

Site Name: Teesmouth and Cleveland Coast **Unitary Authority:** Hartlepool; Middlesbrough; Redcar and Cleveland; Stockton-on-Tees

Status: Site of Special Scientific Interest (SSSI) notified under section 28C of the Wildlife and Countryside Act 1981

Local Planning Authority: Hartlepool Borough Council; Middlesbrough Council; Redcar and Cleveland Borough Council; Stockton-on-Tees Borough Council; Tees Valley Combined Authority

Ordnance Survey 1:50,000 sheets: 93 **National Grid reference:** NZ535526

Notification date: 31 July 2018 **Area:** 2,964.37 ha

Reasons for notification

The Teesmouth and Cleveland Coast SSSI is of special interest for the following nationally important features that occur within and are supported by the wider mosaic of coastal and freshwater habitats:

- Jurassic geology;
- Quaternary geology;
- sand dunes;
- saltmarshes;
- breeding harbour seals *Phoca vitulina*;
- breeding avocet *Recurvirostra avosetta*, little tern *Sternula albifrons* and common tern *Sterna hirundo*;
- a diverse assemblage of breeding birds of sand dunes, saltmarsh and lowland open waters and their margins;
- non-breeding shelduck *Tadorna tadorna*, shoveler *Spatula clypeata*, gadwall *Mareca strepera*, ringed plover *Charadrius hiaticula*, knot *Calidris canutus*, ruff *Calidris pugnax*, sanderling *Calidris alba*, purple sandpiper *Calidris maritima*, redshank *Tringa totanus* and Sandwich tern *Thalasseus sandvicensis*;
- an assemblage of more than 20,000 waterbirds during the non-breeding season; and
- a diverse assemblage of invertebrates associated with sand dunes.

General description

The Teesmouth and Cleveland Coast SSSI is an extensive mosaic of coastal and freshwater habitats centred on the Tees Estuary. These include sand dunes, saltmarshes, mudflats, rocky and sandy shores, saline lagoons, grazing marshes, reedbeds and freshwater wetlands. The site stretches from Crimdon Dene Mouth in the north, to Marske in the south, inland to Billingham and upstream to the Tees Barrage.

The Tees is one of the most heavily modified estuaries in the country and has lost the majority of its former intertidal habitat to land claim. The semi-natural habitats that remain are nestled amongst significant industrial development, including one of the United Kingdom's busiest container ports and a large proportion of its chemical processing industry, and are surrounded by urban settlements.

The SSSI includes the whole of the Tees Estuary, from its mouth between North Gare and South Gare, upstream to the tidal limits of the Tees and Greatham Creek. This contains a large area of intertidal mud and saltmarsh. The coastal strip is predominantly sandy but includes rocky foreshores as well as areas of muddier substrate and an area with peat deposits, including the remains of a submerged forest. There are large dune systems on either side of the estuary mouth: Seaton Dunes to the north of the Tees and Coatham Dunes to the south. Flanking the estuary are extensive areas of wet grassland and freshwater pools, together with smaller patches of a wide range of different habitats including reedbed, saline lagoons and brownfield grassland.

Jurassic geology

The foreshore exposures between Redcar Rocks and Coatham Rocks demonstrate a Lower Jurassic succession that ranges from the Liassic Zone of the Hettangian Stage through to the Margaritatus Zone of the lower portion of the Pliensbachian Substage. The succession also includes much of the Lower Sinemurian and intermittent exposures of parts of the Upper Sinemurian substages. These are the most northerly extensive exposures of the Lower Jurassic in England. Although the higher parts of the succession are closely similar to those exposed further south in Robin Hood's Bay, the mid-Hettangian to Lower Sinemurian part is only exposed at Redcar Rocks, which are dominated by silty mudstones and few limestones, contrasting markedly with the successions of the same age to the south of the Market Weighton Axis. There, the Blue Lias Formation comprises numerous beds of limestone interbedded with mudstones.

In addition to ammonites, the Hettangian and Lower Sinemurian portions of the succession contains a diverse fossil invertebrate assemblage that includes at least 44 species of bivalve, 29 species of gastropods and scaphopods, as well as brachiopods, corals, echinoderms and annelids. The vertebrae and teeth of ichthyosaurs and plesiosaurs also occur, as do the teeth of the fishes *Hybodus* and *Acrodus*. The sequence of ammonite faunas present indicates that the Hettangian-Lower Sinemurian part of the succession is remarkably complete and represents the best Hettangian-Sinemurian boundary section in northern Britain. Within the Hettangian part of the succession, a complete sequence of Angulata Zone ammonite assemblages is likely to be present, while a virtually complete Scipionium to Sauzeanum subzone sequence is present.

Redcar Rocks has potential as a key Hettangian-Sinemurian sequence and complements the better-known Robin Hood's Bay succession where the basal Sinemurian and Hettangian stages are not exposed. In particular, the Semicostatum Zone sequence is one of the best developed anywhere within the Northwest European Province.

