

## MANAGING LUNDY'S MARINE WILDLIFE : A REVIEW OF THE MANAGEMENT PLAN FOR THE MARINE NATURE RESERVE

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A plan to conserve the wildlife on Lundy Island and Marine Nature Reserve has been recently published by English Nature. The nationally important wildlife to be found in the sea is described in this article and an agreed, active conservation plan to conserve the exceptional wildlife on and around Lundy is outlined.

### INTRODUCTION

Lundy Island, despite its small size, possesses a wealth of spectacular scenery and habitats, both above and below the water, harbouring a rich variety of animals and plants. Some of the species are rare in Britain, such as particular types of warm water coral, whilst the Lundy Cabbage occurs nowhere else in the world. The plateau area within the land-based Site of Special Scientific Interest (SSSI) includes maritime heathland dominated by *Calluna* heather which because of the exposed conditions has an unusual wave-like appearance. The heath is rich in lichens, including the rare golden hair lichen *Teloschistes flavicans*.

It is this rich mixture of wildlife and scenery, combined with the island's tempestuous history, dramatic geology and relaxed atmosphere, that makes Lundy such a special place.

To ensure the long term future of the wildlife on the island particularly within the statutory Marine Nature Reserve and SSSI and in the surrounding sea, English Nature has produced a management plan in close cooperation with The Landmark Trust who manage the island and Marine Nature Reserve, The National Trust who own the Island, and Devon Sea Fisheries Committee, who regulate fisheries in the surrounding waters.

During 1993 English Nature prepared a draft of the plan in cooperation with these organisations. Views on the management of Lundy were also sought from a wide variety of bodies including the Lundy Field Society, Devon Wildlife Trust, the Royal Yachting Association and the Royal Society for the Protection of Birds. These views have been taken into account in revising the text of the plan and the final document has been produced. Already new projects to improve education and interpretation of wildlife features have begun and will hopefully lead to wildlife benefits.

### LUNDY'S IMPORTANCE FOR MARINE WILDLIFE

Lundy is the only Marine Nature Reserve in England. It is therefore of great importance not only for the marine communities it contains, but as a means of demonstrating the importance of marine conservation to members of the general public. The beauty of many marine animals and plants is largely unnoticed by most people. Whilst the value of distant marine habitats such as coral reefs are recognised, habitats closer to home are not given the same recognition although they experience similar threats.

The presence of certain marine communities and species which are normally found in the warmer waters of southern Europe and the Iberian peninsula is of international importance. Many of these have not been observed elsewhere in England and are near the limit of their northern distribution around Lundy. This apparent anomaly is explained by the warm sea temperatures around Lundy and the island's favourable location with respect to currents such as the North Atlantic Drift which brings relatively warm water to the area.

Of national importance are the wide variety of habitats within a small area and the large number of rare or unusual species. Habitats range from those which are extremely exposed to wave action to very sheltered ones, and from areas exposed to fast tidal streams to areas where tidal flow is negligible. The very large number of rare species recorded within the reserve is regarded as being of great conservation importance.

Certain habitat types which are widespread in south-west Britain but particularly well-represented at Lundy are those in the rocky shore and underwater areas.

#### LUNDY'S MARINE WILDLIFE

The diversity of Lundy's wildlife results from a complex interaction of winds and wave currents. From the extreme conditions of the wave-swept western coast to the sheltered east coast, there are a multitude of different situations occupied by many different creatures. Habitats range from bare bedrock to sediment plains. Local landform features above and below the sea such as crevices, caves, gullies and rockpools add to the wealth of microhabitats within which different communities develop.

On rocky shores, there are rockpools, caves, boulders and crevices which add to this variety. In the underwater or sublittoral zones, the range of habitats is outstanding with examples rarely found elsewhere in southwest Britain of sheltered rock and sediment habitats in shallow water.

