LUNDY

CANDIDATE SPECIAL AREA OF CONSERVATION
MARINE NATURE RESERVE
AND SITE OF SPECIAL SCIENTIFIC INTEREST

MANAGEMENT PLAN REVISION
2001

Executive summary

Seven years ago English Nature published 'Managing Lundy's wildlife', a management plan for the Marine Nature Reserve and Site of Special Scientific Interest. This plan was developed in close cooperation with The Landmark Trust who manage the Island, owners of the Island The National Trust, and Devon Sea Fisheries Committee, who regulate fisheries in the surrounding waters.

Guided by this plan English Nature, The Landmark Trust, The National Trust and Devon Sea Fisheries Committee have worked in close partnership as a Management Group, to help enhance the management of the Lundy Marine Nature Reserve and Site of Special Scientific Interest.

The plan has been implemented through an agreed annual work programme, derived from the plan's register of policies and projects, which seeks to maximise the nature conservation value of the resources available. The project register identifies a requirement for a full review of the plan in 1999. The international designation of Lundy as a candidate special area of conservation has increased the need for such a revision. The final draft of this revision has been completed, and is produced here for reference and use. This document has involved the cooperation of many interested parties and incorporated comment and amendments produced by the second revision of the draft in 1999.

There have been many achievements over the last seven years and some significant changes. The following lists just some of these and a few of the more current concerns:-

- Lundy is now a candidate Special Area of Conservation (SAC), in recognition of its international importance for marine wildlife
- A great deal of media attention and improved interpretation (interpretation centre, video, leaflets and boards) has led to greatly improved public awareness
- Lundy now has two web sites on the Internet (www.lundyisland.co.uk & www.lundy.org.uk)
- A zoning scheme has been published to clearly present information related to the management of the Reserve
- English Nature now lease the sea bed of the MNR
- A Management and Advisory Group structure has been established and the groups meet regularly
- Much work has been done monitoring marine life, using innovative techniques including acoustic survey to map the sea bed and the use of remote-controlled under water video
- The endemic Lundy cabbage reached record numbers in 1998
- The Landmark Trust secured Heritage Lottery funding for a new jetty and improved visitor facilities, which have now been completed with the inclusion of interpretation displays in the boat shed. This should significantly improve visitor access & awareness of the reserve's work in the future
- Efficient wardening, work programming and reporting has facilitated much of the above
- A seasonal warden's post has been funded for 4 years to assist the Warden during the busy summer months

Current issues include: the desired establishment of a No-Take-Zone, the decline of breeding pairs of puffin, the potential impact of potting on fragile marine species; possible decline of rare solitary cup corals and the damaging effects of grazing pressure.

We believe that there is much to celebrate in the above and see the revision of this management plan as part of a long-term strategy to ensure the future of the wildlife that makes Lundy such a special place.

Philip Collins
Devon Team Manager

Section 1: Introduction

1. Introduction

This management scheme has been developed to fulfil the requirements of the UK Habitats Regulations for the Lundy candidate Special Area of Conservation and to integrate this with a revision of the existing scheme of management for the Marine Nature Reserve and Site of Special Scientific Interest. Given Lundy's national and international importance as a candidate SAC and as England's only statutory Marine Nature Reserve, marine wildlife conservation is considered in more detail in some sections than terrestrial conservation.

However, Lundy is not only important for its marine flora and fauna but also its terrestrial and geological features and to this end this management plan is the first to start to address these aspects of the island. Due to the importance of the terrestrial habitats it is proposed that over the life of this management plan an appendix is developed in collaboration with the Landmark Trust, National Trust and English Nature to address the management of the terrestrial and geological habitats. A number of the sections within this plan have been altered to reflect this and to facilitate the development of the terrestrial management plan.

English Nature's Strategy

English Nature has recently published its strategy *Beyond 2000* which will guide the work of the organisation over the next decade (English Nature, 1997). Within the context of the new strategy, English Nature will take forward marine conservation through delivery of our commitments to internationally designated sites (the *Natura 2000* network) and delivering targets through the *Biodiversity Action Plan*.

The European Union's Habitats Directive 1992 aims to maintain the diversity of Europe's wildlife by protecting vulnerable habitats and the plants and animals that depend on them. To help achieve this aim, each country in the European Union has put forward a selection of sites on land and at sea to include the best examples of a variety of habitats and species outlined in the Directive. These sites will include Special Areas of Conservation (SACs) designated under the Habitats Directive, and Special Protection Areas (SPAs) established under the EC Wild Birds Directive. Where, as in this case, SACs or SPAs consist of areas covered by tidal waters or any part of the sea in or adjacent to Great Britain up to the limit of territorial waters, they are refereed to as European marine sites. The network of conservation sites set up throughout Europe will be know as the *Natura 2000* series.

Lundy has been formally submitted to Europe as a candidate SAC for its Annex I habitat interest of reefs. Through the process of SAC moderation it is proposed that subtidal sandbanks, grey seals (*Halichoerus grypus*) and submerged or partially submerged sea caves will be added as further interest features. SAC status not only gives further recognition to the importance of Lundy's marine conservation interests, but helps to strengthen their environmental protection.

Areas of special interest are the focal points for marine nature conservation identified for their important benthic populations, spawning or nursery areas for fish, fragile intertidal communities and breeding, feeding or roosting areas for birds and sea mammals. The mechanisms to achieve protection for areas of special interest, to include Sites of Special Scientific Interest, and statutory Marine Nature Reserves, under the EC Habitats and Species Directive. Since the development of this strategy for the marine environment, the development of marine Special Areas of Conservation has proceeded apace. Lundy is now one of 33 candidate marine Special Areas of Conservation in the UK, which have been submitted to the European Commission for possible designation. The process of developing

schemes of management for each of these marine sites has developed our links with other users and managers of the marine environment, and has increased our understanding of the biological resources at stake.

Aims of the Management Scheme

Management of Lundy Marine Nature Reserve is synonymous with developing the management scheme for the candidate SAC and is considered essential to ensure the continued protection of its wildlife. This should be based on a continuation of the existing statutory mechanisms and consensus with local interests and other involved organisations. Such an approach should be flexible, recognising continued multi-use of the area whilst establishing core areas of sensitivity. This has been addressed in the form of a zoning scheme for the Marine Nature Reserve, which aims to show people where they can undertake activities with minimal impact on the wildlife or conflict with other users.

This document is a management plan for the Lundy candidate Special Area of Conservation, Marine Nature Reserve and Site of Special Scientific Interest. It addresses the issues relevant to the protection of Lundy's wildlife. The management plan has been produced in order to achieve the following **overall aim**:

> *To manage Lundy's Marine Nature Reserve, candidate Special Area of Conservation and Site of Special Scientific Interest for the benefit of their wildlife and to actively promote the ecologically sustainable use of resources and the use of the reserve for education and enjoyment of all aspects of marine conservation.*

Relevant Authorities

Regulation 5 of the Habitats Regulations identifies the statutory organisations who *"...have functions in relation to land or waters within or adjacent to the site"*. Regulation 34 enables these organisations to establish and implement a management scheme in order to fulfil the requirements of the Habitats Directive for the site, as guided by English Nature's conservation objectives.

The Relevant Authorities for Lundy cSAC are Devon Sea Fisheries Committee, English Nature, Environment Agency and Torridge District Council. The Landmark Trust and the National Trust are not classed as relevant authorities under the Habitats Regulations, but form part of the Lundy Marine Nature reserve Management Group, which has taken on the role of the cSAC management group, and are therefore considered as such for the purposes of this plan.

The National Trust acquired the freehold of the island, down to the mean high water mark, on 29 September 1969.

The Landmark Trust signed a 60 year lease on the area owned by the National Trust in 1969. The Landmark Trust also lease an area of foreshore and seabed adjacent to the Landing Beach from the Crown Estate as an anchorage (Figure 1).

The area between the mean high water mark and mean low water mark jointly covered by the SSSI and the MNR and the seabed below mean low water out to the boundary of the MNR/cSAC are owned by the Crown Estate and leased by English Nature (with the exception of the Landing Bay leased by the Landmark Trust).

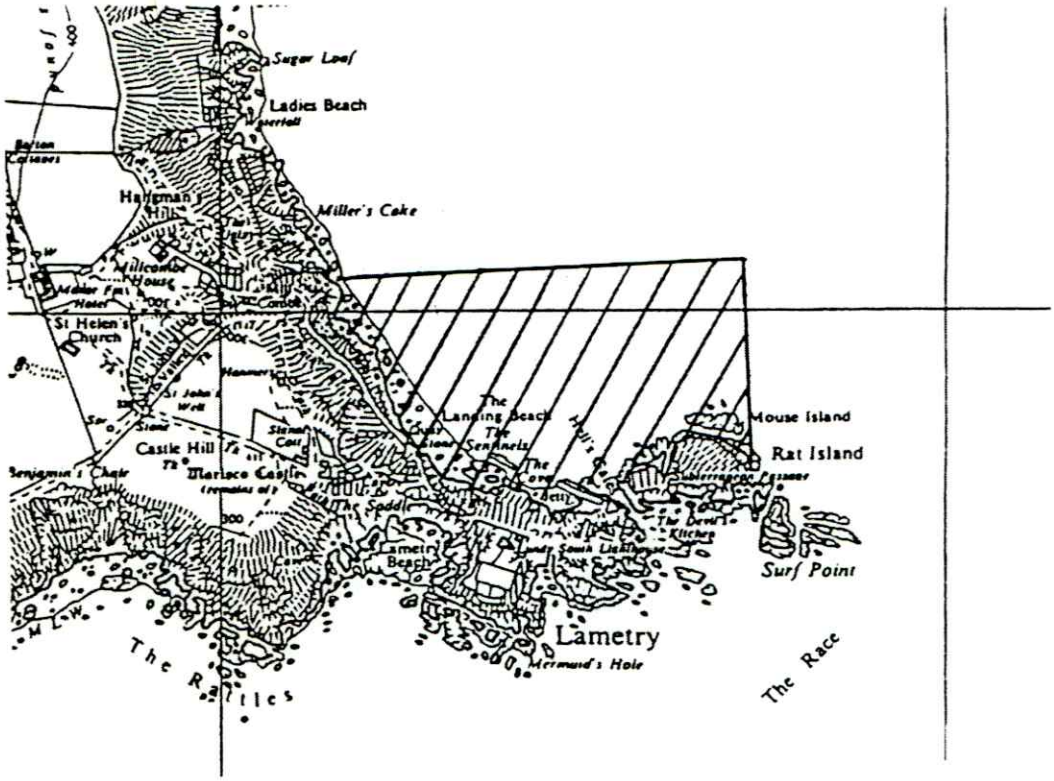


Figure 1. Area of foreshore and seabed leased by the Landmark Trust from the Crown Estate Commissioners for anchorage.

2. Designations and Description of Conservation Features

Special Area of Conservation

Special Areas of Conservation (SACs) are selected initially by each Member State on the basis of the habitats and species listed in Annexes I & II of the Habitats Directive. The habitats and/or species found on each site are referred to as *interest features*. The best examples in each country, once agreed locally and nationally through consultation, are submitted to the EC for consideration. At this stage they are referred to as *candidate* sites. They are then adopted by the EC and must be formally designated by their member states by 2004.

Lundy cSAC was submitted to the European Commission for consideration as a candidate SAC on 9 January 1996 (Appendix I).

Lundy qualifies as a cSAC for the following Annex I habitats and Annex II species as listed in the EU Habitats Directive:

- reefs.
- subtidal sandbanks[1]
- submerged or partially submerged sea caves[1]
- grey seals (*Halichoerus grypus*)[1]

The boundary for the cSAC follows that of the MNR (Figure 2) and fully encompasses the reef features for which the site has been selected on both the west and east coast.

Marine Nature Reserve

Lundy MNR was designated by Order under the Wildlife and Countryside Act 1981 on 20 November 1986 (Appendix II). It remains the only designated MNR in England.

The boundary of the Marine Nature Reserve (Figure 2) was determined by the need to include all habitats, communities and species of high scientific interest in an area that would be small enough to manage. The areas of interest are predominantly on hard substrata extending to about 1.85 km (1 nautical mile) offshore on the west and south coasts and on/in sediments which extend to about 1.85 km (1 nautical mile) off the east coast. Excluded from the reserve are the fishing banks and areas of substrata which commonly occur in the Bristol Channel and its approaches.

Site of Special Scientific Interest

Sites of Special Scientific Interest (SSSIs) are designated under the Wildlife and Countryside Act 1981.

Lundy SSSI was first notified in 1976 and renotified under the Wildlife and Countryside Act (1981) on 3 September 1987. The SSSI boundary (as renotified, see Appendix III) excludes the island's settlement and those fields which have been subject to agricultural intensification.

[1] additional proposed interest features added through the process of SAC moderation in 2000

Other Designations

The whole of Lundy has been designated as a Nature Conservation Zone and a Coastal Preservation Area down to MLWN by Devon County Council within their strategic planning framework. Lundy has been designated Heritage Coast in its own right.

There are 41 scheduled Ancient Monuments on Lundy (18 within the SSSI). Any works affecting them must have Scheduled Monuments Consent from the Department of Culture, Media and Sport. Two offshore wrecks are protected along with their adjacent seabed. Construction works within the cSAC and MNR boundary require consent from the appropriate Competent Authority in consultation with English Nature.

All of the designations listed recognise the ecological and landscape importance of the island and demand sensitive application of planning and development control. Any permission or licensing of new activities which are likely to affect the conservation status of the cSAC interest features are subject to particular scrutiny under the requirements of the Habitats Regulations (1994).

3. Background Site Description to Support Designations

The island of Lundy (51°11'N, 4°40'W) is located at the entrance to the Bristol Channel, 9.7 nautical miles (18 km) north north-west of Hartland Point, North Devon (Figure 3). It is 4.9 km long from north to south and 1.3 km across at its widest point. It has an area of 430 ha and a coastline c. 15 km long. The island rises steeply on all sides to a plateau with the highest point at 141 m above OD.

The candidate Special Area of Conservation (cSAC) and Marine Nature Reserve (MNR) are contained within a rectangle with coordinates 51°09'N 4°38'W; 51°13'N 4°38'W; 51°13'N 4°42'W; and 51°09'N 4°42'W and extend shoreward to the height of the highest astronomical tide. The total area covers approximately 13.9 km^2, of which approximately 0.6 km^2 are intertidal (Figure 2).

Biological Information

Lundy is exposed to a very wide range of physical conditions as the result of different degrees of wave action and tidal streams on sheltered and exposed coasts and headlands. This range of physical conditions combined with its topographical variation has resulted in the presence of an unusually diverse complex of marine habitats within a small area. Lundy has been identified as being of international importance for its marine reef habitats and communities. SACs are selected on the basis of a suite of habitat types identified on Annex I of the Habitats Directive (1992). Lundy's reefs have outstanding examples of Mediterranean Atlantic communities with a limited UK distribution.

The variety of habitats and associated species on Lundy's reefs is outstanding, for example over 316 species of algae have been recorded from the area. The high species richness of the area is also reflected in the large number of rare or unusual species, many of which seldom occur elsewhere in Britain, and the large numbers of individuals of fragile long-lived species which are present on very stable reefs around the island, including solitary corals, sea fans and sponges. Many of the communities found around Lundy include a high proportion of Mediterranean-Atlantic species which are internationally important, representing biogeographically distinct communities at or very close to their geographic limits of distribution. For example the southern kelp *Laminaria ochroleuca* and the seaweeds *Carpomitra costata, Grateloupia dichotoma* and *Birfucaria bifurcata* are at or near the northern limit of their distribution.

All five British species of cup coral are found here, including the rarities *Balanophyllia regia, Caryophyllia inornatus, Hoplangia durotrix* and *Leptopsammia pruvoti.* Other long-lived, slow growing south-western species include the soft coral *Parerythropodium coralloides*, sea fan *Eunicella verrucosa* and a variety of erect branching sponges, found in deep sheltered conditions on the east coast.

Reef interest in the form of bedrock and boulders make up most of the intertidal zone, except in the Landing Bay where coarse sand and slate shingle are found. Sublittoral slopes of bedrock and boulder reefs, steep enough to form submarine cliffs off the north part of the east coast, extend down to a plain of sediment or stones. Around most of the island this is at a depth of 30 to 40 m, but off the southern part of the east coast it varies from a depth of 15 m south of the Knoll Pins to near chart datum in the Landing Bay.

The Site of Special Scientific Interest extends over about two-thirds of the land plateau, including most of the steep slopes and cliffs and the intertidal area down to the low water mark of ordinary spring tides.

The island is composed predominantly of granite but slates outcrop in the south-east. The western slopes and cliffs and north parts of the plateau are fully exposed to the prevailing wind and salt spray, which limit the vegetation to thrift tussocks or patches of maritime grassland. The eastern sidelands are more sheltered and support extensive areas of bracken in the north and scrub dominated by rhododendron in the south. The area of plateau within the SSSI includes dry heath with waved *Calluna* heath rich in lichens. In the more exposed areas there are acidic grasslands. Mire with acidic flushes and several ponds occur.

The sheltered eastern sidelands of the island comprise a mixture of rough grassland, bracken, rhododendron and pockets of scrub woodland. Wildlife diversity is greatest on this side of the island. Many rare and scarce invertebrates have been discovered including several endemic invertebrates, such as the Lundy cabbage flea beetle. The island is grazed by domestic and feral livestock and rabbits. The endemic Lundy cabbage *Coincya wrightii* grows on slate scree in the south-east of the island and on a few cliff sites further north. Other notable higher plants include the balm-leaved figwort *Scrophularia scorodonia* and small adder's-tongue fern *Ophioglossum azoricum*.

Lundy is an important breeding site for several species of seabird, some at the edge of their world range. These include puffin *Fratercula arctica* and manx shearwater *Puffinus puffinus*. Grey seals *Halichoerus grypus* breed in some of the sea caves and on boulder beaches.

The Physical Environment

Geology

Lundy is formed from a laccolith of Eocene granite c. 52 million years old emplaced in weakly metamorphosed sedimentary rocks of the upper Devonian period. The granite is of similar age to the igneous centres of the Inner Hebrides and is, therefore, much younger than the granite bosses of Dartmoor and Cornwall. The sedimentary rocks only survive above sea level in the south-east of Lundy, where slates about 360 to 375 million years old are found. Intrusive dykes of dolerite and trachyte found in both rock types also date from the Eocene (Figure 4). Almost all of the seabed off the south coast is slate. Slate rock re-occurs on the seabed off the north coast. Elsewhere the granite extends up to 1 km offshore.

Geomorphology

Erosion of overlying sediment has exposed the granite of Lundy, which has since been shaped by sea, ice and atmospheric weathering. During the ice ages it is thought that an ice-sheet, originating in the Irish Sea area, surrounded Lundy. Wave-cut platforms, caves, cliffs and stacks found at 60 m, 32 m and 15 m above OD on Lundy correspond to sea levels during the Cromerian, Hoxnian and Ipswichian interglacial periods (Edmunds, Williams & Taylor 1979). Since the last ice age, the sea level has risen cutting Lundy off from the mainland, possibly as recently as 7000 BC. Shoreline erosion along some of the numerous dykes has led to the formation of at least 37 intertidal caves, which comprise one of the proposed interest features for the SAC. Granite blocks, which have broken from the bedrock remain as boulders on the seabed, whereas slate is reduced to small fragments.

Environmental Factors

Lundy experiences the typical climate of south-western Britain with mild, wet winters and relatively cool summers. Temperatures rise in summer to an average monthly maximum of 15°C and fall in winter to an average of 7°C. Average annual rainfall is 1200 mm. The prevailing wind is from the south-west. (Observations at Hartland Point, 18 km to the south south east, indicate that 50% of winds are from the western quadrant).

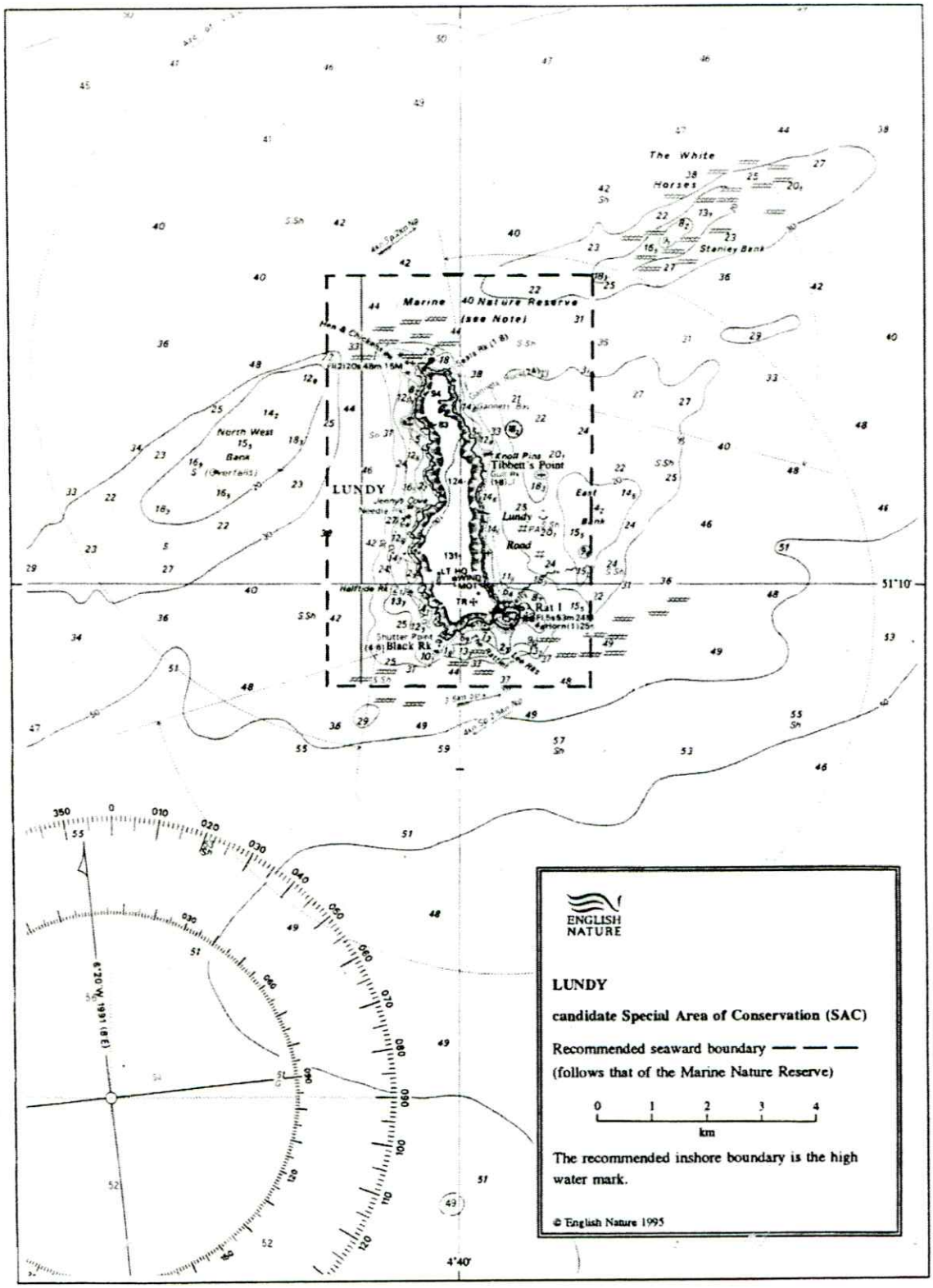
The prevailing wind results in an almost continual swell from the west and south-west. There is no shelter from this direction and the west coast, open to the Atlantic Ocean, experiences very exposed conditions. The east coast in comparison is relatively sheltered and is only occasionally subject to high wind and wave exposure.

