



## Scotland's National Nature Reserves

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## Tentsmuir NNR: The Reserve Story



# Tentsmuir National Nature Reserve: The Reserve Story

## Foreword

Tentsmuir is one of more than 50 National Nature Reserves (NNRs) in Scotland. Scotland's NNRs are places where some of the best examples of Scotland's wildlife and habitats are carefully managed. Whilst nature always comes first on NNRs, they also offer special opportunities for people to enjoy and find out about the richness of our natural heritage.

This Reserve Story provides information on the Reserve and its management history. It describes briefly the wildlife and habitats found on the Reserve, why they are special in National, European and World terms, the history of land use before it became a Reserve, and management of wildlife, people and property on the Reserve to the present day.

The Reserve Story is one of a suite of three documents relating to the management of the Reserve; it provides the background information. The second document the 'Reserve Proposals' outlines how we propose to manage the Reserve in future years and the third, the 'Reserve Plan', is the blueprint for management for the next few years. We are asking for any additional information that may add to the Reserve Story and any comments on the Reserve Proposals before we finalise the Reserve Plan.

Tentsmuir NNR is on the east coast of Scotland, 10km north of St Andrews. Within Tentsmuir NNR is Tentsmuir Point, the tip of a large sand dune system, most of which is now covered by forest and farmland. Sand is still being deposited at the Point and the dunes continue to grow seaward. Indeed, this is one of the fastest growing parts of Scotland. As well as the dunes, there is a large seal colony, and important numbers of wildfowl and waders use the coast especially in the winter months. Morton Lochs, also within the NNR, has open water and a fringing fen which attracts wintering and breeding ducks and a variety of dragonflies and damselflies.

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## MAPS OF TENTSMUIR NNR

### LOCATION MAP



### BOUNDARIES OF TENTSMUIR NNR





## **1 INTRODUCTION TO TENTSMUIR NNR**

Tentsmuir NNR consists of three sites; Tentsmuir Point, Tayport Heath and Morton Lochs. Morton Lochs became a NNR in 1952, the second place in Great Britain to be declared a NNR; two years later Tentsmuir Point became an NNR and Tayport Heath was added in 1988. In 1996 a new policy for National Nature Reserves in Scotland was developed (Appendix 1) and in 2003, to reflect changes in policy, Scottish Natural Heritage (SNH) merged the sites together to become Tentsmuir NNR.

The Reserve is situated in the far northeast corner of Fife. The Reserve covers 539ha, divided between the three sections mentioned above – Tentsmuir Point, Tayport Heath and Morton Lochs.

The name Tentsmuir formerly described the extensive tract of moorland developed over a very large and ancient sand dune system. The moorland has largely disappeared now and has been replaced by conifer forest, farmland and the RAF airbase at Leuchars. The section of Reserve at Tentsmuir Point has the remaining natural dune habitat at the seaward tip of this system. Morton Lochs lie a little inland in a much older part of the dune system, surrounded by conifer plantation.



*Aerial view looking north across Tentsmuir Point*

The climate here is mild and dry. The meteorological data from RAF Leuchars show that during the period of 1971–2000 the average annual rainfall was 655mm, with rain on 116 days in a year and an average of 1523 hours of sunshine per year. The spring months (February, March & April) were the driest of the year, and the second half of the year was wetter. The annual average maximum temperature was 19°C usually occurring in July and the annual average minimum temperature was 0.4°C with minimum temperatures usually occurring in January. The frost-free period extended from early May until October.

SNH manages the whole Reserve and owns 122ha. The foreshore is leased from the Crown Estate Commissioners, and the remainder from Forestry Commission Scotland (FCS). SNH is hoping to lease additional land from FCS at Morton and Tentsmuir. Morton Lochs (24ha) are owned by SNH, although the car park is leased from FCS.

There are three entrances to the Reserve. The main access is from the Forestry Commission car park at Kinshaldy off the B945 Leuchars–Tayport road. From here you can walk through the forest or along the shore to Tentsmuir Point. There is another car park at Lundin Bridge in the east of Tayport, from where you can walk along the shore to Tayport Heath and Tentsmuir Point and through the forest to Morton Lochs. Morton Lochs can also be reached from the B945 Tayport–St. Michaels road and from the right-of-way from Tayport.

The original NNRs at Tentsmuir Point and Morton Lochs were declared more than 50 years ago. In 1952 Morton Lochs NNR covered an area of 19ha, in 1956 it was extended to 24ha. Tentsmuir Point NNR originally covered 37ha in 1954; and was extended by 468ha in 1962, and in 1988 by a further 10ha onto Tayport Heath. NNR status means the land is managed specifically for its wildlife and earth science interest.

The Reserve has features of national and international importance which are protected by a number of European and UK designations.

The European network of protected areas is called **Natura 2000**; this network contains sites with habitats and species important in a European context. The Reserve is part of the much larger Firth of Tay and Eden Estuary candidate **Special Area of Conservation** (SAC). (See Appendix 3).

The SAC has been proposed primarily for the following features:

- estuaries;
- common seals (also known as harbour seals).

It has two further habitats of European interest:

- sandbanks which are slightly covered by sea water all the time;
- mudflats and sandbanks not covered by sea water at low tide.

Estuaries are widespread along the Atlantic coasts of Europe. Approximately 25% of the area of estuaries in the north of Western Europe occurs in the UK. The UK has over 90 estuaries, and 15 of these have been selected for the Natura 2000 network, 3 within Scotland. The 'Firth of Tay and the Eden' estuary site comprises two high-quality estuarine areas. The Tay is the least modified of the large east coast estuaries in Scotland, while the Eden estuary is a representative of the smaller 'pocket' estuary type.

The Firth of Tay and Eden Estuary cSAC supports a nationally important breeding colony of common seal. The common seal is widespread around the shores of the UK, but population density varies greatly from place to place, with low numbers at many sites. The vast majority of common seal haul-outs are found on the coasts of Scotland, but with an additional important concentration on The Wash, and a smaller number in Strangford Lough, Northern Ireland. Nine SACs have been selected for common seals in Scotland. The UK population represents about 5% of the world population, approximately 50% of the EU population, and 45% of the European subspecies.

The Natura 2000 network of European sites also includes areas selected for birds called Special Protection Areas (SPAs). The Reserve is part of the much larger Firth of Tay and Eden Estuary SPA (Appendix 3), the SPA has a number of features, but not all occur on the Reserve.

The Reserve contributes to the following SPA features:

- regularly supports more than 20,000 waterfowl over winter including velvet scoter, cormorant, shelduck, eider, common scoter, black-tailed godwit, goldeneye, red-breasted merganser, goosander, oystercatcher, grey plover, sanderling, dunlin and long-tailed duck.

It supports significant over-wintering populations of:

- bar-tailed godwit;
- greylag goose;
- pink-footed goose;
- redshank.

The UK is of outstanding international importance for its water bird populations. Fifty-seven SPAs, each holding more than 20,000 water birds generally in the non-breeding season, have been selected in the UK. The most important components of these assemblages are those species occurring at levels of more than 1% of national populations or where there are more than 2,000 individuals present.

Many of these wetland sites, including the Firth of Tay and Eden Estuary, are also on the UK Ramsar list of Wetlands of International Importance (Appendix 4). The aim of the Ramsar Convention is “to stem the progressive encroachment on and loss of wetland now and in the future” through the wise use of wetlands.



The NNR lies within two Sites of Special Scientific Interest, (SSSIs are the UK network of statutory protected areas), the Tayport-Tentsmuir Coast SSSI and the Morton Lochs SSSI. See Appendix 2.

The features on the Tayport-Tentsmuir SSSI are:

- coastal geomorphology;
- mudflats – littoral sediment;
- sand dunes – supralittoral sediment;
- significant populations of eider, bar-tailed godwit, goosander, red-breasted merganser, common scoter, long-tailed duck, and pink-footed goose;
- common seal;
- invertebrate assemblage;
- vascular plant assemblage.

The features on Morton Lochs SSSI are:

- standing open water;
- teal;
- sand dunes – supralittoral sediment.

## 2 THE NATURAL HERITAGE OF TENTSMUIR NNR

### Geology/geomorphology

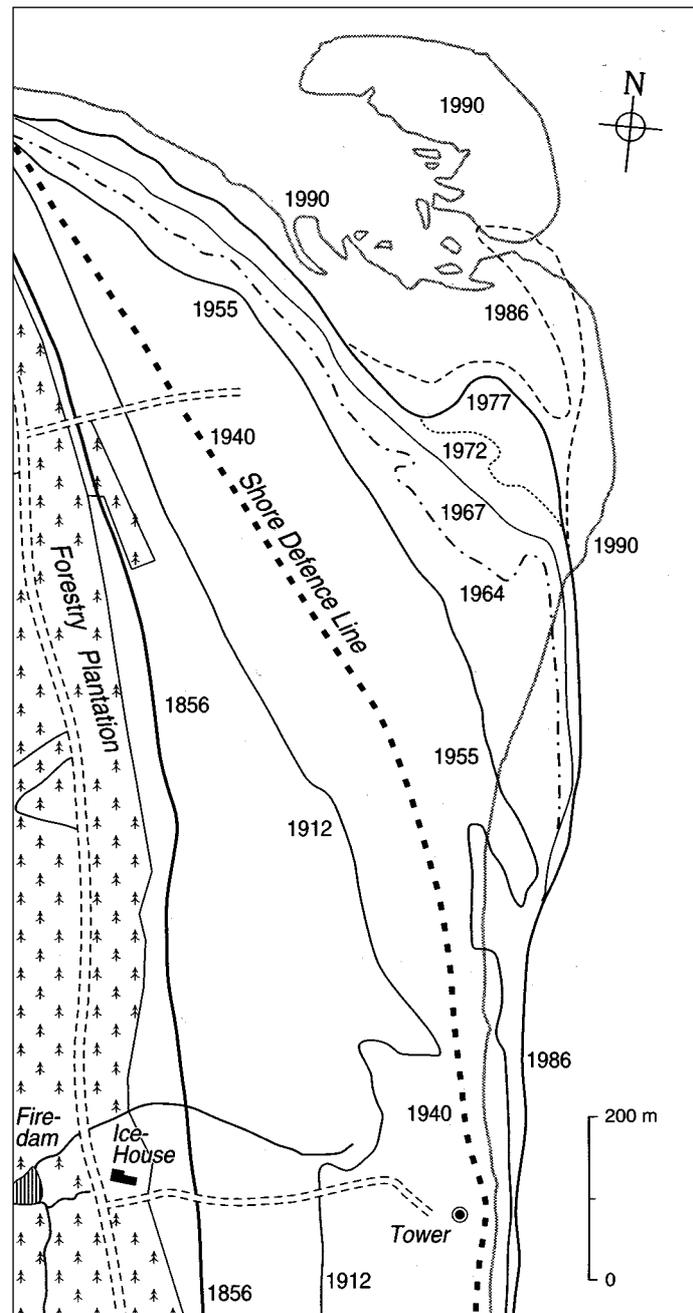
The growth of Tentsmuir Point as an elbow of land jutting into the sea is striking. The land at the Point has formed from sand accumulation in just 100 years, but it is the tip of a much larger dune system developed over 6000 years. A line of anti-tank blocks constructed along the shoreline in 1941 as part of Scotland's wartime defences, has provided a useful reference line for scientists studying coastal changes at Tentsmuir Point.

Waves and currents concentrate huge quantities of sand towards the mouth of the River Tay, depositing an extensive offshore area of sandbanks and mud flats known as the Abertay Sands. These are exposed to strong tidal streams, giving rise to a complex pattern of erosion and deposition, which constantly changes the shape, and size of the banks. The shelter provided by these tidal sands creates ideal conditions for wind and vegetation to build up the beach and dune ridges onshore. The dune ridges at the seaward edge are very mobile, but with time they become stabilised by vegetation. The sand may close off tidal inlets so forming wet dune slacks, but these may eventually dry out too.

