The Sizewell C Project

6.3 Volume 2 Main Development Site

Chapter 14 Terrestrial Ecology and Ornithology

Appendix 14A2 - Designated Sites

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SIZEWELL C DEVELOPMENT – MAIN DEVELOPMENT SITE: VOLUME 2, CHAPTER 14:

APPENDIX 14A2 – DESIGNATED SITES

Documents included within this Appendix are as follows:

APPENDIX 14A2 Designated Sites

ANNEX 14A2.1 - FIGURES (provided separately)

ANNEX 14A2.2 - DESK STUDY:

SAC Citations including Conservation Objectives:

- Alde-Ore SAC
- Benacre To Easton Bavents Lagoons SAC
- Dew's Ponds SAC
- Minsmere to Walberswick Heaths and Marshes SAC
- Orfordness-Shingle Street SAC
- Staverton Park and The Thicks, Wantisden SAC

SPA Citations including Conservation Objectives and Natura 2000 sheets:

- Alde-Ore Estuary SPA
- Benacre to Easton Bavents SPA
- Minsmere-Walberswick SPA

- Sandlings SPA

Ramsar Citations:

- Alde-Ore Estuary
- Minsmere-Walberswick

SSSI Citations:

- Aldeburgh brick pit
- Aldeburgh hall pit
- Alde-Ore estuary
- Crag pit
- Gromford meadow, Snape
- Leiston-Aldeburgh
- Minsmere-Walberswick
- Potton Hall Fields
- Red house farm pit
- Sizewell Marshes
- Snape warrens

County Wildlife Site Citations

VOLUME 2, CHAPTER 14: APPENDIX 14A2 – DESIGNATED SITES

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None provided.

Figures

Executive Summary

This appendix describes the statutory and non-statutory designated sites that fall within the Zone of Influence (ZOI) of the Sizewell C power station at the main development site (hereafter referred to as the "proposed development"). The proposals to construct the Sizewell C power station are hereafter referred to as the Sizewell C Project.

The legislative framework that underpins the designation of European and national statutory designated sites, as well as local (county) non-statutory designated sites, is set out in **Appendix 14A1** – Introduction to the Ecological Baseline.

Readily available desk-study data have been reviewed to provide a contextual summary of the current "ecological condition" for each designated site considered. This appendix then describes the approach taken with regards to the assessment of designated sites and their cited designated interest features. Figures are presented showing the boundaries of the designated sites in relation to the proposed development site (hereafter referred to as the "site") and the citations for each designated site are provided.

In establishing an appropriate ZOI for statutory designated sites, reference was made to the Habitats Regulations Assessment (HRA) Screening Report (Ref 1.1). This has defined 20km as an appropriate distance over which effects upon European designated sites may manifest themselves. This distance has been adopted as an appropriate ZOI for considering potential effects on Special Protection Areas (SPAs), Special Areas of Conservation (SAC) and Ramsar sites. In addition, on a precautionary basis, 20km has also been adopted as an appropriate ZOI for considering potential effects on Sites of Special Scientific Interest (SSSI).

For non-statutory designated sites, the main effects arising from Sizewell C are likely to constitute effects such as land take, hydrological change, changes in air quality, and disturbance from noise and lighting, which are only likely to affect those sites in close proximity to the site. Therefore, 2km has been established as an appropriate ZOI for non-statutory County Wildlife Sites (CWS).

Within the HRA Screening Report, several European designated sites were effectively "scoped out" of further assessment on the basis that there were no likely impact pathways from the Sizewell C Project. These included: Benacre to Eastern Bavents SAC and SPA; Dews Pond SAC; and Staverton Park and the Thicks SAC and so these European sites are excluded from this appendix.

Each of the European sites screened out above is underpinned by individual SSSIs. and therefore, the following SSSI have also been excluded: Dews Pond SSSI; Pakefield to Eastern Bavents SSSI; and Staverton Parks and the Thicks SSSI.

Thirteen other SSSI have also been excluded, as they have been designated solely for geological reasons, and no impact pathways have been identified by which the Sizewell C Project could directly affect the geological interest features of these sites. The sites excluded are as follows: Valley Farm Pitt – Subbourne SSSI

Neutral Farm Pit – Butley SSSI, Red House Farm Pit – Sudbourne SSSI, Richmond Farm Pit – Gedgrave SSSI, Roundhill Pit – Aldeburgh SSSI, Sudbourne Park Pit SSSI, Aldeburgh Brick Pit SSSI, Aldeburgh Hall Pit SSSI, Chillesford Church Pit SSSI, Crag Farm Pit – Sudbourne SSSI, Crag Pit – Aldeburgh SSSI, Gedgrave Hall Pit SSSI and, Holton Pit SSSI.

