

Liverpool Bay Natural Area

A nature conservation profile

29 October 1997

Second Consultation Draft



Prepared for English Nature
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Foreword

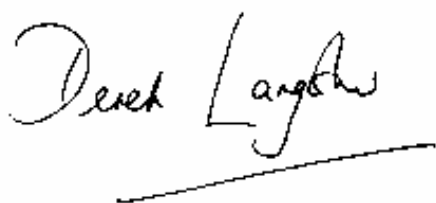
One of the key components of English Nature's *Strategy for the 1990s* has been the Natural Areas approach. We examined the local distinctiveness of each part of England, to identify their characteristic wildlife and natural features, and used this to define a comprehensive series of Natural Areas. Their boundaries are based on the distribution of wildlife and natural features, and on the land use pattern and human history of each area, and thus offer a more effective framework for the planning and achievement of nature conservation objectives than do administrative boundaries. They are **not** designations.

Wildlife is not restricted to designated and protected sites such as nature reserves or SSSIs; it occurs throughout the countryside, coast and built up areas of England. No part of the country is without some wildlife interest. The Natural Areas approach gives us a way of determining priorities for nature conservation areas with ecological and landscape integrity, and to set objectives which reflect these priorities. Together, all Natural Areas provide a powerful vision for nature conservation right across England.

The achievement of the objectives described for each Natural Area will be a key part of our new strategy *Beyond 2000*. The objectives will guide our work over the coming years, and we hope Natural Areas will allow us to help others in achieving what is best for nature conservation locally.

This Natural Area profile is one of a series of 120, one for each Natural Area. In it we describe the wildlife and natural features of the area, and what makes it special and distinctive. Each Natural Area profile is different, since it describes and reflects the local distinctiveness of the area, and therefore includes nature conservation objectives which are particular to that area. The profiles have been written after a wide range of local consultations, both on the boundaries of the Natural Areas themselves and on these profiles.

We hope you will find this document useful, and look forward to working with you to maintain and enhance the wildlife and natural features of England.

A handwritten signature in cursive script that reads "Derek Langslow". The signature is written in black ink and is positioned above a horizontal line that serves as a separator between the signature and the typed name below.

Dr Derek Langslow
Chief Executive

Summary

The development of the Natural Area concept is a key part of English Nature's drive to conserve nature in England. A Natural Area is not a designation but the identification of an area of countryside defined by its unique combination of physical attributes, wildlife, land use and culture. We see Natural Areas as a means to provide a framework for securing public support for wildlife and geological conservation. With this support, development of the idea will greatly improve the ability of all of us to deliver effective nature conservation.

Overall, England and the seas around it have been divided into some 120 Natural Areas. 24 of these are situated around our coast and are maritime in nature. The boundaries of such Natural Areas extend from the inland limit of all coastal and estuarine habitats to the 12 mile limit offshore. The lateral extent is closely related to the coastal process cells and sub-cells which have been defined for the coastline of England and Wales by Hydraulics Research, Wallingford, on behalf of the Ministry of Agriculture, Fisheries and Food. A coastal process cell (or sediment cell), is defined as a length of coastline which is relatively self-contained as far as the movement of sand or shingle is concerned and where interruption to such movement should not have a significant effect on adjacent sediment cells.

The production of this draft Natural Area Profile is a first step towards securing local agreement on the priorities for nature conservation on the section of coast from the Welsh border in the Dee Estuary northwards to Rossall Point, Fleetwood, in Lancashire. It describes and evaluates the wildlife and geology of the area and proposes key nature conservation objectives. It is hoped that these objectives will be adopted and acted upon in other coastal zone management work, including the development of shoreline management plans.

The nature conservation significance of the Liverpool Bay Natural Area lies both in its physical and wildlife features, many of which are of national and, indeed, international importance. Identification and conservation of these features will help to ensure that the distinctive character of the Natural Area is retained and enhanced for the enjoyment and education of future generations.

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

The Natural Area profile is fully consistent with the UK Biodiversity Action Plan and in particular, with the UK Steering Group report on biodiversity submitted to Government in 1995. It is intended that this profile will form the basis of Local Biodiversity Action Plans for a number of component areas.

Liverpool Bay Natural Area

A vision for the future

Looking ahead to the next century, we want to see a coastline which is as natural as possible, at least as rich in wildlife as it is at present, and one which stimulates public interest in coastal wildlife.

To achieve this vision, we must appreciate that the coastline and seas are 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. The seaside holiday has long been an important part of our culture and coastal recreation has become increasingly popular for many of the population living in the vicinity of the Natural Area. The traditional usage of the sea and coastal zone has increased to the point where we are making excessive demands on the natural processes, which in many cases extend beyond their ability to cope. We need to maintain our traditional maritime activities, but with an eye constantly on the ability of the coasts and seas to support them indefinitely.

However, maintaining the *status quo* is insufficient. Many key areas of biological or geological importance have already been destroyed or damaged by inappropriate activities. We need to do more than just maintain what we have; we need to create new areas of wildlife in locations where they have been destroyed and we need to enhance those areas where wildlife is only just managing to survive the many pressures of 20th century coastal practices. Soft cliffs should be allowed to erode naturally and habitat re-creation will be encouraged. Estuaries should be retained in as natural state as possible, with no new reclamation. Natural sediment movement processes should continue unchecked by sea-defences, relying on the natural equilibrium of sediment supply to protect the coast.

We need to ensure the survival of the common species as well as the rarities. Conditions should exist to allow all the native species of plants and animals which live within the Liverpool Bay Natural Area to survive into the next century. Where species have become rare, we will encourage their recolonisation, as appropriate, through the creation of suitable habitats and by schemes of rehabilitation when favourable conditions have been restored.

The main strand of vision then for this profile is that all people should appreciate, understand and above all value the wildlife and coastline within the area. When this happens, the public force for conservation of the natural resources will be irresistible.

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1. The Natural Area Concept

The development of the Natural Area concept is a key part of English Nature's drive to conserve nature in England. We believe that Natural Areas provide an improved framework for securing public support for wildlife and geological conservation and will greatly improve our ability to work together with others to deliver effective action.

A Natural Area is not a designation, but an area of countryside identified by its unique combination of physical attributes, wildlife, land use and culture. These features give a Natural Area a 'sense of place' and a distinctive nature conservation character which we can seek to sustain. The concept relies on wide participation and enables us to 'Think globally, act locally'.

Overall, England and the seas around it have been divided into some 120 Natural Areas. 24 of these are situated around our coast and are maritime in nature. The boundaries of these extend from the inland limit of all coastal and estuarine habitats, offshore to the 12 mile limit. The lateral extent of such Natural Areas is closely related to the coastal process cells and sub-cells which have been defined for the coastline of England and Wales by Hydraulics Research, Wallingford on behalf of the Ministry of Agriculture, Fisheries and Food. A coastal process cell (or sediment cell), is defined as a length of coastline which is relatively self-contained as far as the movement of sand or shingle is concerned: interruption to such movement should not have a significant effect on adjacent sediment cells.

The Natural Areas concept is proposed to facilitate integrated coastal zone management, within which each Natural Area will be viewed and managed as an entity. Natural Areas not only set the context for special sites such as nature reserves and Sites of Special Scientific Interest, but do, just as importantly, serve to promote action to conserve wildlife and geological features throughout the area, through the activities of others.

2. The Role of this Profile

This profile is designed to describe and evaluate the important habitats, species, physical features and coastal processes within this section of coast and to identify the most meaningful actions needed to maintain them.

Although the document has been prepared by English Nature, the profile is written for everyone with an interest in nature conservation in and around the area. Hopefully, it will serve to pull conservation bodies, Local Authorities, local people and sea-users closer together, working towards the achievement of shared objectives that address the top priorities for conservation in the Natural Area.

This document is fully consistent with recent UK thinking on the conservation of biodiversity, a process initiated in Rio de Janeiro 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 document submitted to Government in December 1995, which develops several of the prime objectives laid out in *Biodiversity: The UK Action Plan (1994)*. The Steering Group report, to which the Government is due to respond shortly, 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. It also covers the production of Local Biodiversity Action Plans as a means of implementing the UK plans at the local level. This profile has been written in a style and format which will allow it to be used as a basis for production of local Biodiversity Action Plans in Liverpool Bay.

3. The Natural Area Boundary

The Liverpool Bay Natural Area stretches from the Welsh border in the Dee Estuary, northwards to Rossall Point, Fleetwood in Lancashire. Coastal areas within three counties, namely, Cheshire, Merseyside and Lancashire are represented.

The Natural Area includes open sea out to the 12 mile limit and the estuaries of the Dee, Mersey, Alt and Ribble. Inland, the Natural Area includes coastal habitats such as sand dunes, saltmarsh and soft cliffs, together with a transition zone which encompasses marine habitats. The lateral extent of the Natural Area is based on major sediment cells (coastal process cells) and sub-cells. The northern boundary corresponds to a sub-cell boundary and the southern boundary to a political feature, the Welsh border. Although the southern border, of necessity, follows the Welsh border along the middle of the Dee Estuary, the objectives for the Natural Area, particularly those relating to such issues as coastal processes and water quality, should be considered wherever possible in the context of both the whole estuary and whole coastal cell.

Directly adjacent to Liverpool Bay are three further Natural Areas, namely Urban Mersey Basin, Lancashire Plain and Valleys and, to the north of Rossall Point, Morecambe Bay. It is inevitable that there will be some overlap between the maritime habitats described and the objectives outlined within this profile, and those described in these other Natural Area profiles. A broad transition zone of between 1 and 6 kilometres may therefore exist between Natural Areas. (Please refer to map outlining the Natural Area boundary in Appendix I).

Major uses and activities in Liverpool Bay Natural Area:

Fisheries

Tourism

Sport and Recreation (including wildfowling)

Industry

Urban Development

Coastal Defence and Shoreline Management

Ports, Docks, Navigation and Shipping

Roads and Railways

Mineral Extraction and Sandwinning

Nature Conservation

Agriculture

Oil and Gas Exploration

Dredging (Mersey and Dee)

4. Geological and Landform Features and Coastal Processes

The Liverpool Bay Natural Area is a low lying coastal zone containing four estuaries, namely the Dee, Mersey, Ribble and Alt. Small rocky outcrops are found in the Dee at Hilbre Island and Red Rocks, and on the Mersey at Eastham, Garston, Hale, New Brighton and New Ferry.

The shoreline of the Natural Area experiences a range of physical environments, though is influenced mainly by accreting shores, shallow water and high tidal ranges. This has led to the development of extensive sandy and muddy/sandy beaches along the coast between estuaries, on the Wirral peninsula, at Sefton and at Blackpool. Whilst major sand dune systems are found along the Sefton coast, important relic sand dunes are found between Lytham and Squires Gate and around Bispham and Rossall. Extensive, grazed and un-grazed saltmarshes are found on the Dee, Ribble and Mersey estuaries. A series of relatively stable bar features also occur in the intertidal zone, the ridges and runnels running obliquely away from the shore to the north, perpendicular to prevailing currents. These features help to provide a degree of coastal protection.

A high proportion of the remaining shoreline is experiencing erosion. This can be seen at places such as Formby and at Ince Banks on the Mersey. Shoreline Management Plans are currently in preparation for the two sub-cells within Liverpool Bay, namely Sub-cell 11a: Great Ormes Head to Formby Point and, Sub-cell 11b: Formby Point to River Wyre. These will provide more detailed information on the pathways and processes that dominate physical process change within the Natural Area.

The hinterland is heavily developed with industrial and residential areas such as Liverpool, Birkenhead, Southport, Lytham St Annes and Blackpool extending along much of the coastline. The whole of the Natural Area is influenced by pressure from commercial and residential land uses and many hinterland areas suffer from poor, though improving water quality.

The Natural Area contains a number of sites which have been identified within the Geological Conservation Review (GCR). The objectives of this review was to identify those sites needed to show all the key scientific elements of the earth heritage of Britain. Site selection was undertaken between 1977 and 1990 by the Nature Conservancy Council. The GCR sites and their equivalent SSSIs, are highlighted in Table 4.1. More recently, Hilbre Island has been identified as a potential GCR site.

The GCR sites incorporate a range of key but different geological and landform features. These are outlined below:

- Quaternary sediments with records of recent sea level and climatic changes.
- Four estuaries: the Dee, Mersey, Ribble and Alt.
- The large dune barrier complex extending from Crosby to Southport (including Ainsdale).

Table 4.1 - Geological and geomorphological SSSIs within the Liverpool Bay Natural Area

| County | GCR name | SSSI name | Associated key features |
|---------------|---------------------|---|---|
| Merseyside | The Dungeon | The Dungeon | Permian-Triassic |
| Merseyside | Thurstaston | Dee Cliffs | Pleistocene/Quaternary of Pennines and Adjacent Areas |
| Merseyside | Ainsdale Sand Dunes | Southport Sand Dunes and Foreshore, Ainsdale Sand Dunes and Formby Sand Dunes and Foreshore | Coastal Geomorphology |
| Lancashire | Lytham St. Annes | Lytham St. Annes | Holocene Sea-Levels Coastal Changes* |

* This is a potential SSSI which English Nature proposes to notify in the near future. A number of Regionally Important Geological/Geomorphological sites (RIGS) also occur within the Natural Area.

4.1 Coastal Geology and Landforms

4.1.1 Geological History

The underlying solid geology of the Natural Area is dominated by rocks of Triassic Age, deposited around 240 million years ago. These are generally masked by overlying deposits of Quaternary age, laid down within the last 2 million years. The Triassic period was dominated by the continental deposition of sands and silts in an arid, desert-like climate. It comprises two groups:

1. The Sherwood Sandstone Group (including the Kinnerton Sandstone, Chester Pebble Beds and Wilmslow Sandstone Formations), which was dominantly fluvial (braided river) in origin;
2. The Mercia Sandstone Group (including the Tarporley Siltstone Formation) which was thought to have developed under increasingly intertidal influences.

In other parts of the country, Sherwood Sandstone rocks have yielded the remains of early reptiles (skeletal and trace fossils). Recent discoveries of dinosaur footprints at Hilbre Island confirm the potential of these rocks for such finds. The in-situ nature, uniqueness and clarity of the footprints have led to the identification of Hilbre Island as a potential GCR site. The Dungeon SSSI shows a section through the Tarporley Siltstone Formation of the Mercia Mudstone Group and its faulted contact with the Wilmslow Sandstone Formation.

No younger Mesozoic or Tertiary rocks are known and it is likely that the area was high ground, on which deposition of material was unlikely.

4.1.2 Quaternary History

The Triassic sequence underwent extreme denudation during the Quaternary when the area was glaciated several times by ice sheets advancing southwards down the Irish Sea. Much of the low lying area is covered by glacial clays (till or boulder clay), sands and gravels, with erratics clearly originating from the Lake District and the Southern Uplands. Dee Cliffs SSSI demonstrates the nature of the Quaternary glacial deposits, including well known glacial depositional and deformational structures.

Following the last glaciation, rivers such as the Dee and Mersey have adjusted their courses in response to fluctuating sea levels. Changes in sea level over the last 10,000 years, during the Holocene period, are also recorded in the sequence of marine silts and terrestrial peats found along the low lying coast, as seen clearly within Lytham St. Annes Coastal Changes pSSSI.