The sea around Lundy is greatly influenced by the easterly and north-easterly movement of the North Atlantic Drift, which brings relatively warm water to the area. In spring, the Land's End Corner Current, sweeps around Land's End towards the Bristol Channel and carries water originating in the Mediterranean to combine with the North Atlantic Drift current. Prevailing currents transport sediments from the Bristol Channel north-westwards along the Pembrokeshire coast. The limited sediment load present around Lundy probably originates from the Taw/Torridge estuary and from along the north Devon and Cornwall coasts.

Mean surface temperatures of the seawater range from 8°C to 16°C (UKDMAP). In general, monthly mean temperatures show little variation. Temperature loggers are placed within the Landing Bay and on the wreck of the MV Robert as part of ongoing data collection by English Nature. In 1998 the logger on the Robert showed a maximum of 16.9°C and a minimum of 8.0°C, with an average reading of 11.9°C.

In 1992 the mean tidal heights were: MHWS 8.0 m, MHWN 5.9 m, MLWN 2.7 m and MLWS 0.8 m. Therefore the mean tidal range is 7.2 m for spring tides and 3.2 m for neap tides. Tidal streams running from east to west on an ebbing tide divide, sweeping past the north and south ends of the island at speeds of up to five knots. The west and east coasts experience relatively weak tidal currents.

Numerous springs close to the plateau edge give rise to seasonal streams which run steeply down to the sea. Some of these have been dammed to provide water for stock. Pondsbury, the largest area of standing water on the island, is contained by a dam across one of the few longer watercourses on the island. Other small ponds, for example Rocket Pole Pond, have formed in old quarries.



Taken from Admiralty Chart No. 1164 with the permission of the Controller of Her Majesty's Stationery Office. e Crown Copyright.

Figure 2. Boundary of the candidate SAC and Marine Nature Reserve.

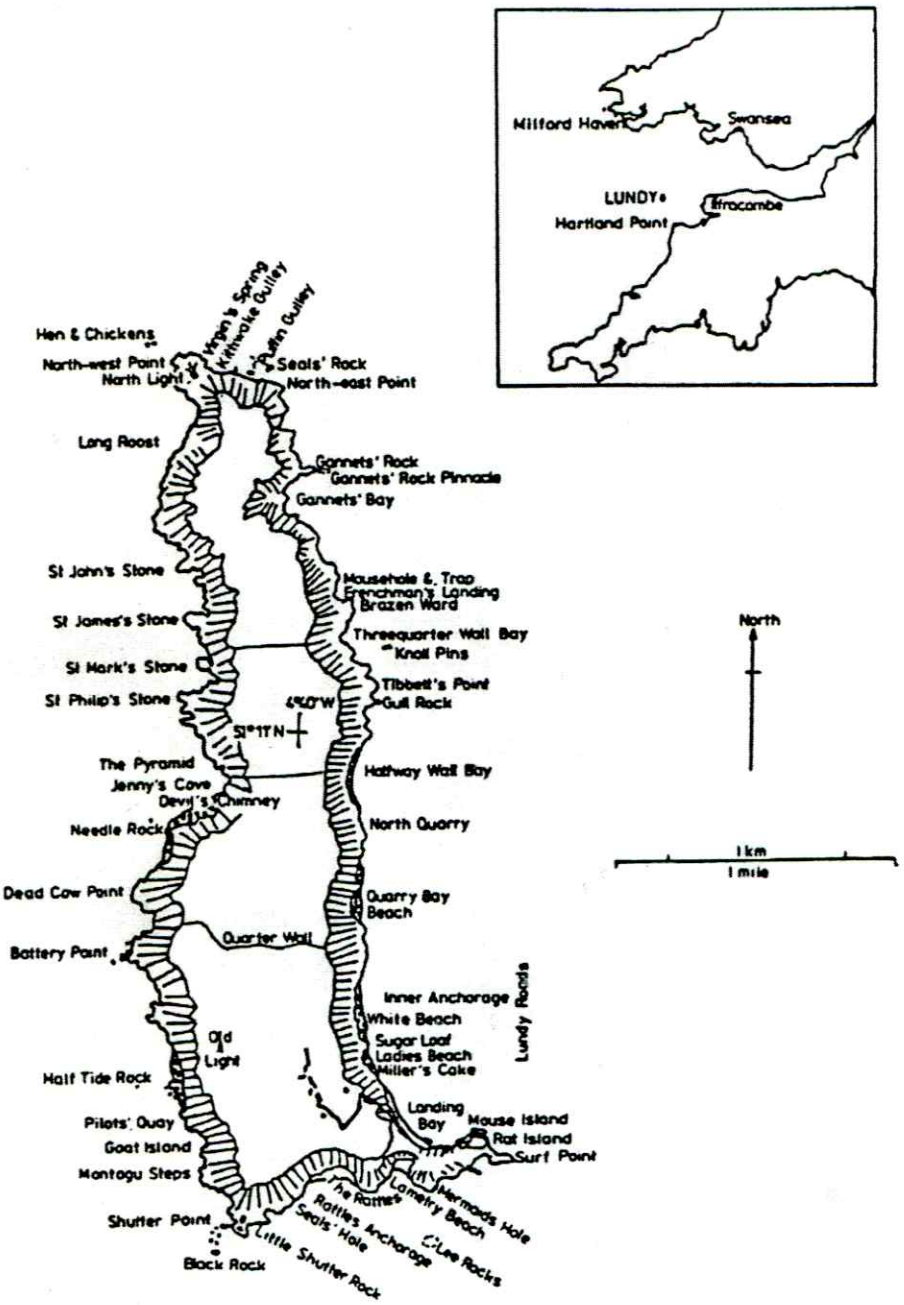


Figure 3. Location of Lundy in south west England and position of coastal features on the island.

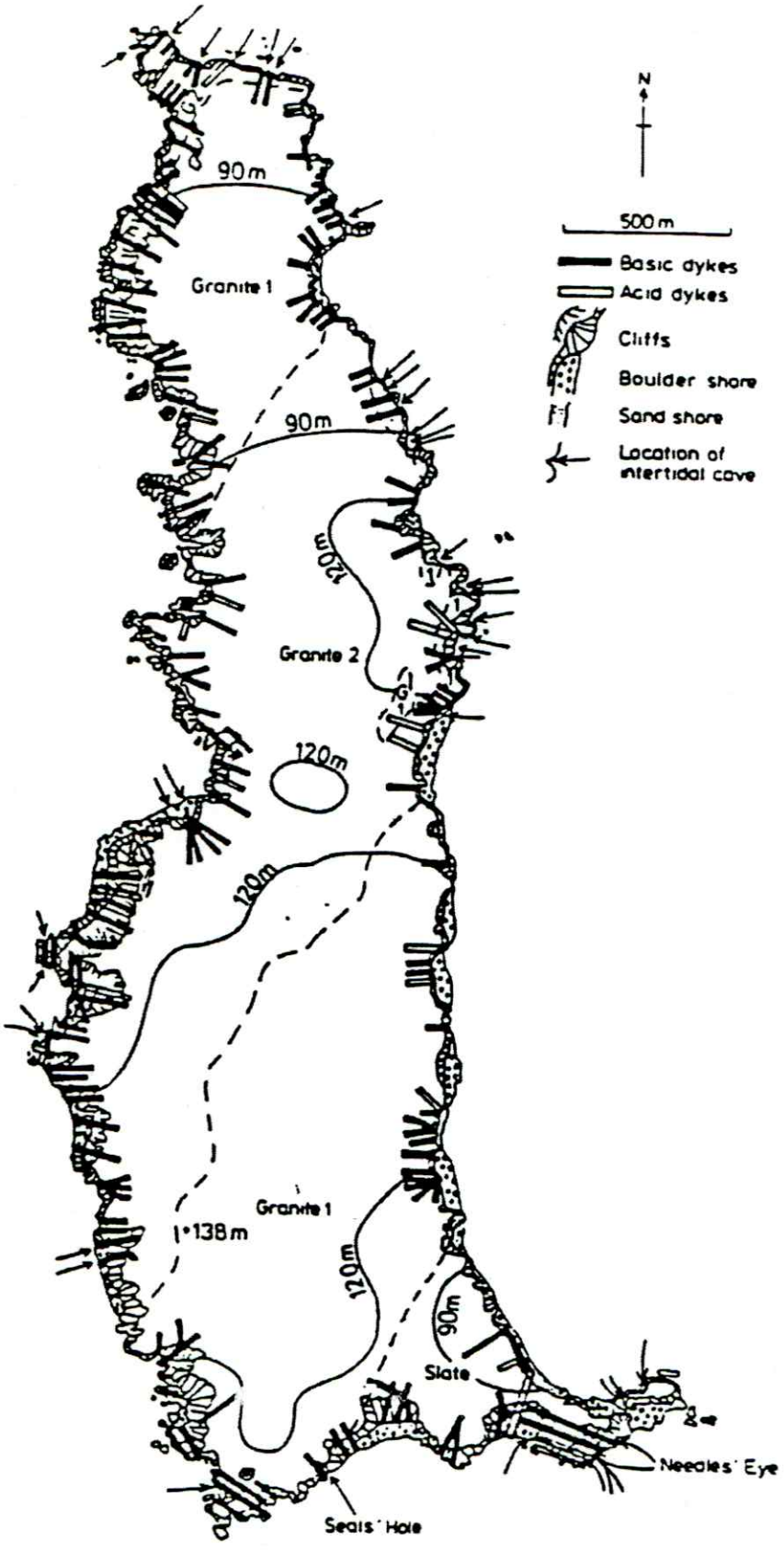


Figure 4. Coastal geomorphology of Lundy. Different rock types are separated by a broken line and heights in metres are approximate (from Hiscock, 1983).

Section 2: Marine

1. The Physical Environment

Substrata

Of the 15 km total length of the intertidal coastline, 11.1 km are estimated to be bedrock (9.2 km granite, 1.9 km slate) and of the remaining length 3.8 km consists of boulder shores. Only 0.1 km, at the Landing Beach, is of coarse sand/slate shale. On the more exposed west coast, the granite shores are steeper and therefore more limited in extent than on the east coast. The slate on the south-east coast has weathered to form a long shore platform with ridges and gullies. Several caves extend backwards for many tens of metres. The subtidal substrata on the west, north and south seabed are predominantly bedrock whereas on the eastern coast there are extensive areas of sediment (Figure 5).

Gradually sloping bedrock on the west coast extends to 35 or 40 m depth at 1 km offshore and is then replaced by coarse sand. Rock surfaces are for the most part unbroken with occasional pinnacles, gullies and steep-sided canyons. In places large boulders overlie the bedrock and patches of small boulders and stones are found in gullies off the south part of the west coast. Small patches of sand are found in shallow water.

A gradually sloping bedrock plain also exists on the south coast, with gullies to 1 km offshore and extensive areas of sand and scattered rock reefs at, for example, Rattles Anchorage, south of Rat Island and South Light. South-west of Black Rock the seabed is very broken and slate pinnacles reach 6 m high. At a distance of 35 m south of Lee Rocks there is a sharp boundary between bedrock and a plain of stones and gravel. Pockets of clean shell gravel are found in gullies.

On the north coast occasional mud and gravel pockets occur on the gradually sloping bedrock. In the vicinity of Seals' hole vertical cliffs drop steeply to 20 m depth and are followed by a steep boulder slope only about 30m offshore. At approximately 30 m depth the boulder slope gives way to a plain of stones.

The east coast contains a wide range of substrata and habitats. Along most of its length (from Quarter Wall to Gull Rock and from Frenchman's Landing to Gannets Rock) boulder slopes give way to a band of mud-covered sediments several hundred metres wide, which then merge with muddy gravel and muddy sand. Rock outcrops are frequent among the sediments. East of Rat Island rock outcrops surrounded by broken slates occur and off the Landing Bay the sea bed consists of extensive rock outcrops amongst gravel. The Knoll Pins are the tips of a rock pinnacle surrounded by sediments to the north, south, and west and a stone plain to the east. The sediments vary from coarse sand on the west, to mud-covered sediments to the north and coarse gravel to the south. To the east of Gannets' Rock there is a north facing vertical and overhanging cliff rising from a stone plain at 33 m to a depth of 10 m above which a gradual slope extends to 5 m. The pinnacle extends about 200 m offshore and is bordered to the east by boulder scree and to the south by a gravel bank. (Figures 5 & 6).

Recent work carried out for English Nature (Sotheran & Wolton, 1997) has produced broad scale biological mapping of the entire subtidal area of the cSAC and MNR.

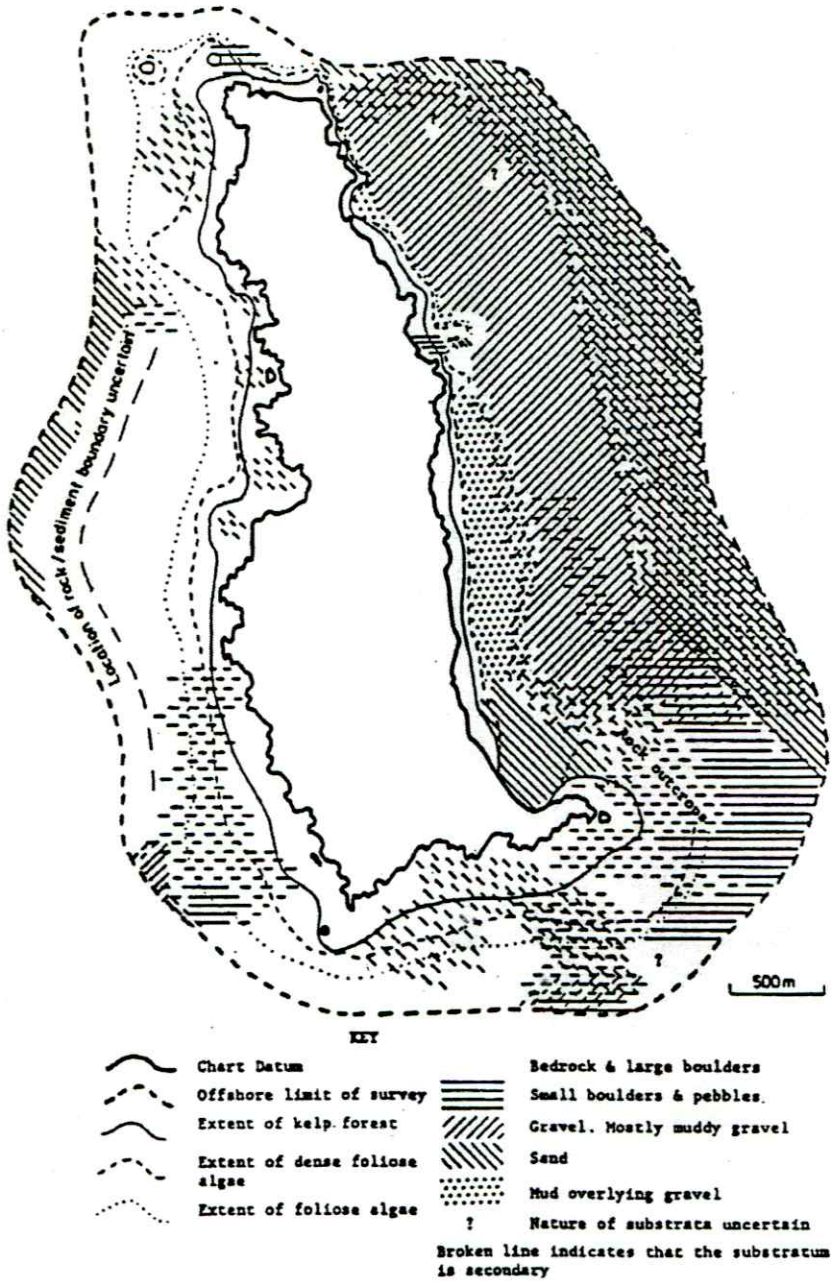


Figure 5. Distribution of sublittoral bottom types and the extent of algal cover (from Hiscock 1983).

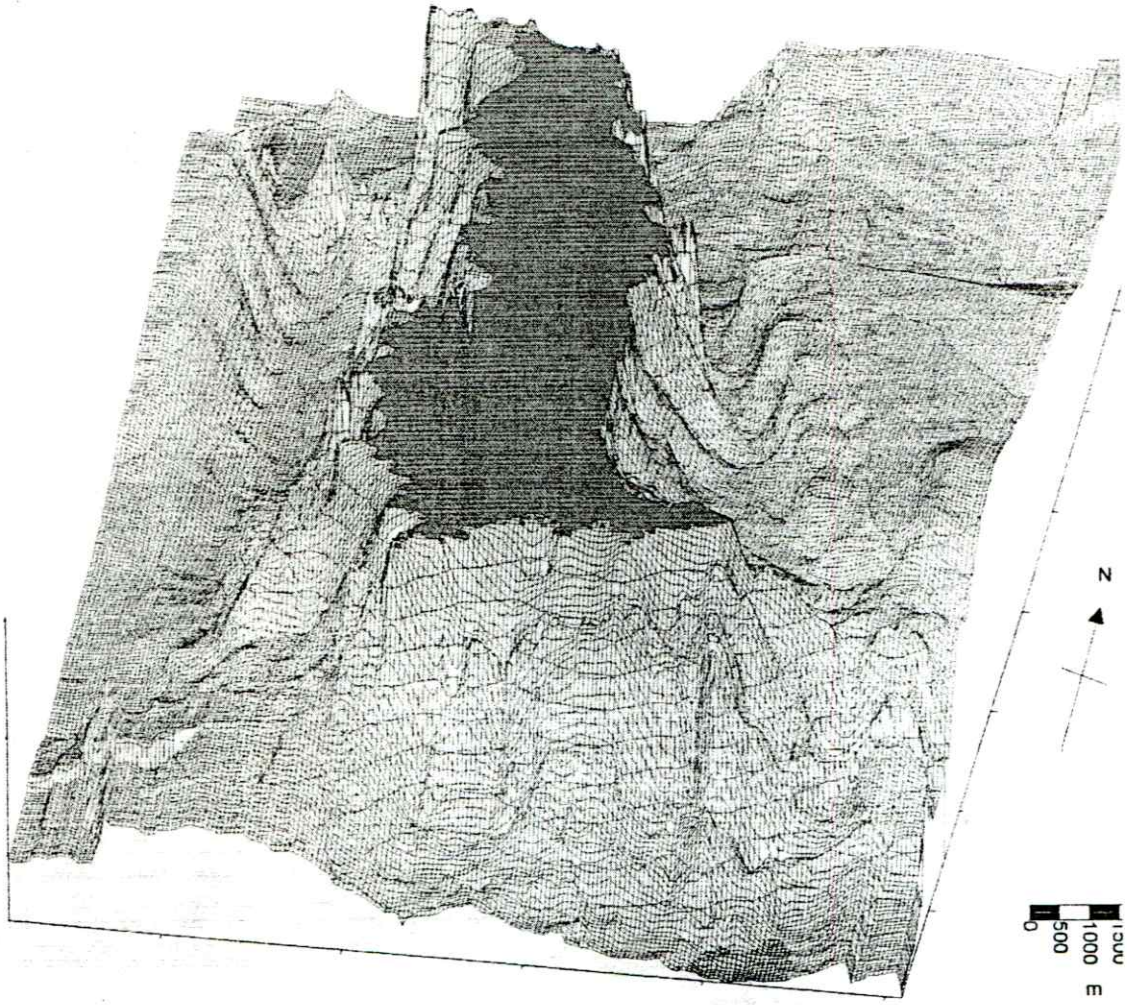


Figure 6. A three dimensional representation of the seafloor around Lundy (from Sotheran & Walton 1997). *N.B.* the vertical scale is exaggerated.

2. Biological Information

The following species, occurring on or around Lundy, are defined as priority species within the UK Biodiversity Action Plan (UKBG/English Nature 1999).

Fish
Cetorhinus maximus - basking shark
Sea anemone group
Amphianthus dohrnii - sea fan anemone
Coral
Eunicella verrucosa – broad sea-fan
Leptopsammia pruvoti – Sunset cup coral

Littoral Communities

The rocky shore communities or biotopes found on Lundy are typical of the south-west of Britain. The range of species is similar around the island, but relative abundance varies greatly depending on wave exposure, rock slope, rock type, aspect, substratum mobility and other environmental factors. Shores range from those fully exposed to waves, to very sheltered, and show a clear zonation of communities. Some species are restricted to the most sheltered or exposed shores. The greatest diversity of species is found on sheltered shores.

1. Communities on bedrock and boulders on the wave exposed west coast

These communities are typical of those that would be found on a very exposed section of coast. Upper and middle shores are dominated by barnacle and limpet communities with very few fucoid algae present. Rich lichen communities are present on the upper shore and in the splash zone.

2. Communities on bedrock and boulders on the south coast west of Hell's Gates

There are a wide variety of habitats on this semi-exposed shore, from boulder beaches to steeply sloping shores. Communities are similar to the west coast although the wider range of situations gives rise to a wider range of communities. Many more species of algae including shelter-loving species such as *Pelvetia canaliculata* grow. Dense patches of knotted wrack *Ascophyllum nodosum* are present. Limpets, barnacles and gastropods have a scattered distribution.

