Teesmouth and Cleveland Coast SSSI

Supporting Information

A supplement to the notification document

Issued by Natural England's Northumbria Area Team on **31 July 2018**

Contact points and further information

This supplementary information to the Teesmouth and Cleveland Coast SSSI notification document is issued on request by Natural England's Northumbria Area Team and is intended to be read in conjunction with the notification document for owners, occupiers and other notified parties. Our address for correspondence is:

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Contents

1. Summary

The Teesmouth and Cleveland Coast SSSI is notified under section 28C of the Wildlife and Countryside Act 1981 (as amended). The site supports a complex of coastal habitats, including sand dunes, saltmarshes, mudflats, grazing marshes and freshwater wetlands. It is of special interest for the following nationally important features:

- Jurassic geology;
- Quaternary geology;
- sand dunes;
- saltmarsh;
- breeding harbour seal;
- breeding avocet, common tern, little tern and a diverse assemblage of breeding birds of sand dunes, saltmarshes and lowland water and their margins;
- ten non-breeding waterbird species (Sandwich tern, redshank, knot, ruff, ringed plover, sanderling, purple sandpiper, shoveler, shelduck and gadwall) and an assemblage of over 20,000 non-breeding waterbirds; and
- a diverse assemblage of invertebrates associated with sand dunes;

Parts of the previously notified Seal Sands SSSI are not considered to be of special interest. Accordingly, these areas are proposed for de-notification under section 28D of the Wildlife and Countryside Act 1981.

2. Information used to support the selection of the Teesmouth and Cleveland Coast SSSI

Feature	Data Source	Author	Date	Content
General	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapters: 1a. Coastlands; 13. Mammals; 17. Invertebrates. Nature Conservancy Council (NCC), Peterborough	Nature Conservancy Council	1989	National selection guidelines for biological SSSIs. Re-published online by JNCC in 2012: http://jncc.defra.gov.uk/page-2303
	British Plant Communities: Volume 3: Grasslands and Montane Communities. Cambridge University Press	Rodwell, J.S. (ed).	1992	National Vegetation Classification (NVC) for lowland grassland communities
	British Plant Communities. Volume 4: Aquatic communities, swamps and tall-herb fens. Cambridge University Press.	Rodwell, J.S. (ed).	1995	National Vegetation Classification (NVC) for aquatic communities, swamps and tall-herb fens
	British Plant Communities. Volume 5: Maritime communities and vegetation of open habitats. Cambridge University Press.	Rodwell, J.S. (ed).	2000	National Vegetation Classification (NVC) for maritime communities and vegetation of open habitats
	Guidelines for the removal of an SSSI notification (de-notification).	English Nature	2005	National guidelines for identifying cases where de-notification may be appropriate
	National Character Area Profile: 23 Tees Lowlands (NE439). Published online: http://publications.naturalengland.org.uk/publication/9860030	Natural England	2013	Description of the environmental characteristics of the Tees Lowlands
	Revised Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection. JNCC, Peterborough. Published online: http://jncc.defra.gov.uk/pdf/SSSI_GuidelinesPart1_PUBLICATION_Dec2013v2.pdf	Bainbridge, I., Brown, A., Burnett, N., Corbett, P., Cork, C., Ferris, R., Howe, M., Maddock, A. & Pritchard, S. (eds)	2013	National selection guidelines for biological SSSIs
	NVC Survey to Inform Review of Protected Sites around Teesside	Hedley, S.	2015	Mapping and description of vegetation across the estuary

Feature	Data Source	Author	Date	Content
	NVC Survey of the Cleveland Golf Course	Hedley, S.	2017	Vegetation survey at Cleveland Golf Course and updated areas for coastal communities across the estuary
Geology	An Introduction to the Geological Conservation Review. Geological Conservation Review Series. JNCC, Peterborough. http://jncc.defra.gov.uk/page-2965	Ellis, N.V. (ed.), Bowen, D.Q., Campbell, S., Knill, J.L., McKirdy, A.P., Prosser, C.D., Vincent, M.A. & Wilson, R.C.L.	1996	Background to the Geological Conservation Review
	Quaternary of Northern England. Geological Conservation Review Series No. 25. JNCC, Peterborough. http://jncc.defra.gov.uk/page-2990	Plater, A.	2002	Detailed description and justification for inclusion of Hartlepool in the Geological Conservation Review
	British Lower Jurassic Stratigraphy. Geological Conservation Review Series No. 30. JNCC, Peterborough. http://jncc.defra.gov.uk/page-2959	Simms, M.J., Chidlaw, N., Morton, N. & Page, K.N	2004	Detailed description and justification for inclusion of Redcar Rocks in the Geological Conservation Review
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Jurassic geology	Evans, D.	2018	Support for notifying the site from Natural England's senior stratigrapher
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Quaternary geology	Brown, E.	2018	Support for notifying the site from Natural England's senior Quaternary geology and Landforms specialist
Saltmarsh	Greatham Creek North (Monitoring). Report for Environment Agency	Ecus Ltd.	2015	Description of vegetation at Greatham North / Saltern Wetlands
	Greatham Creek Saltmarsh Monitoring. Report for Environment Agency	Ecus Ltd.	2016	Description of vegetation at Greatham North / Saltern Wetlands
	Greatham Creek Saltmarsh Monitoring, 2017. Report for Environment Agency	Ecus Ltd.	2017	Description of vegetation at Greatham North/ Saltern Wetlands
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Saltmarsh	Rees, S.	2018	Support for notifying the site for saltmarsh from Natural England's senior coastal specialist
Sand dunes	National Sand Dune Vegetation Survey. Site Report No. 38. Tees Bay Dunes, Cleveland. NCC report	Woolven, S.C. & Radley, G.P.	1988	Description of the Tees Bay dunes

Feature	Data Source	Author	Date	Content
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Sand Dunes	Rees, S.	2018	Support for notifying the site for sand dunes from Natural England's senior coastal specialist
Harbour seal	Scientific Advice on Matters Related to the Management of Seal Populations: 2016. http://www.smru.st-andrews.ac.uk/files/2017/04/SCOS-2016.pdf	Special Committee on Seals	2016	National distribution and population levels
	Tees Seals Research Programme Monitoring Report No. 29 (1989-2017). Industry Nature Conservation Association. Published online: http://www.inca.uk.com/wp-content/uploads/2017/11/Teesmouth-Seals-Report-2017-final.pdf	Bond, I.	2017	Counts of harbour seal on the Tees Estuary from 1989 – 2017
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for harbour seal	Walker, R.	2018	Support for notifying the site for harbour seal from Natural England's senior marine mammal specialist
Birds	Population Estimates of birds in Great Britain and the United Kingdom. *British Birds* **106**: 57-102. https://www.britishbirds.co.uk/wp-content/uploads/2010/12/APEP3.pdf	Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. & Stroud, D.	2013	National population levels
	Quantifying usage of the marine environment by terns *Sterna* sp. around their breeding colony SPAs. JNCC Report No. 500. http://jncc.defra.gov.uk/page-6644	Wilson, L.J., Black, J., Brewer, M.J., Potts, J.M., Kuepfer, A., Win, I., Kober, K., Bingham, C., Mavor, R. & Webb, A.	2014	Estimates of common tern foraging range
	Tees Estuary Inter-tidal Project 2014: Report ER15-273	Ecospan	2015	Condition of intertidal habitats for waterbirds
	Teesmouth National Nature Reserve Breeding Bird Survey 2015	Wilson, S.G.	2015	Breeding records for Teesmouth NNR

Feature	Data Source	Author	Date	Content
	Quantifying foraging areas of little tern around its breeding colony SPA during chick-rearing. JNCC Report No. 548. http://jncc.defra.gov.uk/page-6976	Parsons, M., Lawson, J., Lewis, M., Lawrence, R. & Kuepfer, A.	2015	Estimate of little tern foraging range from the Crimdon colony
	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17. Birds. JNCC, Peterborough. http://jncc.defra.gov.uk/pdf/SSSI_Chptr17_Birds2015June.pdf	Drewitt, A.L., Whitehead, S. & Cohen, S.	2015	National selection guidelines for SSSIs for birds
	Tern verification surveys for marine sites 2015 (NECR212) http://publications.naturalengland.org.uk/publication/6688364374786048	ECON	2016	Verification that common tern use the modelled foraging area
	Industry Nature Conservation Association (INCA) (2016). INCA 201614. Report to Natural England	INCA	2016	Verification that common tern use the modelled foraging area
	Wetland Bird Survey custom data supply for Teesmouth and Cleveland Coast SSSI (2011/12 - 2015/16)	BTO	2017	Population estimates of non-breeding waterbirds using the Teesmouth and Cleveland Coast SSSI
	RSPB Saltholme Annual Report for 2017	RSPB	2018	Breeding records for the RSPB reserves around the Tees Estuary
	Cleveland Bird Club Reports 2010-2017	Teesmouth Bird Club	2011-2018	Summary and analysis of bird records around the Tees Estuary
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Birds and the denotification of part of Seal Sands SSSI	Drewitt, A.	2018	Support for notifying the site for birds and denotifying a small section of part of Seal Sands SSSI from Natural England's senior ornithological specialist
Invertebrates	Invertebrate survey of sites around Teesside. Report to Natural England	Godfrey, A.	2015	Description of invertebrate communities around the Tees Estuary
	Invertebrate survey of Lindisfarne National Nature Reserve. Report to Natural England	Godfrey, A.	2015	Description of invertebrate communities on Lindisfarne National Nature Reserve

Feature	Data Source	Author	Date	Content
	Pantheon - database version 3.7.4 [online] Available at: http://www.brc.ac.uk/pantheon/ [Accessed July 2017]	Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M.C., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. & Foster, G.	2017	Online database tool for analysing invertebrate sample data
	Specialist support for notification of Teesmouth and Cleveland Coast as a SSSI for Invertebrates	Heaver, D.	2018	Support for notifying the site for invertebrates from Natural England's senior invertebrate specialist

3. Explanation of how the Teesmouth and Cleveland Coast meets the SSSI selection guidelines

This section explains how the information listed in section 2 has informed the decision to notify the SSSI, according to the *Guidelines for the selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection* (JNCC, 2013) and *Part 2: Detailed guidelines for habitats and species groups*, hereafter referred to as 'the Guidelines'; and according to the selection guidelines listed in *An Introduction to the Geological Conservation Review* (Ellis *et al.*, 1996).