A full description of the landform features (including sand dunes and saltmarshes), within the Natural Area is given in Section 6.

4.2 Coastal Processes

4.2.1 Sediment transport

The varied tidal regime of the northern Irish Sea and the orientation of the coastline relative to the prevailing winds results in complex sediment circulation along the coast of the Natural Area. Motyka and Brampton (1993) describe the coast of the NA as part of the Great Orme-Solway Firth single coastal cell. This cell is further sub-divided into additional sub-cells, within which any change in sediment volume or supply does not affect adjacent cells. Cells are separated either by littoral drift divides or sediment sinks. The two sub-cells within the Natural Area are described below:

(i) Great Orme to the Mersey (sub-cell 11a)

Within this sub-cell, there is a moderate to high transport rate for sand and a low transport rate for shingle. Both move north eastwards. Predominantly fine sand and silt is transported into the Dee and Mersey estuaries, around which sediment transport, both on the offshore banks and along the coast, is extremely complex.

(ii) Mersey to Fleetwood (sub-cell 11b)

Within this cell, there is a high rate of northerly sand transport and onshore movement of fine sand and silt into the Ribble estuary. Canalization of the outer Mersey has led to major changes in the transport and distribution of sediment within the inner part of Liverpool Bay. South of Blackpool, sand travels south along the coast into the Ribble estuary, whilst further northwards, erosion of the Salter's Bank is resultant in the movement of sand in a direction towards Fleetwood.

4.2.2 Sea level rise and flooding

As elsewhere, any sea level changes across the NA are due to the combined effect of global changes in sea level and local changes in land level. Tide gauge data taken from Liverpool

Bay appears to correspond closely to the absolute global sea level rise of between 1.5 to 2.0 mm/year.

Considerable stretches of the coast have been developed as urban and commercial centres and hard coastal defences have been put in place to protect these and adjacent areas. The intervening stretches of relatively unprotected coast are of great importance for their biological, geological and geomorphological interest. These areas could be affected by changes to natural coastal sediment processes caused by man's activities elsewhere, such as, for example, hard coastal defences, channel dredging and dumping of material at sea.

‘Coastal squeeze’, which derives from a combination of sea-level rise on one hand and pressure from development and fixed coastal defences on the other, may also affect the nature conservation interests on the coast. Changes in sea-level have occurred many times in the geological past. Most recently, they have related to changes in the amount of water in the oceans with the expansion and contraction of ice sheets during the last ice age and to land level changes resulting from the heavy weight of ice. Today, global warming will result in a further sea level rise. In the past, coastal habitats have shifted their location inland or seawards according to the relative levels of sea and land. However, with the present sea level rise, the extent to which habitats have the ability to move inland, and therefore maintain their relative extent and biological diversity, will depend very much on the level of Man’s willingness to take a flexible approach to land-use in the coastal zone and the degree to which these changes are sustainably managed.

Flooding is an important issue for several low lying areas within the Natural Area. Susceptible sections of coast include Southport to Hesketh and Cleveleys to Fleetwood. The dunes and foreshore at Ainsdale form part of a natural defence which prevents flooding of some of the adjoining low lying agricultural land.

4.3 Key Geological, Landform and Coastal Processes Management Issues

- Impact of coast protection works on coastal exposures, landforms and natural coastal processes. Coastal defence schemes can affect a site by:
 - (a) Affecting sediment transport.

The natural forces of wind, waves and tides along the coastline have produced a variety of coastal landscapes, many of which are nationally and internationally important for their habitats and natural features. Maintaining the natural coastal processes, such as sediment transport, is crucial to the conservation of these. Protection of a coastline that is being eroded by marine processes may reduce the input of sediment into the cell, thereby having a potential 'knock-on-effect' down drift.
 - (b) Fixing the coastline and causing ‘coastal squeeze’.

Across the country, sea level rise is expected to result in the accelerated erosion of beaches and cliffs, flooding of low lying coasts and a loss of saltmarshes and mudflats. Retreat of such coastal habitats inland, as would be possible in a natural system, is restricted by fixed coastal defence schemes. Reclamation of coastal habitats at the inland edge would cause ‘coastal squeeze’. Within Liverpool Bay, it is suggested that the following could be most significant:

- (i) Channel movements and related erosion
 - (ii) Extension of saltmarsh
 - (iii) Movement of offshore banks
- (c) Affecting sensitive geological exposures.
Natural processes are a key component in maintaining the integrity of geological profiles and geomorphological features. Coastal defence works, which are designed to reduce erosion, can result in stabilisation and vegetation growth which obscures exposures.
- Offshore exploitation of mineral resources, including sand and shingle extraction.
 - Tourism - impact of visitors and potential erosion.
 - Presence or threat to limited geological and geomorphological features by inappropriate development. Closely linked with this is the need for further site survey and documentation of geological/geomorphological sites and, where appropriate, their designation as Sites of Special Scientific Interest (SSSIs) or Regionally Important Geological/Geomorphological sites (RIGS).

4.4 Key Geological, Landform and Coastal Process Objectives

- (i) **Key Geological and Landform Objective: (Key Objective 1)**
Maintain the integrity of geological and landform features within the Natural Area and enhance their value for interpretation, education and visual amenity.

Rationale

This objective aims to promote the protection of the most important geological/geomorphological features within the Natural Area through protective designation, appropriate management, development control and by encouraging the maintenance or restoration of natural processes:

- Ensure that all remaining sites of geological and geomorphological interest in the Natural Area, which are not already designated as Sites of Special Scientific Interest or Regionally Important Geological/Geomorphological sites, are adequately documented and put forward for designation where appropriate. Ensure a co-operative and effective approach to management of these sites.
- Maintain and, where possible, enhance the existing geological and geomorphological features, by for example, undertaking scrub management.
- Promote further geological and geomorphological research.
- Where developments including infill/landfill are proposed, ensure that geological interests are protected. Advise on modification of proposals or new conservation techniques which would minimise or prevent damage to those interests. If any features are lost, new sites or exposures should be created of an equal or greater quality.

- Ensure that nature conservation, including earth science, is pursued as an after-use for all mineral applications on SSSI's and RIG sites.
- Ensure the sustainable development of tourism/education, ensuring activities are targeted to appropriate areas to avoid damage to important sites.

It is however, acknowledged that natural physical processes will result in the loss of some features.

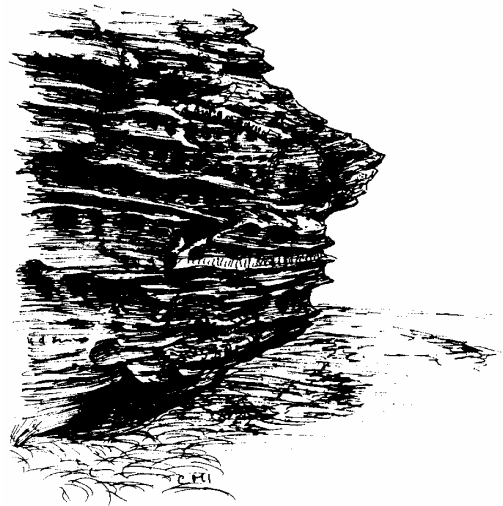
- (ii) **Key Coastal Processes Objective: (Key Objective 2)**
Ensure that coastal processes are allowed to function as naturally as possible and any potential net loss of habitat from 'coastal squeeze' is halted or reversed.

Rationale

This objective aims to halt or reverse the loss of coastal habitats and features from coastal squeeze and to sustain and revitalise the natural coastal sedimentary processes. Other objectives, for example, 8: Development and Infrastructure, will also contribute towards the achievement of these aims.

- Allow the natural processes (sediment erosion, transport and depositional patterns) to occur within the Natural Area with the minimum of human interference. This should include current cliff erosion, sand dune and saltmarsh accretion on the English side of the the Dee Estuary; saltmarsh erosion on the Welsh side of the Dee Estuary; sand dune erosion and dune accretion on the Sefton coast; saltmarsh accretion in the Ribble Estuary and saltmarsh erosion and accretion in the Mersey Estuary.
- Ensure that the operation of sub-aerial processes is as natural as possible, including the wind-driven movement of sand dune systems and the slumping of unprotected soft cliffs.
- Where natural processes are allowed to continue, promote the use of soft (for example, beach nourishment), rather than hard engineering options for the protection of capital assets on the coast and prevent the extension of hard coastal defences into undeveloped areas. Modify existing structures where these are found to be causing disruption to coastal processes.
- Ensure an integrated, holistic approach to planning activities within the coastal zone through the production and implementation of Estuary Strategies and Shoreline Management Plans (SMP). Ensure nature conservation objectives have been incorporated into such plans.
- Ensure that the net loss of habitat from 'coastal squeeze' is halted by seeking opportunities for habitat creation through managed retreat and other soft engineering techniques.
- Promote the use of schemes by port and harbour authorities which minimise the negative effects of capital and maintenance dredging. Seek opportunities to recycle dredged spoil within the coastal zone to assist coastal processes and discourage the disposal of these sediments at more distant offshore dump sites or on other inappropriate sites. Encourage foreshore recharge in appropriate locations.

- Ensure that sand and gravel extraction proposals clearly demonstrate, through agreed research, that they will not impact on sedimentation processes and habitats. Where information is not available, adopt the precautionary principle.
- Promote research into, and the monitoring of, coastal processes and the impact of developments such as channel dredging and aggregate removal. Long term effects on nature conservation interests and the sustainability of coastal sedimentary systems should be determined. This should include gaining a deeper understanding of sedimentary systems which should help predict the likely effects of sea-level rise.
- Use the geological interest of the Natural Area as an educational resource.



5. Key Species

5.1 Key Species Objective: Key Objective 3

Maintain, and where appropriate, enhance the population numbers, population viability and distribution of nationally and internationally important species of plants and animals and key species which are characteristic of the Natural Area.

Rationale

This Natural Profile seeks to identify and highlight those species in Liverpool Bay under the greatest threat and with the highest sensitivity. Although many of the species within the Natural Area are vulnerable to human activities, their populations can be maintained and expanded by appropriate management, taking into account their ecological requirements. This objective aims to promote habitat management which will benefit species and their populations. This objective also aims to promote the protection of rare species as defined under EU and UK legislation, and includes the initiation of further survey and monitoring of key populations. Highest priority should support objectives for key species within Liverpool Bay (as outlined in Appendix 11), with equal emphasis given to species of national and international importance and to species of local importance and significance. The objectives outlined in Section 6 also include elements of habitat management which will benefit species populations.

5.2 The selection of key species

The Natural Area, with its varied and high quality habitats, supports a number of species which are highly valued by wildlife conservation bodies and the general public alike. The Natural Area is of outstanding ornithological significance. The estuaries are valuable staging posts for migrating birds during the spring and autumn and support large numbers of waders and wildfowl throughout the winter. Many species exceed numbers of international significance. A nationally important breeding colony of terns also occurs and breeding redshank and black-headed gulls are also found in a number of localities.

Other important species include grey seals (which haul out on the Dee) and, particularly on the Sefton coast, natterjack toads, sand lizards, red squirrels, great-crested newts and a liverwort known as petalwort.

Limitations on human and financial resources mean that we are unlikely to be able to focus conservation action on all the species within the Natural Area, though we must identify those which are in need of priority 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. Existing frameworks and mechanisms can also be used to aid this process, to include working with well established conservation managers, such as Sefton Metropolitan Borough Council, Lancashire County Council and other Local Authorities and Agencies.

Appendix 11 lists a number of species that may be regarded as key species for Liverpool Bay and which are a priority for action (even if the latter is simply to monitor numbers to confirm they are remaining stable). The species have been selected according to the selection criteria outlined below:

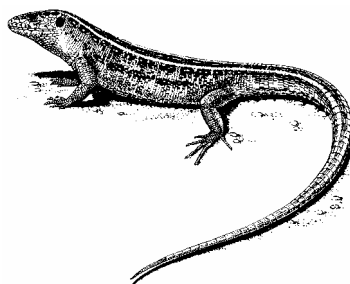
Selection criteria for key species

- 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 Liverpool Bay Natural Area (Protected by the European Habitats Directive, Birds Directive, Berne or Bonn Conventions, or are listed on CITES or Biodiversity: The UK Steering Group Report, December 1995).*
- b. *Species protected by the various schedules of the Wildlife and Countryside Act 1981 (as amended) which are rapidly declining throughout the UK and which have a national stronghold in the Liverpool Bay Natural Area.*
- c. *Species which are at risk in Great Britain, which are nationally rare or nationally scarce and/or which are on the extreme edge of their normal range in Liverpool Bay.*
- d. *Species which are highly characteristic of Liverpool Bay, seldom found in such numbers elsewhere in England and/or which are popular with the general public.*

Some account has also been taken of ensuring that all the important taxa in the NA are represented and that the species selected are spread across the key habitats present.

Following the information given in *Biodiversity: The UK Steering Group Report* (December 1995), the list of species outlined in Appendix 11 includes those species which are either globally threatened or rapidly declining in the UK. Each of the key species listed in Appendix 11 is also identified within the 'Special species' part of its primary habitat description (see 6.3.1 to 6.3.12).

Species in bold are highlighted within *Biodiversity: The UK Steering Group Report* (1995).



Sand lizard

6. Key wildlife habitats

6.1 Key Wildlife Habitat Objective: (Key Objective 4)

Maintain all key habitats within the Natural Area and, where appropriate, enhance the extent, distribution and quality of the most important and characteristic types. Redevelop the natural transitions between sand/mudflats, foreshore, saltmarsh, freshwater marsh, sand dune, grassland and heath communities. Promote the recovery of degraded habitats to a more optimal level.

Rationale

This objective aims to maintain, enhance and expand the key habitat types within Liverpool Bay by promoting more sympathetic and sustainable management practices. Highest priority is given to objectives for nationally and internationally important habitats present within the Natural Area.

6.2 Comparative importance and extent

The Natural Area once largely consisted of natural or semi-natural habitats with natural transitions between communities ranging from estuarine sand/mud flats and foreshore, through saltmarsh /fresh water marsh and sand dunes to heaths and grasslands. This situation has been heavily modified over the years by the activities of man, which have included commercial/residential development, coastal defence, land claim and woodland planting. All of the most important habitats have been affected and some have been much reduced from their original extent, for example, saltmarsh, sand dunes, lowland heathland and unprotected soft cliffs. Future sea level rise, in conjunction with associated coast protection works, could lead to coastal squeeze and a further reduction in coastal habitats.

