

**ENGLISH NATURE**

**NATURAL AREA PROFILE**

**THE ISLES OF SCILLY**

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# Section 1

## **Introduction and Context : Natural Areas and the UK Biodiversity Action Plan**

The development of the Natural Area concept is a key part in English Nature's drive to conserve nature in England. A Natural Area is not a designation, but an area of land and/or sea identified by its unique combination of physical attributes, wildlife, land use and culture. Natural Areas provide a framework for securing public support for wildlife and geological conservation, so that development of the idea will greatly improve the ability of us all to deliver effective nature conservation.

Overall, England and the seas around it have been divided into some 120 Natural Areas, including 24 Maritime Natural Areas. The boundaries of these Maritime Natural Areas extend from the inland limit of all coastal and estuarine habitats, offshore to the 12 mile limit. The lateral extent of each Maritime Natural Area is closely related to the coastal process cells and sub-cells which have been defined by Hydraulics Research for the Ministry of Agriculture, Fisheries and Food to aid the preparation of Shoreline Management Plans. The coastal process cells are areas within which coarse sediment movement is contained in discrete boundaries. Thus coastal processes within the cell will affect other areas within the cell but will have less effect outside that area.

The production of this Profile, which combines the maritime and terrestrial elements, is intended to be a further first step towards securing local agreement on the priorities for nature conservation in the Isles of Scilly. It describes and evaluates the wildlife and geology of the area, and proposes key nature conservation and strategic objectives which can be used by anyone who is formulating plans to help conserve the environment of the Isles of Scilly.

This profile looks at the marine and terrestrial features of the Isles of Scilly and how they have been, and are continuing to be, influenced by both physical and human processes. Objectives for the future conservation of the wildlife resource as an integral part of the existing land management practices. It is anticipated that the implementation of the objectives will help to achieve a sustainable wildlife resource for the benefit of Scillonians and others who have an interest in the well being of the Islands' natural environment.

The status, characteristic wildlife and special species of each of the 13 key wildlife habitats found in the Natural Area are described, the current factors affecting them identified and nature conservation objectives proposed.

This document is fully consistent with recent UK thinking on the conservation of biodiversity, a process initiated in Rio in 1992 when the Prime Minister, together with over 150 world leaders, signed the Biodiversity Convention. In particular, the profile draws heavily on *Biodiversity: The UK Steering Group Report*, a December 1995 report to Government which develops several of the prime objectives laid out in *Biodiversity: The UK Action Plan (1994)*. The Steering Group report includes

lists of species of conservation concern within the UK, as well as costed action plans for some 14 key habitats and 116 key species. This profile could be used to form the basis of Local Biodiversity Action Plans for certain habitats and species requiring particular attention.

## **Section 2**

### **The Natural Area Boundary**

The boundary of the Natural Area is taken to incorporate all of the islands and sea for a twelve mile radius. The Isles of Scilly Natural Area Profile is unusual compared to others in that it combines the terrestrial and maritime features of the area whereas all other Natural Areas in England are either one or the other with an overlap on the coastal fringe.

## Section 3

### The Nature Conservation Interest of the Natural Area

The Isles of Scilly is an archipelago of over 200 low-lying granite islands and rocks located some 28 miles south-west of Land's End. It is the most south-westerly part of Britain and is the only archipelago in England. The unique combination of its relatively isolated location, long history of human occupation and extreme maritime climate have resulted in the development of an island complex of international wildlife importance.

The nature conservation interest of the Isles of Scilly Natural Area lies in its key physical and wildlife features. Many of these features are of importance in Britain and Europe. The identification and evaluation of the key wildlife and geological features is the first stage in the process of formulating objectives for their conservation.

#### **3.1**                      *Physical and geological features*

*Geological history:* The solid geology of the islands is granite, formed around 290 million years before present. The granite is part of a huge subterranean batholith stretching from Dartmoor to the submarine outcrop of Haig Fras, some 100 km to the WNW of Scilly, but exposed only in places where the overlying cover rocks have been stripped from the domes by weathering and erosion. Slow cooling of the batholith during formation has given the granites a distinctive crystalline and coarse-grained texture. This is reflected in the poorly formed, acidic soils of the area.

*Quaternary history:* The maximum glacial limit during the Quaternary (the last two million years) reached as far south as the north coast of Scilly, eroding the rocks over which it passed and depositing glacial tills (sand, gravel and clay) at its limits. Periodic periglacial weathering of the granite during the Quaternary created granite tors and a weathered mantle (regolith) around their bases. Solifluction deposits (head) also developed at this time as these regoliths were mobilised and flowed down slope across permafrost. The result of granite weathering and erosion of low cliffs and platforms takes two forms, an angular head and the production of much sand which is often blown up into small ridges and dunes. In places, such as Porthloo, head deposits may reach a thickness of several metres and are found in association with organic horizons which allow dating and correlation between sites.

*Geomorphological evolution and processes:* During interglacial periods when the climate was warmer, raised beaches formed around the islands as a result of the relatively high sea levels. There are clear traces of raised beaches or platforms at 3-8 metres above the present sea level. These show up best in areas of weathered granite and less clearly where the rock is sound and well jointed. Submarine contours around the archipelago show clearly that the whole group is the result of the erosion and submergence of the once continuous granite batholith. Evidence suggests that the archipelago is still sinking.

The Isles of Scilly is encircled by a 50 metre depth contour which comes to within a few hundred metres

of the shore along much of the north, east and south coasts, suggesting a steep slope into deep water at many locations. The Western Rocks, Annet, St Agnes and the rocks and islands west of Bryher are separated from the rest of the archipelago by depths in excess of 10 metres, whilst St Mary's is separated from Bryher, Samson, Tresco and St Martin's by depths of less than one metre in places, with extensive tidal flats at low tides joining the latter four islands.

Prevailing winds and swell are from the south west and, particularly in view of the deep water close to the shore, south and west facing coasts on the outer rocks and islands are extremely exposed. A high proportion of winds also come from the north. East facing coasts between the islands and in bays have very sheltered conditions.

The amount of blown sand has increased considerably with the most conspicuous area being on Tresco where it forms a ridge on the south east shore of the island reaching a height of 11 m in some parts, forming a quite effective barrier to the sea. A noteworthy characteristic of the islands is the number of sand bars and tombolos which now join former islands. It appears that the overall land area of Scilly has not decreased in recent times, despite earlier submergence of the archipelago, predominantly due to the constant washing up of fine sand from the shallow sea floor around the islands.

#### **Key geological and geomorphological features on the Isles of Scilly**

- Granite weathering landforms, including coastal tors
- Coastal cliff sections showing glacial deposits in the northern islands and head deposits in the south
- Coastal landforms such as beaches, sand bars and tombolos which join the islands
- Raised beaches or platforms at 3-8 m. above present sea-level

#### **Geological/geomorphological SSSI coverage**



Thirteen main habitat types occur in the Natural Area, which are affected to varying degrees by human activities and management practices. However, many species, particularly the more mobile ones, utilise a mosaic of habitat types for various purposes. This is particularly the case for the internationally important colonies of breeding seabirds and non-breeding shorebirds which require a variety of habitats in order to complete their life-cycle, from secluded islets for nesting, invertebrate-rich sediment or rocky shores and open sea habitats for feeding to undisturbed locations for their high tide roosts.

The islands exhibit a diversity of marine, shallow water and intertidal habitats with an associated richness of algal and invertebrate communities and species. The sediment shores and eel-grass beds are particularly rich, including many animal species usually having a more southern distribution.

A valuable facet of the Isles of Scilly's vegetation is that, in many places, there is a complete natural succession from the foreshore up to the tops of the hills. Thus, in low lying areas, one can move from sand dunes through to species rich maritime grassland and beyond to higher ground covered with waved heathland whereas on many of the islands the transition is from rocky shores and boulder beaches to steep, sea-cliffs topped by maritime heath and grassland. In some locations the coastal habitats are backed by predominantly freshwater systems, supporting wet grassland, pools, marshland and swamp vegetation.

Elm hedge banks and copses represent a significant habitat for birds and epiphytic lichens and are also of interest in themselves since the mainland has lost a great deal of its Elms due to Dutch Elm disease. The many shelter belts also provide cover for the many migrant bird that use the islands as a landfall, especially in the autumn.

**Table 1. The main habitats and their significance for nature conservation**

<b>HABITAT</b>	<b>SIGNIFICANCE</b>
Maritime heathland and grassland	National
Wetlands	Local
Arable/bulb fields	National
Hedges, shelter belts and field margins	National
Saline lagoon	National
Sand dune	Local
Sea cliffs	National
Boulder beaches	National
Intertidal rock	National

Intertidal sediments	International
Subtidal rock	National
Subtidal sediment and eelgrass beds	International
Open sea	National

Note that the complex of intertidal habitats as a whole are of international importance for non-breeding waders and that the mosaic of both terrestrial and marine habitats combine to support an internationally important assemblage of breeding sea birds.

### **3.2.1 MARITIME HEATHLAND AND GRASSLAND**

Occurring as a mosaic of vegetation, the maritime heathland and grassland areas occupy the coastal fringes of the islands where the soils have become exhausted and where exposure to the elements is greatest. They are of particular importance for the rich assemblages of lichens and, on the more secluded areas, provide habitat for breeding seabirds.

