Moidart is included in the data sets of peatland habitats prepared by SNH. Moidart vegetation includes some heather moorland but there is a predominance of grass moorland with a variety of grasses, rushes and sedges, generally of low feed value. Lower slopes are subject to the invasion of bracken with its impact on tree and ground flora regeneration and loss of natural grazing (see APPENDIX 4). Ancient woodland is a significant and valuable Moidart habitat. It offers evidence for post-glacial natural forest cover of birch-pine and oak woodland (see APPENDIX 5).
- 7.7 Moidart woodland is characterised typically by oak, birch and alder with an understorey of holly, hazel and rowan. Tree cover extends from sea level (or about 5 m above this) to about 300 m. Much natural woodland occurs today on steeper and more rugged ground which is a factor in their survival. The acid soils have formed over the rocky slopes along Loch Moidart and Loch Shiel and support extensive oak woodlands. Most oak are mature trees, probably in the age range of 120-150 years old, with occasional trees likely to be over 200 years old. From the Middle Ages into the 19th century the oak woodlands in this area were managed extensively for timber and charcoal production for iron smelting; hence the even-aged structure of the woodlands more accessible by water. There is overall a lack of younger trees and saplings apart from on rock ledges and gulleys or within fenced areas. Where grazing animals are excluded and regeneration occurs, there is generally an abundance of seedlings to demonstrate the innate potential of all these species.



Natural regeneration of native woods both within and outwith an enclosure, Loch Shiel, 28 August 2015.



Angus MacLellan - Aonghas Raghail - cutting peat, Buorblaich, 1910.



A measure of the richness of habitats in the Moidart woodlands is the abundance of 'Atlantic bryophytes', a group of mosses and liverworts largely confined to the woodlands in the West Highlands in West Lochaber and Argyll. International classifications of these woodlands includes species of bryophytes now rare on a world scale (see APPENDIX 6). Lichens, with a conspicuous presence on trees and rocks throughout Moidart, are also a significant element of plant communities in the peninsula and a further indicator of biodiversity. Lichens are prominent in all areas of ancient woodland and an indicator of prevailing or changing atmospheric conditions as they vary in tolerance, for example, to acid rain or other conditions of atmospheric pollution. Macrolepidoptera also provide important indicators to richness of habitats (see APPENDIX 7).

#### 7.8 Habitat Designations

7.9 The MDMG area includes a number of natural heritage designations. These are protected under legislation and include the European Special Area of Conservation [SAC] for habitats and species, and Special Protection Area [SPA] for birds; the UK Sites of Special Scientific Interest [SSSI], and listings within SNH's 'Ancient Woodland Inventory'. SACs and SSSIs include features as diverse as native woodland and freshwater pearl mussel. The transition from maritime influenced woodland through to that further inland, in the Loch Moidart SSSI, is a feature adding to the importance of this district. Woodland SSSIs include woods under the criteria of 'Ancient', meaning that they are of semi-natural origin, long-established woodland of 'plantation' origin, and 'Other' i.e. that they appear on General Roy's Map of c. 1747-52.

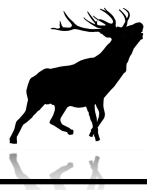
7.10 A Woodland Grant Scheme [WGS] was used in 1996 to fence an area of about 500 ha in Glenuig for the development of native woodland encompassing both areas of planting and natural regeneration. The woodland on Eilean Shona includes a wide variety of trees and is managed under a WGS. A collection of conifers from different parts of the world was made c. 1853-1878 by Captain Swinburne who established 'The Pinetum' on the island.

7.11 Moidart & Ardgour form a SPA on account of the significant population of breeding golden eagles and the Loch Shiel SPA is designated for black throated divers. It is gratifying to consider that conditions are now comparatively favourable for these species and RSPB confirms that they have been breeding successfully (see APPENDIX 8).



Eilean Shona *Pinetum*.

7.12 The extensive native deciduous woodland along the north shore of Loch Shiel form part of the Loch Moidart and Loch Shiel Woods SAC. This SAC extends in total to an area of 1758 ha. Some of the most extensive of the native woodland is located along the steep north-western slopes of Loch Shiel, bounded by the Loch Shiel SSSI. At the southern end of the loch are some mature stands of Scots Pine forming a component part of the South West Group of native pinewoods which are genetically distinct from those found elsewhere in Scotland. Selective underplanting with Scots Pine in the course of the last twenty years has respected this genetic diversity and used exclusively local stock. There are mature stands of European Larch that are rare in Lochaber and areas of alder provide diverse and unspoilt mixed woodland. In the early 1990s over 90 ha of ancient woodland ground above Loch Shiel on Glenaladale was deer-fenced in 10 enclosures to encourage natural tree and ground flora regeneration (see photo in Section 7.7)