The Liverpool Bay Natural Area supports a wide range of marine, coastal and maritime habitats. Key habitats which occur in the Natural Area are listed below. The equivalent key habitats, as identified within the UK Steering Group Report (Volume 2) on Biodiversity (1995) are also outlined.

| Key Habitat in Natural Area | Equivalent Key Habitat in UK Steering Group Report on Biodiversity (1995) |
|------------------------------------|--|
| Sand Dunes | Coastal Sand Dune |
| Estuaries | Estuaries |
| Saltmarsh | Coastal Saltmarsh |
| Grazing Marsh | Coastal and Floodplain Grazing Marsh |
| Cliffs | Maritime Cliff and Slope |
| Lowland Heathland | Lowland Heathland |
| Saline Lagoons | Saline Lagoons |
| Artificial Habitats | None |
| Rocky Shores | None |
| Sedimentary Shores | None |
| Sedimentary Sea-Bed | Offshore Seabed* (broad habitat type only) |
| Inshore/Offshore Waters | Open Coast/Open Sea Water Column* (broad habitat type only) |

- * Key Habitats, as defined within the UK Steering Group Report on Biodiversity (1995), are those for which costed habitat action plans have and/or are being prepared.
- * Broad Habitat Types, as defined within the UK Steering Group Report on Biodiversity (1995), are those for which brief habitat statements have been prepared.

Eight out of the twelve habitats identified within the Liverpool Bay Natural Area (namely sand dunes, estuaries, saltmarsh, grazing marsh, cliffs, lowland heathland, rocky shores and sedimentary shores), have a high level of statutory protection. This is recognized by the representation of these habitats within Sites of Special Scientific Interest (SSSI) within the Liverpool Bay Natural Area.

Furthermore, the high significance of birds on the coast is recognized by the incorporation of many of the Natural Area's key habitats within a number of Special Protection Areas (SPAs) and Ramsars which extend over much of the Natural Area's coastline.

The international significance of the sand dunes on the Sefton Coast is also recognized by their candidate Special Area of Conservation (SAC) status.

6.3 Summary of overall habitat conservation goals

Although key nature conservation objectives are given under each of the habitats described below, this section combines these into nine overall habitat conservation goals for the Natural Area, to help prioritise action.

The key habitat conservation goals (in no particular order), for the Natural Area are:

1. Encourage the production and implementation of Shoreline Management Plans to ensure a holistic approach to coastal planning, including dredging, aggregate extraction and coastal defence. The plans should aim to allow natural coastal processes to continue as far as is possible and should discourage new developments which increase the need for future coastal protection.
2. Ensure the adoption of Estuary Management Plan objectives into statutory local plans and into the activities of estuary managers and users.
3. Encourage sustainable fisheries activities.
4. Promote interpretation to help visitors and local people gain an improved awareness and understanding of the key nature conservation features within the area.
5. Encourage the zonation and development, where appropriate, of voluntary codes of practice, for certain recreational and tourism activities. This will minimise disturbance to species and habitats.
6. Encourage appropriate habitat management.

7. Encourage improvements in water quality by ensuring the development and implementation of suitable water quality objectives, particularly with respect to the avoidance of unacceptable eutrophication of enclosed and near shore coastal waters.
8. Encourage habitat re-creation to ameliorate past losses caused as a direct result of human activities.
9. To undertake research and survey.



6.4 Habitat descriptions and specific conservation objectives

The status, characteristic wildlife, important species and, where known, extinct species, of each habitat are described in the sections that follow. Key species, as identified in Appendix 11, are highlighted in the '*Special species*' section. Those which have been identified within the UK Steering Group Report on Biodiversity (1995) have been highlighted in bold. The main factors currently affecting each habitat type are also given, together with suggested nature conservation objectives. These objectives, although hopefully realistic in the long term are deliberately visionary and unconstrained. They do not include targets, as these will be provided in Local Biodiversity Action Plans.

6.4.1 Sand dunes

Status

The accumulation of sand to form dunes is largely a coastal phenomenon in Great Britain. Two major factors are required for sand dunes to form: a supply of sand along with the wind to move it, together with plant colonisation to stabilise deposited material and to encourage further sand deposition.

Major concentrations of sand dunes occur within the Natural Area. These represent approximately 18% of the total sand dune resource in England. Although the dunes are predominantly located on the Sefton coast, they are also found on the Wirral and Fylde coasts where they form smaller, though equally important, relic fragments. The 1,956 hectare sand dune complex on the Sefton coast is approximately 17 km long with an average width of 1.5km, but in places extending to 5km with an altitudinal height up to 25 m. This complex is one of the finest examples of a calcareous sand dune system on the north-west coast of the UK.

Behind the protective dune barrier lies a low lying hinterland of rich agricultural land, much of which has been reclaimed from former mossland. In addition to their large extent, a

diverse range of plant and animal communities are represented which make the sand dunes of great interest within the UK. This is reflected in the large number of SSSI designations which embrace NNRs and LNRs. Ainsdale Sand Dunes NNR was declared in 1965. Much of the dune complex has also been recently identified as a candidate Special Area of Conservation under the Habitats Directive (Directive 92/43/EU) on the Conservation of Natural Habitats and of Wild Flora and Fauna.

All the dunes are backshore systems. These are characteristic of exposed sections of coast and develop above beaches where there is a good sand supply and an onshore prevailing wind. The wind drives sand inland, resulting in the formation of a series of dune ridges. A complete succession from strandline vegetation through embryo dunes and yellow dunes to grey dunes is represented, though different communities are represented to varying degrees. The Sefton coast sites have a particularly fine set of dune slacks which, although scattered throughout the system, are chiefly found in the fixed grey dunes. These are quite extensive in places. Dune slacks are also particularly species rich and diverse within the dune system at Lytham St Annes. This follows recolonisation after a period of past sand extraction.

Characteristic Wildlife

The main vegetation types include communities dominated by sand sedge, marram grass and red fescue. Sandhill rustic moth is also characteristic of this habitat type, together with sea bindweed, a species which has two or three small populations on the relic dunes between Blackpool and Fleetwood. Further inland, a higher diversity of plant species occurs and a complete vegetation cover forms. Lime-loving plants, such as kidney vetch, carline thistle, yellow-wort, yellow rattle and pyramidal orchid occur. The wet slacks are particularly interesting and are usually dominated by creeping willow. Characteristic species include flat-sedge, round-leaved wintergreen, marsh helleborine, variegated horsetail and small-fruited yellow-sedge. Several of these have a very localised distribution in the north-west of England.

Broad-leaved woodland, consisting largely of poplar, with birch and sycamore, has developed over limited areas of some of the dunes, particularly where there has been past disturbance. Several large plantations, chiefly of Corsican Pine, also occur, particularly in the Formby area. Many of these were planted up between 1893 and 1930 and now support a population of **red squirrels**.

Special species

Pools within some of the dune slacks support internationally important breeding populations of the rare **natterjack toad** and the globally threatened and declining **great crested newt**. Red Rocks SSSI supports a population of **natterjack toads** following a re-introduction scheme in 1996. A small isolated population of **sand lizards**, a species more characteristic of the heathlands of southern England, also survives on the Sefton coast. **Red squirrels** also occur within the adjoining pine plantations, which now represent a significant refuge for this declining species. **Skylarks** are also associated with sand dunes, as are **grey partridges**.

A number of globally threatened and declining species plant species also occur including **dune helleborine**, a species only found at three other localities in Britain outside the Sefton coast dunes and **spanish campion**. The Red Data Book species grey hair-grass also occurs. A large number of Nationally Scarce species are also present, including seaside centaury, Isle of Man cabbage (a species endemic to the British Isles which is of frequent occurrence on the Lytham St Annes to Squires Gate Dunes), green-flowered helleborine, variegated horsetail,

portland spurge, sea spurge, baltic rush, ray's knotgrass, round-leaved wintergreen, twiggy mullein and dune fescue. The globally threatened and declining liverwort, **petalwort**, also occurs. Whinchat and broad-leaved centaury have both become extinct.

Protected sites

Merseyside:

| | |
|------------------------------------|---|
| Altcar Sand Dunes and Foreshore | SSSI/NNR (Cabin Hill)/cSAC/RAMSAR/SPA/LNR |
| Formby Sand Dunes and Foreshore | SSSI/cSAC/RAMSAR/SPA |
| Ainsdale Sand Dunes | SSSI/NNR (Ainsdale Sand Dunes)/cSAC/RAMSAR SPA |
| Southport Sand Dunes and Foreshore | SSSI/cSAC/RAMSAR/SPA/LNR |
| Lytham St Annes Dunes | SSSI/LNR |
| Freshfield Dune heath | SSSI |
| Hesketh Golf Links | SSSI |
| Red Rocks | SSSI/LNR |

Current factors affecting the habitat

- The conservation of these sites is dependent on maintaining natural coastal processes, including sediment transport. Coastal defence schemes, in particular, can have the effect of reducing the input of sediment into a cell down drift, which can affect the supply of sediment required for dune development.
- The fragmentation of sand dune systems, such as on the Fylde coast and on the Wirral peninsula.
- Recreational pressures on the dunes affect natural vegetation communities through trampling and increased erosion and wind blow. Active management is required to rationalise the high recreational pressures.
- Invasion, by such species as sea buckthorn, silver birch and corsican pine, can alter the key vegetation types and character of dunes.
- Diseases in the rabbit population, such as through the arrival of viral haemorrhagic disease in the North West, could reduce rabbit numbers. This would drastically alter the grazing regime and change the nature of the vegetation.
- A Coast Management Plan has been developed for the Sefton coast, involving Sefton Borough Council, English Nature, the National Trust and others. This provides strategies for managing and monitoring the dune and woodland resource and for species conservation, education and recreation. The Plan is being reviewed in 1997.
- Through the aims of the Sefton Coast Management Scheme, the Sefton Coast Life Project aims to develop a nature conservation strategy for the sand dunes of the Sefton Coast. The project is funded by the European Commission and runs until March 1999.
- The detrimental affect of urban development and major works not requiring planning permission, such as waste water treatment pipelines.

Key nature conservation objectives

1. Ensure current tourism and recreational activities are carried out in a sustainable manner. Damage to natural strandlines, beach forms and vegetation arising from beach cleaning operations or overuse by vehicles, for example, should be avoided.
2. Undertake production and implementation of Shoreline Management Plans to enable planning decisions to be made in a holistic fashion and to allow coastal processes to function as naturally as possible.
3. Maintain and, where possible, restore the area covered by sand dunes by allowing their natural spread and development.
4. Restore fragmented sand dunes, such as those on the Fylde coast and Wirral peninsula.
5. Control scrub invasion to ensure that dune slack vegetation and rare plant communities are maintained and, where appropriate, expanded and enhanced. This to be undertaken through a combination of methods including mechanical control and the continuation and/or re-introduction of grazing.
6. Maintain and enhance the internationally important natterjack toad population on the Sefton coast and at Red Rocks on the Dee Estuary. As far as possible restore the species to its historical range, to be achieved through the implementation of proposals in the English Nature Strategy 'Conservation of the natterjack toad on the Sefton coast 1992' (to be re-written in 1997/98), and as outlined in the UK Biodiversity Species Action Plan.
7. Enhance and consolidate the nationally important population of sand lizards by implementing the proposals outlined within the English Nature/EAU "Sand Lizard Conservation Strategy for the Sefton Coast 1992" (to be re-written in 1997/98), and as outlined in the UK Biodiversity Species Action Plan.
8. Maintain the important population of red squirrels on the Sefton coast by appropriate management of their woodland habitat and implementation of the UK Biodiversity Species Action Plan for red squirrels.
9. Maintain the locally important population of great crested newts by appropriate management.
10. Maintain stock grazing at an appropriate level, introducing more stock where appropriate, including where rabbit populations are reduced.
11. Promote research towards gaining a deeper understanding of coastal sedimentary systems, such as on the Sefton coast, Dee Estuary and Ribble Estuary, to aid the prediction of the likely effects of sea-level rise.
12. Further promote the sand dunes as an educational resource.
13. Promote mobile dune systems, by, for example, considering closure of the coast road.
14. Manage the sand dune system along with the LIFE project and the Sefton Coast Management Plan.

6.4.2 Estuaries

Status

Four estuaries, namely, the Dee, Mersey, Alt and Ribble, open on to Liverpool Bay. These are coastal plain estuaries which have large expanses of mud and sand flats, backed by saltmarshes and sand dunes. Whilst all estuaries are predominantly sediment-filled, more than a third of the Mersey's area is subtidal. The Dee, Ribble and Mersey are backed by extensive saltmarshes. All the estuaries are macrotidal and most have a tidal range of between 6.5 and 8.9 metres, the Mersey Estuary having the greatest range.

Estuaries throughout Liverpool Bay are extensive and cover around 38,352 ha, representing around 10% of the total resource in England. Three of the four estuaries are larger than 5,000 ha and are, as such, amongst the largest estuaries in Britain. The Dee straddles the English/Welsh border and is the largest estuary within the Natural Area, with a total area of 16,101 ha. In addition to the large areas of intertidal sand and mudflats and saltmarsh, the Dee also includes the islands of Hilbre; three small low lying sandstone islands located approximately 1km off the extreme north-west corner of the Wirral peninsula.

The estuarine habitats of Liverpool Bay are particularly important for waders and wildfowl. The estuaries are valuable staging posts for migrating birds during spring and autumn and also support large numbers of waders and wildfowl throughout the winter. Recognition of their international importance is provided by their Ramsar and SPA status. Large areas also fall within nature reserves owned and managed by organisations such as English Nature and the RSPB. For example, the Ribble Estuary National Nature Reserve, managed by English Nature, forms a major part of the Ribble Estuary. This is, moreover, one of the largest NNRs in England.

Important fisheries, particularly shellfisheries, are also found within some of the Natural Area's estuaries.

Characteristic wildlife

Estuaries are typically areas of transition, from marine to freshwater communities, and from marine subtidal communities to terrestrial maritime habitats. However, within the Natural Area, the upper part of this transition is severely truncated, making this habitat one of the rarest in the North West. Within these gradients a number of important habitats for wildlife occur. These are described in more detail within the relevant habitat sections 6.4.3 Saltmarsh, 6.4.4 Grazing marsh, 6.4.9 Rocky shores, 6.4.10 Sedimentary shores and, 6.4.11 Sedimentary sea-bed.

Tidal flats are a major feature of estuarine ecosystems and support a wide range of invertebrate animals, such as molluscs, crustacea and worms. These may be particularly abundant in muddy sediments. These are the key groups on which the internationally important populations of waders, in particular, feed.

Important commercial shellfish beds are also found within the Natural Area, principally on the Dee Estuary where an intensive hand-raking fishery for cockles occurs. Four main beds, at Talacre, Salisbury Bank, Thurstaston and West Kirby occur, although their position tends to vary from year to year. Most landing occurs on the more accessible English side. Cockles are also gathered commercially from within the Ribble Estuary, depending on availability and demand.

Both the Ribble and Dee are also important salmon and trout rivers and fishing is licensed between 1 April and 31 August. The Dee has, in addition, been designated a 'bass-nursery area' by the Ministry of Agriculture, Fisheries and Food. Bass fishing is subsequently restricted within the Estuary. Fisheries are given further consideration in Section 6.4.12 Inshore/Offshore Waters.