A description of the main communities and groups of animals and plants that are to be found in the seas around Lundy follows:

##### a. UNDERWATER (SUBLITTORAL) COMMUNITIES

Most visitors to Lundy will never have the opportunity to appreciate the diverse underwater wildlife around Lundy. Confronting this need is one of the main aims of the management plan. Several projects to improve interpretation of underwater marine life are underway so that the beauty and diversity of this hidden world can be brought to life.

Underwater communities on rocks are diverse and rich because of Lundy's position and orientation in the Bristol Channel. Underwater communities around Lundy are distributed according to a number of factors including the type of substratum, light intensity and seawater movements. Topography, amount of silt build up and scouring by sand also have an influence. The presence of many southern species is a strong influence and many species that are rare in the UK are to be found.

The rocky underwater areas sheltered from fierce waves and storms are where the communities of high conservation importance are found. The stability of sheltered areas means that more communities can develop and be maintained. Notable species include the Devonshire cup coral *Caryophyllia smithii* which despite its name is not restricted to the waters around Devon. This species can be found on underwater overhanging rocks and in deep crevices.

A habitat rare in southwest Britain is the large area of muddy gravel off the east coast. This habitat is very valuable. Distinctive animals include the burrowing anemone *Mesacmaea mitchellii* and brittle star *Ophiura albida*. Another rarely encountered habitat is that of mud and mud covering gravel. These sediments support a rich community characterised by the burrow-forming crab *Goneplax rhomboides*, and the brittlestar *Amphiura filiformis*. No similar areas of such high quality are known in south-west Britain. The rare red band fish *Cepola rubescens* is also found in this habitat.

##### b. SHORE (LITTORAL) COMMUNITIES

Rocky shores around Lundy promise some exciting finds to the casual observer. The range of species to be found is similar around the island, but relative abundance varies greatly depending on exposure to wave action, rock slope, rock type, aspect, mobility of the substrate and other environmental factors. Shores range from those that are fully exposed to the force of Atlantic waves to those that are very sheltered and protected. Most show a clear zonation of communities which are usually distinguished by an indicator species.

Some species can only be found in extreme conditions either on very sheltered or very exposed shores. Exposed shores are typified by large numbers of limpets *Chthamalus stellatus* and barnacles *Patella vulgata*. Algae such as the thongweed *Himanthalia elongata* with its button-shaped holdfast and strap-like frond and *Alaria esculenta* are also found. Diversely coloured lichens cover the upper parts of an exposed shore and in the splash zone. It is often difficult to distinguish organism from the living rock.

Sheltered shores on the east coast of the island hold the greatest diversity of species. Conditions are more stable on this side of the island allowing a wider variety of communities to develop. The stalked mustard-yellow fruiting bodies of the egg or knotted wrack *Ascophyllum nodosum* are very obvious in the Spring. This species grows well in sheltered areas and can carpet rocks with its olive-green fronds. The algae *Mesophyllum lichenoides* is also characteristic and is abundant in certain locations on the lower shore. The undersides of stones and boulders hold a remarkable diversity of sponges, crustaceans, sea-mats, echinoderms and fish.

#### c. MARINE PLANTS

The marine flora of Lundy is very rich, totalling over 300 species, and includes a number of rare species (Irvine & Smith 1972). For example, the broad strap-like lamina of the kelp or oarweed *Laminaria ochroleuca* can be seen during very low tides, although it is difficult to distinguish from its commoner relative *Laminaria hyperborea*. Many southern marine plants grow around Lundy including seaweeds such as *Carpomitra costata*, *Grateloupia dichotoma* and *Bifurcaria bifurcata* which 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 the pink encrusting algae *Lithothamnion glaciale* are at the southernmost limit of their distribution. Several other rare algae species, for example *Radicilingua thysanorhizans* and *Pterosiphonia complanata*, are found.

#### d. MARINE INVERTEBRATES

The marine invertebrate fauna of Lundy is also very rich with a number of unusual species rarely found elsewhere in British waters. Several southern species are found in abundance. These include the cup coral *Leptopsammia pruvoti* and the colourfully named scarlet and gold star coral *Balanophyllia regia*. The aptly named sea finger *Alcyonium glomeratum* and the sea fan *Eunicella verrucosa* are both near the northern limit of their distribution.

