

Western Isles Local Biodiversity Action Plan

Audit Report

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Compiled by

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Wildlife & Countryside Act

Numbers of vertebrates protected by legislation (the numbers in brackets show the number with limited protection).

Legislation	Schedule or Annex	Title of Schedule or Annex (or description of Annex)	Mammals	Birds	Amphibians or Reptiles	Fish
Wildlife & Countryside Act, 1981, as amended	1 I	Birds which are protected by special penalties at all times		45		
	1 ii	Birds which are protected by special penalties during the close season		3		
	2 I	Birds which may be killed or taken outside the close season		11		
	3 I	Birds which may be sold alive at all times if ringed and bred in captivity		6		
	3 iii	Birds which may be sold dead from 1 September to 28 February		7		
	5	Animals which are protected	20 (1)		14 (7)	6 (2)
	6	Animals which may not be killed or taken by certain methods	15			
	9 I	Animals which are established in the wild		3		
Habitats Directive, 1992	IIa	Animal species of Community Interest whose conservation requires the designation of Special Areas of Conservation	5			7
	IVa	Animal species of Community Interest in need of strict protection	15		1	1

Legislation	Schedule or Annex	Title of Schedule or Annex (or description of Annex)	Mammals	Birds	Amphibians and Reptiles	Fish
	Va	Animal species of Community Interest whose taking in the wild and exploitation may be subject to management measures	6		7	5
Wild Birds Directive, 1979, as amended	I	Species which shall be the subject of special conservation measures		38		
	II	Species which may be hunted throughout EU		11		
	II	Species which may be hunted in UK only		14		
	III	Species which may be sold alive or dead throughout EU, provided legally killed or captured		1		
	III	Species which may be sold alive or dead in UK only, provided legally killed or captured		12		
	III	Species which may be marketed in the EU, provided it does not lead to them being endangered throughout the EU		5		
	M	Migratory species which shall be the subject of special conservation measures		72		
Conservation Regulations, 1994	2	European protected species of animals	16		7	1
	3	Animals which may not be killed or taken in certain ways	5			5 (1)

Designated Sites

Sites of Special Scientific Interest (SSSI)

Loch Stiapavat
Port of Ness
Loch Scarrasdale Valley Bog
Loch na Cartach
Tolsta Head
Loch Dalbeg
Loch Tuamister
Gress Saltings
Tong Saltings
Stornoway Castle Woodlands
Loch Laxavat Ard & Loch Laxavat Iorach
Achmore Bog
Loch Orasay
Loch Siader
Tob Valasay
Glen Valtos
Mangersta Sands
Cnoc A' Chapuill
Little loch Roag valley bog
Loch nan Eilean Valley Bog
North Harris
Shiant Isles
Flannan Islands
Small Seal Islands
Luskentyre Banks & Saltings
Northton Bay
Loch Meurach
Loch A Sgurr Pegmatite
Pabbay
Berneray
Boreray
Machairs Robach & Newton
Loch an Duin
Vallay
Loch nam Madadh
Mointeach Scadabhaigh
Balranald Bog & Loch nam Feithean
Obain Loch Euphoirt
Loch Obisary
Lochs at Clachan
Baleshare & Kirkibost
West Benbecula Lochs
Loch Bee
Loch Bee Machair
Howmore Estuary, Lochs Roag & Fada
Bornish & Ormiclate machairs
Allt Volagir
Loch Hallan
Eoligarry

Small Seal Islands
Mingulay & Berneray
Rockall

National Nature Reserves (NNR) also classed as SSSIs

Monach Islands
Loch Druidibeg
St Kilda
North Rona
Sulasgeir

Special Protection Areas (SPA)

Ness & Barvas
Flannan Islands
Lewis Peatlands
North Harris Mountains
Shiant Islands
Mointeach Scadabhaigh
North Uist Machair & islands
Monach Islands
St Kilda
Aird & Borve
South Uist Machair & Lochs
Kilpheder & Smerclate
Eoligarry
Mingulay & Berneray

Ramsar Sites

Lewis Peatlands
Loch an Duin
North Uist Machair & Islands
South Uist Machair & Lochs

Abbreviations & Acronyms

CC	Conservation Concern
JNCC	Joint Nature Conservation Committee
O	Distribution offshore & coastal waters
P	Priority Species
S	Species present in Western Isles; geographical location not shown for conservation reasons

Introduction

The UK signed up with more than 150 other countries signed the Biodiversity Convention at the Earth Summit in Rio de Janeiro. The objective of the Convention was to get a formal commitment from governments to actively conserve the planet's biodiversity. As part of the commitment the UK Government undertook to prepare a national strategy for the country's biodiversity. This resulted in 1994 of the launching of the UK's Biodiversity Action Plan.

This commitment passed down to local government bodies who were charged with the preparation of Local Biodiversity Action Plans (LBAP). Guidance on the purpose and content of plans has been difficult to obtain, but as more and more councils started their LBAP process, a pattern became established where the local steering group's priorities was the preparation of an audit recording the significance of the area's biodiversity, usually at some combination of European, UK, national and local scales.

Comhairle nan Eilean Siar commissioned this work in early 2002. This audit is not an end in itself or the final word on the Western Isles' biodiversity. It is first of all only the initial step in a long process in which local people, led by the Comhairle can involve themselves further in the management and conservation of the islands' biodiversity. The Western Isles are in some way fortunate to be able to call on the experience of almost every other area in Scotland as they start along this road. But the audit is also a snapshot of the knowledge accessible in a short period of time - doubtless more is known just now; certainly there is much left to learn.

Scope of this audit report

The aim of the audit report is to describe the biodiversity resource of the Western Isles in terms of habitat resource and important species. The audit is designed as a working document to be used by the LBAP steering group, as an information database in the construction of action plans.

The audit has been compiled from sources of existing information and no field or survey work was carried out. The audit is not a full account of all habitats and species found in the area as it concentrates on the UK priority species and habitats identified by the UK Biodiversity Steering Group. However a small number of habitats and species of local significance, which are not on the UK lists are included on the advice of local experts.

It is also important to stress at this point that the standard audit approach followed here is only one view of biodiversity value - many of the habitats mentioned in particular are significant as much for a suite of *non*-priority species as for their one or two rarities. The whole is more than the sum or the parts, and this is difficult to put over in a series of lists.

Methodology used in compilation of this report

The basic lists of species and habitats were drawn from the current UKBAP inventory of priority habitats and species (as given on the UK Biodiversity Group website) and from the series of SNH Reports outlining the distribution of these and other significant species in Scotland by (inter alia) local government areas. Additional species were suggested by the local experts listed in the acknowledgements.

Information on distribution, populations, threats and opportunities varied a great deal in its availability, particularly between species groups. Birds were particularly well served, with the excellent atlases covering the British Isles being supplemented by local information, both published and unpublished.

Summary habitat and species tables illustrate the geographical spread throughout the Western Isles. In the case of marine species, the 'Western Isles' column was seen as more appropriate, notwithstanding the fact that strandings, for example, might be limited to a few island groups. The same applies to a few terrestrial species where egg collecting or similar pressures were thought to be significant threats to their survival.

For vascular plants, the UK atlas is currently being updated - we were fortunate to have the assistance of the local plant recorder, who provided a 'fast track' to distributional data for both UK priorities and other significant species.

For other 'well-known' species groups, such as mammals or reptiles, we were as much hampered by the fact that the priorities amongst these groups are few in number and the data sources correspondingly more difficult to reach.

It was amongst invertebrate and lower plant groups that the data coverage was most patchy and where dependence on expert knowledge was most critical. For butterflies, we used the recently-published Atlas, but for lichens and bryophytes, for example, we had no alternative but to seek the assistance of a specialist. In some cases the data *does* exist, but only amongst a narrow group of enthusiasts. Since these species make up the vast majority of Biodiversity, even in the Western Isles, it might be appropriate for the local Steering Group to attempt as part of the LBAP process to raise their profile both locally and, where appropriate, nationally.

SPECIES ACCOUNTS

VERTEBRATES

MAMMALS

*Otter **Lutra lutra***

Status: Priority

Legal Status: The otter is listed on Appendix 1 of CITES, Appendix II of the Bern Convention and Annexes II and IV of the Habitats Directive. It is protected under Schedule 5 of the WCA 1981 and Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations, 1994 (Regulation 38). The European sub-species is also listed as globally threatened on the IUCN/WCMC RDL.

Distribution: Widespread. The Western Isles are one of the otter's main strongholds in the British Isles. It is recorded in almost all 10-km squares (JNCC Report 241).

Habitat: Rocky coasts, open water, reed beds, marshes & wetlands

Population estimate: No data

Population trends: No data

Current threats and opportunities: Incidental capture, road traffic accidents, pollution, including acidification, incidental effects of pollution. Promote otter guards on eel nets, promote otter proof fencing at fish farms to prevent predation, reduce road casualties. The Western Isles is extremely important for this species containing one of the highest species densities in the world. Data relating to population numbers is extremely difficult to quantify. Otters require access to both the coast and fresh water which exist in close proximity in the Western Isles. There is no conflict between fish farms and otters, many farms having otter holts in close proximity to cages. Otters are a good environmental indicator of aquatic and inshore habitats.

Information sources: Jane Twelves, personal communication, JNCC 2000, UKBAP

*Pipistrelle bat **Pipistrellus pipistrellus***

Status: Priority

Legal Status: The pipistrelle is listed on Appendix III of the Bern Convention, Annex IV of the EC Habitats Directive and Appendix II of the Bonn Convention (and is included under the Agreement on the Conservation of Bats in Europe). It is protected under Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations, 1994 (Regulation 38) and Schedules 5 and 6 of the WCA 1981 and Schedules 5 and 6 of the Wildlife (Northern Ireland) Order 1985.

Distribution: Widespread. In the Western Isles the bat is known to occur only in Lewis, mainly in Stornoway and its woodland.

Habitat: Buildings, gardens and policy woodland

Population estimate: No data

Population trends: No data

Current threats and opportunities: Habitat change, loss of roosts such as exclusion from roof spaces, incidental effects of pesticides. Provide advice on the retention of roosts and habitat conservation/enhancement and creation/maturation of new mixed plantings.

Information sources: UKBAP

*Harbour porpoise **Phocoena phocoena***

Status: Priority

Legal Status: The harbour porpoise is listed on Appendix II of CITES, Appendix II of the Bern Convention and Annexes II and IV of the EC Habitats Directive. It is also on Appendix 2 of the Bonn Convention and is covered by the terms of the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS), a regional agreement under the Bonn Convention. It is protected under Schedule 5 of the WCA 1981.

Distribution: Temperate/ sub-arctic North Atlantic, coastal waters

Habitat: Oceanic seas and inshore waters/sealochs

Population estimate: No data

Population trends: No data

Current threats and opportunities: Entanglement and drowning in fishing nets, pollution of inshore waters especially. Disease, Noise disturbance, Overfishing, Climate change, Collate site records and strandings and encourage further study. Promote marine site protection, work with fishers to reduce/avoid by-catches & to dispose of discarded gear safely; introduce codes of practice to reduce disturbance from whale watching

Information sources: UKBAP, JNCC 2000



Distribution of Harbour Porpoise

Data source: JNCC International Designations Database; Mark Tasker, JNCC.

The dots on the map shows candidate and possible Special Areas of Conservation in which porpoise have been listed as occurring, with an indication of general population density around the UK. Areas apparently supporting higher population densities are heavily shaded, while coastal waters in which they are usually rare or absent are lightly shaded. Individuals may be seen almost anywhere in UK waters.

Baleen whales

Minke Whale (*Balaenoptera acutorostrata*)

Blue whale *Balaenoptera musculus*.
Fin whale *Balaenoptera physalus*
Sei whale *Balaenoptera borealis*
Humpback whale *Megaptera novaeangliea*.
Northern right whale *Eubalaena glacialis*

Status: Priority

Legal Status: All baleen whales are protected under schedule 5 in both the Wildlife and Countryside Act 1981. All whales are listed on Annex A of EU Council Regulation 338/97 and therefore treated by the EU as if they are on CITES, Appendix I, thus prohibiting their commercial trade. They are listed in Appendix I of CITES (except for *Balaenoptera acutorostrata* population of West Greenland which is on Appendix II), Appendix II of the Bern Convention and Annex IV of the EC Habitats Directive. Whaling is illegal in UK waters (Fisheries Act 1981) but neighbouring countries maintain the right to hunt. The UK recognises only the authority of the International Whaling Commission (IWC) in matters concerning the regulation of whaling.

Distribution: Deep water, migratory species present in all oceans. Six species of baleen whale need to be considered in this grouped action plan. All are present at some time in Western Isles waters. These are:

Minke Whale *Balaenoptera acutorostrata*

Blue whale *Balaenoptera musculus*. Whaling during the late 19th and 20th century greatly reduced its abundance. Scottish catches from the whaling station at Bunavoneader in Harris between 1908 and 1927 amounted to 308 individuals, mostly taken in July, August and September.

Fin whale *Balaenoptera physalus*. Scottish catches from Harris accounted for more than 4000 fin whales between 1908 and 1927.

Sei whale *Balaenoptera borealis*. The whaling station at Bunavoneader took 1722 between 1908 and 1927, though most of these were in just a few years, suggesting episodic movements closer to shelf waters.

Humpback whale *Megaptera novaeangliea*.

Northern right whale *Eubalaena glacialis*. The Harris station accounted for 69 northern right whales between 1908 and 1927.

Habitat: Oceanic seas

Population estimate: not applicable

Population trends: data is poor and difficult to compare over long periods, being based on whaling catches in previous years, but now including hydrophone data

Current threats and opportunities: Acoustic disturbance, pollution, reducing prey, seismic survey explosions, climate change. Collate all site records and strandings to help determine sites and times critical to life history so that protective measures can be implemented. Minimise disturbance to cetaceans from whale watching operations & recreation at sea.

Information sources: UKBAP, JNCC 2000

Small dolphins

Bottlenose dolphin *Tursiops truncatus*

Risso's dolphin *Grampus griseus*
White-beaked dolphin *Lagenorhynchus albirostris*
Atlantic white-sided dolphin *Lagenorhynchus acutus*
Common dolphin *Delphinus delphis*
Striped dolphin *Stenella coeruleoalba*

Status: Priority

Legal Status: All species of cetaceans are given protection under the Wildlife and Countryside Act 1981. All cetacean species are listed on Annex IV (Animal and Plant Species of Community Interest in Need of Strict Protection) of the EC Habitats Directive. All cetacean species are listed on Annex A of EU Council Regulation 338/97 and therefore treated by the EU as if they are on CITES Appendix I thus prohibiting their commercial trade.

The bottlenose dolphin is listed in Annex II and IV of the EC Habitats Directive. Under Annex IV the keeping, sale or exchange of such species is banned, as well as deliberate capture, killing or disturbance. The Directive requires that member states monitor the incidental capture and killing of all cetaceans.

An Agreement on the Conservation of Small Cetaceans in the Baltic and North Seas (ASCOBANS), formulated in 1992, has now been signed by seven European countries, including the UK. Under the Agreement, provision is made for protection of specific areas, monitoring, research, information exchange, pollution control and heightening public awareness. Measures are included aimed specially at protecting dolphins and porpoises in the North and Baltic Seas and cover the monitoring of fisheries interactions and disturbance, resolutions for the reduction of by-catches (below 2% of stock sizes), and recommendations for the establishment of specific protected areas for cetaceans.

The six dolphin species covered in the Western Isles Audit are protected under ASCOBANS' parent Convention, the Bonn Convention. The North and Baltic Sea populations of the bottlenose, Risso's, white-beaked, Atlantic white-sided and common dolphin are included on Appendix II of the Bonn Convention. The western Mediterranean population of the striped dolphin is included on Appendix II of the Bonn Convention.

Distribution: There are six small dolphin species occurring regularly in UK waters: A small resident population of Bottlenose dolphin *Tursiops truncatus* occurs around the sound of Barra.



Distribution of Bottle-nosed Dolphin

Data source: JNCC International Designations Database; Mark Tasker, JNCC.

The map shows candidate and possible Special Areas of Conservation supporting this Annex II species, with an indication of distribution around these and other areas believed to support semi-resident populations around the UK. Core home ranges are heavily shaded, and areas apparently used by animals from these ranges are more lightly shaded. Individuals may be seen almost anywhere in UK waters.

Risso's dolphin *Grampus griseus*. The major UK population occurs around the Hebrides, with groups seen regularly in summer off Stornoway and off South Uist. A study in the North Minches has identified at least 142 individuals but no population estimate has yet been made.

White-beaked dolphin *Lagenorhynchus albirostris* Regularly seen bow-riding boats off the Western Isles

Atlantic white-sided dolphin *Lagenorhynchus acutus*. In UK waters, its distribution is concentrated around the Hebrides, but does not commonly approach small boats.

Common dolphin *Delphinus delphis*. Large school regularly seen between Skye, the Small Isles and the Western Isles.

Striped dolphin *Stenella coeruleoalba*. A subtropical and warm temperate species, with occasional sightings and strandings only.

Habitat: Open waters

Population estimate: no data

Population trends: no data

Current threats and opportunities: Ecosystem changes resulting from over-exploitation of fish stocks; interactions with fisheries (by-catches) and/or boat activities- collisions & noise (shipping, seismic, military, recreational); pollution, organochlorines; climate change. Collation of sight records and strandings to gather more information on distribution of habitats. Establish & manage SAC's, marine protected areas, calving, nursery, feeding; EU ban on drift nets; international co-operation- Agreement on Conservation of small Cetaceans in Baltic & N Sea (ASCOBANS)

Information sources: UKBAP, JNCC 2000

Toothed whales (other than small dolphins)

Northern bottlenose whale *Hyperoodon ampullatus*

Cuvier's beaked whale *Ziphius cavirostris*

Sowerby's beaked whale *Mesoplodon bidens*

True's beaked whale *Mesoplodon mirus*

Killer whale *Orcinus orca*

Long-finned pilot whale *Globicephala melas*

Sperm whale *Physeter macrocephalus*

Status: Priority

Legal Status: All species of cetaceans are given protection under the Wildlife and Countryside Act 1981. All cetacean species are listed on Annex IV (Animal and Plant Species of Community Interest in Need of Strict Protection) of the EC Habitats Directive. All whales are listed on Annex A of EU Council Regulation 338/97 and therefore treated by the EU as if they are on CITES Appendix I thus prohibiting their commercial trade. Whaling is illegal in UK waters (Fisheries Act 1981), but neighbouring countries maintain the right to hunt. The UK recognises only the authority of the IWC in matters concerning the regulation of whaling.

An Agreement on the Conservation of Small Cetaceans in the Baltic and North Seas (ASCOBANS), formulated in 1992, has now been signed by seven European countries, including the UK. Under the Agreement, provision is made for protection of specific areas, monitoring, research, information exchange, pollution control and heightening public awareness. Although aimed primarily at dolphins and porpoises, ASCOBANS includes all toothed whales except the sperm whale. The northern bottlenose whale is also listed on Appendix II of the Bonn Convention, as are eastern north Atlantic populations of the killer whale and the North Sea and Baltic Sea populations of the long-finned pilot whale.

Distribution: The beaked whales are species typical of the north Atlantic, but their status and distribution are poorly known. There are 3 species:

Northern bottlenose whale *Hyperoodon ampullatus* It occurs in small numbers around the Western Isles.

Cuvier's beaked whale *Ziphius cavirostris*

Sowerby's beaked whale *Mesoplodon bidens*

True's beaked whale *Mesoplodon mirus* The distribution is very poorly known, but the few records that exist indicate that it occurs in the Atlantic Ocean west of the Western Isles.

The other toothed whales present in Western Isles waters are:

Killer whale *Orcinus orca*, pods being seen most summers offshore and around the remoter island groups like St Kilda.

Long-finned pilot whale *Globicephala melas*

Sperm whale *Physeter macrocephalus*

Habitat: Oceanic seas

Population estimate: No locally-meaningful data

Population trends: No locally-meaningful data

Current threats and opportunities: Pollution - organochlorines; drive fisheries (Faeroe) acoustic disturbance (seismic) fisheries (entanglement); climate change. Collate all sightings and strandings to gather information on distribution and habitats. Safeguard breeding & feeding areas where known; international co-operation in legislation, research, monitoring.

Information sources: UKBAP, JNCC 2000

Species of Conservation Concern

Red Deer *Cervus elaphus scoticus*

Although originally found in open deciduous woodland, they are more found in the Western Isles on open moorland, peatland and during winter months on croft inbye land. These tend to be smaller in size with smaller antlers than woodland or park animals. Although a pure species, there is always the potential threat of hybridisation-genetic introgression. Many mainland populations now suffer cross-breeding with introduced Sika deer and the Western Isles are now seen as a refuge for pure native stock. For this to be effective there must be no further release in the Western Isles of animals from the mainland. Active management is required to balance wider natural heritage interests with conservation importance of island red deer populations, and the establishment of deer management groups between the estates should be encouraged.

Mountain Hare *Lepus timidus*

Legal Status: Hab Dve Va Cons Reg 3

The species is normally found in moorland habitat of grass and heather. On the mainland the coat apart from the ear tips, changes to a white colour during the winter months but this is not so prevalent amongst island hares. As the species tends to be concentrated in small isolated populations, there is always a potential threat of existence to the species. Extensive and excessive heather burning should be discouraged and numbers of hares should be monitored.

Common or Harbour seal *Phoca vitulina*

Legal Status: Hab Dve 11a Va Cons Reg 3

This species is smaller and less numerous than the grey seal, pups are born in the summer months and attain independence quite quickly. Common seals are found in shallow coastal waters and will enter rivers. They feed mainly on fish, including Whiting, Sole, and Dragnet as well as some molluscs and crustaceans. Threats can be localised when seen as a threat to local fishing activities.

50% of the European Union population of Common seals are in the UK. The Sound of Barra is a proposed SPA for this species, being recognised as an important breeding and moulting area for this species. The Sound of Harris also has significant concentrations. Seals damaging fishing and aquaculture gear can be controlled but disturbance at breeding/moulting areas needs to be limited. There may be some potential locally for seal watching boat trips. Some years ago North Sea seals were infected with a distemper virus but this did not have a major effect in the Western Isles nor on local grey seals. An outbreak has just been reported this month (June 2002) on the Danish coast with 250 seals dead out of a population of 5,000. Dead animals with similar symptoms have also been reported on the Swedish coast. The construction of inter-island causeways could affect seal movements and feeding/breeding grounds but mitigation measures to date appear to have been sufficient.

Grey seal *Halichoerus grypus*

Legal Status: Hab Dve 11a Va Cons Reg 3

This species is gregarious, breeding in large colonies in the autumn and early winter. Some 40% of the world's population of this species breeds in the UK. They feed on Sandeels, cod, flatfish, whiting and dragonet as well as squid. As with the common seal, they can be seen as a threat to local and commercial fishing.

(Figures from the Sea Mammal Research Unit for island populations with shortly be available). Satellite tagging has shown that these animals are only present in such numbers during the short breeding season in October/November, thereafter dispersing all over the North Atlantic out to the Faroes, north and east of Orkney and Shetland etc; very few however enter the Minch. A cull of the species was undertaken in the 70's. A lot of seals were killed but this action did not have the desired effect. Some seals that were not culled were frightened away from these areas and moved to other colonies resulting in a localised population increase. There is considerable debate on the threat seal populations have on fish stocks. Seals are however, fifth in the league table of fish predators, below humans, other fish, seabirds and cetaceans. The after effects of the cull in the 70's indicate the problems that could arise from frightened seals moving into other areas and the effect they could have on fish stock and other environmental factors. The grey seal is a threat to fishfarming also.

BIRDS

PRIORITY SPECIES

Note: GB population figures stated for each species are taken from Population estimates of birds in Britain and the United Kingdom; Brian H Stone, Jane Sears, Peter A Cranswick, Richard D Gregory,

David W Gibbons, Mark M Rehfisch, Nicholas J Aebischer and James B Reid published in Brit. Birds 90 Jan-Feb 1997 pp 1-22.

Key: P = pairs, W = Wintering; I = Individuals; S = Spring Migration; M = Males. Dates in brackets refer to period of the count.

**Common scoter *Melanitta nigra*
-breeding & wintering**

Status: Priority

Legal Status: The common scoter is specially protected under Schedule 1 of the Wildlife and Countryside Act 1981. It is protected as a migratory species under the EC Birds Directive and is listed on Appendix III of the Bern Convention.

Distribution: Wintering and moulting on inshore waters. In the Western Isles birds were only present in one location in Harris during the breeding season in the period covered by the NABB, with no signs of breeding. 20 years earlier birds were present on the islands to the N and W of North Uist. The 1991-97 Wetland Bird Survey found a significant concentration of common scoter off SW Harris and a smaller group of birds off Benbecula.

Habitat: Open seas, breeding on moorland lochs.

Population estimate: GB breeding 76-89 P (1995); wintering 34,500 I (1986-1981)

Population trends:

	Presence by 10 km ² Squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	57	27	67	24
Western Isles	3	0	1	0

Current threats and opportunities: Pollution (oil spills); eutrophication; depletion food supply; fish stocking; shell fishing; afforestation - sedimentation and increased access.

Positive management of peatlands and moorlands; protect key breeding and wintering/moulting sites; Monitor impact of predators, especially mink.

Information sources: Gibbons et al 1994, Thom 1986

Corncrake *Crex crex*

Status: Priority

Legal Status: The corncrake is a globally threatened species. It is listed on Appendix II of the Bern Convention and Annex 1 of the EC Birds Directive. In the UK it is protected under Schedule 1 of the WCA 1981 and the Wildlife (Northern Ireland) Order 1985.

Distribution: Current numbers in the Western Isles are currently 327 singing males (2001 RSPB records). This represents 55% of birds recorded in the 'core areas' (51% of the UK total). The distribution of the Corncrake is spread through all of the island groups in the Western Isles where hay or silage crops are grown: Lewis; Harris; Berneray; North Uist; Benbecula; South Uist; Barra & Vatersay.

Habitat: **Essential early cover in the spring is provided by iris beds and other overgrown vegetation.** Breeds in farmland with late cut winter forage

Population estimate: 591 breeding males in GB. (RSPB 2000)

Population trends: Showing signs of recovery from an all-time low, following implementation of management measures

Current threats and opportunities: Agricultural change, habitat destruction; disturbance; habitat fragmentation; grazing; small or isolated population; predation by cats, mink and ferrets and possibly hedgehogs. Protect tall grassland vegetation; mow to drive birds to edge of cover, do not corral in central grass island.