Special species

All the estuaries within Liverpool Bay support internationally important numbers of birds. There are considerable movements of birds between the estuaries, with different species using different parts of the estuaries at different times of the tidal cycle. Eighteen species occur at international levels and overwinter on the Natural Area's estuaries. These are outlined below:

| | | |
|----------------------|----------------------------|--------------------------|
| Bewick's swan | Whooper swan | Pink-footed geese |
| Shelduck | Wigeon | Teal |
| Pintail | Oystercatcher | Curlew |
| Grey plover | Knot | Sanderling |
| Dunlin | Black-tailed godwit | Bar-tailed godwit |
| Redshank | Lapwing | Turnstone |

Principal wildfowl and wader sites within Liverpool Bay 1990-91 to 1994-95 (based on WeBS Core Counts and surveys of Pink-footed Geese):

| | | |
|--------------------------------|------------------------------------|-------------------------------------|
| (i) <u>Dee Estuary:</u> | (ii) <u>Mersey Estuary:</u> | (iii) <u>Ribble Estuary:</u> |
| shelduck | shelduck | bewick's swan |
| teal | wigeon | whooper swan |
| pintail | teal | pink-footed goose |
| oystercatcher | pintail | shelduck |
| grey plover | redshank | wigeon |
| curlew | dunlin | teal |
| black-tailed godwit | | pintail |
| redshank | | oystercatcher |
| knot | | lapwing |
| dunlin | | grey plover |
| | | black-tailed godwit |
| | | bar-tailed godwit |
| | | knot |
| | | dunlin |
| | | sanderling |
| | | redshank |

Within the estuaries, different species are associated with different habitat types. For example, true estuarine mudflat species include **shelduck**, oystercatcher, **grey plover**, **knot**, **dunlin**, **bar-tailed godwit** and **redshank**. Other species are dependent on other component habitats, such as saltmarsh, grazing marsh and rocky shores. Please refer to the relevant habitat sections for further detail. A large nationally important colony of terns also occurs on the Ribble Estuary.

Protected Sites

Merseyside:

| | |
|--------------------|---|
| Dee Estuary | SSSI/RAM SAR/SPA |
| Mersey Estuary | SSSI/RAM SAR/SPA/Seaforth Nature Reserve (Wildlife Trust) |
| Part of Ribble/Alt | SSSI/RAM SAR/SPA |
| Sefton Coast | SSSI/cSAC/RAM SAR/SPA |

Lancashire:

| | |
|--------------------|------------------|
| Part of Ribble/Alt | SSSI/RAM SAR/SPA |
|--------------------|------------------|

Current factors affecting the habitat

- Estuaries can be subject to a high degree of recreational disturbance. It should however be emphasised that different parts of estuaries will be subject to varying degrees of disturbance. For example on the Ribble, the inner estuary is relatively undisturbed compared with the outer estuary.
- Disposal of effluent into enclosed estuarine waters has an effect on water quality.
- Many estuarine habitats are affected by dredging, partly to maintain deep water channels for shipping.
- The reclamation of intertidal land in estuaries has resulted in reductions in estuarine habitats. This is particularly true of the Ribble, Dee and Mersey estuaries.
- Nature and intensity of fisheries practices.
- Coast defences.



Shelduck

Key nature conservation objectives

1. Secure the implementation of all Estuary Management Plans within the Liverpool Bay NA.
2. Encourage the development of voluntary codes of conduct for water sports.
3. Maintain or improve water quality by appropriate water quality objectives.
4. Assess the environmental impacts of dredging and mariculture before areas affected are considered for extension.
5. Ensure local conditions are suitable for maintaining and, where appropriate, expanding the populations of key wintering and passage wildfowl and waders, by ensuring that:
 - * Feeding and roosting grounds and refuge sites, are kept as free as possible from human disturbance.
 - * There is no net habitat loss due to coastal squeeze.
 - * Opportunities are taken for habitat re-creation by managed retreat.
 - * There is no overall reduction in populations of main invertebrate prey species by, for example, pollution, disturbance or non-sustainable exploitation.
 - * Wildfowling continues to be carried out in a manner and at levels which are sustainable in relation to target and non-target bird populations and their habitats.
6. Ensure conditions are suitable for maintaining the nationally important tern colony and populations of key breeding birds, by implementing species protection measures and appropriate habitat management, including reducing disturbance from human activities.
7. Promote sustainable shellfishing practices
8. Produce appropriate educational/code of behaviour publications.
9. Ensure the movement of important migratory fish is not hindered by physical and water quality barriers.

6.4.3 Saltmarsh

Saltmarshes are areas of land covered by vegetation which are subject to regular inundation by the tides. During flood tides, mud is deposited on marshes which gradually has the effect of raising the level of the marsh above adjacent mud. Here, the reduction in flooding leads to a more specialised flora and fauna. Saltmarshes in the UK are amongst the finest internationally.

The estuaries of the Liverpool Bay NA support extensive areas of saltmarsh (4,269 ha), which reflects the presence of large estuaries and wide intertidal areas throughout the Natural Area. A high percentage of the coastline comprises saltmarsh. A particularly important feature of the Liverpool Bay saltmarshes, (compared with those of Britain as a whole), is the high percentage of mid to upper marsh communities. Within Liverpool Bay, as indeed elsewhere, these have been lost through progressive land claim. Whilst reclamation has been intensive on some estuaries, such as on the Ribble, other areas have been less affected. This accounts, at least in part, for the presence of transitional habitats, including freshwater and brackish marsh, which are characteristic of the English side of the Dee Estuary. In addition, a high proportion of the saltmarshes throughout Liverpool Bay are grazed, though on the Dee in particular, many of the marshes remain un-grazed. On some sites within the Natural Area, however, grazing has itself led to a loss or decline in some species, such as the sea lavenders and sea wormwood.

Many of the saltmarshes, such as the English side of the Dee, together with the Ribble, have increased in area during recent years. Substantial areas of intertidal flats have been colonised by common cord-grass, a major pioneer species of new mudflats. This was introduced to many of the Natural Area's estuaries between 1920 and 1940. Measures to control its spread have been attempted on the Ribble, Dee and Mersey. At present, the rate of spread appears to have slowed. It is also evident that common cord-grass is replaced by other saltmarsh species as the marsh matures.

Some saltmarshes within Liverpool Bay are experiencing erosion, such as on the Mersey and on the Welsh side of the Dee Estuary. Saltmarshes are also likely to be affected by problems of water quality, reclamation and, for the birds that frequent them, disturbance from recreational activities.

Characteristic wildlife

The typical saltmarsh vegetation zonation pattern within the Natural Area is from a pioneer zone of common cord-grass to a low-mid marsh of common saltmarsh-grass. Red fescue saltmarsh is the main mid-to upper marsh vegetation type. Sea-purslane saltmarsh is limited in extent, (unlike marshes on the south and east coasts), due to the prevalence of grazing. Drift line vegetation is dominated either by common couch or sea couch.

Saltmarshes within the Natural Area also provide breeding sites for a wide range of bird species, including oystercatcher, **lapwing**, **redshank**, **dunlin**, **snipe**, **curlew**, **shelduck**, **ruff**, black-headed gull, **lesser black-backed gull** and **herring gull**, together with **common** and **arctic terns** and a number of passerine species, for example, **skylark**. They also provide roosting sites for many waders during high tide periods, together with grazing for wildfowl. Many overwintering species feed on saltmarshes, including **wigeon**, **teal**, **pintail**, **black-tailed godwit**, **bewick** and **whooper swans** and **pink-footed geese**.

The saltmarshes also support a wide range of invertebrates, which are particularly rich in upper marsh zones where pools, seepages, drift line debris and tall vegetation occur.

Special species

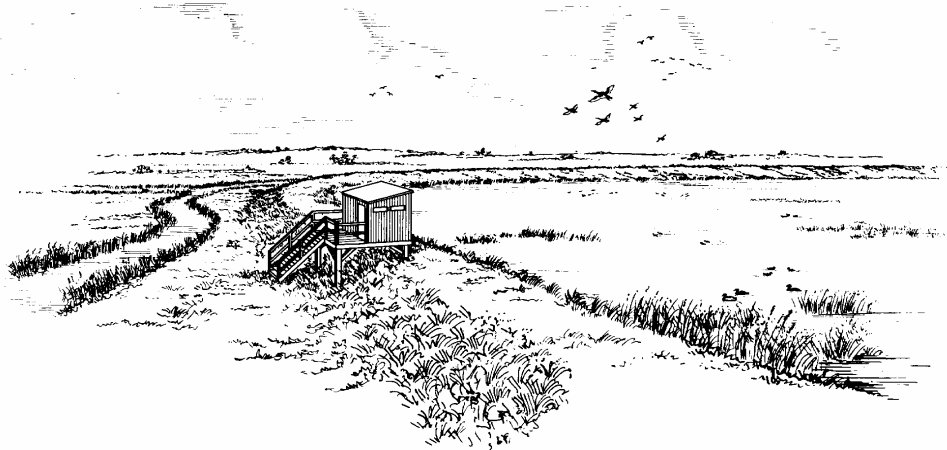
Saltmarsh supports a high number of international, overwintering bird species, including **wigeon, teal, pintail, black-tailed godwit, bewick** and **whooper swans** and **pink-footed geese**. Breeding bird species are also important and include **redshank**, oystercatcher and internationally important numbers of black-headed gulls.

The globally threatened and declining, **sharp club-rush** and the Nationally Scarce, long-stalked orache also occur.

Protected sites

Virtually all the saltmarshes within the Natural Area fall within SSSI's / RAMSAR's and SPA's which emphasises the importance of the habitat within the Natural Area.

| | |
|------------------------------------|-----------------|
| Dee Estuary | SSSI/RAMSAR/SPA |
| Mersey Estuary | SSSI/RAMSAR/SPA |
| Ribble Estuary (including the Alt) | SSSI/RAMSAR/SPA |



Current factors affecting the habitat

- Recreational activities can lead to the disturbance of breeding bird species and feeding and roosting wader and wildfowl populations during high tide periods.
- Rapid spread of common cord-grass into bare mud on lower level saltmarsh can lead to a decline in intertidal feeding areas for waders and wildfowl, though an increase in the area of saltmarsh.
- Wildfowling.
- The risk of pollution.
- Coastal defence works.
- Grazing regime: undergrazing of upper marsh can lead to the spread of couch and other species, whilst overgrazing can lead to a decline in saltmarsh breeding birds.
- Sandwinning
- Estuary dynamics: in particular the balance between erosion and accretion. For example, high level marshes in the Mersey are being eroded.
- Tipping, for example in the upper reaches of the Mersey .

Key nature conservation objectives

1. Habitat re-creation and set back should be promoted. The natural development and spread of saltmarsh should be encouraged if it is lost as a direct result of human interference and/or coastal squeeze.
2. Encourage a range of management regimes, including grazing and non-grazing, in order to promote species and structural diversity of saltmarsh swards. This will also provide a range of habitats for breeding and wintering bird populations and invertebrates.
3. Secure the adoption of Estuary Management Plan objectives within the statutory planning process and into the activities of estuary managers and users.
4. Reduce recreational disturbance by careful management of activities, by means of a voluntary approach.
5. Set water quality objectives to reduce unacceptable eutrophication of estuarine waters.
6. Where it will enhance their nature conservation interest, re-establish grazing regimes on formerly grazed saltmarshes.
7. Maintain a balance between grazed saltmarsh for wintering wildfowl and ungrazed saltmarsh for its botanical and invertebrate interest and breeding bird species, such as pintail.
8. Restore a diverse saltmarsh vegetation.

6.4.4 Grazing marsh

Status

Grazing marsh is a distinctive habitat type consisting of low-lying grassland drained by a series of ditches that may contain brackish or fresh water. Although land-claim of grazing marsh for agricultural purposes and, to a lesser extent, industrial use has occurred within the Natural Area, grazing marsh still occurs around some of the estuaries, most notably on the Mersey, Ribble and south side of the Dee Estuary.

Characteristic Wildlife

The botanical interest of grazing marshes is principally associated with the dyke system, though some sites, such as Meols Meadow SSSI on the North Wirral Coast and Banks Marsh within the Ribble Estuary SSSI, continue to support a species-rich neutral grassland flora. The dykes provide a particularly important refuge for species such as brackish water-crowfoot, a Nationally Scarce species found at Newton's Marsh within the Ribble Estuary SSSI.

Grazing marshes are of high ornithological importance and are used as high-tide and severe weather roosts, both by waders and wildfowl using the estuaries in winter on passage for feeding and by migrating species during the spring and autumn. For example, during winter

the grazing marshes on the Ribble Estuary may support large numbers of **wigeon**, **redshank**, **grey plover** and **black-tailed godwit**, together with large flocks of **golden plover**, **bewick** and **whooper swans** and **pink-footed geese**. Populations of breeding waders are also present and include **ruff** and **black-tailed godwit**.

Special Species

The ornithological significance of grazing marshes is particularly high and, in conjunction with other estuarine habitats, combine to support internationally important numbers of wildfowl and waders.

The dyke flora is also of high interest and two Nationally Scarce species, brackish water-crowfoot and whorled water-milfoil occur.

Protected Sites

Meols Meadow SSSI (Merseyside)

Ribble Estuary SSSI/RAMSAR/SPA (Lancashire and Merseyside)

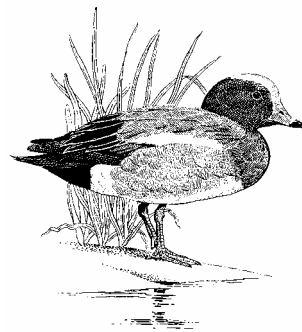
Newton Marsh SSSI (Lancashire)

Current Factors affecting the habitat

- Large areas lie outside protected sites. Partly due to this, much does not reach its ecological potential due to a lack of management of drainage ditches and low water tables.
- Agricultural improvement, together with urban and housing development, results in a loss of grazing marsh.
- Requirements for coastal defences to safeguard sites conflicts with managed retreat.
- Drainage and agricultural intensification.
- Water quality and degree of freshwater flushing through the drainage dykes.
- Management regime - particularly in relation to grazing / non-grazing and water level management during the year.
- Management of drainage dykes.
- Disturbance to birds from recreational pressure.

Key Nature Conservation Objectives

1. Maintain and enhance the quality of existing grazing marshes (and associated grassland) within the Natural Area.
2. Encourage the appropriate management of grazing marsh (appropriate grazing levels and maintenance of water levels), with respect both to drainage dyke flora and suitable habitat requirements for breeding and wintering birds.
3. Restoration (and expansion in area) of grazing marsh should be encouraged, particularly where there is a high regeneration potential.



Wigeon

6.4.5 Cliffs

Status

Sections of cliff within the Liverpool Bay Natural Area are generally low and limited in extent. The eastern shore of the Dee Estuary is backed by a stretch of boulder clay cliffs and others occur around the Mersey Estuary, such as at Eastham and around Hale Head. Further cliffs can be found sandwiched between the upper and lower promenades north of Blackpool. Whilst no longer subject to coastal erosion, these soft cliffs none the less support relic coastal grassland. A mosaic of maritime grassland and heathland also occur on the rocky cliffs of the Hilbre Islands.

Despite a high level of development pressure, very little of the Natural Area's cliffed coastline has been affected by coastal defence works. Natural coastal erosion is prevalent on the soft cliffs and the presence of slumped material is common. Soft cliffs supply sedimentary material and therefore perform an important coastal processes role.