The growth rate at the Point was particularly rapid in the 1980s when some parts grew seawards by some 15m each year. This highly dynamic system will continue to change naturally making it an exceptionally useful site for the study of coastal land formation and erosion. In contrast the southern section of the Reserve reached its widest point in the mid 1980s and is now eroding.

A full description of the changes can be found in the SNH Earth Science Site Management Report (Everett 2001).

**Figure 1 Coastal changes between 1856 and 1990 at Tentsmuir Point (Crawford, 1996)**



## The Habitats

The European SAC interest features are the estuary, the sandbanks constantly covered by shallow water and the sand and mudflats covered at high tide but exposed at low tide.

Onshore, between the shoreline and the forest, the Reserve exhibits a sequence of sand dune communities. At the back of the beach is the strandline, behind which low-lying embryo dunes develop. These grow to form a foredune ridge parallel to the shore, sometimes called yellow dunes because of the amount of bare sand. The conditions here are hostile to plant growth. Not only is there constant burial by fresh sand, but the loose sand is very free draining and therefore subject to drought. Only a few specialist plants can survive in these conditions. At Tentsmuir the most common is marram grass, which binds the loose sand and holds it in place allowing the dunes to build. Small quantities of lyme grass are found within the marram.

Marram grass stabilises the dunes. The dunes are ‘fixed’ when the vegetation cover is more or less complete. On fixed dunes, sometimes known as grey dunes, grassland begins to form. Marram grass persists, but red fescue becomes the most important grass. Other grasses, annual and perennial herbs start to appear and sand-binding mosses and lichens join these. Fixed dune grassland can be a very species-rich community, having typical species such as ladies bedstraw and wild thyme, with lichens an important feature too. The older dunes further inland have dune heath, characterised at Tentsmuir by the presence of abundant crowberry and crossed-leaved heath, and with *Pleurozium schreberi* and *Hylocomium splendens* the dominant mosses.



*Marram grass*

Dune slacks are wet or damp areas between dunes where the water table is close to the surface. They often flood during winter and spring. The vegetation in the slacks has had to adapt to these unusual conditions and is often very species rich.

The Great Slack is the largest and richest dune slack on the Reserve. It has a number of species characteristic of a rich dune slack – bird’s-foot-trefoil, ragged robin, seaside centaury, common centaury, creeping willow violet, northern marsh orchid, yellow rattle, skullcap, cuckooflower, red campion, marsh pennywort, cowslip and grass of Parnassus. For the location of the Great Slack please see the map in Appendix 1.



*Grass of Parnassus*

Tayport Heath is an area of dune heath, which extends westward along the shore of the Tay from Tentsmuir Point. Here the dune system shows a complete sequence of dune and slack development from shoreline through foredune, yellow and grey dunes to dune heath.

## **Morton Lochs**

The Christie family created Morton Lochs in 1906 by flooding areas of dune slack for fishing. The Lochs were created on a wetland site, which was dug out to extend the naturally wet ponds area. There are three lochs: North, South and the smaller West Loch. These now have a mosaic of open water, reed beds, marsh and woodlands. Water levels at Morton have fluctuated over the years, and despite the lochs almost drying out on a number of occasions, they support a rich flora including water plantain, greater pond sedge, yellow flag iris, broad-leaved pondweed, greater spearwort and horned pondweed.



*North Loch at Morton*

The surrounding wet woodland is mainly grey willow with alder, hawthorn, and birch. This woodland occurs as narrow fringes around the lochs and in damp hollows. The field layer is an open scatter of herbs, with marsh bedstraw and frequent water mint and soft rush.

Before Tentsmuir Forest was planted the lochs were surrounded by dune heath. The dunes here are relic dunes dating from some 4000 years ago; they are the oldest part of the Tentsmuir dune system. Despite being ploughed and planted with forestry in 1954, the land to the north and east of the Lochs retains some of the characteristic natural vegetation of the open heath with wet hollows alternating with dry ridges. This area has been cleared of forestry and scrub. The wettest areas contain pondweeds and other wetland species, whilst the dry ridges support remnants of dune heath with sand sedge, heather and heaths. Along the disused railway track there is a narrow strip of herb-rich grassland.

## **The Flora**

The flora at Tentsmuir NNR has been well recorded, with the earliest botanical records dating back to about 1850. In total, 320 species of vascular plant have been recorded at Tentsmuir Point, and over 200 at Morton Lochs. This includes slender centaury, which is protected under Schedule 8 of the Wildlife and Countryside Act 1981. There are five nationally scarce species including coralroot orchid, Baltic rush, seaside centaury, creeping lady's-tresses and oak-leaved goosefoot.

Creeping lady's-tresses and adder's tongue fern are both UK and Fife Biodiversity Action Plan (BAP) species. Other species of regional importance include dense flowered fumitory, greater pond sedge, pink water speedwell, small-fruited yellow sedge and purple milk vetch. About 35 locally scarce species have been recorded.

Species recorded at Morton Lochs include mudwort, dark-leaved willow, greater spearwort and marsh stitchwort, wood horsetail, northern marsh orchid, square stalked St John's wort, hard rush and trailing tormentil. Adder's tongue, greater pond-sedge, field gentian, grass of Parnassus, common wintergreen and moonwort are all found here.

## The Fauna

A highlight of the Reserve is the impressive number of grey and common seals, which haul out on the sandbanks and shoreline of Tentsmuir Point. The colony of common seals is nationally important; approximately 600 adults, representing around 2% of the UK population, haul out at the site to rest, pup and moult. Grey seals, sometimes as many as 2000, haul out on the Abertay sands and the sandbank near the southern end of the Reserve. The seal populations vary throughout the year, but estimates over the last 6 years suggest that the grey seal population peaks at about 2000 and the common seals at about 600.



*Grey seal pup*

Bottlenose dolphins are regularly spotted from the shore of Tentsmuir; with less frequent sightings of minke whale and harbour porpoise. Otters are sometimes seen at Morton Lochs, and occasional sightings of young suggest they breed successfully within the local area.

Bats roost in the old icehouse, bat boxes and natural roosts throughout the Reserve – 2 species of pipistrelle, *Pipistrellus pipistrellus* & *Pipistrellus pygmaeus*, Natterer, brown long-eared and Daubenton have all been recorded. Other mammals found on the Reserve include roe deer, fox, brown hare, and plentiful rabbits. Tentsmuir Forest surrounding the Reserve is an important habitat for red squirrels. Although no surveys have been undertaken, increased sightings suggest the population is spreading.

Tentsmuir Point is one of the most important sites in Scotland for migratory waders and wildfowl. The extensive offshore sand and mud flats alongside a relatively undeveloped coastline provide ideal roosting and feeding conditions for migratory and wintering bird species. The winter populations of waders and wildfowl are of international importance with numbers peaking during the spring and autumn migrations.

The site is especially important during the winter for goosander, red-breasted merganser, common scoter and long-tailed duck, all of which gather in numbers exceeding 2% of their British population. Over 4000 eider gather offshore in flocks called rafts. More than 4000 pink-footed geese are estimated to roost on the northern foreshore and bars in the Reserve.

The birds have been counted regularly over the years. Initially counts were stored on file and reported on in warden's reports, but since 1997 the Reserve has been counted regularly as part of the national Wetland Bird Survey (WeBS). The following table provides details of actual peak bird counts from 1997–2003 at Tentsmuir Point.

**Table 1 Peak numbers of birds from monthly bird counts between 1997 and 2003**

|                        | 1997–1998 | 1998–1999 | 1999–2000 | 2000–2001 | 2001–2002 | 2002–2003 |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| cormorant              | 58        | 18        | 17        | 18        | 6         | 5         |
| dunlin                 | 368       | 250       | 502       | 230       | 400       | 1500      |
| eider                  | 3500      | 2150      | 9500      | 7500      | 4200      | 3500      |
| bar-tailed godwit      | 42        | 84        | 45        | 45        | 370       | 320       |
| goldeneye              | 0         | 8         | 6         | 4         | 0         | 12        |
| goosander              | 8         | 9         | 12        | 12        | 4         | 10        |
| grey plover            | 0         | 7         | 67        | 56        | 230       | 550       |
| greylag goose          | 54        | 88        | 128       | 88        | 140       | 112       |
| long-tailed duck       | 6         | 2         | 14        | 6         | 18        | 320       |
| oystercatcher          | 138       | 158       | 390       | 1420      | 800       | 320       |
| pink-footed goose      | 875       | 6500      | 4000      | 3200      | 2800      | 2000      |
| red-breasted merganser | 0         | 9         | 6         | 30        | 4         | 28        |
| sanderling             | 420       | 175       | 252       | 450       | 750       | 178       |
| common scoter          | 38        | 34        | 35        | 54        | 33        | 180       |
| velvet scoter          | 15        | 16        | 12        | 4         | 0         | 0         |
| shelduck               | 0         | 4         | 8         | 14        | 8         | 18        |

The shelter of the reeds at Morton Lochs provides ideal habitat for birds like the elusive water rail, little grebe, tufted duck and goldeneye. The reeds provide shelter for reed bunting and warblers too. Mute swans are seen every year and in the winter whooper swans have rested here on migration. Teal gather here during the winter months, with up to 800 birds being counted in recent years.

The rare marsh harrier is occasionally seen coursing across the reed-swamp and wetland areas of Morton Lochs, and ospreys use the site as a resting point and for feeding during their migrations, to and from, their summer breeding grounds in Scotland. The woodlands are home to a rich diversity of smaller birds, both during the breeding season and in the winter months, as well as those passing through on migration. In the autumn months mixed flocks of finches (bullfinch, chaffinch, greenfinch) and groups of tits (blue tit, great tit, coal tit, long tailed tit) gather in the treetops. Buzzard breed in the woodland, and goshawk and peregrine are regularly spotted.

The invertebrate fauna of the sand dunes is particularly rich and diverse, including 46 nationally rare or scarce species. Several more species are regionally scarce, all of which contribute to an outstanding assemblage of invertebrates associated with sand dune systems including heath, scrub and pine.

Seventeen species of butterfly have been recorded on the Reserve. The pearl-bordered fritillary is the only BAP butterfly species on the Reserve. Other species found here are the ringlet, common blue, small copper, painted lady, small tortoiseshell, meadow brown, orange tip, small white, large white, green-veined white, grayling, dark green fritillary, small heath and green hair streak. The Reserve is the only known locality for grayling still to exist in Fife.

About 270 moth species, approximately 11% of the British total, have been recorded including 20 nationally notable species. Two UK BAP priority species have been recorded on the Reserve – the cousin German moth and lunar yellow underwing. A survey in 2002 found one individual of the lunar yellow underwing but failed to find the cousin German moth, last recorded here in 1970.

Over 460 species of beetle have been recorded on the Reserve, of these two species are rare and listed in the UK Red Data Book (RDB), and a further 39 are also noted within the RDB. Morton Lochs is an important site supporting over 50 species of water beetle.

Morton Lochs is also considered one of the best sites in Fife for damselfly and dragonfly. Eight species have been recorded including: red veined darter, black darter, common hawker, emerald damselfly, blue-tailed damselfly, large red damselfly and common blue damselfly. A recent colonist is the common darter (1990s).

Common toad and frog breed throughout the Reserve particularly in the lochs ditches and wet slacks. Smooth newt breed at Morton Lochs and in the ditches of the forest and Tentsmuir Point. Common lizard was recorded for the first time on Tentsmuir Point in 2002.

## **Summary**

Tentsmuir is a wonderful Reserve. Tentsmuir Point is an excellent example of an evolving coast, with a full range of habitats from intertidal mud and sand banks offshore, through mobile dunes to fixed dunes with lichen-rich dune heath inland. Morton Lochs are a mosaic of wetland and woodland. The Reserve is rich in flora and fauna, protecting a range of species important in a European, UK and local context.