Therefore, the focus in this appendix has been on those designated sites for which potential impact pathways could exist. The study has identified the following sites for consideration:

- Four SPAs: Outer Thames Estuary; Minsmere to Walberswick; Alde-Ore Estuary and the Sandlings;
- Three SACs: Minsmere to Walberswick Heaths and Marshes; Alde-Ore and Butley Estuaries; and Orfordness to Shingle Street SAC;
- Two Ramsar sites: Minsmere to Walberswick, and Alde-Ore Estuary;
- Eight SSSIs: Alde-Ore Estuary; Blaxhall Heath; Leiston to Aldeburgh; Minsmere to Walberswick Heaths and Marshes; Sandlings Forest; Sizewell Marshes; Snape Warren; and Tunstall Common; and
- Five CWSs: Sizewell Levels and Associated Areas; Suffolk Shingle Beaches; Sizewell Rigs; Leiston Common and Southern Minsmere Levels.

All designated sites are considered vulnerable to various existing threats, as described in their specific citations, including coastal processes, recreational pressure and marine-based activities. However, the majority are largely in good ecological condition, although some do contain some areas in various stages of decline or in unfavourable condition due to the above pressures.

The implications of Sizewell C for each designated site are assessed within **Volume 2, Chapter 14** of the **Environmental Statement (ES)** (Doc Ref. 6.3) following the assessment of the individual Important Ecological Features (IEFs) in this appendix. Each designated site's individual components and features have been reviewed to determine whether or not the integrity of the designated site as a whole would be affected.

1. Designated Sites

1.1 Introduction

a) Purpose of this appendix

1.1.1 This is an appendix to **Volume 2, Chapter 14** of the **ES**. This appendix presents a description of the features of ecological interest of designated sites for the proposed development site (hereafter referred to as the "site"). This includes statutory designated sites: Special Protection Areas (SPAs); Special Areas for Conservation (SACs); Ramsar sites; and Sites of Special Scientific Interest (SSSIs). It also includes the non-statutory County Wildlife Sites (CWS).

1.1.2 This appendix also reviews published documentation to provide a contextual overview of the current ecological condition of each site to determine whether there are any existing issues highlighted as having a detrimental effect on the designated sites in question.

1.1.3 In several instances, the features of ecological interest of designated sites do not permanently occupy the site for which they are a cited feature. For example, breeding marsh harrier (*Circus aeruginosus*) are a cited interest feature of the Minsmere to Walberwick Heaths and Marshes SPA (Ref 1.2). However, marsh harrier forage over the Sizewell Marshes SSSI which is not included within the SPA boundary. Sizewell Marshes SSSI, therefore, provides a "supporting function" for the SPA interest feature (breeding marsh harrier) as a foraging resource. Impacts on land which is 'functionally linked' but lies outside of European designated sites are detailed within the Habitats Regulation Assessment (HRA) Screening Report and **Chapter 14** of the **ES** as necessary but are not addressed within this appendix.

b) Structure of this appendix

1.1.4 This appendix has been set out as follows:

- **Section 1.2** outlines the methodology and approach to the establishment of the designated sites baseline, establishing the ZOI of the proposed development and summarising the data sources that have been used to compile the baseline. It also describes the approach taken with regards to designated sites and their cited interest features, and how the implications for designated sites have been considered within the **ES**.
- **Section 1.3** collates the desk-study information relating to the statutory and non-statutory designated sites within the ZOI of the proposed

development, including their interest features, conservation objectives, site condition, sensitivities, etc., as appropriate.

- Finally, **section 1.4** places an initial valuation on the designated sites identified and highlights those sites that have been considered within the **ES.**

1.1.5 Within this appendix, the term "desk-study" refers to any data or reports that have been reviewed to provide a contextual overview of the current ecological condition of designated sites. It includes information from Natural England.

1.1.6 Figures showing the location of designated sites are set out in **Annex 14A2.1**, detailing the locations of the various designated sites within the ZOI (defined in **Appendix 14A1** – Introduction to the Ecological Baseline and established in **section 1.2** for designated sites) of the proposed development.

1.2 Approach and methodology

a) Introduction

1.2.1 This section sets out the approach and methodology for establishing the ZOI and defines the data sources used in producing the designated sites ecological baseline.

b) Establishing Zone of Influence for designated sites

1.2.2 In establishing an appropriate ZOI for European designated sites, reference was made to the HRA Screening Report. This defined 20km as an appropriate distance over which effects upon European sites may manifest themselves and has therefore been similarly adopted as an appropriate ZOI for considering potential effects on SPAs, SAC and Ramsar sites.

1.2.3 In addition, on a precautionary basis, and given that SSSIs underpin SACs, SPAs and Ramsar sites, 20km has also been adopted as an appropriate ZOI for considering potential effects on SSSIs.

1.2.4 Within the HRA Screening Report, several European designated sites were effectively "scoped out" of further assessment, on the basis that there were no likely impact pathways from the Sizewell C Project. These included Benacre to Eastern Bavents to SAC and SPA; Dews Pond SAC; and Staverton Park and the Thicks SAC and so these European sites have been scoped out of this appendix.

1.2.5 Each European site is underpinned by a number of individual SSSIs and therefore, the following SSSIs have also been scoped out: Dews Pond SSSI;

Pakefield to Eastern Bavents SSSI; and Staverton Parks and the Thicks SSSI.