Quaternary geology

Tees Bay includes a feature known as the 'submerged forest' which has been well studied on the foreshore at Hartlepool between Carr House Sands and just north of Newburn Bridge but which is also exposed south of Teesmouth on the foreshore at Redcar. On the Hartlepool foreshore there is complex of peats, estuarine and marine sediments deposited during the Holocene, which overlie glacial deposits from the Devensian (last Ice Age). Within the peats there are tree stumps and branches from oak, pine and birch within a discontinuous band of peat.

Palaeoenvironmental reconstructions indicate that environments range from former ground surfaces to estuarine environments to marine clastic (composed of fragments of pre-existing minerals or rocks) environments during the mid-Holocene marine transgression. Further phases of sea level rise are recorded by layers of mud and silt within the upper peat bed. The radiocarbon dated sequence contains pollen, diatoms, plant remains and bones of ruminants as well as flint artefacts and charcoal. This evidence of human occupation dates from the Mesolithic to the Romano-British periods, with charcoal and weed pollen indicating the influence of early Neolithic clearances.

Hartlepool is a nationally important site for its geology due to its rich palaeoenvironmental records which indicate fluctuations in relative sea level during the Holocene, from approximately 7,000 to 2,000 years BP. It is also a key archaeological site recording phases of land clearance and human occupation. The location of Hartlepool on the fulcrum between areas of crustal uplift to the north and subsidence to the south makes the site particularly important in interpreting relative sea level change during the Holocene.

Saltmarsh

The Tees Estuary supports the largest area of saltmarsh between Lindisfarne and the Humber Estuary. Its saltmarshes show a succession of vegetation types, from pioneer marshes of glassworts *Salicornia* species and annual sea-blite *Suaeda maritima*, through common saltmarsh-grass *Puccinellia maritima* communities, to stands dominated by common couch *Elytrigia repens* and its hybrid with sea couch *Elytrigia atherica*, *Elytrigia x drucei*, at the limit of tidal influence. The common saltmarsh-grass communities are diverse and sea aster *Aster tripolium*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima* provide a colourful late summer display.

The most extensive area of saltmarsh occurs on Greatham Creek between the Hartlepool-Billingham railway line and the A178 road bridge. This has recently been enlarged by a managed realignment of the northern sea wall, which was breached in 2014. The new intertidal area is actively developing and currently supports extensive stands of annual sea-blite and glassworts. The southern bank is also subject to a managed realignment, which will be breached in 2018.

There are three other significant stands of saltmarsh within the site where sediment has accumulated in the shelter of coastal infrastructure: at Seaton Snook, South Gare and the Seal Sands Peninsula. They are currently dominated by pioneer saltmarsh communities.

Sand dunes

The site supports an extensive complex of dunes flanking both side of the Tees estuary. It is the largest dune complex between Druridge Bay and Spurn Point. The dunes support a large area of semi-natural vegetation, including the typical succession from strandline through foredunes and mobile dunes to fixed dune grassland, as well as transitions to wetter habitats.

There are two main dune systems: Seaton Dunes to the north of the Tees, and Coatham Dunes to the south. The structure and geomorphology of both systems has been heavily influenced by a long history of human intervention, including sand extraction. Most significant has been the construction of two large breakwaters (North Gare and South Gare), which guard the entrance to the estuary. They have a strong influence on sediment dynamics and result in both dune systems showing a combination of the features of bay and spit dune systems.

Small pockets of strandline vegetation occur throughout the site and occasionally include sea sandwort *Honckenya peploides* and sea rocket *Cakile maritima*. Foredunes of sand couch *Elytrigia juncea* are much more extensive and grade into mobile dunes with stands dominated by both marram *Ammophila arenaria* and lyme-grass *Leymus arenarius*. As conditions ameliorate in the semi-fixed dunes the dominance of marram and lyme-grass wanes and other plants such as red fescue *Festuca rubra*, ragwort *Senecio jacobaea* and common cat's-ear *Hypochaeris radicata* become prominent. The band of mobile and semi-fixed dunes around the Tees Estuary is quite narrow in comparison with some dune systems due to the relative stability of the coast.

The bulk of the dunes are covered with extensive stands of fixed dune grassland and in some places this has developed on base-rich slag. The dune grassland includes some diverse swards with herbs such as common bird's-foot trefoil *Lotus corniculatus*, lady's bedstraw *Galium verum*, fairy flax *Linum catarticum* and common restharrow *Ononis repens* forming a prominent component. They also support a number of scarce and threatened species, including purple milk-vetch *Astragalus danicus*, lesser meadow-rue *Thalictrum minus*, field mouse-ear *Cerastium arvense* and carline thistle *Carlina vulgaris*. In contrast there are also large areas with a coarse sward dominated by false oat-grass *Arrhenatherum elatius*.