*Orange tip butterfly on cuckoo flower*

### **3 MANAGEMENT OF TENTSMUIR BEFORE IT BECAME AN NNR**

The dunes at Tentsmuir Point are relatively young, but salmon netting at the Point was important from the 1840s onwards. There were seven nets on the Tentsmuir coastline and each had a bothy and ten men running it. The icehouse, which stills stands in the forest next to the Reserve, was built to store the salmon catch in 1888.

The wider area of Tentsmuir has a long history of use by man, and Whittington (1996) provides a fascinating summary. Man has left evidence that he has lived here since prehistory. Mesolithic hunter-gatherers left their traces at a site they occupied at Morton, and later finds from the Bronze Age include pottery, beads, whetstone (a type of sharpening stone), needles and pins.

In the sixth century, research suggests that the Picts managed parts of Tentsmuir as pasture, and replaced heathland with grassland by burning. In the 8th & 9th centuries the Vikings explored the area and a few settled as farmers.

In the 1600s “Tents Moor” was mainly marsh and lochans. During this period a Great Drain was dug which greatly reduced the marshes, allowing the land to be used for crops. In the 1780s a Danish fleet was shipwrecked on the coast – many sailors settled down in the area.

Early maps drawn in the 17th, 18th and 19th centuries show the changing pattern of land use and farming at Tentsmuir. The maps show various lochs on Tentsmuir that no longer exist today. In the 18th century there are accounts of large ditches or canals being cut to drain the area for cultivation, but in the 19th century when farms merged and became larger, many of the farm steadings in the east were abandoned, the drains were neglected and the land became wet again. So, at the end of the 19th century Tentsmuir was an area of heathland dotted with marshy and boggy areas. Part was managed as a grouse moor before the Great War. Earlsall Muir SSSI is the only remnant of this once extensive habitat.

The most far-reaching change took place in the early 20th century when much of Tentsmuir was planted with conifers. The forest has completely transformed the character and wildlife of the area. The Government bought land in 1924, and by 1927 the Forestry Commission had planted 700ha with Scots pine and Corsican pine. By 1954, the planted area had increased to 1500ha.

The military also moved onto the southwestern corner of Tentsmuir in the 20th century, building the RAF station at Leuchars during the Great War and extending it in the Second World War. Tentsmuir was used as a military training ground, with the Air Ministry using an offshore area as a target bombing range. Indeed, a small section of the Reserve foreshore lay within the danger zone when the Reserve was acquired. Strong winds still occasionally expose munitions dumped and buried during the War – in 2003 an Army Disposal Team carried out a sweep of the shore after shells, shell clips and rolls of rusted barbed wire were exposed.



*Tentsmuir coastal defences*

A line of concrete anti-tank blocks and pillboxes was installed along the shore in 1941. The blocks were constructed on site by Polish forces, who built and manned the defences. The defences were dual purpose, foremost to counter invasion but also providing protection for the Leuchars airfield, from where crews were engaged in anti-shipping and mine laying operations along the coast of northern Europe. Anti-glider posts were also installed on the foreshore, but many are now buried. The area is listed as a scheduled monument called Tentsmuir Coastal Defences because of its historical importance. The line of anti-tank blocks has fortuitously provided a convenient reference marker for measuring coastal change.

The bird life of the wider Tentsmuir area has changed markedly in the last century. In the early part of the 20th century the unfenced moorland was important for breeding birds: large numbers of eider, shelduck, teal, shoveler, dunlin, golden plover, black and red grouse and corncrake nested regularly, while snipe and redshank were considered common breeders. However as the forest grew up during the second half of the century these species were replaced by birds of the forest. Only at Earls Hall Muir, which has remained clear of forestry, are some still found.

## **Morton Lochs**

Morton Lochs were developed from the naturally occurring ponds and wetlands in 1906 by the Christie family, on a site marked as a loch system on maps from the 1600s. The Ninewells Burn was diverted into a natural depression of the land between ridges of sand. When they were created the lochs were between 4 and 8ft in depth, the North Loch half a mile long and a quarter of a mile broad, South Loch about half that size. They were connected by a narrow passage through the embankment.

The lochs were stocked with young carp imported from Italy. Brown trout were also introduced for angling; stock was introduced annually as there was no gravel for the brown trout to spawn. In addition to carp and trout, eels, minnow, gudgeon and stickleback were raised for sale. Some years later it was discovered that swan mussels had been accidentally introduced to the lochs, presumably imported as embryos attached to the introduced fish. These mussels attracted ducks, which visited the lochs in great numbers. The shallow lochs were also outstanding for waders.

Within a few years of their creation, the spread of vegetation around the lochs was causing problems for the fishery. Vegetation was regularly cut to maintain the open water for the fishery. For many years cattle grazed the area around the lochs, but after 1940 the grazing became regular and intensive. From 1940–1951 there was a great increase in rabbits, which over-ran the ground and drastically reduced the plant cover. The combination of the breakdown of retaining banks by cattle and rabbits and the silting of the feeder burn caused a severe reduction in water levels. Over the summer months the lochs dried out completely and the fish and mussels disappeared. In 1952 the reserve was declared and a programme of work to reverse the damage was begun.

It is known the bird life of Morton Lochs has changed dramatically over the years; the early bird lists for Morton Lochs are extraordinary to the contemporary ornithologists. When first created the lochs were surrounded by the boggy heathland that covered all of Tentsmuir. Nowadays mature trees, planted in the 1950s, surround the lochs. In the early 1900s it was not considered exceptional to see between 20 and 30 species of game and wildfowl during an autumn shoot. The records from the time show that the lochs were outstanding for waders, and there was an impressive list of rarities. The first broad-billed sandpiper in

Britain was recorded at Morton Lochs by W Berry and other rarities he listed include bittern, great snipe, and buff-breasted sandpiper. Boase (1964) listed 109 species at Morton Lochs, including black-throated diver, red-throated diver, whooper, bewicks and mute swans, eider, shelduck, common and velvet scoter, dunlin, snipe, and golden plover. Today's species list is very different, reflecting how dramatically the habitats at Morton Lochs have changed in a hundred years, but it still has over 100 species on it.

The water supply to Morton Lochs has changed considerably over the years. Water has been variously supplied through a sluice and by a pipe from the adjacent Lead Burn. At present the supply of water to Morton Lochs has ceased but it is hoped that this uncertainty over the supply of water will be short term. The SNH ornithologist is working on trying to establish the appropriate water level management regime for the species currently using the lochs, and short-term measures involving the use of solar powered pumps have been put in place to ensure that there is adequate water in the lochs (without creating pollution).



*Morton Lochs NNR in the mid 1950s*

## 4 MANAGEMENT OF TENTSMUIR NNR

Tentsmuir Point and Morton Lochs were two of the earliest National Nature Reserves, declared not long after the National Parks and Access to the Countryside Act came onto the statute book in 1949.

A few of the key dates are given below.

|      |   |
|------|---|
| 1949 | Tentsmuir Point and Morton Lochs recommended as Nature Reserves in the Final report of the Scottish Wild Life Conservation Committee.   |
| 1952 | Morton Lochs declared an NNR, the second in the UK, 47 acres purchased from FC for £23.   |
| 1954 | Tentsmuir Point declared an NNR, amongst the third suite in the UK. Tayport to Tentsmuir coast SSSI notified. Nature Conservancy purchased 92 acres of coastal land from the Forestry Commission.   |
| 1962 | Tentsmuir Point NNR extended from 92–1249 acres.  |
| 1968 | Forestry Commission ploughed up and planted the dunes south of the Tentsmuir Point Reserve.   |
| 1969 | Archaeologists establish dig site at Morton – Mesolithic period.  |
| 1970 | Tentsmuir Point & Morton Lochs NNRs, the first Reserve Booklet produced by The Nature Conservancy.  |
| 1975 | Morton Lochs Public Hide constructed – one of the first in Scotland.  |
| 1976 | Morton Lochs drained and silt excavated.  |
| 1977 | Fullerton Hide constructed and opened to commemorate Len Fullerton, a former warden, artist and naturalist.   |
| 1979 | Morton Lochs was also established as a site for research and as a result two booklets were produced by the Nature Conservancy Council: Morton Lochs: Rehabilitation Management Booklet. & Morton Lochs: Habitat Management No.1 Islands. Leaflet. |
| 1983 | Morton Lochs SSSI notified.   |
| 1987 | Goat grazing management trial starts on the Reserves.   |
| 1988 | Tentsmuir Point extended to include Tayport Heath.  |
| 1996 | Highland cattle brought in to graze the Reserves  |
| 1998 | Observation Tower falls into the sea. Erosion – 112 metres lost in 11 years.  |
| 1999 | First Reserve Newsletter produced.  |
| 2000 | NNR Family Day Event established – A Wild Day Out.  |
| 2001 | Tentsmuir Point first interpretation boards and viewpoints erected.   |
| 2002 | Dr John Berry neighbour and former Director of Nature Conservancy in Scotland died February 16.   |
| 2003 | Firth of Tay and Eden Estuary designated a cSAC.<br>Tentsmuir Point Education Pack produced and launched to Fife Schools.   |
| 2003 | SNH Main Board reviews the national suite of NNRs and decides to merge Tentsmuir Point NNR and Morton Lochs NNR to form Tentsmuir NNR.  |

Tentsmuir Point and Morton Lochs have been National Nature Reserves for 50 years. During this time management has been guided by several management plans. The first was produced in 1957; the second in 1963, the third in 1973, between 1984-89 interim policies and prescriptions were used, before the fourth plan was written in 1991, and a further plan covered the period 1997–2002. Huxley (1996) provides a critique of the first four plans.

The first plan covered the original 37ha. It set out three 'objects of management': firstly to retain the area in as unspoilt a condition as possible and allow coastline changes to be studied; secondly, to measure the

coastal accretion and, as opportunity permits, investigate the processes which cause it; and thirdly, to encourage ecological studies within the Reserve.

The second plan was written when the NNR increased in size more than tenfold by the addition of the foreshore 468ha. A fourth objective was added to the earlier three, ie to ensure minimum disturbance of the foreshore and Abertay Sands so that wildfowl will continue to visit them and to protect the nest sites of sea birds.

The third plan from 1973–1977 rephrased these objectives to make them more precise, but nonetheless maintained the same basic approach to management of the Reserve. The fourth plan in 1991 continued in the same direction but refined them into eight ideal management objectives. The fifth plan gave the main objectives as safeguarding the site and preventing the deterioration of habitats and species, and, in addition aimed to encourage research and monitoring and to consider the potential of the Reserve for education, interpretation and demonstration purposes.

Throughout the existence of the Reserves the aims of management of the natural heritage have changed very little, although different methods of managing the site have been tried through the years.