Lowland heathland is a priority for nature conservation because it is a rare and threatened habitat. In England only one sixth of the heathland present in 1800 now remains. The UK has some 58,000 ha, of which the largest proportion (55%) is found in England, which represents about 20% of the international total of this habitat.

#### **Characteristic wildlife**

The dominant plant species are heather, grasses, Western gorse and Cross-leaved heath. Of the relatively few other species that occur, the most frequent are Tormentil, Common Bird's-foot-trefoil and Heath Bedstraw. Where grassland becomes more dominant, particularly towards the cliff line, species such as Thrift, Yorkshire-fog and Red fescue occur. On some islands there are areas that are almost completely dominated by dense stands of Thrift, an unusual vegetation type that is particularly well developed on Annet.

The sheltered, sandy areas within the coastal heaths support many invertebrates, particularly beetles, bees and butterflies. Breeding seabirds occupy many of the heath/grassland/Thrift areas, particularly on the more remote headlands and uninhabited islands. Species present include Puffin, Common Tern, Lesser and Great Black-backed gull.

#### **Special species**

On many sites there is a well developed assemblage of lichens, including a range of rare oceanic species. Of particular note are the *Heterodermia* communities which are now very rare and comparable sites, outside Scilly, only occur in Brittany and the Channel Islands. There is also the unusual occurrence of the normally tree-dwelling Lungwort *Lobaria pulmonaria* to be found growing on heather. Rock or ground-dwelling lichens are also abundant, particularly along the cliffs. Species here include *Ramalina siliquosa*, and the rare *Roccella fucoides* and the Golden-hair lichen *Teloschistes flavicans*.

Short turf areas within the maritime grasslands and heaths support several national rarities, including Least Adder's-tongue *Ophioglossum lusitanicum*, Orange Bird's-foot *Ornithopus pinnatus* and the scarce Small Adder's-tongue *O. azoricum*.

### **Protected sites**

16 of the 20 main areas that support a heathland-grassland mosaic are notified as Sites of Special Scientific Interest. Four SSSIs, Annet, Samson, Tean, Wingletang Down and the Tresco part of Pentle Bay, Merrick and Round Island are also included in the candidate Special Area of Conservation as locations for the nationally rare Shore Dock.

Some of these sites could well be considered as being part of the potential Special Protection Area in recognition of their importance for breeding seabirds, although a precise boundary for the SPA has yet to be defined.

### **Factors which may affect the habitat**

- Lack of management, particularly grazing, leading to loss of open, short heathland due to invasion by bracken and gorse
- Loss of vegetation cover for breeding birds and invertebrates and long term damage to the heather due to accidental summer fires

#### **Key nature conservation objectives for maritime heathland and grassland:**

1. Maintain all existing areas of maritime heathland and grassland.
2. Restore to good quality heath those areas which have been recently invaded by gorse/bracken.
3. Where practical, sustain heathland and grassland areas by the reintroduction of grazing.

There are three main freshwater wetland areas on Scilly, namely Higher Moors and Lower Moors on St Mary's and the Great Pool and Abbey Pool complex on Tresco. The former two are fed by small streams and ground water entering from higher ground and then spreading out over the valley floors to form a mosaic of pools, mire and scrub of willow and alder. The Tresco pools are shallow and relatively extensive with fringing reed beds and willow scrub.

All of the wetlands are particularly valuable as feeding grounds for passage and wintering birds as well as breeding sites for many waterfowl and summer visitors, such as warblers. The flora of the two Moors is rich and provides a valuable addition to the species complement of Scilly.

Higher and Lower Moors contain peat deposits rich in pollen and other palaeoenvironmental evidence, providing information about the vegetational history of Scilly from the Mesolithic onwards. There are also the remains of peat cuts and baulks, relating to when the mires served as a valuable source of fuel.

### **Characteristic wildlife**

Common reed dominates many of the waterside areas and these areas form valuable nesting sites for Sedge and Reed warblers. Old grazing marshes around the Moors have a rich wet grassland flora, with abundant Yellow Iris, Royal Fern, Purple Loosestrife, Water Mint, Hemlock Water-dropwort and, in places, Greater Tussock-sedge. Additional diversity of vegetation types is provided where more acidic, boggy conditions prevail. These relatively small areas support Bog Pimpernel, Marsh St. John's-wort, Bog Stitchwort and, in the wetter areas, Lesser Spearwort.

The mosaic of vegetation types and the relative seclusion provided by the wetlands offer ideal conditions for breeding waterfowl such as Mallard, Gadwall, Teal, Water Rail, Coot and Moorhen. The wetlands are also a focal point for many rare vagrant, passage migrant and wintering birds, for which the Isles of Scilly are internationally famous.

### **Special species**

Apart from the many birds that use the wetlands, some of which do so exclusively, most animals and plants are relatively common species.

### **Protected sites**

All of the main wetland areas, apart from Abbey Pool on Tresco, are notified as Sites of Special Scientific Interest.

### **Factors which may affect the habitat**

- Water loss or abstraction. Maintaining the required water levels at surface is vital, particularly for the Moors on St Mary's; high in summer to benefit growth of the vegetation, with the ability to lower the levels in winter to enable reedbed management.
- Run-off of nutrients from farmland or leachates from landfill could lead to eutrophic or polluted conditions if excessive, thereby changing the balance and health of aquatic plant and animal species; saline intrusion either from the aquifer or because of breaches in the coastal defences could also change the species composition of the open water plant communities.
- Lack of habitat management. Unless reedbeds and grazing marshes are regularly cut and/or grazed, natural succession will lead to rank growth and eventually willow carr and woodland communities will take over. The occasional removal of accumulated silt from the pools is also necessary to ensure their long term existence.
- Reduction of water levels can lead to the drying out and degradation of palaeoenvironmentally important peat deposits. The enlargement of existing pools and digging of drains can destroy the peat itself and the evidence for past peat cutting.

#### **Key nature conservation objectives for wetlands:**

1. Maintain water levels to meet the needs of wildlife and ensure they can be adjusted to enable site management appropriate to the season, via an agreed water level management plan
2. Ensure water quality is high by safeguarding the catchment from potentially harmful run-off, via an integrated catchment management plan
3. Implement favourable site management to provide a mosaic of habitat types and conditions. In particular, maintain and rehabilitate wet reedbeds at Lower Moors and Porth Hellick Pool by 2000.
4. Ensure that the management of wetlands takes account of their palaeoenvironmental and archaeological value.

### **3.2.3**

#### ***ARABLE/BULB FIELDS***

The arable/bulb fields situated on sandy soils are important for many species of plants that are adapted to the annual disturbance associated with the cycle of cultivation, although many species survive only in field corners and margins where they can avoid competition from the crop and use of herbicides. Adjacent hedgebanks also act as refuges providing they have not been treated with herbicide.

## **Characteristic wildlife**

The arable/bulb flora is unique and includes many British extreme rarities along with species that have declined on a massive scale on arable land on the mainland. In addition, many naturalised exotics are also present, for example the Bermuda buttercup.

## **Special species**

Several highly specialised arable weeds occur, including the globally rare and threatened Western Ramping-fumitory, the endemic Purple Ramping-fumitory and the nationally rare Smaller Tree-mallow and Four-leaved Allseed.

## **Protected sites**

Although no Sites of Special Scientific Interest have been specifically selected for their rare arable plant interest, several sites, for example Gugh, do include abandoned fields that are known to support such species.

## **Factors which may affect the habitat**

- On those fields that are currently used for arable/flower production the use of herbicides to control weed growth along hedgerows can be very damaging to their populations of rare arable plants.
- A change in the type of crop grown can also be detrimental to some species if it involves alterations to the growing seasons and/or nutrient status of the soils.
- Abandonment of fields altogether, leading to scrub and bracken encroachment, can also threaten the survival of rare plants that have become dependent on the conditions provided by the regular cropping of land.

### **Key nature conservation objectives for arable/bulb fields:**

1. Maintain and enhance populations of all key species.
2. To retain the traditional cropping regime that allows the rare arable plants to flourish on land that is still farmed.
3. To manage the abandoned fields that are known to harbour rare arable species in a way that at least prevents their further loss.

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|---|
| <p>4. If fields are returned to cultivation, ensure that the cropping regime is appropriate to the requirements of any rare plants that may be present.</p> |
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### **3.2.4 HEDGEBANKS, SHELTER BELTS AND FIELD MARGINS**

Scilly's hedgebanks are now almost unique in Britain for their healthy stands of Elm species, these having died out elsewhere due to the ravages of Dutch Elm disease. Shelterbelts, planted to protect the farmland against the strong winds and sea breezes mainly consist of species imported from around the world to perform this specialised role. These included Tamarisk, Monterey Pine, Euonymus, Pittosporum, Escallonia and Olearia.

#### **Characteristic wildlife**

In addition to the presence of a healthy growth of Elm, the dense network of hedgebanks and shelterbelts acts as a valuable system of wildlife corridors across the farmland. They are also essential breeding sites for many species of birds and act as refuges for many common species of lower and higher plants. Field margins are very important for rare plants.

#### **Special species**

The unusually high population of breeding Song Thrush on Scilly, possibly 12 times as high as anywhere else in the UK, is of special note as this species relies heavily on the presence of dense shrubs along the shelterbelts.

Rare arable weeds are present in some hedgebanks and field margins are also of particular importance for the fumitories including Western Ramping-fumitory and other nationally rare species such as Smaller Tree- mallow.