Information sources: RSPB, Gibbons et al, 1994, Thom, 1986, UKBAP

SPA Designated Area	No of calling males	% of UK breeding population
Eoligarry Barra	28	5
Kilpheder & Smerclate	20	4
South Uist Machair & Lochs SPA	20	4
Aird & Borve	19	3
North Uist Machair & Islands SPA	22	4

	Presence by 10 km ² squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	1488	1319	407	163
Western Isles	35	32	33	32

RSPB Corncrake survey 2000

Area	No of calling males 2000
Lewis	60
Harris	4
Berneray	1
North Uist	66
Benbecula	31
South Uist	96
Eriskay	2
Barra	48
Vatersay	8
Total	316

Red-necked phalarope *Phalaropus lobatus*

Status: Priority

Legal Status: The red-necked phalarope is specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 and Annex 1 of the EC Birds Directive, and is listed on Appendix II of the Bern Convention. RSPB/UK Action Plan

Distribution: Three to five breeding males are recorded at another regularly used site on Lewis. The Western Isles currently supports around 4% of the breeding population of the UK. A number of sites in the Uists were used previously.

Habitat: Breeds in bog pools & freshwater lochs.

Population estimate: GB breeding 36 M (1995)

Population trends:

	Presence by 10 km ² Squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	22	20	10	6
Western Isles	7	5	2	1

Current threats and opportunities: Occlusion of open water; cessation of grazing; drainage & changes in water levels; eutrophication; predation. The reasons for decline in Outer Hebrides are unclear; there still appears to be a number of suitable breeding sites on the Uists.

Protect breeding sites, use grazing to retain open water on breeding mires; prevent drainage. Enclosure to prevent trampling around nests; prevent disturbance, this species being especially vulnerable to egg collectors, so sites need to be kept confidential. (RSPB Action Plan

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

Skylark *Alauda arvensis*

Status: Priority

Legal Status: The skylark is protected under the EC Birds Directive. It is also protected under the WCA 1981.

Distribution: In the Western Isles, the species uses a range of habitats. This is reflected in its distribution, with particularly high concentrations on the peatlands of N and S Lewis, on Barra and on the machairs of the Uists and S Harris. It is not clear from published evidence whether declines have occurred in the Western Isles.

Habitat: Winters and breeds in rough pastures and heaths, farmland & coastal grassland

Population estimate: GB breeding 2,000,000 T (1988-1991)

Population trends:

	Presence by 10 km ² Squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	3769	3734	3656	3314
Western Isles	64	65	65	63

Current threats and opportunities: Agricultural change, herbicides and fertilisers, spring to autumn sown crops, loss of winter stubble, lack of food, grass, wildflower seed & insects, silage. Early cutting destroys nests. Could be vulnerable to introduced ground predators such as cats, ferrets and hedgehogs. Retain long grassland for nesting cover; provide winter stubble.

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

Song thrush *Turdus philomelos*

Status: Priority

Legal Status: The song thrush is protected under the EC Birds Directive and the Wildlife & Countryside Act 1981.

Distribution: In the Western Isles the song thrush is concentrated in areas of population, probably reflecting the presence of hedges, trees and other garden vegetation. These areas include Stornoway, Lochs, Carloway, Tarbert, Balivanich, Lochboisdale and Castlebay with isolated pairs elsewhere. It is not clear whether the declines found in southern Britain are reflected in the Western Isles.

Habitat: Winters and breeds in gardens, woodlands & crofts with scrub cover.

Population estimate: GB breeding 990,000 T (1998-1991)

Population trends:

	Presence by 10 km ² Squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	3650	3615	3567	3326
Western Isles	51	51	61	58

Current threats and opportunities: Agricultural (change & pesticides) pollution; predation, reduced water table.

Promote farming, horticultural and woodland management, sensitive to species needs. Avoid use of pesticides, all of which could severely reduce invertebrate prey. Garden slug pellets may also be a serious factor, or the additional predation on slugs, snails etc by introduced hedgehogs. Feral cats may predate nests and fledglings

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

Linnet *Carduelis cannabina*

Status: Priority

Legal Status: Wild Birds Directive 3 i

Distribution: No data

Habitat: Winters and breeds in scrub in farmland & lowland heath.

Population estimate: GB breeding 520,000 T (1998-1991); very few in Western Isles.

Population trends: No data

Current threats and opportunities: Agricultural change - use of herbicides and fertilisers, change from spring to autumn sown crops with loss of winter stubble - leading to lack of food - grass, wildflower seed and cereal grains; habitat destruction- hedgerow removal.

Retain coastal and other scrub, use agricultural environmental schemes to reverse adverse changes; encourage integrated crop management & organic farming

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

Reed bunting *Emberiza schoeniclus*

Status: Priority

Legal Status: The reed bunting is protected under the Wildlife and Countryside Act 1981 and EC Birds Directive, and is listed on Appendix II of the Bern Convention.

Distribution: In the Western Isles its strongholds are in the machair areas of the Uists and in Barra, with other less dense concentrations in central Lewis and the machairs of Harris. In the Hebrides the species is essentially limited to low ground. Although there has been a small decrease in range there seems not to be any apparent pattern on the broad scale.

Habitat: Winters & breeds in scrubby cover at lower altitudes associated with wetland habitats.

Population estimate: breeding 220,000 T (1998-1991)

Population trends:

	Presence by 10 km ² Squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	3429	3300	3019	2508
Western Isles	39	32	32	27

Current threats and opportunities: Agricultural change - pesticides and herbicides, spring to autumn sown crops, loss of winter stubble; drainage; loss in quality and quantity of wetland habitats; infilling of small ponds; unsympathetic main drainage work
 Create new wetlands; sympathetic management of farmland & water courses.

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

Corn bunting *Miliaria calandra*

Status: Priority

Legal Status: The corn bunting is protected under the Wildlife and Countryside Act 1981 and the EC Birds Directive.

Distribution: The corn bunting was formerly found throughout the Western Isles wherever corn was grown. It is now essentially limited to the Southern Isles and adjoining areas of Harris, with some outlying records in the early 1990s in Ness. Current data indicates that around 1% of the UK breeding population is in the Western Isles.

Habitat: Winters and breeds on farmland

Population estimate: breeding 19,800 (16,000-23,000) T (1993)

Population trends:

	Presence by 10 km ² squares, 1968-72	Breeding by 10 km ² squares, 1968-72	Presence by 10 km ² squares, 1988-91	Breeding by 10 km ² squares, 1988-91
UK and Ireland	1426	1306	932	688
Western Isles	26	23	18	13

Current threats and opportunities: Agricultural change, spring to autumn sowing; increased herbicide; pesticide and fertiliser use. Nests could be vulnerable to introduced ground predators such as cats and hedgehogs.

Provide winter stubble & undersown spring cereals.

Information sources: Gibbons et al, 1994, Thom, 1986, UKBAP

OTHER BIRDS

CC = Conservation Concern

LI = Local Interest

Spotted flycatcher

Muscicapa striata

Status: CC

Is only found in the policy woodland in the grounds of Lews Castle where it breeds before migrating to the African coast for the winter.

Red-throated diver *Gavia stellata*

Status: CC

A 'scarce but characteristic' Annex 1 bird of peaty moorland lochs in the North-west of the UK, the red-throated diver differs from the black-throated diver in that it usually flies away from its breeding loch to the sea or larger lochs to feed. The Western Isles are one of its strongholds, with 10% of the UK

population and the bird is particularly found where human disturbance is at a minimum well away from roads. Present all the way from South Uist to Ness, its main population concentrations are found from Benbecula north. Records in the Western Isles increased in number between the 1960s and the 1990s. Disturbance by birdwatchers can be a problem in some more public areas and the species is always vulnerable to egg collectors. Anglers and boats can also cause disturbance. However, the North Uist Angling Club at least have a code of good conduct for their members and clients, while SNH\RSPB have produced an explanatory leaflet. Loss of nest sites due to afforestation of loch shores, interference with land drainage resulting in flooding of nest sites in wet weather, together with an overall decline in fish stocks are all potential threats, but probably at least as significant in the Western Isles would be an increased loss to predation due to the spread of mink.

Mointeach Scadabhaigh has been classified as an SPA. The qualifying interest covers this species of which there are 48 breeding pairs in the area. (5% of the GB population)

GB Population: Breeding 935-1,500 P (1994), wintering 4,850 I (1980-1986)

Black-throated diver *Gavia arctica*

Status: CC

Needing larger lochs than the red-throated diver due to its habit of feeding largely in fresh-water, often on the loch where it breeds, the black-throated diver is concentrated in those areas of the Western Isles with an abundance of such sites - North Uist, the Bays of Harris and SW Lewis. Although it is even more a bird of the North and West of Scotland than the red-throat, the Western Isles contains a lower proportion of the UK population - about 4%. Predation is an important threat, but because of its preference for larger lochs with islands, disturbance may not be so serious an issue as with the red-throated diver. The bird is protected under Annex 1 on the Birds Directive.

Mointeach Scadabhaigh has been classified as an SPA. The qualifying interest covers this species of which there are 3 breeding pairs in the area. (2% of the GB population)

GB Population: Breeding 155 P (1994), wintering 700 I (1980-1986)

Great northern diver *Gavia immer*

Status: CC

Present only as a wintering bird, the Outer Hebrides probably hold about 10% of the UK total for this species. It is vulnerable to oil spills.

GB Population: Wintering 3,000 I (1983)

Slavonian grebe *Podiceps auritus*

Status: CC

The most widely distributed of all wintering grebes, the Western Isles does not host more than two dozen birds, but this nevertheless represents perhaps 10% of the Scottish total. Since it occurs inshore, it is vulnerable even to small pollution incidents.

GB Population: breeding 70-80 P (1989-1993), wintering 400 I (1983)

Fulmar *Fulmarus glacialis*

Status: LI

A bird whose range and numbers have expanded markedly over the last century, perhaps due to discards and offal from fishing boats. Previous to that, there was only one site – St Kilda. By now the Western Isles population of about 37,000 pairs of which 52% are on St Kilda, accounts for only about 13% of the British Isles total. There are no current major threats to the Fulmar, but current fishery practises may not provide as much food; frequenting inshore waters the species is also vulnerable to oiling incidents or marine pollution such as PCB's. The St Kilda population has been stable since 1987.

GB Population: breeding 539,000 P (1985-1987)

Manx shearwater *Puffinus puffinus*

Status: LI

In the Western Isles, the Manx shearwater is restricted to breeding on the St Kilda archipelago, where the colonies may never the less be small. A large colony persists on the mountain tops of Rum which probably accounts for the rafts of feeding birds seen in the Minch. Not all the factors leading to this distribution are understood. Rats have proved a major problem to this burrowing-nesting seabird in such small colonies as Canna and Eigg and together with mink, would have a major impact should these predators ever reach St Kilda. Boats are not permitted to tie alongside the small pier in St Kilda whilst landing craft supplying the base there are screened for rats etc. Contingency plans have been drawn up by the NTS (who own St Kilda) and SNH in case rats ever did get ashore.

GB Population: breeding 220,000-250,000 P 1985-1987)

Storm petrel *Hydrobates pelagicus*

Status: CC

This Annex 1 species breeds on St Kilda, the Flannan Isles and North Rona and a few other of the remoter islands of the Outer Hebrides, but the Sula Sgeir population has seemingly died out between the 1960s and the 1990s, and none have been recorded breeding on the Shiantas (where, coincidentally perhaps, there are black rats). There are 1121 AOB's (apparently occupied burrows) on St Kilda. Given that its numbers are not accurately known – it breeds in burrows and crevices – its conservation needs are also hard to determine.

GB Population: breeding 20,000-150,000 P (1969-1987)

Leach's petrel *Oceanodroma leucorhoa*

Status: CC

Four of the Leach's petrel's six UK colonies are in the Western Isles – St Kilda, the Flannan Isles, North Rona and Sula Sgeir. It is likely that the colonies are small except for St Kilda, which has 92% of the GB and Irish population, 45,435 AOBs. (Recent studies permit reasonable estimates for St Kilda but numbers at other colonies can as yet only be estimated to within an order of magnitude. What is certain is that the Western Isles population is of very high European significance. Like the storm petrel the feeding habits of this species at sea is little known but rats or mink establishing at their remote breeding colonies would present a major hazard. Great skuas are increasing at St Kilda and some pairs are known to prey upon petrels as they return to their burrows at night, while some great black-backed gulls do similarly in North Rona.

GB Population: breeding 10,000-100,000 P (1969-1987)

Gannet *Morus bassanus*

Status: CC

The Western Isles contains 3 gannetries. Two are long established - St Kilda, which alone accounts for about half the Scottish birds, and Sula Sgeir (source of the Ness gugas). The other, on the Flannan Islands, is recently founded. St Kilda has 60,428 AON's (apparently occupied nests) which is some 19% of the world's population. Gannets are subject to threats from reduction in food supplies, oiling and persistent toxins in the food chain.

GB Population: breeding 201,000 N (1994-1995)

Shag *Phalacrocorax phalacrocorax*

Status: LI

A cliff-nesting bird, the shag is more widely distributed than the cormorant in the Western Isles. The Outer Hebrides contains about 10% of the Scottish breeding population or about 5% of the British Isles total. Oiling, persecution and getting caught in nets are the main threats.

GB Population: breeding 37,500 P (1985-1987)

Cormorant *Phalacrocorax carbo*

Status: CC

Of the UK's 7000 pairs of cormorants, about 5% are thought to nest in the Western Isles in a series of colonies from Benbecula and the Monachs northwards. Being dependent on live fish, they are prone to getting caught in nets and have also been the focus of conflict with fishing and fish farming interests in some areas. Some birds feed on inland lochs. Populations in the north-west of Scotland are in slight decline.

GB Population: breeding 7,000 P (191985-1987), 13,200 I (1987-1992)

Mute swan *Cygnus olor*

Status: LI

In the UK the mute swan is mainly a lowland species, and in the Highlands and Islands is only abundant on suitable nutrient-rich water habitats - Orkney, Caithness, the Moray Firth, Tiree, mainland Argyll and so on. None breed in Harris and Lewis with the Uists providing most of the nesting pairs. This Western Isles breeding population is 3% of the UK total. The wintering population of this species is located in the South Uist Machair & Lochs SPA. In addition to an abundance of vegetation for feeding, this large bird also needs room to take off and this limits its distribution. The use of lead shot and fishing weights have been major threats in the past but the risk of lead pollution to the birds are now receding. Collisions with overhead cables are not an uncommon cause of mortality in the Uists (and also result in power cuts!)

GB Population: breeding 25,750 A (1990), wintering 25,750 I(1990)

Whooper swan *Cygnus cygnus*

Status: CC

The whooper swan, an Annex 1 species, is very rare as a breeding bird in the UK. It has been known for 30% of the known nests to be on machair lochs in the Western Isles in some years, but these isolated pairs rarely if ever succeed in fledging young. Non-breeding summering birds may sometimes number as many as 20. However, the Western Isles are much more significant as a major wintering site for the species - 10% of the UK wintering flock is found on the machair each year - and as a rest stop for birds on passage. For the breeding swans, disturbance, including by egg collectors, is the most significant threat. There are no major threats to the wintering birds, although collisions with overhead cables can occur. Whoopers will venture to feed on open machair in the winter but rarely interfere with crofting.

GB Population: breeding 2 W (1989-1993), wintering 5,600 I (1987-1992)

Greenland white-fronted goose *Anser albifrons flavirostris*

Status: CC

Numbers of wintering Greenland white-fronted geese in the Western Isles dropped considerably over the 30 years from the 1950s to the 1980s and now numbers around 100 individuals, or around 1% of the UK total. The bird, protected under Annex 1 of the Birds Directive, roost mainly on moorland, but go down to croft land and machair to feed. Wintering geese are found both in north-west Lewis and in the Uists.

GB Population: wintering 13,700 I (1986-1991)

Barnacle goose *Branta leucopsis*

Status: CC

Favouring better grazing than the white-fronted goose, the Western Isles' wintering barnacle geese are also derived from the Greenland population. Concentrated in the Shiant, the Monach Isles, the Sound

of Harris and the Barra Isles. The Outer Hebrides supports around 5% of the British Isles total for this Annex 1 species. Conflicts with agriculture can arise, particularly on the better grassland but, being rather nervous of humans, the flocks often spend more time on the offshore islands. Reduction in stock grazing on these islands offshore may result in a sward too long to attract the geese in winter, in which case they could become more of a problem to crofting practices. Increased scaring of the huge flocks on Islay farmland may result in larger flocks wintering in the Western Isles.

Ramsar Site North Uist Machair & Islands. This species is a qualifying species for roosting and feeding of 600 (2.4% of the British wintering population)

GB Population: wintering 26,500 I (1988)

Greylag goose *Anser anser*

Status: CC

The UK greylag goose breeding population is unusual in being legally split into 'native' and feral birds, the former having much stronger protection than the latter. This native population is concentrated in the Highlands and Islands of Scotland, and the Uists in particular have long had a significant flock. The geese nest on moorland, lochs and islands, using croft land as part of their feeding grounds. Elsewhere, including Lewis, greylag geese populations have increased in the last few decades and locally they are an agricultural pest, threatening cropping of some machairs which itself helps maintain other conservation interests. Overall the Western Isles support about 65% of the total UK native greylag goose population. There are no threats to the viability of the population. Sport shooting takes place during the winter while a Goose Management Scheme involving scaring techniques has been in operation in the Uists for ten years; this has now been integrated into a wider national Scheme

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for wintering, 770 individuals (15% of the population). The South Uist Machair & Lochs SPA contains around 30 pairs of this species; 2% of the GB and world population.

GB Population: breeding 500-700 P (1991), wintering 5,250 I (1991)

Shelduck *Tadorna tadorna*

Status: CC

The shelduck is a coastal bird in the Hebrides, nesting in burrows. In the Western Isles it is therefore most frequent in areas of sand dunes – the Uists and South Harris. It occurs less frequently in some areas of west and east Lewis. Nevertheless, numbers are low - a few dozen pairs out of UK and Scottish populations of c. 10000 and 1500 pairs respectively. Shelducks are not threatened in Britain and their numbers have shown an increase in recent times. Nesting birds sometimes succumb to ferrets or cats and would be vulnerable in their nesting burrows to gassing of rabbits in early summer.

GB Population: breeding 10,600 P (1988-1991), wintering 73,500 I (1987-1992)

Wigeon *Anas penelope*

Status: CC

Although shown as widespread in Thom, Atlas data show that the wigeon is actually a rare breeding bird in the Outer Hebrides, with all nesting pairs in North Uist being lost since the 1960s. Its requirements are poorly understood, but most of the Western Isles records have been from the west side of the Uists. It is known to favour eelgrass - a plant of mud flats and estuaries – as a food plant.

UK Population: breeding 300-500 P (1988-1991), wintering 277,800 I (1987-1992)

Gadwall *Anas strepera*

Status: LI

A proportion of the gadwall population of the UK is descended from introduced stock, and it is not clear to what extent the Western Isles records are from birds derived from 'truly wild' stock. In any event, there are precious few nesting records of this duck on nutrient-rich lochs – 3 10 km squares in the Uists

in the original Atlas and one (different) record from Benbecula and one from Harris in the new Atlas. Unlike for many ducks, the wintering population in the British Isles, including the Western Isles, is also very small.

GB Population: breeding 770 P (1990), wintering 8,200 I (1987-1992)

Teal *Anas crecca*

Status: LI

1% of the UK teal population is found in the Western Isles, mainly on the machair lochs of the Uists, but with a much smaller concentration in central and northern Lewis. It is absent from both Harris and Barra. This distribution belies the fact that unlike many ducks the teal actually prefers more nutrient poor lochs. Patterns of decline across the UK are poorly understood however, highlighting the importance of safeguarding of a significant population such as that in the Uists. The same area has a large wintering population. Shooting and mink are the only significant threats to these birds.

GB Population: breeding 1,500-2,600 P (1988-1991), wintering 135,800 I (1987-1992)

Pintail *Anas acuta*

Status: CC

The pintail is a 'scarce or sporadic' breeder in the Western Isles, being lost from its one recorded location in North Uist between the 1960s and 1990. This reflects this duck's continental rather than maritime distribution. Its habitat preferences are for shallow water next to open areas, such as grasslands. Wintering populations in the Western Isles are not significant.

GB Population: breeding 8-42 P (1989-1993), wintering 27,800 I (1988-1992)

Shoveler *Anas clypeata*

Status: CC

The Scottish shoveler breeding population is found in three main areas - the Central Lowlands, Orkney and the Southern Isles. The Western Isles as a whole contain about 3% of the UK population, mainly on machair lochs. The duck needs marshland or rough grassland next to base-rich lochs and the major threats are mink, drainage and other land use change. For the small wintering population, shooting must be the most significant hazard.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding, 13 pairs (1% of the British breeding population)

GB Population: Breeding 1,000- 1,500 P (1988-1991), wintering 10,000 I (1987-1992)

Tufted duck *Aythya fuligula*

Status: LI

Another bird for which the Western Isles, and the Uists in particular are of UK importance, the tufted duck is found on machair lochs. It has also bred in Lewis in the last 20 years. About 4% of the UK breeding population and a significant number of wintering birds are found in the area. The spread of mink in the Uists would be a significant threat.

GB Population: breeding 7,000-8,000 P (1979-1983), wintering 60,600 I (1987-1992)

Eider *Somateria mollissima*

Status: CC

The distribution of breeding eiders is governed, according to the New Atlas, by that of its preferred food – in particular, mussels. Although the bird breeds from North Rona down to Barra Head and across to St Kilda, the Western Isles support about 2% of the UK population. The major concentrations are in the Uists and Barra. Predation of chicks by gulls and crows is exacerbated by wet and windy weather, but

there are few terrestrial threats which are the result of human activity. Mink might pose a threat to nesting birds while mussel farmers might see eiders as potential predators.
GB Population: breeding 31,000-32,000 F (1988-1991), wintering 77,500 I (1986-1991)

Red-breasted merganser *Mergus serrator*

Status: LI

Red-breasted mergansers can use a variety of habitats, both freshwater and tidal and are found mainly in Western Scotland and Western Ireland. The Uists are their Western Isles stronghold, although Lewis also holds some numbers. Persecution or the threat persecution always hangs over this species due to its perceived impact on fish stocks. Numbers are at their highest in the autumn, indicating that the Western Isles are an important passage stopover.

GB Population: breeding 2,200 P (1988-1991), wintering 10,000 I (1986-1991)

Long-tailed duck *Clangula hyemalis*

Status: LI

This is a nationally important bird which winters on the west coast of the Uists. This is the furthest south the species winters in the UK before migrating to the Arctic for the summer months. Offshore flocks would be highly vulnerable to oil spillages while their food supply might be affected by localised pollution.

GB Population: wintering 23,500 I (1986-1991)

Hen harrier *Circus cyaneus*

Status: LI

An Annex 1 bird of moorland areas, the Uists were one of the few areas in the whole of the UK where it was not extirpated by gamekeepers by 1900. Even by the early 1990s, there were no breeding records in Lewis and Harris, although this can partly be explained by the lack of its preferred habitat - lush heather. Thus in the Uists the bird is found not on the machair and crofts or the high eastern hills, but on the ground in between. Other threats to good heather cover would be an increase in sheep densities in its core areas. Around 1% of the UK population is in the Western Isles.

Mointeach Scadabhaigh has been classified as an SPA. A non-qualifying interest covers this species which breeds in the area.

GB Population: breeding 630 P (1988-1989)

White-tailed eagle *Haliaeetus albicilla*

Status: LI

This species was formerly common in Western Scotland. Before its widespread persecution and extirpation in the UK (the last bird died in 1918) it occupied many territories now used by golden eagles. It has been the subject of a large reintroduction programme over many years and breeding occurs throughout the West of Scotland including many of the islands.

GB Population: 19 pairs

Golden eagle *Aquila chrysaetos*

Status: LI

The golden eagle requires large areas of suitable feeding territory, and in the Western Isles, as in most of Scotland, is confined to mountainous and relatively remote locations. Thus, although this Birds Directive Annex 1 species occurs all along the eastern side of the Long Island, its highest densities by far are reached in the hills separating Harris from Lewis. The Western Isles support about 3% of the UK

population, although they may not breed very well. In common with most areas in the west of Scotland, Western Isles birds are found at high densities, reflecting both a lack of persecution and an abundance of food, particularly carrion. A significant threat to golden eagles is the inappropriate growth of forestry, hence the introduction of screening procedures for Woodland Grant Scheme applications. Breeding success would be improved if better moorland management (ie reduced grazing and restricted burning) increased densities of hares, grouse and other medium-sized prey.

GB Population: breeding 422 P (1992)

Merlin *Falco columbarius*

Status: CC

The UK's smallest falcon is a bird of moorland, but unlike the hen harrier and short-eared owl it has significant concentrations not only in the Uists, but also in north Harris and south Lewis. It is not however as ubiquitous as red grouse, suggesting perhaps that keeping efforts in the past may still be having their effect. However, the precise needs of the bird are also somewhat mysterious, as its main prey (skylarks and meadow pipits) are equally common on grassy hills. Afforestation of its habitat is a clear threat, although merlins will use live on forest edges.

Mointeach Scadabhaigh has been classified as an SPA. A non-qualifying interest covers this species which breeds in the area.

GB Population: breeding 1,300 (1,100-1,500) P (1993-1994)

Peregrine *Falco peregrinus*

Status: CC

An Annex 1 bird, the peregrine has not suffered the persecution which has reduced the population in the rest of the UK in the past. Nevertheless the Western Isles are not one of its strongholds in terms of numbers. Although the falcon is widespread, occurring from St Kilda to Barra Head and up to Ness, it is sporadic, and the Western Isles supports only 1% or so of the UK population. It nest on cliffs and is thus primarily a coastal bird in the Hebrides. This is its weakness, as its diet contains a high proportion of seabirds, making it prone to toxin accumulation from various marine pollutants. On remote coastal sites, nests are less prone to disturbance by humans, other than egg collectors.

GB Population: breeding 1,185 P (1991)

Water rail *Rallus aquaticus*

Status: LI

A secretive bird which is known to breed here. Information on this species is sparse. It appears that the Uists is as far west and north that the species is found.

GB Population: breeding 450-900 P (1988-1991)

Spotted crane *Porzana porzana*

Status: LI

A shy Annex 1 bird limited in the Western Isles to machair fens, the spotted crane is usually only detected by its characteristic call. It prefers dense marshland to reedbeds. The total recorded UK population of singing males was only 17 at 10 sites in 1990. In that year none were heard in the Western Isles during the breeding season, but calls were heard in Barra and South Uist outwith that period. The numbers of birds recorded varies greatly from year to year. During the previous Atlas period breeding season records were made in Ness, the Carloway area and South Uist and a bird was also heard in North Uist. On average the Western Isles support about 10% of the total UK population. Most of the likely sites for the bird are protected by SSSI status.