## **Natural Heritage Management**

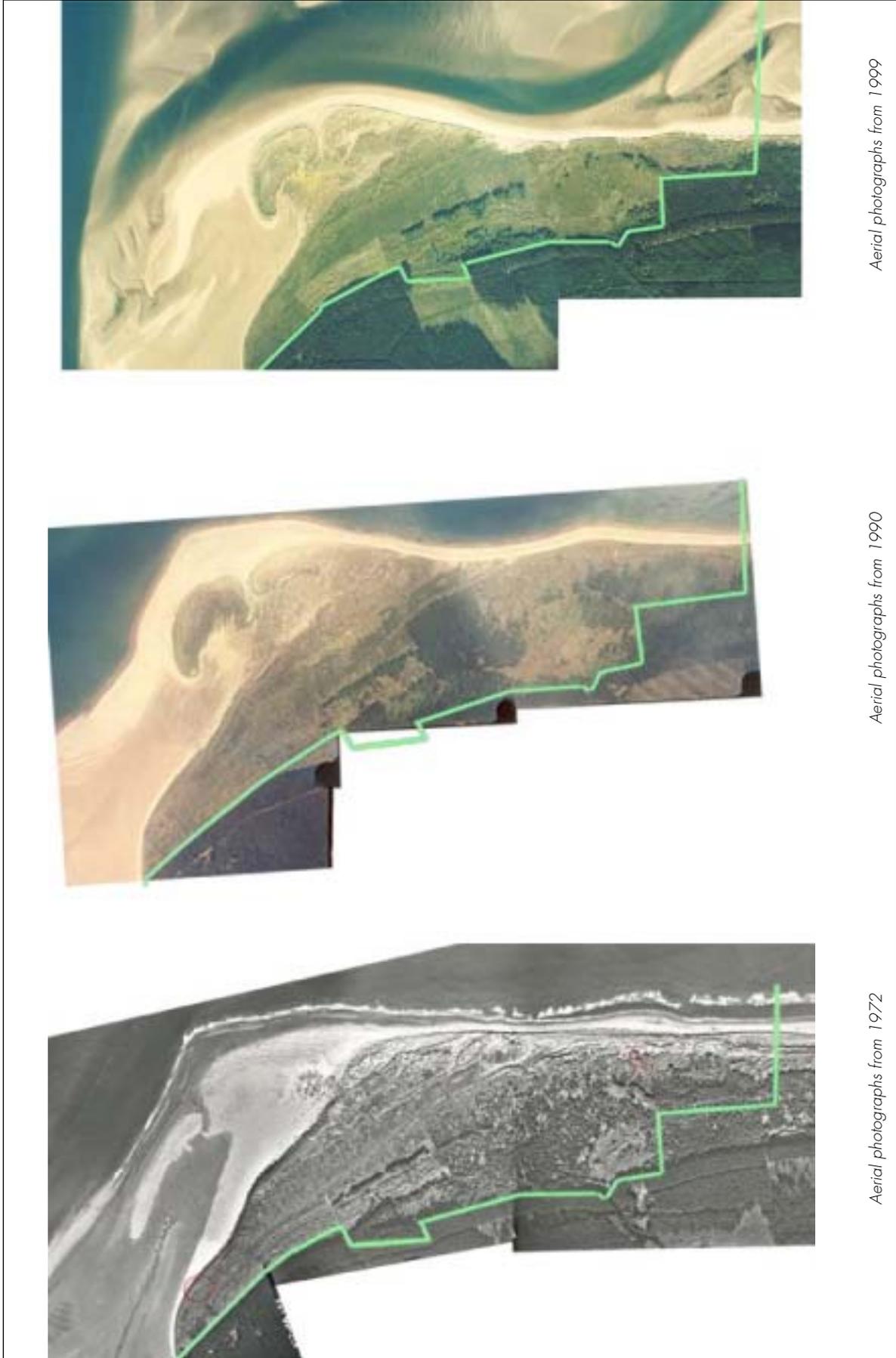
### **Dune Management**

The dunes can be considered in three sections. The mobile dunes along the seaward edge have been left alone to nature, managed by the wind and the waves. In complete contrast, the management of the fixed dunes has been a never-ending battle to remove trees and shrubs and prevent the dunes turning into woodland. The management of the dune slacks has involved various attempts to prevent them drying out to retain their floristic richness.

The very mobile active seaward edge of the Reserve has always been left to develop naturally, with no intervention in the natural processes of accretion and erosion. There has been no change in this approach over the years, and there has been no interference in the processes that shape the coastline. The changing face of the coast has been well studied and is documented in many scientific papers. These are collated in SNH's Earth Science Document for the Tayport – Tentsmuir Coast SSSI (Everett, 2001).

In contrast, active management has been needed to prevent the inland dune areas turning into woodland. There have been many projects to remove the trees and stop the progressive change from dune heath to woodland. The photos below were taken in 1972, 1990 and 1999; they show very clearly the spread of trees onto the dunes and their subsequent removal.

During the 1950s and 1960s, young conifer seedlings were simply pulled out by hand. Records indicate the daunting scale of the task – 5453 seedlings were uprooted in 1958 alone. One area (compartment 5) was left as a control area with no removal of trees. By the 1970s, compartment 5 had become woodland. Invasive sea-buckthorn had formed thickets at the southern end of the Reserve too, and trees and shrubs, including birch and willow, had colonised other areas.



Aerial photographs from 1999

Aerial photographs from 1990

Aerial photographs from 1972

Please note: the photographs are taken from different heights so the scale and exact area of coverage varies from image to image

From 1981 until 1985 regular work parties' hand cleared pine trees and maintained fences. The workers were groups of unemployed people brought to work on the Reserve by Manpower Services, a community enterprise programme.

In the mid 1980s it was decided to try using livestock to graze young trees and shrubs, and in 1987 a flock of goats was introduced; but this was a controversial trial, and in 1996 the goats were removed.

In 1995 a concerted programme of work to restore the open dune system at Tentsmuir Point was developed. SNH's Scientific Advisory Committee gave their support to the work in 1997. The aim was to restore open dune habitat, allowing only 5% tree cover to remain on the Reserve.

Between 1995 and 1999 approximately 5.3ha of mature trees were felled (including compartment 5) and a further 16.9ha cleared of smaller trees and scrub. Over 1300 tons of quality timbers were removed from the Reserve, and large quantities of scrub and small timber were removed and burned or chipped. In 1999 the last of the sea buckthorn that had grown across large areas of the Reserve was removed. Cutting, pulling and treatment with herbicide also controlled gorse, broom and dog rose. Spraying with herbicide controls the rosebay willowherb.

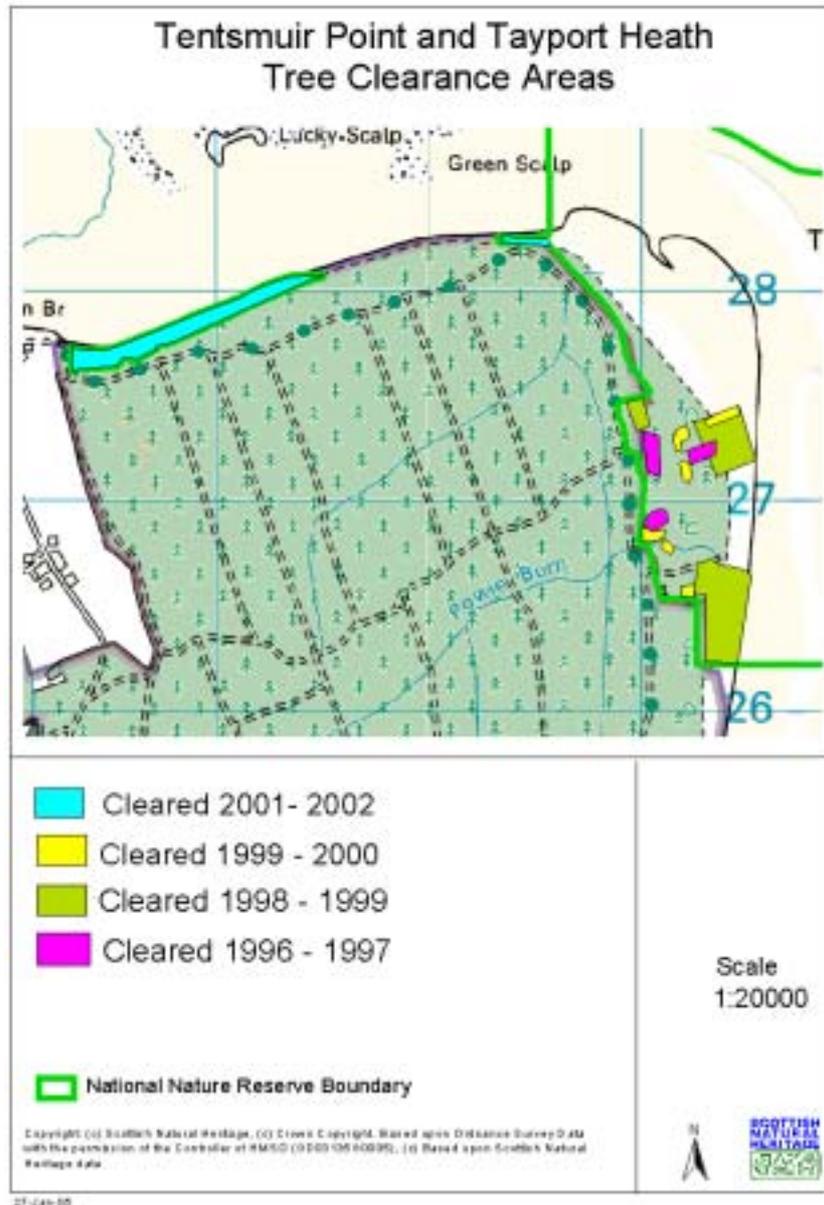
In 1996 Highland cattle were brought in to continue the task started by the goats. Cattle have grazed the Reserve in all except one year ever since – in 2002 no grazier could be found. In 2003 no Highland cattle were available, so Aberdeen Angus were substituted. The low density grazing by cattle (less than 20) has been successful in controlling the regrowth of birch and willow, but is less effective with controlling rosebay willowherb, which the animals do not find palatable. The level of grazing has to be carefully balanced to control the scrub but avoid damaging the lichen-rich heath.

Having tried both grazing throughout the year and only during the summer months, we concluded that summer grazing was more effective and reduced damage to the lichen heath. The breeds were also monitored and Highland cattle were more robust and their grazing regime more effective than Aberdeen Angus. The preferred option is for the reserve to be grazed with Highland cattle during the summer months.

In 2001 the mature trees and scrub vegetation were cleared from Tayport Heath, an area of fixed dune heath. A contractor was employed to remove all trees and scrub sensitively, avoiding as far as possible any damage to the dune heath. The trees were extracted whole using a crane. The trees were chipped on a site nearby in the forest, and the wood chip transported to an equestrian centre for their sustainable use.

The diagram below shows the areas cleared of trees between 1996 and 2002. Once the trees in an area have been felled the brash is removed, stumps are treated and scrub vegetation is cleared. Throughout the Reserve target species (gorse, broom and dog rose) are treated with herbicide, ragwort is pulled and scrub cleared. This work is repeated in selected areas on an annual basis.

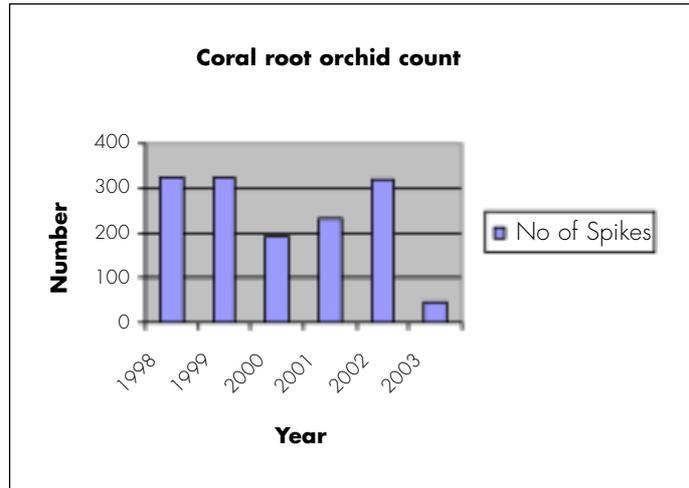
By 2002 the target had been achieved. Only 5% of the original tree and scrub remained. The remaining trees are alder and small areas of willow and birch. These trees will remain to provide habitat for invertebrates, and in particular butterflies. The heath and dune vegetation has recovered to a more natural state following the tree and scrub removal and the area of cover has expanded.



It is clear that as long as there are forest plantations adjacent to the Reserve, trees will continue to seed in and colonise the dunes. The cattle grazing, herbicide treatment and removal of scrub and saplings will have to continue to keep the dunes open and prevent the woodland spreading.

Another cause for concern has been the decline in floristic richness of the dune slacks, attributed to a lowering of the water table in the slacks. The records show that in the mid-1960s, when the Great Slack was prone to flooding by freshwater, it had good populations of salt-loving plants and the largest colony of coral root orchid in Britain. The forest plantations and associated drains have been blamed for lowering the water table, although there may be natural causes too. Various projects have been undertaken to try to re-wet the slacks, for instance in 1989 a sluice was installed on a drain to re-direct water back into the Reserve. In the 1980s it was proposed that pumps be used to enhance flooding, and this was recommended in the 1991 management plan. In March 1998 a wind pump was installed to feed water into the Great Slack from ditches and burns. The wind pump has had varying degrees of success in topping up the water levels of the Great Slack. The success rate is higher in wetter winters.