Characteristic wildlife

The Dee cliffs are particularly important for their herb rich flora. A wide range of lime-loving plants occur, including some which are at the northern limits of their British distribution, for example yellow-wort and bristly oxtongue. They are also good for invertebrates which live in bare ground.

Although the western cliffs of Hilbre are too exposed to support vegetation, the sheltered eastern cliffs support common scurvy grass and sea campion, together with the nationally scarce rock sea lavender and the regionally scarce fern sea spleenwort.

Special species

The nationally scarce rock sea lavender occurs on Hilbre.

Site protection

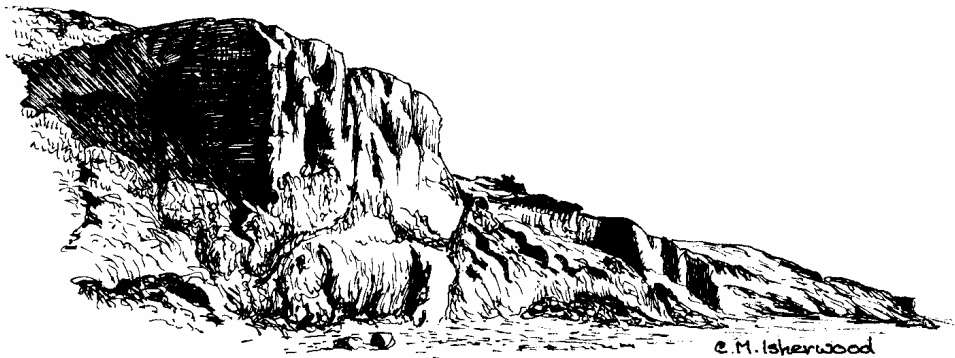
| | |
|----------------|-----------------|
| The Dungeon | SSSI |
| Dee Cliffs | SSSI |
| Mersey Estuary | SSSI/RAMSAR/SPA |

Current factors affecting the habitat

- Coast protection/stabilisation works, designed to prevent further land slips and loss of property, interferes with the natural processes of coastal erosion and sediment movement.
- Urban development on unstable sites leads to the need for further coastal protection.
- Maintenance of natural coastal processes is paramount in maintaining nature conservation interest(s).

Key nature conservation objectives

1. Allow natural processes of erosion to occur (including the slumping of unprotected soft cliffs around the Dee and Mersey Estuaries), to retain geological/geomorphological and biological interests.
2. Restrict new development to stable areas or existing urban areas where adequate coastal protection already occurs.
3. Ensure a broad cliff-top strip of grassland to allow for erosion.
4. Produce and implement Shoreline Management Plans to ensure a holistic approach to coast protection.
5. Maintain and enhance the natural habitats and species communities of slumping cliffs throughout the Natural Area through minimum or non-intervention management.
6. Undertake managed retreat and habitat re-creation where appropriate.



6.4.6 Lowland heathland

Status

The UK has about 20% of all the remaining lowland heathland in Europe. The habitat continues to decline rapidly across the continent and its conservation is regarded as a priority. Heathlands show a strong association with the underlying geology and soils and, within this Natural Area, are found on areas of leached windblown sand (such as at Freshfield Heath) and on podsollic soils which have developed over Triassic sandstones (such as on Thurstaston Common).

Dune Heath constitutes a special category which is of particular conservation importance. This habitat would once have extended along much of the inland side of the Sefton coast dune system.

Within the Natural Area, lowland heathland occurs predominantly in Merseyside, its importance being reflected within five SSSI designations. Only a very limited amount of lowland heathland occurs within the Lancashire part of the Natural Area. Although no SSSIs have been identified in Lancashire, young heather does occur here, principally on flat areas of heath within the roughs of both Royal Lytham St Annes Golf Course and Fleetwood Golf Links. Whilst there are no areas of over mature heather, there is nothing to suggest that it is not native to the sites and that the age classes are nothing more than a function of past management.

Characteristic Wildlife

The most characteristic plant species of lowland heaths within the Natural Area is heather, which occurs with other species including bilberry, wavy hair-grass, and tormentil. The driest areas are characterized by western gorse and bell heather, whilst in the damp peaty hollows, wet heath occurs. This heath is characterized by cross-leaved heath and purple moor-grass, with heath rush, deer grass and bog asphodel being amongst the common constituents.

Dune heath is dominated by heather, but one of the more important common constituents is sand sedge. On wetter areas, species including southern marsh orchid and broad buckler fern occur.

Special Species

The Nationally Scarce marsh gentian, a species characteristic of wet heath and confined to only a few sites in the North West, occurs within the Natural Area. The butterflies silver-studded blue (found only on the Wirral peninsula) and grayling also occur.

Protected Sites

Merseyside:

| | |
|-----------------------|-------------------|
| Ainsdale Sand Dunes | SSSI/NNR/cSAC/LNR |
| Formby Sand Dunes | SSSI/cSAC |
| Freshfield Dune Heath | SSSI |
| Heswall Dales | SSSI/LNR |
| Thurstaston Common | SSSI/LNR |

Current factors affecting the habitat

- Fragmentation of many heaths as a result of development renders small individual sites vulnerable to damage and loss of species.
- Recreational pressure can result in erosion of vegetation and soils, whilst localised eutrophication can lead to the establishment of other types of vegetation. Uncontrolled fires can also be a potential hazard.
- Lack of traditional management by controlled burning or grazing can lead to the invasion of heath with species such as silver birch and Scot's pine, which can alter the key vegetation types and character of heathlands.
- Dumping.

Key Nature Conservation Objectives

- **Maintain a mosaic of heathland types with a variation in age and structure.**
- **Control scrub invasion to ensure heathland vegetation and communities are maintained and, where appropriate, expanded and enhanced.**
- **Re-introduce traditional management, particularly light grazing.**
- **Where appropriate, extend the current resource through habitat re-creation.**



Heather

6.4.7 Saline Lagoons

Status

A number of man-made coastal lagoons, consisting of both brackish ponds and coastal pools, occur within the Natural Area. These are commonly shallow, have a restricted tidal range and often contain lagoonal wildlife comparable to true lagoons, that is to say lagoons wholly or partially separated from the sea by natural sedimentary barriers.

In 1987, the majority of potential lagoon sites in the north-west were surveyed as part of the Nature Conservancy Council's National Lagoon Survey. However, a number of recreational 'lakes' in Merseyside and Lancashire remain un-surveyed. This includes the Marine Lake at Southport, the Fairhaven Lakes at Lytham St Annes and those at Fleetwood and Preston Docks. The South Docks complex, south of the Pier Head in Liverpool, also offers brackish water of restricted tidal range.

The nature conservation value of such sites remains unknown. Since lagoons are a nationally rare habitat and a 'priority habitat type' under Annex 1 of the EU Habitats Directive, it will be important to define the status of this habitat within the Natural Area by undertaking further survey work.

Characteristic Wildlife

True lagoons support only three types of aquatic vegetation, namely strands of green algae, sea-grasses and similar plants (predominantly tasselweeds) and, much more rarely, stoneworts. Most lagoons are predominantly open water, usually have bare sediments on their beds and fringing stands of reeds, saltmarsh plants and/or sedges.

The flora of some lagoons, such as West Kirby Marine Lake, is marine in nature, with a variety of red and brown algae as found in relatively sheltered intertidal zones.

Special Species

Site protection

Part of the marine lake at West Kirby lies within the Dee Estuary SSSI / SPA / Ramsar

Current factors affecting the habitat

- High recreational pressure can lead to a reduction in wildlife interest.
- A deterioration in water quality can lead to a reduction in the wildlife interest of coastal lagoons. Eutrophication can be a particular problem within enclosed waters.
- Disruption to freshwater/seawater inputs can have detrimental effects on the wildlife interest of coastal lagoons.
- The introduction of non-native species may have an influence on the natural ecosystem.

Key nature conservation objectives

1. Encourage a survey of man-made coastal lagoon sites within the Natural Area, particularly those sites which were not surveyed as part of the National Lagoon Survey in 1987, but which were identified as being of potential value.
2. Ascertain what factors affect the interest of the coastal lagoons within the Natural Area.
3. Conserve the lagoonal resource in as natural a state as possible.



Common reed

6.4.8 Artificial Habitats (other than saline lagoons)

Status

A number of artificial habitats occur within the Natural Area. These include pier pilings, groynes, training walls, wrecks, sea and dock walls, docks, together with oil and gas platforms. These objects offer hard substrata in areas that may be largely sedimentary, thus providing discrete new habitats for opportunistic colonising species that otherwise would not be present.

Characteristic Wildlife

Many structures support a plant and animal community characteristic of rocky shores, tending to be dominated by encrusting mussels, barnacles and stunted fucoid algae.

Special Species

The artificial shore at Blundellsands, Crosby, supports plant species unusual for the Natural Area, including yellow horned-poppy.

Site Protection

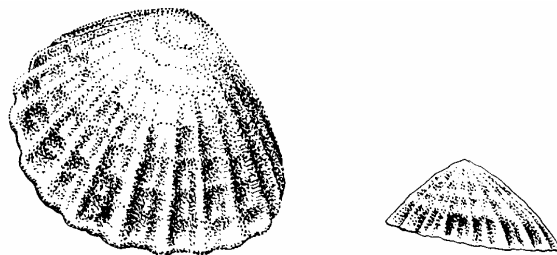
A number of artificial habitats which are located within intertidal areas fall within SSSIs.

Current factors affecting the habitat

- The removal of man-made structures, such as groynes and wrecks.

Key nature conservation objectives

1. Undertake more survey and monitoring work to identify the plant and animal communities present. This should involve liaison with agencies such as English Heritage and the Royal Commission on the Ancient and Historical Monuments of England, who are involved in the survey, recording and management of shipwrecks and unidentified obstructions.
2. Investigate ways to increase the nature conservation interest of artificial structures such as seawalls and breakwaters.



Limpets

6.4.9 Rocky shores

Status

The extent of rocky shores within the Natural Area is very limited although boulder and cobble scars are found on the Fylde coast and within the Ribble and Mersey Estuaries. These are dominated by mussels, although abundant barnacles are also characteristic. A similar, though impoverished community is also found on consolidated clay and boulder exposures near Cleveleys.

Hilbre Island, a low sandstone outcrop at the mouth of the Dee estuary, provides one of the best examples of littoral bed rock within Liverpool Bay. Although species diversity has declined here this century (possibly to be partly attributed to an increase in silt deposition and sediment scour around the islands), the irregular surface of the intertidal rock still provides a great variety of microhabitats, including crevices, gullies, rockpools, vertical faces and overhangs. These provide ideal conditions for a diverse range of littoral species.

The Dee estuary and the North Wirral coast has been identified as a 'Sensitive Marine Area' by English Nature. This represents one of a number of locations around the country which will require a cautious approach to management. Hilbre Island is also a Local Nature Reserve.

Characteristic Wildlife

Rocky shores contain a range of plant and animal species adapted to the rigours of constant immersion and emersion by seawater. A series of factors, including degree of wave action and exposure, are instrumental in determining the types, abundance and distribution of species and communities present. At Hilbre, a typical shore zonation of plant communities occurs, with spiral wrack at the top of the shore, egg wrack and bladder wrack in the mid-shore and serrated wrack on the low shore. These brown seaweeds, together with green seaweeds, characterize the Hilbre vegetation. Lower shore seaweeds are more restricted in their extent.

Animal communities are similarly inhibited by mud on the surface of rocks and general turbidity of the water. Pools high up on reefs and rock masses, with boulders and overhangs, are favoured. The communities tend to be low species diversity examples of common rocky shore communities, typically dominated by fucoid algae, mussels and barnacles. Anemones, starfish and edible crab, however, are also present.

Turnstone, a species characteristic of rocky shores also occurs, particularly at Egremont/New Brighton on the Mersey and on the Dee. During the winter, the rocky shores of Hilbre also support a number of **purple sandpiper**.

Special Species

The shore at Egremont/New Brighton, Wirral supports more than 2% of Western Europe's **turnstones**. Due to their commercial importance, cockles are also particularly important in Liverpool Bay.

Protected Sites

Merseyside:

Dee Estuary

SSSI/RAMSAR/SPA

Mersey Estuary

SSSI/RAMSAR/SPA

Hilbre Island

SSSI/RAMSAR/SPA/LNR

Lancashire:

Ribble (and Alt) Estuaries

SSSI/RAMSAR/SPA

Current factors affecting the habitat

- Although recreational use on rocky shores increases the opportunity for raising public awareness and appreciation, trampling and ad hoc collection can have an adverse effect, particularly on the more fragile and slow growing species.
- Water quality, including oil pollution in some areas and, notably, sewage discharge, can affect shore communities. Increased turbidity reduces algal communities, whilst siltation leads to the smothering of animal communities.
- Coast defences can cause changes in sediment movement. This can lead to the smothering of rocky shore communities with silt, or conversely, the scouring of sediments.

Key Nature Conservation Objectives

1. Promote an understanding and awareness of the marine environment amongst the general public by, for example, promoting the establishment of Voluntary Marine Nature Reserves.
2. Minimise the disposal of sludge at sea.
3. Ensure that coast defences do not result in changes in sediment movements which are likely to lead to the siltation of animal and plant communities..



Turnstone

6.4.10 Sedimentary shores

Status

The mainland shores of this Natural Area are largely sedimentary, being composed largely of sand and mud. Littoral sediments range from mobile, wave exposed sands on the open coast which support impoverished animal communities, to more stable, muddy sediments found in the inner reaches of the estuaries, with abundant invertebrates. The latter generally support a richer community characterized by dense populations of polychaete worms and bivalve molluscs. The benthic fauna consists of estuarine communities with relatively low diversity, though high biomass. The Dee Estuary and the North Wirral coast has been identified as a 'Sensitive Marine Area' by English Nature.

Characteristic Wildlife

The open Fylde coast generally supports an impoverished crustacean/polychaete fauna in mobile fine sand. More stable mid and low shore sands have a much richer community characterized by bivalve molluscs. This also holds true for the fairly stable, fine sands and silts in the outer Ribble and Mersey Estuaries which are characterized by baltic tellin and, in the Ribble, cockles.

Muddier sediments within the inner most parts of estuaries are more sheltered and are subject to low and variable salinities. The fauna is dominated by bivalves and polychaetes, together with gastropods and amphipods. The Ribble, for example, supports a community characterized by the polychaete worm and the bivalve mollusc.

Special species

Sanderling are strictly associated with sandy shores and are internationally important.

Ringed plovers are also associated with this habitat.