1.2.6 Several SSSI have also been excluded from this appendix, as they have been designated solely for geological reasons, and no impact pathways have been identified by which the proposed development could directly affect the geological interest features of these sites. These are:

- Valley Farm Pitt – Subbourne SSSI
- Neutral Farm Pit – Butley SSSI
- Red House Farm Pit – Sudbourne SSSI
- Richmond Farm Pit – Gedgrave SSSI
- Roundhill Pit – Aldeburgh SSSI
- Sudbourne Park Pit SSSI
- Aldeburgh Brick Pit SSSI;
- Aldeburgh Hall Pit SSSI;
- Chillesford Church Pit SSSI;
- Crag Farm Pit – Sudbourne SSSI;
- Crag Pit – Aldeburgh SSSI;
- Gedgrave Hall Pit SSSI; and
- Holton Pit SSSI.

1.2.7 For non-statutory designated sites, the main effects arising from the proposed development are likely to constitute effects such as land take, hydrological change, changes in air quality, and disturbance from noise and lighting, these impacts have a limited impact zone, therefore are only likely to affect those sites in close proximity. Therefore, 2km has been established as an appropriate ZOI for non-statutory CWSs.

1.2.8 **Table 1.1** and **Table 1.2**, in **section 1.3**, identifies those designated sites that have been considered within this appendix.

c) Data sources

i. Ecological features

1.2.9 Information on the features of ecological interest of statutory designated sites of nature conservation importance within the ZOI (as defined in **section 1.2**) was obtained in 2019 from the Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref. 1.3). This included SPAs, SACs, Ramsar sites, SSSIs and National Nature Reserves (NNRs). Information on non-statutory designated sites was obtained from Suffolk Biodiversity Information Service (SBIS) in 2014 and updated in 2018.

ii. Site sensitivities and ecological condition

1.2.10 Information relating to designated site sensitivities and vulnerabilities have been obtained from a variety of published information sources.

1.2.11 Vulnerabilities and ecological condition assessments for SACs and SPAs have been obtained from the Joint Nature Conservation Committee (JNCC) (Ref. 1.4) and Natural England websites (Ref. 1.5). These include:

- the Natura 2000 standard data form (each European site has its own standard form containing site-specific information);
- Site Improvement Plans produced for each European site;
- Regulation 33 advice and conservation objectives for each European site;
- condition assessment information for the component SSSIs that underlie the European designations;
- condition assessment information for individual SSSIs that do not underlie any European designations;
- vulnerabilities and ecological condition assessment for SSSIs have been obtained from the Natural England website in the form of individual condition assessments for each individual SSSI;
- British Trust for ornithology wetland bird survey alert reports for SPA sites (Ref. 1.6) where these have been produced (not all SPAs are covered); and
- information pertaining to Ramsar sites has been obtained from the Ramsar Information Sheets.

1.2.12 Online references to these documents are provided in the references section.

1.2.13 No information concerning the vulnerabilities and ecological condition of CWSs is available from the SBIS. However, the majority of CWSs in proximity to the site are managed by Suffolk Wildlife Trust (SWT) on behalf of SZC Co., as they form part of the EDF Energy Estate (for which SWT produce annual monitoring reports). This information, together with professional judgement and the results of survey work carried out between 2007 and 2019, has been used to inform an assessment of the current ecological condition of the relevant CWSs.

d) Assessment approach of designated sites within the appendices

1.2.14 The ecology baseline consists of individual appendices in taxonomic order (i.e. plants and habitats, invertebrates, amphibians, ornithology, etc.). Within these, the relevant designated sites are reviewed (e.g. SPAs within **Appendix 14A7** – Ornithology (Doc Ref. 6.3)) and information regarding any relevant cited interest features are discussed, together with the results of any relevant secondary and primary survey data. Together this information is reviewed, and an assessment made as to the ecological value of the qualifying features within the ZOI of the proposed development.

1.2.15 For example, **Appendix 14A3** – Plants and Habitats (Doc Ref. 6.3) discusses the plant and habitat cited interest features of the designated sites within the ZOI of the proposed development and, based on a consideration of all the available information, an initial ecological value is assigned to each interest feature. Whilst this valuation is clearly heavily influenced by each site's designation, other issues (such as condition, relative abundance, listing in other legislation or policy, etc.) are also considered.

1.2.16 Although it is important that the individual components of designated sites are assessed objectively in the individual appendices in this way (i.e. as IEFs in their own right), an overall contextual summary of the ecological baseline of each designated site (bringing together information regarding all of the constituent interest features) is also required to aid the assessment of significant effects. This is presented in **section 1.3**.

1.3 Designated sites baseline

a) Introduction

1.3.1 This section brings together desk-study and other information into a contextual summary of the baseline conditions of the statutory and non-statutory designated sites within the ZOI of the proposed development. This section is set out as follows:

- **Section 1.3** defines the cited features for each designated site identified within the respective ZOI (as defined in **section 2.2)**.