GB Population: breeding 1-20 P (1989-1993)

Oystercatcher *Haematopus ostralegus*

Status: LI

The Western Isles supports around 4% of the UK's breeding oystercatcher population, the majority (2000+ pairs) on or associated with machair land. It is ubiquitous from Barra to the Butt of Lewis in suitable habitat. In terms of distribution at least, there have been few significant changes in the last 40 years. This beligerent species is least affected by hedgehog predation, being well able to defend its nests and eggs. The major threat is disturbance by shooting or cockle gatherers on wintering grounds outwith the Western Isles.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 770 pairs (2% of the British population).

The RSPB survey carried out in May & June 2000 recorded 2,578 pairs in the Uist Machair and some adjacent blackland area. Since 1983, the population has increased by an estimated 37%.

GB Population: breeding 33,000-43,000 P (mid 80's), wintering 359,000 I (1987-1989)

Ringed plover *Charadrius hiaticula***Status: CC**

The Western Isles are significant as a breeding, wintering and passage stopover site for the ringed plover. Up to 25% of the UK's breeding birds are found in the Outer Hebrides, with two major concentrations, the Uists and the Barvas-Ness area of Lewis. About 10% of the total Western European wintering population is found in the Western Isles. These include some from the mainland. Ringed plover are coastal birds and most Hebridean pairs nest on shingle beaches or on the ploughed machair where, until recently, they have enjoyed a relative lack of disturbance.

Ramsar Site North Uist Machair & Islands. This species is a qualifying species for breeding in this area. 240 pairs, (3% of the GB population). It also supports 290 pairs during the winter. (1% of the GB population). The RSPB Uist Machair survey carried out in May & June 2000 recorded some 970 breeding pairs. This a fall of around 50% since 1983. Hedgehogs do not seem to be causing significant factor since ringed plover have declined in North Uist also, where hedgehogs are still highly localised. The South Uist Machair & Lochs SPA supports 393 pairs of the species; 5% of the UK total and 3% of the NW and Central European population. In addition the SPA supports some 490 pairs of the wintering population; 2% of the GB total and 1% of the East Atlantic Flyaway population.

GB Population: breeding 8,500 P (1984), wintering 28,600 I (1987-1992), spring migration 30,000 I (1989-1994)

Golden plover *Pluvialis apricaria***Status: CC**

The Western Isles are internationally significant as a passage site for migrating golden plover, an Annex 1 wader of moorlands and bogs. Within the UK, and despite densities in the north-west generally being lower than in climatically less extreme areas of the British Isles, the numbers of breeding birds on the moors of Lewis in particular are important. With a South Uist to Ness distribution, the golden plover is not necessarily a good indicator of overall habitat quality. Nevertheless numbers reflect the low incidence of forestry, disturbance, predators and other negative influences.

Mointeach Scadabhaigh has been classified as an SPA. A non-qualifying interest covers this species which breeds in the area.

GB Population: breeding 22,600 P (1988-1991), wintering 250,000 I (1987-1992)

Grey plover *Pluvialis squatarola***Status: CC**

Although less than 1000 birds winter in Scotland and the Western Isles are not one of the larger wintering grounds, 1% of the UK population nevertheless overwinters in the area.

GB Population: wintering 43,200 I (1987-1992), spring migration 70,000 I, (1989-1994)

Lapwing *Vanellus vanellus*

Status: CC

2% of the UK's breeding lapwings nest in the Western Isles. They do so on any ground with a short turf, be it machair or croft inbye. The combination of grass and fallow on the Uist machairs is particularly favourable. Cropped machair also has the added benefit of lower stocking densities than inbye fields – lapwings are early nesters and trampling/ disturbance by lambing or calving animals, or by cultivation/rolling can be a threat to productivity. In addition to the breeding birds, about 5000 birds winter in the area. Predation by hedgehogs has been identified as a significant problem.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 1,130. The RSPB survey carried out in the Uist Machair in May/June 2000 recorded some 2,681 breeding pairs.

GB Population: breeding 190-240,000 P (1986-1987), wintering 1,500,000-2,000,000 I (1987-1992)

Sanderling *Calidris alba***Status: CC**

A full 10% of the UK's wintering sanderling population is found in the Western Isles, mainly on the mudflats of the Uists.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 410 (2% of GB population). The South Uist Machair & Lochs SPA is a notable assemblage of the wintering population of this species.

GB Population: wintering 23,200 I (1987-1992), spring migration 40,000 I (1989-1994)

Purple sandpiper *Calidris maritima***Status: CC**

4% of the UK wintering purple sandpiper population are to be found in the Outer Hebrides. Unlike most wintering waders, this bird uses mainly rocky shores. Thus, while the Uists held over 1600 birds in the early 1980s, Lewis had 350 and the other islands 580 individuals.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 370 (2% of GB population). The South Uist Machair and Lochs SPA supports the wintering population of this species.

GB Population: breeding 2-2 P (1989-1993), wintering 21,300 I (1989)

Dunlin *Calidris alpina***Status: CC**

The dunlin uses two main breeding habitats in the Western Isles, supporting some 30% of the UK breeding population. The highest densities are on damp machair areas, particularly in the Uists. There has been a 70% decline in dunlin numbers largely due to hedgehog predation. But large numbers, albeit at lower densities, also nest on the moorlands and bogs of Uig and north Lewis. In total about a third of the British Isles population nests in the Outer Hebrides. The main threats reflect the type of habitat. On the machair, hedgehog predation on eggs is critical while changes in management might imply intensification: on the moorland afforestation is probably now at least as significant as land improvement. The area's soft shores and machairs are also important as a wintering and passage site for dunlin.

Ramsar Site North Uist Machair & Islands. This species is a qualifying species for breeding in this area. 60 pairs, (0.7% of the GB population). The RSPB survey of May/June 2000 recorded some 254 breeding pairs in the Uist Machair. Since 1983, species numbers have dropped by some 50% largely due to hedgehog predation. The South Uist Machair & Lochs SPA supports 357 pairs of this species. This represents 5% of the GB total and 3% of the total Schinzii population.

GB Population: breeding 9,150-9,900 P (1980's), wintering 532,000 I (1987-1992)

Snipe *Gallinago gallinago*

Status: LI

The snipe is a bird of boggy ground, so it is not surprising that the Western Isles both supports 1% of the UK's breeding population and is also a significant wintering ground. The population is under some threat from hedgehog predation. Shooting of snipe is also a potential threat to the population if not managed; some estates delay sport shooting until the northern wintering population has arrived so as not to put undue pressure on local breeding birds. Damp machairs and low lying wet areas both on crofts and rough grazings are its preferred habitats. The main threats are therefore drainage, land improvement and afforestation of the agriculturally-poorest ground. However trampling by stock can also be a problem when nests are in damp fields with high livestock densities.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 170 pairs

GB Population: breeding 55,000 P (1985-1991), wintering >100,000 I (1987-1992)

Bar-tailed godwit *Limosa lapponica*

Status: CC

Around 2% of the UK wintering population (1900 birds or so) is found in the Western Isles), almost all on the Uists' sandy flats.

GB Population: wintering 52,500 I (1987-1992)

Whimbrel *Numenius phaeopus*

Status: CC

The whimbrel is a northern bird; Scotland supports the whole of the UK breeding population and most of these are in Shetland. Nevertheless a few pairs nest in the Western Isles, mostly on the moors of Lewis, using more boggy areas than curlews. Apportionment of common grazings is a threat in Shetland, but is unlikely to be a significant influence in Lewis.

GB Population: breeding 530 P (1998-1992), spring migration 3,000 I (1989-1994)

Redshank *Tringa totanus*

Status: CC

A bird which has declined in much of the British Isles, the Outer Hebrides remains one of its strongholds, with perhaps 8% of the breeding total. This wader inhabits wet grasslands where they merge into fens and marshlands of the type found in the Uist machairs, but it is also found on rough grazings with moderately high densities in Lewis. Trampling by high densities of stock, drainage and other loss of breeding habitat, with a recent increase in predation from hedgehogs are the most important threats to the population.

Ramsar Site North Uist Machair & Islands. This species is an additional interest species for breeding 470 pairs (1% of the GB population). The RSPB Uist Machair survey of May/June 2000 recorded 1,532 breeding pairs.

GB Population: breeding 30,600-33,600 P (mid 80's), wintering 114,000 I (1987-1992)

Greenshank *Tringa nebularia*

Status: CC

The greenshank is an Annex 1 bird of the boreal zone which needs abundant water bodies in its upland breeding areas. This it finds in abundance on blanket peatlands in areas such as south Lewis. Overall about 1% of the UK breeding population nests in the Western Isles. Given its preferred habitat and good moorland management, particularly the safeguards in place as regards planting up deep peat, there are

probably no real threats to the greenshank in its Western Isles range. The Western Isles are also a significant wintering area for this species.

GB Population: breeding 1,100-1,600 P (1988-1991), wintering 380 I (1987-1992)

Turnstone *Arenaria interpres*

Status: LI

Around 3300 turnstones winter in the Western Isles each year. The birds, which make up about 4% of the UK total, use rocky shores with seaweed.

Ramsar Site North Uist Machair & Islands. This species is a qualifying species for wintering in this area. 440 (0.7% of the European and British wintering population).

GB Population: wintering 64,600 I (1987-1992)

Arctic skua *Stercorarius parasiticus*

Status: CC

The Outer Hebrides support less than 100 pairs of this Annex 1 bird, out of a Scottish (and UK) total of around 2500. Its colonies are found on moorland in North Uist, Benbecula and north Lewis. Aggressive to intruders (including humans) at its nest, its main competitor in much of its UK range is the larger Great skua.

GB Population: breeding 3,200 T (1985-1987,1991-1993)

Great skua *Stercorarius skua*

Status: LI

The great skua's Western Isles population represents a lower percentage of its UK total than does the Arctic skua's – less than 1%. St Kilda has 200 pairs. Nevertheless, these birds are at their extreme south westerly limits and are therefore of some significance. Again a moorland-nesting seabird, great skua colonies are found on most of the uninhabited remote islands of the Outer Hebrides, as well as north Lewis. The great skua has expanded its range and numbers in the last 100 years and currently is under no significant threats. However its aggressive predation on lambing ewes and newborn lambs in Shetland are a continual cause of concern, while it is also known to prey upon small petrels in St Kilda.

GB population: breeding 8,500 T (1985-1987, 1991-1993)

Great black-backed gull *Larus marinus*

Status: LI

While Scotland supports about 70% of the UK breeding population, the Western Isles contains about 1/8 of the Scottish total of this large gull. Rona currently supports 700 pairs. It prefers nesting sites where it will not be disturbed by humans and its Western Isles distribution reflects this. Expanding in some parts of its range, the Scottish population is stable and there are no immediate causes for concern with this species.

GB Population: breeding 19,000 P (1985-1987, 1993), wintering 40,000 I (1993)

Kittiwake *Rissa tridactyla*

Status: LI

The Western Isles population of this oceanic gull is around 7% of the Scottish total and about 5% of that of the British Isles as a whole. There has been a decline in numbers in St Kilda. A cliff nester, its distribution reflects its breeding and feeding habits. As this species feeds well offshore, any threats will result from marine rather than terrestrial activities.

GB Population: breeding 490,000 P (1985-1987)

Common tern *Sterna hirundo*

Status: CC

The most widely distributed of all terns breeding in coastal areas. Scotland has around 25 % of the total UK population of 15,000 pairs. Nesting colonies are found usually on sand or shingle but its exact status in the Western Isles needs clarification, as does the impact of mink on breeding success.

GB Population: breeding 12,300 P (1984-1987)

Arctic tern *Sterna paradisaea*

Status: CC

Although commoner in the Western Isles than the so-called common tern, the arctic tern is included in this list because it is an Annex 1 species whose Western Isles population is around 2% of the UK total. The majority of colonies are in the machair areas of the Uists, but they are also found elsewhere in the area, from Barra Head to Ness. There is likely predation by mink, especially in Lewis and Harris.

GB Population: breeding 44,000 P (1985-1989)

Little tern *Sterna albifrons*

Status: CC

The little tern is much rarer than its larger relatives and is a bird for which the UK is of particular international importance. This Annex 1 species nests on beaches and is found mainly in Harris and the Uists. As well as frequenting coastal shingle beaches it also nests on ploughed machair. Overall the

Western Isles population represents about 4% of the UK total. Disturbance, an increase in predation, possibly from mink and extreme sea conditions are both potential threats. The South Uist Machair & Lochs SPA supports 31 breeding pairs (1% of the GB population).

GB Population: breeding 2,400 P (1985-1987) SPAs.

Guillemot *Uria aalge*

Status: LI

Although the Western Isles contains about 12% of the Scottish breeding population of guillemots, they are concentrated almost exclusively on the outer uninhabited islands and only small numbers nest on the north-east coast of Lewis. This species is affected by marine activities, such as oil spillages.

GB Population: breeding 1,050,000 A (1985-1987) SPAs (eg Mingulay/Berneray, Flannans, Shiant, St Kilda, Rona/Sulisgeir)

Razorbill *Alca torda*

Status: CC

Although the razorbill uses different parts of the cliff from guillemots, their distribution in the Western Isles is essentially identical. The Outer Hebrides population is estimated to make up around a quarter of the Scottish total, with the cliffs of Barra Head holding a notable concentration. As with all auks, the significant threats lie out at sea: oiling, decreases in the availability of prey, the build up of persistent toxin levels and being caught in fishing nets are all examples.

GB Population: breeding 148,000 A (1985-1987) SPAs (eg Mingulay/Berneray, Flannans, Shiant, St Kilda, Rona/Sulisgeir)

Black guillemot *Cephus grylle*

Status: LI

Unlike guillemots and razorbills, black guillemots are birds of inshore coasts and are not such colonial nesters. The Western Isles contains about 7% of the Scottish population and 3% of the UK's. The birds are very widely distributed. Given that it nests on major islands, with a significant colony on the Monach Isles, predation from land mammals such as mink is an important consideration, as well as inshore oil spillages/pollution.

GB Population: breeding 36,500 A (1982-1990)

Puffin *Fratercula arctica*

Status: LI

Puffins are burrow nesters; being therefore effectively confined to the tops of cliffs they are more vulnerable to land predators. The main Western Isles populations are therefore on the outlying islands offshore. There is some conflict between the needs of puffins and the needs of the also-rare, albeit introduced, black rat on the Shiant. Colonies in the Outer Hebrides account for about 60% of the Scottish total and over half of the British Isles population. Other than predation, threats to puffins are much like those to other auks, being particularly susceptible to over-fishing of sand-eels etc.

GB Population: breeding 898,000 A (1985-1987) SPAs (eg Mingulay/Berneray, Flannans, Shiant, St Kilda, Rona).

Short-eared owl *Asio flammeus*

Status: CC

The Western Isles support about 1% of the UK population of this moorland owl. As with hen harrier, it is limited to the Uists, where there is more of its preferred habitat of extensive open land with an abundance of small prey - something that is linked with deeper vegetation than is commonly found in Lewis and Harris. The Uists have also until recently been relatively free of threats to its nests, which it builds on the ground. Threats include anything which affects heather moorland – afforestation, burning or intensification of grazing being the most obvious, although, as with hen harrier, enclosing ground for planting can lead to a short-term explosion in vole numbers.

Mointeach Scadabhaigh has been classified as an SPA. A non-qualifying interest covers this species which breeds in the area.

GB Population: breeding 1,000-3,500 P (1988-1991)

Dipper *Cinclus cinclus*

Status: CC

Found at the very edge of its range, the dipper is a characteristic bird of the mountain burns of north Harris and south Lewis. Dependent for its food on aquatic invertebrates, it is an excellent indicator of water quality and on the mainland is badly affected by factors such as acidification, often caused by afforestation in vulnerable catchments.

GB Population: breeding 7,000-21,000 P (1988-1991)

Wren *Troglodytes troglodytes*

Status: LI

Although not a species rare, the wren has developed a number of distinct races, which differ in size, colour and song. These include a Hebridean form *T.t.hebridensis* and a St Kilda wren *T.t.hirtensis*, more restricted with an estimated population of only 100 pairs..

GB Population: breeding 7,100,000 T (1988-1991)

Dunnock *Prunella modularis*

Status: LI

As with the wren, the main interest as regards the dunnock is the distinct race *P.m.hebridium* found in the Western Isles. This has different habitat requirements from its mainland relatives, being able to

survive in the absence of scrub, and using instead bracken or rank heather. The bird is very local and unobtrusive.

GB Population: 2,000,000 T (1998-1991)

Twite *Carduelis flavirostris*

Status: CC

A bird found only in the extreme north-west of Europe, the twite population in the Western Isles is about 2% of the UK total. Breeding on moorland and on crofts (using old walls, for example), it gathers into flocks with other finches in the autumn and feeds on any area where seeds are plentiful, particularly cereal stubbles and hay aftermaths. A reduction in cropping would reduce its winter food supply, while the 'tidying' away of old dykes and ruins would lead to a reduction in nest sites.

GB Population: breeding 65,000 P (1988-1991)

Snow bunting *Plectrophenax nivalis*

Status: CC

A winter migrant, numbers in the Western Isles are not large compared to those in eastern Scotland and the Northern Isles. However, it forms an interesting element in the finch flocks which forage on cereal stubbles and fallows on the Uist machair in particular.

GB Population: breeding 70-100 P (1988-1991)

AMPHIBIANS AND REPTILES

Marine turtles

Leatherback turtle *Dermochelys coriacea*

Loggerhead turtle *Caretta caretta*

Kemp's ridley turtle *Lepidochelys kempii*

Green turtle *Chelonia mydas*

Hawksbill turtle *Eretmochelys imbricata*

Status: Priority

Legal Status: All five species are listed on Appendix I of the Convention on the International Trade in Endangered Species of Flora and Fauna (CITES) 1975, Appendix II of the Bern Convention 1979, Appendices I and II of the Bonn Convention 1979 and Annex IV of the EC Habitats Directive. The loggerhead is also listed as a priority species on Annex II of the EC Habitats Directive. All five species are protected under Schedule 5 of the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats & c.) Regulations 1994.

Distribution: The five (of the seven) species of marine turtle to have been recorded in UK waters are leatherback turtle *Dermochelys coriacea*, loggerhead turtle *Caretta caretta*, Kemp's ridley turtle *Lepidochelys kempii*, green turtle *Chelonia mydas* and hawksbill turtle *Eretmochelys imbricata*. However, there is some doubt as to whether reports of hawksbills can be confirmed. West coast April - September in Oceanic seas, plankton feeder.

Habitat: Oceanic seas

Population estimate: No data

Population trends No data

Current threats and opportunities: Boat collisions, incidental capture, pollution, ingestion of plastic. Coastal & deep water fisheries. Promote SNH Turtle Code to; raise awareness of issues affecting marine turtles, especially amongst fishermen.

Information sources: UKBAP

Slow Worm *Anguis fragilia*

Status: Conservation Concern

Legal status: W&C 5 re S9 (1) & 9 (5)

This species is found in upland heath and heather moorland and in drystone walls. It has been recorded in Lewis, Harris and recently in South Uist.

Possible threats are habitat loss and fragmentation and human interference.

FISH

Basking shark *Cetorhinus maximus*

Status: Priority

Legal Status: The basking shark is protected under Schedule 5 of the Wildlife and Countryside Act 1981. They are also protected under the Bern Convention (with EU reservation).

Distribution: West coast April -September in Oceanic seas, plankton feeder

Population estimate: No data

Population trends

Current threats and opportunities: Coastal & deep water fisheries. Code of conduct to reduce levels of harassment.

Information sources: UKBAP

Common skate *Raja batis*

Status: Priority

Legal Status: no legal protection

Distribution: Atlantic coasts, bottom dweller, shallow coastal waters & shelf seas up to 200m

Population estimate: No data

Population trends

Current threats and opportunities: Fisheries (losses to by-catch could lead to extinction. Establish refuge areas; minimise fishing mortality; facilitate migration; re-introduce to areas where extinct, code of contact, promote tagging.

Information sources: UKBAP

Commercial marine fish

Status: Priority

Legal Status: no legal protection

Distribution: North Atlantic, oceanic seas

Population estimate: No data

Population trends No data

Current threats and opportunities: Over fishing; bad fisheries management, habitat degradation, illegal netting, exploitation of aggregates, oil, gas, pipeline discharges to tidal waters. Target stocks, allowable catch, mesh size, closed areas & seasons

Opportunities must include fishfarming; Diversification to other marine species is ongoing and will ultimately reduce the need to overfish wild stocks. However, this needs to be recognised and supported to allow fishfarming to expand by way of allocation of new sites to permit further expansion and diversification alongside salmon.

Information sources: UKBAP

Deep-water fish

Status: Priority

Legal Status: no legal protection

Distribution: Atlantic, oceanic seas.400 m deep & for some species .1000 m

Population estimate: No data

Population trends

Current threats and opportunities: Fisheries operating > 400 M deep. Most species are highly migratory & straddle international boundaries. Research required to minimise damage to non target fish

Information sources: UKBAP

Atlantic Salmon *Salmo salar*

Status: Conservation concern

Legal Status: W& C Act Schedule; Habs Dve 11a Va Cons Reg 3 (in fresh water).

This is the largest of the Salmonidae. It enters burns and rivers laying eggs in gravelly beds which are normally swift flowing and shallow.

The species has an average age of 3 - 5 years of which 2 - 3 years are spent in freshwater when it is a juvenile and 1 - 2 years in the sea migrating to the North Atlantic. At sea they feed on pelagic crustaceans and capelin (*Mallatus villosus*) in the far north. They are host to parasites including sea lice and gill maggots.

Threats from pollution, fish farming, predation from alien species such as mink and inappropriate stocking, habitat degradation and agriculture. Control of pollution; fish farming predators, appropriate stocking and, habitat restoration.

Catch numbers have shown increases in each of the fisheries of the Western Isles, indicating that fish farming may not be a culprit or in the least that improvements in husbandry practices over the last decade is helping the wildstock numbers. Effective sea lice strategies and management by the bigger fish farming companies has played a part in this. Ever increasing seal colonies must be one of the largest threats to salmon around the WI. Run off from agriculture and forestry needs better regulation and control, to the extent that the fish farming industry endures.

Arctic Charr *Salvelinus alpinus*

Status: Conservation concern

Legal Status:

Threats from eutrophication, fish farming, pollution and ill-advised manipulation of water levels.. Management of catchment, control of fish farming through legislation.

It is subject to wide variation with, it is estimated, at least 15 different subsp. in the UK of which at least two distinct forms are present in the Western Isles.

The UK population is non anadromous.

INVERTEBRATES

Molluscs

Freshwater pearl mussel *Margaritifera margaritifera*

Status: Priority

Legal Status: It is listed on Annexes II and IV of the EC Habitats Directive and Appendix II of the Bern Convention and is protected under Schedule 5 of the WCA 1981 (for killing and injuring only). It is currently being considered for increased protection under the WCA 1981.

Distribution: In the Western Isles the species has been recorded in 2 10-km squares since 1970. A 1999 survey in Lewis and Harris (*Cosgrove P.J. & Farquhar J.E.*) produced the following data from 398 rivers and 198 tributaries.

Around 6% of the world's remaining functional population of the species is found in Lewis and Harris.

Evidence was found of the former presence of the species in 11 rivers/burns

6 rivers/burns had populations that were classified as functional or viable

3 rivers/burns were classified as functionally extinct or not currently viable

The species was classified as extinct in 2 rivers/burns.

After this survey was undertaken survey of a river in the Uists was carried out. This was in response to a report by a local naturalist (William Neil) The survey indicated the presence of mussels but the size range indicated that the population was showing signs of difficulty in recruiting juveniles. There are a number of other suitable rivers in the Uists so there is a possibility that other populations do exist.

Habitat: running fresh waters

Population estimate: No data

Population trends Declining

Current threats and opportunities: The species is threatened by destructive pearl fishing and a decline in the host salmonid stock reduces the ability of any population upstream to recover from destructive fishing. Some views indicate that fish farming activity has had a detrimental effect on the host salmonid.

Information sources JNCC Rept 312, UKBAP and Cosgrove P.J. & Farquhar J.E. 1999 SNH Report, *Distribution and Conservation Status of the Freshwater Pearl Mussel Margaritifera Margaritifera in Lewis & Harris.*

Note: The exact geographical location of the populations of this species are not stated on the grounds of species security.

BEETLES

Weevil *Ceutorhynchus insularis*

Status: Priority

Legal Status: no specific protection

Distribution: Dun, in the St. Kilda archipelago

Habitat: feeds on common scurvygrass *Cochlearia officinalis* in coastal areas

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Weevil *Protapion ryei*

Status: Priority

Legal Status: no specific protection

Distribution: No data

Habitat: grasslands, waste places and machairs

Population estimate: No data

Population trends No data

Current threats and opportunities: maintain machair habitats with abundant red clover

Information sources: UKBAP

Carrion beetle *Thanatophilus dispar*

Status: Conservation concern

Belongs to the *Silphidae* family. Has been found at two locations in South Uist at Loch Druidibeg. Has been known to scavenge fish carcasses, but specimens found during a survey in 1995 found no carrion. It has been observed in dense foliage close to water. More research is required.

MOTHS

Northern Dart *Xestia alpicola alpina*

Status: Priority

This species was recently trapped in a Rothamsted Insect Survey in Lewis and Harris. This moth feeds on crowberry, bilberry and beaberry and can be observed on the hill. The larvae feed on *Empetrum nigrum*. The species has a two year life cycle with adults normally reported in even numbered years.

Threats are from disturbance, development and climate change. The current management and habitat structure should be maintained.

Information sources: UKBAP

Belted Beauty *Lycia zonaria atlantica*

Status: Conservation concern

This species which is a sub-species of *Lycia zonaria brittanica* distributed from Lewis in the north down to the island of Pabbay. It is found mainly in sand hills on the Machair with Common Birds foot trefoil, *Lotus corniculatus*, Yellow flag *Iris pseudacorus*; Creeping willow *Salix repens*, and Burnet rose *Rosa piminellifolia*, and feeds on planton, clover, yarrow, dock and dandelion. It is normally on the wing in the early evening.

Management should include the maintenance of bare patches amongst the Machair. The females of this moth are flightless and the impact of predation on them by hedgehogs needs to be assessed.

BEES

Great yellow bumblebee *Bombus distinguendus*

Status: Priority

Legal Status: no specific protection

Distribution: Searches during 1997 showed there to be good populations associated with machair systems on the islands south of, and including, North Uist. Post-1970 records exist for at least 14 10-km squares

Habitat: machair. During August 1997 it was strongly associated with areas that had been winter-grazed and then allowed to grow throughout the summer

Population estimate: No data

Population trends No data

Current threats and opportunities: Management should centre on ensuring a supply of suitable plant food such as *Lotus corniculatus* and nest sites such as bare sandy banks but it is possible that the introduced hedgehogs could be predated nests. The management of *Colletes floralis* should also be considered.