3. Communities on broken bedrock and boulders at Devil's Kitchen

The extensive slate platform to the south of Rat Island is thought to be the richest area in terms of numbers of species and habitats on Lundy. The system of platforms, ridges and gullies slopes broadly south east with several deep pools, overhangs and boulders. This is a fairly sheltered shore. The lower shore has the richest communities, including several unusual mollusc species. The jewel anemone *Corynactis viridis* thrives in a gully where there is a fast flowing current. A small population of the cup corals *Balanophyllia regia* and *Caryophyllia smithii* occurs under an overhang that is uncovered at low spring tides.

4. Communities from the north side of Rat Island to the Landing Beach

The shore in this area is of steeply sloping slate and is the most sheltered shore on Lundy. Fucoid algae such as bladderwrack *Fucus vesiculosus* dominate but a large number of other species are present. The lower shore is broken up and has a rich flora and fauna. Large

numbers of the jewel anemone are present in the strong tidal current between Mouse and Rat Island.

5. Communities on bedrock and boulders on the sheltered east coast

Communities along this stretch benefit from a fairly sheltered aspect. Shores are generally comprised of bedrock, but the southern part of the coast is fringed with large boulders. The intertidal zone is highly disturbed due to traffic movements, leading to an impoverished habitat. The bedrock shores are fairly rich in species. Boulders close to the Landing Bay have rich animal communities with a good proportion of sponges. Certain places along the east coast are dominated by filamentous green algae.

There is a high diversity of algal species in Gannet's Bay because of its very sheltered and shaded position. Fucoids dominate the mid shore, whilst several species of red algae occur at and below mid tide level, e.g. *Ceramium* spp., *Plumaria elegans*.

Lichen communities on the upper shore at many locations are very rich.

6. Communities on bedrock on the exposed north coast

This is a steeply sloping exposed shore. Upper limits are dominated by fucoid algae, the lower limit by a limpet/ barnacle community. Small rockpools are present.

7. Communities in rockpools

Rock pools occur on all coasts. The best examples are at Lametry Beach and Devil's Kitchen. Rock pool communities depend on the exposure that they receive. Typically they harbour algae such as *Corallina officinalis*, *Ceramium rubrum* and *Enteromorpha* spp. Algae provide important substrata for many small animals. Mysid shrimps are sometimes present in pools.

8. Communities in caves

Most caves on Lundy are formed by the erosion of basalt dykes and hold very different communities to those found on the shore. Many are dominated by encrusting 'Lithothamnia' algae and have abundant sponges and encrusting bryozoans.

Sublittoral Communities

The distribution of sublittoral communities is predominantly governed by substratum, light intensity and water movement (wave exposure and tidal streams). Topography, siltation and sand scour also have an influence. As a result of the great variation in these environmental factors there is a very high diversity of sublittoral habitats and communities to be found around Lundy. Communities are also very diverse as a result of the strong southern influence, and many rare species are found.

The sublittoral communities have been separated into distinct categories. These are summarised below. More detailed descriptions are available from English Nature's Devon office.

1. Communities on bedrock and large boulders on wave exposed coasts (south and west)

Along the south coast, upward facing rocks in the sublittoral are characterised by a classic zonation of kelp forests (*Laminaria hyperborea*) in the upper zones and diverse red algae communities in the lower.

On the west coast, there is generally a low turf of sea-mats, sea-squirts and sponges.

2. Communities on bedrock and large boulders on wave sheltered coasts (north and east)

Species diversity is higher here than in the sublittoral fringe of the south coast. Communities show characteristic zoning with depth.

Communities along the east coast are characterised by fast growing algal species, as the substrate is potentially mobile in winter storms.

3. Communities on sandy rocks and rocks adjacent to sand in shallow water

Sand scouring is the dominant determining factor in these communities. Consequently, communities consist more or less exclusively of a wide diversity of algae. The commonest are *Grateloupia* spp., *Ahnfeltia plicata* and *Cladostephus spongiosus*. Many species are not recorded elsewhere on Lundy.

4. Communities of vertical or overhanging rock

The most extensive and best examples of these communities are to be found at Gannet's Rock Pinnacle and Seals Rock. Characteristic species include *Bugula* spp, *Alcyonium glomeratum* and *Parazoanthus axinellae*.

5. Communities on small boulders, stones, large shells and gravel

Communities on these substrata are potentially mobile and are therefore generally composed of colonising species and young individuals. Encrusting barnacles and bryozoa occur on the stones and small boulders.

6. Communities on or in sediments

Sediments extend over large areas of the seabed around Lundy. Sediments on the south coast consist of highly mobile coarse sand and gravel which support very little microfauna or macrofauna. Sediments on the north coast consist of coarse and mixed sediments, support no obvious macrofauna, but have abundant microfauna within the sediments.

Along the sheltered east coast, there are five distinct community types, each associated with different sediments.

7. Communities on wrecks

Wreck communities are distinctly different to other bedrock communities under similar conditions. A number of species rarely recorded elsewhere around Lundy occur on wrecks, e.g. *Sabellaria spinulosa*. Algae have a very sparse distribution. (The most studied wreck is the MV Robert which sank early in 1975, and lies about 1 km east of Tibbett's Point within the boundary of the Marine Nature Reserve.)

8. Communities in caves

Small sublittoral caves occur at the Knoll Pins and Gannet's Bay and contain distinctive communities with several rare species.

9. Communities in canyons

Canyons are a very distinctive feature of some areas of the seabed and tend to support communities similar to those found on deep parts of sublittoral cliffs. They also provide areas of shelter on exposed coasts and allow muddy sediment to accumulate where otherwise it would not.

Flora

The marine flora of Lundy is very rich, totalling over 300 species, and includes a number of rare species. There is a strong southern influence with several Mediterranean-Atlantic species. For example, the kelp *Laminaria ochroleuca* and the seaweeds *Carpomitra costata*, *Grateloupia dichotoma* and *Bifurcaria bifurcata* are at or near the northern limit of their distributions. In contrast, several northern species common throughout the rest of Britain are absent from Lundy and species such as *Lithothamnion glaciale* are at the southernmost limit of their distribution. Several other rare algae species, for example *Radicilingua thysanorhizans* and *Pterosiphonia complanata*, are found.[2]

The marine algae species were first listed by Harvey (1950). More recently Irvine & Smith (1972) added at least 100 species to previous records, describing 298 species in total. Since then further studies have resulted in the recording of three more species (Hainsworth, 1975).

Invertebrate Fauna

The marine invertebrate fauna of Lundy is very rich with a number of unusual species rarely found elsewhere in British waters. Sublittoral communities below the zone of algal domination, are especially diverse with large populations of anthozoans, hydroids, bryozoans, sponges and opisthobranchs. The fauna exhibits a strong southern influence with several Mediterranean-Atlantic species being found in abundance. These include the cup corals *Leptopsammia pruvoti* and *Balanophyllia regia*, the sea finger *Alcyonium glomeratum* and the sea fan *Eunicella verrucosa,* which are near the northern limit of their distribution.[2]

Professor Harvey first produced a species list of the intertidal fauna of Lundy in the 1950s. Following this, more complete lists were compiled in the 1970s and have been published as a series in the reports of the Lundy Field Society.

Vertebrate Fauna

Fish

The wide range of habitats support a large and varied fish fauna typical of south-west Britain. A species list was produced by Pullin (1977).[2] Large numbers of territorial fish such as ballan *Labrus bergylta*, corkwing *Crenilabrus melops* and rock cook wrasse *Centrolabrus exoletus* live within the *Laminaria* zone, as well as pollack *Pollachius pollachius* and shoals of two-spot goby *Gobiusculus flavescens*. The sandy bottom of the Landing Bay and other

[2] Detailed species lists and a document titled 'Marine wildlife information and bibliography' (Eckersley 1994) are held at the Devon office of English Nature.

sandy areas are frequented by other small gobies, dragonet and flatfish. Below the kelp, cuckoo wrasse *Labrus mixtus* are common and lesser spotted dogfish *Scyliorhinus caniculus* are regularly seen.

A population of the red band fish *Cepola rubescens*, which lives in burrows in the sediment off the east coast, has been studied since 1977. The population is unusual because this species normally inhabits much deeper water and is not known to have been observed elsewhere by divers in its natural habitat. Therefore its discovery off Lundy provided a unique opportunity for *in situ* studies to be undertaken. Since 1977 there have been considerable fluctuations in population size and indeed from 1984 to 1987, no records of the fish or their burrows could be found. Irving reported 12 burrows and one individual in 1990 and 5 individuals in 1995. But since 1997 there have been sightings every year, with 3 colonies observed by Irving in 2001.

Basking sharks *Cetorhinus maximus* have been regularly recorded in the summer months. Other sharks, probably porbeagles *Lamna nasus* or blue sharks *Priorace glauca*, have also been sighted.

Mammals

Although the Lundy population of Grey Seals *Halichoerus grypus* is small in relation to other established colonies in the UK, it is important. The estimated population is 60-70 adults (Cole, pers. comm. 2001), but numbers fluctuate according to the time of year, with a maximum of about 120 animals occurring between July and October. Pupping takes place in a number of sea caves around the island, with about 25 pups born annually (Clark 1977, Wilcox 1986). Once pups leave the protection of the caves, there is a high mortality, as it usually coincides with the extreme weather conditions often experienced during the autumn. It is very difficult to estimate the total population size accurately because of the broken and indented nature of the coastline.

Common dolphin *Delphinus delphis*, Bottle-nosed dolphin *Tursiops truncatus*, Risso's dolphin *Grampus griseus* and harbour porpoise *Phocoena phocoena* have all been sighted in the waters around Lundy (Dymond 1973, Cole pers. comm. 2001). The carcass of a pygmy sperm whale, *Kogia breviceps* was also reported (Cole 1997).

Seabirds

Lundy is an important site for breeding seabirds, including several that are of high conservation importance.

The manx shearwater *Puffinus puffinus* which has formerly bred on Lundy, close to the edge of its world range, is identified as a high priority for conservation (Brown & Grice, 1993). Aspinall (1991) could find no evidence of breeding despite playing manx shearwater calls near burrows in an attempt to elicit response, a recognised census technique. However, work carried out by the RSPB in May 2001 investigating the population densities of manx shearwater by employing the above technique (Price & Booker, 2001) revealed an estimated population of 300 to 400 pairs.

Recent information on cliff nesting birds such as the guillemot *Uria aalge* and razorbill *Alca torda* shows that the breeding colonies on Lundy are probably the largest in southern England. According to Price, Robins and Slater (1992), numbers have declined drastically from the thousands of pairs breeding before the war to their present day low levels, reaching a plateau in 1996 (Price & Slader 1996). The most recent counts (Price, 2000) show razorbills

maintaining their numbers and guillemots reaching their second highest level since counts began. Both species are at the edge of their ranges.

Lundy has a small breeding population of puffins, the only breeding population in Devon. The population has declined from about 3,500 pairs in 1939 (Perry, 1940) to the estimated <15 pairs at present (Cole pers. comm. 2001). The puffin is on the edge of its range on Lundy but there is still a healthy population on Skomer, 75 km away. Further monitoring is needed.

The storm petrel *Hydrobates pelagicus*, of high conservation importance, is thought to occur on Lundy although there is little reliable data. Its current status is unknown and further monitoring is needed. Shags *Phalacrocorax aristotelis* breed along the coast, but have declined from 132 pairs in 1956 to 38 pairs in 1996 (Davies & Price, 1986, Price & Slader, 1996). Herring gulls *Larus argentatus*, lesser black-backed gulls *Larus fuscus*, kittiwake *Rissa tridactyla* and puffin *Fratercula arctica* all occur on Lundy and are amber list species (species whose populations are in moderate decline) RSPB (1996). Kittiwake numbers have experienced a dramatic decline over the last 50 years on Lundy, with the 2000 figures indicating that this decline is continuing (Price 2000).

Species	Population estimate	Date	Conservation priority
Manx shearwater	max. 800[3]	2001	High
Storm petrel	unknown	-	Medium
Shag	38 pairs[4]	1996	Medium
Guillemot	2348[5]	2000	High
Razorbill	950[5]	2000	High
Herring gull	762 pairs[5]	2000	Low
Lesser black backed gull	443 pairs[5]	2000	Low
Kittiwake	237 pairs[5]	2000	Low
Puffin	<15 pairs[6]	2001	Medium
Fulmar	83[7]	2001	Low

Table 4 Population and conservation importance of seabirds on Lundy

HIGH PRIORITY - localised and vulnerable population, range issues very important, known significant population declines
MEDIUM PRIORITY - known significant population declines
LOW PRIORITY - numbers using Lundy too small or ephemeral to attract conservation effort

[3] Price, D. & Booker, H. 2001
[4] Price, D. & Slader, P. 1996
[5] Price, D. 2000
[6] Cole, pers. comm. 2001
[7] Davis, T. & Jones, T. 2001

Several bird species once present on the Island have become locally extinct, including the great auk, gannet, tree sparrow and curlew.

3. Conservation History

In 1969 it was first suggested, in the Journal of the Devon Trust for Nature Conservation, that Lundy should be recognised as a marine nature reserve because of its outstanding marine interest. Following this, a report produced by the Lundy Field Society (Hiscock 1971) assessed the scientific interest of the area and recommended the establishment of a voluntary marine nature reserve around the island.

An advisory committee was formed in 1973 and produced a management policy, which provided for the management of the foreshore and seabed for 1 km around Lundy as a marine nature reserve for the purposes of research, education and recreation. This included a code of conduct for visitors to and users of the marine nature reserve (Hiscock, 1972).

During the 1970s a great deal of research was carried out and resulted in relatively complete descriptions of the littoral and sublittoral habitats and lists of the flora and fauna. Mounting concern over the impact of trawling resulted in a `gentlemen's agreement' between the advisory committee and Devon Sea Fisheries to stop this activity off the southern half of the east coast where populations of the Red band fish had been found in unusually shallow water and delicate benthic communities were known to occur.

In 1981 the Wildlife and Countryside Act was passed which enabled, for the first time, the establishment of statutory Marine Nature Reserves in this country. Lundy was an obvious choice and by 1983/84 consultations were taking place. A draft Management Plan was produced in 1983 (Hiscock, 1983). The Lundy Marine Consultation Group, consisting of representatives from all interested groups, was set up in 1985 as a forum for discussing the feasibility of establishing a statutory Marine Nature Reserve. A formal consultative paper by the Nature Conservancy Council was sent out to interested parties in 1986 and included details of draft byelaws, boundaries and a code of conduct.

On 20 November 1986, the Lundy (Bristol Channel) Marine Nature Reserve Order designating the Reserve was signed by the Minister of State for the Environment.

Since 1984, long term monitoring studies have been carried out in the littoral and sublittoral to investigate changes in populations and communities of high conservation interest. Particular attention has been paid to communities of Mediterranean-Atlantic species and the population of Red band fish. An analysis of the monitoring data collected from 1984 to 1991 shows that many of the species and communities of high nature conservation interest are very stable, long-lived and slow recruiting, and therefore highly vulnerable to damage.

On 30 March 1995 consultation over proposals to put forward Lundy to the European Commission as a candidate SAC was undertaken. Following this Lundy was submitted to The Commission for consideration on 9 January 1996.

The importance of two wrecks (the Iona II and one at Gull Rock, see Figure 7) within the MNR was recognised by their designation under the Protection of Wrecks Act 1973.

Past Conservation Management

Following the statutory designation in 1986, the first formal management plan was published in 1994. This current document updates that management plan and takes into account the new requirements of the Habitats Directive.

At present there is a Warden in post on the island (funded jointly by English Nature and Landmark Trust). Approximately 70% of the Warden's time is spent on matters concerning the marine nature reserve. In recent years a voluntary assistant has been taken on for the busy summer period, with 70% of their time being spent on the MNR.

The Secretary of State designated the Lundy Island Marine Nature Reserve on 20th November 1986 under Section 37 of The Wildlife and Countryside Act (1981). The following year Devon Sea Fisheries Committee made three byelaws under Section 36 of the same Act for the conservation of the sea fish within the designated area.

Byelaw 13 - Prohibition of Spear Fishing within the Lundy Marine Reserve
Byelaw 14 - Trawling and Netting Prohibition - Part of Lundy Marine Nature Reserve
Byelaw 15 - Potting Restriction - Lundy Marine Nature Reserve

These are included in Appendix IV together with the Code of Conduct for visitors to the island.

Concern over the number of lobster and crab pots being deployed on the east side of the island led on 28 June 1991 to an agreement to create a no-fishing zone for the summer months in the area known as Lundy Roads on the east coast. It appears to have worked will but only extends to within 75 m of the shore. The area inshore of the no fishing zone supports some of the most delicate benthic communities which are especially vulnerable to damage by potting activity. This area also supports many of the reef communities for which Lundy has gained international recognition as a cSAC. The Habitats Regulations require that these communities are maintained in favourable condition and that any potentially damaging activities are managed to secure this.

There has been much debate in recent years over the impact of potting activities on fragile marine features and the need for crustacean conservation measures. Devon Sea Fisheries Committee introduced three new byelaws, on 13th September 1998, aimed at safeguarding Crustacea stocks.

- A ban on the removal of any 'V' notched lobster
- A ban on the removal of any lobster with a carapace length less than 87mm long (from 85mm), with this minimum length increasing to 90mm in two years' time
- A ban on the removal of any berried lobster (i.e. a female carrying eggs)

Concerns raised over the damage to fragile species by fisheries activities has prompted discussion over the possibility of a no take zone (NTZ) for the east coast of Lundy. The debate is also fuelled by the need to maintain the interest features of the cSAC as stated above. Initial discussions have taken place with in industry and proposals for a NTZ will continue to be developed. No take zones are seen as both a fisheries management tool, to manage and increase stocks, and directly for marine conservation. As a fisheries management tool, their use is being advocated by a number of fisheries groups around the south-west including the South West Fish Producers Organisation and the Cornish Fish Producers Organisation. Results from other NTZs in temperate and tropical waters have indicated that the increased catch resulting from migration of stock from within the NTZ compensates for

the lost area in a short timescale (three years in the case of the New Zealand Rock Lobster). However, it is uncertain what level of benefit would occur in the UK until an example can be established and monitored.

Concerns have also been expressed over the damage being done to the sensitive reef features by anchors, primarily in the location of the most popular dive sites. It has been proposed and agreed that a mooring be laid at these sites to prevent or minimise any further damage.

4. Historical and Cultural Information

Archaeology

Lundy Island lies across a once much-used shipping route. Consequently many wrecks are located around Lundy, although few are well preserved (Figure 7). Two are protected under the Protection of Wrecks Act 1973 which prevents salvage operations, damage or removal of parts of designated wrecks without a licence. These wrecks may not be dived without a licence[8]. The *Iona II*, a paddle steamer which was built in 1863 and sank the following year, lies in a protected zone with a diameter of 100 m centred on the point 51°11'2"N, 4°38'47"W. The wreck situated close to Gull Rock is of interest because of the likely early date of its military equipment. It lies in a protected zone 200 m across centred on 51°11'7"N, 4°39'25"W.

Resource Management

Commercial Fisheries

Two types of commercial fishing are carried out within the MNR. Netting for all fish within the reserve is controlled under the byelaws and only one permit has been issued. Potting for lobsters and edible crabs has, however, been carried out around the island to varying degrees of intensity for over a hundred years.

Potting levels have increased from those envisaged when the MNR was established. At that time, fishing vessels, mainly from Port Isaac in North Cornwall, visited the area to fish for crabs and lobsters during the summer months. Now five vessels, two from Port Isaac, two from Ilfracombe and one from Bideford, lay about 100 pots within the reserve with many more laid to the west. In summer, the catch averages 3 kg per pot per week for crabs and 0.5 kg per pot per week for lobsters.

Most of the pots for crabs are laid off the west coast, whilst those for lobsters are laid close to the east shore. Potting occurs throughout the reserve except in the exclusion zone shown in Figure 8 (for more detail, see Appendix V) (Downes, pers. comm. 1993). All forms of fishing are prohibited within the protected wreck zones.

5. Public Interest

Research

Biologists have been visiting Lundy since the end of the last century recording the flora and fauna. Professor Harvey of Exeter University studied the intertidal zone in the late 1940s and early 1950s. Since 1969 there has been a much more intensive programme of research in the area which has resulted in comprehensive flora and fauna species lists[2] and a much better understanding of the marine ecology of the area. The driving force behind much of this

[8] See leaflet, 'Underwater finds' available from the warden.

research has been Dr Keith Hiscock. The majority of the research work has been published in the Annual Reports of the Lundy Field Society. Much recent survey work has been carried out by volunteers from the Marine Conservation Society under the scientific guidance of Robert Irving.

A monitoring programme was set up in 1984 to record changes in a variety of littoral and sublittoral communities of high nature conservation interest (Hiscock 1984). The results have recently been analysed and have given great insight into the stability of the communities (Fowler & Pilley 1992).

Education

A marine interpretation centre has now been installed on the island, with the warden now meeting the visitors off the boat at the entrance. Leaflets and displays are available on the mainland (Ilfracombe and Bideford) and on the *Oldenburg*, where a video of the MNR is also shown. The warden leads snorkelling groups, shore walks, seabird walks and slide shows. There are plans to increase the information available by provision of a curriculum pack for schools, new display boards at the shore offices, a divers guide in book form and an updated video.

Recreation

Lundy is a very popular site for divers who either stay on the Island or come over for the day. Most make use of the charter boats that work in the area but some bring their own inflatables on the Oldenburg or come out in RIBs. There are also local hard boats that come out most weekends in the summer. Facilities on the Island are limited and comprise a compressor and the dive huts, which have changing rooms and basic kitchen facilities, although these have recently been improved and rebuilt in the new boat shed building. At present these are run by the warden and so are dependant on her availability. In the past diving on the Island has been run as a separate concern and this could be arranged in the future It is thought that divers do not have a great impact on the reserve, although sporadic souvenir collecting still does occur even though it is prohibited.

A limited amount of sports angling is carried out around the island. The impact of this on the MNR has yet to be fully assessed.

Pleasure boats and other vessels frequently visit and anchor off Lundy. The leeside of the island offers protection from storms and during bad weather many vessels anchor there. There are a few long established moorings at the Landing Bay but when these are full anchoring occurs also. Elsewhere anchoring is discouraged but does occur regularly at popular dive sites. The impact on benthic communities in these areas needs to be assessed. Moorings will be laid at the popular dive sites to allow dive boats to pick up a buoy rather than anchor. This should help minimise damage from anchors.