- **Section 1.3** sets out the conservation objectives for the European designated sites.
- **Section 1.3** sets out the sensitivities and current ecological condition for each site (where available) in order of designation hierarchy (European sites, national sites, local sites).
- **Section 1.3** brings this information together and summarises it in tabular form (**Table 1.5**).

b) Features of ecological interest

1.3.2 The desk-study revealed four SPAs, three SACs, two Ramsar sites and 12 SSSIs within 20km of the site. These are shown on **Figure 14A2.1** and **Figure 14A2.2** in **Annex 14A2.1** (note that this only includes those designated sites screened in (see **section 1.2**).

1.3.3 An additional SAC, the Southern North Sea SAC with the Annex II species harbour porpoise (*Phoecena phoecena*) as the cited interest feature (Ref 1.7), covering inshore and offshore waters in the North Sea (including adjacent to the Suffolk coast), is considered in **Volume 2, Chapter 22:** Marine Ecology.

1.3.4 The locations of the designated sites (in relation to the site) included within this baseline, and the reasons for their designation, are summarised in **Table 1.1** and **Table 1.2**.

1.3.5 For habitats that are qualifying features these are included in the plants and habitats section of **Volume 2, Chapter 14** of the **ES.** The only faunal qualifying features are birds, this is also discussed further within **Volume 2, Chapter 14** of the **ES**. Marine designations and qualifying feature are included within **Volume 2, Chapter 22** of the **ES**. Full details of all international designations are presented in the HRA Screening Report.

Table 1.1: Summary of statutory designated sites.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
SACs		
Minsmere to Walberswick Heaths and Marshes (Ref. 1.8).	Supports the following Annex I habitats as a primary reason for selection: Annual vegetation of drift lines. Occurs on a well-developed beach strandline of mixed sand. Species include those typical of sandy shores, such as Sea Sandwort (*Honckenya peploides*) and shingle plants such as Sea Beet (*Beta vulgaris* ssp. *Maritima*). European dry heaths. This type of vegetation is dominated by Heather (*Calluna vulgaris*), Western Gorse (*Ulex gallii*) and Bell Heather (*Erica cinerea*). Annex I habitats present as qualifying features, but not primary reason for selection: Perennial vegetation of stony banks. This comprises vegetated coastal shingle with plant species Yellow horned-poppy (*Glaucium flavum*) rare Sea-kale (*Crambe maritima*) and Sea Pea (*Lathyrus japonicus*). Where sea spray is blown over the shingle, plant communities with a high frequency of salt-tolerant species such as Thrift (*Armeria maritima*) and Sea Campion (*Silene uniflora*) occur. These may exist in a matrix with abundant lichens.	Adjacent to the site.
Alde-Ore and Butley Estuaries (Ref. 1.9).	Supports the following Annex I habitats as a primary reason for selection: Estuaries The estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Annex I habitats present as qualifying features, but not primary reason for selection: Mudflats and sandflats not covered by seawater at low tide. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).	5km
Orfordness to Shingle Street (Ref. 1.10).	Supports the following Annex I habitats as a primary reason for selection:	8km