Information sources

The Northern Colletes *Colletes floralis*

Status: Priority

Legal Status: no specific protection

Distribution: In the Western Isles it is recorded in 5 10-km squares

Habitat: machair

Population estimate: No data

Population trends No data

Current threats and opportunities: Management of the machair should focus on maintaining red clover and other late flowering plants such as *Centaurea nigra*. It is possible that introduced hedgehogs could be predated nests.

Information sources: UKBAP

DRAGONFLIES

Common Hawker *Aeshna juncea*

Status: Conservation concern

The common hawker is found at a relatively high altitude on ponds which tend to have a substantial reed population, avoiding alkaline pools used by *Aeshna caerulea*. They are very active during sunny weather but tend to settle on bracken and heath in dull conditions. They are normally on the wing between mid June and mid September.

Habitat loss may threaten populations at local level. No management is required in the present circumstances.

Common blue damselfly *Enallagma Cyathigerum*

Status: Conservation concern

The species frequents large open lochs, canals and streams where there is an abundance of marginal vegetation. The flies tend to hover at a relatively low altitude over the water, normally into the wind so that they are blown backwards. They have also been observed on the wing between mid May and mid September.

Blue tailed damselfly *Ishnura elegans*

Status: Conservation concern

Flies low amongst the vegetation along the edges of canals, lochs, ponds and slow moving streams without too much fringing vegetation. It is usually seen on the wing between May and the beginning of September. It is reported to be the only representative of odonata in partially polluted ponds. There are currently no threats to this species.

Four spotted Chaser *Libellula Quadrimaculata*

Status: Conservation concern

It is frequently seen over boggy pools where the males hawk for long periods. Several of the species can be found over lochs and ponds although they are parochial, staying within their own area. It has declined in areas of intensive agriculture. It is usually on the wing between mid May and mid August.

Large Red Damselfly *Pyrrhosoma nymphula*

Status: Conservation concern

This damselfly is normally the first one to be seen in the year being on the wing between mid May and mid August.

It is normally observed around slow-moving streams, lochs, marshes and peat bogs as well as brackish water.

The species has declined in areas of intensive agriculture.

It is one of the commonest damselflies and is very easy to approach.

Black Darter *Sympetrum Scoticum*

Status: Conservation concern

This species is usually found on peaty bogs with a predominance of heather and other marshy ground with emergent vegetation. It is noted as a restless species flying only a few yards before settling.

It is normally on the wing between the end of June and the end of September.

Potential threats are from drainage and peat extraction

Highland Darter *Sympetrum migrescens*

Status: Conservation concern

This species is usually found in the same habitat as the Black darter, peaty bogs, predominated by heather. It likes a wide range of still water from bog pools to lochs and ditches and occasionally in slow moving streams. Threats are from pollution and overshadowing of breeding areas. It is normally on the wing between the end of June and mid August.

Common Darter *Sympetrum striolatum*

Status: Conservation concern

The species is found in a wide range of habitats from ponds to lochs and rivers. It will tolerate brackish waters. It tends to return to the same perch or patch after periods of flight. This will occur for several days before the species moves on. It is a fast darter with excellent hovering characteristics. It tends to skirt ponds and settles on light coloured objects or bare ground.

Potential threats are from pollution and overshadowing of breeding sites.

It is seen on the wing between the middle of June and the end of October and is therefore one of the last dragonflies to be seen in the year.

BUTTERFLIES

Dark-green fritillary *Argynnis aglaja*

Status: Local Interest

Is observed flying over a range of open sunny habitats, particularly flower rich grassland, moorland and favours calcareous soils. Larvae feed on *Viola spp.* Although it is widely distributed, it is rarely found in large numbers. It has been recorded in the Uists and Barra.

The major threat to this species is the loss of flowery grassland and moorland. The grazing impact of local rabbit population is also seen as a threat.

Monitor local populations for possible declines.

Large heath *Coenonympha tullia*

Status: Conservation concern. Protected under Section 5 of the Wildlife and Countryside Act with respect to sale only.

The Highlands and Western Isles has some 20% of the UK population. The apparent decline is probably due to under-recording. This species is confined to wet boggy habitats. These contain sphagnum moss with Hare's tail, Cottongrass and Cross-leaved heath. The future existence of the species is dependent upon the continuing existence of peatland habitats. Over grazing of habitats is also seen as a threat to the Large Heath. Larvae feed on *Eriophorum angustifolium*, *Molina caerulea* and *Rynchospora laba*.

VASCULAR PLANTS

Eyebrights (*Euphrasia* species endemic to the UK)

Euphrasia campbelliae, *E. heslop-harrisonii*,
E. rotundifolia, *Euphrasia marshallii*

Status: Priority

Legal Status: no specific legal protection

Distribution: These species should be considered as a group until their individual distributions are better known and their taxonomic status verified. At present, the taxonomic status of *E. rotundifolia* is uncertain and some, or all, of the records may turn out to be a hybrid species.

Habitats: Habitats include damp, lowland heaths (*E. campbelliae*), maritime heaths and grassland (*E. rotundifolia*), dune grass and salt marsh (*E. heslop-harrisonii*).

Population estimate: No data

Population trends No data

Current threats and opportunities: no data

Information sources: UKBAP

Juniper *Juniperus communis*

Status: Priority

Legal Status: no specific legal protection

Distribution: In the Western Isles there are only 3 post-1987 records, with one square lost since the years 1970-1987 and 16 since the previous period. All known records are from Harris southwards, and the species was found on both the west and east sides of the Uists.

Habitats: a component of montane heath vegetation, and is often found also on sea cliffs.

Population estimate: No data

Population trends No data

Current threats and opportunities: no data. Certain authorities regard all North West Scottish populations as moribund (Michael Scott, pers comm.), meaning that the plants are relicts which are not capable of reproducing themselves sexually under current conditions.

Information sources: UKBAP

Marsh clubmoss *Lycopodiella inundata*

Status: Priority

Legal Status: no specific legal protection

Distribution: In the Western Isles there are only 3 post-1987 records, with one square lost since the years 1970-1987 and 16 since the previous period. All known records are from Harris southwards, and the species was found on both the west and east sides of the Uists.

Habitats: a component of montane heath vegetation, and is often found also on sea cliffs.

Population estimate: No data

Population trends The species was recorded in a single square in Harris pre-1970, but currently has no known sites in the Western Isles. However, due to the problem of possible under-recording, it is

nevertheless included in this audit. See Rasmussen & Lawesson, *Watsonia* 24(1): 45-55 (2002) who argue that its normally ephemeral in Scotland

Current threats and opportunities: no data.

Information sources: UKBAP

Slender naiad *Najas flexilis*

Status: Priority

Legal Status: Slender naiad is listed under Annexes II and IV of the EC Habitats Directive and Appendix I of the Bern Convention. It is protected under Schedule 4 of the Conservation (Natural Habitats, etc.) Regulations 1994 and Schedule 8 of the WCA 1981.

Distribution:

Population estimate: The plant has been found in 5 10-km squares in the Western Isles since 1980, out of a UK total of 19. The South Uist Machair & Lochs Ramsar site contains this species

Population trends No data

Current threats and opportunities: This could be a threat to the populations of *Najas flexilis*. Current threats of this species include; Eutrophication which leads to an increase in photosynthesis by algae and macrophytes that in turn increases the use of carbon dioxide which then becomes limited. Slender naiad cannot like other algae and macrophytes cannot utilise bicarbonate in such circumstances and therefore ceases to photosynthesize; acification which results in the species failing to produce seed; and extensive weed growth including Canadian pondweed. A report in The Times of June 2002, expressed concern about the spread of the weedy waterplant *Elodea nuttallii* in the lochs in South Uist which a potential threat to the species.

Information sources UKBAP, JNCC 2000; Slender naiad, Ruth Wingfield, Scottish Crop Research Institute

Pillwort *Pilularia globulifera*

Status: Priority

Legal Status: no specific protection

Distribution: In the Western Isles the species has been recorded in 3 squares since 1987, all in Balranald Bog (SSSI) in North Uist. It has not been seen in 2 previous sites in Harris and a further 2 in Lewis since that date.

Habitat: slightly acid to neutral lakes, ponds and marshlands where it grows on bare mud (often a clay or clay-sand substrate) subject to fluctuating water levels

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Shetland pondweed *Potamogeton rutilus*

Status: Priority

Legal Status: no specific protection

Distribution: Has been found in North Uist and Benbecula

Habitat: lochs in which it occurs are often situated on calcareous rocks or sand

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Irish lady's-tresses *Spiranthes romanzoffiana*

Status: Priority

Legal Status: Irish Lady's-tresses is included in Schedule 8 of the Wildlife (NI) Order but is not specially protected in Great Britain. It is classified as *Near Threatened*. It was once included in the Red Data Book, but was removed after more sites were discovered in the 1980s.

Distribution: The Western Isles contains 5 of the 14 10-km squares in which the plant has been found since 1987. These are split between Barra and Benbecula

Habitat: a species of marshy meadows, often close to streams, rivers and lakes and subject to inundation in winter

Population estimate: No data

Population trends No data. The species may be under-recorded in the UK, as its grass-like leaves are very difficult to see when not in flower. Consequently changes in its status are not easy to assess. A recent SNH survey undertaken between 1995 and 1996 failed to find 58 out of 69 populations that had been recorded before 1990. No Scottish location recorded before 1981 is now known to be still present, although in some cases plants are present nearby. It is possible that this behaviour was the result of dormancy in unusually dry weather. An alternative explanation is that a large reservoir of unrecorded populations was revealed by surveys between 1980 and 1989 and has subsequently suffered a catastrophic decline. However, little is known of the natural fluctuations in this species.

Current threats and opportunities: This species is a priority for conservation action because of the European importance of the UK populations.

Information sources: UKBAP

Scottish scurvygrass *Cochlearia scotica*

Status: Priority

Legal Status: no specific protection

Distribution: Has been found in North Uist and Benbecula. Western Isles sites include Northton Bay SSSI and Luskentyre Banks and Saltings SSSI.

Habitat: a variety of northern coastal habitats

Population estimate: No data - taxonomically uncertain.

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Pyramidal Bugle *Ajuga pyramidalis*

Status: Local Interest

A Scarce attractive plant of cliffs and ravines, the pyramidal bugle is scattered in small and unstable populations e.g. North Tolsta, Allt Volagir SSSI (S.Uist), and Barra. The species is local in N. Scotland. There is no known threat to its Western Isles population because they are out of the reach of grazing animals.

Early orache *Atriplex praecox*

Status: Local Interest

A Scarce small prostrate plant, whose leaves are usually purple. It is found in stony muddy places on upper seashore, but in natural habitats. It occurs in the Uists and in N and SW Scotland. There are no known human threats to this species.

Curved sedge *Carex maritima*

Status: Local Interest

Inconspicuous but distinctive in appearance, this Scarce species is found in wet sand by the sea. A large population is found at Barvas, Lewis and at Northton SSSI, S. Harris. It is a plant confined to Northern Britain, and mainly to Scotland. No human threats.

Cowbane *Cicuta virosa*

Status: Local Interest

A distinctive and highly poisonous plant of marshes and loch margins, this scarce species of the parsley family is found in the South Uist Machair & Lochs Ramsar site. It is very localised in Britain as a whole.

Western marsh-orchid subspecies *Dactylorhiza comosa subsp. scotica*

Status: Local Interest

A very handsome orchid with spotted leaves and dark purple flowers, this sub-species is endemic to machair in Western Isles (its entire world population is in N.Uist). Taxonomically its status is debatable and it is not recognised by all authors. See "Wild orchids of Scotland" by B.Allan & P.Woods, HMSO, p.104 (1993). It has no official status.

Lapland Marsh-orchid *Dactylorhiza lapponica*

Status: Conservation concern

A marsh orchid which thrives in slightly acidic to base rich flushes. Potential threats are improvements to pasture, isolated population, human disturbance and grazing.

A hybrid Horsetail *Equisetum x mildeanum*

Status: Local Interest

A cross - *E. sylvaticum* x *pratense*, this horsetail has no official status but is very rare. The second parent was recorded in the 19th century but may have been this hybrid. There has been only 1 record in the Western Isles (Ben Lees, N.Uist) and only 3 in Scotland.

Variegated horsetail *Equisetum variegatum*

Status: Local Interest

A Scarce species of sea cliffs (Lewis) or damp dunes (S.Harris and N.Uist). It is very local in Britain as a whole.

Eyebrights

Euphrasia foulaensis & *E. frigida*

Status: Local Interest

Both these eyebrights are scarce species needing an expert for recognition. *E. foulaensis* is sometimes abundant on saltmarsh, and is otherwise found on N. Scottish coast and northern islands. *E. frigida* is characteristically on higher hills, and outwith the Western Isles is found in the Scottish Highlands only. They are under threat from pasture improvement

Autumn Gentian subspecies *Gentianella amarella subsp. septentrionalis*

Status: Local Interest

Although having no official status, this gentian is endemic to Scotland. A pretty plant with flowers purple outside and creamy yellow within, instead of the blue-purple of the common subspecies. It is found on machair in Lewis, where it is abundant north of Barvas. Other locations are in W.Ross, Sutherland, Caithness and Shetland.

Holygrass *Hierochloa odorata*

Status: Local Interest

This Red Data Book species grows in wet meadow at Nunton, Benbecula and there is also a report from S.Uist. It is hard to find unless flowering.

Bog orchid *Hammarbya paludosa*

Status: Local Interest

The bog orchid is a scarce small yellowish-green plant, hard to find, which is widely distributed in small quantity in richer valley mires or marshes. Most UK records are from Scotland.

Hawkweed microspecies *Hieracium scarpicum*

Status: Local Interest

This microspecies has no official status, but is endemic to Western Isles. A handsome and quite distinctive plant with large yellow flower heads, it is found on crags on Scarp and nearby Lewis. Hawkweeds are a specialist group of numerous similar taxa and need expert determination. The species is illustrated on the cover of Angus Duncan's book about Scarp.

Spring quillwort *Isoetes echinospora*

Status: Local Interest

This Scarce species grows submerged in nutrient-poor lochans in scattered localities throughout the main islands. It can be confused with the commoner *I. lacustris*.

Baltic rush *Juncus balticus*

Status: Local Interest

A characteristic plant of machair in all the main island groups, nearly all the British localities of this scarce plant are in Scotland. The species is found in the South Uist Lochs & machair Ramsar site.

Thread rush *Juncus filiformis*

Status: Local Interest

Similar to *J. balticus* but much more slender, this scarce species is found only at Loch Arnol (Lewis). Most of the remaining UK records are also in Scotland.

Oysterplant *Mertensia maritima*

Status: Local Interest

This Scarce species is a very handsome plant with bluish leaves and flowers. It grows on shingle banks above high tide level. An ephemeral, it comes and goes with winter storms. Always very local, this explains its recent disappearance from Benbecula. It probably cannot be conserved!

Thyme broomrape *Orobanche alba*

Status: Local Interest

Growing on thyme in rocky places, this Scarce species is a handsome parasite with orange-red spikes (in spite of its latin name). It is found in small numbers at Northton, S.Harris and is abundant on Fuday between S. Uist and Barra.

Northern knotgrass *Polygonum boreale*

Status: Local Interest

More robust than the common knotgrass (*P. aviculare*) and a weed of cultivation and roadsides. In spite of being a weed it is Scarce and confined to N. coast of Scotland and Shetland. Perhaps not in need of conservation *per se* because of being a weed, it forms part of the very interesting weed community associated with traditional arable cultivation.

A hybrid pondweed *Potamogeton x billupsii*

Status: Local Interest

Extremely rare. Loch na Liana Moire, Benbecula, is the only locality in the world. *P. coloratus* x *P. gramineus*.

Fen pondweed *Potamogeton coloratus*

Status: Local Interest

This Scarce species is distinguished by its net-veined leaves. It has only one locality in Benbecula, and is scarce in Scotland, being more frequent in E. England.

Leafy pondweed *Potamogeton epihydrus*

Status: Conservation concern

A Red Data Book species found in nutrient-poor lochans on moorland in S.Uist. This is its only native habitat in Britain (it is also known in England as an introduction). Its existing population has been damaged by peat digging, but this possibly also creates new habitat for recolonisation.

Needs close monitoring, populations clearly vulnerable to pollution, but no evident short term risk.

Slender-leaved pondweed *Potamogeton filiformis*

Status: Local interest

A Scarce species scattered throughout the Western Isles, in machair lochs. A grass-leaved plant which is not easily identified, it is generally confined to northern and western Britain. The plant occurs in the South Uist Machair and Lochs Ramsar site.

Creeping spearwort *Ranunculus reptan*

Status: Conservation concern

A dainty creeping Red Data Book plant of loch shores, probably spread by wildfowl. There has been only one old record in Harris and this has not been reconfirmed. Probably always ephemeral in Britain, it also disappears by hybridisation with *R. flammula*, the lesser spearwort.

Spiral tasselweed *Ruppia cirrhosa*

Status: Local Interest

A Scarce species of shallow brackish pools or lochans from Barra to Lewis. It looks like a grass-leaved pondweed, and is difficult to distinguish from *R. maritima* unless in fruit.

Perennial glasswort *Sarcocornia perennis*

Status: Local Interest

This Scarce species is the only glasswort that is easy to recognise because of its woody base. It is found on saltmarsh in N.Uist.

Eelgrass *Zostera marina* & *Z. angustifolia*

Status: Local interest

These are scarce marine flowering plants, growing in sand at or below lower tidemark. They are usually found quite generally around the west coast washed up on beaches, but are usually not seen growing. They are thought to have decreased during the last century.

CRYPTOGAMIC PLANTS & FUNGI

ALGAE

Note: due to the lack of recording of these species, distribution data is minimal.

Baltic stonewort *Chara baltica*

Status: Priority

Legal Status: no specific protection

Distribution: The size of the Hebridean populations is uncertain. There are 2 known sites - Loch an Strumore and Loch an Duin.

Habitat: a variety of habitats adjacent to the sea, including lakes, lagoons, quarry pools and pools in sand dunes

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Bearded stonewort *Chara canescens*

Status: Priority

Legal Status: no specific protection

Distribution: Loch Mor, Baleshare

Habitat: clear brackish water up to 2.5 m deep in lagoons, lakes and pools by the coast

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Mossy stonewort *Chara muscosa*

Status: Priority

Legal Status: no specific protection

Distribution: one site in the Western Isles

Habitat: sand in the shallow margins of water bodies

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Foxtail stonewort *Lamprothamnium papulosum*

Status: Priority

Legal Status: Schedule 8 of the Wildlife and Countryside Act 1981 since 1987

Distribution: at nine sites on North Uist and up to three on South Uist, although two of the latter are not confirmed. At many of the North Uist sites, the species is locally frequent, often co-occurring with other brackish stonewort species. It has been argued that the Hebridean sites may represent the most secure global stronghold for foxtail stonewort.

Habitat: sandy or silty substrates in depths of up to 2 m in coastal lagoons or lagoon-like habitats

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Bird's nest stonewort *Tolypella nidifica*

Status: Priority

Legal Status: no specific protection

Distribution: The Western Isles population at Loch an Duin seems to be scattered sparsely over one bay.

Habitat: brackish water

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

BRYOPHYTES: LIVERWORTS & MOSSES

Priority Species

Silky Swan-neck Moss *Campylopus setifolius*

Status: Priority

Legal Status: no specific protection

Distribution: No data

Habitat: varied moist or wet, acidic to mildly basic habitats, including turf on slopes, rock ledges, block screes, edges of streams, flushes and sometimes mires, from near sea-level to 800 m.

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Bryum dixonii

Status: Conservation concern

An oceanic moss long considered endemic to Scotland but now reported in Switzerland. Found in St. Kilda on unstable damp basic rock and soils. Has a high turnover.

Geocalyx graveolens

Status: Conservation concern

A very rare liverwort (also rare in Europe) found on sheltered, shaded, peaty/heathery slopes at low altitude near coast, on St Kilda and in S Harris. It could be vulnerable to heather-burning.

Campylopus shawii

Status: Local interest

An oceanic moss which is scarce in Britain (mainly Outer Hebrides and Skye), in damp flushes, wet heaths and bogs. Outer Hebrides and Skye are European headquarters of this species.

Glyphomitrium daviesii

Status: Local interest

This nationally scarce oceanic moss is found on well-drained and mostly well-lit rock surfaces. Commonest in the far NW, especially on basalt, it appears to have declined further south, possibly because of atmospheric pollution.

Myurium hochstetteri

Status: Local interest

An oceanic moss which is scarce and very local in Britain (commonest on Outer Hebrides; less so on Inner Hebrides and extreme western mainland of W Highlands; one record from W Ireland). It is found

mainly in coastal rocky, grassy and heathy places. Unusual in having a northern distribution in Britain, then (apart from an Irish record) a big gap before appearing again in Azores, Madeira and the Canaries.

Sanionia orthohecioides

Status: Local interest

A nationally rare northern-oceanic moss found in mossy turf on steep E-facing well-drained slopes on St Kilda.

FUNGI

Note: due to lack of recording of these species, distribution data is minimal

Agaricales- mushrooms & toadstools

Pink meadow cap *Hygrocybe calyptriformis*

Status: Priority

Legal Status: no specific protection

Distribution: This species has only been recorded in one square in the Western Isles – on St Kilda. However, survey work was still continuing when the UKBG action plan was written

Habitat: a species of montane to sub-alpine regions. Its main habitats include lawns, grassy meadows, pastures and woodland margins. It has been recorded from both limestone grassland and acidic grassland

Population estimate: No data

Population trends No data

Current threats and opportunities: no data.

Information sources: UKBAP

Ascomycetes- spore shooters

Geoglossum elongatum (Earth Tongue)

Status: Conservation concern

Legal Status: no specific protection

This is an ascomycetes spore shooter found in wet acid grassland.

Known as a starback it is found in Scalpay.

Current threats are agricultural land improvements including drainage. Management should involve no cultivation or drainage

Geoglossum simile (A Cup Fungi - Earth Tongue)

Status: Conservation concern

Found in Sphagnum bogs, with only a current reported presence on St. Kilda.

Geoglossum starbackii (Cup Fungi - Earth Tongue)

Status: Conservation concern

Thrives in acid turf. It requires conditions where there are no cultivations and no fertiliser or herbicide applications. Its current situation in the Red Data Book (RDP) is vulnerable.

Current threats are agricultural land improvements. Land should not be cultivated and no fertiliser or herbicide should be applied.

Microglossum atropurpureum

Status: Conservation concern

A terrestrial saprophyte found in grassland

Current threats are improvement to agricultural land. Areas should not be cultivated and should not receive applications of either pesticides or herbicides.

UREDINIOMYCETES-RUSTS

Puccinia eriophori

Status: Conservation concern

This is an Uredinimycetes (Rusts) which is found on deer grass *Triclophorum caespitosa* in blanket bog and on moorland. It can be found on cultivated plants including Athaea Rosa.

AGARICALES-MUSHROOMS & TOADSTOOLS

Collybia acertrata

Status: Conservation concern

A Saprophyte found on soil or plant debris. It has been recorded on roadside grass in Harris. Is threatened by atmospheric pollution

Entoloma bloxamii (madidum)

Status: Conservation concern

Threatened by agricultural pollution. Suitable sites should not be cultivated or herbicides or pesticides applied.

BOLETALES-BOLETES

Leccinum salicola

Status: Conservation concern

A bolete which is found with *Salix (creeping Willow)*.

It has been recorded in North Uist.

Is threatened by trampling and land development. Coastal dunes should be maintained

LICHENS

Note: due to the lack of recording of these species, distribution data is minimal.

Anaptychia ciliaris subsp. *Mammillata*

Status: Conservation concern

Found on interface of coastal rocks and turfs on St. Kilda and South Uist

Threats include trampling and overgrazing

Lecanora straminea

Status: Local interest

Classed as Near Threatened in the Red Data Book and Nationally Rare, this arctic-maritime species, associated with bird colonies, is present on the St Kilda group and the Flannan Isles, and apparently Benbecula (also Shetland). It is a distinctive yellow-green lichen with closely adpressed radiating lobes.

Multiclavula vernalis

Status: Local interest

A curious basidiomycete lichen which grows on algal-and moss-covered soil in damp crevices and gullies. It was first reported for the British Isles by Watling & Fryday (*Mycologist* **6**: 67, 1992; with colour photo) from Shetland, West Lewis and North Harris. Coppins (pers comm.) is not aware of any further records of this boreal species in the British Isles. Its current RDB status is Data Deficient.

UK Priority Habitat Accounts

Coastal and Marine Habitats

Broad Habitat Supra Littoral Rock

Priority Habitat Maritime cliff and slopes

Status

Maritime cliffs and slopes comprise sloping to vertical faces on the coastline where a break in slope is formed by slippage and/or coastal erosion. The zone defined as cliff-top extends landward to at least the limit of maritime influence (ie limit of salt spray deposition), which may continue for up to 500 m inland. On the seaward side, the plan extends to the limit of the supralittoral zone and so includes the splash zone lichens and other species occupying this habitat. Maritime cliffs can broadly be classified as 'hard cliffs' or 'soft cliffs', though there are a number of intermediate types. Hard cliffs are vertical or steeply sloping; they are inclined to support few higher plants other than on ledges and in crevices. Soft cliffs are formed in less resistant rocks such as shales or in unconsolidated materials such as boulder clay; being unstable they often form less steep slopes and are therefore more easily colonised by vegetation. Soft cliffs are subject to frequent slumping and landslips.

Vegetation of a strictly maritime nature occurs where exposure to the waves and winds is at its greatest. Ledges on such cliffs support a specialised flora with species such as (locally) rock samphire *Crithmum maritimum* and rock sea spurrey *Spergularia rupicola* and (more widely) Scots lovage *Ligusticum scoticum*. Seabird nesting ledges enriched by guano support a particular community characterised by oraches *Atriplex* spp. Maritime grasslands occur on cliffs and slopes in less severely exposed locations; a maritime form of red fescue *Festuca rubra* is a constant component, together with maritime species such as thrift *Armeria maritima*, sea plantain *Plantago maritima*, buck's-horn plantain *P. coronopus* and sea carrot *Daucus carota* ssp *gummifer*.

Extent

Approximately 4000 km of the UK coastline has been classified as cliff. Such conditions are found principally on the northern and south-western coasts. In extreme conditions, such as on the Isle of Lewis, saltmarsh vegetation can occur on cliff-tops. In other areas, where cliffs occur adjacent to sand dunes, sufficient wind blown sand can accumulate on the cliff-tops to allow cliff-top dune vegetation to develop (perched dunes). On exposed hard cliffs giving little foothold to higher plants, lichens are often the predominant vegetation.