Spikes of coral root orchid in the slacks are counted each year. Fluctuations in number can be attributed to visitor disturbance, cattle trampling and weather. 2003 was a particularly dry year, which reduced the number of spikes found.



The numbers of rabbits on the Reserve has fluctuated widely over the years, and from time to time there have been projects to control their numbers because of the damage they can cause. After myxomatosis, in 1955 the Nature Conservancy paid

a small subscription to the Cupar and District Rabbit Clearance Society to trap rabbits to keep their numbers down. This seems to have worked for it was reported that rabbits had been eliminated by 1960. But by the 1970s the rabbits had returned, and were held responsible for virtually eliminating scrub vegetation in the slacks, and encouraging the spread of rosebay willow herb over the drier dunes. Rabbit control was re-introduced and exclosures maintained until the mid 1990s. The exclosures were removed in 1997 and 1998 when a visual assessment suggested that there was no significant difference between the vegetation within and outwith the exclosures. The rabbit population remained steady until 2001 when myxomatosis once again devastated the population.

### **Bird and Seal Management**

At Tentsmuir Point preventing disturbance to birds and seals has always been an aim. Byelaws were introduced in 1962 and Reserve wardens and volunteers carried out routine patrols to make sure visitors observed the byelaws and did not damage the flora and fauna. The approach has not changed much over the years. Today, the Reserve manager still has to persuade a few visitors to behave responsibly and keep dogs under control to prevent disturbance to the birds and the seals.

When mink spraints were observed at Morton Lochs in 2000, a mink control programme was started straight away because mink are such voracious predators. The first year (2000) two mink were caught and destroyed. Annual monitoring has shown no further sign of mink at Morton. Mink control was carried out at Tentsmuir Point in winter 2003 as spraints had been observed earlier in the year. However, none were caught. Adjacent landowners control foxes, but there is no fox control on the Reserve.

There have been a number of research projects on the seals, current research is looking into the behaviour and feeding patterns of common seals. As part of this research, satellite recorders are being attached to seals to monitor their movements. The University of St. Andrews Sea Mammal Research Unit carries out the research.

### **Wetland Management at Morton Lochs**

Morton Lochs have undergone many changes since their creation. Before becoming a Reserve, the lochs periodically dried up during summer because the supply burn silted up and the retaining banks were breached.

In the 1950s when the Reserve was set up, the lochs were in need of extensive repair work to improve the retaining banks and restore an adequate water supply. This work was completed in 1952, the water levels were adjusted, and the vegetation recovered. In the late 1950s the lochs were stocked with roach introduced from the Tay, in an effort to replace the fish stocks lost when the lochs dried out in the 1940s. The lochs dried out on three further occasions in the 1960s and 1970s.

Left unchecked, the fen vegetation in the Lochs will spread rapidly reducing the area of open water. Before it became a Reserve, cattle grazed around the lochs keeping the vegetation in check, but when grazing ceased the reeds spread rapidly. Various projects have been undertaken to prevent vegetation, particularly reeds, choking the lochs. In 1976 a major programme of work was undertaken. The lochs were drained, silt and sediment which had built up was excavated with machinery, landscaping work was undertaken; islands were created, ditches cleared and the lochs expanded. The aim of these works was to recreate open water, reduce the vegetation cover and create islands for breeding birds.

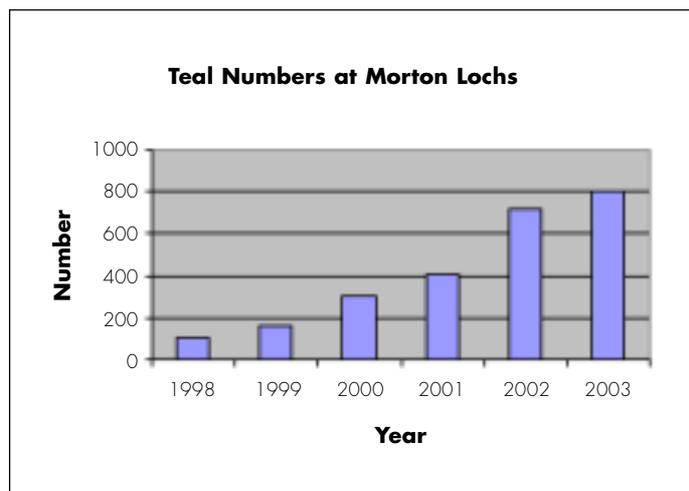
These works benefited the lochs for a period. However, by the late 1990s the lochs were again dominated by reeds, so an annual programme of reed clearance was introduced to increase the area of open water.

The aim of management of the lochs is to keep a balance of open water and wetland for wildlife; this is achieved by a number of management projects. The water level is monitored closely, and is manipulated by use of the spillways. An agreement with a neighbouring farmer in 1992 was needed to maintain the water level in the lochs. The inflow and outflow ditches are kept clear. Herbicide applied by a piston pump sprayer mounted on a boom lance from either the loch shore or dinghy contains the spread of reeds. In 2003, trees and scrub were cut and cleared from around the southern margins of the South Loch to recreate open ground and reduce shading of the loch. Silt is periodically removed from the ditches and inflow.

The catchment area for Morton Lochs is mainly agricultural. This has caused occasional water quality problems due to high levels of nitrates and phosphates. The impact of the high levels of nutrients are threefold – the death of macrophytes, algal blooms and epiphytic scums. This is exasperated by not being able to maintain a high through flow of water throughout the year. In 2002 and 2003 bales of barley straw were put into the North Loch to help alleviate the algal problems, but with only limited success.

One species that has responded particularly well to the reduction of reeds and increase in open water has been the teal, the number counted on the lochs in winter has risen from 100 in 1998 to 800 in 2003. Teal numbers were even higher in the past.

There are have been several other small-scale projects to encourage the wildlife. Bird boxes have been put up in the woodlands. Bat boxes have been put up around Morton Lochs and near the icehouse, and an otter holt was built from brash left from a felling contract.



In the conifer forest that surrounds the Lochs, remnants of the dune heath still survive under the forest canopy. In the area to the north of the Lochs, a programme has been initiated to restore the dune heath. This area was cleared of quality timber in 1998, but brash and poor timber, smaller trees and scrub were left. In 2003 the remaining birch and scrub were cleared and the brash and debris removed from the site. The management methods being used have been developed from those used on the dunes at Tentsmuir Point.

### **Management for People**

People have always been able to visit Tentsmuir Point and Morton Lochs, but in recent years SNH has put more effort into making the Reserve an enjoyable place to visit.

The first booklet about the Reserve was produced in 1970. A public hide was constructed at Morton Lochs in 1975 so that visitors could view the wildlife. A second hide, the Fullerton hide named after one of the first wardens, was opened in 1977.

In recent years there has been a burst of activity at Morton Lochs stimulated by the policy for National Nature Reserves in Scotland developed in 1996. The policy identified three purposes for NNRs, the key purpose being to use Reserves to raise awareness of Scotland's natural heritage.

To implement the policy new interpretative panels were installed, and new leaflets were printed, one for the NNR and another for sites in the local area in partnership with others. A Reserve newsletter was started in 1999, this proved so popular, that in the course of 5 years the print run has grown from 80 to over 600.

A family fun day was introduced in 2000, and has been held annually since. This popular event, with a programme of varied activities attracts upwards of 100 visitors. There used to be a programme of guided walks but attendance was falling, so guided walks are now available on request rather than through a scheduled programme. This has proved a popular move, and in 2003 some 26 groups were guided around the Reserve.

In 2002 new footpaths and boardwalks, some suited for all abilities, were constructed at Morton Lochs, including an educational boardwalk across the Fullerton Lagoon. A third hide, the John Berry hide, was added in 2003 and the South hide was replaced.

In 2003–04 visitors to Tentsmuir were surveyed as part of a survey of 21 NNRs around Scotland. The survey found that most visitors to Tentsmuir were Scots, mainly from Tayside and Fife, on a short trip from home and many were repeat visitors.

A Teachers Education Pack for the 5–15 age group was produced for the Tentsmuir Point in 2003 and distributed to mainly Fife schools. The pack proved very popular, with requests for copies being received from across Scotland and the number of schools visiting the Reserve has increased.



*Open day at Tentsmuir NNR*

In 2004 new legislation on the right of access came into effect. This is accompanied by The Scottish Outdoor Access Code which provides guidance on responsible behaviour for recreational users, and on responsible land management in relation to the new rights. We do not anticipate that this will have a major impact on the management or access arrangements for the NNR providing access is taken responsibly.

### **Management of the Property**

SNH manage all the land in the Reserve. Some is owned by SNH and some is leased from the Crown Estate Commissioners and Forestry Commission Scotland (FCS). There are agreements that allow access for vehicles through FCS land.

The Reserve office at Fetterdale (off the NNR) has been rented from FCS since the mid 1960s. Since 1994 SNH has owned a storage workshop for tractors and other equipment at the Fetterdale office.

The boundary of the Reserve is marked by sea fences maintained to keep the cattle within agreed areas. Maintenance of the sea fences is done on a day-to-day basis by Reserve staff, but due to the difficult conditions, specialist contractors are employed at the end of each winter to carry out maintenance.

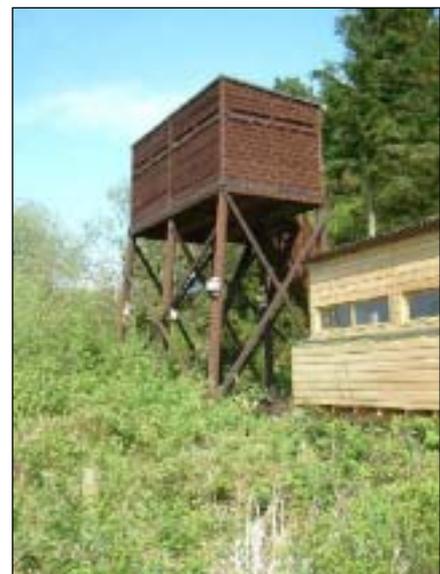
The visitor infrastructure – the car park, paths, hides and information boards – have to be maintained by Reserve staff and contractors.

The number of staff at Tentsmuir has fluctuated over the years. Since the establishment of the Reserves there has been a warden, and in many years an assistant warden too, either throughout the year or as a seasonal post. The assistant warden post is currently shared with FCS.

The Reserve has benefited from an enormous amount of time from volunteers who have helped with biological recording, building projects, beach clean ups, patrols and organising events. In addition the many voluntary wardens for the Reserve have greatly contributed to the knowledge, management and maintenance of the NNR.

The Reserve staff meet The Tentsmuir and Eden Liaison Group to discuss local management issues, co-ordinate activities with local activities and to develop the interpretation and education strategy. There are representatives on the group from Forestry Commission Scotland, Fife Council Countryside Resources Group, SNH, Tayport Community Council, and local landowners and land managers.

SNH has spent considerable sums of money on maintaining and enhancing the Reserve. In the period 1997–2004 the average annual spend on management works and capital projects was £33,000. This includes expenditure on items such as footpaths, birdhides, fencing and on hiring machinery (some of it very specialised). SNH also spent an average of £13,000 over the period on publications and educational material featuring the Reserve and a further annual average of £1000 on specialist research contractors to carry out monitoring.



*Bird hides at Morton Lochs*

## **In Conclusion**

Tentsmuir NNR, comprising Tentsmuir Point, Tayport Heath and Morton Lochs has a rich natural heritage. Management of the Reserve has maintained this interest for more than 50 years. The coastal sandflats and banks remain largely undisturbed and the numbers of birds and seals using the area continue to be internationally significant. The dune heath at Tentsmuir Point and Tayport Heath has been cleared of trees and scrub vegetation and is recovering. Morton Lochs have been restored to a mosaic of open water and wetland habitats supporting a diverse range of wildlife.