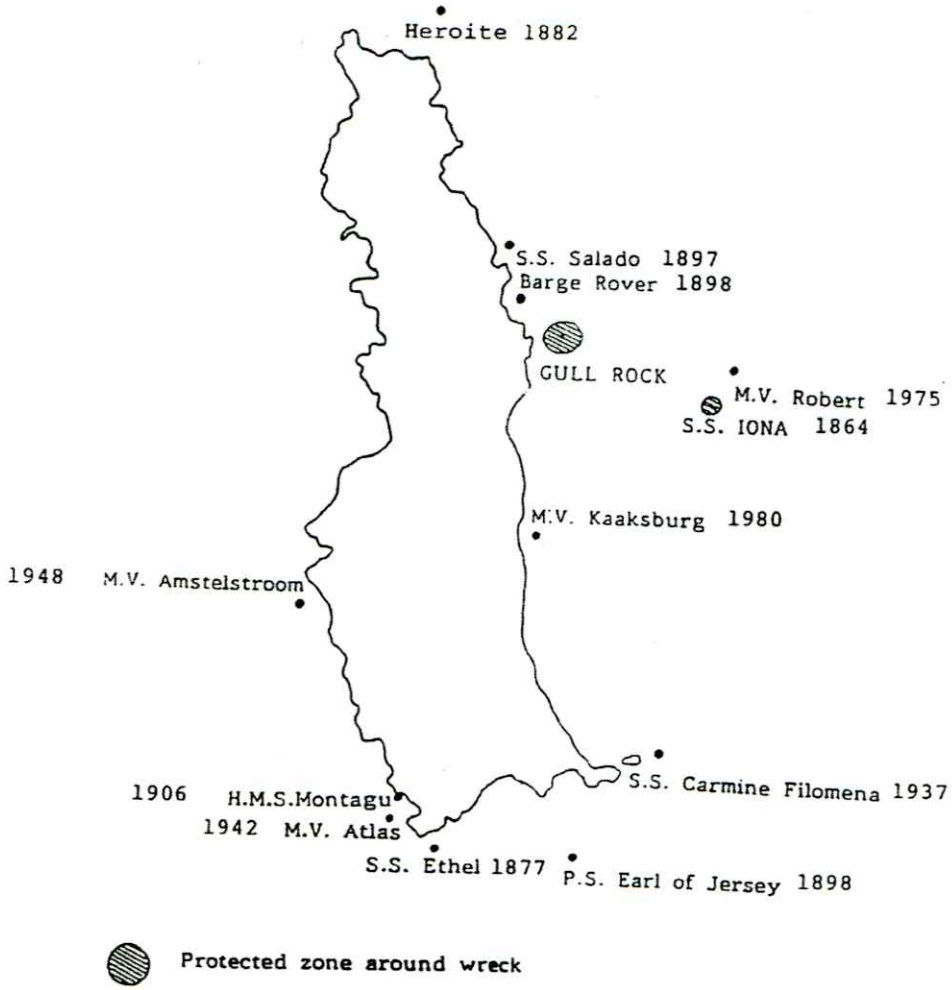


Figure 7. The location of certain, well-known wrecks and the protected zones around those of archaeological interest.

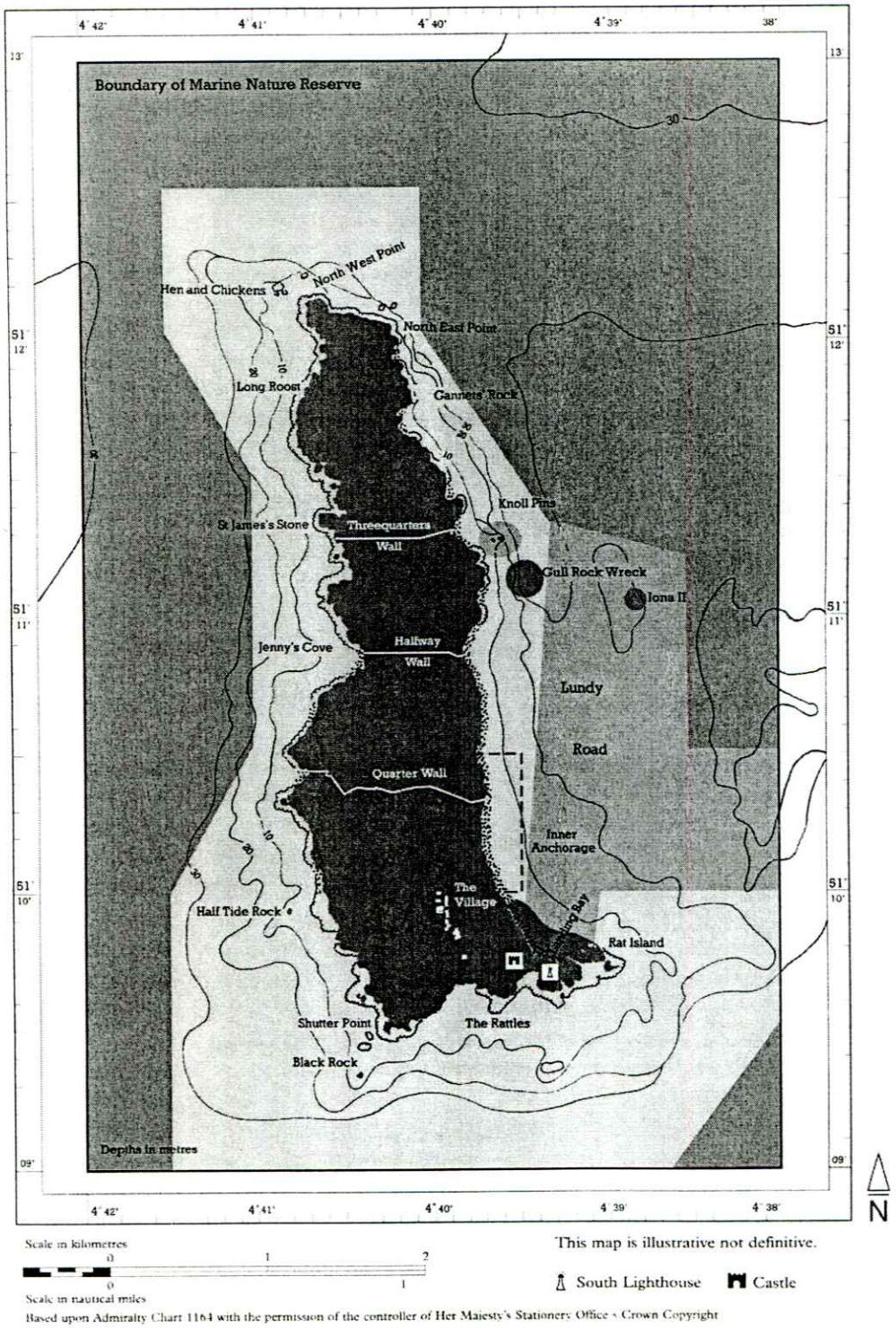


Figure 8. Zoning scheme for Lundy Marine Nature reserve.

6. Generation of Objectives

Evaluation of MNR Features

The criteria used originally to assess the conservation value of marine sites around Lundy are based on the criteria described by Ratcliffe (1977) for terrestrial areas and are applied in the sense of the joint NCC/NERC Working Party on Nature Conservation in the Marine Environment. The procedure for SAC selection is described in The Habitats Directive: selection of Special Areas of Conservation in the UK, JNCC (1997).

Size

Within the MNR there are extensive areas of good examples of widespread habitats and unusual or rarely encountered habitats in Britain. The east coast includes the wave-sheltered rocky sublittoral areas which support communities of high conservation importance because of their rarity. No similar areas of such high quality are known in south-west Britain. The large extent (1.8 km^2) of muddy gravel off the east coast is considered of high importance since this habitat and its associated communities are rarely encountered in south-west Britain. The approximately 40 ha of mud and mud over gravel comprise another rarely encountered habitat.

Diversity

The diversity of species and communities around Lundy is very high within the context of south-west Britain and, for the length of coastline, in the British Isles as a whole. Rock communities in the sublittoral are rich, in part, because of the position of Lundy in south-west Britain, with warm water currents allowing species normally more southern in their distribution to occur. The small numbers of the sea urchin *Echinus esculentus* are also important since grazing pressure is low. Intertidal rock communities in sheltered areas are somewhat impoverished compared to those on the mainland because of the absence or very low abundance of some key gastropod species with short-lived planktonic larvae. Community diversity is high because of the wide range of environmental conditions and substratum types resulting from variable wave and tidal stream exposure around the island.

Naturalness

All of the communities within the MNR are natural communities influenced very little by the activities of man with the exception of communities on wrecks. The *MV Robert*, which lies within the Reserve boundary is the only wreck whose communities have been thoroughly studied. These are of high scientific interest and provide an opportunity to study colonisation and succession, important factors within the MNR.

Rarity

There are a large number of rarely encountered communities and species present around Lundy (see Tables 2 and 3). It is this large number of rare communities and species that ensures the high scientific interest of the island, rather than the presence of any one community or species.

Fragility

Most communities present around Lundy are probably resilient to minor environmental change. However there are a number of potential problems that can be identified resulting from activities within and outside the Reserve boundary. Many of the communities and

species would be vulnerable to an increase in suspended sediment load, resulting from dredging for sand and gravel on nearby banks, as this would settle on the seabed smothering communities and also reduce light penetration. The ecology of sublittoral rocky and sediment areas would be adversely affected by fishing activity (eg trawling, dredging and potting activity) as this disturbs and can cause considerable physical damage to benthic communities as well as diminishing natural stocks. The use of tangle nets for fishing would trap non-target species in addition to commercial crustaceans. Delicate benthic communities are also vulnerable where anchors are used or where pots are dropped on the seabed. Populations of slow-growing species, including sea fans and cup corals, have been severely reduced by collecting in the past and are vulnerable to damage and future collection by divers.

Typicalness

Lundy provides representatives of a wide range of commonly occurring habitats, communities and species. Those habitat types which are widespread in south-west Britain but particularly well-represented at Lundy are the rocky littoral and sublittoral areas which contain typical examples of communities subject to a wide range of exposures and extending to depths below the infralittoral.

Recorded history

The large amount of scientific study, particularly descriptive surveys, carried out around Lundy has provided a very good base for assessment and management. A greater amount of information has been collected from here than for any other marine site in the British Isles with sublittoral rocky areas as a key component.

Position in an ecological/geographical unit

Lundy falls within the Lands End to Minehead Natural Area. Lundy is already managed by organisations dedicated to the conservation of the scenic and wildlife values of the island.

Potential value

The potential value of Lundy for recreation, particularly associated with studies of natural history and associated activities, has not been fully realised. The wide range of habitats, communities and species makes Lundy an excellent location for the amateur naturalist as well as professional biologists and divers.

Intrinsic worth/appeal

The area above the low water mark is of SSSI status and the presence of extensive seabird populations and the colony of grey seals makes the whole area of high scenic, scientific and recreational value. This feature is rated very highly. The colourful nature of many of the species and communities around the island is outstanding in south-west Britain. The scenic appeal both above and below water are highly attractive features.

Research and educational value

Descriptive and monitoring studies of near shore sublittoral and intertidal areas around Lundy have been completed in greater detail than for any other similar sized area in Britain. This provides a basis for identifying sites which could provide important information on the dynamic aspects of sublittoral communities. In the context of marine nature reserve management, information is needed on the longevity, growth rates and reproductive success of several species of nature conservation importance. Many of these species are present on

Lundy and there is the opportunity to use the island for long-term studies of these species and of sublittoral communities in general.

There is also great potential to conduct fisheries research.

These values have been proven over the past twenty years by the very large quantity of research carried out around the island, the running of several courses in marine ecology, and the visits to Lundy by amateur divers specifically because of the underwater wildlife appeal. However, the value of the island for these activities must be set against the difficulty of reaching the island, the restricted availability of accommodation once there and the inaccessibility of the majority of the intertidal shores.

Summary of important features of the MNR

The outstanding scientific interest of the marine environment around Lundy has been demonstrated over the past twenty years in a wide range of scientific publications and reports. In addition, a large number of acknowledged experts in various fields of marine ecology have worked at Lundy and consider the area to be outstanding. In relation to other areas along the south-west coast of Britain, Lundy is of exceptional interest.

Biotic and abiotic features of the Marine Nature Reserve have been evaluated in terms of their international, national, regional or local importance and are described in Tables 2 and 3. These are based on the results of the south-west Britain sublittoral survey (Hiscock 1981) and other surveys carried out in Britain. For definitions of ratings and importance see Appendix VI.

INTERNATIONAL	NATIONAL	REGIONAL	LOCAL
Intertidal			
1. Communities on mostly unbroken bed-rock on the open shore 2. Communities on broken bed-rock (slate shores) 3. Communities in caves 4. Communities under stones and boulders.	1. Communities in rock pools.	1. Communities on boulder beaches.	1. Communities in sand.
Sublittoral			
1. Communities on mostly unbroken bed-rock. 2. Communities on stable boulders. 3. Communities on cliffs 4. Communities in sublittoral caves. 5. Communities in canyons.	1. Communities on wrecks. 2. Communities on muddy gravel. 3. Communities in mud and muddy sand.	1. Communities on mobile boulders. 2. Communities on sandy rocks and rocks adjacent to sand in shallow depths. 3. Communities on stones subject to strong tidal streams. 4. Communities on clean stable or semi-stable gravel. 5. Communities on clean mobile gravel. 6. Communities in sandy mud or mixed sediments 7. Communities on sand-covered and scoured rocks. 8. Communities on mixed sediments.	1. Communities in medium well-sorted sand in the Landing Bay. 2. Communities in coarse sand off the north and south coasts. 3. Communities in muddy sand.

Table 2. Marine communities of high nature conservation interest around Lundy.

INTERNATIONAL	NATIONAL	REGIONAL
Algae - Rhodophyta		
Schmitzia hiscockiana *(Schmitzia neopolitana)*	*Schmitzia neopolitana* *Pterpsiphonia pennata*	*Grateloupia dichotoma* *Scinaia turgida* *Asparagopsis armata* *Drachiella spectabilis* *Myriogramme minuta*
Algae - Phaeophyta		
	Choristocarpus tenellus *Carpomitra costata*	*Laminaria ochroleuca* *Microsporangium gelatinosum*
Animals - Porifera (sponges)		
	Axinella damicornis *Adreus fasicularis* *Tethyspira spinosa* *Thymosia guernei* *Axinella polypoides*	*Rhaphidostyla incisa*
Animals - Coelenterata: anthozoa		
Hoplangia durotrix *Halcampoides purpurea* *Caryophyllia inornata* *Leptopsammia pruvoti* *Eunicella verrucosa* *Balanophyllia regia* *Parerythropodium coralloides*	*Aglaophenia kirchenpaueri* *Alcyonium glomeratum* *Mesacmaea mitchellii* *Parazoanthus axinellae* *Parazoanthus anguicomus* *Aiptasia mutabilis* *Amphianthus dohrnii*	*Aureliana heterocera*
Animals - molluscs: opisthobranchia		
	Colpodaspis pusilla *Tritonia nilsodhneri* *Greilada elegans* *Trapania pallida* *Trinchesia sp* *Caloria elegans*	
Animals - Bryozoa		
	Callopora discreta *Ammatophora nodulosa* *Smittina affinis* *Mimosella verticillata* *Hippoporidra lusitanea*	
Animals - Ascidiacea (sea squirts)		
	Archidistoma aggregatum *Molgula oculata*	*Pyc oclavella aurilucens*
Animals - Pisces		
	Cepola rubesens	*Cetorhinus maximus* *Mola mola*
Animals - Mammals		
		Halichoerus grypus

Table 3. Marine species of high scientific interest around Lundy.

General features

Lundy is now a candidate Special Area of Conservation (SAC), in recognition of its international importance for marine wildlife. Of international importance is the presence of both intertidal and subtidal reef communities and species of Mediterranean-Atlantic or oceanic character. Many of these have not been observed elsewhere in England and are near the limit of their northern distribution at Lundy.

Of national importance are firstly the wide variety of habitats within a small area and secondly the large number of rare or unusual species. Habitats range from those extremely exposed to wave action to those very sheltered and from areas exposed to fast tidal streams to areas where tidal flow is negligible. In the intertidal habitat, diversity is increased by the presence of rockpools, caves, understone and crevices. In the sublittoral the range of habitats is outstanding with examples of sheltered rock and sediment habitats in shallow water many of which are rarely found elsewhere in south west Britain. The very large number of rare species recorded within the reserve rather than the presence of any one species is regarded as being of great conservation importance.

The MNR in wider perspective

Lundy is the only MNR in England at the present time. It is therefore of great importance not only for the marine communities it contains, but also as a flagship for marine conservation in England.

Ecological Relationships and Implications for Management of the MNR

Lundy is of high scientific interest because of the great diversity of habitats and communities found in such close proximity and for the large number of rare species. These result from the complex interactions of a number of environmental factors.

The main causes of the great diversity in habitat are rock type and water movement which affects the supply and distribution of mobile substrata. Varying exposure to wave action and tidal streams around the island result in a range of habitats from bare bedrock to sediment plains. In addition, local topographical features such as crevices, caves, gullies and rockpools produce a great diversity of microhabitats within which different communities develop. On the shore, wave action is vital in determining species distribution. The zonation of species up the shore is governed by the regular ebbing and flowing of the tide. In the sublittoral zone, tidal streams as well as wave action are the chief factors influencing the distribution of species. These in turn influence, for example, siltation and food supply. With increasing depth, light attenuation and reduced wave action results in the development of different communities.

The large number of Mediterranean-Atlantic species found around Lundy is due to the relatively warm sea temperatures and the island's location with respect to currents flowing from sources of recruitment. Many of these species are near or at the northern limit of their distribution. Analysis of the monitoring data for the last eight years has shown that many of these species, particularly those in the sublittoral zone, show remarkable stability. In general, communities which are composed of long-lived, slow growing species with poor recruitment are much more vulnerable to disturbance and take much longer to recover than highly dynamic communities where species have a short life span and high recruitment. For example, it is estimated that the sea fan *Eunicella verrucosa* grows at an average rate of only about 10mm per year and that the population is still showing the effects of extensive collecting in the 1960s and 1970s. Likewise many of the southern sponge and anthozoan species take a long time to recover from disturbance. The vulnerability of these species must

be taken into account when prescribing management. Activities likely to cause direct physical damage (for example potting, trawling, anchoring, diving) must be recognised and regulated through the management plan to minimise their impact.

It is the complex interactions of environmental factors that determines the present rich communities found in the Marine Nature Reserve. Management can generally have little direct impact on these factors unless it produces a major change in the water movement regime. Changes in the tidal stream velocity or degree of wave action would have a marked impact on the habitat and therefore the community type that develops. More relevant are changes in the water quality brought about by man's activity within or in the vicinity of the reserve. An increase in turbidity (caused, for example, by sediment plumes from aggregate dredging or construction work at the Landing Beach) reduces light penetration, thereby restricting algal growth. Increased deposition of sediment may smother existing communities and cause their replacement by others better adapted to the altered conditions. The interrelatedness of environmental factors in the marine environment should be taken into account when deciding on management options. The marine communities around Lundy are for the most part natural and the main management required to ensure that they survive is to minimise the disturbance caused by man's activities.

Factors Influencing Objectives

Man-induced trends

The development of a road from the Landing Beach to Divers Beach in 1990 and 1991 resulted in the creation of a considerable quantity of fine shingle and silt adding significantly to that produced by natural processes. This washed off the Landing Beach and formed a plume of sediment along the east coast for several months whilst construction was in progress. The fine shingle and silt also smothered many of the small intertidal rockpools located between the Landing Beach and Divers Beach thus damaging important examples of these communities. Some of these rockpools are now being recolonised.

During 1998 major reparation work was undertaken on the road between the Landing Beach and the Dive Beach following its collapse late in 1997. Both the collapse and the repair work resulted in shingle being added to both beaches and the inevitable periodic formation of sediment plumes in the Landing Bay. Several rockpools have been either totally or partially smothered by this shingle. It is intended that this shingle be removed and utilized during the construction of the jetty in 1999. It is hoped that the rockpools will quickly recolonise.

Work on the jetty started in March 1999, and was completed in September 1999. The construction was of an open structure to reduce changes to water and sediment movement. Piles were sunk into the seabed to support a concrete platform, prefabricated on the mainland. A full Environmental Assessment was carried out which raised no major objections but did stipulate some recommendations concerning the timing of the pile laying.

Whilst these projects have caused short term damage and disturbance to the reserve they resulted in the formation of two new manmade habitats not found elsewhere in the reserve. Monitoring of the colonisation of these new habitats is being undertaken.

Extensive souvenir collection of several sublittoral species (in particular the sea fan *Eunicella verrucosa*) in the late 1960s resulted in a serious diminishment of the populations. This species is vulnerable and classed as locally threatened in the IUCN Invertebrate Red Data Book. This activity is now banned but, although recovery is taking place, it is still possible to see the effects because of the species' slow recruitment and growth rates.

Potting in the reserve necessarily causes a decrease in the population size of crabs and lobsters and is believed to be damaging to fragile and slow growing species such as sea fans, cup corals and branching sponges. An increasing database of information is being collated on this subject and assessment of the potential impacts and consideration of management options are ongoing.

External factors

Several activities, which are carried out within the Bristol Channel, could potentially influence the waters and therefore marine wildlife communities around Lundy.

Aggregates are extracted from a number of sites within the Bristol Channel. These are not thought to seriously affect the waters around Lundy. However, if future sites were nearer, sediment plumes produced by the extraction process could smother benthic communities and reduce water clarity. All applications to extract aggregates are subject to the Government View Procedure, administered by the Department of the Environment, Transport and the Regions.

Some licences for oil exploration within the Bristol Channel have already been issued and more may be issued in the future. This type of activity within the vicinity of the MNR could have far-reaching consequences for marine life.

Legal constraints

Constraints of tenure

The ownership of Lundy by the National Trust and its leasing to the Landmark Trust eases the running of the Marine Nature Reserve. Therefore no constraints are envisaged although continued close liaison is necessary. English Nature lease sea seabed of the MNR from the Crown Estate Commissioners. This is with the exception of the seabed in the Landing Bay, which is leased by the Landmark Trust from the Crown Estate Commissioners. This does not affect the status of the MNR except in that this area is recognised as an area subject to disturbance. However, new types of development within the MNR, including setting up alternative mooring and anchorage areas, will require consent from the Crown Estate.

Constraints of access

The public have privilege of access to the foreshore and the right of navigation and recreational fishing (except spear-fishing). Access to the island is controlled by the Landmark Trust.