Distribution

Hard cliffs are found in several locations in the Western Isles, particularly on the east of the archipelago, where the coastline is afforded some protection from prevailing west and south-westerly winds.

Example local Sites

There are many significant areas of maritime cliffs and slopes, including a 16km coastline between North Tolsta and Ness in Lewis. Much of the coastline of the Eye peninsula is on the exposed Valtos peninsula in the Uig region of Lewis.

Associated priority/conservation concern species or priority habitats

Maritime cliffs are often significant for their populations of breeding seabirds, many of which are of international importance. Some 70% of the international population of gannet *Morus bassanus* and important proportions of the European populations of shag *Phalacrocorax aristotelis*, razorbill *Alca torda* and guillemot *Uria aalge* nest colonially on cliff ledges whilst significant populations of Manx shearwater *Puffinus puffinus* and puffins *Fratercula arctica* nest in burrows in turf on cliff-tops or slopes. Coastal cliffs are also important for crag nesting species, such as raven *Corvus corax* and peregrine *Falco peregrinus*.

The supralittoral zone represents the lowest belt of terrestrial vegetation on maritime cliffs and is usually exemplified by a zone of orange and grey maritime lichens.

There are a range of UK BAP species found associated with this habitat:-

Cathormiocerus britannicus a weevil, *Caloplaca aractina* a lichen, *Euphrasia campbelliae* an eyebright, *Euphrasia rotundifolia* an eye bright.

UK Action Plan status

Nine lengths of coastline in the UK have been nominated as 'Vegetated sea cliffs of the Atlantic and Baltic coasts' candidate Special Areas of Conservation (SAC) under the EC Habitats Directive for their cliff features (two of which include substantial representation of soft cliffs). Under the EC Birds Directive, 38 Special Protection Areas (SPA) in the UK have been designated which include cliff sites – of which the major Western Isles representative is St Kilda.

Maritime Cliffs and Slopes Habitat Action Plan produced.

Objectives:

1. Seek to maintain the existing maritime cliff resource of cliff-top and slope habitat, of about 4000 km.
2. Maintain wherever possible free functioning of coastal physical processes acting on maritime cliff and slope habitats.
3. Seek to retain and where possible increase the amount of maritime cliff and slope habitats unaffected by coastal defence and other engineering works.
4. Increase the area of cliff-top semi-natural habitats by at least 500 ha over the next 20 years.
5. Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top vegetation, by 2010, and as much as possible before 2015.

Threats

- Intensification of agriculture has led to maritime grassland on more level terrain being ploughed out, while that on sloping ground has been abandoned and, where not maintained by exposure, is frequently overgrown by scrub. Localised eutrophication can be caused by fertiliser run-off from improved land and this encourages coarse, vigorous 'weed' species at the expense of the maritime species. Agricultural land drains discharging on the cliff face may cause local acceleration of erosion. Erosion is a highly significant factor in soft cliffs.
- High rates of erosion do not imply a loss of the cliff resource, however, cliff-top vegetation may be destroyed where it is squeezed between a receding cliff face and cultivated land. Cliff erosion in many places provides an essential supply of sediment to coasts lying down-drift of the cliffs.

- There have been many instances of development and holiday accommodation being built too close to cliff-tops. Built development also prevents cliff-top biological communities from retreating in response to cliff erosion, subjecting them to a form of 'coastal squeeze'. Development on cliff-tops reduces the landscape value of a site, but can also cause heavy localised erosion and disturbance to nesting birds. An increase in the number of walkers and dogs along some coastal footpaths has increased livestock worrying and even losses and forced a number of farmers to remove their stock from these sites. Consequently, some of the sites are now suffering from a lack of appropriate grazing, and scrub encroachment is likely to become a problem.
- Predators, such as cats and rats, can have a significant impact on populations of cliff or burrow nesting seabirds, particularly on island sites. Also the spread of certain alien, invasive plants, can have a devastating impact on indigenous maritime plant communities.

Opportunities

- The UK Government has set out its commitment to sustainable management of the coast in a number of publications including the Scottish Office *Coastal Planning* (NPPG 13). Focus on Firths has been initiated in Scotland.
- More general management initiatives include agri-environment schemes which encourage management and restoration of maritime grassland, heathland and other cliff-top habitats and promote the management of maritime grassland and heath habitats by scrub control and grazing where appropriate, through relevant agri-environment schemes and management agreements.
- Assess the maritime cliff sites where the native flora and fauna is being affected by introduced species and encourage operations to remove rats, cats or other introduced predators affecting breeding seabirds on maritime cliff and slope sites, identified by 'Seabird 2000' and other surveys.

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Broad Habitat **Supra Littoral Sediment**

Priority Habitat **Coastal sand dunes**

Status

Coastal sand dunes develop where there is an adequate supply of sand (sediment within the size range 0.2 to 2.0 mm) in the intertidal zone and where onshore winds are prevalent. The critical factor is the presence of a sufficiently large beach plain whose surface dries out between high tides. The dry sand is then blown landwards and deposited above high water mark, where it is trapped by specialised dune-building grasses which grow up through successive layers of deposited sand.

Sand dunes form in relatively exposed locations, and in a number of physiographic situations. The most common are bay dunes, where a limited sand supply is trapped between two headlands; spit dunes, which form as sandy promontories at the mouths of estuaries; and hindshore dunes, which occur in the most exposed locations where large quantities of sand are driven some distance inland, over a low-lying hinterland. This last type forms the largest dune systems in the UK. Less common types are: ness dunes, which build out from the coast; dunes on offshore islands, which are often superimposed on a base of other material such as shingle; climbing dunes where sand is blown up on to high ground adjacent to the beach; and tombolos, where a neck of sand is deposited between two islands or between a promontory and an island.

Extent

The ongoing Sand Dune Vegetation Survey of Scotland indicates that there may be as much as 48,000 ha of dune and machair in Scotland, of which 33,000 ha is dune. In Scotland dunes are found on all coasts but are less frequent in the north-west and in Shetland; they are particularly extensive in the Western Isles and Inner Hebrides where they are associated with machair.

Distribution

Coastal sand dunes, associated with machair systems are found throughout the western coastline of the Western Isles. The Western Isles features a large number of Scottish coastal sand dune habitats.

Example local sites

Coastal sand dunes can be found on the west coast of Barra, Monach Isles, South Uist, North Uist, Pabbay, Taransay, Horgabost (Harris) and some areas of Lewis including Reef and Cliff, Bosta, Barvas, Eoropie (Ness) and North Tolsta.

Associated priority /conservation concern list species or other priority habitats

The machair entry in this audit should be read in conjunction with this entry, since the two habitats frequently occur adjacent to each other, and similar objectives apply to both.

The following BAP priority species have significant populations on sand dunes:

- Ground beetle *Panagaeus crux-major*
- Dune gentian *Gentianella uliginosa*
- Dune thread moss & *Bryum mamillatum*
- Moss *Bryum warneum*
- Petalwort *Petalophyllum ralfsii*

Sand dune communities vary geographically: lyme grass *Leymus arenarius* is increasingly common in northern Britain, growing alongside marram grass in mobile dunes.

Dune grassland and dune slacks, especially on the more calcareous systems, support a wide variety of colourful flowering plants, including a number of species of orchid. Sand dune systems are also very rich in invertebrates, including butterflies, moths and burrowing bees and wasps.

UK Action Plan status

Coastal Sand Dune Habitat Action Plan produced.

Objectives:

1. Protect the existing sand dune resource of about 54,500 ha from further losses to anthropogenic factors, whether caused directly or indirectly (eg by sea defence schemes affecting coastal processes).
2. Offset the expected net losses due to natural causes of about 2% of the dune habitat resource over 20 years by encouraging new dunes to accrete and where possible by allowing mobile dune systems to move inland.
3. Seek opportunities for restoration of sand dune habitat lost to forestry, agriculture or other human uses. A target figure of up to 1000 ha to be reinstated by 2010 (to be reviewed as a result of the inventory proposed in 5.5.1) is suggested.
4. Encourage natural movement and development of dune systems, and control natural succession to scrub and woodland where necessary.
5. Maintain dune grassland, heath and lichen communities on the majority of dune systems; Atlantic dune woodland should be created on up to five carefully selected sites.

A large proportion of the sand dune resource in the UK is designated as SSSI. In a partial survey of Scottish dunes, 24 of the 34 sites surveyed were designated as SSSI. Twenty one sites in the UK have been selected as candidate SACs under the EC Habitats Directive for their sand dune features, including the South Uist Machair and Lochs, North Uist Machair and the Islands

Threats

- Unless artificially constrained, the seaward edges of sand dunes can be a highly mobile feature, though there is a natural trend to greater stability further inland. Very few dune systems are in overall equilibrium, and a majority of those in the UK demonstrate net erosion rather than net progradation; insufficient sand supply is frequently the underlying cause. There is no particular geographical distribution of either trend, both normally being present along any one stretch of coastline, and often within individual sites. Changes may be cyclical, both seasonally and over longer periods of time.
- Dune slacks support characteristic communities dependent on a seasonally high water table, including the formation of temporary or even permanent ponds. There may be considerable variation in the behaviour of the water table from year to year, resulting in a stressed ecosystem where only specialised species can survive. However in some dune systems with important slacks, a long term fall in the water table has led to loss of the specialist slack flora and invasion by coarse vegetation and scrub. While unusually dry summers may have contributed to this problem, the long-term causes are believed to be local extraction of water and/or drainage of adjacent land used for agriculture or housing.
- The preponderance of grassland and heath vegetation on British dunes is due to a long history of grazing by livestock. Continued grazing is normally necessary to maintain the typical fixed dune communities, but over-grazing, particularly when combined with the provision of imported feedstuffs, can have damaging effects. An occasional problem is under-grazing, leading to invasion by coarse grasses and scrub, though rabbits are locally effective in maintaining a short turf. Parts of some stabilised dune systems have been entirely converted to agricultural use, resulting in almost total loss of the conservation interest.
- Recreation is a major land use on sand dunes. Many dune systems are used extensively by holiday-makers, mostly on foot but also for parking cars and in some cases for driving four-wheel-drive vehicles or motorcycles. Moderate pressure by pedestrians may cause little damage, and may even

help to counteract the effects of abandonment of grazing. However, excessive pedestrian use, as on routes between car parks and beaches, and vehicular use in particular, have caused unacceptable erosion on many dune sites.

- Many dune systems are affected by sea defence works or artificial stabilisation measures such as sand fencing and marram planting. These practices are particularly prevalent on the more developed coastlines where drifting sand may be perceived as a threat to urban or holiday developments. While carefully applied dune management measures can help to counteract severe erosion which may threaten the existence of a dune, engineered defence systems usually reduce the biodiversity inherent in the natural dynamism of dune systems, and may cause sediment starvation down-drift.

Opportunities

- Many sand dune sites benefit from protective management under ESA, CPS or RSS management prescriptions.
- The Sand Dune Survey of Great Britain was initiated in 1987 and provides information on the vegetation and current management of all significant dune systems. The Scottish survey is currently being completed and final results were due to be published in 2000 and will guide future dune management.
- Restoration of sand dune habitat lost to forestry, agriculture or other human uses.

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Broad Habitat **Supra Littoral Sediment**

Priority Habitat **Machair**

Status

Machair is a distinctive type of coastal grassland found in the north and west of Scotland, and in western Ireland. It is associated with calcareous sand, blown inland by very strong prevailing winds from beaches and mobile dunes.

In its strict sense, 'machair' refers to a relatively flat and low lying sand plain formed by dry and wet (seasonally waterlogged) short-turf grasslands above impermeable bedrock, a habitat termed 'machair grassland'. However, *machair* can also cover the beach zone, mobile and semi-fixed foredunes, dune slacks, fens, swamps, lochs (some of them brackish), saltmarsh, and sand blanketing adjacent hillslopes, together forming the 'machair system'. It is also often associated with an inland transition to heath and mire termed 'blackland', which can include sand-affected peatland. Though this audit principally addresses the machair grassland, this is an integral part of the wider machair system so the plan must consider the former in the context of the latter.

Machair grassland plains are complex features in terms of origin, development, processes, local habitat types and management. They are formed from sand blown inland following the periodic breakdown of foredunes above the beach and contain a mosaic of wet and dry grassland communities. These are related to grazing and tillage history superimposed upon gradients of surface stabilisation, soil acidity, and salinity which are controlled by local sand blow, water-table fluctuation and micro-topography, giving rise to highly complex habitat mosaics. Some plant communities are largely restricted to western and northern Scotland.

Machair has a very long history of management by local communities over several millennia. In recent times this has involved a mix of seasonal extensive grazing (mainly by cattle, with pastures rested in the summer) and low-input low-output rotational cropping based on potatoes, oats and rye. A very small area of bere barley is also cultivated. This traditional mixed management sustains varied dune, fallow and arable weed communities which offer in some areas superb displays of flowering colour across wide expanses of unfenced land in summer. The periodic ground disturbance and seasonal absence of stock supports very important breeding wader populations. The wider machair system has a rich invertebrate fauna. This traditional agriculture is associated mainly with the Uists; in other parts of the Western Isles there has been a marked decline in such land management with a corresponding decline in wildlife.

There is a very strong association between traditional land use and crofting communities. Machair is a living, cultural landscape and much of its conservation value is dependent on the maintenance of viable crofting agriculture based on low-input shifting cultivation. Machair is highly susceptible to agricultural modification and is particularly sensitive to changes in grazing, sand and shingle extraction, and recreational impact.

Extent

	Area (ha)	Breakdown (ha)
England	not present	-
Scotland	17500	Western Isles 10 000 Tiree & Coll 4000 Rest of Scotland 3500
Wales	not present	-

Northern Ireland	not present	-
Total UK extent:	17500	17500

Data source: Stewart Angus, SNH, amended as per UKBAP.

It is estimated that 'machair grassland' is restricted to about 25,000 ha in world-wide extent, with 17,500 ha in Scotland and the remainder in western Ireland, so that world distribution is very restricted. The full (global) geographical extent of the wider 'machair systems' is believed to be in the region of 40,000 ha, with some 30,000 ha in Scotland and 10,000 ha in Ireland.

Distribution

Machair habitats are spread down the Western coastline of Vatersay, Barra, South Uist, Benbecula, North Uist, Berneray, south Harris and parts of north Lewis.

Example local sites

The best examples of machair sites can be seen in South Uist, Benbecula and North Uist, with areas in Barra, Vatersay and Berneray.

Associated priority/conservation concern list species or priority habitats

Machair grassland is an integral part of a wider machair system comprising sand dunes, saltmarsh, coastal lagoons, open waters and marshes, and the action plans for these related habitats should be considered when planning management. A degree of sand movement is essential to maintenance of the machair habitat.

The following BAP priority species have significant populations on machair:

Alauda arvensis Skylark

Bombus distinguendus Great yellow bumblebee

Colletes floralis Northern colletes

No plant sub-communities of the National Vegetation Classification are confined to machair, but the two most indicative are the *Festuca rubra-Galium verum* fixed dune grassland, *Ranunculus acris-Bellis perennis* sub-community of dry machair (SD8d) and the *Festuca rubra-Galium verum* grassland, *Prunella vulgaris* sub-community of wet machair (SD8e).

Few rare plant species are largely restricted to machair systems. Exceptions are the slender naiad *Najas flexilis* which is strongly associated with machair lochs, some pondweeds, *Potamogeton* spp (grass-wrack pondweed *Potamogeton compressus*, Shetland pondweed *Potamogeton rutilus*) and their hybrids, and the endemic orchid *Dactylorhiza majalis scotica*. This environment is more important as one of the last areas in Britain supporting old field successions, some of which are a century or more old. The great complexity and diversity of habitats and plant communities within machair systems is also a special feature. Two nationally scarce birds, corncrake *Crex crex* (which is globally threatened) and corn bunting *Miliaria calandra*, are noted birds of machair systems. The machair breeding wader populations of the Uists are amongst claimed as the most important in the north-west Palaeartic.

UK Action Plan status

Machair Habitat Action plan has been produced.

Objectives:

1. Maintain existing extent of machair.

2. Restore improved machair grassland to traditional mixed management with no over-grazing. Aim to reduce improved grassland extent by 30% by 2010, with concomitant reductions in stocking levels to avoid over-grazing of machair.
3. Promote increased use of cattle as principal stock as part of new practices.
4. Apply appropriate remedial methods to 50% of sites currently suffering severe over-grazing by 2005 and 100% by 2010.
5. Restore machair habitat and management to large sites degraded by sand extraction in the Western Isles by 2010 (for sites with exhausted sand reserves or no further planning permission).
6. Restore areas previously cultivated by traditional methods to rotational cultivation in association with cattle production, increasing cultivated area by 20% by 2005.

Approximately 80% of the Scottish machair area is notified as SSSI and some 50% is notified as or may become Special Protection Area (SPA) under the EC Birds Directive. 'Machair' is listed as a habitat type in Annex 1 of the EC Habitats Directive and 16 SSSIs fall within proposed machair Special Areas of Conservation (SACs), amounting to about half the area of the habitat, and overlapping substantially with SPAs. A few SSSIs are designated as Wetlands of International Importance under the Ramsar Convention, comprising perhaps 5% of the area of the habitat. One site is a Man and Biosphere Reserve. Three sites are managed as NNRs by SNH with further machair in RSPB reserves. The coastal edge of much machair in the Uists is protected as Geological Conservation Review sites, indicating its geomorphological importance.

The proportion of protected machair in Scotland is unknown because total machair extent is uncertain. In the Western Isles recent survey shows 4770 ha of designated dune and machair habitat which is 46% of the vegetated blown sand resource (excluding machair loch area).

Threats

- Earlier cutting of grass for silage rather than hay reduces seeding by flowering plants and destroys the nests of characteristic birds such as the corncrake.
- 'Improvement' of machair grassland by re-seeding, drainage and stock feeding, can reduce sward species diversity as well as habitat diversity over a wider area.
- Social changes in crofting, resulting in heavy all-year grazing of machair grasslands as part of a switch from arable to stock grazing, and from cattle to sheep as predominant stock, reduces sward species diversity and the ability of plants to flower, set seed and provide cover for breeding birds.
- Under-grazing and poor management of seasonal grazing allows rank, weedy and species-poor grassland to develop.
- Predation of breeding birds by introduced species (feral mink and feral ferret/polecat in Lewis and Harris, hedgehog mink, and feral ferrets in the Uists).
- Stock-induced erosion due to access to foredunes and beach, creates blow-outs in outer dune crests, on steep slopes, and around areas used for shelter.
- Coastline retreat due to rising sea levels and possibly increasing storminess, produces extensive slow erosion of the outer dune or machair grassland edge which can be accelerated by stock damage.
- Sand extraction from internal dunes and machair disrupts habitat zonations and water-table relationships.
- Sand and shingle extraction from the beach zone increases the rate of coastal retreat of the dune edge and reduces available sand for blowing inland.
- Poor recreational management, especially in some areas used for caravanning and camping, initiates erosion and accelerates coastal edge retreat and grassland sward change.

Opportunities

- Much of the machair area in Scotland is crofted land, enjoying unique forms of management and land tenure since the passing of the Crofting Act of 1886 and subsequent legislation, consolidated under the Crofters (Scotland) Act 1993. Habitat management proposals for conservation must be tailored to crofting requirements to be successful, especially since much of the natural heritage interest is dependent on crofting practices.
- Commercial extraction of sand from machair is now under planning control, but sand extraction for agricultural use (including the croft house) is 'permitted development' and does not require planning permission, and in some of the more densely populated crofting areas there may be extensive unregulated sand extraction. It is however controlled by SEERAD in the case of crofters with ESA contracts.
- Environmental Impact Assessment is a statutory requirement for certain proposed developments where there is likely to be a significant effect on the environment.

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Broad Habitat

Supra Littoral Sediment

Priority Habitat **Coastal vegetated shingle**

Status

Shingle is defined as sediment with particle sizes in the range 2-200 mm. It is a globally restricted coastal sediment type with few occurrences outside north-west Europe, Japan and New Zealand. Shingle beaches are widely distributed round the coast of the UK, where they develop in high energy environments. Shingle structures take the form either of spits, barriers or barrier islands formed by longshore drift, or of cusped forelands where a series of parallel ridges pile up against the coastline. Some shingle bars formed in early post-glacial times are now partly covered by sand dunes as a result of rising sea levels leading to increased deposition of sand. In northern and western Britain, shingle may derive from deposits transported to the coast by rivers or glacial outwash. Shingle structures are of geomorphological interest.

The vegetation communities of shingle features depend on the amount of finer materials mixed in with the shingle, and on the hydrological regime. The classic pioneer species on the seaward edge include sea kale *Crambe maritima*, Babington's orache, *Atriplex glabriuscula*, and sea campion *Silene uniflora*; such species can withstand exposure to salt spray and some degree of burial or erosion.

Extent

Shingle structures sufficiently stable to support perennial vegetation are a comparatively rare feature even in the UK. The major vegetated shingle structures surveyed in 1987-1991 by Sneddon and Randall totalled some 5000 ha in England, 700 ha in Scotland and 100 ha in Wales.

Distribution

Coastal vegetated shingle is found in all island groupings within the Western Isles. Much of the West coast of Lewis, exposed to high energy sea activity features the habitat.

Example local sites

In machair areas, such as found on the west coast of North Uist, South Uist and Benbecula, shingle structures perform a protective function and have an important interaction with species of the associated habitat.

Associated priority/Conservation Concern list species or other priority habitat

Shingle structures may support breeding birds including gulls, waders and terns. Diverse invertebrate communities are found on coastal shingle, with some species restricted to shingle habitats. The following BAP priority species have significant populations on vegetated shingle sites: Great Northern Bumblebee *Bombus distinguensis* and northern *colletes* bee.

UK Action Plan status

Vegetated shingle is a rare habitat; all major examples and many minor ones have therefore been notified as SSSIs. Vegetated shingle is listed as a habitat type under Annex I of the EC Habitats Directive ('Perennial vegetation of stony banks'), and two sites in Scotland are proposed as SACs.

Coastal Vegetated Shingle Habitat Action Plan produced.

Objectives:

1. Prevent further net loss of existing vegetated shingle structures totalling about 5800 ha. (However local gains and losses due to storm events occur sporadically and should be accepted provided that the national and regional resources are maintained overall.)
2. Prevent, where possible, further exploitation of, or damage to, existing vegetated shingle sites through human activities, and maintain the quality of existing plant and invertebrate communities which are currently in favourable condition.
3. Achieve the restoration, where possible, of degraded or damaged habitats of shingle structures, including landward transitions, where such damage has been extensive and natural recovery is not likely to be initiated, by 2010.

Threats

- The health and ongoing development of a shingle feature depend on a continuing supply of shingle. This may occur sporadically as a response to storm events rather than continuously. It is frequently lacking owing to interruption of coastal processes by coast defence structures, by offshore aggregate extraction or by artificial redistribution of material within the site.
- Shingle features are rarely stable in the long term. Many structures exhibit continuous longshore drift, and ridges lying parallel to the shoreline tend to be rolled over towards the land by wave action in storm events. This movement has a knock-on effect on low-lying habitats behind the shingle. Movement is likely to be accelerated by climate change resulting in sea level rise and increased storminess.
- Shingle structures have been regarded as a convenient source of aggregates, and have been subject to varying degrees of extraction resulting in severe alteration of morphology and vegetation. Industrial plant, defence infrastructure and even housing have been built on shingle structures, destroying vegetation and ridge morphology.
- Shingle vegetation is fragile; the wear and tear caused by access on foot, and particularly by vehicles, has damaged many sites. The causes include military use, vehicle access to beaches by fishermen, and recreational use. Such disturbance can also affect breeding birds.
- In a few cases areas of shingle were traditionally grazed, but this management has now largely ceased, leading to domination by willow carr on wetlands and changes to vegetation structure. The impacts of removal of grazing on breeding birds and other shingle species are not fully understood.

Opportunities

- Many shingle sites have been damaged in the past, and there is little positive management of the habitat. It is often impossible to achieve the restoration of degraded or damaged habitats of shingle structures, such as landward transitions, where such damage has been extensive and natural recovery is not likely to be initiated or to control recreational use. Allowing natural landward movement of shingle features will, in some cases, affect other habitats such as saline lagoons, grazing marsh, fens and reedbeds, some of which will be designated sites. The implementation groups for the relevant HAPs should be advised on how to make appropriate provision for habitat creation. In some cases, breaches in shingle banks may lead to the development of saltmarsh habitats and this needs to be taken account of in the respective HAPs.
- Environmental Impact Assessment is a statutory requirement for certain proposed developments where there is likely to be a significant effect on the environment.
- Prevent further exploitation of, or damage to existing vegetated shingle sites through human activities, and maintain the quality of existing plant and invertebrate communities which are currently in favourable condition.

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Broad habitat **Littoral Sediment**

Priority Habitat **Seagrass beds (*Zostera* spp)**

Status

Seagrass beds develop in intertidal and shallow subtidal areas on sands and muds. They may be found in marine inlets and bays but also in other areas, such as lagoons and channels, which are sheltered from significant wave action.

Three species of *Zostera* occur in the UK, and all are considered to be scarce (present in 16-100 ten km squares). Species include narrow-leaved eelgrass *Zostera angustifolia* on the mid to lower shore and eelgrass and *Zostera marina* predominantly in the sublittoral. The plants stabilise the substratum, are an important source of organic matter, and provide shelter and a surface for attachment by other species. Eelgrass is an important source of food for wildfowl, particularly brent goose and widgeon which feed on intertidal beds. Where this habitat is well developed the leaves of eelgrass plants may be colonised by diatoms and algae. The soft sediment infauna may include amphipods, polychaete worms, bivalves and echinoderms. The shelter provided by seagrass beds makes them important nursery areas for flatfish and, in some areas, for cephalopods.

Extent

It is thought that there is around 1000Ha of *Zostera spp* around the shores of the UK.

Distribution

A small number of sites, frequently associated with saline lagoons can be found throughout the Western Isles, commonly associated with flat, sandy slopes (although not exclusively).

Example local sites

Sites where known seagrass habitats exist include; Lochmaddy, Lochboisdale, Loch seaforth, East Loch Tarbert.

Associated priority/conservation concern list species and other priority habitats

Reference should be made to the habitat action plans *for saline lagoons and saltmarsh*.

UK Action Plan Status

Areas of seagrass are included in some coastal ASSIs/SSSIs, Ramsar sites, SPAs (under the EC Birds Directive) and voluntary marine protected areas. Two out of the three UK Marine Nature Reserves have seagrass beds and the habitat occurs in a number of areas proposed as SACs under the EC Habitats Directive.

Information on the distribution of seagrass beds is being collected as part of the JNCC Marine Nature Conservation Review.