The Reserve is well used by visitors and the number of educational visits has increased since the teachers' pack was produced. The success of the Reserve newsletter shows there is continuing interest in the Reserve.

This document introduces Tentsmuir National Nature Reserve. We hope you have enjoyed finding out more about this special Reserve; if you can add to our knowledge please let us know.

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## PHOTOGRAPHY

Photography by Lorne Gill, P.A. MacDonald and SNH.

Aerial photography:

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1999 – Flown by W.H. Ekin for Scottish Natural Heritage

2004 – Copyright Ken Whitcombe, Kenbarry Photography

## **APPENDIX 1 – National Nature Reserves**

Scotland's National Nature Reserves are special places for nature, where many of the best examples of Scotland's natural heritage are protected. Nature comes first on our NNRs (referred to as primacy of nature). These Reserves also offer special opportunities for people to enjoy and find out about the richness of our natural heritage. National Nature Reserves (NNRs) are declared under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981.

A new policy for National Nature Reserves in Scotland was developed in 1996. This policy requires NNRs in Scotland to have four attributes, and to be managed for one or more of the three purposes.

The attributes are:

- **Primacy of nature.** The needs of nature will be placed at the heart of decisions about land-use and management of our NNRs, and nature conservation will be the overriding land use, although it may not be the sole purpose of management.
- **National importance.** It must be of national importance that the NNR be managed as a nature Reserve, for the protection of geological features, habitats or species found there.
- **Best practice management.** NNRs must be well managed, not only to safeguard the nature conservation interests, but also to provide for people's enjoyment and understanding.
- **Continuity of management.** Both research and management on NNRs require us to take a long-term view, so it is important that management continuity is assured.

The purposes are:

- **National awareness** of NNRs – on these Reserves people can take pride in the natural heritage 'on display' and come to understand it better and enjoy it to the full.
- **Specialised management** of NNRs – the character of the interest requires specialised and pro-active management that is best delivered by a nature Reserve.
- **Research-related** NNRs – These NNRs will offer opportunities for research into the natural heritage and its management that specifically require a nature Reserve location and which are not available elsewhere.

Between 2000–2003 all of Scotland's National Nature Reserves were reviewed against this policy. Because of the review there are now 53 National Nature Reserves in Scotland.

### **More information can be found at:**

National Nature Reserves

<http://www.nnr-scotland.org.uk>

Scotland's National Nature Reserves: A policy statement

<http://www.snh.org.uk/pdfs/polstat/nnrpolicy.pdf>

Tentsmuir NNR



## **APPENDIX 2 – Site of Special Scientific Interest**

The Site of Special Scientific Interest (SSSI) designation is the main nature conservation designation in Great Britain. The SSSI series has been developed over the last 50 years, and since 1981 as the national suite of sites providing statutory protection for the best examples of GB's flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, many SSSIs were renotified and others newly notified under the Wildlife and Countryside Act 1981. SSSIs continue under the Nature Conservation Act (Scotland) 2004, which further strengthens their protection and makes the system more user friendly.

These sites are also used to underpin other national and international nature conservation designations. Most SSSIs are privately owned or managed; others are owned or managed by public bodies or non-government organisations. There are more than 1400 SSSIs in Scotland.

### **Web Links:**

'The Nature of Scotland – A Policy Statement'

<http://www.scotland.gov.uk/library3/environment/nas-00.asp>

'People and Nature: A New Approach to SSSI Designations in Scotland'

<http://www.scotland.gov.uk/library/documents-w1/pandn-00.htm>

Guidelines for selection of biological SSSIs

<http://www.jncc.gov.uk/Publications/sssi/default.htm>

Site of Special Scientific Interest (SSSI)

<http://www.snh.org.uk/about/ab-pa01.asp>

List of Scottish SSSI

[http://www.snh.org.uk/pdfs/protect/SSSI\\_02.pdf](http://www.snh.org.uk/pdfs/protect/SSSI_02.pdf)

### Tayport – Tentsmuir Coast SSSI

|                   |   |
|-------------------|---|
| Country           | Scotland  |
| Unitary Authority | Fife  |
| Grid Ref*         | NO 452994 to NO 502232*   |
| Notified          | 9/3/1954  |
| Re notified       | 25/9/1999   |
| Area (ha)         | 1202.11 ha  |
|                   | NNR Boundary <span style="color: green;">———</span> SSSI Boundary <span style="color: orange;">———</span> |

\* This is the approximate central point of the SSSI.



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### DESCRIPTION:

Tayport to Tentsmuir Coast is a key geomorphological site for the study of active beach and coastal processes, in particular those associated with coastal progradation (shoreline advance). It is exceptional in Scotland for the rate and amount of coastal accretion (sediment accumulation) since the time of the post-glacial sea-level high. This accretion is actively continuing and is due to the massive sediment load carried to the sea by the River Tay and built into extensive bar and spit systems. The interest of the site is significantly enhanced by the juxtaposition of three distinctive coastal environments – that of the north coast dominated by the dynamic processes of the Tay estuary; that of the Abertay sand bars and shoal banks which play a fundamental role in the coastal accretion, and that of the coast to the south where open coast processes become progressively more dominant. The site has considerable potential for studies of the processes and development of coastal progradation and of the interaction of vegetation with accretionary processes and landforms.

The site exhibits an extensive and relatively undisturbed area of intertidal sand and mudflats with some of the most extensive eelgrass *Zostera* spp. beds in the Tay estuary. Three nationally scarce species of *Zostera* are present. These intertidal habitats show transitional developments into salt marsh communities, occurring both as distinct habitat units and smaller fragments dominated by saltmarsh grass *Puccinellia maritima* and sea club-rush *Scirpus maritimus*, grading into landward areas of saltmarsh rush *Juncus gerardi*. Rapidly accreting sand dunes continue the landward development and are predominantly lime-poor, but calcareous and more neutral dune substrates also exist. The dune system exhibits a complete sequence of dune and slack successional development from strandline, dominated by couch-grass *Elymus repens*, through foredunes and yellow dunes with sand couch-grass *Elymus farctus*, marram grass *Ammophila arenaria* and lyme grass *Leymus arenarius*, to grey dunes, slacks and dune heath with scrub and deciduous woodland. Species here range from moss and lichen communities through richer areas with creeping willow *Salix repens*, coral root orchid *Corallorhiza trifida* and seaside centaury *Centaureum littorale* to more acid situations with heather *Calluna vulgaris*, crowberry *Empetrum nigrum*, grey willow *Salix cinerea* and silver birch *Betula pendula*.

This diversity of habitats supports over 320 higher plant species and over 160 fungi, lichens, mosses and liverworts, several of which are recorded as nationally and regionally scarce, such as seaside centaury and coral root orchid together with baltic rush *Juncus balticus* and dense flowered fumitory *Fumaria densiflora*. Several of these species are distinctly "northern" and occur here at or near their southern limit in eastern Britain, contrasting markedly with the predominantly "southern" flora on sand dunes elsewhere in Fife. In contrast species like the broad helleborine *Epipactis helleborine*, fern grass *Desmazeria rigida* and sea purslane *Halimione portulacoides* occur here at their most extreme northern location.

The intertidal flats regularly support a large assemblage of wintering waterfowl including nationally important passage or wintering populations of pink-footed goose, eider, long-tailed duck, common scoter, red-breasted merganser, goosander and bar-tailed godwit in numbers in excess of 1% of their British populations. The site is particularly important for wintering eider, with peak numbers exceeding 12,000, some 15% of the British wintering population.

The outer sandflats provide for a nationally important pupping and moulting haul-out for over 400 common seals. Grey seals also use the area as a summer haul-out in numbers averaging around 1,500, but not for breeding or moulting.

The sand dune invertebrate fauna is particularly rich and diverse, including 46 nationally rare or scarce species. Four of these are Red Data Book species, including the cousin German moth *Paradiarsia sobrina*. Several more species are regionally scarce, all of which contribute to an outstanding assemblage of invertebrates associated with sand dune systems including heath, scrub and pine.

## **PREVIOUS NOTIFICATIONS**

Part declared under Section 19 of the National Parks and Access to the Countryside Act 1949 as a National Nature Reserve on 9 March 1954 and extended 28 September 1962 and again in 1988.

Notified under Section 28 of the Wildlife & Countryside Act 1981 as an SSSI on 21 February 1984. Re-notified with extension on 1 February 1993.

### Morton Lochs SSSI

|                   |   |
|-------------------|---|
| Country           | Scotland  |
| Unitary Authority | Fife  |
| Grid Ref*         | NO 463265*  |
| Notified          | 1/1/1952  |
| Re notified       | 21/2/1984   |
| Area (ha)         | 49.6ha  |
|                   | NNR Boundary  SSSI Boundary  |

\* This is the approximate central point of the SSSI.



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### ORNITHOLOGICAL/BOTANICAL: OPEN WATER/COASTLAND

This site lies at the western (inland) edge of the Tentsmuir sand dune system and contains representative areas of open water, fen and reed-swamp, dune grassland, scrub and woodland. The flora includes a number of locally rare vascular plant species.

The lochs are of regional significance as a refuge for passage and wintering wildfowl. In autumn the site regularly supports nationally important numbers of Teal.

### PREVIOUS NOTIFICATIONS

Part declared under the National Parks and Access to the Countryside Act, 1949 as a National Nature Reserve on 20 May 1952 and extended 16 June 1956.

## **APPENDIX 3 – Natura 2000 Sites**

Natura 2000 is a European network of protected sites representing areas of the highest value for natural habitats and species of flora and fauna that are rare, endangered or vulnerable in the European Community. The term Natura 2000 comes from 1992 EC Habitats Directive: it symbolises the conservation of precious natural resources for the year 2000 and beyond into the 21st century. Scotland's Natura 2000 sites will help protect these important areas now and for generations to come.

The Birds Directive is the commonly used name for the 1979 'Council Directive 79/409/EEC on the Conservation of Wild Birds'. This Directive protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds that are rare or vulnerable in Europe as well as all migratory birds that are regular visitors.

The Habitats Directive is the common name for 'Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora' was adopted in 1992. It builds on the Bird Directive by protecting natural habitats and other species of wild plants and animals, as well as modifying the provisions of the Birds Directive in relation to SPAs. Sites selected under the Habitats Directive are called Special Areas of Conservation (SACs). The Directive also lists European Protected Species.

These Directives are major contributions by the European Community to implementing the Biodiversity Convention agreed by more than 150 countries at the 1992 Rio Earth summit.