There are a number of damp depressions ('slacks') in both dune systems, which support a range of wetter vegetation types, usually with a sward dominated by mixtures of red fescue, Yorkshire fog *Holcus lanatus* and creeping bent *Agrostis stolonifera*. Creeping willow *Salix repens* is extremely scarce in the Tees Estuary and so does not form a regular component of the dune slacks in contrast to many dunes systems. A particularly prominent feature of some of the slacks are large and colourful stands of marsh orchids *Dactylorhiza* species and their hybrids. Some of the slacks show affinities with saltmarsh vegetation, with a selection of salt tolerant species such as saltmarsh rush *Juncus gerardii*, sea plantain *Plantago maritima* and sea-milkwort *Glauca maritima*, and are likely to have been derived from the isolation of saltmarsh vegetation by developing dunes. More consistently wet slacks support swamp communities. Fertile feather moss *Drepanocladus polygamus* and flat-sedge *Blysmus compressus* occur in some of the slacks.

Harbour seal

Harbour seals *Phoca vitulina* (also known as common seal) have lived at the mouth of the River Tees for hundreds of years but were lost from the estuary for much of the 20th century, principally due to pollution. They recolonised the estuary in the 1980s and have subsequently established a regular breeding colony. Harbour seals are present in the estuary and the tidal Tees throughout the year, with regular haul outs at Greatham Creek and Seal Sands. Pupping tends to occur in June and July on the intertidal mud of Seal Sands.

Breeding birds

The Teesmouth and Cleveland Coast SSSI is nationally important for breeding avocet *Recurvirostra avosetta*, little tern *Sternula albifrons* and common tern *Sterna hirundo*, and for its diverse assemblage of breeding birds associated with sand dunes, saltmarsh and lowland open waters and their margins.

Avocets were first confirmed breeding on the estuary in 2008 and numbers have subsequently increased. They nest at a range of sites, with Number 4 Brinefield, Greenabella Marsh and RSPB Saltholme regularly used.

Little terns formerly nested in the site in large numbers but since the late 1990s they have largely relocated to a large colony at Crimdon, just to the north of the Tees in the adjacent Durham Coast SSSI. Small numbers of birds have bred at South Gare in recent years. The site remains a critical foraging area for little tern and supports important pre- and post-breeding gatherings.

The majority of common tern breed on islands and artificial rafts within the RSPB Saltholme reserve, with small numbers scattered at a number of other locations around the estuary. They feed out at sea as well as along the tidal Tees and its main tributaries.

The extensive sand dunes, saltmarsh and wetlands across the site support a diverse assemblage of breeding birds. In addition to avocet and little and common terns, this includes a number of scarce and declining species, such as shoveler *Spatula clypeata*, pochard *Aythya ferina*, ringed plover *Charadrius hiaticula* and little ringed plover *C. dubius*.

Non-breeding birds

The extensive areas of open water, grazing marsh and intertidal habitat provide safe feeding and roosting sites for large numbers of waterbirds throughout the year. The site is of special interest for ten species (shelduck *Tadorna tadorna*, shoveler, gadwall *Mareca strepera*, ringed plover, knot *Calidris canutus*, ruff *Calidris pugnax*, sanderling *Calidris alba*, purple sandpiper *Calidris maritima*, redshank *Tringa totanus* and Sandwich tern *Thalasseus sandvicensis*) and an assemblage of over 20,000 non-breeding waterbirds in the non-breeding season. The assemblage comprises a wide variety of waterbirds, including (in addition to the aforementioned species that are reasons for notification in their own right), large numbers of wigeon *Mareca penelope*, lapwing *Vanellus vanellus*, black-headed gull *Chroicocephalus ridibundus* and herring gull *Larus argentatus*. Shoveler, gadwall and ruff are predominantly associated with the extensive freshwater wetlands of the site, while ringed plover, knot, sanderling, purple sandpiper and Sandwich tern mostly use the open coast. Redshank are widespread across the site, but the greatest foraging concentrations occur, along with the largest numbers of shelduck, on the intertidal mud of Seal Sands and Greatham Creek. Seal Sands and Bran Sands are also regularly used by ringed plover and knot.

Invertebrates

The extensive complex of sand dunes within the site supports a nationally important invertebrate assemblage, including at least 14 threatened species. The assemblage is diverse and makes use of a wide range of niches, with a strong dependency on open but consolidated sand exposures within which to nest and hunt, as well as on flower-rich swards for nectar and pollen gathering. The assemblage does not include a high number of rarities but is a good example of its type in the north of its range. As such, species such as the tephritid fly *Acanthiophilus helianthi*, whose larvae feed within the capitula of carline thistle, occur towards the northern edge of their British range. The grayling butterfly *Hipparchia semele* is found here and remains a scarce species on this north-eastern coastal strip.