#### **Protected sites**

There are no Sites of Special Scientific Interest that have been notified especially for their plants or animals associated with hedgebanks or shelterbelts.

#### **Factors which may affect the habitat**

- Loss of the frost-sensitive foreign species from the shelterbelts due to exceptionally cold winters/salt spray
- Lack of coppicing and/or replacement of Elms and other species of trees and shrubs, leading to senescence and loss of the dense, low growth that is of value to birds and other animals as

cover.

- Insensitive management of hedges and field margins, for example applying herbicides to hedgebanks or timing of management operations during the bird breeding season.

**Key nature conservation objectives for hedges, shelterbelts and field margins:**

1. Maintain a wide age range of tree and shrub growth along the hedgebanks and shelterbelts via a rolling programme of coppicing and replanting.
2. Prevent the establishment of Dutch Elm disease on Scilly by strict control of timber imports.
3. Ensure sympathetic management of habitats for rare and scarce plants and breeding birds.

### 3.2.5

### *SALINE LAGOONS*

Saline lagoons are a priority habitat under the EC habitats and species directive. They are a scarce coastal feature, often transient in soft coastlines and easily infilled for reclamation, rubbish disposal or damaged during coastal protection works.

Saline lagoons typically contain a mixture of freshwater and seawater, which enters via percolation through a shingle barrier or through a restricted connection channel to the open sea. Tidal levels do not fluctuate markedly, and communities of plants and animals within lagoons are adapted to the stresses of variable salinity caused by increased freshwater input from rainfall, or increased salinity due to evaporation in dry hot weather.

There are several wetlands on Scilly that have a brackish influence, due to a combination of influence from salt spray and/or connection to the sea by a pipe with a tidal flap. However, the only true saline lagoon is the Pool of Bryher.

#### **Characteristic wildlife**

A number of salt tolerant plants live in and around the edges of the Pool of Bryher, namely Sea-milkwort, Saltmarsh Rush and Lesser Sea-spurrey with Brackish Water-crowfoot occurring in the open water.

## Special species

The uncommon Beaked Tasselweed and the nationally scarce sand shrimp *Gammarus chevreuxi*, both saline lagoon specialities, are present.

## Protected sites

Pool of Bryher is within a SSSI. The other wetlands having a brackish influence, namely Big Pool St Agnes, Great Pool Tresco, Porth Hellick Pool and Lower Moors are within SSSIs

## Factors which may affect the habitat

- Water quality and eutrophication are a problem within the enclosed waters, particularly for the Pool of Bryher which is sensitive to excessive loading from septic tank outfalls from the adjacent hotel complex.
- Agricultural management of the surrounding land in the catchment area is a key factor in controlling nutrient enrichment of the waters.

### **Key nature conservation objectives for saline lagoons:**

1. Reduce eutrophication of waters due to all sources.
2. Ensure the balance between salt water and fresh water inputs is maintained when coastal defence and other engineering works are carried out.
3. Ensure that no pollution from residential sources occurs.

### 3.2.6

### *SAND DUNES*

Sand dunes occur along the low lying, relatively sheltered stretches of coast around the Isles of Scilly with the most well developed areas being at the southern end of Tresco, Bar Point on St Mary's and on St Martin's fronting Higher Town and Great Bays. In addition, there are several areas where dune grassland has developed behind the beach or foredunes.

### Characteristic wildlife

Where there is a fresh supply of blown sand, dunes are able to actively grow. These areas are characterised by the sand-binding marram grass *Ammophila arenaria*. 'Yellow dunes' are more stable

and many annual and perennial plants occur. Where conditions become more stable 'dune grassland' occurs where marram grass is less dominant and a more species rich sward develops. In some places, for example at the southern end of Tresco, the dune grassland gives way to extensive areas of lichen-rich heathland dominated by Heather, Bell Heather and bracken.

### **Special species**

On the foreshore of Samson and in damp, sandy areas near the shore of Wingletang Down, the nationally rare and globally threatened Shore dock is found. The rare Babington's Leek, Balm-leaved Figwort and Dwarf Pansy also occur within dune grassland, the latter being of particular note as it grows on Scilly and nowhere else in Great Britain. The dunes are also of importance for nesting birds such as terns, Ringed Plover and Oystercatcher.

### **Protected sites**

The majority of the sand dune sites are notified as Sites of Special Scientific Interest. These are Pentle Bay, Merrick and Round Islands SSSI on Tresco, Tean SSSI, Pool of Bryher and Popplestone Bank SSSI and Rushy Bay and Heathy Hill SSSI on Bryher and Plains and Great Bay SSSI on St Martin's.

In addition, all of the key localities for Shore Dock lie within the Isles of Scilly candidate Special Area of Conservation, namely the rock/boulder beaches of Annet SSSI, Tean SSSI, Wingletang Down SSSI, Samson SSSI and the Tresco part of Pentle Bay, Merrick and Round Island SSSI.

### **Factors which may affect the habitat**

- Coastal defence works inhibiting the natural supply of windblown sand
- Removal of sand for construction purposes
- Net erosion due to a combination of sea level rise and prevention of natural roll-back of the dune system
- Invasive, non-native species such as Hottentot Fig
- Disturbance to nesting birds

#### **Key nature conservation objectives for sand dunes:**

1. Maintain natural coastal processes
2. Prevent activities that result in the net loss of sand supply to the dune systems

3. Only permit development on the coast that is sustainable within the framework of the Shoreline Management Plan
4. Maintain suitable conditions for characteristic species, controlling the spread of non-native species
5. Ensure the nationally important areas for breeding birds are kept free from disturbance.

### 3.2.7

### SEA CLIFFS

The sea cliffs on Scilly range from relatively high and steep granite buttresses and islands to the low edges around the smaller islands and between headlands made up of glacial tills. The hard rock cliffs are of particular nature conservation value as they support the completely natural rock crevice plant communities and large populations of breeding sea birds.

There are also important cliff-edge archaeological sites, particularly the often extensive limpet middens. Such features have potential for providing evidence on the vegetational and land-use history of the Islands and the rate of change in sea-level.

#### Characteristic wildlife

Plant species are similar to those of the heathland and grassland assemblages described in Section 3.2.1 above with the added interest of those adapted to crevice in the rocks. These have to withstand regular soaking by sea spray and extremely shallow and porous soil conditions. Higher plants include Thrift, Rock Samphire, Buck's-horn Plantain and luxuriant growth of many species of lichens, for example *Ramalina siliquosa*.

Large colonies of gulls and other sea birds occur along the steeper cliffs and the many rocky islets, particularly where visitor access is difficult or prohibited altogether. Species include Kittiwake, Fulmar, Herring Gull, Lesser Black-backed Gull, Guillemot and Razorbill.

#### Special species

The granite cliffs on some of the more exposed headlands support rare species of lichens, such as *Roccella fuciformis* and the Golden Hair lichen *Teloschistes flavicans*.

#### Protected sites

The majority of the headland cliffs and all of the smaller island groups are within SSSIs.

### **Factors which may affect the habitat**

- Disturbance by visitors during the bird breeding season would be damaging to the cliff nesting colonies of sea birds.
- Predation of the nesting seabirds by rats.
- Climbing over the cliffs could locally damage the crevice plant communities where trampling pressure is excessive.
- Coastal defences can have damaging knock-on effects on nearby soft cliffs unless care is taken to ensure sympathetic designs are employed.

#### **Key nature conservation objectives for seacliffs:**

1. To ensure that vulnerable colonies of cliff nesting birds are protected from human disturbance and excessive predation by rats.
2. To ensure that sensitive crevice plant communities are protected from trampling.
3. To ensure that coastal defence schemes do not cause increased rates of erosion of soft cliffs.

### **3.2.8**

#### ***BOULDER BEACHES***

Areas of boulders and rock above the high tide mark are those found in the upper limits of the littoral zone, a zone only wetted by wave splash and salt spray.

On Scilly, boulder beaches occur all around the rocky shores, in places as scattered groups of boulders but in others as fairly continuous stretches covering the upper shore. The latter formations have developed extensive networks of crevices and tunnels which provide secluded locations for wildlife, particularly breeding birds and, where they extend down into the littoral and sublittoral zones of the foreshore, many species of marine flora and fauna take hold.

#### **Characteristic wildlife**

Boulder beaches provide sheltered haul out areas for grey seal and feeding grounds for wintering bird species such as turnstone and purple sandpiper. Associated breeding birds include rock pipit and, of particular note for Scilly, wren.

#### **Special species**

Some of the more extensive boulder beaches support large populations of Storm petrel which reach internationally significant levels. These areas are also of importance as secondary habitat for the Scilly shrew.

The boulder beach locations of the nationally rare Shore Dock are within Annet SSSI and Tean SSSI, which are also within the Isles of Scilly candidate Special Area of Conservation.

### **Protected sites**

Most of the key boulder beaches that support Storm petrels are covered by an SSSI where these lie above MHWM.

The Isles of Scilly are a potential Special Protection Area for some species of breeding seabirds, namely Storm petrel and Lesser Black-backed gull, and possibly also for the wintering waders in some locations.

### **Factors which may affect the habitat**

- Removal, repositioning or covering of existing boulder beaches as part of a coastal defence scheme.
- In certain areas and at certain times, recreational access can lead to disturbance of nesting or feeding birds.