The following websites provide further information:

Special Areas of Conservation:

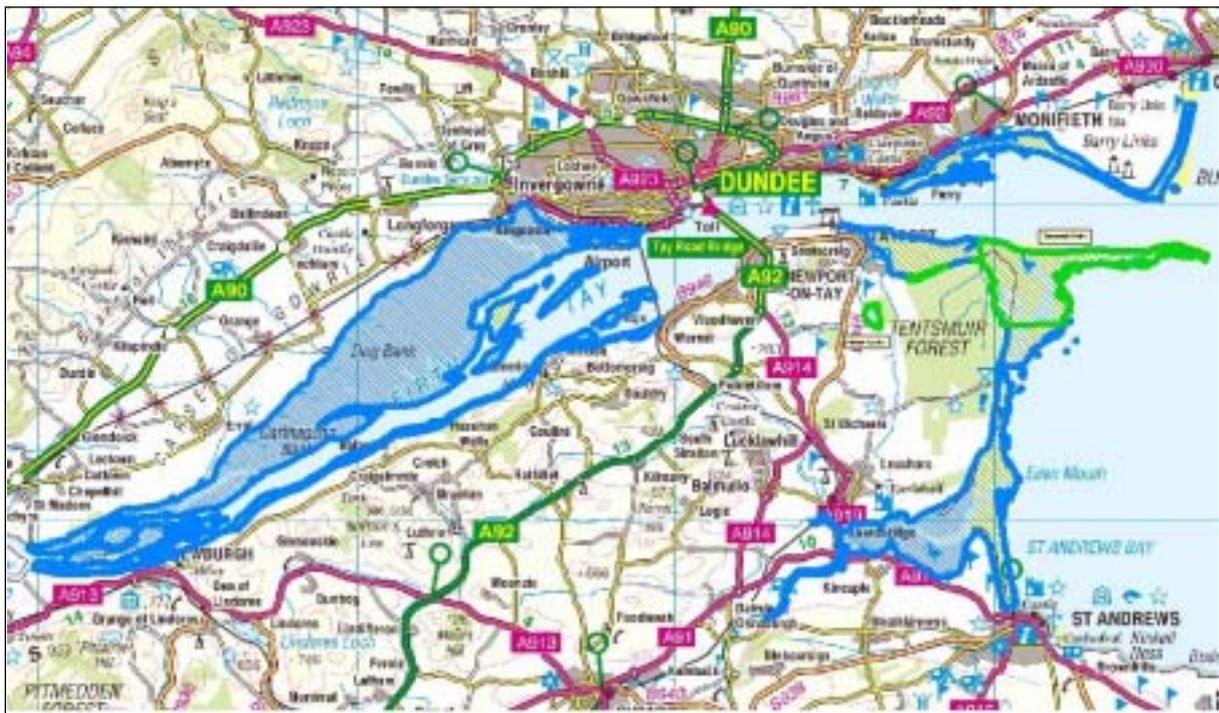
**<http://www.jncc.gov.uk/ProtectedSites/SACselection>**

Special Protection Areas:

**<http://www.jncc.gov.uk/UKSPA/default.htm>**

**Firth of Tay and Eden Estuary SPA**

|                   |   |
|-------------------|---|
| Country           | Scotland  |
| Unitary Authority | Dundee, Fife, Perth and Kinross   |
| SPA status        | Classified 2/2/2000   |
| Latitude          | 56 24 30 N  |
| Longitude         | 03 05 00 W  |
| SPA EU code       | UK9004121   |
| Area (ha)         | 6923.29ha   |
| Component SSSIs   | Barry Links, Eden Estuary, Inner Tay, Monifieth Bay, Tayport to Tentsmuir Coast |



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The Firth of Tay and Eden Estuary is located on the east coast of central Scotland. The Firth stretches for some 35km along the estuary from near Newburgh to the estuary mouth. For much of its length the main channel of the estuary lies close to the southern shore and the most extensive intertidal flats are on the north side, west of Dundee. In Monifieth Bay, to the east of Dundee, the substrate becomes sandier and there are also Mussel *Mytilus edulis* beds. The south shore consists of fairly steeply shelving mud and shingle. The Inner Tay Estuary is particularly noted for the continuous dense stands of Common Reed *Phragmites australis* along its northern shore. These reedbeds, inundated during high tides, are amongst the largest in Britain. Eastwards, as conditions become more saline, there are areas of saltmarsh, a relatively scarce habitat in eastern Scotland. The site is of importance in summer for breeding terns and Marsh Harrier *Circus aeruginosus*, whilst in the migration periods and in winter the estuary holds major concentrations of waterbirds, especially waders, sea-ducks and geese. Sea-ducks also feed, loaf and roost outside the SPA in the open waters of the Firth.

### **Qualifying species**

This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Appendix I of the Directive:

#### **During the breeding season;**

\*Little tern *Sterna albifrons*, 44 pairs representing at least 1.8% of the breeding population in Great Britain (Seabird Census Register)

\*Marsh harrier *Circus aeruginosus*, 4 pairs representing at least 2.5% of the breeding population in Great Britain (1997)

#### **Over winter;**

Bar-tailed godwit *Limosa lapponica*, 2,400 individuals representing at least 4.5% of the wintering population in Great Britain (winter peak mean).

This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

#### **Over winter;**

Greylag goose *Anser anser*, 1,355 individuals representing at least 1.4% of the wintering Iceland/UK/Ireland population (5 year peak mean 1991/2–1995/6)

Pink-footed goose *Anser brachyrhynchus*, 3,769 individuals representing at least 1.7% of the wintering Eastern Greenland/Iceland/UK population (5 year peak mean 1991/2–1995/6)

Redshank *Tringa totanus*, 1,800 individuals representing at least 1.2% of the wintering Eastern Atlantic – wintering population (winter peak mean)

### **Assemblage qualification: A wetland of international importance**

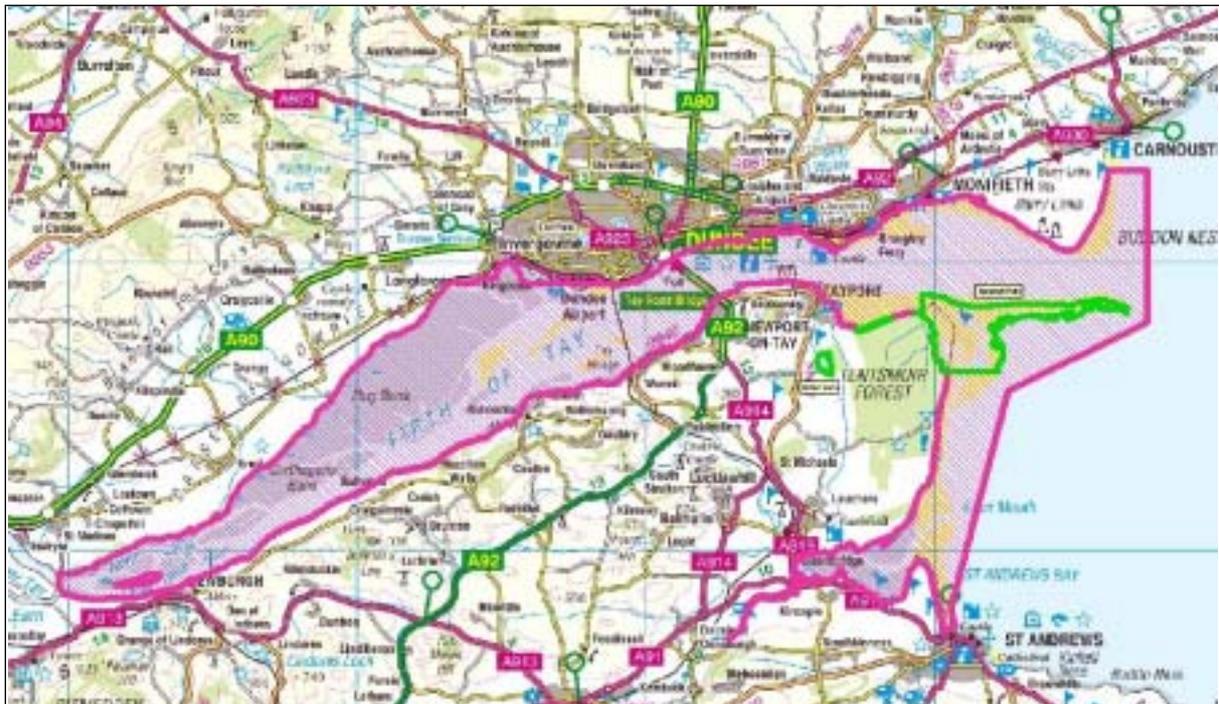
The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

Over winter, the area regularly supports 34,074 individual waterfowl (5 year peak mean 1991/2–1995/6) including: velvet scoter *Melanitta fusca*, pink-footed goose *Anser brachyrhynchus*, greylag goose *Anser anser*, redshank *Tringa totanus*, cormorant *Phalacrocorax carbo*, shelduck *Tadorna tadorna*, eider *Somateria mollissima*, bar-tailed godwit *Limosa lapponica*, common scoter *Melanitta nigra*, black-tailed godwit *Limosa limosa islandica*, goldeneye *Bucephala clangula*, red-breasted merganser *Mergus serrator*, goosander *Mergus merganser*, oystercatcher *Haematopus ostralegus*, grey plover *Pluvialis squatarola*, Sanderling *Calidris alba*, dunlin *Calidris alpina alpina*, long-tailed duck *Clangula hyemalis*.

**Firth of Tay and Eden Estuary SAC**

|                   |  |
|-------------------|--|
| Country           | Scotland   |
| Unitary Authority | Angus, City of Dundee, Fife, Perth and Kinross   |
| Grid Ref*         | NO 420294  |
| Latitude          | 56 22 00 N   |
| Longitude         | 02 57 00 W   |
| SAC EU code       | UK0030311  |
| Area (ha)         | 15412.53ha   |
|                   | NNR Boundary  SAC Boundary  |

\* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.



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## **Appendix I habitats that are a primary reason for selection of this site**

### **1130 Estuaries**

The Firth of Tay and the Eden estuary are two high-quality estuarine areas. The two **estuaries** have been proposed within a single site because they are integral components of a large, geomorphologically complex area that incorporates a mosaic of estuarine and coastal habitats. The Tay is the least modified of the large east coast estuaries in Scotland, while the Eden estuary represents a smaller 'pocket' estuary. The inner parts of the estuaries are largely sheltered from wave action, while outer areas, particularly of the Tay, are exposed to strong tidal streams, giving rise to a complex pattern of erosion and deposition of the sandbank feature at the firths' mouth. The sediments within the site support biotopes that reflect the gradients of exposure and salinity, and are typical of estuaries on the east coast of the UK. The abundance, distribution and composition of the associated plant and animal communities are ecologically representative of northern North Sea estuaries.

## **Appendix I habitats present as a qualifying feature, but not a primary reason for selection of this site**

**1110** Sandbanks which are slightly covered by sea water all the time

**1140** Mudflats and sandflats not covered by seawater at low tide

## **Appendix II species that are a primary reason for selection of this site**

### **1365** Common seal *Phoca vitulina*

The Firth of Tay and Eden Estuary supports a nationally important breeding colony of **common seal *Phoca vitulina***, part of the east coast population of common seals that typically utilise sandbanks. Around 600 adults haul-out at the site to rest, pup and moult, representing around 2% of the UK population of this species.

## APPENDIX 4 – Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention. In the UK, the first Ramsar sites were designated in 1976. Since then, many more have been designated. Compared to many countries, the UK has a relatively large number of Ramsar sites, but they tend to be smaller than many countries. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are Special Protection Areas (SPAs) classified under the Birds Directive.

### Firth of Tay and Eden Estuary

|                  |                  |
|------------------|------------------|
| Designation date | 28/7/2000        |
| Coordinates      | 56°24'N 003°05'W |
| Elevation        | 0–5m             |
| Area (ha)        | 6,923ha          |



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A complex of estuarine and coastal habitats in eastern Scotland adjacent to the city of Dundee. The site includes extensive invertebrate-rich intertidal mudflats and sandflats created by the massive sediment load deposited by the River Tay, as well as large areas of reedbed and sand dune and a small amount of saltmarsh. At least four species of wintering waterfowl are present above the 1% threshold of international importance, and on average some 48,000 waterfowl are supported there in winter, including 14 species in nationally important numbers. Some disturbance is caused in some parts of the site by large numbers of walkers and illegal use of all-terrain bicycles, but these and other potential threats are considered manageable. Students from many nearby universities conduct research on the site.

**Importance:** In winter, the site supports over 48,000 waterbirds. This includes internationally important populations such as 1% of the Western Palearctic population of *Limosa lapponica*, 1.2% of the Iceland/UK/Ireland population of *Anser anser*, 1.2% of the Eastern Greenland/Iceland/UK population of *Anser brachyrhynchus* and an average of 1% of the Eastern Atlantic population of *Tringa totanus*.

**Wetland types:** G (48%), E (25%), F (19%), Sp (6%), H (1.2%), M (0.8%)

The Firth of Tay and Eden Estuary is a complex of estuarine and coastal habitats in eastern Scotland. The site includes extensive invertebrate-rich intertidal mudflats and sandflats created by the massive sediment load deposited by the River Tay. Also present are large areas of reedbed and sand dune and a small amount of saltmarsh.