Constraints of other legal users and byelaws

Other legal users of the shore, seabed, water column and sea surface include a wide range of statutory and non-statutory bodies and individuals who either have a legal right to certain activities or a general right not covered by law. These include: fishing for commercial species; salvage of wrecks owned by the salvor; navigation; discharge of substances from vessels. If English Nature wishes to implement byelaws affecting the legal rights of any other statutory body, it is that statutory body which has to seek and implement those byelaws. English Nature and Devon Sea Fisheries Committee have introduced byelaws which restrict certain activities and these are listed in Appendix II. Restrictions also exist regarding the protected wrecks and Scheduled Ancient Monuments.

Health and safety of employees

Work on the shore, in boats and underwater around Lundy is potentially hazardous. Employees of English Nature, including those undertaking commissioned work but employed by another organisation, are expected to abide by appropriate English Nature safety codes outlined in the Safety Handbook.

Section 3: Terrestrial

1. The Physical Environment

Soils

The soils of Lundy are identified as belonging to the Moretonhampstead and Moorgate associations by the Soil Survey of England and Wales. Moretonhampstead series soils, which predominate in the south of the island, are well drained, gritty, loamy soils with a humose surface horizon in places. Moorgate series soils, which are found in the north, are shallower, well drained, gritty, loamy soils which occasionally have a thin iron pan. These occur with Hexworthy soils, which are gritty, loamy, very acid soils with a wet, peaty surface horizon and often a thin iron pan. These soil types are found on steep slopes as well as the flatter areas and may be interspersed between rock outcrops and boulders. The soils are well drained and absorb winter rain readily, except on steep slopes where there is some surface run-off.

2. Biological Information

The following species, occurring on or around Lundy, are defined as priority species within the UK Biodiversity Action Plan (UKBSG/English Nature 1995, UKBG/English Nature 1999).

Vascular plant
Coincya wrightii - Lundy cabbage
Beetle
Psylliodes luridipennis - a flea beetle

Flora and Fauna

Variations in historic and pre-historic management, in aspect, slope, geology, exposure and in drainage, have given rise to several widespread vegetation communities on the plateau and sidelands of Lundy. There are, in addition, several distinct localized communities as well as extensive areas of transition between community types. A number of studies have been carried out on the vegetation, many published in the journal of the Lundy Field Society. The most recent overall description is that of the National Trust Biological Survey (1991). The reader is referred to that document for fuller description and species lists.

Several rare and local higher plant species have populations on Lundy including the endemic Lundy cabbage *Coincya wrightii*, the local balm-leaved figwort *Scrophularia scorodonia* as well as the uncommon small adders-tongue fern *Ophioglossum azoricum* and hay-scented buckler fern *Dryopteris aemula*. Also, Lundy supports the largest population of the rare and specially protected Golden-hair lichen, *Telioschistes flavicans*, in the UK.

The main communities can be summarized as follows:

Woodland and Scrub

While pollen records indicate the presence of oak, alder, birch and hazel (Gardner, 1969), there remains nothing that could be described as semi-natural woodland. The stands of trees on the south-eastern slopes of the island are largely dominated by exotic species, especially sycamore *Acer pseudoplatanus*. Floristic interest here is low, though these areas provide

valuable shelter and feeding for migrant passerine birds which can arrive on Lundy in large numbers in spring and autumn.

There are semi-natural scrub communities in areas protected from extremes of climatic exposure and/or grazing pressure. Areas of gorse *Ulex europaeus* and *U. gallii* as well as stands dominated by blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna* are found on slopes on the south-eastern sidelands.

The most conspicuous woody-plant community on Lundy is that dominated by rhododendron *Rhododendron. ponticum*. This was introduced to the garden of Millcombe in the early 19th Century and has invaded extensive areas of the eastern sidelands. Seedlings of this woody weed are found outside these areas, notably in the moist plateau turf at Pondsbury and around other wetland areas. A full account of the distribution of rhododendron can be found in Compton *et al.*, (1998) where control measures are advocated as they are in the prescriptive section of this management plan.

Heath

Low *Calluna vulgaris* dominated heath forms extensive stands in the northern quarter of the island and occurs in smaller stands elsewhere on the less intensively grazed fringes, as at the south-western corner of the island. Its growth and distribution are strongly controlled by grazing pressure and have been influenced by fire. In the northern areas the heath often demonstrates the "waved heath" form associated with regular directional exposure to salt-laden winds.

Other ericoids are not well represented here, though bell-heather *Erica cinerea* and cross-leaved heath *E. tetralix* are occasional.

In the northern stands the heathland shows good development of lichen communities dominated by *Parmelia* and *Cladonia* species and there is a healthy population of the rare *Teloschistes flavicans* on the western sidelands. Serious fires in the 1930s as well as subsequent smaller burns have probably had a profound effect on the distribution of heathland as well as on its epiphyte flora. The North End was particularly affected by the 1930s fire.

There are extensive areas of transition between heath and other communities, notably with bare rock (where colonization after deep fires is still taking place), with acid grassland and with bog communities.

Acid Grassland

Where plateau areas are not dominated by heath there are extensive areas of acid grassland dominated by *Agrostis capillaris, A. stolonifera, A. canina, Festuca rubra* and *F. ovina*. Acid grassland occurs on deeper fertile soils and where there is little influence from agricultural fertilizer and lime application. High grazing and trampling pressures favour acid grassland. These communities are best represented at Middle Park. Within the close turf of these grasslands are a number of other acid grassland species and strong populations of the rhizomatous sedge *Carex arenaria*. Here, and in transitions with heath, are outstanding displays of the rare small adder's tongue fern *Ophioglossum azoricum*. In the heathland/grassland transition mosaic near the Rocket Pole, is a population of autumn lady's tresses *Spiranthes spiralis*, together with the Island's second colony of dwarf adder's-tongue fern.

The soil invertebrate fauna of these areas warrants further study.

Maritime Grasslands

The sidelands of Lundy, where encroachment by bracken *Pteridium aquilinum* or rhododendron has not occurred support a range of herbaceous vegetation. In areas most exposed to salt-laden winds maritime species such as thrift *Armeria maritima*, sea campion *Silene maritima*, buck's-horn plantain *Plantago coronopus* and rock spurrey *Spergularia rupicola* occur frequently in a turf dominated by the grasses *Festuca rubra* and *Holcus lanatus*.

Maritime grassland on the western sidelands contains small patches of Golden-hair lichen, particularly on Ackland's Moor.

Where grazing by rabbits has been very intense, and particularly on steeper slopes, as above Kittiwake Gully in the extreme north, thrift may dominate to the virtual exclusion of all else.

The cover of bracken in exposed western grasslands is usually sparse. However in the more sheltered eastern sidelands there are extensive stands of grassland under a continuous, though seasonal, low bracken canopy. In these areas there are impressive stands of bluebell *Hyacinthoides non-scriptus*.

The most sheltered grasslands of the south-eastern sidelands exhibit a range of tall herbaceous vegetation with species such as red campion *Silene dioica* and hogweed *Heracleum sphondylium*. Here are found hay-scented buckler fern *Dryopteris aemula* and scattered plants of the red-data book balm-leaved figwort *Scrophularia scorodonia* and the world's population of Lundy cabbage *Coincya wrightii* . Both species also occur on unstable cliffs and slopes on slate substrata above the landing beach. These areas show incipient scrub development with the establishment of plants such as bramble *Rubus fruticosus*, ivy *Hedera helix*, gorse *Ulex* spp. and blackthorn *Prunus spinosa*. These are also the communities which appear to be most prone to invasion by rhododendron.

Improved Grasslands

In the non-SSSI enclosures at the south of the island the grasslands are floristically poor grass leys, dominated by sown grasses such as rye grass *Lolium perenne*. In other areas, such as Ackland's Moor, Castle Hill and the southwestern corner of the island, intensification of agricultural effort has been less recent and less persistent and a semi-improved grassland occurs. Here *Festuca rubra* and *Agrostis capillaris* may dominate with associates such as yarrow *Achillea millefolia*, white clover *Trifolium repens, Cerastium* spp. etc. In areas of impeded drainage within semi-improved grassland there are stands of soft rush *Juncus effusus* giving rise to a community of limited extent akin to a fen meadow.

Mire and Fen Communities

Several flush and mire communities occur, but the development of *Sphagnum*-rich bog is virtually restricted to the Pondsbury basin, surrounding an artificially impounded body of open water.

At Pondsbury, in the *Sphagnum* mire are populations of deer grass *Scirpus cespitosus*, bog asphodel *Narthecium ossifragum*, bog pimpernel *Anagallis tenella*, marsh lousewort *Pedicularis palustris*, creeping willow *Salix repens*, round-leaved sundew *Drosera rotundifolia* and cotton-grass *Eriophorum angustifolium*. Transitions with open water are marked by marsh St John's wort *Hypericum elodes* while drier fringes are typically rich in sharp-flowered rush *Juncus acutiflorus*. Ivyleaved bellflower *Wahlenbergia hederacea* occurs in this wetland complex.

A number of runnels and flushes occur, particularly on the margins of the plateau where they incise the bevel above the sidelands. These have good invertebrate faunas and are floristically rich. The western flushes which rise from acid grasslands or acid mires are typically marked by populations of bog pondweed *Potamogeton polygonifolius*. The flush at Gannets Coombe has small but impressive stands of greater tussock-sedge *Carex paniculata* and, elsewhere along the east sidelands, communities approaching tall-herb fen can be found.

Lundy has several small freshwater pools, some of which have populations of introduced fish (mirror carp, crucian carp and golden orf).

Cliff, Rock and Crevice Communities

Most of the perimeter of Lundy is precipitous, and on rocky cliffs are characteristic western cliff communities with sea beet *Beta maritima*, rock spurrey *Spergularia rupicola*, early scurvy-grass *Cochlearia danica*, rock samphire *Crithmum maritimum* and sea spleenwort *Asplenium marinum*. These open-rock communities frequently grade with the herbaceous communities described above, but on the unstable slate cliffs of the southeast there are a number of active screes and plentiful opportunities for the establishment of short-lived, regular-seeding plants of rocky slopes. One such plant, known only from Lundy, is the Lundy cabbage *Coincya wrightii*. Associated with this is the endemic Lundy cabbage flea beetle *Psylloides luridipennis*.

Another robust herb, balm-leaved figwort *Scrophularia scorodonia* also flourishes under the unstable conditions of the southeastern cliffs above the landing bay and access road. The maintenance of a degree of instability is probably essential for these species.

Invertebrate Fauna

Endemics

These include the endemic Lundy cabbage Flea Beetle *Psylliodes luridipennis*, an endemic 'form' *pallipes* of uncertain taxonomic status of the weevil *Ceuthorhynchus contractus* and an undescribed island form of the flea beetle *Psylliodes napi*. These feed on the island's previously mentioned endemic plant, Lundy cabbage, *Coincyia wrightii* and constitute the only assemblage of endemic invertebrates associated with an endemic plant in the whole of Britain.

Island 'forms' of the solitary bee *Halictus rubicundus* varient *nesiotis* and of the beetle *Stenus ossium* var. *joyi* have also been described from Lundy.

Invertebrates

Nine Red Data Book (RDB) and 70 Nationally Scarce species of Invertebrate have been recorded from the island. Particularly scarce species are the RDB beetle *Melanophthalma distinguenda*, which is known elsewhere in the UK only from Steep Holm, also in the Bristol Channel, the click beetle *Cardiophorus erichsoni*, RDB species known only from one site each in Cornwall, South Devon and Pembrokeshire. The weevil *Procas armillatus*, RDB species, whose specific ecology is unknown and for which Lundy is the only known site since 1950. The moth *Nothis congressariella*, RDB species associated with the RDB Balm-leaved figwort, *Scrophularia scorodina*, which is abundant on part of the island and otherwise only occurs at a few sites in Devon, Cornwall and on the Isles of Scilly.

Other invertebrate groups are described in various publications of the Lundy Field Society. See the National Trust biological survey for a synopsis.

Vertebrate Fauna

Mammals

The Pygmy shrew *Sorex minutus* and grey seal are thought to be the only mammals native to Lundy, though the island currently hosts wild or feral populations of rabbits, brown rat, ship or black rat, sika deer, goats and Soay sheep. A Brown long-eared bat has been recorded, and there are periodic bat sightings, but there is no confirmed breeding or roosting of any bat species.

Rabbits, the feral ungulates listed above, and domestic livestock have undoubtedly had a profound effect upon the structure and distribution of vegetation on Lundy. Several behavioural and ecological studies have been carried out, but the precise contribution of individual species is hard to assess given the instability in numbers of rabbits (which in "good" years occur at very high density) and the response of plant growth in response to short-term climatic fluctuations.

Rats are known, worldwide, to be inimical to ground-nesting seabird colonies. It is possible that Lundy's very small populations of puffin would increase with the removal of rats. Seabirds frequently recorded at Lundy but for which there is no proof of breeding, such as storm petrel could establish breeding colonies following rat eradication. Rats are also considered to be pests in the domestic environment and control is essential around the settlement.

Wolton (1995) reviewed the dilemma of whether or not to control rats on Lundy, and considered various management options. Rats of both species have been controlled, through poisoning, since 1987, in an attempt not to eradicate them but to limit their numbers, principally for human health & hygiene reasons. This policy needs to be re-examined.

It is the view of English Nature, Landmark Trust and National Trust that rat control may be desirable. Due to the complexity of control on the island a costed feasibility study has been carried out to inform any future decisions with regard to rat control on the islands.

Landbirds (for seabirds, see the marine section)

Breeding birds

The island supports modest populations of species typical of the British Atlantic fringe such as: stonechat, rock pipit, peregrine falcon and raven. On the plateau is a suite of species associated with low-intensity pastoral farming including: lapwing (in very low numbers), meadow pipit, skylark and wheatear. Oystercatchers breed along the coastal fringe.

Migrant birds

Lundy is well known in ornithological circles for its transient populations of migrant birds. As at many west coast islands there can be spectacular "falls" of nocturnal migrants during suitable weather conditions in spring and autumn, as well as smaller numbers of diurnal migrants and oceanic species (such as the much fêted ancient murrelet in the early 1990s).

Typically these falls of migrants are composed largely of commoner species of northwest Europe: flycatchers, the warblers *Phylloscopus* and *Sylvia* spp, and migratory thrushes and

chats, but most years see the arrival of vagrants from both North America and Eurasia, some of which are extremely rarely recorded in the western palaearctic.

Lundy has been, and still is, a focus for ornithological activity with regular parties of bird ringers using the island's two remaining Heligoland traps or, more frequently, mist nets. Detailed daily records of visual sightings and trappings are kept.

3. Conservation History

Lundy SSSI was first scheduled in 1976 under the National Parks and Access to the Countryside Act 1949. It was renotified in 1987 under the Wildlife and Countryside Act 1981.

The designation of the majority of the island above mean low water mark as SSSI recognised a number of biologically important features: the areas of waved *Calluna* heath with associated rare lichens and invertebrates; the breeding seabirds and seals, and rare plants. The long history of biological research primarily carried out by the Lundy Field Society has added to this value.

Lundy was listed in the Nature Conservation Review in 1997 as much of the island is of recognised national importance for wildlife conservation.

Thirteen sites were scheduled as Ancient Monuments following a number of excavations in the 1960's. In 1998 the number of Scheduled Ancient Monuments was increased to 41 in a review of monuments under the Monuments Protection Programme by English Heritage; this gives increased recognition to the huge wealth of archaeology surviving on the island.

Past Conservation Management

A *Management Plan for Lundy*, drafted by Neil Wilcox in 1988, makes a number of recommendations for managing terrestrial communities, notably those dominated by rhododendron and planted trees.

The National Trust Biological Survey of Lundy (1991) makes a number of management recommendations, particularly in relation to the management of grazing within the SSSI and provides a valuable description of the island's terrestrial communities.

The Island has a Countryside Stewardship Agreement with DEFRA where a programme of rhododendron control, bracken cutting, dry stone walling and tree planting is agreed and grant aided. This rhododendron control is to contain the spread and to try and restrict the plant to discrete clumps with broadleaf trees planted between the clumps. Funding is also received from English Nature's Species Recovery Programme to employ specialist rope access contractors to control the rhododendrons that are threatening the Lundy cabbage. The programme of work is set out in Compton *et al.* (1998).

Grazing, the critical management tool for the majority of the SSSI, has historically been carried out under a series of flexible understandings between the parties concerned. Stocking practice has been determined largely as a result of the island's agricultural priorities at the time rather than through an analysis of nature conservation needs. This situation was addressed in 1994 through the 'Agreed Grazing Management' plan (Wolton 1994). The Agreed Grazing Management document will be reviewed during this plan period.

Management of the islands waste is currently subject to review by the management group to insure disposal options do not cause damage to the terrestrial or marine environment.

4. Historical and Cultural Information

Archaeology

Flint microliths dated to the Mesolithic period are the first evidence of human presence on Lundy. At this time Lundy may still have been connected to the mainland. There is no further evidence of occupation until the late Bronze Age when the 12 or so hut circles were constructed within a compound on the North End. By the early Iron Age a number of hut groups with associated small fields were spread over the plateau. The inhabitants are likely to have subsisted on crops grown in their fields, grazing the unenclosed areas with livestock, fishing and fowling. Any tree cover was probably cleared at an early stage. Certainly by 1274 none remained, as an inquisition that year reported that no timber was to be found.

Lundy is rich in archaeological remains dating from the Mesolithic period to the present day. In 1990 the National Trust began the Historic Landscape Survey of Lundy, a topographical survey of the island, which will identify and document in detail all visible archaeological traces of past land use. The survey is ongoing.

Lundy contains a remarkable and unique archaeological landscape. The island has been inhabited since at least 5000 BC and traces of settlement and activity from prehistoric times to this century survive throughout the island. These include prehistoric and medieval settlements associated with field systems and religious/ritual monuments ranging from prehistoric standing stones and burial mounds to the unique early Christian cemetery and nineteenth-century church. Farming, fishing and fowling would have been the mainstay of island life for much of this period and the use of natural resources is reflected in granite boundaries, buildings and millstones, with evidence for past water management surviving as ponds and dams and walled springs. The island was a royal rabbit warren in the medieval period. In the post-medieval period, maximum use was made of the east sidings by the creation of narrow cultivation terraces.

Defence, signalling and the strategic position of Lundy led to the construction of the small medieval and later castle, lighthouses in the nineteenth century, and a number of gun or signalling batteries surviving on the cliff slopes.

The short lived granite quarry on the east cliffs had a huge impact on the island, and the quarries and ruined buildings form a rare, undeveloped time capsule of industrial life and activity from the 1860's. The use of Lundy as a gentleman's residence in the nineteenth and twentieth centuries developed much of the village and led to the creation of walled gardens at Millcombe and an unsuccessful attempt at commercial exploitation - a golf course on Acklands Moor. Throughout this period of settlement, man's activities on Lundy have had a direct influence on the type of flora and fauna found on the island.

Much of the archaeological wealth of Lundy has survived because the island was only intermittently developed and then on a relatively small scale. The well preserved, low, ruined walls of houses and boundaries, reminiscent of upland archaeology, from the prehistoric period onwards, lie north of the Three-Quarter Wall. Much more subtle and buried features are found at the southern end of the island where they have been under more pressure from ploughing and other activities. The latter are less visible on the surface but may be very significant below ground as excavations in the 1960's in Bull's Paradise and the Old Cemetery demonstrated.

The National Trust recorded the visible archaeology of Lundy in an historic landscape survey in the 1990's. The survey is now recorded on a database and digital plan. It is hoped that a map based computer record will be available for use on the island in 1999-2000. New

information on the archaeology will always emerge as new research and survey takes place and this will need adding to the record. Two areas of importance under consideration for further study are a programme of environmental archaeological analysis and a study of the many dispersed artefacts which have been collected from Lundy. The importance of Lundy's archaeology is reflected in the high number of sites protected as Scheduled Ancient Monuments, recently increased to 41, 18 of which are within the SSSI.

Land Use History

Historically the vegetation on Lundy has been grazed at varying intensity and by a variety of animals: from sheep, cattle, rabbits and ponies for commercial use to the introduction of exotic species such as Soay sheep and Sika deer (Thackery 1989). The vegetation has also been affected by past cultivation: the eathwork remains of ploughed field systems are found from north of Three Quarter Wall right down the plateau to around the modern village, with small cultivation terraces being created along the East Sidings from at least the medieval period. Trees, scrubs and peat or turf were probably used for fuel and at times settlement pressure must have made the supply of fuel scarce. It is hoped that a study of the paleo-environment of Lundy (currently being planned) will provide more information on past land use and development.

Presently, much of the plateau is farmed commercially by the Landmark Trust. An 'Agreed Grazing Management' plan (Wolton 1994) was drawn up in 1994 to ensure that grazing levels are consistent with the maintenance of the semi-natural habitats and therefore of benefit to conservation.

5. Public Interest

Research

Lundy has been the subject of documented research for many years. The Lundy Field Society, established in 1946 to study and record the natural history of the island has contributed extensively to the body of research, publishing an annual report since 1947. The objects of research have included studies of seabirds, butterflies and moths, Red Data Book plants, their associated invertebrates and pond communities.

Education

Lundy has been used for many field trips and courses over the years. However, because the island is difficult to reach, it is not as popular a site for study as might be expected. However, the potential for encouragement of further study of various aspects of the land environment, history and archaeology is high. There is considerable scope for the island as an educational resource. The warden includes terrestrial ecology in her walks and talks. There has also been much promotion and interest in the endemic Lundy cabbage, for which a poster, postcard and leaflets are now available.

Recreation

Lundy attracts day visitors, who arrive mainly on the Landmark Trust's boat the *Oldenburg* which may visit several times a week during summer months. There is also accommodation for 139 paying guests in the converted buildings and campsite. Typically day visitors will visit the settlement, the Tavern and make short exploratory walks in the southern part of the island. Residential guests are likely to cover most of the flatter parts of the island on foot during a visit and many have specialist interests which include natural history/ornithology, archaeology, history, rock climbing (seasonal restrictions apply in some areas) and SCUBA

diving. Landing fees, residential fees and the proceeds from sales in the Tavern and shop provide an important source of income for the Landmark Trust.

6. Generation of Objectives

Evaluation of the SSSI

As a biological SSSI listed in the Nature Conservation Review Lundy is of recognised national importance, and part of a series of sites whose conservation is considered fundamental for the maintenance of biological diversity in Great Britain.

The island endemics, notably the Lundy cabbage and the Lundy cabbage flea beetle, are plainly of outstanding interest and their survival should be ensured.