Threats

- A wasting disease was responsible for die-back of large areas of seagrass in the UK in the 1930s. The fungus and slime mould which colonised the weakened seagrass have recently reappeared in seagrass beds in other areas of the UK.
- The extent of seagrass beds may change as a result of natural factors such as severe storms, exposure to air, and freshwater pulses. Grazing by wildfowl can have a dramatic seasonal effect with more than 60% reduction in leaf cover reported from some sites. Warm sea temperatures coupled with low level of sunlight may cause significant stress and die back of seagrass.
- Physical disturbance, for example by trampling, dredging, and use of mobile bottom fishing gear, land claim and adjacent coastal development through the construction of sea defences and potential for changes in the hydrological regime.
- Nutrient enrichment, at low levels, may increase production in *Zostera* while high nitrate concentrations have been implicated in the decline of mature *Z. marina*. Phytoplankton blooms, resulting from nutrient enrichment, have been shown to reduce biomass and depth penetration of eelgrass. Eutrophication can also result in a shift to phytoplankton epiphyte or macroalgal dominance.
- Eelgrass is known to accumulate Tributyl, tin and possibly other metals and organic pollutants. Several heavy metals and organic substances have been shown to reduce nitrogen fixation which may affect the viability of the plant, particularly in nutrient poor conditions. Accumulated pollutants may become concentrated through food chains.

Opportunities

- A report on the status of eelgrass in Scotland was published in 1993 covering latest information on taxonomy and systematics, distribution, threats and suggestions for further work.
- Certain associated terrestrial margins in the Western Isles have been identified as SSS/SAC sites, thus offering an opportunity to preserve the habitat, study its management and protect from detrimental management activities.
- Management of surrounding land under ESA and CPS/RSS habitat management prescriptions will prevent habitat damage (particularly by Eutrophication).

- Environmental impact assessments required before developments or improvements are carried out on surrounding land will offer further protection against detrimental activity.

Information sources

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Pers.Comm. Janet Khan, SNH

Broad Habitat **Littoral Sediment**

Priority Habitat **Coastal Saltmarsh**

Status

Coastal saltmarsh refers to the upper, vegetated portions of intertidal mudflats, lying between mean high water neap tides and mean high water spring tides. The lower limit of saltmarsh is the lower limit of pioneer saltmarsh vegetation (but excluding seagrass *Zostera* beds) and the upper limit is one metre above the level of highest tides to take in transitional zones.

Saltmarsh vegetation consists of a limited number of salt tolerant species adapted to regular immersion by the tides. A natural saltmarsh system shows a clear zonation according to the frequency of inundation. At the lowest level the pioneer glassworts *Salicornia* spp can withstand immersion by as many as 600 tides per year, while transitional species of the upper marsh can only withstand occasional inundation.

The communities of stabilised saltmarsh can be divided into species-poor low-mid marsh, and the more diverse communities of the mid-upper marsh. On traditionally grazed sites, saltmarsh vegetation is shorter and dominated by grasses. At the upper tidal limits, true saltmarsh communities are replaced by driftline, swamp or transitional communities, which can only withstand occasional inundation.

Extent

Saltmarshes are usually restricted to comparatively sheltered locations in five main physiographic situations: in estuaries, in saline lagoons, behind barrier islands, at the heads of sea lochs, and on beach plains. The development of saltmarsh vegetation is dependent on the presence of intertidal mudflats. The most recent saltmarsh surveys of the UK estimate the total extent of saltmarsh (including transitional communities) to be approximately 45,500 ha with 6747 ha in Scotland. In north-west Scotland it is characterised by a large number of very small saltmarsh sites at the heads of sea lochs, embayments and beaches. It is estimated that, at the mean high water line, 3% of the Scottish coastline consists of saltmarsh vegetation.

Large areas of grazing marsh have been agriculturally improved. As a consequence, many saltmarshes now adjoin improved land, and the upper and transitional zones of saltmarshes have become comparatively scarce in reclaimed and improved areas. Sites still displaying a full range of zonation are particularly valuable for nature conservation. In Scotland, transitions (eg to freshwater, grassland and dune communities) are still comparatively common.

Distribution

Small areas of Saltmarsh sites can be found throughout the Western Isles, associated with protected coastline and shallow beaches. Several of the saltmarsh sites are found at river estuaries and associated with areas of improved land.

Example local sites

Example sites can be found at Tong in Lewis and Northton in Harris.

Associated priority/conservation concern list species or other priority habitats

Saltmarshes are an important resource for wading birds and wildfowl. They act as high tide refuges for birds feeding on adjacent mudflats, as breeding sites for waders, gulls and terns and as a source of food for passerine birds particularly in autumn and winter. In winter, grazed saltmarshes are used as feeding grounds by large flocks of wild ducks and geese. Areas with high structural and plant diversity, particularly where freshwater seepages provide a transition from fresh to brackish conditions, are particularly important for invertebrates. Saltmarshes also provide sheltered nursery sites for several species of fish.

The following BAP priority species have significant populations on saltmarsh: the eyebright *Euphrasia heslop-harrisonii*.

UK Action Plan status

Coastal Saltmarsh Habitat Action Plan Produced.

Objectives:

1. The overall objectives of this plan are to offset the current losses due to coastal squeeze and erosion to maintain the existing extent of saltmarsh habitat of approximately 45,500 ha, and to restore the area of saltmarsh to 1992 levels (the year of adoption of the Habitats Directive which included saltmarsh as a habitat type of community interest). There is a need to identify realistic and achievable targets for creation. The results of individual estuary evaluations during the first five years of this 15 year plan will allow the headline targets set out below to be reviewed and refined. Such studies will also identify potential locations for saltmarsh creation. There will be a presumption against any further net loss of saltmarsh to land claim or other anthropogenic factors. The best available information has been used to establish the targets below.
2. There should be no further net loss (currently estimated at 100 ha/year). This will involve the creation of 100 ha/year during the period of this plan. However, local losses and gains are to be expected in this essentially dynamic system.
3. Create a further 40 ha of saltmarsh in each year of the plan to replace the 600 ha lost between 1992 and 1998, based on current estimates.
4. Maintain the quality of the existing resource in terms of community and species diversity and, where necessary, restore the nature conservation interest through appropriate management. It will be desirable for some managed realignment sites to develop the full range of saltmarsh zonation.

Threats

- Grazing has a marked effect on the structure and composition of saltmarsh vegetation by reducing the height of the vegetation and the diversity of plant and invertebrate species. Intensive grazing is considered to be a problem in some areas, however it creates a sward attractive to wintering and passage wildfowl and waders, whilst less intense grazing produces a tussocky structure which favours breeding waders. In recent decades, some grazed saltmarshes have been abandoned, leading to domination of the mid to upper marsh by rank grasses.
- Agricultural improvement (re-seeding and draining) has affected the upper edge and transition zones of some saltmarshes in the past and may still occur on a small scale. Eutrophication due to sewage effluent and agricultural fertiliser run-off has caused local problems of algal growth on saltmarshes.
- Saltmarshes are affected by a range of other human influences including waste tipping, pollution. Oil pollution can potentially destroy saltmarsh vegetation and whilst it usually recovers, sediment

may be lost during the period of die-back. The effects of recreational pressure are not well understood but may be locally significant.

- Small scale land reclamation for industry, harbour facilities, transport infrastructure and waste disposal remain as threats.

Opportunities

- Appropriate grazing of traditionally grazed saltmarshes is encouraged through management agreements and agri-environment schemes and other initiatives.
- The LFASS encourages farmers and crofters to redress the balance of cattle and sheep within LFAs.
- Opportunities exist to integrate crofting with conservation management and demonstrations of such integration assist in promoting “good practice”.
- Training courses are available to farmers and crofters to help them encourage biodiversity and implement management through agri-environment schemes.

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Broad Habitat **Inshore Rock**

Priority Habitat **Tidal rapids**

Status

The term 'tidal rapids' is used to cover a broad range of high energy environments including deep tidal streams and tide-swept habitats. The JNCC's Marine Nature Conservation Review (MNCR) defined rapids as 'strong tidal streams resulting from a constriction in the coastline at the entrance to, or within the length of, an enclosed body of water such as a sea loch. Depth is usually shallower than five metres.' In deeper situations, defined in this plan as being more than five metres, tidal streams may generate

favourable conditions for diverse marine habitats (eg the entrances to fjordic sea lochs, between islands, or between islands and the mainland, particularly where tidal flow is funnelled by the shape of the coastline). Wherever they occur, strong tidal streams result in characteristic marine communities rich in diversity, nourished by a constantly renewed food source brought in on each tide.

The marine life associated with these habitats is abundant in animals fixed on or in the seabed, and typically include soft corals, hydroids (sea fans), bryozoans (sea mats), large sponges, anemones, mussels and brittlestars in dense beds. In shallow water, bedrock and boulders often support kelp and sea oak plants, which grow very long in the tidal currents, and have a variety of animals growing on them. Other smaller red and brown seaweeds grow on cobbles and pebbles, many of these being characteristic of tide-swept situations. Coarse gravel is a more difficult habitat for animals to colonise, as it is constantly moving, yet even here there are typical animals, such as sea cucumbers, worms and burrowing anemones. Maerl beds are also closely identified with the conditions found in tidal narrows and rapids in the north of the British Isles (Orkney and Western Isles).

In deeper water, such as between islands, strong tidal streams may be felt down to 30 m. The variability of sea lochs in size, shape, number of basins and length and depth of sills, produces a wide range of marine communities. The seabed may be of bedrock and boulders, or a range of mixed material down to coarse shell gravel. The species composition of tidal rapids in some sea lochs may also be influenced by marked variations in salinity.

Extent

An important range of tidal rapid habitats are found in Scottish and Irish fjordic and fjardic sea lochs. Fjordic sea lochs occur in the more mountainous areas of the Scottish west coast and islands and were formed by the scouring action of glaciers and ice sheets. The result was an over-deepened basin (with some examples recording a charted depth of 200 m) or a series of basins connected to each other and the open sea by narrow and shallow 'sills' at depths of less than 30 m, with many less than 20 m. It is this high energy sill habitat, over which the tide flows, that produces the diverse communities that inhabit this environment. A considerable volume of water may move over the sill during the tidal cycle, with a tidal range in some Scottish sea lochs of up to 5 m on spring tides, generating a tidal flows of up to 10 knots. For example, Strangford Lough in Northern Ireland also has a long rapids system with very strong tidal streams up to 8 knots.

Distribution

Fjardic sea lochs are much shallower than their fjordic counterparts and often feature a maze of islands and shallow basins connected by rapids, which are usually less than five metres deep and often intertidal. Fjardic sea lochs are found mainly on the eastern coastline of the Western Isles.

Example local sites

Example sites include: Lochmaddy, Sound of Harris and its islands, East Loch Tarbert.

Associated priority/conservation concern list species or other priority habitats

Other priority habitats which share high energy environments include; maerl beds and *mud in deep water*

UK Action Plan status

A few Scottish rapids are partly included within intertidal SSSIs, but these designations do not include the sublittoral parts of the rapids which contain much of the marine biological interest.

Rapids can be included in protected sites as Special Areas of Conservation (SACs) under the EC Habitats Directive as 'reefs' (if the seabed is of rock or a biogenic reef, such as a mussel bed); under 'large shallow inlets and bays', or in the priority habitat 'lagoons'. However, rapids with mixed sediments occurring in sea lochs and sounds (many are of this type) do not qualify under the present habitat definitions. The importance of UK rapids in an international context means that current protection through site designation is inadequate.

Loch Maddy is a candidate SAC under the category of 'shallow inlet' and includes numerous shallow tidal rapids between the many islands of the loch.

Many other sea lochs with tidal rapids are included in the list of 29 Marine Consultation Areas, a non-statutory designation used by SNH to denote areas of special marine interest in connection mainly with consultations over the siting of fishfarms and other works.

Threats

- The richness and variety of marine life in tidal rapids relies primarily on the strong water currents to carry food in, and waste materials and fine sediments away. Any obstruction to the water flow can be expected to have adverse effects on the fauna and flora. However, in a few cases, in the Western Isles, solid causeways with no provision for water exchange, or with only small culverts, have been built across rapids, for instance the causeway joining Vatersay with Barra.
- Tidal power generation has been suggested in conjunction with bridge construction in areas with strong tidal flow as a means of generating electricity. Depending on scale and local circumstances, these could have a devastating effect on communities in rapids and within enclosed bodies of water.
- Rapids often have dense beds of animals, for example mussels, which may become attractive for exploitation in the future. Rapids can be a sanctuary for crustaceans because strong tidal currents make creeling difficult.
- Rapids may contain species sensitive to water pollution. Although the currents in rapids may quickly disperse one-off sources of pollution, chronic continuing pollution could affect sensitive marine life.

Opportunities

- Consider the role of Coastal Fora and particularly the Minch Project in promoting the awareness of, and disseminating information about, tidal rapids.
- In Scotland, the planning boundary is normally the Mean Low Water of Spring tides, which could include maerl where it occurs in the subtidal fringe. New developments subject to the requirement for planning permission impacting on shorelines where maerl beds are present will be considered by protecting authorities.
- Significant maerl bed/tidal rapids habitats in the Western Isles have been identified and are in the process of being protected as candidate Marine SAC's (e.g. Lochmaddy Marine SAC)

Information sources

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Pers.Comm. Janet Khan, SNH

Broad Habitat **Inshore Sediment**

Priority Habitat **Maerl beds**

Status

Maerl is a collective term for several species of calcified red seaweed. It grows as unattached nodules on the seabed, and can form extensive beds in favourable conditions. Maerl is slow-growing, but over long periods its dead calcareous skeleton can accumulate into deep deposits (an important habitat in its own right), overlain by a thin layer of pink, living maerl.

Maerl beds typically develop where there is some tidal flow, such as in the narrows and rapids of sea lochs, or the straits and sounds between islands. Beds may also develop in more open areas where wave action is sufficient to remove fine sediments, but not strong enough to break the brittle maerl branches. Live maerl has been found at depths of 40 m, but beds are typically much shallower, above 20 m and extending up to the low tide level.

Maerl beds are an important habitat for a wide variety of marine animals and plants which live amongst or are attached to its branches, or burrow in the coarse gravel of dead maerl beneath the top living layer. Maerl beds, because of the wide geographical range over which they occur, have a wide range of associated animals and plants, with species diversity tending to be greater in the south and west. Due to the fragility of maerl, the beds are easily damaged and have probably declined substantially in some areas.

Extent

Maerl beds are found off the southern and western coasts of the British Isles, north to Shetland, but are particularly well developed around the Scottish islands and in sea loch narrows, around Orkney, and in the south in the Fal Estuary. Maerl beds also occur in other western European waters, from the Mediterranean to Scandinavia.

The distributions of the three main maerl bed-forming species in the UK are not entirely clear because of problems with identification in the field. *Phymatolithon calcareum* occurs throughout British waters, while *Lithothamnion glaciale* is a northern species with its southern limits at Lundy in the Bristol Channel and in the North Sea, off Yorkshire. *Lithothamnion corallioides* has caused the most problems with identification, but appears to be a south-western species with Scottish records as yet unconfirmed. Currently, it is known to occur in less than 15 of the ten km squares for the UK as defined by JNCC.

Distribution

Maerl beds occur predominantly on the eastern coast of the Western Isles islands. Coastal features of rocky shoreline and offshore islands are typical locations. Consequently, Maerl beds occur on suitable sites on the east coast of Lewis and Harris from Stornoway to Rodel, North Uist, South Uist, Barra and Vatersay.

Example local sites

Include; Lochmaddy Marine SAC, Loch Seaforth, Loch Erisort, East Loch Tarbert and Barra.

Associated priority/conservation concern list species or other priority habitats

Reference should be made to the habitat action plans produced for saline lagoons and tidal rapids. In particular, attention needs to be drawn to operations that may damage benthic habitats.

UK Action Plan status

Maerl Beds Habitat Action Plan produced

Objectives

1. Maintain extent, variety and quality of maerl beds and associated plant and animal communities in the UK subject to best available information.

No maerl species are specifically listed for protection under the Wildlife and Countryside Act 1981 or the Wildlife (NI) Order 1985. However, maerl is mentioned in the JNCC guidelines for selection of intertidal SSSIs as a component of the tidal rapids part of saline lagoons. The guidelines also list 'tide-swept algae' as a community of at least national importance, which could include maerl on the lower shore.

This happens at a few sites, for instance at Taynish on the shores of Loch Sween, Argyll, where the SSSI boundary (but not the National Nature Reserve boundary) extends to Mean Low Water of Spring tides and includes the rapids, which are of high marine interest. At best SSSI designation can only afford limited protection to a very small proportion of the total maerl habitat.

Other areas with maerl beds are included in the list of 29 Scottish Marine Consultation Areas. Although this is a non-statutory designation used by SNH to denote areas of special marine interest, it is used in planning consultations, particularly over the siting of fish farms.

Threats

- Maerl is of commercial value as a soil conditioner on acidic ground, as an animal food additive, for the filtration of acid drinking water and in pharmaceutical and cosmetic products. An exploratory licence was awarded to a company to remove 20 tonnes of maerl off Barra, but was not subsequently taken up.
- Scallop dredging has been identified as the biggest impact on maerl beds in the Clyde, causing serious decline of both maerl, by breaking and burying the thin layer of living maerl, and the associated species. Other types of mobile fishing gear are also likely to damage the living layer of maerl on top of the bed.
- Heavy anchors and mooring chains could cause considerable damage to maerl beds.
- Maerl communities have been damaged by eutrophication, which has caused smothering of the maerl by excess growth of other seaweeds and increased sedimentation.
- Finfish farms discharge large amounts of nutrients into sea lochs, derived from uneaten food and waste materials. Finfish farms also routinely use chemicals which are specifically toxic to fish lice and other crustaceans and molluscs. When such chemicals disperse in the marine environment there is the possibility that fauna associated with maerl beds may be affected.
- Maerl beds rely on water movement to disperse fine sediment particles, which would otherwise accumulate between the maerl fragments and smother the bed. Any obstruction to the water flow can be expected to have adverse effects on the maerl and its associated fauna and flora. The building of barrages, causeways and bridges are potential blockages to water flow, particularly in sea lochs and between islands.

Opportunities

- In Scotland, the planning boundary is normally the Mean Low Water of Spring tides, which could include maerl where it occurs in the subtidal fringe. New developments subject to the requirement

for planning permission impacting on shorelines where maerl beds are present will be considered by protecting authorities.

- New fish farm sites are subject to normal planning consent. Protecting authorities must be consulted within this process. Where necessary, habitat surveys can be carried out and action implemented to protect from damage caused by eutrophication, toxins or direct physical damage.
- Significant maerl bed habitats in the Western Isles have been identified and are in the process of being protected as candidate Marine SAC's (e.g. Lochmaddy Marine SAC)

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Broad Habitat **Inshore Sediment**

Priority Habitat **Saline lagoons**

Status

Lagoons in the UK are essentially bodies, natural or artificial, of saline water partially separated from the adjacent sea. They retain a proportion of their sea water at low tide and may develop as brackish, full saline or hyper-saline water bodies. The largest lagoon in the UK is in excess of 800 ha (Loch of Stenness) although the rest are much smaller and some may be less than 1 ha. Lagoons can contain a variety of substrata, often soft sediments which in turn may support tasselweeds and stoneworts as well as filamentous green and brown algae. In addition lagoons contain invertebrates rarely found elsewhere. They also provide important habitat for waterfowl, marshland birds and seabirds. The flora and invertebrate fauna present can be divided into three main components: those that are essentially freshwater in origin, those that are marine/brackish species and those that are more specialist lagoonal species. The presence of certain indigenous and specialist plants and animals make this habitat important to the UK's overall biodiversity.

There are several different types of lagoons, ranging from those separated from the adjacent sea by a barrier of sand or shingle ('typical lagoons'), to those arising as ponded waters in depressions on soft sedimentary shores, to those separated by a rocky sill or artificial construction such as a sea wall. Sea water exchange in lagoons occurs through a natural or man-modified channel or by percolation through, or overtopping of, the barrier. The salinity of the systems is determined by various levels of fresh water input from ground or surface waters. The degree of separation and the nature of the material separating the lagoon from the sea are the basis for distinguishing several different physiographic types of lagoon.

Extent

139 sites, covering about 3892 ha have been identified in Scotland. Saline lagoons found in the Western Isles represent a small percentage of this total (<10%), but sites are locally important because of the diverse wildlife populating the habitat.

Distribution

Small numbers of saline lagoons can be found throughout the Western Isles, commonly associated with flat, sandy slopes (although not exclusively).

Example local sites

Saline lagoons can be found at a number of sites, including; Luskentyre (Harris), Lower Barvas, Coll and Gress (Lewis).

Associated priority/conservation concern list species or other priority habitats

A number of species found only, or predominantly, in saline lagoons are listed as priority species under the UK Biodiversity Action Plan. The species considered to be associated with saline lagoons are:

starlet sea anemone *Nematostella vectensis*
Ivell's sea anemone *Edwardsia ivelli*
lagoon sandworm *Armandia cirrhosa*
the hydroid *Clavopsella navis*
lagoon sand shrimp *Gammarus insensibilis*
the lagoon seaslug *Tenellia adspersa*
Baltic stonewort *Chara baltica*
bearded stonewort *Chara canescens*
foxtail stonewort *Lamprothamnium papulosum*
bird's nest stonewort *Tolypella nidifica*

UK Action Plan status

No action plan.

Threats

- The processes which lead to the natural development of some types of lagoons are generally inhibited by human coastal activities. It is probable that the formation of new lagoons will not keep pace with the process of lagoon loss. Current factors affecting this habitat type are listed below.
- The bar-built sedimentary barriers of 'typical' coastal lagoons tend to naturally move landwards with time. Lagoons behind them will eventually be in-filled as bar sediments approach the shore.
- Pollution, in particular nutrient enrichment leading to eutrophication, can have major detrimental effects. This may result from direct inputs to the lagoon or from water supply to the lagoon.

- Artificial control of water (sea and fresh) to lagoons can have profound influences on the habitat.
- Saline lagoons can be seen as candidates for infilling or land claim as part of coastal development.
- Some coastal defence works can prevent the movement of sediments along the shore and lead to a gradual loss of the natural coastal structures within which many coastal lagoons are located.

Opportunities

- Sea level rise may present opportunities for creation of new lagoon habitats where sea water inundates freshwater areas, including sites that were once coastal lagoons.
- Coastal groups are currently preparing shoreline management plans for defined lengths of coast. The production of these plans will require identification of key habitats, including coastal lagoons, and confirmation of their management requirements.
- Certain lagoons in the Western Isles have been identified as SSSI sites, thus offering an opportunity to preserve the habitat, study its management and protect from detrimental management activities.
- Management of surrounding land under ESA and CPS/RSS habitat management prescriptions will prevent habitat damage.
- Environmental impact assessments required before developments or improvements are carried out on surrounding land will offer further protection against detrimental activity.

Information sources

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Broad Habitat **Inshore Sediment**

Priority Habitat **Mud in deep water**

Status

Mud habitats in deep water (circalittoral muds) occur below 20-30 m in many areas of the UK's marine environment, including marine inlets such as sea lochs. The relatively stable conditions associated with deep mud habitats often lead to the establishment of communities of burrowing megafaunal species where bathyal species may occur with coastal species. The burrowing megafaunal species include

burrowing crustaceans such as *Nephrops norvegicus* ('prawns') and *Callinassa subterranea*. The mud habitats in deep water can also support seapen populations and communities with *Amphiura* spp. Burrows and mounds produced by megafauna are prominent features on the surface of plains of fine mud, amongst conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea*. These soft mud communities occur extensively throughout the more sheltered basins of sea lochs and voes. As these sites are typically sheltered from wave action, these communities may occur in quite shallow depths (15 m).

Within deep fjordic sea lochs, 'forests' of the nationally scarce tall seapen *Funiculina quadrangularis* can occur, together with the other two species of seapens. The mud is also extensively burrowed by crustaceans, mainly *N. norvegicus*, and the goby *Lesueurigobius friesii* may be present in burrow entrances.

Areas of soft anoxic mud can have extensive bacterial mats of *Beggiatoa* spp. The anoxia may be the result of natural conditions of poor water exchange in some island sea lochs or of nutrient enrichment under fish farm cages. The associated fauna is usually impoverished but scavenging species such as *Asterias rubens* and *Carcinus maenas* are typically present.

Extent

Mud in deep water is a relatively common habitat found around the shores of England, Scotland, Wales and the Island of Ireland. However, human activity in the form of nutrient discharge from farming and sewage, fishing, fish farming and offshore development such as oil extraction have resulted in damage to a large area of the habitat. Recent mapping and research studies have identified a number of different habitat types in west coast scottish sealochs, Irish sea loughs and around the islands of Shetland and throughout the Hebridean archipelago.

Distribution

Mud habitats in deep water are likely to be relatively common around the island's coastline, occurring in most sealochs.

Example local sites

Notable examples of sites include; Loch Seaforth, Lochmaddy, Loch Erisort and Loch Tamanavay.

Associated Priority/conservation concern list species or other priority habitats

Reference should be made to the action plans for sheltered muddy gravels and serpulid reefs, because of their similar physical conditions. A degree of compatibility will therefore exist in the aims and objectives of these action plans and this should facilitate their implementation.

Two species statements have been written for *Funiculina quadrangularis* (a seapen) and *Styela gelatinosa* (a sea Squirt).

UK Action Plan status

Mud in Deep Water Habitat Action Plan produced

Objective:

Protect a representative range of 8 to 10 sites, illustrating typical mud biotopes in deep water, by 2009.

The JNCC Marine Nature Conservation Review (MNCR) classification for sublittoral mud biotopes is still under development and additional new biotopes are likely to be added which have to be taken into account in the future. The characteristic species in circalittoral mud biotopes are:

1. Seapens - *Virgularia mirabilis* and *Pennatula phosphorea* and burrowing megafauna (CMU.SpMeg). Distribution: Shetland; Scottish west coast sea lochs; Western Isles; Irish Sea including off the Welsh coast; North Sea and southern England.
2. Burrowing urchin *Brissopsis lyrifera* and the brittle star *Amphiura chiajei* (CMU.BriAchi). Distribution: Northern part of Irish Sea; the Clyde and Minch and some Scottish sea lochs (eg Loch Etive).

Currently the three species of seapens and the sea squirt *S. gelatinosa* have no statutory protection under UK or EC legislation. Some deep mud habitats are covered by some of the marine Special Areas of Conservation (SAC) sites, selected for 'Large shallow inlets and bays' under the EC Habitats Directive. However, this Annex I habitat is generally limited to 30 m.