**Biological/Ecological notes:** Invertebrate-rich mudflats comprise the majority of the sub-sites. These include important areas of *Zostera* spp. in Tayport Bay. Small areas of saltmarsh can be found in Tayport Bay, Eden Estuary and the Inner Tay Estuary. These are dominated by *Juncus gerardii*, *Scirpus* spp. and *Schoenoplectus* spp. on the Inner Tay and *Puccinellia* spp. and *Festuca* spp. on the Eden Estuary. Successional sand dune communities are to be found on Tentsmuir Point, which is one of the most extensive dune systems in Scotland. In total, 14 National Vegetation Communities (NVC) are found here. The *Phragmites australis* reedbeds are some of the most important in the UK and include the largest continuous stand of reed in the UK. The nationally rare lichen *Cladonia mitis* occurs here. Other nationally important and scarce species include *Chenopodium glaucum*, *Juncus balticus*, *Centaurium littorale*, *Zostera marina*, *Z. angustifolia* and *Z. noltii*. Noteworthy fauna includes nationally important species such as *Limosa limosa*, *Melaniitta fusca*, *M. nigra*, *Mergus serrator* and *Pluvialis squatarola*. Fish include *Salmo trutta*, *S. salar*, *Osmerus eperlanus* and *Alosa alosa*. Mammals occurring at the site include *Halichoerus grypus*, *Phoca vitulina*, *Lutra lutra*, *Tursiops truncatus* and *Phocoena phocoena*.

**Hydrological/Physical notes:** The site can be characterised as coastal, with estuaries, intertidal sediments, lowlands, open coast and subtidal sediments. The soil and geology are characterised by alluvial mud, sand, sandstone and other sedimentary deposits.

**Human uses:** The site and surrounding area is partially owned by local authorities, part is communal land, part is nationally owned and part is privately owned. Functional jurisdiction resides with the Scottish Office Agriculture, Environment and Fisheries Department\*. On-site activities include nature conservation, recreation, research, sport fishing, hunting and military activities. Activities in the surrounding area include commercial forestry, hunting, agriculture, a harbour and urban development. Surveys and research have been conducted on birds, focusing on numbers, species, disturbance, distribution and reedbed breeding birds. Seal movement, population and breeding have also been studied. Sea trout behaviour and population studies have been conducted. Coralroot orchids have been studied, as has vegetative succession.

**Conservation Measures:** The site has been designated as an EU Special Protection Area (SPA), a Site of Special Scientific Interest (SSSI) and as a National Nature Reserve (NNR). A management plan has been implemented.

**Adverse Factors:** No adverse factors currently reported.

**Site Management:** Scottish Natural Heritage, 46 Crossgate, Cupar, Fife KY15 5HS, Scotland.

\* Now replaced by: Scottish Executive Environment and Rural Affairs Department.

## **APPENDIX 5 – Protected species**

There are a number of laws protecting species in the UK; this is only a brief synopsis.

### **The Wildlife and Countryside Act 1981**

This is a key Act, which makes it an offence to intentionally kill, injure, or take any wild bird or their eggs or nests (except for species listed in Schedule 2). Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young. The Act also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.

The Act makes it an offence (subject to exceptions) to intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals.

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

### **The Habitats Directive**

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora requires Member States to take the requisite measures to establish a system of strict protection for the animal species listed in Appendix IV, ie animal and plant species of community interest in need of strict protection. There are 13 European Protected Species in Britain. All European Protected Species are also fully protected under the Wildlife and Countryside Act 1981, but the Regulations provide a greater level of protection, primarily through licensing procedures.

In summary, for any European Protected Species of animal, the legislation makes it an offence to deliberately capture, kill, injure or disturb any such animal. This includes taking or destroying eggs of such animals. It is also an offence to damage or destroy their 'breeding sites' or 'resting places' (this does not have to be deliberate or intentional for an offence to have been committed). For any European Protected Species of plant, the legislation makes it an offence to deliberately pick, collect, cut, uproot or destroy any such plant. This applies to all stages of their biological cycle. European Protected Species of plants and animals are also protected from being transported, kept, sold, exchanged, advertised for sale etc.

### **The Biodiversity Convention**

The Convention on Biodiversity was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992. In the UK the Government launched the UK Biodiversity Action Plan, a national strategy that identified broad activities for conservation work over the next 20 years, and established fundamental principles for future biodiversity conservation. A number of Biodiversity Action Plans (UKBAP) have been produced for selected habitats and species, and some areas have developed local biodiversity action plans (LBAP) too.

## Red Data Book Species

Red Data Books list species that are threatened or endangered. In the past species in Britain were included as Red Data Book species if they occurred in fewer than 15 10x10km squares. Britain is moving towards the IUCN (The World Conservation Union) criteria which categories species as Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable.

| Common name            | Scientific name                   | *Wildlife & Countryside Act 1981 | European protected species | **Red data book species | Biodiversity Action Plans |             |
|------------------------|-----------------------------------|----------------------------------|----------------------------|-------------------------|---------------------------|-------------|
|                        |                                   |                                  |                            |                         | UK wide                   | Local plans |
| slender centauray      | <i>Centaureum littorale</i>       | ✓                                |                            | ✓                       |                           |             |
| Daubenton's bat        | <i>Myotis daubentonii</i>         | ✓                                | ✓                          |                         |                           |             |
| pipistrelle            | <i>Pipistrelle</i> sp.            | ✓                                | ✓                          |                         | ✓                         | ✓           |
| Natterer's bat         | <i>Myotis nattereri</i>           | ✓                                | ✓                          |                         |                           |             |
| brown long-eared bat   | <i>Plecotus auritus</i>           | ✓                                | ✓                          |                         |                           |             |
| red squirrel           | <i>Sciurus vulgaris</i>           | ✓                                |                            |                         | ✓                         | ✓           |
| otter                  | <i>Lutra lutra</i>                | ✓                                | ✓                          |                         | ✓                         | ✓           |
| brown hare             | <i>Lepus europaeus</i>            |                                  |                            |                         | ✓                         |             |
| minke whale            | <i>Balaenoptera acutorostrata</i> |                                  | ✓                          |                         | ✓                         |             |
| watervole              | <i>Cicindela</i> sp.              |                                  |                            |                         | ✓                         | ✓           |
| great crested newt     | <i>Triturus cristatus</i>         |                                  | ✓                          |                         | ✓                         |             |
| lunar yellow underwing | <i>Noctua orbona</i>              |                                  |                            |                         | ✓                         |             |
| cousin German          | <i>Protolampra sobrina</i>        |                                  |                            |                         | ✓                         |             |
| ramshorn snail         | <i>Planorbium corneum</i>         |                                  |                            |                         | ✓                         |             |
| freshwater pea mussel  | <i>Pisidium tenuilineatum</i>     |                                  |                            |                         | ✓                         |             |
| skylark                | <i>Alauda arvensis</i>            |                                  |                            |                         | ✓                         |             |
| linnet                 | <i>Acanthis cannabina</i>         |                                  |                            |                         | ✓                         |             |
| reed bunting           | <i>Emberiza schoeniclus</i>       |                                  |                            |                         | ✓                         |             |
| Scottish crossbill     | <i>Loxia scotia</i>               |                                  |                            |                         | ✓                         |             |
| corn bunting           | <i>Miliaria calandra</i>          |                                  |                            |                         | ✓                         |             |
| common scoter          | <i>Melanitta nigra</i>            |                                  |                            |                         | ✓                         |             |
| spotted flycatcher     | <i>Muscicapa striata</i>          |                                  |                            |                         | ✓                         |             |
| tree sparrow           | <i>Passer montanus</i>            |                                  |                            |                         | ✓                         |             |
| grey partridge         | <i>Perdix perdix</i>              |                                  |                            |                         | ✓                         |             |
| song thrush            | <i>Turdus philomelos</i>          |                                  |                            |                         | ✓                         |             |
| roseate tern           | <i>Sterna dougallii</i>           |                                  |                            |                         | ✓                         |             |
| bartailed godwit       | <i>Limosa lapponica</i>           |                                  |                            |                         | ✓                         |             |
| greylag goose          | <i>Anser anser</i>                |                                  |                            | ✓                       | ✓                         |             |
| pink-footed goose      | <i>Anser brachyrhynchus</i>       |                                  |                            | ✓                       | ✓                         |             |
| red-breasted merganser | <i>Mergus serrator</i>            |                                  |                            |                         |                           | ✓           |
| velvet scoter          | <i>Melanitta fusca</i>            |                                  |                            | ✓                       |                           | ✓           |
| common scoter          | <i>Melanitta nigra</i>            |                                  |                            |                         | ✓                         |             |
| shelduck               | <i>Tadorna tadorna</i>            |                                  |                            |                         | ✓                         |             |

Tentsmuir National Nature Reserve – The Reserve Story

| Common name         | Scientific name              | *Wildlife & Countryside Act 1981 | European protected species | **Red data book species | Biodiversity Action Plans |             |
|---------------------|------------------------------|----------------------------------|----------------------------|-------------------------|---------------------------|-------------|
|                     |                              |                                  |                            |                         | UK wide                   | Local plans |
| goose-ander         | <i>Mergus merganser</i>      |                                  |                            |                         |                           | ✓           |
| oystercatcher       | <i>Haematopus ostralegus</i> |                                  |                            |                         | ✓                         |             |
| grey plover         | <i>Pluvialis squatarola</i>  |                                  |                            |                         | ✓                         | ✓           |
| sanderling          | <i>Calidris alba</i>         |                                  |                            |                         | ✓                         |             |
| dunlin              | <i>Calidris alpina</i>       |                                  |                            |                         | ✓                         | ✓           |
| long tailed duck    | <i>Clangula hyemalis</i>     |                                  |                            | ✓                       |                           |             |
| corncrake           | <i>Crex crex</i>             |                                  |                            |                         |                           | ✓           |
| reed bunting        | <i>Emberiza schoeniclus</i>  |                                  |                            |                         |                           | ✓           |
| spotted flycatcher  | <i>Muscicapa striata</i>     |                                  |                            |                         |                           | ✓           |
| redshank            | <i>Ringa tetanus</i>         |                                  |                            |                         | ✓                         |             |
| black-tailed godwit | <i>Limosa limosa</i>         |                                  |                            | ✓                       |                           |             |
| goldeneye           | <i>Bucephala clangula</i>    |                                  |                            | ✓                       |                           | ✓           |

\*This is the major legal instrument for wildlife protection in the UK.

\*\*Red Data Books are an established method of presenting information about the status of the rarest and most threatened animals and plants.

## APPENDIX 6 – UK and local biodiversity habitats

| HABITAT                                | UK BAP | Local BAP |
|--|--------|-----------|
| boundary and linear features           | ✓      |           |
| bracken                                | ✓      |           |
| broadleaved, mixed and yew woodland    | ✓      |           |
| coniferous woodland                    | ✓      |           |
| dwarf shrub heath                      | ✓      |           |
| fen, marsh and swamp                   | ✓      |           |
| littoral sediment                      | ✓      |           |
| rivers and streams                     | ✓      |           |
| standing open water and canals         | ✓      |           |
| coastal saltmarsh                      | ✓      |           |
| coastal sand dunes                     | ✓      |           |
| eutrophic standing waters              | ✓      |           |
| fens                                   | ✓      |           |
| mud habitats in deep water             | ✓      |           |
| mudflats                               | ✓      |           |
| reedbeds                               | ✓      |           |
| saline lagoons                         | ✓      |           |
| wet woodland                           | ✓      |           |
| coastal                                |        | ✓         |
| moorland                               |        | ✓         |
| standing water                         |        | ✓         |
| wetlands                               |        | ✓         |
| woodlands                              |        | ✓         |
| unimproved and semi improved grassland |        | ✓         |