3.1 Geology

The Geological Conservation Review (GCR) systematically assessed sites to identify key localities that aid the interpretation of the geological evolution of Great Britain. Each GCR site demonstrates a unique and/or representative feature of this geological evolution, and the relationship between sites is particularly important in building up a picture of landscape evolution, and biological and environmental change over time.

All SSSIs with a geological interest have been assessed through the GCR process and sites described in the Review are eligible for selection on the basis of one or a number of the following categories:

(1) Sites of importance to the international (**I**) community of Earth scientists.
(2) Sites that are scientifically important because they contain exceptional (**E**) features.
(3) Sites that are nationally important because they are representative (**R**) of an Earth science feature, event or process that is fundamental to Britain's Earth history.

The Teesmouth and Cleveland Coast SSSI supports two GCR sites (see Table 1 and the detailed descriptions below). These were features of two of the previously notified SSSIs: Hartlepool Submerged Forest SSSI (supporting the Hartlepool GCR site) and Redcar Rocks SSSI (Redcar Rocks GCR site).

Table 1 GCR sites within the Teesmouth and Cleveland Coast SSSI

GCR Site Name	GCR Network	Number of sites in Network	Criteria that site meets			Explanation
			I	E	R	
Redcar Rocks	Hettangian, Sinemurian and Pliensbachian	30	-	-	X	The Hettangian and early Sinemurian successions are lithologically distinct from those south of the Markey Weighton Axis and otherwise largely unexposed within the Cleveland Basin, except between Redcar Rocks and Cotham Rocks where a very complete sequence of ammonite assemblages facilitates correlation and comparison with successions of the same age in the rest of Britain and more broadly across the Northwest European Province.
Hartlepool	Quaternary of North-East England	30	-	X	X	Hartlepool Bay records sea level and coastal change during the Holocene, in a key area of the country between areas of crustal uplift to the north and subsidence to the south.

3.1.1 Hettangian, Sinemurian and Pliensbachian

The rocks exposed on the foreshore between Redcar Rocks and Coatham Rock at Redcar, provide exposures of fossiliferous mudstones and siltstones belonging to the Redcar Mudstone Formation; deposited in the Cleveland Basin, to the north of the Market Weighton High during the Early Jurassic, approximately 201-189 million years ago. The Redcar Mudstone Formation contains a diverse assemblage of fossil molluscs including a very complete sequence of ammonite assemblages that are of significance in providing correlations with other successions within the Northwest European Province.

The succession between Redcar Rocks and Coatham Rock complements the sequence exposed further south at Robin Hood's Bay: Maw Wyke to Beast Cliff SSSI since it provides access to rocks of Hettangian and early Sinemurian age that are not exposed at Robin Hood's Bay. With the exception of the earliest Hettangian, between them, these two sites provide access to the whole Hettangian to Pliensbachian succession within the Cleveland Basin, facilitating the comparison and correlation of this lithologically distinct succession with those south of the Market Weighton Axis as well as that of the Hebrides Basin in Northwest Scotland.

3.1.2 Quaternary of North-East England

Hartlepool provides important stratigraphical evidence for Holocene sea-level changes in eastern England. The interest comprises a sequence of inorganic and organic deposits, including a peat bed, in the intertidal area. The deposits have yielded pollen, molluscs and archaeological remains, which together with radiocarbon dating, have been used to establish the pattern of relative sea-level change over the last 7000 years. The site is also noted for its submerged forest, which is one of the best known and most extensive in Northern England.

3.2 Coastal habitats

The principal coastal habitats of special interest in the SSSI are saltmarsh and sand dunes. Selection of these habitats is covered by Chapter 1 (Coastlands) of Part 2 of the Guidelines.

The Guidelines (Part 2, Chapter 1, section 1.1) state that:

> 'Coastal habitats are classified into four main types - saltmarshes, sand-dunes, shingle beaches, and seacliffs and slopes.'

They go on to state that (Part 2, Chapter 1, section 1.4):

> 'Representation of plant communities (based upon National Vegetation Classification [NVC] communities where the classification is available) within each of the four main coastal habitats should form the basis for choosing sites within each AOS [Area of Search]…The most important sites are … those with some or all of the following attributes:
>
> 1.4.1 the widest range and the best examples of the main NVC communities and of other coastal vegetation types not described in the NVC;
> 1.4.2 a complete succession or zonation, including pioneer and mature communities;
> 1.4.3 transitions to other, terrestrial vegetation types;
> 1.4.4 a large area or lateral extent (in continuous or discrete units depending on the degree of natural or man-made interruptions);
> 1.4.5 important physiographic features.'

And that (Part 2, Chapter 1, section 3.4):

> 'Combinations of saltmarsh and sand-dune (also with shingle in certain places) are especially interesting for the study of coastal processes.'

3.2.1 Saltmarsh

Saltmarshes are nationally and internationally important intertidal habitats that exhibit a range of vegetation types resulting from the deposition of fine sediments by coastal processes. The Teesmouth and Cleveland Coast SSSI includes all of the significant stands of saltmarsh in the Tees Estuary (see photograph 4 in section 9), which together cover over 50 ha (see Table 2 below). There are no other saltmarshes in the AOS, the Tees Lowlands National Character Area (NCA)[1], with the nearest extensive systems over 85 km to the North at Alnmouth Saltmarsh and Dunes SSSI (South East Northumberland Coastal Plain NCA) and over 130 km to the south east on the Humber Estuary SSSI (Humber Estuary NCA).

The Guidelines (Part 2, Chapter 1, section 3.3) state that:

> 'Saltmarshes form an important component of many large estuarine systems which are the wintering and migration haunts of internationally important populations of duck, geese and waders.'

And that (Part 2, Chapter 1, section 3.4):

> 'Combinations of saltmarsh and sand-dune (also with shingle in certain places) are especially interesting for the study of coastal processes.'

They give more detailed guidance for specific areas (Part 2, Chapter 1, section 3.5):

> '…For each geographical grouping, guidance on the minimum area above which sites should be selected is given. **Smaller sites can be selected where they are species-rich or have a better representation of NVC communities.'**

The Guidelines do not discourage selection of saltmarsh outside of these areas (detailed information was only available for some areas (Adam 1978) and so more specific criteria could only be developed for these). For outlying areas, the Guidelines (Part 2, Chapter 1, section 3.13) state that:

> 'If other saltmarsh communities, besides those mentioned above, occur in any geographical region but are not included within sites chosen for the main types, the best example in each AOS should be selected. Every saltmarsh sub-community of the NVC present in an AOS should also be represented, preferably by the best example. Quality should be assessed by

[1] National Character Areas (NCAs) divide England into 159 natural areas, each defined by a unique combination of landscape, biodiversity, geodiversity and economic and cultural activity. Teesmouth and Cleveland Coast SSSI lies within the Tees Lowlands NCA. NCAs are now used as 'areas of search' for the purposes of SSSI selection (where appropriate) in England. For more information on NCAs, see https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making

size and floristic richness. In practice such outliers will almost certainly occur in sites selected for other interests, notably estuarine birds.'

The Tees Estuary supports the largest area of saltmarsh between Lindisfarne and the Humber Estuary. Saltmarsh communities are found throughout the estuary, but there are five significant stands (see Table 2 and the map in section 8). The main area (>35 ha) of saltmarsh on the estuary occurs along the margins of Greatham Creek, upstream of Seal Sands. This is dominated by low-mid and mid-upper marsh communities, with only small stands of pioneer vegetation. The area of intertidal habitat has recently been increased by a managed realignment scheme undertaken by the Environment Agency. In September 2014 the flood defence embankment on the northern bank of Greatham Creek was breached just west of the A1198 road bridge, restoring approximately 22 ha of intertidal habitat (known as 'Greatham North' or the 'Saltern Wetlands'). Saltmarsh is developing rapidly and the area now supports large stands of pioneer marsh. Another managed realignment is due to be completed within the SSSI on Cowpen Marsh, opposite the Greatham North breach, in September 2018. There are three smaller stands of predominantly pioneer saltmarsh that have developed in the shelter of artificial breakwaters (at Seaton Snook, the Seal Sands Peninsula and South Gare). None of the saltmarshes have been grazed in recent times.

Table 2 Areas of saltmarsh vegetation within the Teesmouth and Cleveland Coast SSSI (as surveyed by Hedley 2015 and 2017)

Saltmarsh NVC community	Site					
	Greatham Creek	Greatham North	Seal Sands peninsula	Seaton Snook	South Gare	Total
SM8 Annual *Salicornia* salt-marsh community	0.14 ha	Present	0.12 ha	3.09 ha		3.35 ha
SM9 *Suaeda maritima* salt-marsh community	0.47 ha	Present	0.20 ha	0.10 ha	0.93 ha	1.70 ha
SM10 Transitional low-marsh vegetation with *Puccinellia maritima*, annual *Salicornia* species and *Suaeda maritima*			3.12 ha			3.12 ha
SM13a *Puccinellia maritima* salt-marsh community, sub-community with *Puccinellia maritima* dominant	3.42 ha					3.42 ha
SM13c *Puccinellia maritima* salt-marsh, *Limonium vulgare* - *Armeria maritima* sub-community	18.44 ha					18.44 ha
SM24 *Elymus pycnanthus* salt-marsh community	13.07 ha		0.50 ha		0.24 ha	13.81 ha
SM28 *Elymus repens* salt-marsh community	1.26 ha				Present	1.26 ha
Total	36.80 ha	22.00 ha	3.94 ha	3.19 ha	1.17 ha	45.1 ha[2]

[2] Large stands of grazing marsh that are isolated from tidal influence behind sea walls and which are therefore not 'active' saltmarsh have been excluded. The vegetation at Greatham North has been recorded at fixed point quadrats, but the site has not been mapped and so the area of the communities that are present is not known. 22 ha of intertidal was created at Greatham North. These data therefore represent the minimum areas present.

The Tees Estuary does not fall within the geographical groupings described in the Guidelines and so the criteria from the 'outliers' section of the saltmarsh guidelines are relevant.