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	Coastal lagoons. The percolation lagoons at this site have developed in the shingle bank adjacent to the shore at the mouth of the Ore estuary. The fauna of these lagoons includes typical lagoon species, such as the cockle *Cerastoderma glaucum*, the ostracod *Cyprideis torosa* and the gastropods *Littorina saxatilis tenebrosa* and *Hydrobia ventrosa*. The nationally rare starlet sea anemone *Nematostella vectensis* is also found at the site. Annual vegetation of drift lines. Orfordness is an extensive shingle spit, some 15km in length, and is one of two sites representing annual vegetation of drift lines on the east coast of England. Drift-line vegetation occurs on the sheltered, western side of the spit, at the transition from shingle to saltmarsh, as well as on the exposed eastern coast. The drift-line community is widespread on the site and comprises Sea Beet and Orache *Atriplex* spp. Perennial vegetation of stony banks. The 15km spit has been selected as it supports some of the largest and most natural sequences in the UK of shingle vegetation affected by salt spray.	
SPAs		
Outer Thames Estuary SPA (Ref. 1.11).	Supports populations of European importance of the following Annex I species: Overwinter/passage Red-throated diver (*Gavia stellata*). Protects foraging areas for common tern (*Sterna hirundo*) and little tern (*Sternula albifons*) during the breeding season.	Within the site and adjacent to SPA.
Minsmere to Walberswick (Ref. 1.12).	Supports populations of European importance of the following Annex I species: During the breeding season: Avocet (*Recurvirostra avosetta*), bittern (*Botaurus stellaris*), little tern, marsh harrier, nightjar (*Caprimulgus europaeus)* and woodlark (*Lullula arborea*). Overwinter: Avocet, bittern and hen harrier (*Circus cyaneus)*.	Adjacent to the site.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
Sandlings (Ref. 1.13).	Supports populations of European importance of the following Annex I species: During the breeding season: Nightjar and woodlark.	0.7km
Alde-Ore Estuary (Ref. 1.14)	Supports nationally important numbers of the following Annex 1 species: During the breeding season: Marsh Harrier Avocet Sandwich tern Little tern lesser black-backed gull Overwinter: redshank. Avocet Ruff	5km
Ramsar sites.		
Minsmere to Walberswick (Ref. 1.15).	The site fulfils the following Ramsar criteria as justification for its selection: Ramsar criterion 1: Contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and a rare transition in grazing marsh ditch plants from brackish to fresh water. Ramsar criterion 2: Supports nine nationally scarce plants and at least 26 Red Data Book (RDB) invertebrates.	Adjacent to the site.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	Supports a population of the mollusc *Vertigo angustior* (Habitats Directive Annex II; British RDB Endangered), recently discovered on the Blyth estuary river walls, and an important assemblage of rare breeding birds associated with marshland and reedbeds, including: Bittern, gadwell (*Anas strepera*), Eurasian teal (*Anas crecca*), northern shoveler (*Anas clypeata*), marsh harrier, avocet, and bearded tit *(Panurus biarmicus*).	
Alde-Ore Estuary (Ref. 1.16).	The site fulfils the following Ramsar criteria as justification for its selection: Ramsar criterion 2: Supports a number of nationally-scarce plant species and British RDB invertebrates. Ramsar criterion 3: Supports a notable assemblage of breeding and wintering wetland birds. Ramsar criterion 6: Supports a number of species/populations occurring at levels of international importance. This includes lesser black-backed gull (*Larus marinus*) during the breeding season, and pied avocet (*Recurvirostra avosetta*) and common redshank (*Tringa totanus*) during the winter.	5km
SSSI		
Alde – Ore Estuary (Ref. 1.17).	This site stretches along the coast from Bawdsey to Aldeburgh and inland to Snape. The scientific interests of the site are outstanding and diverse. The shingle structures of Orfordness and Shingle Street are of great physiographic importance whilst the cliff at Gedgrave is of geological interest. The site also contains a number of coastal formations and estuarine features including mud-flats, saltmarsh, vegetated shingle and coastal lagoons which are of special botanical and ornithological value. The cited biological interest features of the site are as follows: Birds: Aggregations of breeding birds - avocet (*Recurvirostra avosetta*), black headed gull (*Larus ridibundus*), herring gull (*Larus argentatus*), lesser black-backed gull (*Larus fuscus*), little tern (*Sterna albifrons*), marsh harrier (*Circus aeruginosus*), sandwich tern (*Sterna sandvicensis*), shoveler (*Anas clypeata*).	5km

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	Aggregations of non-breeding birds – avocet, bewick's swan (*Cygnus columbianus bewickii*), redshank (*Tringa tetanus*), shelduck (*Tadorna tadorna*), teal (*Anas crecca*), wigeon (*Anas Penelope*). Assemblages of breeding birds - Lowland damp grasslands. Habitats: Estuaries Saline coastal lagoons. SD1[1] - *Rumex crispus - Glaucium flavum* shingle community. SD2 - *Cakile maritima-Honkenya peploides* strandline community. Sheltered muddy shores (including estuarine muds). SM14 - *Atriplex portulacoides* saltmarsh. Vascular Plant Assemblage. Fauna: Invertebrate Assemblage. Population of Schedule 5 sea anemone - *Nematostella vectensis*, Starlet Sea Anemone.	
Blaxhall Heath (Ref. 1.18).	Blaxhall Heath is one of the few fragments of the once extensive Sandlings heath of coastal Suffolk. The notified biological interest features of the site are as follows: Habitats: H8 - *Calluna vulgaris - Ulex gallii heath.* SD11 - *Carex arenaria - Cornicularia aculeata* dune community. U1 - *Festuca Ovina - Agrostis Capillaris - Rumex Acetosella* Grassland.	11.6km

[1] SD1 and similar initials refer to the National Vegetation Classification (NVC) habitat type. The NVC is published by Cambridge University Press in a five-volume series entitled British Plant Communities, which area edited by John Rodwell.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
Cransford Meadow (Ref. 1.19).	This site consists of two unimproved species-rich meadows which have developed in a shallow valley close to the headwaters of a tributary of the River Alde. The notified biological interest features of the site are as follows: Habitats: MG5 - *Cynosurus cristatus - Centaurea nigra* grassland.	14.9km
Gromford Meadow (Ref. 1.20).	Gromford Meadow is a good example of an unimproved base-rich marsh on an alluvial soil with a high organic content. It borders the River Alde and is fed by springs. It is species-rich and contains a variety of characteristic fen meadow and marshland plants. The notified biological interest features of the site are as follows: Habitats: M22 - *Juncus subnodulosus - Cirsium palustre* fen meadow	10km
Iken Wood (Ref. 1.21).	Iken Wood lies close to the banks of the River Alde and may well be the only ancient coppice wood on blown sand in Britain. It is the most interesting example of lowland coppice oakwood in Suffolk and has a distinctive flora typical of woods on light soils. The notified biological interest features of the site are as follows: Habitats: W10 - *Quercus robur - Pteridium aquilinum - Rubus fruticosus* woodland.	10.8km
Leiston to Aldeburgh (Ref. 1.22).	Leiston-Aldeburgh contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in close juxtaposition and the associated transition communities between habitats is unusual in the Suffolk Coast and Heaths. The notified interest biological features of the site are as follows: Birds: Aggregations of breeding birds - Gadwall, (*Anas Strepera),* Marsh Harrier (*Circus aeruginosus)*, Woodlark (*Lullula arborea*). Aggregations of non-breeding birds Gadwall, Shoveler (*Anas clypeata)*, White-fronted Goose (*Anser albifrons)*.	0.7km