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- 7.13 These woodlands are rich in plant species, especially mosses, liverworts and lichens, including many nationally rare species and species with an Atlantic distribution. However the woodlands were assessed as 'Unfavourable – No Change' status in the most recent Woodland Site Condition Monitoring assessment carried out by SNH. This is due to their poor structure and lack of adequate regeneration, but also due to vegetation competition (eg. from bracken) and by wildfire incidents (see APPENDIX 9). Parts of the woodland habitat are grazed by cattle and over-wintering deer causing browsing damage that has reduced the extent of natural woodland regeneration and, due to their correlation with the woodlands, the conditions of the moss and liverwort flora are also deemed as unfavourable. 'Unfavourable' assessments due to grazing and browsing pressure offer updates but no explanations or solutions. A 'Woodland Plan' currently being prepared for one area of these woodlands (and due for completion in Spring 2016), aims firstly to move some of the notified features of the designated sites from 'Unfavourable – No Change' or 'Unfavourable – Declining' status to 'Unfavourable – Recovering' status or better. Thereafter, the plan proposals will be to improve and regenerate the woodlands.
- 7.14 The spread of *Rhododendron ponticum* has obliterated native shrubs and other ground flora on the western seaboard and in some inland areas of the peninsula. It is limiting natural regeneration but this is a longstanding issue going back over a century or more. Rhododendron clearance schemes are regularly undertaken. The Eilean Shona 'Pinetum' has already been mentioned (§ 6.10) In addition, the extensive colonisation of richer loam soils by bracken represents a serious scourge that attracts less attention. Some areas of bracken have been cleared over the last two decades to enhance natural regeneration and grazing.
- 7.15 Habitat Assessment
- 7.16 Information relating to habitats and their conditions has been, and will continue to be gathered. Guidelines have been developed by SNH on Site Conditions Monitoring [SCM] and Habitat Impact Assessments [HIA], for comparing habitat type or species with sets of quality standards (to maintain habitats in their current condition or allow species to continue in a sustainable state).

The following table covers the areas of designated sites or habitats in Moidart open to deer, and SNH's SCM status for each.



Designation	Name	Feature	Condition
National Scenic Area	Morar, Moidart and Ardnamurchan	Landscape	N/A
National Scenic Area	Loch Shiel	Landscape	N/A
Special Protection Area	Moidart and Ardgour	Golden Eagle	Favourable
Special Protection Area	Loch Shiel	Black-throated diver	Unfavourable – recovering due to management
Special Area of Conservation	Loch Moidart and Loch Shiel Woods	Alder woodland on floodplains	Unfavourable - no change
		Intertidal mudflats and sandflats	Favourable
		Mixed woodland on base-rich soils associated with rocky slopes	Unfavourable – no change
		Otter	Favourable - maintained
		Western acidic oak woodland	Unfavourable – no change
Site of Special Scientific Interest	Loch Shiel	Black-throated diver	Unfavourable – recovering due to management
		Bryophyte assemblage	Unfavourable - declining
		Chequered skipper	Favourable - maintained
		Native pinewood	Favourable - maintained
		Oligotrophic loch	Favourable - maintained
		Upland oak woodland	Unfavourable – no change
Site of Special Scientific Interest	Loch Moidart	Beetle	Favourable - maintained
		Moine (geology)	Favourable - maintained
		Mudflats	Favourable - maintained
		Saltmarsh	Favourable - maintained
		Upland oak woodland	Unfavourable - declining



7.17 **Monitoring**

7.18 This Table summarises the methods used in monitoring progress with DMP objectives and ADMG 'Benchmark Assessment' (also see section 10)

Objective or issue	Method of assessment	Monitoring period and frequency	Who is responsible	Use of information	DMP reference
Deer numbers/ Density	Visual count at the end of the hind season	Every 2 years	Land Managers/ SNH helicopter	Share with DMG & incorporate into DMP	6.6 & 9.1
Habitat Impacts	HIA survey following Best Practice methodology	Every 3 years	Land Managers	Share with DMG & incorporate into DMP	8
Cull figures	Larder Records	Annual	Land Managers	Share with DMG & incorporate into DMP	6.11 & 9.4
Annual Recruitment	Visual count of groups of hinds and calves	Annual, early April	Land Managers	Share with DMG & incorporate into DMP	6.8
DVCs	SNH Monitoring Forms	Monthly October to May	Land Managers/ Police Scotland	Share with DMG/ Community	6.12
Crop/Woodland damage	HIA survey	Annual	Land Managers/SNH	Share with DMG & incorporate into DMP	8.18
Ground flora degradation	HIA survey	Annual	Land Managers	Share with DMG & incorporate into DMP	8

Monitoring: comments and additional information

- Monitoring is being carried out by landholders and professional land managers;
- Training is being undertaken to develop capacity;
- This is informing current and future deer management within the MDMG area;
- Information will be made available on a regular basis (normally bi-annually) to the MDMG secretary/ data officer in an appropriate and agreed format;
- Constraints and limiting factors are identified and discussed in current practice;
- Consultation will include discussion of desired and achievable objectives;
- Discussion will be sustained on 'Actions' i.e. who will do what, when and where;
- The review process is part of the DMP eg. ongoing assessment of actions, annual update and annual revision;
- Major review will be carried out in or before 2020;
- Preparation of revised plan will be ongoing and leading to implementation in 2020.