#### **Key nature conservation objectives for boulder beaches:**

1. Maintain boulder habitats above the high tide mark in a natural state, by allowing the natural processes which lead to their formation to continue.
2. Protect boulder beaches of conservation importance, particularly where Storm Petrels breed, from recreational disturbance.
3. To incorporate conservation requirements into a shoreline management plan.
4. Maintain strandline vegetation along beaches for important non-breeding wader populations.

### **3.2.9**

#### ***INTERTIDAL ROCK***

Scilly has a wide range of rocky shores types for a relatively small area. On the open, wave exposed western coast a limited range of species can withstand the constant battering of the Atlantic swell. These shores have animal dominated communities with sparse red seaweeds and the kelp *Alaria esculenta* on the lower shore. With increased shelter from wave action, such as can be found on shores sheltered by offshore rocks or shallow water, an increase in algal diversity occurs, with brown seaweeds on the upper and midshore, and kelps and red seaweeds on the low shore. In embayments where there is little wave action, the whole shore becomes dominated by brown seaweeds. Prehistoric field boundary walls and hut circle remains provide an additional habitat for both plant and animal species.

### **Characteristic wildlife**

The extensive length of rocky shores and their many sheltered and undisturbed coves and small islands provide ideal haul out and pupping sites for Grey seals.

Seaweed covered rocky shores provide rich feeding grounds for the many waders that migrate through the area and for the significant populations of birds, such as Sanderling, Turnstone and Ringed Plovers, that stay to overwinter in the Isles of Scilly.

Rocky shores contain a range of plant and animal species adapted to the rigours of constant immersion and emersion by seawater. Typical zonation of plant and animal communities occurs on many of the shores in the Isles of Scilly, with spiral wrack at the top of the shore, bladder wrack in the mid shore and serrated wrack on the low shore. Associated with these brown seaweeds are limpets, winkles and top shells. At the bottom of the shore, in the shallow subtidal area which is only uncovered during low spring tides, beds of kelp are present, with rich associated communities of sponges red algae and ascidians.

Some species which are abundant on the nearby mainland rocky coasts are absent from the islands. These include the edible winkle *Littorina littorea*. It is suggested that the absence of some species is due to the predominantly west to east water movement, which impedes the transport of larval stages from mainland to Scilly. The barnacle *Semibalanus balanoides*, which is a common shore species around much of Britain is also rare on Scilly its place being taken by other barnacles *Chthamalus* spp.

### **Special species**

A number of rare and scarce marine species have been identified as part of a review of the area for the Joint Nature Conservation Committee publications *Coasts and seas of the United Kingdom: Region 11 Falmouth Bay to Kenfig*. Many of these occur on shores within the Isles of Scilly, particularly those of the western coast, where extreme wave exposure leads to conditions which are unusual compared with other location in southern Britain. These include species such as the orange-peel seamat *Turbicellepora magnicostata* and the red seaweed *Schmitzia hiscockiana*.

## Protected sites

Only the St Martin's Sedimentary Shore SSSI has been notified to cover intertidal habitats and this only includes rocky areas coincidentally with the main interest of the sediment community.

## Factors which may affect the habitat

- Recreation on rocky shores can affect the biota due to trampling or recreational collection. There is also educational collecting by students in some areas, again with adverse effects on the biota.
- Water quality, including oil and other forms of pollution is an issue in some areas.
- Shoreline management, including coastal protection affects the natural processes of some rocky shores.

### **Key nature conservation objectives for intertidal rock:**

1. Encourage the establishment/enhancement of areas suitable for interpretation, education and public appreciation.
2. Ensure oil spill and other pollutant counter plans are developed and updated.
3. If appropriate, encourage the designation of a Marine Environment High Risk Area around Scilly.
4. Encourage the production and implementation of shoreline management plans, including nature conservation objectives.
5. Establish suitable water quality objectives for coastal waters.

### 3.2.10

### *INTERTIDAL SEDIMENTS*

Intertidal sediments range from mobile wave exposed coarse sand, with sparse animal communities of sandhoppers, to more stable, fine and sandy sediments in the shelter between the islands with dense populations of worms and bivalve molluscs. The sediments around the Isles of Scilly are unusual in being mostly coarse grained, since they are derived from granite erosion, even in the more sheltered areas. This gives unusual conditions of coarse sediments in areas of shelter from wave action, with rich

communities of burrowing animals, many of which are more typical of subtidal sediments.

In addition, intertidal peats and organic silts represent an important palaeoenvironmental resource. The range of evidence they contain (pollen, plant macrofossils, diatoms, foraminifera) and the fact that they can be radiocarbon dated, means that they are a valuable source of information on the process of vegetational change and marine submergence.

### **Characteristic wildlife**

The various stretches of sediment shores that are concentrated within the shelter of the island group provide feeding grounds for the many wintering waders that stay and migrating birds that pass through the Isles of Scilly each year.

Communities associated with sediments are animal dominated, with most sediments too mobile to support plants. Notable exceptions are ephemeral blankets of green algae which cover mudflats during summer, and extensive areas of eelgrass *Zostera* spp. which are present on more stable sand flats between the islands. Associated with intertidal eelgrass beds are a diverse range of other animals inhabiting the stable organic sediments and plants often attached to the eelgrass itself.

Within the sediment is a variable community of burrowing animals. In mobile wave exposed sandy sediments, the only inhabitants may be small crustacean amphipods. With increasing stability, diversity and density of animals increases, to include a range of polychaete worms, bivalve molluscs and occasionally sea potatoes such as *Echinocardium cordatum*. Diversity reaches a peak in stable lower shore sandy sediments, where dense populations of worms and molluscs dominate.

Four principle areas of sediment shore occur, namely east of Samson, between Bryher and Tresco, adjacent to Old Grimsby, Tresco and south of St Martins. The marine life of these intertidal flats varies according to the wave exposure and tidal currents. At Samson, an area of around 30,000 m<sup>2</sup> of intertidal sediment grades from clean fine sand in the north with increasing amounts of gravel and mud towards the south.

Upper shore sediments are characterised by sparse lugworm populations, whilst lower shores have rich populations of bivalve molluscs, polychaete worms and two species of burrowing heart urchin. Tresco Flats differ in having strong tidal streams flowing over them. This water movement makes the sediment highly mobile in most areas. However, where localised shelter from the tide occurs large populations of burrowing sea anemones are present.

Additional diversity is provided by the presence of a small eelgrass (*Zostera*) bed which harbours many other species including stalked jellyfish. At Old Grimsby Harbour extensive beds of eelgrass are present. This important species increases sediment stability and encourages a diverse community of associated species, including molluscs, polychaetes and burrowing sea anemones within the sediments and a range of plants and animals associated with the leaves. Variations in tidal currents and wave exposure over the area result in sediment sorting, leading to a diverse range of infaunal communities.

## Special species

In lower shore sediments dense beds of burrowing heart urchins occur, including the purple heart urchin *Spatangus purpureus*, which although widespread in subtidal sediments, is found in the intertidal only in Scilly.

Studies of flora associated with eelgrass beds indicate a higher diversity of species, particularly of south-western algae, than in other eelgrass beds in England. Unusual species of algae include *Asparagopsis armata* and *Jania rubens*. A number of rare species also associated with *Zostera* beds include the hydroid *Laomedea angulata* and the mollusc *Jujubinus striatus*.

## Site Protection

One sediment shore on St Martin's is notified as SSSI on the basis of its rich animal communities and the site will also form part of the Isles of Scilly candidate Special Area of Conservation under the European Habitats and Species Directive.

## Factors which may affect the habitat

- Recreational pressures on sediment shores may be high, from trampling for example or bait digging or disturbance to breeding or roosting birds.
- Excessive beach cleaning resulting in the loss of strandline vegetation used by feeding shore birds.
- Excessive removal of animal specimens for scientific study.
- Oil pollution, both from catastrophic events and longer term inputs from harbour activities, can result in high organic loading.
- Other forms of pollution such as plastics and lost containers, particularly from ships and wrecks, can form a hazard for wildlife as well as for people.
- Shoreline management, in terms of coastal protection and harbour dredging can result in major changes to intertidal communities.
- Water quality has an overall effect on the communities present, particularly since pollutants can become bound up with sediments.
- Removal of sand from the coastal system for construction purposes.

**Key nature conservation objectives for intertidal sediments:**

1. Maintain the natural extent and physical diversity of the intertidal mudflats and sandflats in order to ensure the favourable conservation status of their fauna, including the wintering bird populations, within their limits of acceptable change.
2. Maintain strandline communities on beaches as feeding habitat for important wader populations.
3. Encourage the development and implementation of a single scheme of management for the candidate Special Area of Conservation.
4. Encourage the establishment/enhancement of areas suitable for public interpretation and appreciation.
5. Ensure that oil spill and other pollutants counter plans are developed and updated.
6. If appropriate, encourage the designation of a Marine Environment High Risk Area around Scilly.
7. Encourage the development and application of Shoreline Management Plans which include nature conservation objectives.
8. Reduce pollution and eutrophication from terrestrial sources.

**3.2.11**

***SUBTIDAL ROCK***

Subtidal rock in the Isles of Scilly consists largely of rocky reefs which fringe the coastline, particularly adjacent to hard cliffs and shores. Also of note are offshore bedrock reefs which emerge from sediment. These reefs support unusually large and mature populations of a number of slow growing and fragile species, many of which have a limited distribution.