Underwater areas have very large numbers of a variety of sea anemones, sea-firs, sea-mats, sponges and sea slugs.

#### e. FISH

Many brightly coloured fish can be found around the island including large numbers of territorial fish such as ballan wrasse *Labrus bergylta*, corkwing *Crenilabrus melops* and rock cook wrasse *Centrolabrus exoletus*. These species all live within the kelp forests together with pollack *Pollachius pollachius* and shoals of two-spot goby *Gobiusculus flavescens*. The sandy bottom of the Landing Bay and other sandy areas are frequented by other small gobies, dragonet and flatfish. Below the kelp, the brightly coloured cuckoo wrasse *Labrus mixtus* is common (Plate 1, at front), and lesser spotted dogfish *Scyliorhinus caniculus* are regularly seen.

A population of the rare red band fish *Cepola rubescens*, is found off the east coast. This species has the unusual habit of living in burrows in sediments. The population is also unusual because the red band fish normally inhabits much deeper water. Its discovery off Lundy provided a unique opportunity for *in situ* studies to be undertaken. Studies have found that since research began in 1977, there have been considerable fluctuations in population size. Indeed from 1984 to 1987, no records of the fish or their burrows could be found. The most recent records (Irving, 1990) revealed twelve burrows and one individual within a small, discrete area.

Basking sharks *Cetorhinus maximus* are regularly recorded during the summer months on migration. Other sharks such as porbeagles *Lamna nasus* or blue sharks *Prionace glauca*, have also been sighted.

#### f. SEABIRDS

Lundy island is an important site for breeding seabirds in the South west. Several birds are of high value to conservation, including the ground-nesting manx shearwater *Puffinus puffinus* whose populations in the British Isles have declined by about twenty percent over the past twenty years (Wingfield- Gibbons *et al*, 1993). There is doubt over whether manx shearwaters breed on Lundy although about 1200 pairs are estimated to be present during the summer. Cliff nesting birds such as the guillemot *Uria aalge*, razorbill *Alca torda* and ocean wandering species like the storm petrel *Hydrobates pelagicus* can be observed around the island.

#### g. MARINE MAMMALS

The Lundy population of grey seals *Halichoerus grypus* is small in relation to other established colonies around the UK coast but nonetheless important. Grey seals are only one of two mammals thought to be native to Lundy, the other being the pygmy shrew. The estimated population is eighty adults (pers.comm. Gibson 1993). However, numbers fluctuate according to the time of year, with a maximum of about 120 animals present between July and October. Pupping takes place in a number of sea caves around the island, with about twenty-five pups born annually, although there is a high mortality (Clark 1977, Wilcox 1986).

Common dolphin *Delphinus delphis*, Risso's dolphin *Grampus griseus* and harbour porpoise *Phocaena phocaena* have all been sighted in the waters around Lundy (Dymond 1973).

#### HUMAN INFLUENCES AROUND LUNDY

##### a. FISHERIES

The waters around Lundy have long been used as a source of crabs and lobsters by local fishermen. Potting takes place along the west coast of the island for crabs and off the east coast for lobsters. Management of marine resources is important in order to protect Lundy's special marine features. Management of the reserve will allow these activities to continue around the island but will encourage sensible use so that fish stocks are able to renew and recover themselves whilst supporting fishing and marine wildlife.

##### b. EDUCATION AND INTERPRETATION OF MARINE WILDLIFE

Lundy remains a popular destination for field trips and courses for study in both the marine and land environments. However, because few of the shores are accessible from land, large-scale marine biological study is more difficult than might be expected.