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	Assemblages of breeding birds - Lowland damp grasslands. Assemblages of breeding birds - Lowland open waters and their margins. Variety of breeding bird species (70). Habitats: H1 - *Calluna vulgaris - Festuca ovina* heath. Lowland ditch systems. S4 - *Phragmites australis* swamp and reed-beds. SD1 - *Rumex crispus - Glaucium flavum* shingle community. U1 - *Festuca Ovina - Agrostis Capillaris - Rumex Acetosella* grassland. Vascular Plant Assemblage. W1 - *Salix cinerea - Galium palustre* woodland. W2 - *Salix cinerea - Betula pubescens - Phragmites australis* woodland. W6 - *Alnus glutinosa - Urtica dioica* woodland. Fauna: Outstanding dragonfly assemblage.	
Minsmere to Walberswick Heaths and Marshes (Ref. 1.23).	Contains a complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh, which combine to create an area of exceptional scientific interest. The tidal mudflats form sheltered feeding grounds for wildfowl and shorebirds. The notified biological features of the site are as follows: Birds: Aggregations of breeding birds – Avocet (*Recurvirostra avosetta)*, Bearded Tit (*Panurus biarmicus*) Bittern (*Botaurus stellaris)*, Cetti's Warbler (*Cettia cetti)*, Garganey (*Anas querquedula)* and Marsh Harrier *(Circus aeruginosus).* Assemblages of breeding birds - Lowland damp grasslands. Variety of breeding bird species (70). Variety of wintering bird species (90).	Adjacent to the site.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	Plants and Habitats: Vascular Plant Assemblage . W6 - *Alnus glutinosa - Urtica dioica* woodland H1 - *Calluna vulgaris - Festuca ovina* heath. H8 - *Calluna vulgaris - Ulex gallii* heath. Lowland ditch systems. M22 - *Juncus subnodulosus - Cirsium palustre* fen meadow. M23 - *Juncus effusus/ acutiflorus - Galium palustre* rush pasture. M27 - *Filipendula ulmaria - Angelica sylvestris* mire. Population of Schedule 8 plant - Red-tipped Cudweed *(Filago lutescens)*. S2 - *Cladium mariscus* swamp and sedge-beds. S26 - Phragmites australis - Urtica dioica tall-herb fen. S4 - *Phragmites australis* swamp and reed-beds. Saline coastal lagoons. SD1 - *Rumex crispus - Glaucium flavum* shingle community. SD11 - *Carex arenaria - Cornicularia aculeata* dune community. SD12 - *Carex arenaria - Festuca ovina - Agrostis capillaris* dune grassland. SD2 - *Cakile maritima-Honkenya peploides* strandline community. SD6 - *Ammophila arenaria* mobile dune community Sheltered muddy shores (including estuarine muds). SM14 - *Atriplex portulacoides* saltmarsh. SM24 - *Elytrigia atherica* saltmarsh. U1 - *Festuca Ovina - Agrostis Capillaris - Rumex Acetosella* grassland. Fauna: Invertebrate assemblage.	

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
Potton Hall Fields (Ref. 1.24).	Potton Hall Fields are of special interest for their populations of the nationally rare Red-tipped Cudweed, several thousand of which have been recorded there. The plant occurs in only two other counties in Britain and, being listed on Schedule 8 of the Wildlife and Countryside Act 1981 (Ref. 1.24). The notified biological features of the site are as follows: Population of Schedule 8 plant - Red-tipped Cudweed.	6.5km
Sandlings Forest (Ref. 1.25).	This site is notified for its coniferous woodland. The notified biological features of the site are as follows: Aggregations of breeding birds – Nightjar (*Caprimulgus europaeus)*, Woodlark (*Lullula arborea)*.	17.8km
Sizewell Marshes (Ref. 1.26).	Contains a large area of lowland, unimproved wet meadows which support outstanding assemblages of invertebrates and breeding birds. Several nationally scarce plants are also present. The notified biological features of the site are as follows: Fauna: Assemblages of breeding birds - Lowland damp grasslands. Invertebrate Assemblage. Habitats: Lowland ditch systems. M22 - *Juncus subnodulosus - Cirsium palustre* fen meadow. M23 - *Juncus effusus/acutiflorus - Galium palustre* rush pasture. S26 - *Phragmites australis - Urtica dioica* tall-herb fen. Vascular plant assemblage.	Within the site.
Snape Warren (Ref. 1.27).	Snape Warren is an important remnant of the once extensive “Sandlings” heaths of coastal Suffolk. The notified biological features of the site are as follows: H8 - *Calluna vulgaris - Ulex gallii* heath. U1 - *Festuca Ovina - Agrostis Capillaris - Rumex Acetosella* grassland.	8.2km

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	U4 - *Festuca ovina - Agrostis capillaris - Galium saxatile* grassland.	
Tunstall Common (Ref. 1.28).	Tunstall Common is a fragment of the once extensive 'sandlings' heath of coastal Suffolk and is a good example of this dry lowland heath type. The notified biological features of the site are as follows: H1 - *Calluna vulgaris - Festuca ovina* heath. U1 - *Festuca Ovina - Agrostis Capillaris - Rumex Acetosella* Grassland.	10.8km

1.3.6 The desk-study identified seven CWSs within 2km of the site. The reasons for their designation are described in **Table 1.2**.