**Characteristic wildlife**

Similar to the intertidal rocks, communities of subtidal rocky substrata vary with wave exposure, tidal currents depth, turbidity of water and substratum stability. Clear water allows the growth of luxuriant

beds of kelp, including a southern species which grows here in greater abundance than anywhere else in Britain. In deeper water, lower light intensity prevents the growth of kelp and the rock is instead colonised by sponges, anemones, soft corals and sea squirts. Communities become extremely rich where stronger tidal streams occur, particularly with turfs of seamats, hydroids, sponges and sea squirts.

### **Special species**

Many nationally scarce and rare species have been recorded, most of which have a southerly distribution and are better represented in Scilly than anywhere else in Britain. Of particular note are extensive reefs of tideswept bedrock with sponges such as *Axinella damicornis*, *Tethyspira spinosa*, *Desmacidon fruticosum*, the soft coral *Parerythropodium coralloides*, and the sea fan *Eunicella verrucosa*.

Also of interest is a Pacific red alga which is believed to have arrived on the floats of a flying boat during the war.

### **Site protection**

All areas of reef are included within the Isles of Scilly marine park. This is a voluntary protection measure which covers the entire island archipelago.

### **Factors which may affect the habitat**

- Many species are slow growing and fragile. As such they are easily damaged by physical disturbance.
- Water quality, particularly due to sewage discharge, may affect reefs communities, particularly due to increased turbidity, reducing algal communities, or siltation, smothering animal communities.
- Other forms of pollution such as plastics and lost containers, particularly from ships and wrecks, can form a hazard for wildlife as well as for people.

#### **Key nature conservation objectives for subtidal rock:**

1. Encourage sustainable fishing practices and the possible development of fishery exclusion zones.
2. Aim to minimise the impact of long sea outfalls.
3. Promote understanding and awareness of the marine environment amongst the public, especially divers.

4. Ensure that oil spill and other pollutant counter plans are developed and updated.
5. If appropriate, encourage the designation of a Marine Environment High Risk Area around Scilly.

### 3.2.12 *SUBTIDAL SEDIMENTS AND EELGRASS BEDS*

Subtidal sediments cover a large proportion of the Isles of Scilly. Sediments typically grade from coarse material such as pebbles and coarse sands in shallow water where maximum wave disturbance occurs, to fine silt and mud in deeper water where there is little disturbance from waves or currents.

#### **Characteristic wildlife**

Communities of sediments are animal dominated, varying according to sediment stability and grain size. Algae have a limited distribution, occurring on the surface of some sandier sediments during summer. Of particular note are beds of eelgrass *Zostera marina* which occur over large areas.

Burrowing animals consist of a rich variety of polychaete worms, molluscs, sandhoppers and burrowing anemones.

#### **Special species**

A number of nationally rare and scarce species have been recorded from sediments which range from coarse sand and gravel to fine sand and muddy gravel. Many of the rare species are associated with extensive subtidal areas of *Zostera marina*, the diversity of which has been shown to increase with greater depth. A number of polychaete worms present in the sediments of Scilly have not been recorded elsewhere in Britain. Species normally found further south in warmer waters include the Trumpet anemone *Aiptasia mutabilis*. The Seahorse *Hippocampus ramulosus* is also known to breed in the eelgrass beds.

A chiton *Leptochiton scabrides* has been recorded from stones in coarse sand. In fine sand the bivalve *Callista chione* occurs, along with the seasquirt *Molgula oculata*.

These habitats are also likely to provide key feeding reserves for important seabird populations such as Shag and Roseate tern.

#### **Site protection**

All areas of subtidal sediments are included within the Isles of Scilly marine park. This is a voluntary protection measure which covers the entire island archipelago. Subtidal sediments are one of the

reasons for recommending the Isles of Scilly as a candidate Special Area of Conservation.

**Factors which may affect the habitat.**

- Recreational pressures, in the form of marinas, moorings and anchoring, may cause damage to sediment communities, particularly those containing sensitive species such as eelgrass.
- Fisheries activities which cause damage to sediment communities.
- Water quality affects sediment communities in the short term due to direct pollution, and in the long term as pollutants become bound up in sediments.
- Other forms of pollution such as plastics and lost containers, particularly from ships and wrecks, can form a hazard for wildlife as well as for people.
- A wasting disease of *Zostera*, caused by the slime mould *Labyrinthula*, is present and may cause die-back of stressed eelgrass beds.
- The potential effect of the non-native brown seaweed, *Sargassum muticum*, is unknown at present.

**Key nature conservation objectives for subtidal sediments and eelgrass beds:**

1. Maintain the natural extent and physical diversity of the subtidal sandbanks in order to ensure the favourable conservation status of their flora and fauna within their limits of acceptable change.
2. Involve all user groups in the development of a single scheme of management for the candidate Special Area of Conservation.
3. Review the requirements for sand extraction and its impact on the coastal processes as part of the development of a Shoreline Management Plan.
4. Minimise pollution and eutrophication from land-based sources.
5. Ensure that oil and other pollutant counter plans are developed and updated.
6. If appropriate, encourage the designation of a Marine Environment High Risk Area around Scilly.
7. Identify and quantify the natural and human factors affecting eelgrass beds.

### 3.2.13

### *OPEN SEA*

Around the Isles of Scilly there is a large amount of open sea, extending out from the shallow nearshore waters to the deeper oceanic waters at the 12 mile limit. This section describes the wildlife importance of this watery habitat, and the species which inhabit the sea rather than being attached to the bottom (the benthos).

Within the 12 mile limit, water depths quickly increase close to the shore, to around 60 metres within a few kilometres of the north and east of the island group and to beyond 80 m around the western and southern edge of the group. Current speeds between the islands are generally low, increasing around the outer edge of the island group to approximately 2 knots at spring tides.

#### **Characteristic wildlife**

The range of plants and animals is larger than might at first be expected. In addition to the commercially fished species such as mackerel and herring, there are a range of microscopic single celled plants and animals known as the plankton. These ultimately form the base of the food-chain upon which commercial species depend. At the larger end of the scale are a range of whales and porpoises which frequent the inshore waters.

#### **Special species**

Four out of the 26 UK species of whales and dolphins occur regularly in the area. These are the harbour porpoise *Phocoena phocoena*, the bottlenose dolphin *Tursiops truncatus*, the common dolphin *Delphinus delphus*, and the long-finned pilot whale *Globicephalus melas*. In addition, because of the proximity to oceanic waters, a number of other cetaceans are occasional visitors. These include fin whales, sperm whales, striped dolphins, Risso's dolphin and killer whales.

Of note are basking sharks *Cetorhinus maximus* which use the area in summer, filtering plankton from the surface waters.

Poorly defined but possibly important populations of sea birds use the offshore waters for feeding. The internationally important Storm Petrel and nationally important Manx shearwater, Shag and Roseate Tern breeding populations may have important feeding areas in this zone.

#### **Protected sites**

No sites have been proposed or given protection for the open sea.

#### **Factors which may affect the habitat**

- Fisheries activities such as trawling cause changes to open sea species, both target species and non target species due to incidental capture.
- Oil and other forms of pollution and activities involved with exploration and exploitation may affect species of open water. Cetaceans in particular may be disturbed by noise pollution from shipping movements and offshore installations.
- Basking sharks and cetaceans have been shown to avoid areas intensively used by boats.

**Key nature conservation objectives for the open sea:**

1. Agree a code of conduct for boat owners in contact with cetaceans.
2. Involve all user groups in the development of any management and zoning schemes.
3. Review and update the information for open water utilisation by marine life and fisheries activities.
4. Ensure the impacts of oil exploration and production are minimised.
5. Reduce pollution and eutrophication from land-based and seaward sources.
6. Ensure that oil and other pollutant counter plans are developed and updated.
7. If appropriate, encourage the designation of a Marine Environment High Risk Area around Scilly.

### 3.3

### *Wildlife - species*

The range of habitats present in Scilly supports a high diversity of species, some of which are unique in the UK, with particularly significant groups of species being the breeding sea birds, non-breeding shorebirds, lichens and flowering plants of heaths, grasslands and arable fields.

Of special note are the colonies of breeding seabirds, especially of Shag, Guillemot and Razorbill on the cliffs, Storm Petrel on the boulder beaches, Lesser and Great Black-backed Gulls, Puffin, Common Tern, Sandwich Tern and the nationally rare Roseate Tern on the offshore islands. Outside the breeding season the complex of intertidal habitats is of at least national importance for shorebirds such as turnstone, ringed plover and sanderling.

Scilly is renowned for its clean air and this helps to provide the conditions suitable for a luxuriant growth of oceanic lichens. Many species occur, including the rare *Roccella fuciformis* and the only known European record of *Heterodermia propagulifera*, which, together with *H. leucomelos* and *H. obscurata*, communities which are now very rare and comparable site outside Scilly only occurring in Brittany and the Channel Islands. Some of the heathlands support Lungwort, *Lobaria pulmonaria* and *L. scrobiculata*, lichens that normally grow on trees but here are found on heather. The islands are also one of the few remaining strongholds for the nationally scarce and declining golden hair-lichen *Teloschistes flavicans*, also found on the heathland areas.