Currently, there is information available to people visiting the island that tells them about Lundy's special marine wildlife features, but there is a need to add to and improve this material. There are opportunities to provide information to people travelling on the MS Oldenburg on their journey to and from the island. Projects in the Management Plan include updating information leaflets, improving the recorded announcement and developing a video facility showing films about Lundy's marine wildlife. A new promotion board for Lundy is in place at Ilfracombe, emphasising Lundy's hidden marine world.

Recent market research shows clearly that many visitors are interested in marine wildlife and are keen to know more. The research project, undertaken as a review of explanatory material and facilities, looked at what might be done to make the most of Lundy's marine and land wildlife features for the education and enjoyment of the public. A consideration of the review's recommendations, together with other initiatives, will hopefully lead to an increase in the value of Lundy for education. New projects include a series of explanatory leaflets covering topics such as seals and the wildlife of rocky shores. There are also plans for a mobile information display board to help the warden in his work. Other exciting possibilities include beaming live pictures of sea creatures from the underwater Remote Operated Vehicle to TV screens on the Landing Bay.

##### c. RECREATION

There are various recreational activities taking place in the marine environment around Lundy. The island is popular with divers and there is a well-used snorkelling trail

near to the Landing Bay presently overseen by the warden. A limited amount of sports angling is carried out around the island. Divers do not have a great impact on the reserve, although in the past souvenir collection was a problem. This is now prohibited.

Pleasure boats and other vessels frequently visit and anchor off Lundy. The lee-side of the island offers protection from storms and during bad weather many vessels anchor here. There are long established moorings at the Landing Bay, but elsewhere anchoring is discouraged because of the impact on benthic marine communities and nesting seabirds.

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

#### d. RESEARCH INTO THE MARINE ENVIRONMENT

The outstanding scientific interest of the marine environment around Lundy has been demonstrated by the wide range of scientific publications and reports produced over the past twenty years. The Lundy Field Society has been at the forefront of this research, fulfilling one of its aims to study and record the natural history of the island. 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 indeed of exceptional interest.

This interest is reflected in the number of descriptive and monitoring studies of near-shore underwater and intertidal areas around Lundy, which 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 underwater 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 underwater communities in general.

This principle has been put into practical use and has shown results that have great implications for marine conservation management. Analysis of monitoring data for the last eight years has shown that many of the communities, 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 (Eno, 1992). Likewise many of the southern sponges and sea anemones take a long time to recover from disturbance. The vulnerability of these species has to be taken into account when prescribing management.

All of the marine communities within the Marine Nature Reserve are natural communities little influenced by the activities of man with the exception of those on wrecks. The *MV Robert*, which lies within the Reserve boundary is the only wreck which has been closely studied by marine biologists. The presence of the wreck has provided an unusual opportunity to study colonisation and succession, important factors guiding management within the Marine Nature Reserve.

English Nature is keen for the long tradition of biological research around Lundy to continue.

### MANAGEMENT

#### a. MANAGEMENT HISTORY

In 1969 it was first suggested, 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 assessed the scientific interest of the area and recommended the

establishment of a voluntary marine nature reserve around the island (Hiscock 1971).

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.

A management policy was drafted 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". A code of conduct for visitors to, and users of the marine nature reserve was produced (Hiscock, 1972).

In 1981, the Wildlife and Countryside Act was passed which enabled, for the first time, the establishment of statutory Marine Nature Reserves. Following extensive consultation, the Lundy (Bristol Channel) Marine Nature Reserve Order designating the Reserve was announced on the 20th November 1986 by the Minister of State for the Environment.

Despite being a voluntary marine nature reserve since 1973 and a statutory one since 1986, until now there has been no formal management plan in operation. A draft management plan was produced in 1983 but was not put into action (Hiscock, 1983).

#### b. GENERAL MANAGEMENT APPROACH

English Nature has recently launched its strategy for addressing the pressures facing the marine environment. This strategy summarises our philosophy, aims and approach to marine nature conservation (English Nature, 1993)

Our approach to marine wildlife management has been to divide the marine environment into broad areas which reflect the range of nature conservation interests, and within which management objectives and programmes of work can be developed. A tiered approach has been taken to ensure protection of individual sites, of more mobile species and of biological and physical processes in the wider seas.