Threats

- The majority of deep mud habitats are subject to some demersal fishing effort, principally for *Nephrops norvegicus*. *Nephrops* is one of most important fisheries in Scotland and benthic trawls or pots/creels are the two methods of fishing employed. The use of benthic trawls can result in the removal of non-target species and disturbance to the seabed. Where heavy demersal fishing occurs, populations of *Brissopsis lyrifera* may be reduced. Potting for prawns and other crustacea selectively removes some of the burrowing megafauna from deep mud areas but the physical impact of the pots on the seabed and non-target species is generally considered to be slight. *Styela gelatinosa* is not known to be associated with *Nephrops* so fisheries by-catch damage to it is not likely to occur.
- Marine fish farms. These are often sited within island sea lochs and may have direct effects on mud communities, including smothering and increasing the Biological Oxygen Demand of the mud. Additional effects may result from the discharges of chemicals, some of which are especially toxic to crustaceans.
- Pollution. Nutrient enrichment leading to eutrophication can have significant detrimental effects. This can lead to changes in the structure and composition of deep mud communities.
- Development. The construction of roads, bridges and barrages may affect the local hydrodynamic and sediment transport regimes of inshore enclosed areas and consequently affect the deep mud substratum.
- Anchoring. This can cause physical damage to static megafaunal species such as seapens and *S. gelatinosa*.
- Offshore oil rigs and other oil installations. These can cause a variety of disturbance effects such as smothering due to disposal of drill cuttings, localised disturbance of sediments due to anchors and rig feet placement and trench digging for pipelines. This may be an issue if development of oilfields off the western Coastline of the Hebrides occurs.

Opportunities

- Considerable research is undertaken by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) of DEFRA and the Fisheries Research Service (FRS) of SEERAD into the effects of fishing gear on benthic habitats and communities. Deep mud communities are being studied as part of the UK National Monitoring Programme.
- A broad variety of research into deep mud communities, seapens and burrowing megafauna is being undertaken by a number of research institutions, principally the University Marine Biological Station Millport, Dunstaffnage Marine Laboratory, Oban and the University of Newcastle (long-term studies).
- New fish farm sites are subject to normal planning consent. Protecting authorities must be consulted within this process. Where necessary, habitat surveys can be carried out and action implemented to protect from damage caused by eutrophication, toxins or direct physical damage.

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Terrestrial and Freshwater habitats

Broad Habitat **Arable and Horticulture**

Priority Habitat **Cereal fields, margins and fallow ground**

Status **Cereal field margins – priority; cereal fields & fallows – local interest**

The cultivation of cereal crops provide a variety of habitats during the normal cycle of both winter and spring sown crops. All cereal crops grown in the Western Isles are spring sown. Valuable nesting, cover and feeding habitats are provided during cultivation (open ground), establishment (light cover), summer growth (late cover), harvest and fallow.

The term "cereal field margin" refers to strips of land lying between cereal crops and the field boundary, and extending for a limited distance into the crop, which are deliberately managed to create conditions which benefit key farmland species. They can take a variety of forms in the UK, the principal types being wildlife strips and conservation headlands.

Extent

Cereals account for 51% of the total area of arable land in Great Britain (defined as total crops plus bare fallow plus grassland less than five years old). The corresponding proportion for Scotland is 44%. Under the ESA scheme crofters who sign up (90% uptake) must cultivate at least 15% of their traditional arable share.

The margins of cereal fields could be managed in ways, which would benefit wildlife, without having serious detrimental effects on the remaining cropped area. Cereal fields and margins as described in this audit could provide nesting and feeding sites for birds. Many species of butterflies, bees/wasps, and plant bugs are associated with such sites. Many polyphagous invertebrates (i. e. feeders on a range of foods) breed in crops, spending the winter in grassy banks and at the interface of crops, nearby water margins and other features. Even excluding soil invertebrates, micro-organisms and transients, some 2000 species of invertebrate are commonly found in cereal fields.

Distribution

Most of the cereal fields and associated margins are situated in traditional machair cropping areas. These are primarily found on the Western coastline of Barra, South Uist, Benbecula, North Uist, Berneray with smaller areas in Harris and Lewis. Further small (locally significant) areas of cereal cropping (mainly oats) are carried out on improved 'blackland' soils in crofting townships.

Machair cropping involves planting cereals rotationally in strips, leaving the land after harvest to remain fallow. Cereal cropping on 'blackland' areas is normally a precursor to re-seeding fields with grass and the cereal crop may be undersown with a new ley.

Example local sites

Communal machair cropped areas on the west coast of Barra, South Uist, Benbecula, North Uist and Berneray. Blackland cereal production can be seen in the Ness, Back and Stornoway areas of Lewis. Many CPS or RSS and all ESA participants in the Western Isles are growing cereal crops under the scheme's 'extensive cropping' prescription.

Associated priority/conservation concern species and other priority habitats

Even more dependent on cereal field margins are the rare arable flowers. Overall, some 300 species of plants can occur in arable fields. Threatened and important bird and plant species found in these fields and margins include Corn Bunting and Corncrake.

UK Action Plan status

Cereal Field Margin Habitat Action Plan produced.

Objective:

1. Maintain, improve and restore by management the biodiversity of some 15,000 ha of cereal field margins on appropriate soil types in the UK by 2010.

See also – Machair Habitat Action Plan (where crops are grown on machair habitat)

Threats

The main factors which have reduced the area and wildlife value of cereal crops in the Western Isles are:

- Intensification of cereal production, including the use of herbicides to ensure a weed free crop.
- The reduction in rotation of cereal crops with other land covers (including grass leys and fallows).
- The geographical retreat of cereal growing from many northern and western areas means that this habitat no longer occurs in large parts of the UK, particularly the Less Favoured Areas (LFAs).
- Grassy field margins are retained by some framers to act as buffers to cereal fields: management is usually minimal.
- Withdrawal of former CCAGS grants for cropping.
- Closure of ESA scheme to new applicants and for existing plans a possible shift over 10 years to a competitive regime under the nationwide RSS.
- Problems of crofting infrastructure – availability of machinery, shortage of skills, cereals perceived as unnecessary in situations of sheep monoculture.
- Grazing pressure from rabbits and or geese, especially on seed crop.
- Availability of suitable seed sources given that the mineral deficient (particularly manganese) but calcium-rich machair soils only allow small oats/rye/ bere barley to thrive.

Opportunities

- Under the current procedures for pesticide registration and review, some compounds have statutory label exemptions preventing their use on the outermost 6 metre wide strips of crops. These restrictions are designed to prevent overspraying of water courses and protect non-cropped habitats.

- Cereal fields and their margins are targeted under specific management options in several environmental and land management schemes including ESAs and the Countryside Premium Scheme/Rural Stewardship Scheme. There is a specific 'arable option' in the Western Isles ESA (for a maximum of only one ha per farm). Cereal field margins are also being managed in some areas, either voluntarily or with Government support, as 'grass wildlife strips' or undersown conservation headlands".
- SNH are piloting the growing of cereal crops under the 'Corncrake Management' initiative in the Barvas and Ness Corncrake SPA.

Information Sources

Biodiversity: The UK Steering Group Report - Volume II: Action Plans (December 1995) Page 235
 SNH, 32-34 Francis Street, Stornoway (Pers. Comm)

Broad Habitat Improved Grassland

Status

Improved grasslands are species-poor, grass dominated swards, often sown for agricultural or recreational use, or created by modification of unimproved grasslands by fertilisers and selective herbicides. They are rye grass *Lolium spp.* and white clover *Trifolium repens* dominated. Grass remains one of the cheapest animal feed stuffs and as farm profit margins have decreased this has resulted in an intensification of grassland management on many farms since 1980. In the past two decades the change from hay to silage has stimulated increased agrochemical use on improved grassland, further degrading their already limited biodiversity. The biodiversity of improved grasslands is low.

Extent

In the past 50 years improved grassland have increased by approximately 90% in area due to the increased intensification of farming. This expansion has been largely at the expense of other habitats of high biodiversity importance, particularly unimproved grasslands, although large areas of moorland and other habitats have also been converted. In recent years the area of improved grassland has remained relatively stable.

Distribution

Improved grasslands occur mainly in crofting townships and throughout the Western Isles in active crofting areas.

Example local sites

There are numerous small sites including; Lower Barvas, Goathill farm -Stornoway & North Dell (Lewis) and Borve in Harris.

Associated priority/conservation concern list species or other priority habitats

Very locally improved grasslands can be of importance for winter feeding waterfowl including internationally important populations of species such as greylag goose, barnacle goose *Branta leucopsis* and widgeon *Anas penelope*. Where machine use is infrequent and stocking densities are low such grassland may retain a range of ground nesting birds such as lapwing *Vanellus vanellus*, Skylark *Alauda arvensis*.

UK Action Plan status

No UK Action plan Produced.

Threats

Target activities which would damage semi-natural habitats, include

- economic development
- recreation and some forms of forest planting
- areas of improved grassland which have no potential for restoration to semi-natural habitat

Opportunities

- A number of conservation management schemes involve compensation to farmers for damage caused by wildfowl grazing on improved grasslands.
- Existing important sites, which include areas of improved grasslands, should be identified and their potential for wildlife assessed.
- Encourage environmentally sensitive farming methods. There are opportunities to encourage best practice for improved grasslands, in particular the integration of conservation management into agricultural practice.

Information Sources

Crofts, A. & Jefferson, R.G. (Eds.) (1994). *The Lowland Grassland Management Handbook*. EN/The Wildlife Trusts Peterborough.

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Broad Habitat **Neutral Grassland**

Priority Habitat **Lowland meadows**

Status

The habitat includes grasslands cut for hay and unimproved neutral pastures where livestock grazing is the main land use. Unimproved neutral grasslands have undergone a significant decline in the 20th century, almost entirely due to changing agricultural practice.

The distribution of lowland meadow in the Western Isles is complicated by the fact that traditional cereal and potato cropping used to be much more extensive and tended, at least on heavier ground, to occupy the best land. Over the years it seems probable that fodder growing has shifted onto this land, in turn

giving former cut fields over the grazing. Some hay meadows, even if 'herb-rich' may therefore have been cropped until recently, while others may be ancient.

These lowland meadows and pastures are associated with low-input nutrient systems, and covers the major forms of neutral grassland which have a specialist group of scarce and declining plant species. Among flowering plants, these include greater butterfly orchid *Platanthera chloranthas*. Meadows do however tend to be extractive ecosystems and the firm division between 'improved' and 'unimproved' established by recent conservation usage fails to recognise the need for occasional nutrient inputs. In the past this may have been provided (unsustainably) by 'paring and burning' of moorland, or, more sustainably, by the folding of stock or the rotation of a maunred potato patch across the cut areas. While the use of particular fields for grazing pasture and hay cropping may changes over time, the characteristic plant community may persist with subtle changes in floristic composition. Additional examples may be found in recreational areas, church-yards, roadside verges and a variety of other localities.

Excluded from this habitat are maritime grassland communities confined to coastal habitats (which will be covered in maritime cliff and machair accounts) and *Molinia - Juncus* pastures (which are covered in the purple moor grass and rush pasture (*Molinia-Juncus*) account).

Extent

Extensive agricultural modification of unimproved grasslands in Scotland occurred primarily between the 1940s and 1970s. The overall outcome of habitat change in the lowland agricultural zone is that *Cynosurus - Centaurea* grassland, is now highly localised, fragmented and in small stands. Scotland is estimated to have between 2000-3000 ha of this community, with particular concentrations in the crofting areas of Lochaber, Skye and the Western Isles.

Recent survey findings reveal that the impact of agricultural improvements have been pervasive, and the extent of species-rich neutral grassland surviving today in the UK is less than 15,000 ha.

Distribution

Lowland meadows largely occur in crofting areas. These crofting areas are located around the coastline of islands. In areas of low levels of traditional crofting activity (e.g. Lewis and Harris) lowland meadows, historically cut for hay are poorly managed and are either abandoned or, more frequently, continuously grazed by sheep.

Example local sites

A significant number of lowland meadows are found in the crofting areas of Lewis, Harris, North Uist, Benbecula, South Uist and Barra.

Associated Priority and Conservation Concern Species

Lowland meadows and pastures are important habitats for skylark *Alauda arvensis* and a number of other farmland birds, notably corncrake *Crex crex* which has experienced a major range contraction across the UK and which has a stronghold in the Western Isles. Their requirements should also be taken into account in the implementation of the plan.

UK Action Plan status

Lowland Meadows Habitat Action Plan produced.

Objectives:

- 1 Arrest the depletion of unimproved lowland hay meadow throughout the UK.
- 2 Within SSSIs and ASSIs, initiate rehabilitation management for all significant stands of unimproved lowland hay meadow in unfavourable condition by 2005, with the aim of achieving favourable status wherever feasible by 2010.
- 3 For stands at other localities, secure favourable condition over 30% of the resource by 2005, and as near to 100% as is practicable by 2015.
- 4 Attempt to re-establish 500 ha of lowland hay meadow of wildlife value at carefully targeted sites by 2010.

See also Machair Habitat Management Plan.

Threats

- The factors currently affecting lowland meadows reduce the quality and decrease the amount of the habitat. Its fragmentation brings increased risk of species extinctions in small remnant areas. Agricultural improvement through, drainage, ploughing, re-seeding, fertiliser treatment, slurry application, conversion to arable and a shift from hay-making to silage production, heavy grazing pressure and changes in stock species and breeds can all lead to floristic impoverishment. Abandonment of land leads to rank over-growth and locally to bracken (*Pteridium aquilinum*) or scrub encroachment. Supplementary stock feeding, associated with increased stocking levels, can lead to enrichment as well as localised poaching. Application of herbicides and other pesticides can alter species composition, killing out broadleaved species and floristic impoverishment due to heavy grazing pressure and changes in stock species and breeds.
- Agricultural intensification has led to the extensive development of nutrient-demanding, productive *Lolium perenne* grasslands. These are managed for grazing and also silage production, which has widely replaced traditional hay-making. Where fertiliser input is reduced or in swards that have only been partially improved, *Lolium - Cynosurus* grassland is common; in many respects this is intermediate between improved and unimproved lowland neutral grasslands but has few uncommon species and is generally of low botanical value.

Opportunities

- In the Western Isles it is still possible that the long-term future of lowland meadows is as part of viable livestock systems. For this to happen support payments and other regulations need to recognise their functional role and the long-term strategies needed, even under traditional agriculture, to maintain these functions, particularly the maintenance of an appropriate nutrient status. The priority therefore is to firstly preserve what remains and, in short order, reinstate these meadows at the centre of crofting agriculture.
- There is also a need for habitat restoration and expansion, particularly in areas where year-round grazing now occurs. In many of these seed banks and even rosettes of herb species may allow a rapid return to the previous floristic diversity. While there is the Machair ESA, CPS and RSS, there is limited uptake on the Western Isles of creation and management of species rich grassland. Several studies currently in progress are investigating possibilities for establishing species-rich grasslands by cessation of nutrient inputs, seeding and turfing with wild species and arable reversion. The role of direct seeding using wild species in habitat restoration and expansion requires further assessment; guidelines for selecting seed sources of local provenance need to be agreed.

- There is a lack of information on the invertebrates associated with restored lowland meadows. It would be valuable to look at the colonisation of these grasslands by invertebrates, and the stability and resilience of these communities in the longer term.
- Appropriate forms and levels of low-input nutrient application, the relative importance of different types and breeds of livestock (sheep in particular), desirable hydrological regimes in wet grasslands, and the timing of hay cutting need to be determined.
- The LFASS encourages farmers and crofters to redress the balance of cattle and sheep within LFAs. Training courses are available to farmers and crofters to help them encourage biodiversity and implement management through agri-environment schemes.
- Opportunities exist to integrate crofting with conservation management and demonstrations of such integration assist in promoting “good practice”.

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Broad Habitat **Dwarf Shrub Heath**

Priority Habitat **Upland heathland**

Status

Upland heath is typically dominated by a range of dwarf shrubs such as heather *Calluna vulgaris*, blaeberry *Vaccinium myrtillus*, crowberry *Empetrum nigrum*, bell heather *Erica cinerea*. Wet heath is most commonly found in the Western Isles. In 'favourable conditions' it is dominated by mixtures of cross-leaved heath *Erica tetralix*, deer grass *Trichophorum cespitosum*, heather and purple moor-grass *Molinia caerulea*, over an understorey of mosses often including carpets of *Sphagnum* species. This habitat is distinct from blanket bog which occurs on deeper peat and which usually contains frequent occurrence of hare's-tail cotton-grass *Eriophorum vaginatum* and characteristic mosses. High quality heaths are generally structurally diverse, containing stands of vegetation with heather at different stages of growth. Upland heath in 'favourable condition' also usually includes areas of mature heather.

Extent

This habitat type is present on an estimated 1,700,000 and 2,500,000 ha in Scotland. Dwarf shrub heaths are recognised as being of international importance because they are largely confined within Europe to the British Isles and the western seaboard of mainland Europe.

Distribution

Distribution of these communities is influenced by climate, altitude, aspect, slope, maritime influences and management practices, including grazing and burning. Heathland vegetation occurs widely on mineral soils and thin peats (<0.5 m deep) throughout Western Isles. It is characterised by the presence of dwarf shrubs at a cover of at least 25%. Blanket bog vegetation may also contain substantial amounts of dwarf shrubs, but is distinguished from heathland by its occurrence on deep peat (>0.5 m). It descends to near sea-level in the Western Isles. It forms mosaics with other habitats such as blanket bog and other mires, grassland, bracken, scrub, trees and woodland, freshwater and rock habitats frequently form intimate mosaics with heathland vegetation in upland situations.

Example local Sites

This habitat is common in the Western Isles, with sites including the majority of the designated SAC/SPA of the Lewis Peatlands. Other Island groups with example sites, include the central – eastern landmass of Harris, North Uist, Benbecula, South Uist and Barra.

Associated priority/conservation concern species or priority habitats

An important assemblage of birds is associated with upland heath, including red grouse *Lagopus lagopus*, merlin *Falco columbarius* and hen harrier *Circus cyaneus*. Some forms of heath also have a significant lower plant interest, including assemblages of rare and local mosses and liverworts that are particularly associated with the wetter western heaths. The invertebrate fauna is especially diverse. Priority species identified as part of the Biodiversity Action Plan programme that occur on the Western Isles currently include a crane fly *Tipula (Savtshenkia) serrulifera*. Their requirements should also be taken into account in the preparation of any action plan.

In the Western Isles, this habitat is commonly associated with *blanket bog*.

UK Action Plan Status

No Habitat Action Plan.

Threats

- There have been considerable losses of heather moorland in recent times. An estimated 18% was lost in Scotland between the 1940s and 1970s and the trend continued throughout the 1980s with a further estimated loss of 5%. Much of this loss is attributed to agricultural land improvements, heavy grazing by sheep (and, in certain areas, red deer), and afforestation. Many upland heaths suffer from overgrazing and damaging burning regimes. Some of the problems caused by these management practices are described below. Although conversion of heathland to acid grassland is not a purely recent phenomenon and have become less significant over the past ten years, they have reduced the interest of wet heath.
- As well as direct loss of habitat, many areas of upland heathland are characterised by limited structural diversity with few natural transitions from open heathland into scrub and woodland. Undergrazing occurs but is generally only of local significance. Agriculture is the dominant land use in the Western Isles. There is likely to be further significant loss of heather moorland to acid grassland if current grazing levels and pressures continue
- High stocking levels of sheep and red deer *Cervus elaphus* are a problem in parts of the Western Isles. Inappropriate methods of supplementary feeding and the absence or minimal use of

shepherding also contribute to the problem of overgrazing. Heavy grazing can prevent regeneration of native woodland and scrub, which enhance biodiversity value. Difficulties in negotiating agreements with Common Grazings are preventing take-up of agri-environment schemes.

- Poorly managed muirburn (ie large-scale and too frequent in operation) reduces the habitat quality of upland heath by causing a simplification of structure, loss of lower plant assemblages and erosion of peat. Encroachment by bracken can lead to a loss of biodiversity; this is a significant problem in some upland areas. The date and conditions under which heather can be burned are defined by law. Codes of good practice are published by the SEERAD. The burning regulations restrict the burning of heather and associated vegetation to specific times of the year.
- Afforestation (mainly by non-native conifers) leads to direct loss of dwarf-shrub habitat, although temporary and permanent areas of heathland are now being created within some existing forests by restructuring after the first rotation. Quarries, windfarms, communication masts, access tracks and certain other planning developments can impact directly on wildlife interest. Acidification, tropospheric ozone and nitrogen enrichment caused by atmospheric deposition can lead to vegetation changes including a reduction in the lichen and bryophyte interest. Nitrogen deposition can increase the likelihood of insect defoliation of upland heathland.
- The interaction of two or more of the factors listed above often greatly increases the overall impact on upland heathland vegetation. For example, poorly managed burning followed by heavy grazing will result in the loss of dwarf shrubs more rapidly than would either factor in isolation. It is possible that grazing pressures interact with pollution to influence vegetation change.
- Climate change could potentially lead to changes in vegetation composition and structure. The future position is still unclear. Localised damage and threats from other forms of land use such as military use and recreation, are of minor concern.

Opportunities

- The emphasis is on reducing fragmentation and creating and maintaining blocks of upland heathland greater than 10 km². SNH are currently preparing management plans for SACs and SSSIs, and many upland heath SSSIs receive beneficial management through management agreements. For example, the Peatland Management Scheme. SNH promote the uptake of positive management with owners and occupiers of SSSIs through their Natural Care Strategy.
- Agri-environment and other schemes have been established with the objective of protecting and improving heather moorland habitats through encouraging lower stocking levels and more appropriate management practices by compensating farmers and crofters for reducing stock numbers and following appropriate management.
- The LFASS encourages farmers and crofters to redress the balance of cattle and sheep within LFAs.
- Opportunities exist to integrate crofting with conservation management and demonstrations of such integration assist in promoting “good practice”.
- Training courses available to farmers and crofters to help them encourage biodiversity and implement management through agri-environment schemes need to be promoted and funded.

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Broad Habitat **Fen, Marsh and Swamp**

Priority Habitat **Fens**

Status

Fens are peatlands which receive water and nutrients from the soil, rock and ground water as well as from rainfall: they are minerotrophic. Two types of fen can broadly be distinguished: topogenous and soligenous. Topogenous fens are those where water movements in the peat or soil are generally vertical. They include basin fens and floodplain fen. Soligenous fens, where water movements are predominantly lateral, include mires associated with springs, rills and flushes in the uplands, valley mires, springs and flushes in the lowlands, trackways and ladder fens in blanket bogs and laggs of raised bogs. Fens can also be described as `poor-fens` or `rich-fens`. Poor-fens, where the water is derived from base-poor rock such as sandstones and granites occur mainly in the uplands, or are associated with lowland heaths. They are characterised by short vegetation with a high proportion of bog mosses *Sphagnum* spp. and acid water (pH of 5 or less). Rich-fens, are fed by mineral-enriched calcareous waters (pH 5 or more) and are mainly confined to the lowlands and where there are localised occurrences of base-rich rocks such as limestone in the uplands. Fen habitats support a diversity of plant and animal communities.

Extent

The UK is thought to host a large proportion of the fen surviving in the EU. As in other parts of Europe fen vegetation has declined dramatically in the past century.

Distribution

Fens are widely distributed in the Western Isles and are commonly located on the periphery of the large area of upland heath and blanket bog which dominates the central and easterly coasts of the Islands and in particular are found on the landward sides of machair habitats. Although areas of true fen are small in size, they have particular importance as local habitats. Most fens in the Western Isles are Topogenous.

Example local sites

True fens can be found at various locations around the peripheral areas of the Lewis Peatlands SAC.

Associated priority/conservation concern list species or other priority habitats.

Blanket bogs, upland heath and machair are associated with fens.

UK Action Plan Status

Fen Habitat Action Plan Produced

Objectives:

1. Identify priority fen sites in critical need of, and initiate, rehabilitation by the year 2005. All rich fen and other sites with rare communities should be considered.
2. Ensure appropriate water quality and water quantity for the continued existence of all SSSI/ASSI fens by 2005.

Threats

- Fens are dynamic semi-natural systems and in general, management is needed to maintain open-fen communities and their associated species richness. Without appropriate management (e.g. mowing, grazing, burning, peat cutting, scrub clearance), natural succession could lead to scrub and woodland forming. However, given the climatic conditions and vegetational history of the Western Isles, progress towards a scrub-dominated habitat is slow or non-existent in many fens. Current factors affecting this habitat type are:
- Past loss of area by drainage and conversion to intensive agriculture.
- Small total area of habitat and critically small population sizes of several key species dependent on the habitat.
- Lack of or inappropriate management of existing fens leading to drying and scrub encroachment.
- Valley fens are particularly susceptible to agricultural run-off and afforestation within the catchment.
- Enrichment or hypertrophication resulting in changing plant communities.

Opportunities

- Fens have been identified as a locally significant habitat in the RSS interim local priority species list for the Western Isles. This rewards the management of fens identified in the conservation audit with extra ranking points.
- The SNH funded Lewis Peatlands Scheme protects habitats such as fens, by inviting land managers to enter agreement restricting and reinstating peat workings and avoiding damage to habitats by crossing with ATV and tractors.
- An environmental impact assessment must now be carried out before any agricultural 'Improvement' or any development is carried out on unimproved land.

- Statutory conservation agency staff provide advice to a range of fen owners on appropriate management, rehabilitation, extension and creation.

Information sources

Biodiversity: The UK Steering Group Report - Volume II: Action Plans (December 1995)_Page 241

Broad Habitat **Fen, Marsh and Swamp**

Priority Habitat **Reedbeds**

Status

Reedbeds are wetlands dominated by stands of the common reed *Phragmites australis*, wherein the water table is at or above ground level for most of the year. They tend to incorporate areas of open water and ditches, and small areas of wet grassland and carr woodland may be associated with them. Reedbeds are amongst the most important habitats for birds in the UK. They are used as roost sites for several raptor species in winter.

Extent

There are about 5000 ha of reedbeds in the UK, but of the 900 or so sites contributing to this total, only about 50 are greater than 20 ha, and these make a large contribution to the total area.

Distribution

Reedbeds are widely dispersed in the Western Isles, commonly associated with river estuaries in flat areas or in marginal machair areas. Typically, reedbeds in the Western Isles are small and distributed on both the north east and western coasts of Lewis, the west coast of south Harris and the western coastline of the Uists and Barra.

Example local Sites

Coll, Gress and Reef in Lewis, Borve and Northton in Harris.

Associated priority/conservation concern list species and other priority habitats

Reed bunting is closely associated with reedbed habitats.

UK action plan status

Reedbed Habitat Action Plan produced

Objectives:

1. Identify and rehabilitate by the year 2000 the priority areas of existing reedbed (targeting those of 2ha or more) and maintain this thereafter by active management.