Site Protection

Merseyside:

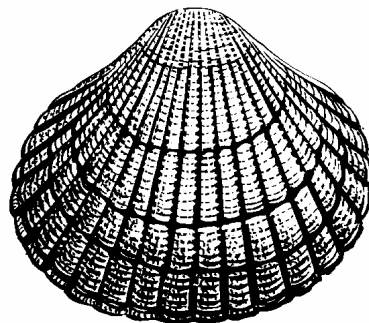
| | |
|------------------------------------|---|
| Dee Estuary | SSSI/RAMSAR/SPA |
| Mersey Estuary | SSSI/RAMSAR/SPA |
| North Wirral Foreshore | SSSI |
| Altcar Sand Dunes and Foreshore | SSSI/NNR (Cabin Hill)/cSAC/RAMSAR/SPA |
| Formby Sand Dunes | SSSI/cSAC |
| Ainsdale Sand Dunes | SSSI/NNR (Ainsdale Sand Dunes)/cSAC/LNR |
| Southport Sand Dunes and Foreshore | SSSI/cSAC/LNR |
| Part of Ribble /Alt | SSSI/RAMSAR/SPA |

Lancashire:

| | |
|---------------------|-----------------|
| Part of Ribble /Alt | SSSI/RAMSAR/SPA |
|---------------------|-----------------|

Current factors affecting the habitat

- Recreational pressures on sediment shores are high, for example from holiday makers.
- Inappropriate mechanical beach cleaning damages invertebrate populations, particularly sand-hoppers, reducing the ability of these animals to remove organic debris from beaches.
- The risk of oil pollution, from catastrophic events or longer term inputs from harbour activities, can be detrimental to wildlife interests.
- Coastal protection and harbour dredging can result in major changes to littoral communities.
- Water quality has an overall effect on the communities present, particularly since pollutants can become bound up with sediments.
- Organic pollution
- Commercial fishing.
- Mariculture.
- Sandwinning.
- The development of Spartina.



Cockle

Key nature conservation objectives

1. Encourage the establishment and enhancement of areas suitable for public interpretation and appreciation.
2. Ensure that oil and chemical spill contingency plans are realistic, effective and workable. Plans should be regularly reviewed and adhere to a standard form along the coast.
3. Encourage the production and implementation of Shoreline Management Plans, to include the incorporation of nature conservation objectives.
4. Encourage industrial and agricultural practices that reduce pollution and eutrophication from terrestrial sources.
5. Develop a sustainable strategy for mariculture which balances the needs of the industry with the desire to prevent the deterioration of the conservation interests.
6. Promote sensitive bait digging and shellfish gathering practices to minimise over-use and disturbance to important waterfowl populations.
7. Promote the establishment of Voluntary Marine Nature Reserves.
8. Prevent damage to beach invertebrate populations by inappropriate mechanical cleaning methods.

6.4.11 Sedimentary sea-bed

Status

The sea-bed of the Natural Area, like the mainland shores, are predominantly sedimentary in nature, being mixtures of coarse, fine and muddy sand with pebbles and occasional cobbles. Sediment habitats and communities are representative and typical of communities occurring within the north and east basins of the Irish Sea with low species diversity, though high biomass.

The sea-bed in the centre of the Lune Deep is composed of rippled fine sand and mud. This feature is considered in more detail within the adjoining Morecambe Bay Natural Area profile.

Characteristic wildlife

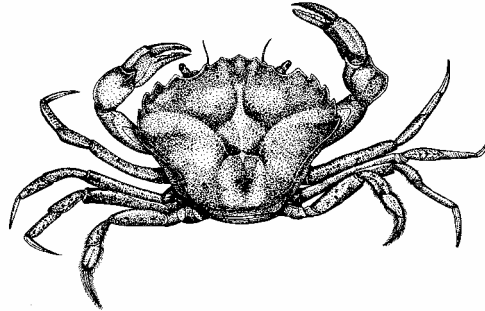
The fauna is sparse with occasional lugworm casts, swimming crabs and common shore crabs. The deeper sediment is poorly colonised with only a few lugworm and no obvious epifauna, apart from the occasional juvenile flatfish.

Special species

A nationally rare worm known as *Ophelia bicornis* occurs in the outer Ribble Estuary. Here it is usually found entirely buried in loose, mobile sand in the lower shore. This is an Atlantic European species with very specific habitat requirements.

Site protection

Sub-tidal areas fall outside the jurisdiction of SSSIs, the boundary for these being the mean low water mark, and their interest is not sufficient to warrant candidate marine Special Area of Conservation (SAC) status under the Habitats Directive (92/43/EU).



Shore crab

Current factors affecting the habitat

- Recreational pressures, in the form of marinas, moorings and anchoring, can cause damage to sediment communities, particularly those supporting sensitive species.
- Fisheries activities, such as trawling and mariculture, can cause damage to sediment communities.
- Oil pollution, from exploration and exploitation, can affect sediments, particularly adjacent to production or exploratory platforms or rigs, where drill cuttings and debris may totally smother and alter the characteristics of the sediment.
- Poor water quality can directly affect sediment communities, in the short term by increasing Biological Oxygen Demand (BOD), clogging gills etc. and in the long term as pollutants become bound up in sediments.
- Dredging proposals, both capital, maintenance, routing work and extraction, cause the redistribution of sediments and possible changes in local environmental conditions.

Key nature conservation objectives

1. Encourage sustainable fishing practices.
2. Develop and implement a sustainable strategy for mariculture with users and regulators.
3. Develop management and zoning schemes in conjunction with and involving all user groups.
4. Encourage dredging operators to use dredged material positively for the purpose of habitat enhancements/coastal defence, or to dispose of spoil in the least environmentally damaging way.
5. Encourage the Oil and Gas Industry to adopt the least environmentally damaging approaches in undertaking their activities. Impacts of oil exploration should be minimised, particularly with regard to the location of drilling sites and the disposal of drill cuttings and drilling mud. Adequate regard should be given to sensitive sites in oil spill response plans. Promote the preparation of sensitive benthic community maps/risk maps.
6. Reduce pollution and eutrophication from land-based sources where necessary, to ensure the maintenance of a sustainable ecosystem.

6.4.12 Inshore/Offshore Waters

Status

Within the Natural Area, open sea extends from the shallow nearshore waters to deeper waters at the 12 mile limit. This section describes the importance of this habitat, including the species which inhabit the water column, rather than being attached to the bottom (the benthos).

Characteristic wildlife

A number of important commercial fisheries operate within Liverpool Bay between August and May. Common or brown shrimp are caught in a number of shallow waters, including the mouth of the Dee Estuary (Rock Channel and Hilbre Swash), within the Ribble Estuary, in the Penfold Channel off Southport and in Formby Pool. The shrimp fisheries are carried out at different intensity, varying from trawls and push nets, to tractor-towed nets. When shrimps are out of season, cockles and mussels are sometimes gathered by hand, such as at Blundellsands and Formby.

Inshore trawlers also take a variety of white fish, (including sole, plaice, whiting, rays, turbot, brill, dabs and flounders), from further offshore. Fleetwood is the most important fishing port within the Natural Area and supports a trawl fleet comprising around 45 vessels, between 20 and 25 of which fish grounds mainly within the 12 mile zone. Trawlers fish from the Fylde coast south to the North Wirral coast, often fishing off the Sefton Coast in the main white fishing grounds, north of Taylor's Bank, offshore from Ainsdale.

Shallow waters off the North Wirral coast also provide an important nursery ground for a number of species, including sole, plaice and rays.

In addition to commercial fish species, there are a range of microscopic single-celled plants and animals known as plankton. These ultimately form the base of the food chain upon which commercial species depend. At the larger end of the scale, a small number of cetaceans occur, together with large wintering populations of seabirds.

The coastal waters of the Natural Area are relatively unimportant for cetaceans. The species most frequently recorded in nearshore waters are the **harbour porpoise** and **bottlenose dolphin**. Offshore areas have higher densities and a greater variety of cetaceans.

As a whole, the Natural Area holds surprisingly few **common** or **grey seals**. There are no major breeding sites in the Natural Area, but a large number of **grey seals** regularly use the outer area of the Dee Estuary for feeding and, at low water, haul out on the eastern rise of the West Hoyle Bank close to Hilbre Island. In recent years the population peak has varied between 300 and 340 individuals. **Common seals** are only occasionally recorded here.

The shallow nearshore waters and large estuary complexes, characterizing the Natural Area, is reflected in the composition of the seabird community, which comprises mostly birds (eg. wintering sea duck and divers) that prefer these habitats. The most important colonies are located on or close to these large estuaries. Whilst the Dee and Ribble/Alt Estuaries support important offshore populations of **cormorant**, the Mersey Estuary supports important wintering populations of great-crested grebe. In addition, the low lying land in the Ribble Estuary supports important black-headed gull and **common tern** colonies.

Special species

Harbour porpoise and **bottlenose dolphin** are listed in Annex II of the Habitats Directive (Directive 92/43/EU) on the Conservation of Natural Habitats and of Wild Flora and Fauna.

Grey seals have been highlighted as a species of conservation concern within the UK Steering Group Report on Biodiversity. The relatively low numbers found within the Natural Area, however, make no significant contribution to the UK population.

Numbers of **cormorants** in the Dee Estuary exceed 2% of the national total, whilst wintering great-crested grebes in the Mersey average more than 1% of the national total. Numbers of **cormorant** in the Ribble and Alt Estuaries are nationally important.

Protected sites

Whilst inshore waters overlap in part with the Ribble and Alt, Mersey and Dee Estuaries (SSSI, and SPA / Ramsar), offshore areas are not protected by any specific conservation legislation.

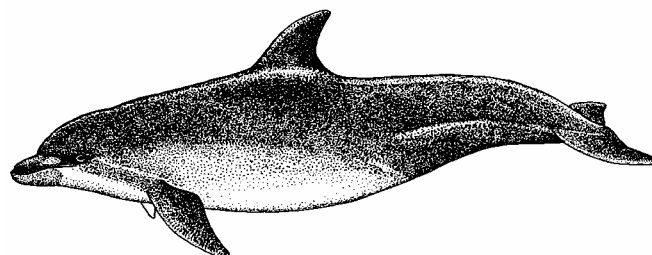
Current factors affecting the habitat

- Lack of knowledge and understanding of the open sea.
- Marine pollution and contamination. Liverpool Bay has high levels of contaminants, which includes PCBs, mercury and lead: seals and cetaceans are particularly vulnerable.

- Marine litter may cause injury to animals of the open sea, including seabirds and cetaceans. Plastics, old nets and other discarded material can cause entanglement and suffocation.
- Oil pollution and activities involved with exploration and exploitation may affect species of open water. Cetaceans especially may be disturbed by noise pollution from ship movement and offshore installations.
- Some fishing activities can cause changes to open sea species, both target and non-target species, due to incidental capture.
- Recreational activities can lead to disturbance, for example to seabirds and seals.

Key nature conservation objectives

- Review knowledge of open water utilization by marine life and fisheries activities.
- Include all user groups in the development of management and zoning schemes.
- Reduce pollution and eutrophication from land based sources.
- Ensure that the results of by-catch studies are used to minimise the impact of fisheries, cetaceans, marine life and seabird populations.
- Ensure that the impacts of oil exploration and production are minimised and that oil pollution contingency plans incorporate adequate measures to safeguard key marine/maritime species and habitats.
- Monitor and enhance populations of wild fish, mollusc, crustacea and other groups of nature conservation and commercial importance.
- Agree a sustainable fisheries strategy with users and regulators to optimise and sustain the economic yield from fisheries.
- Ensure core feeding areas and haul out sites for the grey seal population at the mouth of the Dee Estuary are free from disturbance from human activities.



Bottlenose dolphin

7. Other key objectives

Sections 4-6 outlined four key objectives, namely, 1: Key Geological and Landform Objective; 2: Key Coastal Processes Objective; 3: Key Species Objective and, 4: Key Habitats Objective. These are directed towards the wildlife and natural features of the Natural Area and are aimed at addressing the major issues affecting the nature conservation interests of the Natural Area.

The following objectives are equally important. Objective 5, which relates to the public's perception and understanding of the wildlife and natural features within the Natural Area, is particularly important. These objectives are also designed to help achieve the key nature conservation objectives referred to above.

7.1 Public Perception, Tourism and Leisure (Objective 5)

Promote public understanding and support for the conservation of coastal habitats and natural features. Ensure that tourism and leisure activities are conducted in an environmentally sustainable manner.

Rationale

The proximity of large population centres to the coast and major tourism centres on the coast (the latter including those of national importance, such as the Fylde), means that tourism and recreational activities are important factors affecting the wildlife and natural features of the Natural Area. It is important that such activities are integrated with other human uses on the coast and are conducted in an environmentally sustainable manner.

As a result of large scale public access to coastal areas there is a need to promote an understanding of the natural processes and the conservation management of features that are of importance for nature conservation and recreation.

Key components

- 7.1.1 Promote the acceptance by planners, land owners, managers and the public that the processes of erosion, accretion and of sediment transport in general are natural and normal and should be interfered with as little as possible.
- 7.1.2 Promote public understanding and support for the conservation and positive management of important coastal habitats, species and populations, and of geological and geomorphological features. For example, on sand dunes, this might involve the felling of conifer plantations and the removal of scrub, in appropriate areas.
- 7.1.3 Encourage the use of nature conservation features as assets for attracting tourism by, for example, utilizing public transport or green methods of transport. Provide interpretative and educational material and facilities.
- 7.1.4 Control or rationalise visitor access in areas which support particularly sensitive habitats or species populations, for example, on fragile sand dunes or feeding/roosting areas used by internationally important wildfowl and wader populations. Promote recreational activities in appropriate areas, which accord with their environmental

sensitivity and discourage those which are not, for example, motorbike racing and hovercrafts.

- 7.1.5 Promote spatial and seasonal zoning to avoid conflicts between recreational and nature conservation interests. For instance, beach zonation to separate important wildfowl and wader feeding and roosting areas from locations used for car parking and activities including bathing, sand yachting, wind surfing and sailing.
- 7.1.6 Promote self-regulation and the observance of voluntary codes of practice by members of the public and local recreational clubs to help avoid disturbance to nature conservation interests.
- 7.1.7 Promote the enforcement of regulatory measures by appropriate authorities, including the Environment Agency, where self-regulation is not working (including making bylaws).

7.2 Exploitation and Management of Resources (Objective 6)

Promote the wise use and sustainable development of the terrestrial and marine resources of the Natural Area.

Rationale

The Natural Area contains a number of important economic resources, whose exploitation in the past has had detrimental effects on the nature conservation interests of the area. This objective aims to ensure that the ongoing and future exploitation of such resources is conducted in a sustainable manner.

(The components of this key objective have been incorporated into the respective habitat sections).

7.3 Water Quality, Resources and Pollution (Objective 7)

Work towards achieving the water quality objectives as recommended, in particular, by the Environment Agency's Water Level Management Plans, Catchment Management Plans and Local Environment Action Plans, and encourage the sustainable use of the water environment in the Natural Area.

Rationale

Above and beyond the demands of the natural ecosystem, the water resources of the Natural Area are used for and affected by many activities, including water abstractions for domestic, industrial and agricultural use, and water discharges (such as effluents), arising from manufacturing, processing, refining, building, mineral extraction, domestic and agricultural activities.

This objective aims to prevent any further loss or damage to important wildlife habitats and their associated communities, from deterioration in water quality, other forms of pollution and from water abstractions. The aim is to promote improvements in water quality and quantity, together with pollution control.