The saltmarsh of the Tees Estuary meets the Guidelines by:

1. *Demonstrating the widest range and the best examples of the main NVC communities within the AOS*. The Tees Estuary includes all of the significant stands of saltmarsh within the AOS including the largest and most diverse stands.
2. *Demonstrating a complete succession or zonation of saltmarsh habitats*. The Tees Estuary marshes show a complete succession of communities from pioneer, through low-mid to mid-upper (see Table 2).
3. *Demonstrating a large area*. The Tees Estuary contains over 50 ha of saltmarsh (including the saltmarsh communities that have developed in Greatham North). This is the largest area of saltmarsh between Lindisfarne and the Humber Estuary.
4. *Demonstrating combinations of sand dune and saltmarsh*. There are transitions to sand dune at Seaton Snook, South Gare and on the Seal Sands.

3.2.2 Sand dunes

Sand dunes are nationally and internationally important habitats that exhibit a range of vegetation types resulting from the deposition of sand by coastal processes. The Teesmouth and Cleveland Coast SSSI includes a complex of sand dunes (see photograph 5 in section 9) that together form the Tees Bay Dune system and support over 180 ha of sand dune vegetation (see Table 3 below). There are no other sand dune systems in the AOS (Tees Lowland NCA). The Hart Warren dune system, which forms part of Durham Coast SSSI, is adjacent to the northern boundary of the Teesmouth and Cleveland Coast SSSI (in the Durham Magnesian Limestone Plateau NCA). The nearest extensive dune system to the south is much further away at Spurn Point, part of the Humber Estuary SSSI (Humber Estuary NCA), over 130 km to the south east.

The Guidelines (Part 2, Chapter 1, section 5.5) state that:

> 'As with salt marshes, sand-dunes need to be treated as whole ecosystems, with suites of plant communities in successional sequence characteristic of the particular region.'

And continue (Part 2, Chapter 1, section 5.6):

> '…Because of the truncation of many dune systems, caused by afforestation and other developments, sites with a complete succession from accreting foredune to stable dunes with grassland, heath or native scrub are of prime importance.'

The guidelines then describe more specific selection criteria (Part 2, Chapter 1, section 5.6):

> 'Within each AOS containing sand dune systems, the following are eligible for selection:
>
> 5.6.6 Except in the western and northern Highlands and Islands, any dune systems (excluding forest or enclosed grassland) exceeding 200 ha in area:
>
> 5.6.7 If not covered by 5.6.6, the largest dune systems with acidic, intermediate and calcareous substrates or representing different structural types.
>
> 5.6.8 The best example of any dune system containing plant sub-communities of Table 2b[3] [of the Guidelines] not represented by selection under 5.6.6 or 5.6.7 or occurring as better examples or in different combinations and relationships. These will be determined especially by extent, floristic richness and presence of community indicator species.

[3] Table 2b in Chapter 1 of the Guidelines was based on an early version of the NVC for maritime communities and vegetation of open habitats. Following the publication of the final version (Rodwell, 2000), the Joint Nature Conservation Committee has assessed table 2b against the published NVC. The published NVC equivalents of the communities listed in table 2b are now used when assessing sand dune habitats against the Guidelines.

5.6.9 The best combinations of dune with other coastal habitats (particularly saltmarsh or shingle).

…

5.6.12 It is important that within this selection the best examples of the range of physiographic features, representing the different processes of dune formation, are included.'

The 'Tees Bay Dunes' are a complex of dunes that stretch from the town of Seaton Carew, in the north, to the cliffs which rise up between Marske and Saltburn, in the south (see Woolven and Radley (1988) for more details). There are two breaks in the dunes, one natural (the mouth of the River Tees) and one manmade (the town of Redcar), which divide the complex into three main parts: Seaton Dunes; Coatham Dunes and Redcar/Marske dunes. There is also a small dune system that has developed in the shelter of the Seal Sands peninsula in the middle of the estuary. The Redcar/Marske dunes are a very narrow strip with their landward extent curtailed by built development, amenity grassland and intensive agriculture and they are not considered further in the assessment of special interest. However, their beach plain is still intact and continuous with the Coatham system to the north.

Table 3 Sand dune vegetation communities at Seaton Dunes and Coatham Dunes

Sand dune NVC community	**Site**			
	Seaton Dunes	**Seal Sands Peninsula**	**Coatham Dunes**	**Total**
SD2 *Honkenya peploides - Cakile maritima* strandline community	Present		Present	Present
SD4 *Elymus farctus* ssp. *boreali-atlanticus* foredune community	1.92 ha	0.06 ha	6.09 ha	8.07 ha
SD5 *Leymus arenarius* mobile dune community	0.03 ha	0.08 ha	1.85 ha	1.96 ha
SD6 *Ammophila arenaria* mobile dune community	7.02 ha	0.07 ha	13.00 ha	20.09 ha
SD7 *Ammophila arenaria - Festuca rubra* semi-fixed dune community	11.50 ha	0.37 ha	28.90 ha	40.77 ha
SD8 *Festuca rubra - Galium verum* fixed dune grassland	20.05 ha	0.60 ha	31.35 ha	52.00 ha
SD9 *Ammophila arenaria - Arrhenatherum elatius* dune grassland	12.78 ha	0.82 ha	47.33 ha	60.93 ha
SD16 *Salix repens - Holcus lanatus* dune-slack			0.98 ha	0.98 ha
SD19 *Phleum arenarium - Arenaria serpyllifolia* dune annual community	Present		Present	Present
Total	53.30 ha	2.00 ha	129.50 ha	184.80 ha[4]

Both Seaton and Coatham dunes are relatively large dune systems (supporting approximately 50 ha and 130 ha respectively of sand dune vegetation), despite historic losses to a range of developments, such as a caravan site, car parks and the tipping of iron waste slag. Despite their geomorphology being heavily modified, each with a long history of sea wall construction, culminating in the creation of large artificial breakwaters (the North and South 'Gares' respectively)

[4] The area of SD16 excludes stands that Hedley (2017) considered a very poor fit to the NVC and likewise the stands of SD17 are excluded. SD2 and SD19 both tend to occur in small stands and were not thoroughly mapped by Hedley (2015 and 2017) so areas for these communities are not given in the Table. These figures therefore represent the minimum areas present.

which strongly influence sediment dynamics and result in them both showing a combination of the features of bay and spit dune systems (Woolven & Radley 1988), the dune vegetation and large elements of successional stages have been maintained.

Seaton Dunes

Seaton Dunes stretch from Seaton Carew in the north to the mouth of the River Tees in the south. The frontal dunes are divided into two sections by the North Gare Breakwater (built in the late 19th century), which forms the north-western entrance to the Tees Estuary. Between Seaton Carew and the North Gare the dunes face the open sea and a series of accretion ridges are visible. To the south of the Gare the dunes face into the estuary and are much narrower and eroding. Behind the frontal dunes lies an area of gently undulating stable dune grassland, the majority of which is occupied by the Seaton Carew golf course. Towards the south end of the fixed dunes are a series of wetter depressions. Landward of the golf course the dunes merge into Seaton Common, an extensive area of grazing marsh.

Coatham Dunes

Coatham Dunes stretch south-east from the mouth of the River Tees to Redcar. The majority of the dunes have formed in the lee of the South Gare (which was constructed with tipped slag during the 1860s), with the shelter to the south and east of the breakwater encouraging the accumulation of sediment. The dune front of this main block faces into the North Sea. There is a much smaller section of dunes to the west of the Gare, behind Bran Sands, that faces into the estuary. The main, seaward-facing dunes consist of a single, broad ridge, for most of their length, with lower ground behind, including some damper depressions. The dunes behind Bran Sands also consist of a narrow single ridge. The inland dune structure of Coatham is hard to interpret, but does appear to show signs of large-scale sand extraction. Like Seaton Dunes to the north, a long-established golf course is present on the eastern third of Coatham Dunes.

Both Seaton and Coatham Dunes support a large area of semi-natural vegetation including a full succession of sand dune communities from strandline and foredunes to fixed dune grassland (see Table 3 and the map in section 8). The dune flora is rich and includes the nationally rare rush-leaved fescue *Festuca arenaria*, as well as purple milk-vetch *Astragalus danicus.* There are also a number of damp depressions in both dunes ('slacks'), which support a range of wetter vegetation types. Their margins show interesting transitions to drier dune communities. A particularly prominent feature of some of the slacks are large and colourful stands of common spotted and marsh orchids (and fragrant orchid in Coatham Dunes) and their hybrids. Some of the slacks support vegetation is well described by the descriptions of slack communities within the NVC, but some of the larger slacks show a closer affinity to saltmarsh vegetation, while others support swamp communities. Hedley (2015 & 2017) suggests that this variation in vegetation within slacks is likely to be the result of different modes of development. For example, isolation of saltmarsh vegetation from tidal influence by shifts in dune ridges is likely to result in a slack with affinities to saltmarsh, whereas erosion of the dune surface down to the water table (either by wind scour or through sand extraction) is likely to result in a more 'classic' slack community.

An interesting feature, perhaps expressed more strongly here than in other less modified dunes, is that the precise scale and sequence of vegetation types is the result of an interplay between anthropogenic (both historic and continuing) and ongoing natural influences. For example, in some areas tipped slag has been colonised by a sparse cover of plants, which due to the base-rich nature of the iron slag often includes a number of calcicoles such as yellow-wort *Blackstonia perfoliata* and blue fleabane *Erigeron acer*. Blown sand blurs the distinction between dune vegetation and these areas of slag resulting in some complex mosaics of vegetation.

The Guidelines encourage consideration of entire ecological units and supporting processes. In accordance with this approach, given the close proximity of Seaton, Seal Sands peninsula and Coatham dunes (<2 km apart, separated by the River Tees and with the Seal Sands peninsula dunes in between), shared sediment supply, mode of development, bird and invertebrate populations and similar vegetation types, they are considered together in this assessment as a single complex, the Tees Bay Dunes. The Tees Bay Dunes meet the Guidelines by:

1. *Representing the largest dune system with calcareous substrate in the AOS*. The Tees Bay Dunes are the only dune system in the Tees Lowlands NCA.
2. *Demonstrating the best combinations of dune with other coastal habitats (particularly saltmarsh or shingle)*. There are transitions to saltmarsh in the Seaton, Seal Sands Peninsula and Coatham Dunes.
3. *Demonstrating the best examples of the range of physiographic features, representing the different processes of dune formation*. The Tees Bay Dunes demonstrate two modes of dune formation – bay and spit.
4. *Demonstrating the widest range and the best examples of the main NVC communities within the AOS*. The Tees Bay Dunes include all of the significant stands of sand dune vegetation within the Tees Lowlands NCA including the largest and most diverse stands.
5. *Demonstrating a complete succession or zonation of sand dune habitats*. The Tees Bay Dunes support a complete succession of vegetation types from embryo to fixed dunes. They also include a number of transitions from various wet slack communities to dry dune communities.
6. *Demonstrating a large area*. The Tees Bay dunes support over 180 ha of sand dune vegetation.