These tiers are:

- 1 The wider sea. This is identified as the first tier because if the sea itself is not in a healthy state then sites will degrade despite all our efforts to maintain them.
- 2 Marine wildlife areas, which are often areas of high biodiversity containing valuable or susceptible sites. The seas around Lundy have been identified as a marine wildlife area.
- 3 Areas of special interest, which are of the highest nature conservation value and often include habitats or sites highly susceptible to damage. They are identified for their important benthic populations, spawning or nursery areas for fish, fragile intertidal communities, or breeding, feeding or roosting areas for birds and sea mammals. Lundy Marine Nature Reserve is an area of special interest.

Such an approach lets increasing levels of protection for habitats and species to be applied, whilst allowing sufficient flexibility to develop different management techniques.

Management of Lundy Marine Nature Reserve is based on this approach and is essential to ensure continued protection of its valuable wildlife resource.

The management plan for Lundy Marine Nature Reserve and Site of Special Scientific Interest has been produced in order to achieve the following overall aim:

*To manage the Lundy Marine Nature Reserve and Site of Special Scientific Interest for the benefit of their wildlife, ensuring the ecologically sustainable use of resources, and promoting the use of the reserve for education, and enjoyment of all aspects of marine conservation.*

#### c. SOME MANAGEMENT CONCERNS

Factors outside the Marine Nature Reserve boundary affect marine wildlife within the

boundary. The most important of these influences is that of water quality both within and in the proximity of the Reserve. Possible problems include increased turbidity, resulting from aggregate dredging in the Bristol Channel, which leads to reduced levels of light penetrating the waters around Lundy. The growth of algae in the sea and on the lower shores would be reduced and affect the functioning of the marine ecosystem. Increased siltation would also smother important animal communities on the sea floor.

The marine communities around Lundy are for the most part natural. The main management required to ensure their survival is to minimise the disturbance caused by Man's activities within the Reserve and to influence what activities occur in the seas around Lundy.

Activities likely to cause direct physical damage to fragile and slow-growing communities (for example potting, trawling, anchoring, diving) are recognised and need to be considered through existing regulations and the management plan so as to minimise their impact.

The ecology of underwater rocky and sediment areas can be adversely affected by, for example fishing activity (eg trawling, dredging and potting) 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 can trap or affect non-target species including marine mammals such as seals. Delicate communities on the sea floor are also vulnerable where anchors are used. Populations of slow-growing species, including sea fans and cup corals, have been severely reduced by collecting in the past and remain vulnerable to damage and collection.

#### d. THE MANAGEMENT PLAN - STRUCTURE

The management plan is set out according to a standard format, with three main sections. The first section (Description) describes all the relevant features of Lundy including its physical environment, the wildlife that lives there, and man's influence. The second section (Generation of objectives) analyses what is special about Lundy and its wildlife and, based on this analysis and other relevant factors, sets out a proposed series of objectives in order to achieve the overall management aim for the Marine Nature Reserve and SSSI. The third section (Prescription) details what action is needed to successfully accomplish each objective. The emphasis of the plan is on its use as a working document.

#### e. MANAGEMENT ACTION - THE ZONING SCHEME

Management is focussed on using existing statutory mechanisms and achieving consensus with local interests and involved organisations. This will result in small areas of control surrounded by far larger areas as buffer zones. Therefore as part of the management plan, English Nature has proposed 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 (Plate 3, at front). Details of the scheme, which interprets the existing byelaws and code of conduct, have been sent to all interested bodies and comments received. The responses have been very positive, and it is hoped that the scheme will be widely used.

#### FURTHER INFORMATION

Full details of the zoning scheme and the marine strategy are available from English Nature's marine task force at our Peterborough headquarters. Copies of the full management plan and further information on the marine wildlife to be found around Lundy can be obtained from English Nature's Devon and Cornwall team in Okehampton, at the address at the beginning of this article.

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