Key Components

- 7.3.1 Promote the effective implementation of water quality and quantity objectives and the control of pollutants affecting the nature conservation interests within the Natural Area, by enforcing existing legislation.
- 7.3.2 Prevent new developments or activities which are likely to result in unacceptable loss, damage or change to habitats and associated communities, by causing an unacceptable deterioration in water quality, quantity, unacceptable increases in water turbidity, or unacceptable changes in water temperature.
- 7.3.3 Promote the effective control of diffuse sources of pollution, such as eutrophication from agricultural runoff.
- 7.3.4 Promote the improvement of water quality where it would benefit important habitats and their associated communities and important bird populations. Encourage local industries and services to adopt Environmental Management Systems conforming to British Standard 7750.
- 7.3.5 Promote and encourage more environmentally friendly beach cleaning operations, which do not cause damage to strandline, embryo dune and other shoreline habitats.
- 7.3.6 Promote the effective control of oil and chemical pollution from, for example, shipping, installations and oil and gas exploitation, in part through the implementation of the recommendations of the Donaldson Enquiry.
- 7.3.7 Promote the restoration and reclamation of contaminated land and landfill sites to avoid or minimise the pollution of coastal waters within the Natural Area.
- 7.3.8 Promote the preparation and updating of contingency planning arrangements by appropriate authorities and industries, to minimise the adverse impacts of any accidental release of pollutants.
- 7.3.9 Promote the sustainable use of water in terms of water use and water conservation.
- 7.3.10 Promote the further monitoring and understanding of pollutant inputs, their behaviour and impacts on water quality.
- 7.3.11 Promote further monitoring and understanding of the effects of water abstraction.

7.4 Development and Infrastructure (Objective 8)

Ensure that the planning of land and sea-based development, their design and management, is in keeping with the wise use and sustainable development of the environment within the Natural Area.

Rationale

Like other developed areas, large sections of the Natural Area, which once supported natural or semi-natural habitats and features of importance, have been destroyed by past

development. This has included development of industrial, commercial and residential centres and their associated activities. Pressure from existing and new development continues to affect the remaining nature conservation features of the coast despite current legislation and the environmental responsibilities of regulatory authorities.

Differences between the planning control systems at sea and on land exacerbate the problems associated with current coastal protection and planning policies. The offshore impacts of onshore development and the onshore impacts of offshore development should continue to be carefully considered. There is a clearly a need to consider developments in their integrity, rather than in a piecemeal fashion by different regulatory authorities.

This objective aims to minimise any further loss, or damage to, important wildlife habitats or natural features within the Natural Area, by promoting the sustainable use of the coast. Development may be compatible with sustainable use if it does not preclude the retention of the environmental capital of the coast. In particular, there is a need to consider the wider economic, social and environmental implications of decisions made and actions undertaken, to take a long term rather than short term view.

Other objectives, particularly 2: Coastal Processes; 7: Water quality; and 9: Planning and regulation, will also help achieve this aim.

Key Components

- 7.4.1 Promote the location of new development within existing urban areas and avoid their location on estuaries or along the open coast if they do not require an estuarine or coastal location (PPG 20).
- 7.4.2 Promote sustainable development opportunities, such as the appropriate re-use of existing development to reduce demand for previously undeveloped areas.
- 7.4.3 Promote the design of new development and the expansion of existing development, which does not cause or exacerbate existing pollution problems within the coastal zone and does, where possible, serve to reduce pollution.
- 7.4.4 Protect remaining areas of nature conservation value within estuaries and on the coast, and maintain the viability of such areas.
- 7.4.5 Promote the sensitive location of energy generating developments, such as gas fired power stations and wind turbines, and the mitigation of any negative effects, to minimise deleterious impact on the nature conservation interests and natural coastal processes of the Natural Area.
- 7.4.6 Ensure that proposals for barrage construction give full consideration to the complexity of issues which could adversely affect the natural environment, including changes to tidal regimes and reaches, permeability to normal tidal movement, water quality behind barrages, impeded passage of migratory fish, changes to sediment patterns and effects on the zonation of plant and animal communities.
- 7.4.7 Where a development proposal (plan or project), either alone or in combination, is likely to have a significant impact on a European site (candidate SAC or SPA), ensure

that an appropriate assessment is undertaken under the Habitats Directive (92/43/EU). An appropriate assessment should also be undertaken, as a matter of Government policy, for Ramsar sites.

7.5 Planning, Regulation and Communication (Objective 9)

Increase the coverage of statutory sites, where appropriate, to protect additional areas of semi-natural habitat and geological features of importance, such as areas of sand dunes and heaths on the Sefton coast and existing or former estuarine habitats on the Dee Estuary. In addition, encourage effective communication by using established networks and simplifying channels of communication.

Rationale

The previous objectives (1-8), are best achieved via the implementation of an integrated approach to the management of development activities on land and sea. This should involve the effective use of existing control and regulatory mechanisms, statutory and non-statutory, and their improvement where necessary. The preparation of integrated coastal zone and estuary management strategies and plans have the aim of co-ordinating and influencing the activities of the regulatory authorities, voluntary sector and public who have an influence on the natural resources of the coast.

This objective encourages the most effective use of established frameworks, with the aim of ensuring the maintenance and enhancement of the nature conservation interest of the Natural Area.

Key Components

- 7.5.1 Increase the coverage of statutory sites, where appropriate, to protect additional areas of semi-natural habitat and geological features of importance, such as areas of sand dunes and heaths on the Sefton coast and estuarine habitats on the Dee Estuary.
- 7.5.2 Promote effective voluntary management of non-statutory sites (such as Sensitive Marine Areas, Sites of Biological Importance, Biological Heritage Sites and Regionally Important Geological/Geomorphological Sites). Extend their designations, where appropriate, to cover additional areas.
- 7.5.3 Promote the designation of further Local Nature Reserves and the acquisition or management of land by non-governmental organisations and local authorities, to be managed for the benefit of nature conservation.
- 7.5.4 Promote the sustainable use of estuaries and the associated coast, through the completion, implementation and integration of Estuary Management Plans for the Ribble and Alt, Mersey and Dee. Use the existing management group structure to influence and to provide links between the various planning structures over the control of development on land and sea.
- 7.5.5 Promote the implementation and integration of existing marine regulations and byelaws and their accessibility to and understanding of the public.

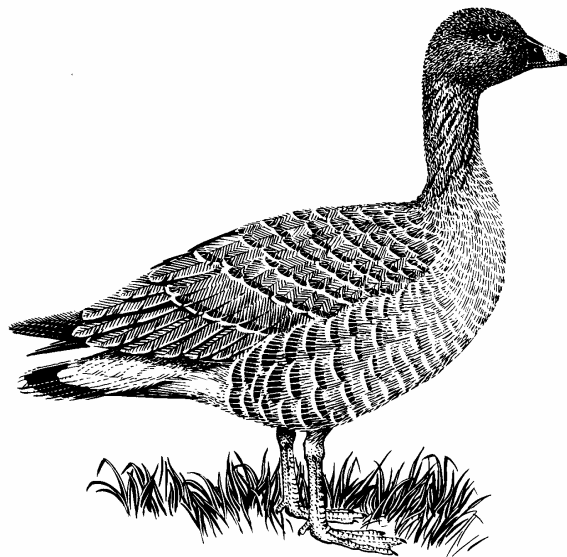
- 7.5.6 Promote the integration of all objectives within the Natural Area Profile and non-statutory plans (such as Estuary Management Plans), into the statutory planning process.

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Pink-footed goose

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10. Glossary

Backshore Dunes

Dunes which develop above beaches with a good sand supply and an onshore prevailing wind, which drives sand inland as a series of dune ridges or mobile parabolic dunes.

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.

Coastal squeeze

Being caught between man-made sea defences and rising sea levels, coastal features are being drowned in a process known as 'coastal squeeze'.

EU Birds Directive (79/409/EU)

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 (eg 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 (GCR)

In which nationally important geological and geomorphological sites were assessed and selected with a view to their long-term conservation. A series of volumes are being published by the Joint Nature Conservation Committee.

Geomorphology

The study of landforms and the processes that formed them.

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 Directive (92/43/EU)

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.

Integrity

The coherence of a site's ecological/geological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated.

Invertebrate

Animal without a backbone (eg worms, insects, molluscs).

Littoral

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

Local Nature Reserve (LNR)

Areas with a special natural value that are declared by local authorities. LNRs can be declared only when the local authority has a legal interest in the land. The reserves are managed to enhance their natural value and bylaws may be passed to protect them.

Macrotidal

Tidal range greater than 4m.

Marine Nature Conservation Review (MNCR)

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 (NNR)

A reserve declared 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.

Natural Area (NA)

An area of countryside identified by its unique combination of physical attributes, wildlife, land use and culture.

Ramsar Site

An area that has been designated a 'Wetland of International Importance' as defined by the 'Ramsar Convention' of 1971. Ramsar is the town in Iran where this convention was adopted. The UK Government signed the convention in 1973.

Red Data Book (RDB)

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.

Regionally Important Geological/geomorphological Site

Any geological or geomorphological site, excluding SSSIs, in a county that are considered worthy of protection for their educational, research, historical or aesthetic importance.

Sensitive Marine Area

An area of importance for marine plant and animal communities, populations of seabirds, sea mammals or sea and migratory fish that they support, as identified by English Nature.

SSSI - Site of Special Scientific Interest

An area of land notified by English Nature under Section 28 of the Wildlife and Countryside Act 1981 (as amended) as being of special nature conservation interest.

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.

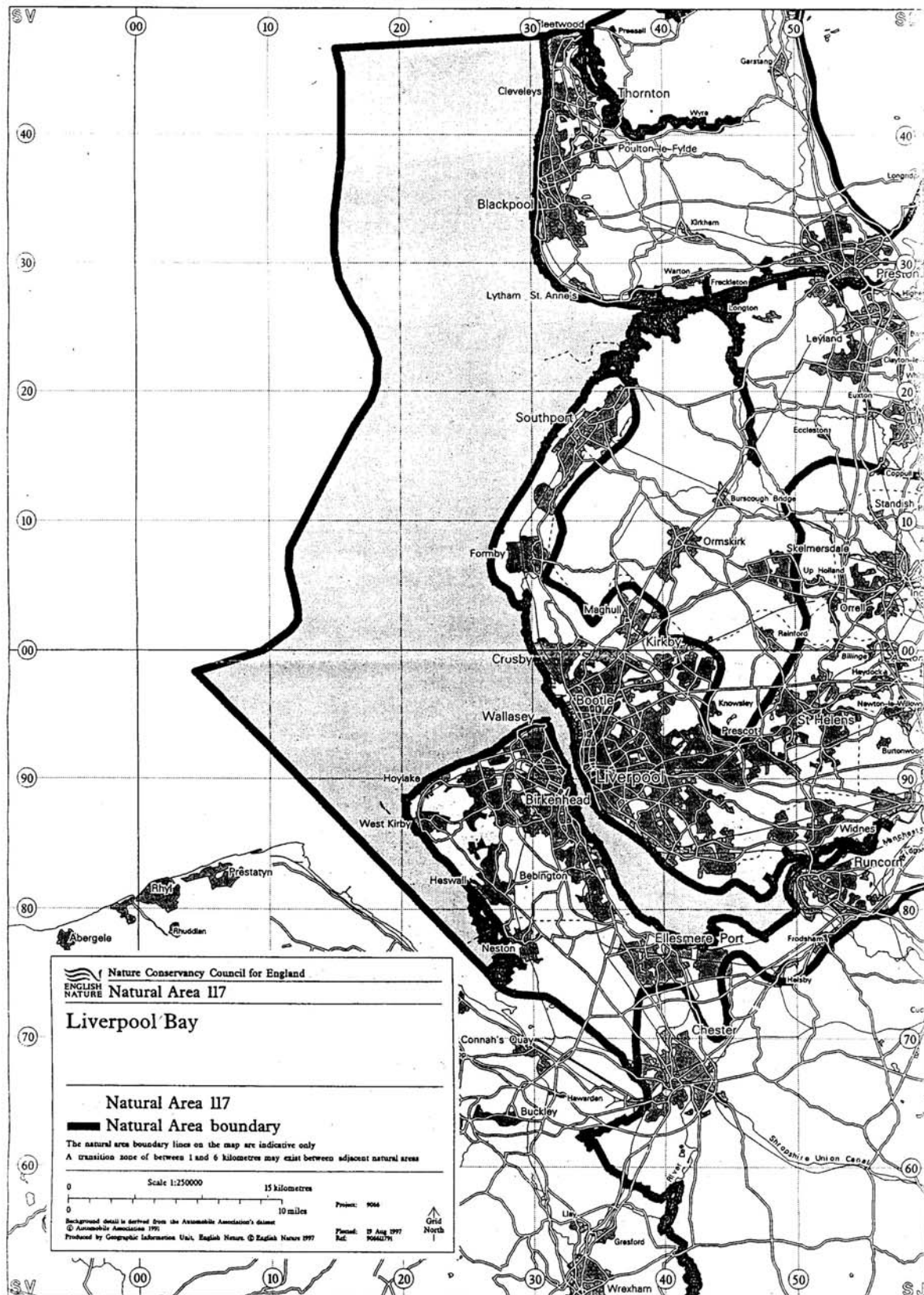
Sustainable Use

Bruntland definition (1989): use of a resource at a level which does not exceed the capacity of that resource to renew or replace itself.

Sustainable development

Defined as development that meets the needs of present generations without compromising its potential to meet the needs and aspirations of future generations.