3.3 Harbour seal

Harbour seals (also known as common seal) (see photograph 6 in section 9) have lived at the mouth of the River Tees for hundreds of years, but following rapid declines in the late 1800s, thought to be principally driven by pollution, they were lost as a breeding species by the 1930s. They recolonised the estuary in the 1980s, most likely due to environmental improvements, and have been monitored since 1989. The number of harbour seals using the estuary has risen over this time period and in 2017 there were 19 pups born on the estuary (see Figure 1) and a peak haul-out count (see Figure 2) of 128 (INCA 2017).

Figure 1 Number of harbour seal pups born on the Tees Estuary from 1989-2017. Reproduced from INCA (2017)

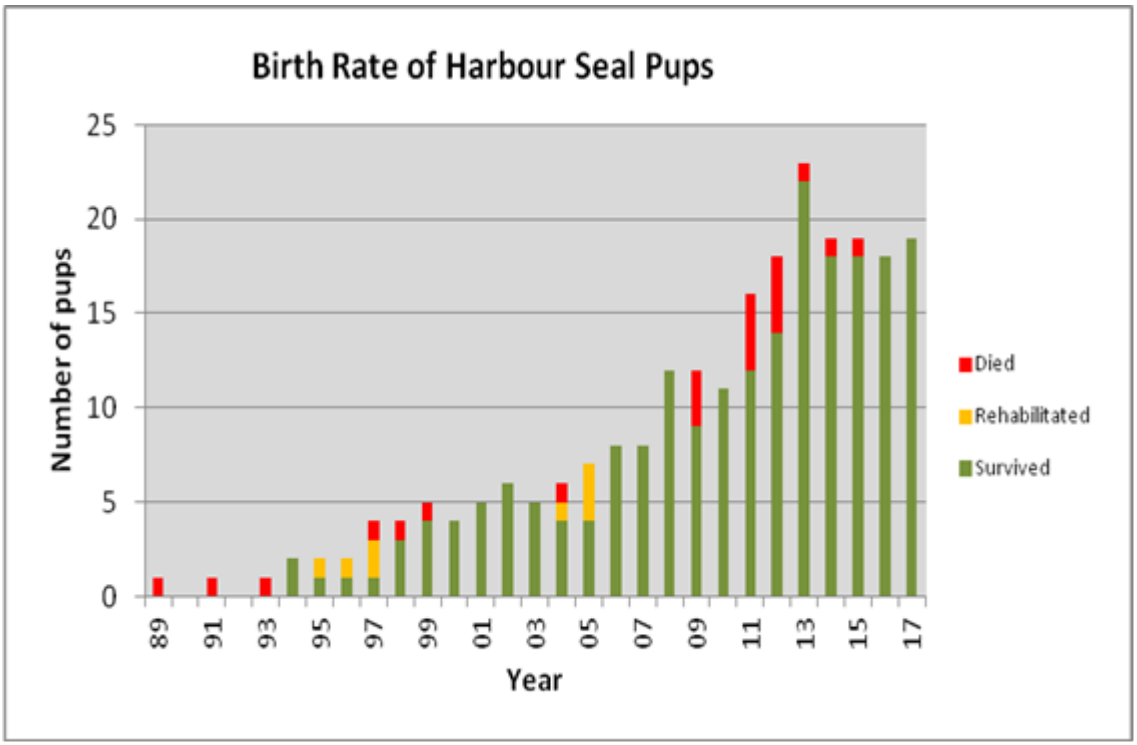
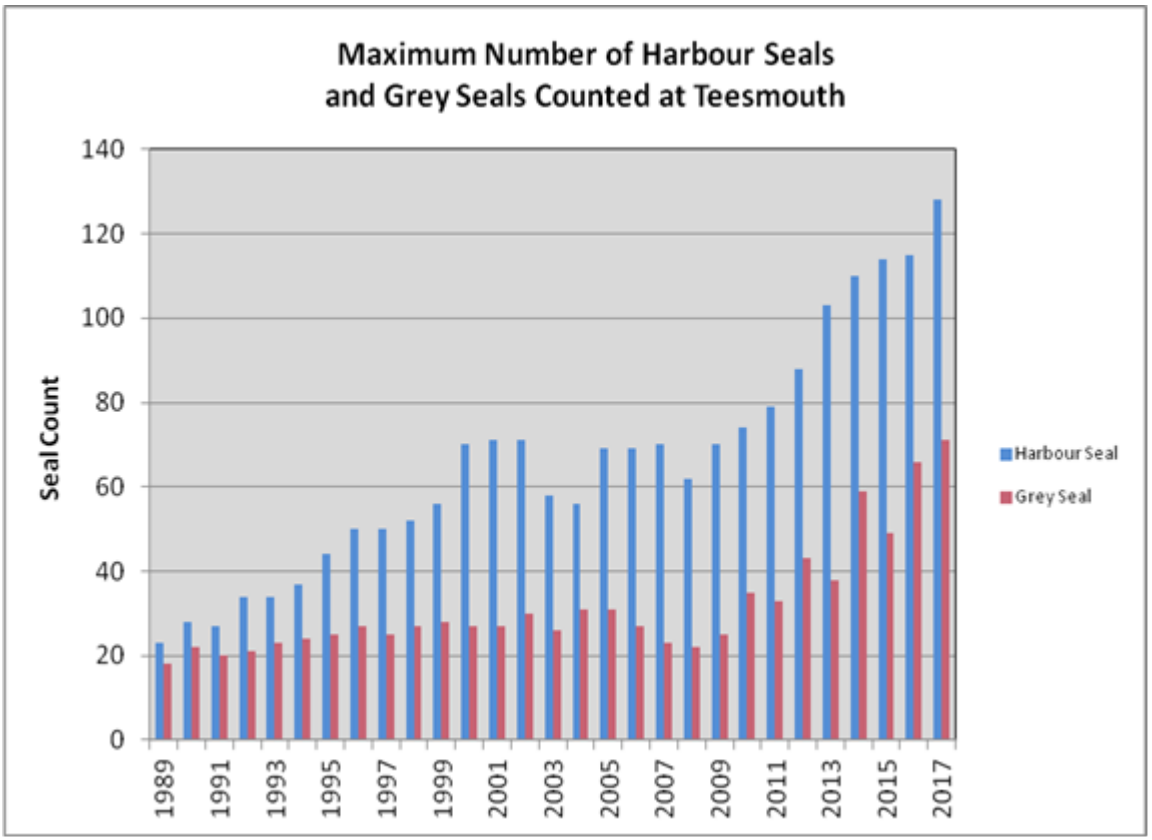


Figure 2 Maximum count of harbour and grey seals on the Tees Estuary from 1989 – 2017. Reproduced from INCA



The Guidelines (Part 2, Chapter 13, section 3.1.4) state that:

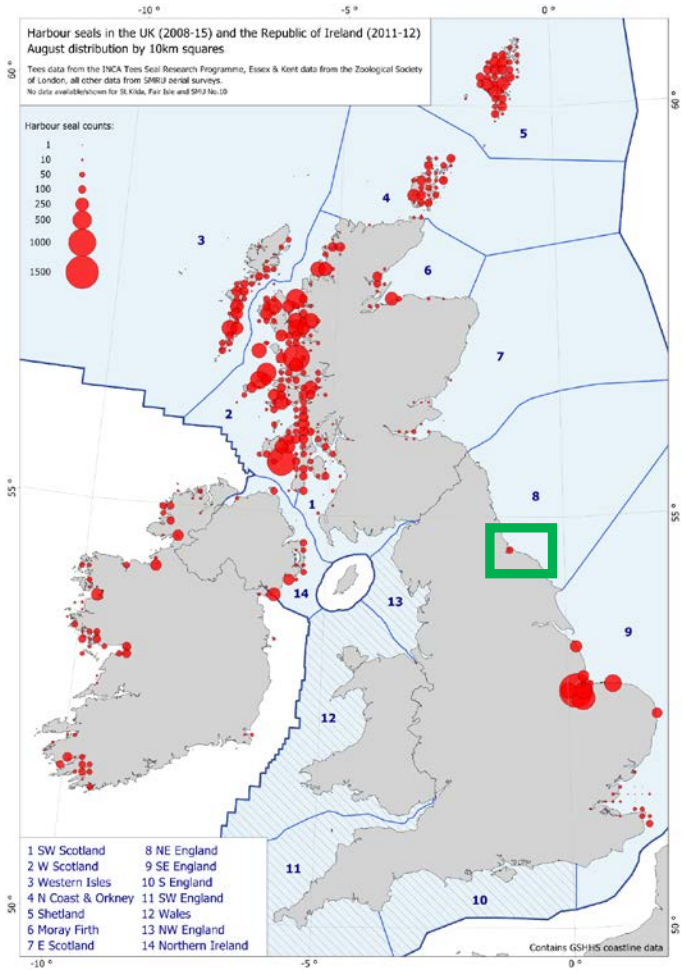
> 'This species [harbour seal] has six main areas of population around the British coasts - (i) the Inner Hebrides and west mainland coast of Scotland, (ii) the Outer Hebrides, (iii) Shetland, (iv) Orkney, (v) the east coast of Scotland and (vi) the Wash and east coast of England…the two largest pupping sites and moulting haul-outs (which may be the same) for each population area should be selected as SSSIs.'

Our understanding of harbour seal population dynamics and movements has improved considerably since the publication of the Guidelines. In addition, there are new geographical divisions that are being used for the regulation of human activities in the marine environment. Both of these changes have been used to inform development of 'Management Units (MUs)' to replace the 'population areas' used in the Guidelines. MUs use our best understanding of species biology to divide populations into geographical areas at the scale that human activity is managed at.

For harbour seal the boundaries of the English MUs have been defined to accommodate the Conservation of Seals (England) Order 1999, which covers both seal species from the Scottish border north of Berwick-upon-Tweed to Newhaven Pier. This area has been divided to separate sites in north-east England (including the Farne Islands, Holy Island and the Tees Estuary) from those in south-east England (including The Wash, Norfolk and the Humber, Blackwater and Thames Estuaries) because they are considered to support discrete populations of harbour seals (see Figure 3). The distribution of harbour seals is not thought to change throughout the year.