Many of the grassy heaths support plants of national rarity, including Early meadow-grass, Orange Bird's-foot and Balm-leaved figwort, also with the scarce Western and Suffocated clovers, Hairy Bird's-foot-trefoil and Small Adder's-tongue. On the dune areas there are several rarities present, such as Babington's leek and the Dwarf Pansy, at its only location in the UK, and Shore Dock which is more usually found in boulder beaches on Scilly.

The islands' small scale, mixed farming enterprises with significant areas of horticulture, in particular bulbs and spring flowers, provides ideal conditions a large number of rare arable weeds. It is the most important area in the world for the nationally rare Western Ramping-fumitory and supports several nationally scarce species, including Lesser Quaking-grass *Briza minor*, Small-flowered Catchfly *Silene gallica* and Shepherd's-needle *Scandix pecten-veneri*.

The Isles of Scilly has a relatively low number of animal species due to their remote position from the mainland. However, all of the main islands do support large numbers of Britain's rarest shrew, the Lesser white-toothed shrew, which is its only UK locality. The islands are a favoured haunt of good

numbers of Grey Seal, with the Scilly population contributing to the south west's nationally important population. There are only two species of bat recorded on the islands, the recent decline of these mammals being of particular cause for concern.

The number invertebrate species is relatively low compared to that of the British mainland, with those recorded being predominantly coastal in their habitat requirements. For example, there are 380 beetles (out of about 4000), about 45 bugs (out of about 500) and only two resident dragonflies (out of 38). There are several nationally scarce centipedes to be found amongst the crevices of the rocky shores, the nationally rare groundbugs *Emblethis griseus* and *Piesma quadratum spergulariae*. So far as is known, the latter subspecies is endemic to Scilly where it was discovered in 1965 feeding on Rock Sea spurrey.

There are a number of nationally scarce and rare flies, ants, moths and beetles present, the latter group in particular are to be found on a wide variety of habitat types from seaweed and stones on sandy shores to freshwater pools and marshy grassland. In addition, Scilly is well known for its local races and variations of invertebrates. Examples are the Island Carder Bee (which is a possible subspecies of Moss Carder Bee *Bombus muscorum*), a dark form of the Rose Chafer. In addition, there are colour forms for Shuttle-shaped Dart, Feathered Ranunculus and Lesser Yellow Underwing moths.

### **3.3.1 The selection of key species**

The Isles of Scilly Maritime Natural area contains a number of species which are highly valued, whether by wildlife conservation bodies or by the general public. Limitations on human and financial resources mean we are unlikely to be able to focus conservation action on them all, but we must identify those which are priorities for action, by virtue of the criteria listed below. However, we can rely on habitat conservation measures to conserve the great majority of the remaining species.

**Figure 2. Below are listed those species that may be regarded as key species for the Isles of Scilly which are a priority for action, even if that is only monitoring numbers to confirm they are remaining stable.**

**Selection criteria for key species**

- a. *Species that are endemic to the UK, or which are threatened on a global or European scale, and which have significant populations in the Isles of Scilly Natural Area. (Protected by the European Habitats Directive, Berne or Bonne Conventions, or are listed on CITES).***
- b. *Species which are rapidly declining throughout the UK and which have a national stronghold in the Isles of Scilly.***
- c. *Species which are threatened in Great Britain, being listed in the relevant Red Data Book, and/or which are on the extreme edge of their normal range in the Isles of Scilly.***
- d. *Species occurring in the area which are nationally rare or nationally scarce.***
- e. *Species which are highly characteristic of the Isles of Scilly, seldom found in such numbers elsewhere in England, and/or which are popular with the general public.***

**Account has also been taken of the need to ensure that all the important taxa in the Natural Area are represented and that the species selected are spread across the key habitats present.**

Each of the key species listed in Table 2 is described, in terms of its status and distribution, within the Characteristic wildlife or Special species part of its primary habitat description (see Sections 3.2.1 to 3.2.13).

**Table 2. Key species covered by the selection criteria**

<b>Common name</b>	<b>Scientific name</b>	<b>Criteria</b>	<b>Primary habitat</b>
<b>Mammals</b>			
Scilly Shrew	<i>Crocidura suaveolens cassiteridum</i>	<b>a</b>	Scrub and rank grassland
Grey Seal	<i>Halichoerus grypus</i>	<b>a</b>	Secluded beaches and offshore islands
<b>Reptiles</b>			
Leathery turtle	<i>Dermochelys coriacea</i>	<b>e</b>	Open sea
Loggerhead turtle	<i>Caretta caretta</i>	<b>e</b>	Open sea
Dolphins porpoises and whales	Cetaceans	<b>a</b>	Offshore water
<b>Birds(breeding)</b>			
Common Tern	<i>Sterna hirundo</i>	<b>a</b>	Maritime heath and rocky islets
Roseate Tern	<i>Sterna dougallii</i>	<b>a+c</b>	Maritime heath and rocky islets
Sandwich Tern	<i>Sterna sandvicensis</i>	<b>a+c</b>	Maritime heath and rocky islets
Storm Petrel	<i>Hydrobates pealgicus</i>	<b>a+c</b>	Boulder beaches and maritime heath
Guillemot	<i>Uria aalge</i>	<b>c</b>	Rocky cliffs
Manx Shearwater	<i>Puffinus puffinus</i>	<b>a+c</b>	Rocky cliffs
European Shag	<i>Phalacrocorax aristotelis</i>	<b>e</b>	Rocky cliffs and islets
Lesser Black-backed gull	<i>Larus fuscus</i>	<b>a</b>	Rocky cliffs and islets
Oystercatcher	<i>Haematopus ostralegus</i>	<b>c</b>	Strandline
Puffin	<i>Fratercula arctica</i>	<b>a</b>	Maritime heath

Razorbill	<i>Alca torda</i>	<b>a+c</b>	Rocky cliff
Shelduck	<i>Tadorna tadorna</i>	<b>a+c</b>	Dune grassland
Gadwall	<i>Anas strepera</i>	<b>a+c</b>	Pools
Ringed Plover	<i>Charadrius hiaticula</i>	<b>a+c</b>	Strandline
Song Thrush	<i>Turdos philomelos</i>	<b>a + e</b>	Shelter belts and scrub
<b>Birds(wintering)</b>			
Sanderling	<i>Calidris alba</i>	<b>a+c</b>	Shoreline
Turnstone	<i>Arenaria interpres</i>	<b>a+c</b>	Shoreline
<b>Fish</b>			
Giant Goby	<i>Gobius cobitis</i>	<b>b</b>	Rock pools
Basking shark	<i>Cetorhinus maximus</i>	<b>b</b>	Open sea
<b>Invertebrates(terrestrial)</b>			
A groundbug	<i>Emblethis griseus</i>	<b>c</b>	Sand dunes
A groundbug	<i>Piesma quadratum spergulariae</i>	<b>a+c</b>	Rock Sea-spurrey
Yellow V Moth	<i>Oinophila v-flava</i>	<b>c</b>	<i>Pittosporum</i> shelterbelts
A moth	<i>Nothris congressariella</i>	<b>c</b>	Balm-leaved Figwort
A moth	<i>Homoeosoma nimbella</i>	<b>c</b>	Coastal grassland
Red Barbed Ant	<i>Formica rufibarbis</i>	<b>c</b>	Heathland
<b>Invertebrates(marine)</b>			
A sponge	<i>Axinella damicornis</i>	<b>d</b>	Subtidal rock
A sponge	<i>Tethyspira spinosa</i>	<b>d</b>	Subtidalrock
A sponge	<i>Desmacidon fruticosum</i>	<b>d</b>	Subtidal rock
A hydroid	<i>Laomedea</i>	<b>d</b>	Eelgrass, low water to shallow

	<i>angulata</i>		subtidal
'Pinkies' (a soft coral)	<i>Parerythropodium coralloides</i>	<b>d</b>	Subtidal rock
Sunset coral	<i>Leptosammia pruvoti</i>	<b>d</b>	Subtidal rock
Gold and Scarlet Star coral	<i>Balanophyllia regia</i>	<b>d</b>	Inter and subtidal rock
Cup coral	<i>Caryophyllia inornata</i>	<b>d</b>	Subtidal rock
Pink sea fan	<i>Eunicella verrucosa</i>	<b>d</b>	Subtidal rock
Ginger tiny anemone	<i>Isozoanthus sulcatus</i>	<b>d</b>	Silty subtidal rock (occasionally intertidal pools)
An anemone	<i>Parazoanthus axinellae</i>	<b>d</b>	Subtidal rock
Trumpet anemone	<i>Aiptasia mutabilis</i>	<b>d</b>	Eelgrass beds
An amphipod	<i>Ampherusa ovalipes</i>	<b>d</b>	Amongst subtidal algae
An amphipod	<i>Pereionotus testudo</i>	<b>d</b>	Among coralline algae, lower shore rock and subtidal
The sponge shrimp	<i>Typton spongicola</i>	<b>d</b>	In sponges, subtidal rock
A hermit crab	<i>Cestopagurus timidus</i>	<b>d</b>	Subtidal rock and sediment
A chiton (coat of mail shells)	<i>Leptochiton scabrides</i>	<b>d</b>	Subtidal sediment
A sea snail	<i>Jujubinus striatus</i>	<b>d</b>	Subtidal, associated with seaweeds and eelgrass
A sea snail	<i>Bittium simplex</i>	<b>d</b>	Subtidal sediment
The bean slug	<i>Tritonia nilsodneri</i>	<b>d</b>	Feeds on <i>Eunicella verrucosa</i>
A sea slug	<i>Trapenia pallida</i>	<b>d</b>	Subtidal rock
A sea slug	<i>Atagema gabba</i>	<b>d</b>	Subtidal rock
Spiny cockle or red-nose	<i>Acanthocardia aculeata</i>	<b>d</b>	Intertidal and subtidal sediment