Habitats such as the areas of waved *Calluna* heath and maritime grassland are regionally important. This value is increased by the presence of the nationally rare Golden-hair lichen *Teloschistes flavicans*, and dwarf adders tongue *Ophioglossum azoricum*.

Other habitat features are of local and/or regional importance and a number of rare or local plant and animal species are associated with the semi-natural plant communities of the plateau and sidelands.

Lundy is regionally important as a breeding site for a representative array of seabirds. There is also an important breeding colony of grey seals.

The long history of documented scientific research illustrates the long interest in Lundy's special natural features and adds considerably to the value of the SSSI.

A full survey and evaluation of Lundy's biological features on land can be found in the National Trust's biological survey (National Trust, 1991).

The archaeological importance of the island enhances the interest of the SSSI.

As with other small isolated islands, the combination of special features, the inter-relationship between them and with the surrounding sea, and the microcosm effect which provides excellent opportunities for study and recreation, mean that the terrestrial part of Lundy as a whole is extremely important for nature conservation in addition to each of its individual features.

Factors Influencing Objectives

Man-induced trends

Rhododendron encroachment along the eastern sidelands is reported to be having a detrimental effect on the Lundy cabbage population. The small adders tongue fern could be threatened by changes, such as reseeding and fertilising, aimed at increasing the quality of the grassland. Any increase in stock level or types of stock and grazing regime require careful consideration to prevent damage to the islands habitats.

The introduction of the cat and rat to the island in the past poses a threat to the existing seabird populations.

Fire has caused serious damage to the waved heathland in the past, and needs to be guarded against.

Any decline in air quality would affect lichen communities, especially the Golden-hair lichen

Managerial constraints

The main constraint to management is the provision of adequate finance and inevitably not all desired projects can be undertaken immediately. Therefore priorities must be assigned to the various projects prescribed, in discussion with the main interested parties. Grants have been obtained from MAFF, under the Countryside Stewardship scheme, for: containing the spread of rhododendrons; tree planting; dry stone walling; bracken control; and heathland management. The areas concerned are agreed in advance. The heathland management agreement puts some constraints on farm management.

Section 4: Objectives and Prescriptions

Objectives

English Nature, as the Government's nature conservation adviser in England, has a statutory responsibility for developing conservation objectives to guide the management of Lundy Special Area of Conservation. The role of the conservation objectives is to express what needs to be achieved by all the relevant authorities in order to maintain the favourable condition of the site, including the habitats and species it contains and thus deliver the aims of the Habitats Directive.

In addition to conservation objectives, English Nature, in collaboration with the other relevant authorities, must also provide advice on any operations or activities which may cause deterioration or disturbance to the interest features of the site. This is advice, along with the conservation objectives, is available in the Regulation 33 package (English Nature's statutory advice under Regulation 33 of the Habitats Regulations), issued to relevant authorities in January 2000, and should be used in conjunction with this management plan.

In this management plan, objectives for the SAC are listed as part of the objectives outlined for the management for the whole island, below:

Objective 1

To sustain and where possible enhance the character and range of natural habitats, communities and species within the MNR *and* ***To maintain the reefs[9] within the Lundy cSAC in favourable condition, taking account of natural change, with particular reference to:***

Rocky shores
Kelp forests
Vertical and overhanging circalittoral rock communities
Circalittoral bedrock and stable boulder communities

Rationale: Lundy is a site of great marine nature conservation importance. Its geology and topography result in a wide range of physical conditions leading to the development of a high diversity of littoral and sub-littoral habitats. The internationally important reefs support species and communities of highly restricted range for which the cSAC has been identified. To maintain these species in favourable condition is a statutory responsibility under Regulation 3(3) of the Habitats Regulations 1994. Species of particular importance are those with predominantly southern distribution which are represented in Britain only in the extreme south-west in conditions of good water quality. Some of the species of sessile animal found within these communities (notably the sea fan *Eunicella verrucosa*, branching sponges and the cup coral *Leptopsammia pruvoti*) are now known to be extremely slow-growing and to show low recruitment rates. It is thus considered important to protect these from the risk of physical damage. .

There has been conjecture in recent years about declining water quality and divers in particular refer to reductions in water clarity. If there is substance to these reports it may be possible to influence the discharge of pollutants and enhance conditions at Lundy. However, some improvement in water quality has been demonstrated in recent years.

[9] Also subtidal sand banks, sea caves and grey seals (when confirmed)

Lundy has traditionally supported a fishery and in recent years there has been intensive potting effort for crabs and lobsters, including spiny lobsters. This fishery should be sustainable not just in fishery terms but also in terms of the long-term viability of the full natural range of species and communities. The maintenance of a diverse natural system at Lundy may contribute to fisheries away from the MNR. It may be possible to operate a fishery at Lundy which does not prejudice the interests of other groups of people or later generations thereof nor threaten the survival of non-target species. The definition, monitoring and management of a sustainable system must be based on sound scientific thinking and methodology. Recreational and other uses must likewise conform with these principles and in particular SCUBA diving, whose popularity is rapidly growing, must be carried out in a manner which does not threaten the long-term viability of the natural system.

It is fundamental to the achievement of this objective that there is scientifically sound monitoring of sub-features identified in the cSAC Regulation 33 Advice (AppendixVI). Such monitoring is also a requirement of the Habitats Directive and any modification of management methods should be based upon its results.

Policy development: Policies derived from Objective 1 must include monitoring of sensitive or target communities as well as monitoring of potential impacts. There should also be protective policies (giving rise to enforcement prescriptions if necessary) which relate to the prevention of damage to these communities if it can be demonstrated that the control of certain activities is required to achieve the Objective. Consideration is being given to the revision of the Lundy Zoning Scheme, to reflect the requirements of the cSAC Regulation 33 advice.

Objective 2

To maintain or increase populations of Biodiversity Action Plan priority species and nationally rare & scarce species, especially those listed in the Red Data Book.

Rationale: A basic principle for maintaining biodiversity is the prevention of extinction through protection and management and where possible, enhancement of populations of species within their natural ranges. Where these natural ranges are restricted, for whatever reason, to a small number of sites the burden of responsibility lies more heavily upon the managers of those sites. **The UK Biodiversity Action Plan provides a basis for prioritising at national level, while the development of Local BAPs extends the rationale to regional and sub-regional levels.**

Policy development: Monitoring of rare species is pivotal to their conservation, so the design and adoption of monitoring programmes is the first policy here. Alongside this is a policy to maintain conditions contributing to the survival of vulnerable species and to address problems identified in the monitoring programme.

Objective 3

To maintain the extent and quality of the important terrestrial plant communities and archaeological sites.

Rationale: Lundy's semi-natural plant communities and the species they support are of high intrinsic interest and contribute greatly to the island's aesthetic appeal. They are controlled in part by factors outside human control (climate, rainfall, soils etc.) but are significantly influenced by grazing, trampling, burning and hydrology.

Policy development: The first policy must be to define the present state and to monitor any changes which take place. Some basic definition in terms of National Vegetation Classification (NVC) is advocated. A simple programme of vegetation mapping and description of vegetation structure within grazing units, would provide a baseline against which to audit the success or failure of management.

Grazing is seen as one of the central pillars of vegetation management within the Lundy SSSI, and is closely linked with the farm management on non-SSSI land. The Island has entered into a Countryside Stewardship Agreement with DEFRA which includes grazing restrictions.

The control of invasive plant species is moving along with a programme of control for rhododendron well developed. Policies need to be developed relating to the management of the wetlands through the maintenance of old dam structures and open water areas. Expert advice will need to be taken on these issues.

Remaining policies are concerned with prevention of damage by fire or mechanical means.

Objective 4

To maintain or increase the populations of breeding seabird species and provide suitable habitat for migrant bird species.

Rationale: While small, Lundy's seabird colonies are numerically significant in a regional context, and are important as sub-populations close to the southern edge of the range of most north Atlantic seabirds. Seabird colonies are also valuable as indicators of prey populations which, in turn, reflect fishing methods and effort.

The majority of breeding land birds are not considered vulnerable, though Peregrine is a Schedule 1 species (Wildlife & Countryside Act) and warrants special protection. Together with the migrant birds, Lundy's breeding land birds contribute to the attraction of the island and provide valuable opportunities for ecological and ethological study. Although Lundy rarely, if ever, supports numerically significant elements of the European populations of migrant birds, it nonetheless provides shelter and feeding for very large numbers of such birds using the east Atlantic flyway.

Policy development: The `protection' of seabirds at breeding colonies is restricted to avoidance of disturbance from various quarters and to the reduction of the impact of non-native predators. Feral cats have already been eliminated from the island.

Objective 5

To use Lundy to promote marine conservation and the concept of ecologically sustainable use of marine, coastal and terrestrial resources.

Rationale: As England's only Marine Nature Reserve, Lundy is able to play a lead role in exemplifying English Nature's approach to a variety of marine issues. English Nature aims to stimulate awareness of the need for marine conservation and to raise English Nature's profile.

It is important that the Landmark Trust and other partners are forewarned of any initiative involving Lundy to ensure that English Nature does not `cross wires' with similar projects, particularly the Landmark Trust's promotional strategy for Lundy. It is also important to bear in mind that this objective is not concerned with the

promotion of Lundy as a destination, but rather with the promotion of wildlife conservation and ecologically sustainable resource use.

Policy Development: Lundy can be promoted at a variety of different levels, for example: using Lundy in general promotional posters, leaflets etc; via the internet; using Lundy data and experience in developing educational material; by integrating with locally based marine initiatives, such as the development of the Wildlife Trusts Partnership, marine campaigning; promoting English Nature's involvement with Lundy in the media; by publishing survey and monitoring data and integrating with wider marine science initiatives. Terrestrial aspects should be similarly promoted.

Objective 6

To optimise the interpretation and education potential of Lundy to island visitors and users.

Rationale: Lundy receives approximately 10,000 day-visitors every year. It has regular residential visitors numbering about 5,000, it is visited by large numbers of yachtsmen and divers and it is fished by boats from local ports. As a minimum requirement all visitors to the island and its surrounding MNR should leave with the knowledge that they have visited a special area for marine conservation which is being managed as a Marine Nature Reserve.

Furthermore English Nature, the Landmark Trust and the National Trust should ensure that there are opportunities for the visitor to Lundy to learn more of the special biological resource and of the reasons for marine and terrestrial conservation.

In addition, it is essential to continue and develop ways of providing information on Lundy's important land-based habitats and wildlife.

Policy Development: There are detailed proposals in the policies and projects section.

Objective 7

To encourage informed and sympathetic recreational use.

Rationale: It is accepted, whether or not English Nature are instrumental in influencing visitor patterns and behaviour, that there will be recreational use of the island and its waters. Enjoyment through recreation can educate people about marine wildlife. English Nature should attempt to ensure that these uses are non-damaging and consistent with the policies of English Nature and the Landmark Trust/National Trust. There is overlap between this objective and that covered in Objective 6 but it is felt that there should be an explicit policy statement underlining English Nature's full acceptance of sport and recreation.

Policy Development: Policy will relate to promotion of the Zoning Scheme and Code of Conduct for the MNR and to wardening functions. Numerical data should be collected on different forms of recreational use, its impacts assessed and all efforts should be made to ensure that users receive and comply with the code of conduct.

Objective 8

To promote, encourage and report research which will help the achievement of objectives 1-7 and advance understanding of marine and terrestrial ecosystems.

Rationale: Monitoring of key groups and habitats (either as biologically important aspects of the Reserve or SSSI, as target species for fishery, as BAP species, or as indicators of change within the MNR) will take place as functions of the policies derived above. However there will be at least three major areas where additional research or monitoring could be of value, these are:

- where current monitoring methodology is insufficiently refined to provide the answers needed in the Lundy monitoring strategy and where methods must be developed further;
- where information gathering on Lundy can contribute to worldwide data sets such as those on the effects of climate change which facilitate interpretation of Lundy monitoring data and
- where taxonomic or physiological data will significantly assist our efforts to achieve Objective 1.

It is, of course, obvious that any such research should in its own right be ecologically sustainable and there will be a strong bias towards non-damaging methods.

Policy Development: A research and monitoring paper was produced in 1996 and forms an appendix to this plan. This paper will be reviewed to reflect the requirements of the cSAC Regulation 33 advice. Steps should be taken to ensure the integration of monitoring on Lundy with wider initiatives (such as those of the EU) and to 'offer' Lundy as a suitable observatory of global effects (again, ensuring that such monitoring does not adversely affect the MNR).

Objective 9

To integrate nature conservation and archaeological interests.

Rationale: The conservation of the island's archaeological resource is a high priority.

Policy Development: English Nature and our partners on Lundy will continue to liase with relevant archaeological bodies, and other interested organisations, to discuss relevant issues.

Objective 10

To integrate objectives 1-9 with legal constraints and obligations.

Rationale: All management must take into account legal constraints and obligations.

Policy development: Provision for incorporating amended or primary legislation into management needs to be made. For example, Health and Safety legislation is now tighter, with the introduction of a European Union Health and Safety Directive. It is also now the case that Lundy is a candidate SAC under the European Directive on the Conservation of Habitats and Species (The Habitats Directive). The development of

conservation policy on Lundy must now comply not only with conservation goals in the context of UK legislation but also with European requirements.

Objective 11

To provide an administrative structure which facilitates decision making, reserve management and effective communication with outside bodies and meets national and international conservation obligations.

Rationale: The only management plans that survive and become useful are those that are responsive and receptive to change. Providing open channels of communication between main partners and groups with interests in Lundy will make the plan work effectively for nature conservation. Co-operation between all organisations involved with the management of Lundy Island is essential.

Policy development: A two tier system for consultation has been established. A management group consisting of representatives of the Landmark Trust, National Trust, Devon Sea Fisheries Committee the Environment Agency and English Nature is supported by a reserve advisory group. The Lundy Management Group has assumed the responsibilities of the committee of statutory bodies which oversees the Scheme of Management for the Special Area of Conservation. Terrestrial interest are now represented by the membership of the management group.

The management plan will be subject to regular reviews and a full review in 2006. During the timescale of this plan a more detailed terrestrial management plan will be prepared by the management group to ensure that the terrestrial management of the island ensures the islands habitats are in favourable condition by 2010.

Management Actions

The stated overall aim of the Management Plan has generated 11 key objectives required to achieve that aim. The following section outlines the activities (or projects) that are necessary to fulfil the objectives identified in the previous section in the light of practical restraints.

Projects are grouped within separate policies under each objective. This action plan sets out the timescale for tackling the projects over the lifetime of the plan. The list of projects and timetable will be revised as necessary. Project priorities are under consideration.

EN = English Nature , W = Warden, DSFC = Devon Sea Fisheries Committee, LT = Landmark Trust, LFS = Lundy Field Society, EA = Environment Agency, LMRAG = Lundy Marine Reserve Advisory Group

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
1. To sustain and where possible enhance the character and range of natural habitats, communities and species within the MNR *and* To maintain the reefs[9] within the Lundy cSAC in favourable condition, taking account of natural change							
1.1 Protect habitats, communities and key species from damage							
Further work to identify areas vulnerable to damage. Produce a sensitivity map.	EN			✓			
Ensure that BAP lists of habitats and species inform selection of key species at Lundy.	EN	✓	✓	✓	✓	✓	✓
Establish mooring and anchorage areas as appropriate to prevent damage to vulnerable areas.	EN/W/LT		✓	✓			
Insist on good diving practice to prevent damage to vulnerable communities and species. Promote this through interpretative material.	W/EN	✓	✓	✓	✓	✓	✓
Review the ecological impact of recreational/sports fishing.	EN			✓			
Consider all proposed or potential development within the MNR or in the surrounding area. Give consideration to the likely effects of the development, advise on the environmental implications and request the production of a statutory EA where appropriate. Raise objections where necessary to protect the resource.	EN	✓	✓	✓	✓	✓	✓
Discourage activities which might result in the introduction of species not naturally occurring at Lundy.	EN	✓	✓	✓	✓	✓	✓
Review the effectiveness of the zoning scheme and update to reflect both this and the SAC management scheme.	EN	✓	✓				
1.2 Ensure that any commercial fishery at Lundy is managed on an ecologically sustainable basis							
Maintain a licensing system for the fishery.	DSFC	✓	✓	✓	✓	✓	✓

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Regulate fishing effort and police the fishery.	DSFC	✓	✓	✓	✓	✓	✓
Continue to collect data on the fishing effort and fishing methods.	DSFC/W	✓	✓	✓	✓	✓	✓
Monitor stocks of commercial species.	DSFC/ST	✓	✓	✓	✓	✓	✓
Where stocks are currently seriously depleted, carry out appropriate management.	DSFC	✓	✓	✓	✓	✓	✓
Where appropriate for fisheries management and conservation purposes create sanctuary/nursery areas.	DSFC	✓	✓	✓	✓	✓	✓
Establish No Take Zones where necessary to protect vulnerable areas of reef interest from potting damage.	EN/DSFC	✓	✓				
Discourage use of damaging or over-effective fishing gear (e.g. parlour pots).	EN/DSFC	✓	✓	✓	✓	✓	✓
1.3 Maintain water quality around Lundy							
Review the likely effect of dredging applications in the wider sea on water quality around Lundy. Object where necessary.	EN/EA	✓	✓	✓	✓	✓	✓
Ensure adequate water quality standards are maintained and where required under Regulation 50 of the Habitats Regulations 1994 reviewed.	EN/EA	✓	✓	✓	✓	✓	✓
Be alert to the risk of pollution and liase with the appropriate authorities over contingency plans.	EN/W	✓	✓	✓	✓	✓	✓
Establish water quality monitoring.	EA	✓	✓				
1.5 Monitor habitats, communities and key species							
Comply with the programme of condition monitoring for the SAC as set out in the Regulation 33 advice.	EN/EA	✓	✓	✓	✓	✓	✓
Continue measurement and photographic monitoring of littoral cup coral populations at Gannets' Rock, Devil's Kitchen and Rat Island.	W/ST	✓	✓	✓	✓	✓	✓
Continue viewpoint photography at Landing Bay, Lametry Beach and Rattles Beach.	W	✓	✓	✓	✓	✓	✓
Review the sublittoral photographic monitoring at Quarry Bay, the Knoll Pins, Gannets Rock and M/V Robert in the context of the need to report on the condition of SAC features	EN				✓		
Carry out regular monitoring of Grey seals.	W	✓	✓	✓	✓	✓	✓
Establish west coast monitoring sites to report on SAC condition.	EN	✓					
Monitor physical parameters of the seawater, including the turbidity and temperature.	W	✓	✓	✓	✓	✓	✓
Integrate monitoring programmes with local or national schemes.	EN	✓	✓	✓	✓	✓	✓
2. To maintain or increase the populations of BAP priority species and nationally rare and scarce species, especially those listed in the Red Data Book							
2.1 Monitor populations of selected BAP and nationally rare and scarce species							

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
To continue the monitoring programme for *Coincya wrightii* which has been ongoing since 1993. Carry out regular monitoring programmes for *Scrophularia scorodonia, Ophioglossum azoricum, Telioshistes flavicans* and Peregrine falcon.	W/LFS	✓	✓	✓	✓	✓	✓
Implement UK BAP for Lundy cabbage.	EN/W	✓	✓	✓	✓	✓	✓
Implement BAP plans for all other priority species.	EN/W	✓	✓	✓	✓	✓	✓
2.2 Protect populations of BAP and nationally rare and scarce species.							
Maintain areas of suitable unstable ground for *Coincya* and *Scrophularia*.	W	✓	✓	✓	✓	✓	✓
Operate a grazing regime appropriate for the maintenance of a short sward favouring *Ophioglossum*.	LT/W/EN	✓	✓	✓	✓	✓	✓
Prevent encroachment of Bracken into *Ophioglossum* and *Dryopteris aemula* stands.	W	✓	✓	✓	✓	✓	✓
Prevent encroachment of Rhododendron into *Coincya* and *Scrophularia* stands.	W	✓	✓	✓	✓	✓	✓
Revise SSSI boundary to include all major populations of *Coincya, Scrophularia, Ophiglossum & Telioshistes*.	EN						✓
Minimise disturbance to Peregrine nests by climbers.	W	✓	✓	✓	✓	✓	✓
Determine the continued presence of Red Data Book invertebrates, particularly beetles and spiders, and identify any related conservation problems.	EN/W	✓	✓	✓	✓	✓	✓
3. To maintain the extent and quality of the important terrestrial plant communities and archaeological sites							
3.1 Map, describe and monitor the plant communities							
Provide baseline vegetation descriptions by producing vegetation map/air photograph overlays and NVC descriptions of the major communities. Plan monitoring scheme.	EN	✓	✓	✓	✓	✓	✓
Assess the growth forms of heather, to enable signs of damage to be detected, on an annual basis.	EN/W	✓	✓	✓	✓	✓	✓
Assess the extent of bracken stands once every three years.	EN/W	✓			✓		
3.2 Maintain appropriate grazing regimes							
Conduct a full grazing review to determine suitable stocking rates.	EN/W				✓		
Adjust stock numbers/type to maintain vegetation at desired state.	LT/W	✓	✓	✓	✓	✓	✓
Keep records of stock movements, location and numbers.	LT/W	✓	✓	✓	✓	✓	✓
Provide and maintain necessary walls, fences, gates and water holes.	LT/W	✓	✓	✓	✓	✓	✓
Ensure that no stock feeding takes place within the SSSI.	LT/W	✓	✓	✓	✓	✓	✓
Control rabbits, soay sheep, deer and goats as necessary.	LT/W	✓	✓	✓	✓	✓	✓
3.3 Minimise risk of fire damage							