The Tees Estuary is selected as a SSSI for breeding harbour seals because it is currently the only known harbour seal pupping site in the North East England Management Unit.

Figure 3 Harbour seal Management Units (SCOS 2016) – the green box highlights the Tees Estuary



The population on the Tees is relatively small (but increasing) compared with some other sites in GB. However, harbour seals have declined at a number of sites in Orkney and along the east coast of Scotland and the reasons for this decline are currently unknown, so the Tees population could be increasingly important in the future. In addition harbour seals are susceptible to Phocine Distemper Virus (PDV) and the last outbreak in 2002 affected the SE England population (centred on The Wash) more than any other population in the UK, so additional protection for the NE England population at Teesmouth, which has apparently been less susceptible to PDV, would be beneficial for the overall resilience of harbour seal populations along the North Sea coasts of Great Britain.

3.4 Birds

The Guidelines (Part 2, Chapter 17, section 3.1) state that:

> '…these selection guidelines for birds complement the Ramsar Convention and UK SPA Selection Guidelines (JNCC 1999, Stroud *et al.,* 2001) so that locations supporting international features will also qualify for SSSI selection for the same features. The SPA Stage 1 selection guidelines include locations which regularly support:
>
> (i) 1% or more of the GB population of a species listed in Annex I of the EU Birds Directive in any season;
> (ii) 1% or more of the biogeographical population of a regularly occurring migratory species (other than those listed in Annex I of the EU Birds Directive) in any season;
> (iii) over 20,000 waterbirds (as defined by the Ramsar Convention) or 20,000 seabirds in any season;

3.4.1 Breeding birds

The Guidelines (Part 2, Chapter 17, section 3.2) state that:

> 'Localities which regularly support 1% or more of the total British breeding population of any native species and seabird colonies of over 10,000 breeding pairs will qualify for SSSI selection…'

and that:

> 'In view of the mobility of some birds this criterion applies to sites used for other essential activities by breeding birds, for example…feeding areas.'

The Teesmouth and Cleveland Coast SSSI supports over 1% of the total British breeding population of avocet (between 2010 and 2014 the SSSI supported an average of 18 breeding pairs which represents 1.2% of the GB breeding population). Avocet is a feature of the Teesmouth and Cleveland Coast pSPA and therefore also qualifies for SSSI selection as a result of being an international feature. The majority of birds breed on Number 4 Brinefield, Greenabella Marsh and the RSPB Saltholme reserve.

Little tern was a feature of the previously notified South Gare and Coatham Sands SSSI, but they have not bred in significant numbers there since 2005. A number of other locations within the Teesmouth and Cleveland Coast SSSI have been used for breeding in the recent past (Seaton Sands, Seaton Snook, RSPB Saltholme, Saline Lagoon on Number 4 Brinefield) but not in significant numbers since 2007. A single pair fledged two chicks at South Gare in 2015 and two pairs nested there unsuccessfully in 2017. There is a large little tern colony at Crimdon Dene, just north of Teesmouth and Cleveland Coast SSSI, but within Teesmouth and Cleveland Coast pSPA and Durham Coast SSSI. This colony became established in the mid- to late-1990s and has grown into a significant colony, with a recent peak of 114 pairs in 2012. It is considered that little terns choose colony locations around the Tees Estuary each year depending on the local conditions (such as fish stocks, disturbance and vegetation growth at nest sites.

The little terns nesting at Crimdon use the Teesmouth and Cleveland Coast SSSI for feeding. In addition they form pre- and post-breeding gatherings within the SSSI (in particular at North and South Gare). Little tern is a feature of the Teesmouth and Cleveland Coast pSPA (between 2010 and 2014 supporting an average of 81 breeding pairs, representing 4.3% of the GB population). The Teesmouth and Cleveland Coast SSSI therefore supports essential activities (foraging and roosting/loafing) of more than 1% of the total British breeding population of little tern. In addition little tern qualify for SSSI selection due to being an international feature.

The Teesmouth and Cleveland Coast SSSI supports over 1% of the total British breeding population of common tern (between 2010 and 2014 the SSSI supported an average of 399 breeding pairs which represents 4.0% of the GB breeding population). Common tern is a feature of the Teesmouth and Cleveland Coast pSPA and therefore also qualifies for SSSI selection as a result of being an international feature. The majority of common terns 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 guidelines also provide criteria for selecting sites that support important breeding assemblages. They state that (Part 2, Chapter 17, section 3.8):

> 'Localities which support an especially good range of bird species characteristic of a particular habitat, as defined by an index value, will qualify for SSSI selection…'

And Annex 1 of the same chapter (Part 2, Chapter 17) states that:

> '…if two habitats are included in one well-defined site, the indices for species which are on both habitats list and have been recorded for the site should be double-counted; other species score in the usual way; for the site to qualify on this basis, its total score should exceed the qualifying threshold value for the two habitats combined.'

Annex 1 gives a site threshold value of 44.5 for 'Lowland water and their margins' and 27 for 'sand-dunes and saltmarsh' giving a combined threshold of 71.5. The Teesmouth and Cleveland Coast

SSSI has an assemblage of breeding birds of sand dunes, saltmarsh and lowland open water and their margins that exceeds the mixed habitat site selection threshold (see Table 4, below). Only species with probable or confirmed breeding status[5] within or near (for species that regularly use the site for essential activities) to the site have been included. Many of the breeding species in the assemblage are declining in Britain.

Table 4 Assemblage of breeding birds of 'lowland open waters and their margins' and 'sand-dunes and saltmarsh' in Teesmouth and Cleveland Coast SSSI

Species	Species score	Lowland open water and their margins	Sand-dunes and saltmarsh	Teesmouth and Cleveland Coast SSSI score
Avocet	3	Y	Y	6
Black-headed Gull	1		Y	1
Common Tern	2.5	Y	Y	5
Gadwall	3.5	Y		3.5
Garganey	5	Y		5
Grasshopper Warbler	2	Y	Y	4
Great Crested Grebe	3	Y		3
Grey Heron	2	Y		2
Greylag Goose	2	Y		2
Lapwing	1		Y	1
Linnet	1		Y	1
Little Egret	4	Y	Y	8
Little Grebe	3	Y		3
Little Ringed Plover	3	Y		3
Little Tern	3		Y	3
Mute Swan	3	Y		3
Oystercatcher	1		Y	1
Pochard	4	Y		4
Redshank	2	Y	Y	4
Reed Bunting	1	Y	Y	2

[5] Evidence of probable or confirmed breeding is defined by the British Trust for Ornithology as follows and must relate to birds recorded in potentially suitable nesting habitat:

Probable breeding:

- Pair observed in suitable nesting habitat in breeding season
- Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different days a week or more part at the same place or many individuals on one day
- Courtship and display (judged to be in or near potential breeding habitat; be cautious with wildfowl)
- Visiting probable nest site
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
- Brood patch on adult examined in the hand, suggesting incubation
- Nest building or excavating nest-hole

Confirmed breeding:

- Distraction-display or injury feigning
- Used nest or eggshells found (occupied or laid within period of survey)
- Recently fledged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
- Adults entering or leaving nest-site in circumstances indicating occupied nest (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating
- Adult carrying faecal sac or food for young
- Nest containing eggs
- Nest with young seen or heard

Species	Species score	Lowland open water and their margins	Sand-dunes and saltmarsh	Teesmouth and Cleveland Coast SSSI score
Reed Warbler	1	Y		1
Ringed Plover	3	Y	Y	6
Sedge Warbler	1	Y	Y	2
Shelduck	2	Y	Y	4
Shoveler	3.5	Y		3.5
Snipe	2	Y		2
Stonechat	2		Y	2
Tufted Duck	2	Y		2
Water Rail	3	Y		3
Yellow Wagtail	2	Y		2
Total				**92**
Thresholds		**44.5**	**27**	**71.5**

3.4.2 Non-breeding birds

The Guidelines (Part 2, Chapter 17, section 3.3) state that:

> 'Localities which regularly support 1% or more of the total British non-breeding population of any native species in any season and non-breeding waterbird assemblages of over 20,000 individuals will qualify for SSSI selection.'

The non-breeding population sizes of waterbirds using the Teesmouth and Cleveland Coast SSSI have been estimated from Wetland Bird Survey (WeBS) counts, which cover the majority of the SSSI. All except two of the WeBS sectors fall within the 'Tees Estuary' WeBS site. Durham Coast - Sector 1a (53408) and Durham Coast - Sector 1b (53409) are on the open coast north of Hartlepool and within the 'Durham Coast' WeBS site. Unfortunately no recent data are available for Durham Coast - Sector 1b. Population estimates (five year peak means for 2011/12 - 2015/16) have been derived by BTO by combining counts from Durham Coast – Sector 1a with all of the Tees Estuary WeBS sectors, except the Reclamation Pond sector (52421), which has been progressively drained and infilled in recent years under planning permission. There are some small areas that are not counted within WeBS so the population sizes may be slight underestimates.

Peak counts for each season have been extracted from any month of the year. This is because the populations of a number of waterbirds peak in the SSSI outside of the winter period e.g. passage waders during late spring or early autumn. It is not possible to distinguish between breeding and non-breeding individuals in the data and this means that the peak counts of a small number of waterbirds may include a proportion of breeding individuals (e.g. common tern). However, if counts were restricted to winter months then significant passage populations would be excluded. This is not considered to significantly affect the total waterbird population estimate.

The Teesmouth and Cleveland Coast SSSI currently supports an assemblage of 26,786 waterbirds and >1% of the British non-breeding population of four species (shoveler, ruff, gadwall and sanderling, see Table 5).

Table 5 Numbers of non-breeding waterbirds using Teesmouth and Cleveland Coast SSSI

Species/feature	5 year peak mean (2011/2012 – 2015/2016)	% GB population
Assemblage of over 20,000 waterbirds	26,786	n/a
Shoveler	180	1.0%
Gadwall	428	1.7%
Ruff	19	2.4%
Sanderling	242	1.5%

Five species (shelduck, ringed plover, knot, purple sandpiper and redshank) were notified features of one or more of the previously notified SSSIs and do not currently occur in nationally significant

numbers (see Table 6). Two of these species (knot and redshank) are also features of the current Teesmouth and Cleveland Coast SPA/Ramsar site. Sandwich tern is a feature of the current Teesmouth and Cleveland Coast SPA/Ramsar site but not any of the previously notified SSSIs and likewise does not currently occur in nationally significant numbers. Turnstone was a feature of the previously notified Seaton Dunes and Common SSSI but it did not occur in nationally important numbers at time of notification nor does it now and, accordingly is not notified in its own right as a feature of the Teesmouth and Cleveland Coast SSSI.