A bivalve	<i>Callista chione</i>	<b>d</b>	Intertidal and subtidal sediment
A flask shell	<i>Gastrochaema dubia</i>	<b>d</b>	Subtidal sediment
<b>Vascular plants</b>			
Babington's Leek	<i>Allium babingtonii</i>	<b>c</b>	Sand dunes, bulb fields and grassland
Balm-leaved Figwort	<i>Scrophularia scorodonia</i>	<b>c</b>	Sand dunes and hedges
Early Meadow-grass	<i>Poa infirma</i>	<b>b+c</b>	Maritime grassland
Four-leaved Allseed	<i>Polycarpon tetraphyllum</i>	<b>b+c</b>	Maritime grassland
Shore Dock	<i>Rumex rupestris</i>	<b>b+c</b>	Boulder beaches/rock and sand dunes
Smaller Tree-mallow	<i>Lavatera cretica</i>	<b>b+c</b>	Maritime grassland
Western Ramping-fumitory	<i>Fumaria occidentalis</i>	<b>a+b</b>	Arable / bulb fields and banks
Purple Ramping-fumitory	<i>Fumaria purpurea</i>	<b>a</b>	Arable/bulb fields
Shepherd's-needle	<i>Scandix pecten-veberis</i>	<b>d</b>	Arable/bulb fields
Small-flowered Catchfly	<i>Silene gallica</i>	<b>a,b,d</b>	Arable/bulb fields
Dwarf Pansy	<i>Viola kitaibeliana</i>	<b>b+c</b>	Dune grassland
Least Adder's-tongue	<i>Ophioglossum lusitanicum</i>	<b>b+c</b>	Short maritime grassland
Orange Bird's-foot	<i>Ornithopus pinnatus</i>	<b>b+c</b>	Short maritime grassland
<b>Lower plants</b>			
A moss	<i>Sematophyllum substrumulosum</i>	<b>c</b>	Rocks
Golden hair-lichen	<i>Teloschistes flavicans</i>	<b>a,b + c</b>	Maritime heath and grassland

A lichen	<i>Usnea subscabrosa</i>	<b>c</b>	Maritime heath and grassland
A lichen	<i>Lecidea sarcogynoides</i>	<b>c</b>	Maritime heath and grassland
A lichen	<i>Catillaria subviridis</i>	<b>c</b>	Maritime heath and grassland
A red seaweed	<i>Aglaothamnion diaphanum</i>	<b>d</b>	Subtidal rock
A red seaweed	<i>Cryptonemia lomation</i>	<b>d</b>	Subtidal rock
A red seaweed	<i>Gelidium sesquipedale</i>	<b>d</b>	Subtidal rock
A red seaweed	<i>Gelidiella calcicola</i>	<b>d</b>	Associated with coralline algae
A red seaweed	<i>Gracilaria bursa pastoris</i>	<b>d</b>	Subtidal rock
A red seaweed	<i>Schmitzia hiscockiana</i>	<b>d</b>	Littoral rock
A red seaweed	<i>Gigartina pistillata</i>	<b>d</b>	Subtidal rock, occasionally intertidal in pools
A red seaweed	<i>Cruoria cruoriaeformis</i>	<b>d</b>	Associated with coralline algae
A red seaweed	<i>Bornetia secundiflora</i>	<b>d</b>	Subtidal rock
A red seaweed	<i>Pterosiphonia pennata</i>	<b>d</b>	Subtidal rock and muddy pebbles
A brown seaweed	<i>Carpomitra costata</i>	<b>d</b>	Subtidal rock

## Section 4

### Influences on the nature conservation interest

#### *4.1 Physical*

At 28 miles from the mainland, the remote location of Scilly since the seas returned following the Ice Age has resulted in a relatively impoverished fauna and flora. On the other hand, this geographical isolation has provided a refuge for some species that have declined elsewhere on the mainland and also provides an attractive location for species, such as breeding seabirds, that are sensitive to more intensive disturbance by people.

Their geographical position in the Atlantic also influences which species occur on Scilly. Thus, the islands provide an important point along the spring and autumn routes of large numbers of migrating birds and the marine fauna and flora contains representatives from the Atlantic and Mediterranean regions.

Furthermore, the extremely oceanic conditions, providing relatively constant sea temperatures all year round, together with the virtually pollution free waters and the diverse substrates ranging from rock to fine sediment substrates, combine to provide for the development of very rich and diverse marine communities.

On land, the stable oceanic climate results in virtually frost and snow free weather during the relatively warm winters and cool summers, with an average monthly mean of 9°C. There is low rainfall (average 825 mm per year), although moisture is also deposited as sea fogs. The air is characterised by its extreme purity due to lack of airborne dust and industrial pollutants, enabling an exceptionally rich lichen flora to thrive. The beneficial effects of the climate are tempered by the exposure of much of the islands to Atlantic storms and frequent strong winds and the effects of salt spray.

There is a variety of soil types across the islands, from the podsol directly on the granite to the peaty topsoils on the alluvial areas that are subject to a high ground water. On the enclosed land, deeper, more fertile soils have developed on the head materials.

The average annual sea level rise has been predicted to be between 2 and 3 mm for Scilly. This factor will have significant implications for the future management of the coastal habitats and built environment, particularly when considered in conjunction with the possibility of increased storminess of the weather due to global warming.

#### *4.2 Past land use*

Following the last Ice Age Scilly became forested with a mixed deciduous woodland of oak, elm, ash, hazel and birch, with lime, holly, alder and willow also present. Semi-nomadic peoples occupied the land, gathering vegetable foods, hunting wild animals and harvesting the resources of the sea. During the Neolithic (4000 BC - 2500 BC) there was limited production of cereals resulting in only sporadic

clearance of the forest cover.

At the beginning of the Bronze Age (2500 BC - 700 BC) Scilly became permanently settled and farming began on a large scale. There is an abundance of archaeological evidence of this date. The pollen evidence shows that there was a marked decline in woodland species during this time and sea level rise had by then led to the formation of a number of separate islands from the original single land mass.

Throughout the Iron Age (700 BC - AD 43) the farming of small rectilinear or irregular shaped fields continued, but soil degradation had by then resulted in the abandonment of upland areas (which became heathland) and the more intensive use of low-lying land which was itself being gradually reduced by the rising sea level. By the end of the Iron Age virtually all the woodland had been cleared and Scilly had become transformed into an open landscape of cultivated fields, pasture, heathland and dunes.

Mixed subsistence farming continued throughout the next millennium and the irregular pattern of most the anciently enclosed land persisted at least up to the Post-Medieval Period (AD 1540 - 1900). During this time the advent of the flower industry resulted in the creation of the characteristic narrow, hedged enclosures on the enclosed farmland. The heathlands continued to be used as rough summer pasture and as a source of fuel and bedding and the wetlands as a source of fuel peat, reeds and coppiced willow.

Past land use in Scilly is reflected in the present day vegetation and field pattern, as well as by the numerous archaeological monuments that survive on the heathlands and intertidal sand flats. Of particular note are the large concentrations of Bronze Age ritual monuments and post-medieval fortifications.

#### ***4.3 Present land use***

Scilly continues to sustain a mixed agricultural and horticultural economy, although farming now accounts for less than 15% of the total economic base. As a consequence, the number of fields which are becoming inundated by invasive bracken, brambles and gorse is gradually increasing. The traditional link between the grazing of the fields and turning out the stock onto the coastal heathlands in summer, combined with their various uses as sources of fuel and animal bedding, are no longer a widespread practices. As long as the lack of available stock grazing persists there needs to be alternative management techniques for the control of invasive species, such as mowing.

Much of the land that is not farmed is of very high wildlife and archaeological value and is managed by the Isles of Scilly Environmental Trust. Restoration of cutting and/or grazing of these areas is a priority for the Trust and various schemes are being used to provide the necessary resources, including English Nature's Reserves Enhancement Scheme for the land notified as Sites of Special Scientific Interest and the Ministry of Agriculture's Countryside Stewardship Scheme for the remainder of the land. Many archaeological sites are Scheduled Monuments and as such can be the subject of a Management Agreement with English Heritage, who also fund Capital Management Works, such as repairs, vegetation clearance and improvements to public access and interpretation. Public access to these areas

is an essential ingredient for the thriving tourist industry and this is permitted by the Duchy.

The tourist industry now forms the largest part (85%) of the economy and helps to support the survival of the farm units that do not have the benefit of income from flower production. However, the income from flowers has been in decline since the 1960's and the number of active producers has reduced, although those that remain are either highly intensive or are in decline.

There are new measures now available to assist farmers with maintaining their land for the benefit of wildlife, the landscape and people's appreciation of these features. Thus, the farmland is also eligible for entry to the Countryside Stewardship Scheme which can make payments towards sustaining the landscape, improving wildlife habitats, conserving archaeological sites and enhancing opportunities for people to enjoy the countryside.