Appendix I Map outlining the Natural Area Boundary



Appendix II Key species within the Liverpool Bay Natural Area

| Common name | Latin name | BAP list species (short-S, med-M, long-L) | Reasons for selection | Key habitat |
|--------------------------|------------------------------|---|-----------------------|---|
| Mammals | | | | |
| Harbour Porpoise | <i>Phocoena phocoena</i> | S | a,b | Inshore/offshore waters |
| Bottlenose Dolphin | <i>Tursiops truncatus</i> | L | a,b | Inshore/offshore waters |
| Grey Seal | <i>Halichoerus grypha</i> | L | a,b,d | Inshore/offshore waters |
| Common Seal | <i>Phoca vitulina</i> | L | a,b | Inshore/offshore waters |
| Red Squirrel | <i>Sciurus vulgaris</i> | S | a,b,d | Pine plantations adjacent to sand dunes |
| Rabbit | <i>Oryctolagus cuniculus</i> | ? | d | Estuaries (sand dunes) |
| Reptiles | | | | |
| Sand Lizard | <i>Lacerta agilis</i> | S | a,d | Sand dunes |
| Amphibians | | | | |
| Natterjack Toad | <i>Bufo calamita</i> | S | a,d | Sand dunes (slacks) |
| Great Crested Newt | <i>Triturus cristatus</i> | S | a | Sand dunes (slacks) |
| Birds | | | | |
| Grey Partridge | <i>Perdix perdix</i> | S | a | Sand dunes |
| Little Tern | <i>Sterna albifrons</i> | L | a | Sand and shingle/estuaries |
| Common Tern | <i>Sterna hirundo</i> | L | a | Sand and shingle/estuaries |
| Teal | <i>Anas crecca</i> | L | a | Estuaries |
| Pintail | <i>Anas acuta</i> | L | a,d | Estuaries |
| Shelduck | <i>Tadorna tadorna</i> | L | a | Estuaries |
| Oystercatcher | <i>Haematopus ostralegus</i> | | a,d | Estuaries |
| Grey Plover | <i>Pluvialis squatarola</i> | L | a | Estuaries |
| Knot | <i>Calidris canutus</i> | L | a | Estuaries |
| Sanderling | <i>Calidris alba</i> | L | a | Estuaries |
| Dunlin | <i>Calidris alpina</i> | L | a,d | Estuaries |
| Black-tailed Godwit | <i>Limosa limosa</i> | L | a | Estuaries |
| Bar-tailed Godwit | <i>Limosa lapponica</i> | L | a | Estuaries |
| Redshank | <i>Tringa totanus</i> | L | a | Estuaries |
| Curlew | <i>Numenius arquata</i> | L | a | Estuaries |
| Lesser black-backed gull | <i>Larus fuscus</i> | L | a | Estuaries (saltmarsh) |
| Arctic Tern | <i>Sterna paradisaea</i> | L | a | Estuaries (saltmarsh) |
| Bewick's Swan | <i>Cygnus columbianus</i> | L | a | Estuaries (saltmarsh) |
| Whooper Swan | <i>Cygnus cygnus</i> | L | a | Estuaries (saltmarsh) |
| Pink-footed Goose | <i>Anser brachyrhynchus</i> | L | a,d | Estuaries (saltmarsh) |
| Wigeon | <i>Anas penelope</i> | L | a | Estuaries (saltmarsh) |
| Snipe | <i>Gallinago gallinago</i> | L | a | Estuaries (saltmarsh) |
| Ruff | <i>Phoenicurus ochruros</i> | L | a | Estuaries (saltmarsh) |
| Lapwing | <i>Vanellus vanellus</i> | L | a | Estuaries (saltmarsh) |
| Herring gull | <i>Larus argentatus</i> | L | a | Estuaries (saltmarsh) |

| Common name | Latin name | BAP list species (short-S, med-M, long-L) | Reasons for selection | Key habitat |
|----------------------------|---|---|-----------------------|----------------------------------|
| Purple sandpiper | <i>Calidris maritima</i> | L | a | Estuaries (rocky shores) |
| Turnstone | <i>Arenaria interpres</i> | L | a | Estuaries (rocky shores) |
| Ringed plover | <i>Charadrius hiaticula</i> | L | a | Estuaries (sedimentary shores) |
| Common Scoter | <i>Melanitta nigra</i> | M | a | Inshore/offshore waters |
| Cormorant | <i>Phalacrocorax carbo</i> | L | a | Inshore/offshore waters |
| Golden Plover | <i>Pluvialis apricaria</i> | L | a | Estuaries (grazing marsh) |
| Skylark | <i>Alauda arvensis</i> | S | a,d | Sand dunes/saltmarsh |
| Peregrine | <i>Falco peregrinus</i> | | d | Estuaries (saltmarsh) |
| Merlin | <i>Falco columarius</i> | | d | Estuaries (saltmarsh/sand dunes) |
| Hen Harrier | <i>Circus cyaneus</i> | | d | Estuaries (saltmarsh) |
| Short-eared Owl | <i>Asio flammeus</i> | | d | Estuaries (saltmarsh/sand dunes) |
| Invertebrates | | | | |
| A pill woodlouse | <i>Armadillidium album</i> | | c | Estuaries (sand dunes) |
| Vascular Plants | | | | |
| Grey Hair-grass | <i>Corynephorus canescens</i> | | c | Sand dunes |
| Spanish Campion | <i>Silene otites</i> | L | a,c | Sand dunes |
| Isle of Man Cabbage | <i>Coincya monensis subsp. monensis</i> | | c | Sand dunes |
| Dune Helleborine | <i>Epipactis leptochila var. dunensis</i> | L | c,d | Sand dunes |
| Seaside Centaury | <i>Centaureum littorale</i> | | c | Sand dunes |
| Green-flowered | <i>Epipactis phyllanthes</i> | | c | Sand dunes |
| Helleborine | | | | |
| Marsh Helleborine | <i>Epipactis palustris</i> | | c | Sand dunes |
| Variiegated Horsetail | <i>Equisetum variegatum</i> | | c | Sand dunes |
| Portland Spurge | <i>Euphorbia portlandica</i> | | c | Sand dunes |
| Sea Spurge | <i>Euphorbia paralias</i> | | c | Sand dunes |
| Baltic Rush | <i>Juncus balticus</i> | | c | Sand dunes |
| Ray's Knotgrass | <i>Polygonum oxyspermum subsp. raii</i> | | c | Sand dunes |
| Round-leaved | <i>Pyrola rotundifolia</i> | | c | Sand dunes |
| Wintergreen | | | | |
| Twiggy Mullein | <i>Verbascum virgatum</i> | | c | Sand dunes |
| Dune Fescue | <i>Vulpia fasciculata</i> | | c | Sand dunes |
| Sharp Club-rush | <i>Schoenoplectus pungens</i> | L | a,c | Estuaries (saltmarsh) |
| Long-stalked Orache | <i>Atriplex longipes</i> | | c | Estuaries (saltmarsh) |
| Brackish Water - crow foot | <i>Ranunculus baudotii</i> | | c | Estuaries (grazing marsh) |
| Whorled Water-milfoil | <i>Myriophyllum verticillatum</i> | | c | Estuaries (grazing marsh) |
| Rock Sea Lavender | <i>Limonium britannicum</i> | | c | Cliffs |
| Marsh Gentian | <i>Gentiana pneumonanthe</i> | | c | Lowland heathland |
| Baltic Rush | <i>Juncus balticus</i> | | d | Sand dunes |
| Saltmarsh Flat-sedge | <i>Blysmus rufus</i> | | d | Estuaries (saltmarsh) |
| Sea Buckthorn | <i>Hippophae rhamnoides</i> | | d | Estuaries (sand dunes) |
| Marram Grass | <i>Ammophila arenaria</i> | | d | Estuaries (sand dunes) |

| Common name | Latin name | BAP list species (short-S, med- M, long-L) | Reasons for selection | Key habitat |
|----------------------|---------------------------------------|--|-----------------------------|------------------------|
| Lower Plants | | | | |
| Petalwort | <i>Petalophyllum ralsfii</i> | S | a,c | Sand dunes |
| Sandhill Rustic Moth | <i>Luperina nickerlii gueneei</i> | | c | Estuaries (sand dunes) |
| Fish | | | | |
| Cockles | <i>Cerastoderma edule</i> | | d | Estuaries |
| Common Shrimp | <i>Crangon crangon</i> | | d | Estuaries |

Species in bold are highlighted within Biodiversity: The UK Steering Group Report (1995): Volume 2: Action Plans.

Appendix III Latin names of species referred to within this profile

| Common Name | Latin Name |
|-------------------------|---|
| A pill woodlouse | <i>Armadillidium album</i> |
| A worm | <i>Ophelia bicornis</i> |
| Arctic Tern | <i>Sterna paradisea</i> |
| Baltic Tellin | <i>Macoma balthica</i> |
| Baltic Rush | <i>Juncus balticus</i> |
| Bar-tailed Godwit | <i>Limosa lapponica</i> |
| Bell Heather | <i>Erica cinerea</i> |
| Bewick's Swan | <i>Cygnus columbianus</i> |
| Bilberry | <i>Vaccinium myrtillus</i> |
| Bivalve Mollusc | <i>Scrobicularia plana</i> |
| Black-headed Gull | <i>Larus ridibundus</i> |
| Black-tailed Godwit | <i>Limosa limosa</i> |
| Bladder Wrack | <i>Fucus vesiculosus</i> |
| Bog Asphodel | <i>Narthecium ossifragum</i> |
| Bottlenose Dolphin | <i>Tursiops truncatus</i> |
| Brackish Water-crowfoot | <i>Ranunculus baudotii</i> |
| Bristly Oxtongue | <i>Picris echioides</i> |
| Broad Buckler-fern | <i>Dryopteris dilatata</i> |
| Broad-leaved Centaury | <i>Centaurium latifolium</i> |
| Carline Thistle | <i>Carlina vulgaris</i> |
| Cockle | <i>Cerastoderma edule</i> |
| Common Cord-grass | <i>Spartina anglica</i> |
| Common Couch | <i>Elymus repens</i> |
| Common Reed | <i>Phragmites communis</i> |
| Common Saltmarsh-grass | <i>Puccinellia maritima</i> |
| Common Scurvy Grass | <i>Cochlearia officinalis</i> |
| Common Scoter | <i>Melanitta nigra</i> |
| Common Seal | <i>Phoca vitulina</i> |
| Common Shrimp | <i>Crangon crangon</i> |
| Common Tern | <i>Sterna hirundo</i> |
| Cormorant | <i>Phalacrocorax carbo</i> |
| Corsican Pine | <i>Pinus nigra var. maritima</i> |
| Creeping Willow | <i>Salix repens</i> |
| Cross-leaved Heath | <i>Erica tetralix</i> |
| Curlew | <i>Numenius arquata</i> |
| Deergrass | <i>Trichophorum cespitosum</i> |
| Dune Fescue | <i>Vulpia fasciculata</i> |
| Dune Helleborine | <i>Epipactis dunensis</i> |
| Dunlin | <i>Calidris alpina</i> |
| Egg Wrack | <i>Ascophyllum nodosum</i> |
| Flat-sedge | <i>Blysmus compressus</i> |
| Golden Plover | <i>Pluvialis apricaria</i> |
| Grayling | <i>Hipparchia semele</i> |
| Great Crested Grebe | <i>Podiceps cristatus</i> |
| Great Crested Newt | <i>Triturus cristatus</i> |
| Green Algae | <i>Chaetomorpha, Ulva & Enteromorpha spp.</i> |

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| Green-flowered Helleborine | <i>Epipactis phyllanthes</i> |
| Grey Partridge | <i>Perdix perdix</i> |
| Grey Plover | <i>Pluvialis squatarola</i> |
| Grey Seal | <i>Halichoerus grypha</i> |
| Harbour Porpoise | <i>Phocoena phocoena</i> |
| Heather | <i>Calluna vulgaris</i> |
| Heath Rush | <i>Juncus squarrosus</i> |
| Hen Harrier | <i>Circus cyaneus</i> |
| Herring Gull | <i>Larus argentatus</i> |
| Isle of Man Cabbage | <i>Coincya monensis subsp. monensis</i> |
| Kidney Vetch | <i>Anthyllis vulneraria</i> |
| Knot | <i>Calidris canutus</i> |
| Lapwing | <i>Vanellus vanellus</i> |
| Lesser Black-backed Gull | <i>Larus fuscus</i> |
| Little Gull | <i>Larus minutus</i> |
| Little Tern | <i>Sterna albifrons</i> |
| Long-stalked Orache | <i>Atriplex longipes</i> |
| Marram Grass | <i>Ammophila arenaria</i> |
| Marsh Gentian | <i>Gentiana pneumonanthe</i> |
| Marsh Helleborine | <i>Epipactis palustris</i> |
| Merlin | <i>Falco columbarius</i> |
| Natterjack Toad | <i>Bufo calamita</i> |
| Oystercatcher | <i>Haematopus ostralegus</i> |
| Peregrine | <i>Falco peregrinus</i> |
| Petalwort | <i>Petalophyllum ralsfii</i> |
| Pink-footed Goose | <i>Anser brachyrhynchus</i> |
| Pintail | <i>Anas acuta</i> |
| Polychaete Worm | <i>Hediste diversicolor</i> |
| Portland Spurge | <i>Euphorbia portlandica</i> |
| Purple Moor-grass | <i>Molinia caerulea</i> |
| Purple Sandpiper | <i>Calidris maritima</i> |
| Pyramidal Orchid | <i>Anacamptis pyramidalis</i> |
| Rabbit | <i>Oryctolagus cuniculus</i> |
| Ray's Knotgrass | <i>Polygonum oxyspermum subsp. raii</i> |
| Red Fescue | <i>Festuca rubra</i> |
| Redshank | <i>Tringa totanus</i> |
| Red Squirrel | <i>Sciurus vulgaris</i> |
| Ringed plover | <i>Charadrius hiaticula</i> |
| Rock Sea Lavender | <i>Limonium britannicum</i> |
| Round-leaved Wintergreen | <i>Pyrola rotundifolia</i> |
| Ruff | <i>Phoenicurus ochruros</i> |
| Saltmarsh Flat-sedge | <i>Blymus rufus</i> |
| Sanderling | <i>Calidris alba</i> |
| Sand Lizard | <i>Lacerta agilis</i> |
| Sand Sedge | <i>Carex arenaria</i> |
| Sandhill Rustic Moth | <i>Luperina nickerlii</i> |
| Sea Bindweed | <i>Convolvulus soldanella</i> |
| Sea Buckthorn | <i>Hippophae rhamnoides</i> |
| Sea Campion | <i>Silene uniflora</i> |
| Sea Club-rush | <i>Scirpus maritimus</i> |

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| Sea Couch | <i>Elymus pycanthus</i> |
| Sea Lavender | <i>Limonium vulgare</i> |
| Sea-purslane | <i>Halimione portulacoides</i> |
| Sea Spleenwort | <i>Asplenium marinum</i> |
| Sea Spurge | <i>Euphorbia paralias</i> |
| Sea Wormwood | <i>Artemisia maritima</i> |
| Seaside Centaury | <i>Centaurium littorale</i> |
| Serrated Wrack | <i>Fucus serratus</i> |
| Sharp Club-rush | <i>Schoenoplectus pungens</i> |
| Shelduck | <i>Tadorna tadorna</i> |
| Short-eared Owl | <i>Asio flammeus</i> |
| Silver Birch | <i>Betula pendula</i> |
| Silver-studded Blue | <i>Plebejus argus</i> |
| Sky lark | <i>Alauda arvensis</i> |
| Small-fruited Yellow Sedge | <i>Carex serotina</i> |
| Snipe | <i>Gallinago gallinago</i> |
| Southern Marsh-orchid | <i>Dactylorhiza praetermissa</i> |
| Spanish Champion | <i>Silene otites</i> |
| Spiral Wrack | <i>Fucus spiralis</i> |
| Stoneworts | <i>Lamprothamnium</i> |
| Tasselweeds | <i>Ruppia spp.</i> |
| Teal | <i>Anas crecca</i> |
| Tiger Beetle | <i>Cicindela spp.</i> |
| Tormentil | <i>Potentilla erecta</i> |
| Turnstone | <i>Arenaria interpres</i> |
| Twiggy Mullein | <i>Verbascum virgatum</i> |
| Variegated Horestail | <i>Equisetum variegatum</i> |
| Wavy Hair-grass | <i>Deschampsia flexuosa</i> |
| Western Gorse | <i>Ulex gallii</i> |
| Whinchat | <i>Saxicola rubetra</i> |
| Whooper Swan | <i>Cygnus cygnus</i> |
| Whorled Water-milfoil | <i>Myriophyllum verticillatum</i> |
| Wigeon | <i>Anas penelope</i> |
| Yellow Horned-poppy | <i>Glaucium flavum</i> |
| Yellow-Rattle | <i>Rhinanthus minor</i> |
| Yellow-wort | <i>Blackstonia perfoliata</i> |