It is considered that at least some of the declines in these species are due to site-specific anthropogenic factors and that action can be taken to restore their populations towards favourable condition (see section 5). These six species are therefore retained as SSSI features despite their current populations not currently meeting the selection threshold. Three of the species (knot, redshank and Sandwich tern) are additionally eligible for selection due to being international site features (they have been retained as features of the pSPA/Ramsar site for the same reasoning around causes of decline as described above).

Table 6 Species that are features of the current Teesmouth and Cleveland Coast SPA/Ramsar site and/or were features of the previously notified SSSIs

Species	SPA/Ramsar site	Previously notified SSSI
Shelduck		Seal Sands SSSI
Ringed plover		Redcar Rocks SSSI; Seaton Dunes and Common SSSI; South Gare and Coatham Sands SSSI
Knot	Y	Redcar Rocks SSSI; Seal Sands SSSI; Seaton Dunes and Common SSSI; South Gare and Coatham Sands SSSI
Purple sandpiper		Tees and Hartlepool Foreshore and Wetlands SSSI
Redshank	Y	Seal Sands SSSI
Sandwich tern	Y	

3.5 Invertebrate assemblage

The Guidelines (Part 2, Chapter 17, section 3.4.2) state that:

> 'Nationally scarce species, known or estimated to occur in 16-100 10 km grid squares in Britain...should also be represented, where possible, in the SSSI series within each AOS where they occur. In practice, assemblages of nationally scarce species may be identified as of significance...'

With reference to nationally scarce species, the Guidelines (Part 2, Chapter 17, section 3.4.6) also state that these:

> '....should generally be conserved as part of rich invertebrate faunal assemblages'.

Selection of assemblages is considered in Part 2, Chapter 17, section 3.5 of the Guidelines:

> 'The process of analysing species assemblages…is likely to provide a sound basis for

In England, an online analytical tool for assessing invertebrate interest, known as Pantheon, has been developed. Pantheon is a Natural England and Centre for Ecology & Hydrology database tool for analysing invertebrate sample data that recognises and scores the quality of characteristic invertebrate assemblage types in species lists. It is instrumental in identifying and assessing nationally important assemblages, both at a macro-habitat and micro-habitat scale.

A search of invertebrate data for the Tees Estuary revealed a number of historic records of scarce species, but little recent survey effort. As a result an invertebrate survey was commissioned to provide up-to-date information on the invertebrate interest of the area (Godfrey 2015). Pantheonwas used to analyse the species records from this survey. This identified a high quality invertebrate assemblage associated with sand dune habitats (Pantheon recognises this as Specific Assemblage Type (SAT) F111 Sand and Chalk Assemblage), with 13 scoring SAT species at Seaton Dunes and seven at Coatham Dunes.

The England default threshold for a good example of the F111 assemblage is 19 species, though this was founded on three extreme south coast sites and Sefton coast (28 species) on the warmer western shores of Lancashire. Though the latter site greatly exceeded the default score, this site is both south of Teesside, on the west and milder, Gulf-stream washed coast, and with a longer run of habitat. It is known that the default assemblage values often discriminate against northern sites and many of the species in the pool do not have ranges that extend that far north; it is the intention in the Pantheon database to eventually arrive at regional benchmarks. However, until that point is reached, a number of northern sand dune sites so far sampled for Common Standards Monitoring purposes provide appropriate comparators (see Table 7).

Table 7 Invertebrate Common Standards Monitoring results from northern F111 sites

Site	Species in sample	SAT score
Duddon Estuary dunes (2012)	77	10
Lytham St Ann's (2012)	37	5
Bamburgh dunes (2012)	53	5
Lindisfarne dunes (2012)	47	9
Lindisfarne dunes (2015), central dunes, sample 2	[6]	10

Whilst the Bamburgh and Lytham sites score poorly, the Duddon Estuary at roughly the same latitude and Lindisfarne dunes to the north (and on the same coast) scored (in both 2012 and 2015) lower than Seaton Sands and only slightly higher than Coatham dunes. This suggests that Seaton Dunes may be a good example in a northern context and that Coatham dunes may be close to being a good example if this regional threshold is recalibrated to ten species present in standardised sampling for this assemblage type.

In addition to having a higher number of F111 species present, Seaton Sands was also found to be six times more diverse as a community than that found at Coatham dunes when the Shannon Diversity measure was calculated. The F111 assemblage at these two dunes is selected not so much for the suite of rare species, but rather as a representative example of the northern expression of the sand and chalk assemblage. The SSSI series is gradually both building up and recognising the defined invertebrate assemblages and these two dunes provide part of that suite of representation. The Tees Bay Dunes is the only dune system in the Tees Lowlands NCA and hence in the AOS.

There were a number of range-restricted and threatened species at both sites as set out in Table 8.

In terms of the resources utilised by the species in the assemblages it does reflect the relatively early successional nature of the sand dunes, with a level of dependency on a short sward and bare ground, particularly true of the conservation status concern taxa. Pooling data from both dunes and removing duplicates leaves a combined species list (185 taxa) showing a resource dependence on tall sward and scrub (68 species), with 37 taxa under short sward and bare ground. Fifteen of the short sward and bare ground taxa are associated with bare sand, indicating a typical UK sand dune condition issue of insufficient dynamism. Of the 14 taxa with conservation status, nine require a bare sand resource.

[6] Pooling all F111 samples here achieved 22 species but this is inconsistent with standard methodology.

Table 8 Scarce and threatened invertebrate species at Seaton Dunes and Coatham Dunes[7]

Species	GB Conservation and Red List status	Seaton Dunes	Coatham Dunes
A fly *Acanthiophilus helianthi*	Notable	✓	
A fly *Eribolus slesvicensis*	pNationally Scarce	✓	
A fly *Medetera saxatilis*	Data Deficient	✓	
A fly *Medetera truncorum*	Data Deficient	✓	✓
Flea bee-fly *Phthiria pulicaria*	Nationally Scarce	✓	✓
A fly *Tetanops myopinus*	pNationally Scarce		✓
A beetle *Amara (Celia) praetermissa*	Nationally Scarce	✓	
A beetle *Calathus (Calathus) ambiguus*	Nationally Scarce	✓	
A beetle *Cercyon (Cercyon) littoralis*	Nationally Scarce		✓
A beetle *Gabrius osseticus*	Notable b	✓	
Cinnabar moth *Tyria jacobaeae*	Section 41 Priority Species - research only		✓
Grayling butterfly *Hipparchia semele*	Vulnerable; Section 41 Priority Species;	✓	
Small heath butterfly *Coenonympha pamphilus*	Near Threatened; Section 41 Priority Species	✓	
Striped snail *Cernuella (Cernuella) virgata*	Data Deficient		✓

3.6 Site boundary determination

The Guidelines state that (Part 1, section 8.2, p.34):

> 'SSSI boundaries should be drawn to encompass the special features of the site and all land necessary to ensure the sustainability of those features. Consideration should be given to the inclusion of whole management units, entire ecological units and supporting processes (such as hydrology or sediment supply)….Boundaries should take account of dynamic processes (such as active coastal and floodplain geomorphology).

And that (Part 1, section 8.10, p.37):

> 'The lower or seaward boundaries of SSSIs should normally extend to the extent of the local authority planning area. This varies between countries. In England it is normally to Mean Low Water Mark (MLWM)… However, these boundaries can, and should where appropriate, include estuarine channels or lagoons whose beds are below low water, and enclosed subtidal parts of river mouths.

The guidelines (Part 1, section 9.3, p.39) state that:

> '…There should be a presumption in favour of selecting sites with habitat combinations. The boundaries should be chosen to delineate the combination as a single geographical and ecological entity.'

The boundary of the Teesmouth and Cleveland Coast SSSI has been drawn to include the full extent of the Tees Estuary from its tidal limits at the Tees Barrage to the seaward limit of the estuarial waters between the North and South Gares (see photograph 1 in section 9). The SSSI also includes the estuary's associated coastal habitats (sand dunes and saltmarshes), freshwater wetlands and adjacent open coast extending from Crimdon Dene in the north to Marske in the south. Collectively, this complex of habitats includes nationally important geological features, sand dunes and saltmarshes, as well as supporting nationally important numbers and assemblages of breeding harbour seals, breeding and non-breeding birds and invertebrates. More detailed consideration of the boundary rationale for particular features which have had greatest influence in determining the extent of the SSSI is set out below.

[7] One taxon can have several designations.

3.6.1 Coastal habitats

The guidelines (Part 2, Chapter 1, section 11.2) state that:

> 'Physical processes are crucial to the existence of the habitats which make up a sedimentary coastline. Thus the movement of material, by both the sea and the wind, results in the formation of a series of habitats from soft intertidal sediments to sand-dunes and shingle features above High Water Mark. Because of the underlying physical processes and the associated biological successions which take place, the area of intrinsic scientific interest of a sedimentary coast is taken to include all those semi-natural habitats which lie adjacent to one another and where there is an important functional interdependence.
>
> In estuaries, where these habitats are most clearly in physical association, saltmarshes in particular may be dependent on the presence of other features. Thus a shingle structure may enclose a saltmarsh, and loss of the protecting shingle would ultimately result in loss of the saltmarsh. Sand-dunes may similarly perform the same function. In both cases, if the saltmarsh is valuable, regardless of the status of the protecting structures (although many will be important for nesting terns and other birds or for their vegetation), these will have to be incorporated within the site.
>
> The seaward limit of most sedimentary coastal sites will be Mean Low Water Mark … However it may be convenient to draw a line across the mouth of the estuary from suitable points on the shoreline. Because channels and intertidal banks move, this is the only way of ensuring that those areas which qualify are within the SSSI.'

All areas of saltmarsh in the Tees Estuary, from the tidal limit of the Tees and its main tributaries downstream to the estuary mouth, are included in the SSSI, as are the entirety of the adjacent intertidal mud and sand flats and the river channel. The boundary also includes artificial breakwaters which influence sediment dynamics within the estuary.