In addition, there are similar opportunities under Measure 4.2 of the Single Programming Document of Objective 5b where funds are available from the European Agriculture Guidance and Guarantee Fund. This Fund will also help with the underpinning of the rural infrastructure by supporting agricultural diversification, marketing and product development. This measure will also have significant knock-on benefits for wildlife conservation. For example, the provision of a mobile abattoir for the islands would help to make stock keeping a more viable enterprise for the farming community and so, as a consequence, there would be a greater number of stock available for grazing the coastal heaths and grasslands.

## Section 5

### The Future - a vision, who can contribute and strategic goals

#### A vision

Looking ahead to the next century, what do we want the Isles of Scilly and its surrounding seas to look like? We certainly want to see an area which is at least as rich in wildlife as it is at present, and a coastline which is natural, stimulating public interest in coastal wildlife and traditional activities. The main strand of this vision for the Isles of Scilly is that all people who live in and visit the islands will appreciate, understand and above all value the natural assets of the area.

However, maintaining the *status quo* is insufficient in the face of natural changes and those imposed by the fluctuating fortunes of the farming and tourist industries. Soft cliffs will mostly be allowed to erode naturally, with agricultural land behind being returned to natural maritime grassland. Sediment movement processes will be allowed to operate freely where unconstrained by the need to defend developments, relying on the natural equilibrium of sediment supply to protect the coast.

All the native species of plants and animals which live in the Isles of Scilly Natural Area will survive into the next century. We need to ensure the survival of the common species as well as the rarities otherwise while the rarities become common, the commonplace may disappear through neglect. Where species have become rare we will encourage their recolonisation through creation of suitable habitats, and by reintroduction schemes when favourable conditions have been restored.

To achieve this vision we must appreciate that the coastline is used, enjoyed and managed by people. The British are an island race, with a rich maritime tradition. Many of our traditional industries have involved the sea, for transport or supply of raw materials or finished products and this is particularly the case for Scilly island economy. The summer holiday on the coast has long been an important part of our culture and this traditional usage of the sea and coastal zone has increased to the point where we are making significant demands on the natural systems, which in many cases are beyond their ability to cope without resorting to importing energy supplies and alternative sources of water. Although on Scilly the number of visitors is regulated by the capacity of the accommodation and transport infrastructure we need to keep an eye constantly on the ability of the natural environment to support them. For example, if the transport systems were to be developed to carry significantly greater numbers of day trippers then we would need to carefully assess the potential impact on the currently undisturbed areas where seabirds breed.

#### Strategic goals

In order to deliver the vision, the following strategic goals need to be met. They have more or less been defined in previous documents and still apply today. However, with the recent emphasis on biodiversity

and the need for integrated objectives this Natural Area profile is an opportunity to re-state the future direction of wildlife and earth science conservation on Scilly in both the marine and terrestrial environment.

The following are not in any order of priority:

<b>Strategic Goal 1</b>	To sustain a healthy and diverse environment for all to enjoy now and in the future.
<b>Strategic Goal 2</b>	To allow the free functioning of the natural processes within the context of the sustainable use of the land and sea.
<b>Strategic Goal 3</b>	To protect and manage habitats and species for the benefit of wildlife and people.
<b>Strategic Goal 4</b>	To maintain the landform and geological interest of the islands for study.
<b>Strategic Goal 5</b>	To encourage understanding of the need to protect and sensitively manage the natural features of the islands for the benefit of the present and future generations.
<b>Strategic Goal 6</b>	For all sectors of the community to work in partnership in order to maximise the efficient use of available resources to achieve the strategic goals.

### **Who can contribute**

The long standing interdependence of people's quality of life, the economy and the natural environment will continue and we will all need to remain vigilant of the forces for change, some of which could be detrimental to this relationship while others, if handled sensitively and implemented through a partnership of the Council, Central Government, Duchy of Cornwall, Environmental Trust, RSPB, English Nature and other relevant agencies, with support from rest of the community and user groups such as the Boatmen's Association, they could be used to benefit the natural environment of Scilly and all who appreciate and depend on it either directly or indirectly.

There have been many studies and assessments made and reports written about the Isles of Scilly, notably the Comprehensive Land Use and Community Development Project by Graham Moss Associates in 1984. The need for the natural features and processes to be protected and managed is enshrined within the work and policies of several bodies particularly the Council of the Isles of Scilly, through the daily custodianship of the land by the Duchy of Cornwall and the work of the Environmental Trust.

In addition, new initiatives are continually coming to the fore, such as Local Agenda 21, which will involve the Council and the broader community in applying the concept of sustainable land use in a direct and practical way at the local level. A more recent initiative is the endorsement by the Government of the UK Steering Group's Report on Biodiversity, which sets out national action plans for species and habitats which will be one of our contributions to meeting the challenges of the Biological Diversity Convention held in Rio de Janeiro in 1992. These national habitat and species action plans can then be focussed down to the regional and more local level, several of which could be developed specifically for the Isles of Scilly.

Funding for habitat management is likely to continue to come through a combination of sources and we will all need to remain active in helping to draw in assistance from a variety of sources and to ensure the most effective utilisation of resources. This approach must also be flexible enough to accommodate other interests, such as archaeological and landscape conservation, where the principles of land management for wildlife and historic features largely coincide. The proposed Conservation Area Partnership will be a useful vehicle through which an integrated and holistic approach to land management can be developed.

## Section 6

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## Section 7

### Glossary

#### **Amphipod**

Small free-living crustacea which typically inhabit sediments or swim amongst weed.

#### **Benthos**

Those organisms attached to, or living on, in or near the seabed, including that part which is exposed by tides as the littoral zone.

#### **Biodiversity**

The variety of life on Earth or any given part of it.

#### **Coastal cell**

A compartment of coastline, divided from neighbouring sections of coast in terms of longshore drift, current flow, and wave convergence and divergence.

#### **EC Birds Directive (79/409/EEC)**

This applies to birds, their eggs, nests and habitats. It provides for the protection, management and control of all species of naturally occurring wild birds in European territory.

#### **Endemic species**

A species of animal or plant confined to a particular region and having, so far as is known, originated there.

#### **Epiphyte**

A plant or lichen which grows on another, usually without parasitising it.

#### **Eutrophication**

The over enrichment of an aquatic environment with nutrients, especially nitrates and phosphates, often anthropogenic (e.g. sewage, fertiliser run-off) which may result in stimulation of growth of algae and bacteria, and can reduce the oxygen content of the water.

#### **Geological Conservation Review**

A series of volumes published by the Joint Nature Conservation Committee, which reviews the current state of knowledge of key earth science sites in Great Britain.

#### **Geomorphology**

The study of the evolution of land forms or of the arrangement and form of the Earth's crust.

#### **Habitat**

A place in which a particular plant or animal lives. Often used in a wider sense referring to major assemblages of plants and animals found together.

**Habitats and Species Directive (92/43/EEC)**

This requires member states of the European Union to take measures to maintain or restore natural habitats and wild species at a favourable conservation status in the Community, giving effect to both site and species protection objectives.

**Infauna**

Benthic animals which live within the seabed.

**Invertebrate**

Animal without a backbone (e.g. worms, insects, molluscs).

**Local Nature Reserve**

An area of land that is of special nature conservation interest locally. LNRs are declared and managed by local authorities under the National Parks and Access to the Countryside Act 1949.

**Littoral**

The area of the shore that is occupied by organisms which are adapted to or need alternating exposure to air and by wetting by submersion, splash or spray.

**Marine Nature Conservation Review**

A project initiated by the Nature Conservancy Council in 1987 to consolidate the information already collected on British marine ecosystems, particularly that collected by marine survey projects commissioned by NCC since 1974, and to complete survey work and interpretation of data.

**National Nature Reserve**

A reserve declared under law and managed by English Nature or by a body approved by English Nature.

**Nationally scarce species**

A terrestrial species of plant or animal which occurs in between 16 and 100 ten km squares in Great Britain. Or, a marine species which occurs in between 9 and 55 of the ten km squares within the three mile limit of territorial seas for Great Britain.

**Nationally rare species**

A terrestrial species of plant or animal which occurs in 15 or less ten km squares in Great Britain. Or, a marine species which occurs in eight or fewer ten km squares within the three mile limit of territorial seas for Great Britain.

**Ramsar site**

Sites designated under the Convention on Wetlands of International Importance, especially as a waterfowl habitat (the Ramsar convention).

**Red Data Book**

Catalogues published by the International Union for the Conservation of Nature (IUCN) or by national authority listing species which are rare or in danger of becoming extinct either nationally or globally.

**SSSI - Site of Special Scientific Interest**

An area of land notified by English Nature under the Wildlife and Countryside Act 1981 (as amended) as being of special nature conservation interest.

**SPA/SAC**

Special protection Area (notified under the European Birds Directive) of Special Area of Conservation notified under the European Habitats and Species Directive.

**Sublittoral**

The marine zone only exposed to air at its upper limit by the lowest spring tides, although almost continuous wave action on extremely exposed open coasts may extend the upper limit high into the intertidal region. The sublittoral zone extends from the upper limit of the large kelps and includes, for all practical purposes all nearshore areas below the littoral.

**Turbidity**

The condition of water having a high loading of suspended sediment, reducing light penetration and underwater visibility.