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Produce and implement a fire plan.	LT/W	✓	✓	✓	✓	✓	✓
Provide and maintain fire beaters at prominent sites.	LT/W	✓	✓	✓	✓	✓	✓
3.4 Control undesirable invasive plant species							
Restrict Rhododendron distribution, seeking to eradicate the plant north of Quarter Wall.	W	✓	✓	✓	✓	✓	✓
Restrict Bracken distribution, particularly where it is encroaching into heather stands.	W	✓	✓	✓	✓	✓	✓
3.5 Prevent damage to plant communities							
Restrict as far as possible vehicle movements to agreed tracks.	LT/W	✓	✓	✓	✓	✓	✓
Maintain vehicle tracks in suitable and safe condition.	LT/W	✓	✓	✓	✓	✓	✓
Restrict stock feeding to agreed feeding stations.	LT/W	✓	✓	✓	✓	✓	✓
Rehabilitate eroded footpaths in consultation with the appropriate authorities & implement regular maintenance programme.	W	✓	✓	✓	✓	✓	✓
Restrict use of agrochemicals.	LT/W	✓	✓	✓	✓	✓	✓
3.6 Maintain open water and wetlands							
Monitor extent and level of open water in Pondsbury.	EN/W	✓	✓	✓	✓	✓	✓
Review excavation reverse or arrest hydroseral processes at Pondsbury.	EN/W	✓	✓	✓	✓	✓	✓
Maintain existing dams as necessary in consultation with archaeological experts.	LT/W	✓	✓	✓	✓	✓	✓
Maintain drainage of the vehicle track.	LT/W	✓	✓	✓	✓	✓	✓
Monitor levels of water abstraction.	LT/W	✓	✓	✓	✓	✓	✓
4. To maintain or increase the populations of breeding seabird species and provide suitable habitat for migrant bird species							
4.1 Monitor bird populations							
Monitor seabird numbers and map distribution, especially of puffins.	W	✓	✓	✓	✓	✓	✓
Monitor seabird productivity at selected sites.	W	✓	✓	✓	✓	✓	✓
Keep records of migrant birds.	W	✓	✓	✓	✓	✓	✓
4.2 Minimise disturbance							
Continue restrictions on rock climbing during the breeding season.	W	✓	✓	✓	✓	✓	✓
Discourage boat users from disturbing cliff-nesting birds.	W	✓	✓	✓	✓	✓	✓
Insist on prior booking by bird ringers and encourage good practice.	W	✓	✓	✓	✓	✓	✓
Encourage birdwatchers and other visitors to keep disturbance to a minimum.	W	✓	✓	✓	✓	✓	✓
Adjust the timing and extent of habitat management to reduce bird disturbance.	LT/W	✓	✓	✓	✓	✓	✓
4.3 Control introduced predators							
Review feasibility and desirability of eradication of both species of rat from Lundy.	EN	✓	✓				

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Permit localised rat control as necessary.	LT/W	✓	✓	✓	✓	✓	✓
Ensure all domestic cats are neutered & negotiate ban on future introduction.	EN/LT	✓	✓	✓	✓	✓	✓
4.4 Improve cover for bird shelter and feeding							
Progressively replace rhododendron thickets with native prickly trees & shrubs, where it will cause no threat to Lundy cabbage distribution, and is of benefit to the cabbage as a stock control mechanism.	W	✓	✓	✓	✓	✓	✓
5. To use Lundy to promote marine conservation and the concept of ecologically sustainable use of marine, coastal and terrestrial resources							
5.1 Promote Lundy MNR as the "flagship" of English Nature's marine site protection programme							
Upgrade Lundy MNR to Spotlight Reserve status.	EN	✓					
Publish a summary of the Lundy Management Plan and SAC Scheme of Management.	EN		✓				
Keep the research and monitoring programme up to date and in line with new scientific developments.	EN	✓	✓	✓	✓	✓	✓
Disseminate the results of research and surveys.	EN	✓	✓	✓	✓	✓	✓
5.2 Use English Nature's work on Lundy to promote a wider understanding of marine nature conservation issues							
Seek opportunities to publicise the marine conservation work on Lundy.	EN/LT/W	✓	✓	✓	✓	✓	✓
Maintain media contacts.	EN/W	✓	✓	✓	✓	✓	✓
5.3 Use Lundy MNR as a focus for the development of policies and practices for marine site protection							
Develop the concept of integrating marine conservation with managed fisheries.	EN/DSFC	✓	✓	✓	✓	✓	✓
Develop the concept of integrating marine conservation with recreational activities.	LMRAG	✓	✓	✓	✓	✓	✓
6. To optimise the interpretation and education potential of Lundy to island visitors and users							
6.1 Ensure that all visitors and users are aware of the existence and purposes of the MNR							
Maintain and update signs on Lundy, the *Oldenburg*, the quays at Bideford and Ilfracombe and possibly at other harbours from which boats travel to Lundy.	EN/LT	✓	✓	✓	✓	✓	✓
Broadcast Lundy video and introductory commentary to visitors travelling to Lundy on the *Oldenburg*.	EN/LT	✓	✓	✓	✓	✓	✓
Produce an updated MNR/SAC video to be shown on the *Oldenburg*.	EN/LT	✓					

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Maintain the series of EN/LT leaflets to be made available on the *Oldenburg* and on Lundy.	EN/LT	✓	✓	✓	✓	✓	✓
Contact diving boats, yachts and ships anchoring off Lundy when possible.	W	✓	✓	✓	✓	✓	✓
Maintain contacts with diving clubs and boat owners who visit Lundy regularly. Consider issuing them with leaflets for distribution.	W	✓	✓	✓	✓	✓	✓
Produce a dive guide for sale to visiting and prospective divers.	EN	✓					
Maintain contacts with fishermen through the DSFC and other relevant organisations.	W	✓	✓	✓	✓	✓	✓
Encourage schools and colleges to take advantage of Lundy's obvious education potential by production of an Education Pack.	W		✓				
Carry out a review of Lundy's interpretive facilities in 2003 and then every 10 years. Initiate & include the results from an annual visitor questionnaire.	EN/W			✓	✓		
6.2 Provide additional facilities to ease access to the MNR							
Maintain and improve facilities for divers.	LT/W	✓	✓	✓	✓	✓	✓
Establish a system so that the diving centre is open when required, either using island staff or by franchise.	LT/W	✓	✓	✓	✓	✓	✓
Continue guided walks in the intertidal zone and snorkelling safaris in the sublittoral.	W	✓	✓	✓	✓	✓	✓
6.3 Provide interpretation for visitors to the SSSI							
Continue to provide guided walks on the island.	W	✓	✓	✓	✓	✓	✓
Install interpretation display in the beach building.	EN	✓					
Maintain and update interpretation in the beach building.	EN/W	✓	✓	✓	✓	✓	✓
6.4 Provide additional on-site information to enable interested visitors to learn more about the ecology and conservation of Lundy							
Maintain and update the display area in the Church.	W	✓	✓	✓	✓	✓	✓
Develop of the interpretive centre planned in the Rocket Shed.	LT/EN/W	✓	✓				
Produce leaflets/worksheets to aid interpretation of the islands ecology as and when necessary.	W/EN	✓	✓	✓	✓	✓	✓
Warden to meet day visitors at the beach building whenever possible.	W	✓	✓	✓	✓	✓	✓
6.5 Consider the declaration of the SSSI as a National Nature Reserve							
EN to consult relevant partners over the proposal.	EN	✓	✓	✓			
7. To encourage informed and sympathetic recreational us							
7.1 Limit adverse effects of recreational use							
Ensure that users see copies of the Code of Conduct/Zoning Scheme.	W	✓	✓	✓	✓	✓	✓

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Review Code of Conduct / Zoning Scheme to reflect SAC priorities and generally make it more "user friendly".	EN		✓	✓			
Patrol the MNR, cSAC & SSSI to ensure compliance with the Zoning Scheme and Bylaws	W	✓	✓	✓	✓	✓	✓
7.2 Monitor recreational use							
Collect data on recreational use and assess its impact.	W	✓	✓	✓	✓	✓	✓
8. To promote, encourage and report research which will help the achievement of objectives 1-7 and advance understanding of the marine and terrestrial ecosystems							
8.1 Maintain an overview of research and monitoring work and priorities, in the form of a register							
Maintain list of priority research topics.	EN	✓	✓	✓	✓	✓	✓
Liase with organisations and institutions with the necessary expertise.	EN	✓	✓	✓	✓	✓	✓
Integrate research programmes with local or national schemes, where possible.	EN	✓	✓	✓	✓	✓	✓
9. To integrate nature conservation and archaeological interests							
9.1 To consider an integrated policy towards nature conservation and archaeological features							
Investigate the importance of the wrecks around Lundy to marine conservation.	EN/W	✓	✓	✓	✓	✓	✓
Establish contact with relevant archaeologists to discuss reconciling the management of both nature conservation and archaeological features both in the MNR (wrecks) and SSSI (monuments).	EN/LT/W	✓					
10. To integrate objectives 1-9 with legal constraints and obligations							
10.1 To ensure that work carried out in conjunction with the above objectives meets relevant Health and Safety regulations							
Continue to review the Warden's skills with respect to safety and provide training as appropriate ensuring that all English Nature's policy statements and procedures are fully complied with.	EN/W	✓	✓	✓	✓	✓	✓
Ensure that employees of English Nature, and those undertaking commissioned work but employed by another organisation, abide by the appropriate safety codes as outlined in the 'Safety Handbook' and relevant legislation.		✓	✓	✓	✓	✓	✓
Ensure that Risk Assessments are produced as necessary, kept under regular review, and made easily accessible.	EN/W	✓	✓	✓	✓	✓	✓
10.2 Ensure that the management of the cSAC, MNR and SSSI complies with established rights of navigation and rights of way							

Conservation objective & implementation	Responsibility	Timeframe					
		00/01	01/02	02/03	03/04	04/05	05/06
Be aware of the effect that management may have on established or designated access routes.	EN/W	✓	✓	✓	✓	✓	✓
10.3 Ensure that the terms of EN's lease of the seabed are complied with	EN	✓	✓	✓	✓	✓	✓
11. To provide an administrative structure which facilitates decision making, reserve management and effective communication with outside bodies and meets national and international conservation obligations							
11.1 Ensure full consultation over policy development							
Maintain wide consultative links through a Lundy Marine Reserve Advisory Group, which will aim to represent the views of all interested parties.	LMRAG	✓	✓	✓	✓	✓	✓
Maintain the MNR Management Group consisting of representatives from EN, DSFC, LT, EA and NT. Regular meetings will be held to review statutory provisions and consider management issues. The Advisory Group will be sent copies of the minutes and will be able to make representations to the Management Group.	EN/DSFC/LT/NT/ LMRAG/EA	✓	✓	✓	✓	✓	✓
Expand Management Group meetings to include terrestrial management.	EN/LT/NT/DSFC EA/LMRAG	✓					
Use the above Management Group to take forward the development and implementation of a cSAC scheme of management aided by the Advisory Group.	EN/DSFC/LT/NT/ LMRAG/EA	✓	✓	✓	✓	✓	✓
11.2 Operate the management plan							
Produce Annual Work Programmes.	EN/W/LT	✓	✓	✓	✓	✓	✓
Secure sufficient resources to carry out the Work Programmes.	EN	✓	✓	✓	✓	✓	✓
Appoint personnel as needs dictate & expand the use of volunteers.	EN/LT	✓	✓	✓	✓	✓	✓
Review monitoring strategy in the light of SAC requirements.	EN	✓	✓	✓	✓	✓	✓
11.3 Review and revise the Management Plan							
Ensure analysis of and feedback from all monitoring projects.	EN/W	✓	✓	✓	✓	✓	✓
Maintain reserve recording and reporting systems.	EN/W	✓	✓	✓	✓	✓	✓
Review annually the project register in the Management Plan taking into account the results of research and monitoring, the archaeological interests, the legal constraints and obligations, and the integration of the conservation interests with those of the Landmark Trust, the National Trust and the inhabitants of Lundy. Produce a full review by 2004.	EN	✓	✓	✓	✓	✓	✓
Converge timing of SAC scheme of management with pre-SAC management plan review. Future review dates: 2005, 2011 etc.	EN	✓					

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Appendices

Appendix I	Lundy Special Area of Conservation citation
Appendix II	Lundy Marine Nature Reserve citation
Appendix III	Lundy Site of Special Scientific Interest Citation
Appendix IV	MNR Bylaws and Code of Conduct
Appendix V	Zoning scheme
Appendix VI	Definitions of ratings of importance.

Appendix I

Reasons for recommendation as a candidate Special Area of Conservation (incorporating possible amendments)

Area name: **Lundy**

Administrative area: **Devon**

Component SSSI: **Lundy**

This area has been recommended as a candidate Special Area of Conservation (SAC) because it contains habitat types and/or species which are rare or threatened within a European context. In addition, an amendment to the candidate SAC is being considered based upon further habitat or species considerations. The SSSI citation describes the special interests for which the site was notified in the British context. [NB: not for marine interests below mean low water mark]. The interests for which the site was selected as SSSI may differ from the interests selected in a European context.

The habitats and/or species for which the area has previously been recommended as a candidate SAC are listed below, together with proposed additional interests (where applicable). The reasons for their selection are listed, together with a brief description of the habitats and species as they typically occur across the UK. This area contains the interests described although it may not contain all the typical features. In some cases, amendments to the boundary of the candidate SAC are also being considered.

Interest(s) previously submitted to the European Commission

European interest(s):

1. **Reefs**

- **for which this is considered to be one of the best areas in the United Kingdom.**

Reefs. These are areas of rock or biological concretions formed by various invertebrate species. Reefs occur in the subtidal zone, but may extend onto the shore. They form the habitat for a variety of biological communities such as those characterised by encrusting animals and attached seaweeds.

Additional proposed interest(s)

European interest(s):

2. ***Halichoerus grypus***

- **for which the area is considered to support a significant presence.**

Grey seal. Grey seals spend most of the year at sea. They come ashore in the autumn to form breeding colonies on rocky shores, beaches, in caves, occasionally on sandbanks, and on small uninhabited islands. It is these breeding areas that are proposed for protection. Grey seals are

among the rarest seals in the world and over 90% of the European Union population of this species breeds on the UK`s coast.

3. Sandbanks which are slightly covered by sea water all the time

- **for which the area is considered to support a significant presence.**

Subtidal sandbanks. Sandbanks permanently covered by sea water to depths of up to 20 metres below low water can include muddy sands, clean sands, gravelly sands, eelgrass *Zostera marina* beds, and maerl beds (carpets of small, unattached, calcareous seaweed).

4. Submerged or partially submerged sea caves

- **for which the area is considered to support a significant presence.**

Sea caves. These are tunnels or caverns on the shore or below the sea surface in which vertical or overhanging rock surfaces form the main habitat. They are typically colonised by encrusting animal species.

For agency use only:

Date issued: _____

Reference number or date of map: _____

Nature Conservancy Council for England

ENGLISH NATURE

Candidate Special Area of Conservation

Lundy

Devon

Candidate Special Area of Conservation: land marine

This map is intended as a location map only. Please refer to the larger scale maps for the detailed boundary. The boundary shown is derived from the larger scale mapping and may not necessarily match the background detail on this map

Hectares: 3382.56 Date: 5 Jun 1995

Scale 1:50000 3 kilometres Ref:5000054a51

0 0 2 miles

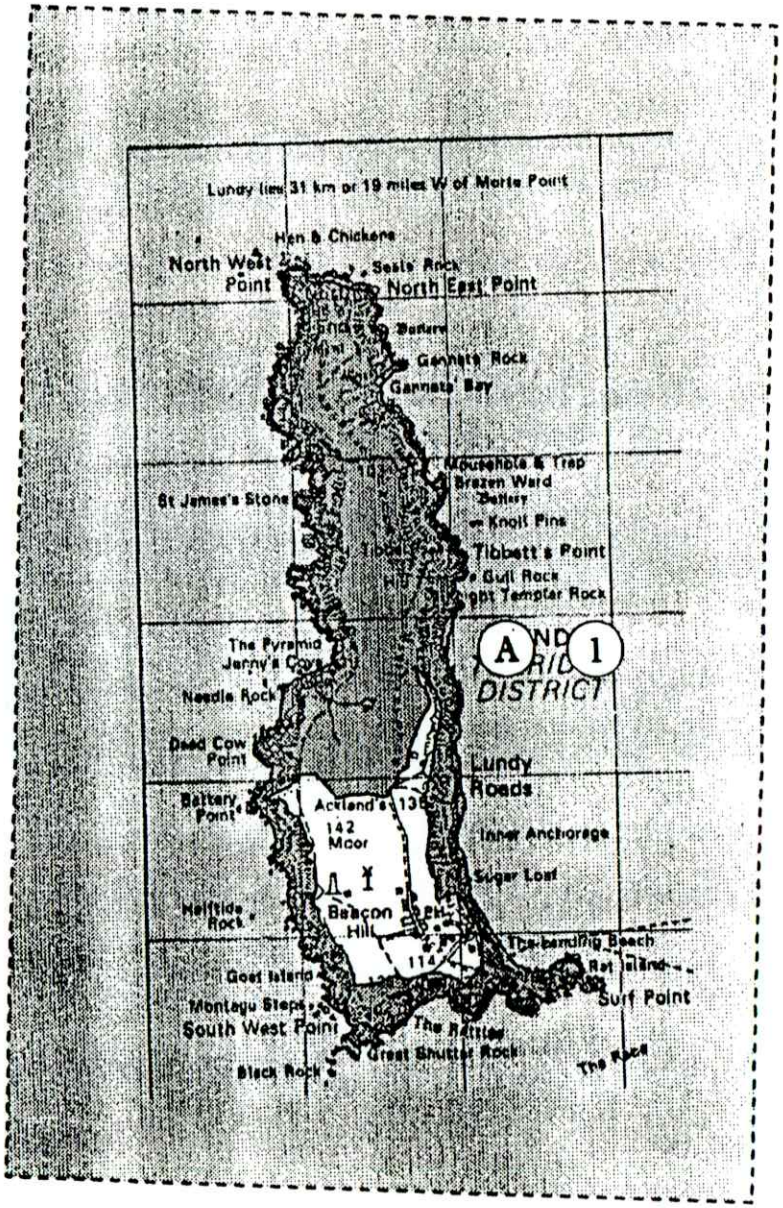
Grid North

Component Site of Special Scientific Interest

A Lundy

Marine component

1 Lundy



Appendix II

WILDLIFE AND COUNTRYSIDE ACT 1981, SECTION 36

LUNDY (BRISTOL CHANNEL) MARINE NATURE RESERVE ORDER 1986

Whereas, in the case of the land described in Schedule 1 hereto, which is covered (continuously or intermittently) by tidal waters or parts of the sea, it appears to the Secretary of State expedient, having regard to the application made by the Nature Conservancy Council ("The Council") under the provision of section 36 of the Wildlife and Countryside Act 1981 ("the Act") that the said land and the waters covering it should be managed by the Council for the purposes -

a. conserving marine flora or fauna or geological or physiographical features of special interest in the area; and

b. providing under suitable conditions and control special opportunities for the study of, and research into, matters relating to marine flora and fauna and the physical conditions in which they live, or for the study of geological and physiographical features of special interest in the area; and

Whereas, the application was accompanied by the following byelaws proposed to be made, for the protection of the area specified in Schedule 1 and set out in Schedule 2 hereto -

a. a copy of byelaws proposed to be made by The Council under Section 37 of the said Act of 1981; and

b. A copy of byelaws proposed to be made by the Devon Sea Fisheries Committee under section 5 of the Sea Fisheries Regulation Act 1966.

Now therefore the Secretary of State, in exercise of the power conferred on him by section 36(1) of the Act and of all other powers enabling him in that behalf, hereby designates the land and the waters covering it, described in Schedule 1 and shown hatched and edged in black on the map annexed hereto, as a marine nature reserve.

Pursuant to Section 36(2) of the Act this Order hereby authorises the making under Section 37 of the Act the byelaws proposed to be made by the Nature Conservancy Council as set out in Schedule 2 hereto.

This Order may be cited as the Lundy (Bristol Channel) Marine Nature Reserve Order 1986, and shall take effect on 20 November 1986.

SCHEDULE 1

(Description of land and waters covering it)

All that area of land and the water covering it (continuously or intermittently) around the island of Lundy at the mouth of the Bristol Channel, as shown hatched and edged black on the map annexed hereto.

SCHEDULE 2

1. The byelaws proposed to be made by the Council are annexed hereto.

2. The byelaws proposed to be made by the Devon Sea Fisheries Committee are annexed hereto.

Signed by authority of
the Secretary of State
20 November 1986

I G MUCHMORE

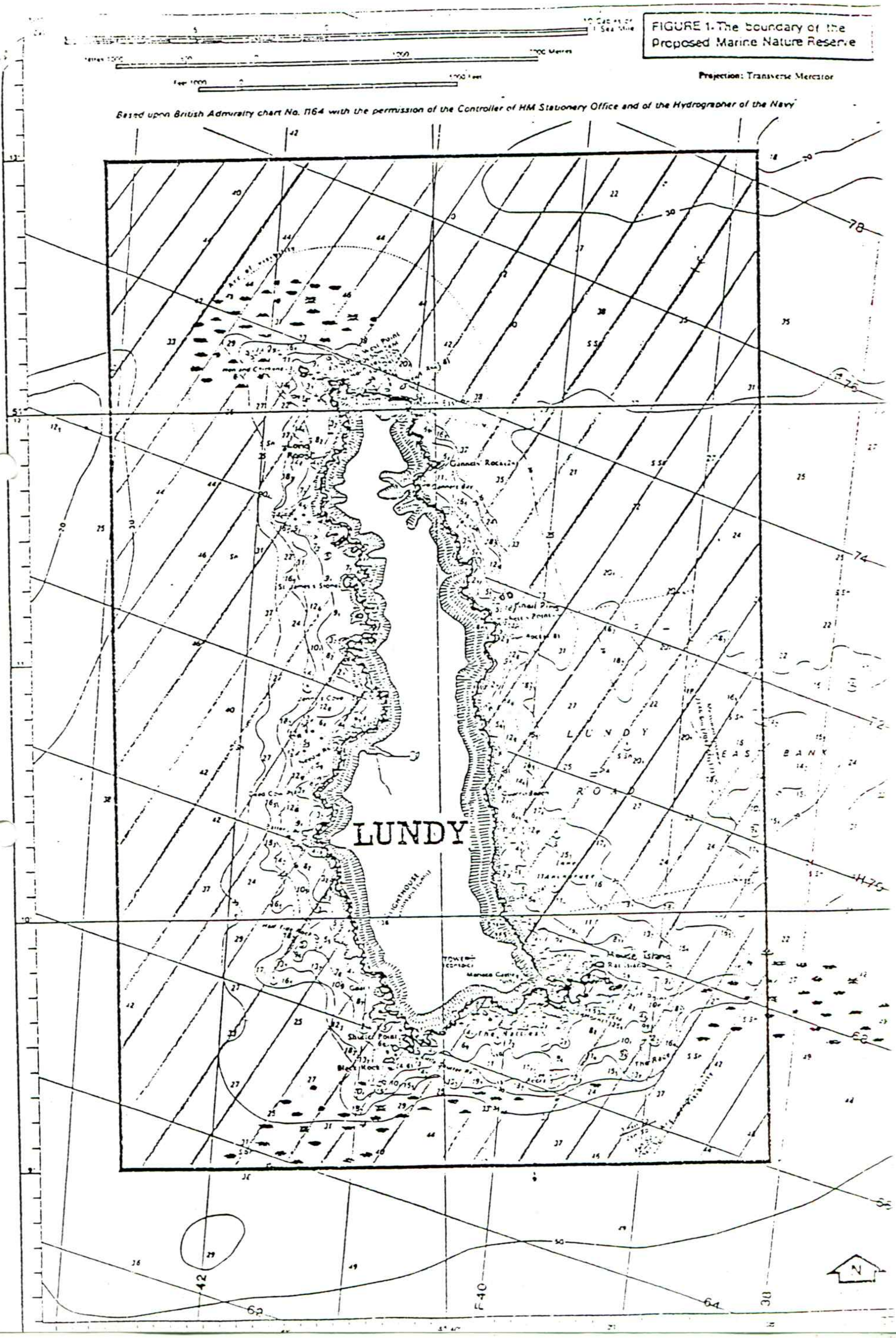


FIGURE 1. The boundary of the Proposed Marine Nature Reserve

Appendix III

Appendix III SSSI citation sheet

Site Notified to Secretary of State on
3 September 1987

CITATION SHEET

COUNTY: DEVON

SITE NAME: LUNDY

DISTRICT: TORRIDGE

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended)

Local Planning Authority: Devon County Council, Torridge District Council

National Grid Reference: SS 135460 Area: 345.0 (ha) 852.5 (ac)

Ordnance Survey Sheet 1:50,000: 180 1:10,000: SW 14 NW SW

Date Notified (Under 1949 Act): 1976 Date of Last Revision: -

Date Notified (Under 1981 Act): 1987 Date of Last Revision: -

Other Information: Owned by the National Trust, managed by the Landmark Trust. Devon County Structure Plan Nature Conservation Zone.