On the open coast, the SSSI boundary extends to the Mean Low Water mark, whilst within the estuary includes the full extent of the estuarial waters.

And (Part 2, Chapter 1, section 11.2.4):

> 'All active sedimentary habitats depend for their continued survival on the availability of suitable 'feeder' material. Thus in most circumstances the integrity of the site will only be maintained by including the source (normally the fronting intertidal sand and/or shingle) within the protected area.'

The Guidelines (Part 2, Chapter 1, section 11.2.7) state that:

> 'Normally those systems which have been identified as being of importance will be included in totality; i.e. the site selected will include the whole system together with the sandy shore above Mean Low Water Mark.'

The beach plain down to the Mean Low Water mark fronting each of the dune systems and extending to the north and south, provides the sediment supply and is included within the SSSI in its entirety.

The Guidelines describe how to treat Links golf courses (Part 2, Chapter 1, section 11.2.8):

> 'Golf courses (links): These may not always be highly modified and may contain, particularly in the non-intensively managed 'roughs', substantial areas of important vegetation. Intensively managed greens, tees and fairways are usually of limited interest and should be excluded where they form a substantial proportion of the site.'

And for the treatment of sea buckthorn scrub they state (Part 2, Chapter 1, section 11.2.11):

> 'Where this [invasive dense scrub] forms part of a natural succession or where control measures are likely to be successful in maintaining the interest of the site, the stands should be included. Areas where dense scrub has all but destroyed the main dune interest in the absence of grazing should normally be excluded if rehabilitation is impossible, except where they are important for migratory passerine birds. There may be some scrub types -

notably *Hippophae* in the east - where some examples should be included within the SSSI series.'

The total known extent of sand dune habitat in the Tees Bay Dunes complex has been been included within the SSSI boundary, together with the beach plain down to Mean Low Water mark. The boundary also includes artificial breakwaters which influence sediment dynamics within the estuary. Both golf courses are included in their entirety because the intensively managed areas do not form a significant proportion of the whole site; excluding them would create a very complex boundary and management of the fairways can have wider impacts (for instance drainage could dry out adjacent dune slacks). Areas of sea buckthorn have also been included within the boundary. This is because recent clearance of stands of sea buckthorn on site has successfully restored open dune habitats.

3.6.2 Birds

The guidelines (Part 1, section 8.9, p.36) state that:

> 'Ornithological requirements usually reinforce the need to select the whole of major systems…It may be appropriate to include artificial structures, such as piers or islands which are used by many thousands of birds for foraging or roosting at high water, and for which the site is notified.'

They also state that (Part 2, Chapter 17, section 3.2, p.4):

> 'Any site considered should normally be large enough to include all the areas required by the individuals concerned.'

The boundary has been drawn to include all habitat that is considered to be essential to the nationally and internationally important bird features that use the Tees Estuary and its adjoining open coast (see photographs 2 and 3 in section 9). This includes a range of semi-natural habitats as well as artificial structures (such as North and South Gare) and heavily modified habitats (such as brownfield grassland and improved pasture), as well as some small areas included to ensure that the boundary follows recognisable features on the ground. The boundary includes the full extent of the estuarial waters (including docks and harbours) that provide feeding habitat for breeding common terns.

The boundary also includes Cowpen Bewley Mitigation Lagoons (within unit 21 of the SSSI). These lagoons have been designed as suitable compensatory habitat for the loss of a site known as the Reclamation Pond, which supported a range of non-breeding waterbirds before the fulfilment of an extant planning permission for its infill. Recent ornithological records indicate that birds potentially displaced from Reclamation Pond are starting to use the mitigation areas and the lagoons are beginning to provide supporting habitat for the relevant SSSI interest features (namely shoveler, gadwall and the assemblage of over 20,000 waterbirds). In time, the lagoons are expected to form a significant part of the network of waterbird habitats across the SSSI.

The Guidelines (Part 2, Chapter 17, section 3.1, p.4) state that:

> 'Ultimately, it would be most effective if all of the component SSSI supporting a SPA were amalgamated into a single SSSI.'

The Teesmouth and Cleveland Coast SSSI has amalgamated all of the component SSSIs of the Teesmouth and Cleveland Coast pSPA/Ramsar, except for a small section of Durham Coast SSSI, into a single SSSI.

4. Explanation of why parts of the previously notified Seal Sands SSSI are not considered to be of special interest

This section explains why Natural England is of the opinion that parts of the previously notified Seal Sands SSSI are not of special interest, according to the *Guidelines for the removal of an SSSI notification (denotification)* (English Nature, 2005), hereafter referred to as the 'Denotification Guidelines'.

The Denotification Guidelines (section 3.1, p.5) state that:

'[Natural England] will adopt a precautionary approach to the question of the existence of special interest in cases where denotification is under consideration and in doing so will apply a set of guiding principles to assess whether a site (or part of a site) is of special interest; these are:

i. Whether the site meets the requirements of the Guidelines for Selection of Biological SSSIs and the Geological Conservation Review.

ii. If restoration of the special interest is possible or practicable.

iii. Where the special interest has moved entirely outside the site, but remains adjacent or in close proximity, the site will not be denotified until the land now containing the special interest is notified.

iv. Where there is some prospect that natural processes may return the special interest within a reasonable time, the site is unlikely to be denotified.

v. Where cartographical errors were included in the original notification of the site.

vi. A change of special interest from that for which it was notified, or a change that will lead to a new special interest, will not usually be a reason for denotification.

And goes on to state that (section 3.3, p.6):

'.....developments or other activities, which may damage features of interest of SSSIs, may after careful consideration be justified and can be legally permitted. This may result in permanently covering over, removing or otherwise destroying the site or part of the site. Activities which may result in permanent loss or damage of the features of special interest may be authorised under legislation such as the Town and Country Planning Act 1990..... Denotification of the site will not, however, be considered in this context until after the special interest of the site has been irreversibly lost, through the implementation of the permission in full.'

An area previously notified as part of Seal Sands SSSI is not considered to be of special interest following the full implementation of industrial development (unit 7 and part of unit 6). The area was formerly mudflat (supporting the notified bird interest of Seal Sands SSSI) but during the 1970s was reclaimed and subsequently used as the site of industrial developments. It now supports industrial buildings, hard standings and coarse brownfield grassland and is not considered to be of special interest.

5. Assessment of the current condition of the Teesmouth and Cleveland Coast SSSI

This section contains information on the current condition of the SSSI, the distribution of the interest features within the site and the remedial action that needs to be carried out to achieve favourable or recovering condition in those areas of the site where the interest features are currently assessed as being in adverse condition (see Table 9 and 10).

Table 9 Condition assessment for each unit of Teesmouth and Cleveland Coast SSSI

Unit*		Interest features	Reported condition **	Date of last assessment
Number	Name			
1	Hartlepool and North Sands	Breeding and non-breeding birds	Unfavourable - declining	March 2018
2	Hartlepool South Pier to North Gare	Saltmarsh; sand dunes; invertebrates; breeding and non-breeding birds	Unfavourable - declining	March 2018
3	Seaton Dunes	Sand dunes; invertebrates; breeding and non-breeding birds	Unfavourable - no change	March 2018
4	Seaton Common	Breeding and non-breeding birds	Favourable	March 2018
5	Seaton Field	Non-breeding birds	Favourable	March 2018

Unit*		Interest features	Reported condition **	Date of last assessment
Number	Name			
6	North Gare to Seaton Snook	Saltmarsh; sand dunes; invertebrates; breeding and non-breeding birds	Unfavourable - declining	March 2018
7	River Tees	Harbour seal; breeding and non-breeding birds	Favourable	March 2018
8	Seal Sands	Harbour seal; breeding and non-breeding birds	Unfavourable - declining	March 2018
9	Seal Sands Peninsula	Saltmarsh; sand dunes; non-breeding birds	Favourable	March 2018
10	Emergency Access Road	Non-breeding birds	Favourable	March 2018
11	Greenabella Marsh	Breeding and non-breeding birds	Favourable	March 2018
12	Seal Sands Intertidal Project	Breeding and non-breeding birds	Favourable	March 2018
13	Long Drag Reedbed	Breeding and non-breeding birds	Favourable	March 2018
14	Number 4 Brinefield	Breeding and non-breeding birds	Favourable	March 2018
15	Greatham Creek	Saltmarsh; harbour seal; breeding and non-breeding birds	Favourable	March 2018
16	Saltern Wetlands	Saltmarsh; harbour seal; breeding and non-breeding birds	Favourable	March 2018
17	Saltern Borrow Pits	Breeding and non-breeding birds	Favourable	March 2018
18	Greatham Tank Farm	Breeding and non-breeding birds	Favourable	March 2018
19	Cowpen Marsh Managed Realignment	Breeding and non-breeding birds	Favourable	March 2018
20	Cowpen Marsh	Breeding and non-breeding birds	Favourable	March 2018
21	Cowpen Bewley Mitigation Lagoons	Non-breeding birds	Unfavourable - recovering	March 2018
22	RSPB Saltholme	Breeding and non-breeding birds	Favourable	March 2018
23	Portrack Marsh	Breeding and non-breeding birds	Favourable	March 2018
24	North Tees Mud Flat	Non-breeding birds	Favourable	March 2018
25	Bran Sands Lagoon and Dabholme Gut	Breeding and non-breeding birds	Favourable	March 2018
26	Bran Sands	Sand dunes; breeding and non-breeding birds	Unfavourable - declining	March 2018
27	South Gare to Marske	Jurassic geology; saltmarsh; sand dunes; breeding and non-breeding birds	Unfavourable - declining	March 2018
28	South Gare and Coatham Dunes	Saltmarsh; sand dunes; invertebrates; breeding birds	Favourable	March 2018

Unit*		Interest features	Reported condition **	Date of last assessment
Number	Name			
29	Coatham Quarries and Lagoons	Sand dunes; invertebrates; non-breeding birds	Favourable	March 2018
30	Cleveland Golf Course	Sand dunes, invertebrates; breeding birds	Favourable	March 2018
31	Redcar Boating Lake	Non-breeding birds	Favourable	March 2018
32	Coatham Village Green	Sand dunes, invertebrates; breeding birds	Favourable	March 2018
33	Coatham Marsh	Breeding and non-breeding birds	Favourable	March 2018

* **Site units** are divisions used by Natural England for administrative purposes only.
** **Reported condition**
SSSIs are notified because of special biological or geological features. When these features are being managed so that their special nature conservation interest is being maintained they are said to be in favourable condition. This is a United Kingdom standard and the terminology and definitions are more fully described in 'A Statement on Common Standards Monitoring,' produced by the Joint Nature Conservation Committee in 1998.