Table 1.2: Summary of non-statutory designated sites.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
Sizewell Levels and Associated Areas (Ref. 1.29).	An area of wet meadow, sallow scrub and birch/alder considered to be of regional importance for the following reasons: The area contains a number of uncommon plants, for example Ragged Robin (*Silene flos-cuculi*) and Purple Loosestrife (*Lythrum salicaria*). The waterlogged grazing marsh provides cover for large numbers of swan, teal, mallard (*Anas platyrhynchos*) and moorhen throughout the winter. Also, of note are the plantations to the north of Sizewell belts; Goose Hill, Nursery Covert and Kenton Hills all support breeding populations of a number of nationally rare birds.	Within the site.
Southern Minsmere Levels (Ref. 1.30)	This site contains all the marshes east of Eastbridge to the sea, south of Minsmere New Cut. It abutts the internationally important Minsmere-Walberswick SSSI, which contains the Minsmere RSPB reserve. The entire valley is of great importance for wildlife forming perhaps the last unspoilt and least improved of Suffolk's larger marshland river valleys. This eastern portion of the valley is of interest principally for breeding wader and wildfowl and for overwintering birds. The extensive area of open marsh, managed in the traditional manner with cattle grazing and	Within the site.

Designated Site.	Cited Interest Features.	Approximate Distance from the Site.
	high water levels provides ideal conditions for feeding birds. Botanically the marshes are not of the same quality as those further up the valley. Many of them are improved, although some of the dykes retain a reasonable flora with plants such as broad- leaved pondweed, frogbit and water violet. Additional interest is given by a few small areas of scrub and woodland on the site. In 1994 a large proportion of this County Wildlife Site was confirmed as part of the extended Minsmere-Walberswick SSSI.	
Suffolk Shingle Beaches (Ref. 1.31).	The site is part of a stretch of shingle beach along the Suffolk coast which supports a range of shingle plants, including the nationally scarce plant, sea pea. Other typical shingle flora includes Sea Kale, Sea Spurge (*Euphorbia paralias*), Sea Sandwort and Sea Bindweed (*Calystegia soldanella*).	Within the site.
Aldringham to Aldeburgh Disused Railway Line (Ref. 1.32).	The site supports a species-rich flora both on the line of the old track and on the gently sloping embankments. Plants typical of lightly trampled conditions have been recorded on the footpath itself, and these include the nationally rare species Mossy Stonecrop (*Sedum acre*) and an unusual species of clover, Suffocated Clover (*Trifolium suffocatum*).	0.23km
Sizewell Rigs (Ref. 1.33).	The two rigs off-shore from the A and B stations support a growing breeding colony of kittiwakes (*Rissa tridactyla*), which is the most southerly colony in the North Sea.	0.4km
Leiston Common (Ref. 1.34).	Leiston Common is a small but important site for wildlife conservation in Suffolk. Bell heather, a rare plant in Suffolk, grows here, together with more widespread plants such as Harebell (*Campanula rotundifolia*), Heath Bedstraw (*Galium saxatile*) and Tormentil (*Potentilla erecta*). Another notable and uncommon feature of the site is the presence of an extensive and diverse lichen flora.	0.6km
Dower House (Ref. 1.35).	Grassland on the cliff top of the Dower House is a valuable example of unimproved dry acid/dry maritime grassland. The sward includes species typically associated with acid grasslands and heaths, such as Heath Violet (*Viola canina*) and Heath Speedwell (*Veronica officinalis*). In addition to the site's botanical interest, it is also important for reptiles. The surrounding Blackthorn scrub is also important for birds, particularly as feeding stations for migrants.	1km

c) European site conservation objectives

1.3.7 For each European site, Natural England produces a set of conservation objectives. These are required to assist public bodies in complying with the law and are also designed to help with the protection and improvement of these sensitive sites. The following objectives all apply to Minsmere to Walberswick Heaths and Marshes SAC (Ref. 1.36) and SPA (Ref. 1.37), the Alde, Ore and Butley Estuaries SAC (Ref. 1.38) and Alde-Ore Estuary SPA (Ref. 1.39), and the Orfordness to Shingle Street SAC (Ref. 1.40):

> *"Ensure that the integrity of the site is maintained or restored, as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:*

- *the extent and distribution of qualifying natural habitats and habitats;*
- *the structure and function (including typical species) of qualifying natural habitats, and*
- *the supporting processes on which qualifying natural habitats rely."*

1.3.8 The conservation objectives for the Sandlings and Outer Thames Estuary SPAs differ from this generic objective, as follows.