Description and Reasons for Notification:

Lundy Island, in the Bristol Channel, is 18km from the nearest mainland. It is about 5km long by 1km wide, aligned north-south, with cliffs rising to a plateau at about 110m. The rock is mostly granite, with slate at the southern end, and the plateau soil is mainly loam with some peat. The west side is very exposed to weather and salt spray and has virtually bare cliffs, while the eastern side is comparatively sheltered and is largely covered with scrub. The plateau carries mainly heathy vegetation except where the land has been agriculturally improved or built on. These activities are concentrated towards the southern end, though there is archaeological evidence of historic land use over the whole island.

There are several features of interest. Some of the heath occurs in a waved form which only develops in conditions of extreme exposure to wind. One plant occurs only on Lundy. There are important breeding populations of sea and coastal birds, and the island is a well-known staging post for migrating birds, while many vagrants have been recorded. Seals breed in several sea caves. Flora and fauna, both marine and terrestrial, have been studied and recorded for many years.

The plateau vegetation comprises mainly dry heath, with a notable area of waved Calluna heath at the north end, which is also rich in lichens, eg Teloschistes flavicans and several species of Cladonia and Parmelia. Elsewhere there is either a dry heath/acidic grassland mosaic, characterised by heaths and Western Gorse (Ulex gallii), or semi-improved acidic grassland in which Yorkshire Fog (Holcus lanatus) is abundant. Tussocky Holcus/Armeria (Thrift) communities occur mainly on the western side, and some patches of Bracken (Pteridium aquilinum) on the eastern side. Boggy areas and acidic flushes are found around ponds, and elsewhere, eg above Gannet's Bay. The grass and heathland is heavily grazed by domestic livestock, also by Rabbits (Oryctolagus cuniculus) and feral animals such as Soay sheep, goats and Sika Deer (Cervus nippon).

The western cliffs are mainly bare, but there are some patches of cliff grassland. The eastern cliffs also carry some grassland and such areas on both sides are well used by rabbits and by seabirds which nest in burrows; notably the Puffin (Fratercula arctica) and Manx Shearwater (Procelaria puffinus). Below the grass heath and bracken, the eastern cliffs carry extensive areas of Rhododendron (Rhododendron ponticum) and other scrub, which is the main shelter for deer. Scree near the landing beach is the main station for the endemic Lundy Cabbage (Rhynchosinapis wrightii) and the south eastern cliffs also carry Balm-leaved Figwort (Scrophularia scorodonia). The Royal Fern (Osmunda regalis) occurs locally.

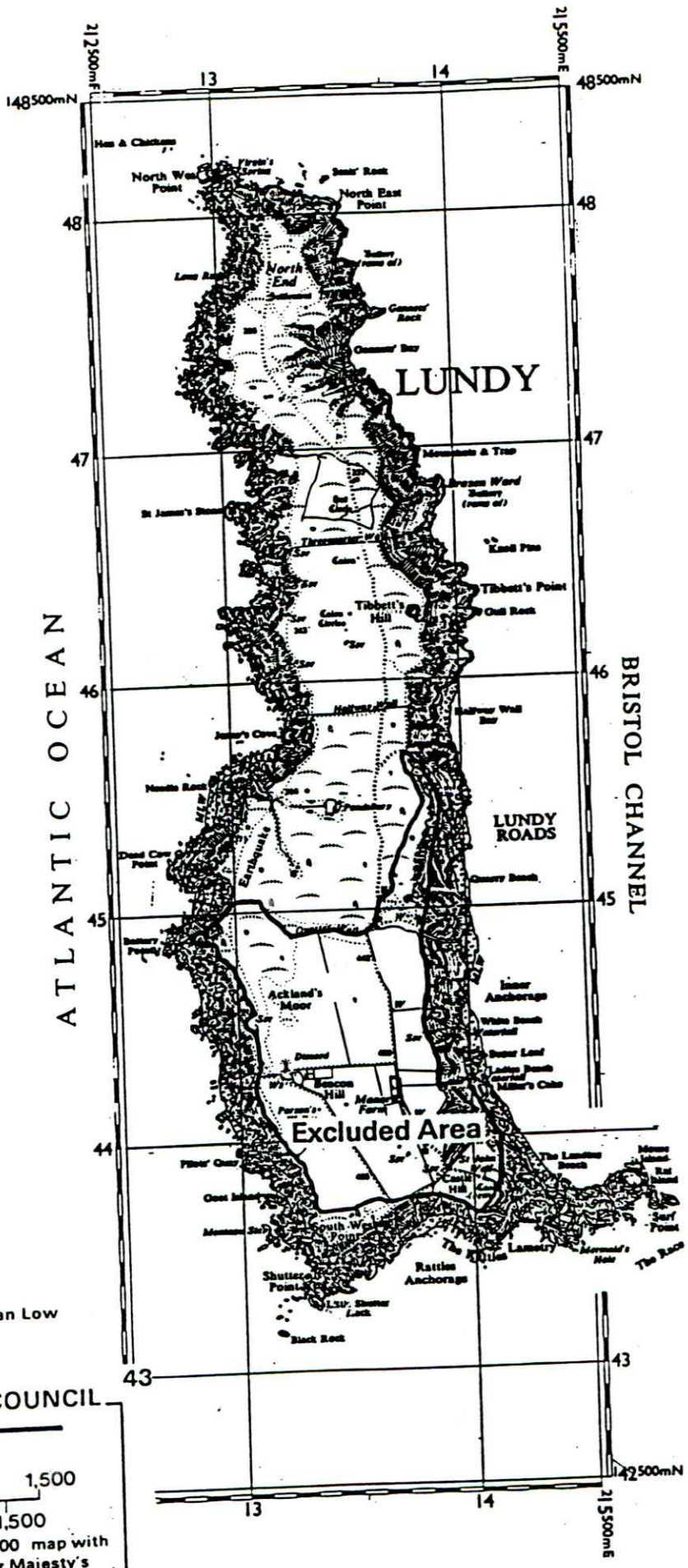
Large numbers of Kittiwake (Rissa tridactyla) nest on the cliffs, as do Razorbill (Alca torda), Guillemot (Uria aalge), Peregrine (Falco peregrinus) and Raven (Corvus corax). The island is well known as an observation point for passage and vagrant species, and several birds nest on the plateau; mainly passerines and waders.

Many invertebrate animals have been recorded, particularly in the more sheltered areas and include a substantial number of flightless species.

Rocks and sea-level caves support a breeding colony of Grey Seal (Halichoerus grypus). The intertidal area is small, but it is an integral part of a marine nature reserve of great interest surrounding the island. There is an extensive literature of observation and research covering many groups of flora and fauna. In particular, the Lundy Field Society Journal contains detailed records since 1946.

LUNDY
DEVON

Site Notified to Secretary of State on 3 September 1987



NOTE: The Seaward boundary is the Mean Low Water mark

NATURE CONSERVANCY COUNCIL

Site boundary thus

Scale 1:25 000

0 Metres 500 1,000 1,500

0 Yards 500 1,000 1,500

Appendix IV

MNR bye-laws

1. **Bye-laws made by English Nature (formerly Nature Conservancy Council) under Section 37 of the Wildlife and Countryside Act 1981 for the protection of Lundy Marine Nature Reserve with the consent of the Secretary of State for the Environment**

The following bye-laws, authorised by The Lundy (Bristol Channel) Marine Nature Reserve Order 1986, have been made by English Nature under section 37 of the Wildlife and Countryside Act 1981 and all other powers enabling it in that behalf in relation to Lundy Marine Nature Reserve and they have effect by virtue of section 36 (3) (b) of the said Act as from their making.

In these bye-laws -

"the Council" means English Nature:

"the reserve" means the area comprising the land and waters covering it known as Lundy Marine Nature Reserve which is described in Schedule 1 to these bye-laws.

2. Subject to the provisions of bye-law 3, in relation to any part of the reserve no person shall, without the written permission of the Council issued for that purpose or without a reasonable excuse, intentionally or recklessly -

(a) kill, take, destroy, molest or disturb any animal or plant in that part;

(b) do anything which interferes with the sea bed in that part;

(c) damage or disturb any object in that part;

(d) deposit rubbish in that part.

3. (I) Nothing in these bye-laws shall prohibit or restrict the exercise of any right of passage by a vessel.

(2) Nothing in these bye-laws shall interfere with the exercise of any functions of a relevant authority, any functions conferred by or under any enactment, (whenever passed) or any right of any person (whenever vested) including in particular but without prejudice to the generality of the foregoing any estate, right, power, privilege, authority or exemption of the Crown, or any right of fishery .

(3) Nothing in these bye-laws shall make unlawful -

(a) anything done for the purpose of securing the safety of any vessel, or of preventing damage to any vessel or cargo, or of saving life;

(b) the discharge of any substance from a vessel; or

(c) anything done more than 30 metres below the sea bed.

4. A written permission issued by the Council for the purposes of these bye-laws may -

(a) contain such terms and conditions as the Council think fit;

(b) be varied or revoked by the Council after not less than seven days written notice which shall, in the case of notice varying the permission, specify the variation or variations.

5. No person acting in pursuance of a written permission issued for the purposes of these bye-laws shall, without reasonable excuse, refuse or fail to produce that permission when requested to do so by an officer or other employee of the Council, or by any other person authorised by the Council in that behalf.

6. Any person who contravenes byelaws 2 or 5 shall be guilty of an offence and liable on summary conviction to a fine not exceeding £1,000.

2. Bye-laws made by the Devon Sea Fisheries Committee, confirmed by the Minister of Agriculture, Fisheries and Food, for the protection of Lundy Marine Nature Reserve

The Devon Sea Fisheries Committee bye-laws made on 24 July 1981 and confirmed by the Minister of Agriculture, Fisheries and Food on 30 September 1982 included the following new bye-laws.

13. Prohibition of Spear Fishing -Lundy Island Marine Nature Reserve

No person shall use in fishing for sea fish or shell fish any harpoon spear or like instrument within the area designated by the Secretary of State for the Environment. by Order under section 36 of the Wildlife and Countryside Act 1981, as the Lundy Island Marine Nature Reserve, that is, the area enclosed by the following limits:

from a point	51°09'N	04°42'W	thence due North
to a point	51°13'N	04°42'W	thence due East
to a point	51°13'N	04°38'W	thence due South
to a point	51°09'N	04°38'W	thence due West
to a point	51°09'N	04°42'W	

14. Trawling and Netting Prohibition -Dart of Lundy Island Marine Nature Reserve

Within the area enclosed by the following limits:

From point A To	51°09'N	04°41 '30"W	thence a line due North
Point B	51°10'N	04°41'30"W	thence a line in a North/ Easterly direction
To point C	51°10'30"N	04°41'W	thence a line due North
To point D	51°11 '30"N	04°41'W	thence a line in a North/ Westerly direction
To point E	51°12'N	04°41 '30"W	thence a line due North
To point F	51°12'30"N	04°41 '30"W	thence a line due East
To point G	51°12'30"N	04°39 '48"W	thence a line due South
To point H	51°11'48"N	04°39 '48"W	thence a line in a South/ South Easterly direction
To point J	51°11 '18"N	04°39'18"W	thence a line in an East/ South Easterly direction
To point K	51°11 '12"N	04°38'30"W	thence a line due South

To point L	51°10'30"N	04°38'30"W	thence a line due East
To point M	51°10'30"N	04°38'W	thence a line due South
To point N	51°09'30"N	04°38'W	thence a line in a South Westerly direction thence a
To point p	51°09'N	04°39'W	line due West
To point A			

no person shall fish for sea fish or shell fish:.

a. by trawling.

b. using any kind of tangle net or moored or fixed net except that in the area lying to the west of the line running due North on longitude ()4°39'30"W between point Q 5lol0'N and point R 5lol0'30"N to the extent of mean high water mark medium spring tides on the eastern side of Lundy island the use of fixed gill nets will be permitted; or

c. using any gill net, other than those fixed gill nets as included in b. above, except in accordance with the written authority of the Sea Fisheries Committee signed by their Clerk and in accordance with the conditions contained in that authority .

15. Potting Restriction -Dart of Lundy Island Marine Nature Reserve

No person shall use pots, traps or other like instruments for the purpose of capturing (or storing) sea fish or shell fish within 100 metres of low water mark around the Knoll Pins as defined by low water mark.

16. Dredging

In these bye-laws the term 'trawling' includes dredging which shall be interpreted as the towing along the sea bed of any device for catching fish.

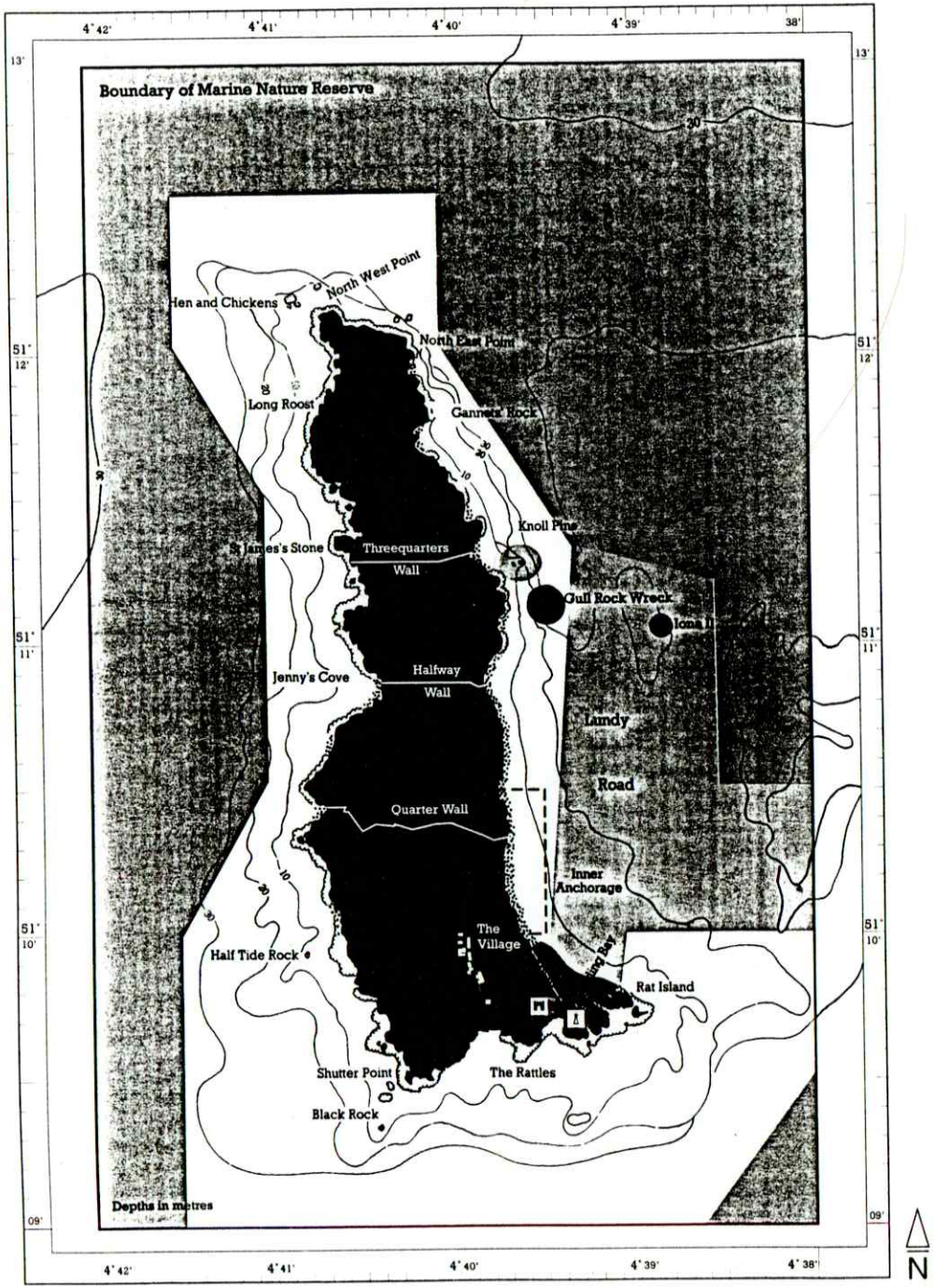
Description of reserve (schedule bye-law I)

The reserve is the area designated as a marine nature reserve under *S36* of the Wildlife and Countryside Act 1981 by The Lundy (Bristol Channel) Marine Nature Reserve Order 1986. Its description is as follows:

The reserve includes that volume of sea and area of sea bed around the island of Lundy fully contained within a rectangle with co-ordinates 51°()9'N 4°38'W; 51°13'N 4°38'W; 51°13'N 4°42'W; and 51 °()9'N 4°42'W and extends shoreward to include all land covered continuously or intermittently by tidal waters or parts of the sea as delineated by Highest Astronomical Tide (HAT).

Appendix V

Lundy Marine Nature Reserve



Zoning scheme

	Activity	General Use Zone		Refuge Zone	Sanctuary Zone	
Recreational	Diving	Yes	Yes	Yes	Yes	No
	Snorkelling[1]	No	Yes	No	No	No
	Swimming[1]	No	Yes	No	No	No
	Spearfishing	No	No	No	No	No
Commercial	Trawling	Yes	No	No	No	No
	Dredging	Yes	No	No	No	No
	Potting	Yes	Yes	Yes[2]	Limited[3]	No
	Tangle nets	Yes	No	Limited[4]	No	No
	Fixed nets	Yes	No	Limited[4]	No	No
Collecting	Group educational excursions	Permit	Permit	Permit	Permit	No
	Scientific research	Permit	Permit	Permit	Permit	Permit

1 The Landing Bay has a snorkel trail, where it is safe to swim or snorkel at low water. There are many hazardous currents and steep cliffs around the island, so seek advice on the island before snorkelling and swimming elsewhere. All these types of activity are undertaken at your own risk.

2 Potting is not encouraged in a 200m zone stretching seaward from high water mark, from Gannets' Rock South to the Landing Bay.

3 You will require a permit for potting between 1 October and 30 June in the Sanctuary Zone. Potting is prohibited within 100m of the low water mark around the Knoll Pins.

4 You can use tangle and fixed nets in only one part of the Refuge Zone and then only if you have a licence. This is the area west of the line running due north on longitude 04°39.5'W between the points 51°10'N and 51°10.5'N (area within dashed line on map), as far as the mean high water mark medium spring tides.

Please Note -

(i) All vessels are asked to avoid anchoring in all zones whenever possible, except the general use zone and near the Landing Bay in the Inner Anchorage. Anchoring within the archeological exclusion zone is not allowed at any time.

(ii) All activities have to comply with existing fisheries regulations and byelaws (Devon Sea Fisheries Committee byelaws 13 to 15 give further information). You are discouraged from rod and line fishing in the Landing Bay area because of the danger to snorkellers and swimmers from fishing tackle. The wardens can advise on suitable locations.

(iii) Where zones touch the shore, they cover all intertidal areas within the reserve up to the point of the highest astronomical tide.

The Warden for the Marine Nature Reserve can be contacted for

Appendix VI

Definitions of ratings of importance

International

Communities which are outstandingly good examples of their type in the north-east Atlantic. Communities recorded at only a very few locations in the north-east Atlantic.

Species which are recorded at only a few locations in the north-east Atlantic. Species recorded in higher abundance at Lundy than anywhere else in the north-east Atlantic or where Lundy is one of only a very few locations where large quantities are recorded.

National

Communities which are outstandingly good examples of their type in Britain. Communities recorded at only a few locations in Britain. Both of these definitions refer to communities which are or are likely to be widely occurring in other parts of north-west Europe.

Species which are recorded at only a few locations in Britain but are more widespread in other parts of the north-east Atlantic. Species recorded in higher abundance at Lundy than anywhere else in Britain or where Lundy is one of only a very few locations where large quantities are recorded in Britain. This rating is also used for species which are or are probably widely distributed in south-west Britain but where Lundy populations provide particularly good and well-documented examples of the species.

Regional

Communities which are present elsewhere in Britain but which are outstandingly good examples of their type in south-west Britain or are as good as similar communities present elsewhere in Britain. Communities recorded at only a few locations in south-west Britain.

Species which are unrecorded at only a few locations in south-west Britain but are widespread in other parts of Britain. Species recorded in higher abundance at Lundy that anywhere else in south-west Britain or where Lundy is one of only a very few locations where large quantities are recorded in south-west Britain.

Local

Communities which are widespread in south-west Britain with are good or better examples as several other locations.

This management plan will be subject to periodic amendments and review, which will be issued in loose-leaf format for inclusion in this document. Please use the table below to document these changes.

Date	Section amended	Reason for amendment

In order to ensure that you are informed of any changes to this document, please send your details for addition to the mailing list to:

Kate Donovan, English Nature, Devon Team, Level 2, Renslade House, Bonhay Road, Exeter, EX1 2QU.