Table 10 Area of site in each condition category

Condition category	Number of units	Area covered by assessment
Favourable	25	1,953.81 ha (66%)
Unfavourable – recovering	1	43.87 ha (1 %)
Unfavourable – no change	1	99.75 ha (3 %)
Unfavourable – declining	6	879.60 ha (30%)
Total	33	2,977.03 ha

Two-thirds of the Teesmouth and Cleveland Coast SSSI is in favourable condition. The majority of the remainder of the site is in 'unfavourable – declining' condition (30%), due to declines in non-breeding waterbirds, for which there are two main reasons:

- recreational disturbance on the open coast; and
- opportunistic macroalgae dominating intertidal mud.

Achieving sustainable recreational access to the open coast will require coordinated effort by a number of partners. Natural England is establishing a partnership to develop and implement an access management strategy.

The spread of *Enteromorpha* algal mats across Seal Sands is the main reason for 'unfavourable – declining' condition of unit 8. The previous remedy for this unit sought to address the impacts of Billingham Sewage Treatment Works, which discharged treated effluent into the Tees Estuary. In 2008 Northumbrian Water Limited invested £8 million in diverting this discharge to the existing Seaton Carew Long Sea Outfall, thereby removing a major source of nutrients from the SSSI. Recent monitoring indicates that the algal mats, whilst still extensive, have reduced from their peak extent in 1999 (Ecospan 2015). The remedy identified is for further investigations (working with the Environment Agency) into other potential sources of nutrients into the Tees Estuary.

More generally, the Tees Estuary has suffered massive land reclamation since the 18th Century, with the final phase in the 1970s. Approaching 90% of the intertidal within the estuary has been lost. Natural England is working with partners to recreate intertidal habitat wherever possible. A 30 ha managed realignment is currently being created by the Environment Agency and will be completed in September 2018.

There are large stands of sea buckthorn in Seaton Dunes (unit 3) which are damaging the dune vegetation. Seaton Carew Golf Club has successfully removed some of the buckthorn using

funding from a Natural England Conservation and Enhancement Scheme (CES) and Natural England is encouraging further removal.

Table 11 Reasons for adverse condition in 'unfavourable – no change/declining' units

Reasons for adverse condition	Remedy mechanism	Remedy status*	Site units
Recreational disturbance	Natural England – developing Coastal Access Partnership	Identified	1, 2, 6, 8, 26, 27
	Natural England - Managing Coastal Access on Teesmouth National Nature Reserve		
	Hartlepool Council – Managing Coastal Access		
	Redcar and Cleveland Council – Managing Coastal Access		
	North Eastern IFCA – Managing bait collection		
Other – Opportunistic algae	Environment Agency - Investigation	Identified	8
Lack of corrective works – inappropriate scrub control	Natural England – Conservation and Enhancement Scheme	Identified	3

***'Identified**' means that the remedy has been identified by Natural England but has not yet been agreed with the party responsible for implementing the required action.

6. Selection of 'operations requiring Natural England's consent'

To achieve positive management of the SSSI owners and occupiers will require consent before undertaking some operations to safeguard the special features of SSSI. These operations are known as Operations requiring Natural England Consent.

When determining the list of operations requiring consent for individual SSSIs, relevant operations are identified from a Natural England master list. Selection is based on the likelihood that the operations may cause damage to the special features that are the reasons for notification of the SSSI. As well as selecting operations from the master list the precise wording of each operation may be tailored to suit the particular circumstances at the site.

It is not possible to predict every possible eventuality that may arise on a site but the aim is to identify all operations where it is reasonably foreseeable that, if carried out at certain times or in a particular manner somewhere within the SSSI, they are likely to damage the special interest features. The table below records at least one reason justifying the inclusion of each operation in the list for Teesmouth and Cleveland Coast SSSI. It is not intended to be exhaustive and in most cases there will be other ways in which the specified operation is likely to cause damage.

Standard reference number	Type of operation	At least one reason for listing
1.	Cultivation, including ploughing, rotovating, harrowing and re-seeding.	Important habitats and associated flora/fauna could be destroyed.
2.	Grazing and alterations to the grazing regime (including type of stock, intensity or seasonal pattern of grazing).	Some of the important habitats and associated flora/fauna are sensitive to over and/or under grazing.
3.	Stock feeding and alterations to stock feeding practice.	Could lead to localised nutrient enrichment or poaching which would damage important habitats and associated flora/fauna.
4.	Mowing or cutting vegetation and alterations to the mowing or cutting regime (such as from haymaking to silage).	Important habitats and flora/fauna sensitive to mowing and/or cutting.
5.	Application of manure, slurry, silage liquor, fertilisers and lime.	Important habitats and flora/fauna sensitive to nutrient enrichment.

Standard reference number	Type of operation	At least one reason for listing
6.	Application of pesticides, including herbicides (weedkillers) whether terrestrial or aquatic, and veterinary products.	Important habitats and associated flora/fauna are sensitive to pesticides, herbicides and veterinary products.
7.	Dumping, spreading or discharging of any materials.	Risk of obscuring/smothering geological features, important habitats and associated flora/fauna.
8.	Burning and alterations to the pattern or frequency of burning.	Important habitats and associated flora/fauna are sensitive to burning.
9.	Release into the site of any wild, feral, captive-bred or domestic animal, plant, seed or micro-organism (including genetically modified organisms).	Could lead to unforeseen interactions with indigenous species and changes in community composition.
10.	Killing, injuring, taking or removal of any wild animal (including dead animals or parts thereof), or their eggs and nests, including pest control and disturbing them in their places of shelter.	Could lead to unforeseen changes in community composition and direct damage to notified species populations.
11.	Destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungal fruiting bodies, leaf-mould, turf or peat.	Could damage important habitats and associated flora/fauna.
12.	Tree and/or woodland management and alterations to tree and/or woodland management (including, planting, felling, pruning and tree surgery, thinning, coppicing, changes in species composition, removal of fallen timber).	Risk of damage to breeding bird habitats and incidental damage to other features.
13a.	Draining (including the use of mole, tile, tunnel or other artificial drains).	Some of the important habitats and flora/fauna are sensitive to changes in water levels and hydrology.
13b.	Modification to the structure of water courses rivers, streams, springs, ditches, dykes, drains), including their banks and beds, as by re-alignment, regrading, damming or dredging	Could alter estuary dynamics and drainage and have a direct impact on important habitats and associated flora/fauna in the immediate vicinity or downstream of works.
13c.	Management of aquatic and bank vegetation for drainage purposes.	Direct damage to important habitats and associated flora/fauna.
14.	Alterations to water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes). Also the modification of current drainage operations (including the installation of new pumps).	Some of the important habitats and associated flora/fauna are sensitive to changes in water levels and hydrology.
15.	Infilling or digging of ditches, dykes, drains, ponds, pools, marshes or pits.	Direct damage to important habitats and associated flora/fauna.
16a.	Freshwater fishery production and/or management, including sporting fishing and angling and alterations to freshwater fishery production and/or management.	Could damage bird habitat by changing aquatic community composition, as well as causing disturbance.

Standard reference number	Type of operation	At least one reason for listing
16b.	Coastal fishing, fisheries management and seafood or marine life collection, including the use of traps or fish cages and alterations to coastal fishing practice or fisheries management and seafood or marine life collection.	Could damage bird and harbour seal supporting habitat through removal of prey, as well as causing disturbance.
17.	Reclamation of land from sea, estuary or marsh.	Direct loss of geological features and important habitats and impacts on estuary dynamics.
18.	Bait digging in intertidal areas.	Could disturb waterbirds and remove their prey.
19.	Erection and repair of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures.	Direct loss of geological features, important habitats and associated flora/fauna. Could influence important coastal processes such as sediment supply.
20.	Extraction of minerals including peat, shingle, hard rock, sand and gravel, topsoil, subsoil, shells and spoil.	Direct loss of geological features, important habitats and associated flora/fauna.
21.	Destruction, construction, removal, rerouting, or regrading of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, including soil and soft rock exposures or the laying, maintenance or removal of pipelines and cables, above or below ground.	Direct loss of geological features, important habitats and associated flora/fauna.
22.	Storage of materials on sensitive features (notified geological features, sand dunes, saltmarshes and wetland habitats).	Risk of obscuring/smothering geological features, important habitats and associated flora/fauna.
23.	Erection of permanent or temporary structures or the undertaking of engineering works, including drilling.	Direct loss or damage to geological features, important habitats and associated flora/fauna.
24a.	Modification of natural or man-made features and clearance of boulders, large stones, loose rock.	Direct loss or damage to geological features, important habitats and associated flora/fauna.
24b.	Battering, buttressing or grading of geological exposures and cuttings (rock and soil).	Direct loss or damage to geological features, important habitats and associated flora/fauna.
26.	Use of vehicles or craft.	Risk of direct damage to geological features, important habitats and associated flora/fauna.
27.	Recreational or other activities likely to damage or disturb the features of special interest.	Risk of direct damage or disturbance to geological features, important habitats and associated flora/fauna.
28a.	Game and waterfowl management and hunting practices and alterations to game and waterfowl management and hunting practice.	Risk of direct damage and/or disturbance to important habitats and associated flora/fauna.
28b.	Use of lead shot.	Several breeding and non-breeding birds, are vulnerable to lead poisoning through accidental ingestion with grit (including wildfowl) or secondary ingestion by predatory and scavenging species.

7. Site unit maps

The maps on the following pages show the provisional boundaries of the site units, which are divisions used by Natural England for administrative purposes only.

8. Distribution of sand dune and saltmarsh vegetation within the Teesmouth and Cleveland Coast SSSI

9. Photographs

[insert aerial photo here]

Photograph 2: Sandflats at North Gare Sands (© Jenny Loring)

Photograph 3: Grassland and wetland at Saltholme Pools (© Dave Mitchell)

Photograph 4: Lapwing flock over saltmarsh and mudflats at Greatham Creek (© Jenny Loring)

Photograph 5: Sand-dune grasslands at Seaton Common (© Tom Charman)

Photograph 6: Harbour seal, Teesmouth NNR (© Carl Watts)