2. This target should provide habitat for 40 pairs of bitterns and provide optimum conditions for other reedbed species.
3. Create 1,200 ha of new reedbed on land of low nature conservation interest by 2010.
4. The creation of new reedbed should be in blocks of at least 20 ha with priority for creation in areas near to existing habitat, and linking to this wherever possible. The target should provide habitat for an estimated 60 breeding pairs of bitterns boosting numbers to previous levels.

Threats

- Loss of area by excessive water extraction and, in the past, land drainage and conversion to intensive agriculture.
- Lack of or inappropriate management of existing reedbeds leading to drying, scrub encroachment and succession to woodland. Pollution of freshwater supplies to the reedbed: siltation may lead to drying; toxic chemicals may lead to loss of fish and amphibian prey for key species; accumulation of poisons in the food chain and eutrophication may cause reed death.

Opportunities

- Identify and rehabilitate the priority areas of existing reedbed and maintain this by active management through promotion of agri-environment schemes or by providing the most recently available advice.
- Encourage expansion or recreation of reedbeds eg as a preferred condition of after-use for mineral extraction sites.
- Encourage the development of water level management policies and appropriate coastal zone management plans to protect existing reedbeds.
- Ensure that development schemes do not affect the integrity or the conservation interest of reedbeds.
- Encourage creating new reedbeds for effluent treatment and other primary purposes receive up-to-date advice on reedbed creation for wildlife.
- Initiate training courses and establish demonstrations for land managers and countryside land management advisors on techniques of reedbed creation and management.

Information Sources

Biodiversity: The UK Steering Group Report - Volume II: Action Plans (December 1995) Page 230

Broad Habitat **Bogs**

Priority Habitat **Blanket bog**

Status

Blanket bog is a globally restricted peatland habitat confined to cool, wet, typically oceanic climates. It is, however, one of the most extensive semi-natural habitats in the UK and ranges from Devon in the south to Shetland in the north. Peat depth is also very variable and there is no agreed minimum depth of peat which can support blanket bog vegetation. It includes the EC Habitats Directive priority habitat 'active' blanket bog, the definition of active being given as 'still supporting a significant area of vegetation that is normally peat forming'.

The period over which blanket peat has been accumulating and the depth it can attain are very variable and not necessarily related. Studies indicate that most blanket peat development began 5000-6000 years ago, but the range extends from 9000 - 1500 years ago. There is evidence to suggest that some areas of blanket bog began to form following clearance of the original forest cover by early man, but the relative significance of this activity and changing climate on the historical and contemporary extent of the resource has yet to be determined.

The principal vegetation (NVC) types covered by this plan are M1, M2, M3, M15, M17, M18, M19, M20 and M25, together with their intermediates. Other communities, such as flush, fen and swamp types, also form an integral part of the blanket bog landscape.

This audit entry encompasses all areas of blanket bog supporting semi-natural blanket bog vegetation, whether or not it may be defined as 'active'. It excludes areas which no longer support such vegetation, except where the restoration of such areas is necessary for the protection and/or enhancement of adjacent bog.

The presence, extent and type of surface patterning is another important feature of blanket bogs. In general, the intensity and complexity of patterning increases towards the north and west. The range of erosion features associated with many areas of blanket bog is another aspect of this structural diversity and an as yet unknown extent of this appears to be natural in origin.

The extensive nature of blanket bog is such that certain other habitats, although distinctive, are probably most appropriately considered as integral components of the wider blanket bog assemblage of habitats for management purposes. This would include some areas classed as 'intermediate bog' (ie sharing features of both raised and blanket bog) together with examples of spring, flush and poor fen, a range of oligotrophic water bodies whose catchment is largely or entirely blanket bog, and those relatively small areas of heath and grassland which occur on better drained slopes and by the many streams and rivers which drain areas dominated by blanket bog. Not only are all such areas in hydrological connection with the surrounding peat mass, they frequently contribute to the overall habitat requirements of the peatland fauna. Several of these habitats are also the subject of their own habitat action plans.

Extent

The total extent of blanket peat in the UK amounts to just under 1.5 million ha. There is no agreed figure for the extent of blanket bog vegetation, but Scotland approximately 1,060,000 ha. Significant proportions of peat soil, probably in excess of 10%, no longer support blanket bog vegetation.

Distribution

In the Western Isles, blanket bog dominates large parts of inland Lewis, along with parts of Harris and North Uist. Elsewhere it forms part of the mosaic of upland habitats on the east side of the Uists and on Barra.

Example local sites

The most significant sites for blanket bog in the Western Isles Lewis as covered by the Lewis Peatland SAC and SPA and Mointeach Scadabhaigh SAC/SPA

Associated priority/conservation concern list species and other priority habitats

Blanket bogs support a very wide range of terrestrial and aquatic vertebrates and invertebrates. As with plant species, some of these are widespread and common, some are much more local, and quite a number are of international interest for either their rarity or for the densities of their breeding populations on blanket bogs, for example red-throated diver *Gavia stellata* and Eurasian golden plover *Pluvialis apricaria*. Studies of the invertebrate fauna of blanket bogs are extremely patchy and merit collation and synthesis. Blanket bogs also fulfil an important role as repositories of archaeological and palaeoecological material and have functional values as agricultural rough grazing, sporting estate and water catchments. In the context of climate change the role of blanket bogs as a carbon store is also now considered significant.

Blanket bogs are an important habitat for a wide range of species, as indicated above. However, none of the priority species listed under the Biodiversity Action Plan are principally associated with this habitat type. Other examples include the common scoter *Melanitta nigra* and Baltic bog-moss *Sphagnum balticum*, also occur and their requirements should be taken into account during the implementation of any action plan.

UK Action Plan status

Blanket Bog Habitat Action Plan produced.

Objectives:

1. Maintain the current extent and overall distribution of blanket mire currently in favourable condition.
2. Improve the condition of those areas of blanket mire which are degraded but readily restored, so that the total area in, or approaching, favourable condition by 2005 is 340,000 ha (ie around 30% of the total extent of restorable blanket mire).
3. Introduce management regimes to improve to, and subsequently maintain in, favourable condition a further 280,000 ha of degraded blanket mire by 2010.
4. Introduce management regimes to improve the condition of a further 225,000 ha of degraded blanket mire by 2015, resulting in a total of 845,000 ha (ie around 75% of the total extent of restorable blanket mire) in, or approaching, favourable condition.

Threats

- Studies in Scotland (where most of the resource lies and where it accounts for some 13% of the land area) suggest a 21% reduction in the extent of blanket mire between the 1940s and the 1980s. The greatest single cause of this reduction (51%) is afforestation. Further losses of extent and condition can be attributed to drainage and heavy grazing and peat cutting. Atmospheric pollution, which has resulted in significant habitat change in, for example, mid and south Wales and the Pennines, is not a major problem in the Western Isles. The potential threat from climate change could over-ride many of the following factors. However, it is precisely because of the unknown effects climate change could have that it is important that as much of the resource as possible, representing its full biogeographical extent, is brought into, or maintained at, favourable condition.
- Drainage - extensive tracts of blanket bog have been drained in the past in attempts to improve the quality of the grazing. New drains continue to be dug and old drains cleaned in some areas. Even without maintenance most drains continue to lower the adjacent water table and some initiate erosion.
- Heavy grazing (by sheep, red deer, cattle and horses) - especially if accompanied by supplementary feeding, burning, fencing and drainage, has a significant impact on vegetation. This is a particular concern on common grazings.

- Burning - agricultural and sporting management both involve the use of fire to modify moorland vegetation for the benefit of livestock, grouse and deer in particular. Poorly managed and/or accidental fires can be particularly damaging to blanket bog.
- Forestry - although new planting may be relatively small scale, some existing plantations are having an impact on the hydrology and species composition of adjacent areas of blanket bog, notably as the trees mature. Aerial application of fertilisers and pesticides can also result in drift on to adjacent bog.
- Peat extraction - commercial extraction, though relatively limited in extent (some 2000 ha in Scotland), can have important local effects. Domestic cutting, most of which occurs on common land, is locally extensive (some 50,000 ha in Scotland) and, particularly where mechanical methods are employed, can have a significant impact, especially where the distinction between commercial and domestic activity can be difficult to determine.
- Agricultural improvement - drainage, fertiliser application and conversion to pasture has occurred frequently in the past and can be of local significance.
- The increased use of all-terrain vehicles for recreational, agricultural and sporting activities can also result in local erosion.
- Planning developments - wind farms and communication masts, together with their associated infrastructure, are increasingly being proposed on areas of blanket bog, especially those at high altitude. There are also threats from hydro-electric schemes in Scotland.

Opportunities

- Extensive areas of blanket mire are given legal protection by being designated as SSSIs. Precise UK-wide data on the extent protected are lacking because on many sites blanket mire is part of the general upland interest, rather than being a specific interest in its own right. Extensive areas of Lewis have been designated as Special Areas of Conservation (SACs) under the EC Habitats Directive. In addition, some are either proposed or already designated as Ramsar sites and some as Special Protection Areas (SPAs) under the EC Birds Directive.
- Many areas of blanket mire are common grazings with associated peat cutting and grazing rights. Any proposals for changes in management must recognise and address the implications of this form of legal tenure.
- Proposals to bring blanket bog into intensive agricultural management will require an assessment under the Environmental Impact Assessment Directive.
- SNH is also currently undertaking an assessment of the resource in Scotland (Scottish Blanket Bog Inventory - SBBI) using satellite imagery to extrapolate from ground-referenced sample plots.
- The statutory conservation agencies, as part of their commitment under the UK Biodiversity Action Plan, are preparing management plans for those sites designated as SSSIs, or proposed as SACs and SPAs. Plans should be completed by 2004.
- The Forestry Commission has prepared a policy Guideline Note (in press) on forestry and bogs. It describes the criteria which FC will use in considering whether to support either the planting of trees on blanket bog or restoration of the habitat
- SNH operates a Peatland Management Scheme in the Lewis and North Uist SACs to encourage sympathetic land management. Blanket bogs fall within the Moorland Management option of the RSS.

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Broad Habitat **Standing Open Water and Canals**

Priority Habitat **Mesotrophic lochs**

Status

Mesotrophic lochs are those in the middle of the trophic range between eutrophic (nutrient rich) and oligotrophic (nutrient poor). They are characterised by having a narrow range of nutrients, the main indicators being inorganic nitrogen (N) and total phosphorus (P) and are sensitive to artificially increased levels of nitrogen and phosphorus. Thus, this is an increasingly rare type of loch.

Mesotrophic lochs potentially have the highest macrophyte diversity of any loch type. Relative to other freshwater bodies, they contain a higher proportion of nationally scarce and rare aquatic plants. Macroinvertebrates are well represented, with particularly important groups being dragonflies, water beetles, stoneflies and mayflies.

In general, fish communities in mesotrophic lochs are a mix of coarse and salmonid species, but today there are fewer truly natural assemblages due to introduced species.

Extent

They are relatively infrequent in the UK and largely confined to the margins of upland areas in the north and west.

Distribution

Small mesotrophic lochs occur throughout the Western Isles associated with marginal inbye/moorland land.

Example local Sites

A good example can be seen at Garry Beach SSSI near North Tolsta in Lewis. Sites can also be seen throughout the North and South Uist, in machair and marginal machair areas.

Associated priority/conservation concern list species or priority habitats

European Otter (*Lutra lutra*), Red throated diver (*Gavia stellata*), Black throated diver (*Gavia artica*), Pillwort (*Pilularia globulifera*)

UK Action Plan status

Mesotrophic Lakes Action Plan produced.

Objectives:

1. Maintain the characteristic plant and animal communities of current mesotrophic lakes.
2. Identify and implement effective remedial action to address nutrient-enrichment in polluted mesotrophic lakes by 2010.

Threats

- Pollution by excessive nutrient input (enrichment leading to eutrophication) is the main impact. Man made nutrient inputs can include: sewage effluent, point and diffuse sources associated with agriculture and forestry;
- accidental spillages (eg fertiliser, silage, slurry) and fish farms.
- Ploughing up grassland and surrounding habitats and drainage increase the possibility of soil erosion with a consequent increase in water-borne sediments. Settled sediments may continue to introduce nutrients into the water. Ploughing associated with afforestation can have a similar effect, as can peat-cutting on moorland catchments.
- Introductions of fish can alter the natural integrity of mesotrophic lochs in various ways:
 1. through competition, altering the native species composition
 2. if bottom-feeding fish are involved, through continual disturbance of the sediments, leading to turbidity
 3. and the mobilisation of nutrients (favouring algal blooms) through altering the structure of the food web, for example leading to increased predation of the invertebrates that graze algae.
- Excessive water abstraction can lead to a reduction in the quantity of water reaching the loch which may affect the time the water is in the loch and increase the time available for nutrient uptake by aquatic macrophytes and algae. This enhances plant production, which is the primary symptom of eutrophication.
- Industrial pollution is of minimal concern on the Western Isles. Pesticide losses however can be locally damaging. Water acidification is also a factor in some upland catchments. Recreation is currently of minor concern on the Western Isles.

Opportunities

- The scope of agri-environment schemes to target mesotrophic lochs is limited, however promoting the use of buffer zones as necessary can assist with minimising diffuse pollution on adjacent land.

- Forestry policy must take full account of the sensitivity of mesotrophic lakes to nutrient enrichment and water acidification. Under Natural Care long-term management agreements can be established to protect mesotrophic SSSI's/SPA's/SAC's.
- The use of best practice management techniques and, where appropriate restoration measures.
- Fisheries management policy for SSSI mesotrophic lochs affected by fisheries related impacts must be assessed and revised.

Information Sources

Biodiversity: The UK Steering Group Report - Volume II: Action Plans (December 1995) Page 265
 SEPA *Mesotrophic Lakes - their conservation in the UK* (1999)

Broad Habitat **Standing Open Water and Canals**

Priority Habitat **Eutrophic standing waters**

Status

Eutrophic standing waters are highly productive because plant nutrients are plentiful, either naturally or as a result of artificial enrichment. Their beds are covered by dark anaerobic mud, rich in organic matter. Many lowland water bodies in the UK are heavily polluted. Small pools, field ponds and brackish waters, enriched by human activity, are not considered here.

In their natural state eutrophic waters have high biodiversity. Planktonic algae and zooplankton are abundant, submerged vegetation is diverse and numerous species of invertebrate and fish are present. Plant assemblages differ but fennel-leaved pondweed *Potamogeton pectinatus* and spiked water-milfoil *Myriophyllum spicatum* are characteristic throughout the UK. Common floating-leaved plants include yellow water lily *Nuphar lutea* and there is often a marginal fringe of reedswamp, which is an important component of the aquatic ecosystems.

Bottom-dwelling invertebrates such as snails, dragonflies and water beetles are abundant. Coarse fish such as brown trout are typical of eutrophic standing waters, but salmonids also occur naturally in some. Amphibians (although there are very few native species) are often present and the abundance of food can support internationally important waterfowl populations such as wigeon *Anas penelope*, gadwall *Anas strepera* and shoveler *Anas clypeata*.

Extent

The total area of still inland water is estimated as 1604 km² in Scotland, approximately 15% of which is eutrophic. The total UK area for eutrophic standing waters is likely to be around 1785 km².

Distribution

Eutrophic standing waters are found in the intensively used agricultural land (crofting use) and on the machair habitat. Due to the fact that crofting agriculture involves low intensity management systems, the majority of eutrophic standing waters are found associated with machair systems.

Example local Sites

Small areas of eutrophic standing water can occur anywhere intensive crofting activity is carried out, but the majority of naturally occurring examples are found on the cultivated machair zones of North Uist, South Uist and Benbecula.

Priority and Conservation Concern Species Associated with the Site.

Eutrophic standing waters is an important habitat for a number of priority species. They include convergent stonewort *Chara connivens* and starry stonewort *Nitellopsis obtusa*.

In the Western Isles there is a close link with the *machair* habitat (naturally occurring) and *improved grasslands* (artificially induced through farming practice)

UK Action Plan status

Eutrophic Standing Water Habitat Action Plan Produced

Objectives:

1. It is proposed that eutrophic water bodies in the UK should be classified into three tiers distinguished on the grounds of naturalness, biodiversity and restoration potential. The exact criteria for these categories have yet to be agreed and the total number of sites falling into each Tier confirmed.
2. Ensure the protection and continuation of favourable condition of all `Tier 1` eutrophic standing waters.
3. By 2005 take action to restore to favourable condition (typical plant and animal communities present) `Tier 2` eutrophic standing waters that have been damaged by human activity.
4. Ensure that no further deterioration occurs in the water quality and wildlife of the remaining `Tier 3` eutrophic standing water resource.

Threats

- Some lochs are relatively resistant to change whereas others are more sensitive. Periodic `blooms` of blue green algae, which may be natural phenomena, are documented. In water bodies that are heavily enriched as a result of human activity, biodiversity is depressed because planktonic and filamentous algae (blanket-weed) increase rapidly at the expense of other aquatic organisms. Sensitive organisms, such as many of the pondweed *Potamogeton* and stonewort *Chara* species, then disappear and water bodies may reach a relatively stable but biologically impoverished state.
- Pollutants find their way into these waters from point and diffuse sources. Organic and inorganic fertilisers and nitrogen-rich gases cause nutrient enrichment (eutrophication) of the water, with consequent damage to plant and animal communities. Diffuse-source pollution generally exceeds that from point-sources.
- Changes in land cover can release nutrients from the soil causing enrichment. The long-term effect of such land-use changes is an increase in the risk of pollution and siltation, which can smother fish spawning sites and damage aquatic vegetation. These problems are exacerbated by the removal of waterside vegetation and reedswamp, which are effective barriers to particulate matter and act as sinks for nutrients.
- Water abstraction can depress water levels and increase water retention time and reduced flushing rate. This may exacerbate nutrient enrichment, cause deterioration of marginal vegetation through drawdown and cause shallow lakes to dry out. A reduction in the throughput of fresh water could increase the salinity of a coastal water body.
- The introduction of fish, the removal of predators, and the manipulation of existing fish stocks for recreational fishing leads to the loss of natural fish populations and may affect plant and invertebrate communities.

- Recreation and sport can create disturbance that affects bird populations. Marginal vegetation may suffer from trampling and the action of boats and propellers destroys aquatic plants and stirs up sediment, contributing to enrichment and encouraging the growth of algae. The construction of leisure facilities may destroy valuable habitat and can lead to increased pollution.
- Release of non-native plants and animals can be very damaging.
- A potential threat that may over-ride all the others is climate change. A substantial change in water supply and throughput would alter the character of water bodies and a rise in temperature would produce wide-ranging effects such as acceleration of plant growth.

Opportunities

- Restoration to favourable condition (typical plant and animal communities present) eutrophic standing waters that have been damaged by human activity through minimising diffuse pollution inputs.
- An increasing number of Farm Waste Management Plans in catchments of vulnerable eutrophic standing waters through appropriate risk assessments and appropriate use of nutrients, could help prevent nutrient leaching from agricultural sources.
- Continuation of existing Environmentally Sensitive Areas (ESA) schemes including measures designed to benefit water courses and other water features at ESA reviews
- Uptake of other agri-environment measures included in the Rural Stewardship Scheme such as water margin management that benefit eutrophic standing waters.
- Water companies also have statutory duties towards nature conservation and whilst there are tight legislative controls over point source pollution, contamination from diffuse sources is much more difficult to regulate.

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Broad Habitat **Montane subalpine/alpine**
Status

This type includes montane heath and snow bed communities which are dominated by stiff sedge and dwarf forb communities of alpine lady's mantle, moss campion and saxifrage species. It also includes moss and lichen dominated heaths of mountain summits. It does not include montane dwarf shrub heaths, flushes, grasslands, and rock and scree communities that straddle the notional boundary of the former treeline with little change in floristics and these should be treated as components of other broad habitat types.

Extent

High hills and mountain regions of Scotland.

Distribution

Montane habitats feature along the upland spine of hills which run along the eastern edge of the Uists and make up large upland areas of south Lewis, west Harris central and southern Harris and central Barra.

Example local sites

High hills of North Harris, including Clisham, Mealisival (Uig in Lewis), the summits of Hecla, Beinn Mhor and Stulaval in South Uist and North Lee and Eaval in North Uist.

Associated priority/conservation concern list species or priority habitats

Bird species including Golden Eagle and Merlin forage and nest in this habitat. Lower montane margins are shared with upland heathland habitat.

UK Action Plan status

No Action Plan, but broad habitat description exists.

Threats

- Some glens running up to montane habitats are potentially suitable for forestry. Forestry presents a threat to the montane habitat from the introduction of alien species and monoculture, causing irreversible damage to the montane habitat.
- Poorly managed muirburn can damage fragile vegetation in montane habitats.
- Increases in sheep numbers driven by attractive headage payments can lead to overgrazing of local or wider plant communities. Payments are slowly moving away from a headage basis to an area basis tied to stocking densities and this trend is not significant at the moment. Sheep also cause erosion to scree, rocky ledges and slopes while looking for shelter and grazing.
- Development including the installation of pathways, routing of services, erection of communication masts can all impact on local plant communities and impair the landscape characteristics of montane habitats.

Opportunities

- The introduction of Environmental Impact Assessments will protect (unimproved) montane habitat.

- Management under CPS/RSS prescriptions designed to protect habitats from poor muirburn technique and overgrazing.
- Designation of sites, such as the North Harris Hills SSSI.

Information Sources

UK Biodiversity Group Tranche 2 Action Plans - Volume II: Terrestrial and freshwater habitats (December 1998)

Local Habitats

Short Accounts

Built up Areas and Gardens

The wide range of habitats, including patchwork short grassland, rank grassland, bare and cultivated ground, small scale garden cropping and trees & shrubs in a small physical area, are attractive to species not seen elsewhere in the Western Isles. In particular, the food supply, association with human activity, shelter and proximity to the Lews Castle Grounds Woodland in the case of Stornoway are attractive to bird species. Although the habitat is common on the mainland, the low number of built up areas in the Western Isles make them an important habitat in a local context.

This habitat is primarily found in and around the Burgh of Stornoway, but smaller examples can be seen in Tarbert and Leverburgh in Harris, Lochmaddy (North Uist), Balivanich (Benbecula), Lochboisdale (South Uist) and Castlebay in Barra.

Examples of species associated with this habitat include; song thrush.

Native Woodlands

Small areas of native scrub woodlands are found throughout the Western Isles. The main classification would be as wet woodland, with species including alder, rowan, birch and willow, with smaller areas of ash. Most woodland is in sheltered areas and/or places inaccessible to sheep. Several good examples are found on lochan islands.

This habitat is damaged by overgrazing from sheep, deer and rabbits and is particularly threatened in the Western Isles by unmanaged sheep grazing and expanding populations of deer (particularly in North Uist), leading to damage to regenerating trees and ground flora impoverishment.

Specific opportunities exist under Woodland Grant Scheme (WGS) and the Rural Stewardship Scheme (RSS) to provide financial support for established and regenerating areas of native or scrub woodland.

Lews Castle Grounds Woodlands

Lews Castle woodland is the unique example of lowland parkland woodland in the Western Isles. The woodland has its origins in the 17th Century, with substantial replanting in the 19th Century. The woodland features native species, but there are substantial numbers of non-native trees, which have both been planted and have regenerated naturally. Species found in the woodland include Ash, Oak, Birch, Horse Chesnut, Fir and Pine. The parkland features the island's only walnut tree.

Many of the trees are mature and the parkland also features grassland, open heathland and woodland flora.

The woodland at Lews Castle is the subject of a Millennium Forest for Scotland Project, to extend the access network of walkways, clear invasive species such as rhododendron and replant the areas with native tree species.

Dystrophic Lochs

Nutrient starved (dystrophic) lakes or lochs are commonly found in areas of poor surrounding nutrient supply. Many lochs and lochans in peat and moorland areas in the Western Isles are dystrophic and support a characteristic range of associated species. This habitat is commonly found in the Western Isles, but is nationally important. Of particular interest is the way in which small lochans link together to provide a network of dystrophic standing water habitats within low altitude lowland and upland heath, seen elsewhere only in the 'Flow Country' of Caithness.

The habitat is found in all of the islands where acid grassland/moorland and nutrient poor soils exist.

Summary Table - Habitats

Broad Habitat	Abbreviation	Priority Habitat	Abbreviation	St Kilda	Lewis	Harris	North Uist	Monach Isles	Berneray & Boreray	Benbecula	South Uist	Eriskay	Barra & Watersay
Arable & Horticultural	OA	Cereal Fields and Margins	FM		✓	✓	✓		✓	✓	✓		✓
Improved Grassland	IG	Coastal & Floodplain grazing marsh	GM		✓	✓	✓			✓	✓		✓
Neutral Grassland	ON	Lowland Meadows	LC		✓	✓	✓	✓	✓	✓	✓	✓	✓
Acid Grassland	OG	Lowland dry acid grassland	LD	✓	✓	✓	✓		✓	✓	✓	✓	✓
Dwarf shrub heath		Lowland Heathland	LH		✓	✓	✓		✓	✓	✓	✓	✓
		Upland Heathland	UH	✓	✓	✓	✓	✓			✓		✓
Fen, marsh and swamp	OW	Purple moor grass & rush pastures	PM		✓	✓	✓	✓		✓	✓		✓
		Fens	FE		✓	✓	✓			✓	✓		✓
		Reedbeds	RE		✓	✓	✓			✓	✓		✓
Bogs		Blanket bog	BB		✓	✓	✓	✓		✓		✓	
Standing open water and canals	OS	Mestotrophic lakes	MS		✓	✓	✓		✓	✓	✓		✓
		Eutrophic Lakes			✓	✓	✓			✓	✓		✓
Montane - Subalpine	SA				✓	✓	✓			✓	✓		✓
Alpine	AL				✓	✓	✓			✓	✓		✓
Supra littoral rock		Maritime cliff and slopes	MC	✓	✓	✓	✓	✓	✓	✓	✓		✓
Supra littoral sediment		Coastal sand dunes	SD		✓	✓	✓	✓	✓	✓	✓	✓	✓
		Machair	MH		✓	✓	✓	✓	✓	✓	✓	✓	✓
		Coastal vegetated shingle	VS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Littoral sediment		Seagrass beds (<i>Zostera noltii</i>)	SM	✓	✓	✓	✓	✓			✓		✓
		Saltmarsh		✓	✓	✓	✓			✓	✓		✓
		Sheltered muddy gravels		✓	✓	✓	✓			✓	✓		✓
Inshore Rock		Tidal Rapids			✓				✓	✓		✓	
Inshore sediment		Maerl beds			✓		✓				✓		✓
		Saline lagoons			✓		✓				✓		✓
		Mud in deep water			✓		✓				✓		✓

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