1.3.9 The conservation objectives for the Sandlings SPA (Ref. 1.41) are:

> *"Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:*

- *the extent and distribution of the habitats of the qualifying features;*
- *the structure and function of the habitats of the qualifying features;*
- *the supporting processes on which the habitats of the qualifying features rely;*
- *the population of each of the qualifying features; and*
- *the distribution of the qualifying features within the site."*

1.3.10 The conservation objective for the Outer Thames Estuary SPA (Ref. 1.42) is:

> *"… subject to natural change, maintain or enhance the red-throated diver population and its supporting habitats in favourable condition".*

d) Site sensitivities and condition

1.3.11 This section sets out the vulnerabilities, sensitivities and, where information is available, the current ecological condition for each of the sites identified in **section 1.3**. This has involved a review of publicly available documentation (see **section 1.2**) and provides a synthesis highlighting the information considered most relevant to the Sizewell C Project (i.e. what aspects the proposed development is most likely to affect).

1.3.12 Each designated site is discussed in turn, and a summary is provided in **Table 1.5**, which also considers the implications of the proposed development for the current condition of these sites. Note that a number of sites have more than one designation, and the term "site" encompasses all the designations.

i. Minsmere to Walberswick Heaths and Marshes Special Area of Conservation, Special Protection Area and Ramsar

1.3.13 The Minsmere to Walberswick Heaths and Marshes SAC is a site proactively managed by a number of organisations including: Natural England, the Royal Society for the Protection of Birds (RSPB) and the National Trust. The Natura 2000 data form highlights that the SAC is vulnerable to tree and scrub encroachment on the open heathland habitat, and that the annual vegetation of drift lines is vulnerable to human disturbance (Ref. 1.8). The SPA data form highlights that the site is at risk due to the coastline being pushed back by natural processes, and this is being addressed through the shoreline management plan (e.g. alternative sites for new reedbed creation are being sought to offset any loss due to coastal processes) (Ref. 1.12).

1.3.14 The Ramsar Information Sheets highlights that the site is vulnerable to external forces such as sea level rise, coastal erosion, and visitor pressure; in particular, trampling of vegetated shingle and disturbance to little tern nesting habitat (Ref. 1.14).

1.3.15 The Site Improvement Plan for the site (Ref. 1.43) raises a number of issues, those considered most relevant to the proposed development being:

- to reduce habitat and bird disturbance (primarily from recreation disturbance);

- air pollution – to assess the potential impacts of atmospheric nitrogen deposition and to produce a Site Nitrogen Action Plan;
- water pollution – to ensure appropriate thresholds are maintained; and
- coastal squeeze[2] – to ensure that there is scope for natural adaptation of intertidal habitat creation to offset impacts from sea level rise.

1.3.16 The British Trust for Ornithology Web Alerts have raised no issues for the SPA in relation to the two species concerned, bittern and avocet (Ref. 1.6).

1.3.17 Finally, the Natural England condition assessment of the SSSI underpinning the SAC divides the site into 120 separate management units. This indicates that 54% of units are in "favourable" condition with 40.5% being "unfavourable but recovering". Of the relatively small area that is not in favourable condition, 3% is "unfavourable, no change", 0.2% is "unfavourable declining" and 0.8% is either "destroyed" or "partially destroyed". These units were last reviewed between 1 December 2008 and 30 September 2014 (Ref. 1.23).

1.3.18 Reasons given for management units not being in favourable condition include coastal squeeze, inappropriate coastal management, and public disturbance. Of note is that some of the SSSI units historically contained vegetated shingle (the SAC interest features "*Annual vegetation of drift lines*", and "*Perennial vegetation of stoney banks*") which have been lost to coastal erosion or damaged by trampling resulting from high visitor pressure. Significantly, Unit 113, located on the coast immediately to the north of the site, no longer supports "*Annual vegetation of drift lines*", this feature having been destroyed and lost to coastal erosion.

ii. Alde – Ore and Butley Estuary Special Area of Conservation, Special Protection Area and Ramsar

1.3.19 The Alde – Ore and Butley Estuary contains specific areas proactively managed for nature conservation by SWT, the National Trust, and the RSPB. The Natura 2000 data form highlights that the SAC is vulnerable to erosion and sea-level rise, which has resulted in the loss of saltmarsh; however, it also notes that there are long-term plans for managed retreat to increase the extent of saltmarsh (Ref. 1.9). The Natura 2000 data form for the SPA also highlights vulnerabilities to sea-level rise and coastal squeeze, and again notes that this is being addressed through managed retreat. Human

[2] An environmental situation where the coastal margin is squeezed between the fixed landward boundary (such as a sea wall or other sea defense artificial or otherwise) and the rising sea level, such that habitats cannot migrate inland but instead are eroded.

disturbance from recreation is considered minimal, as the system is considered reasonably robust.

1.3.20 The Ramsar Information Sheets highlights erosion as an issue (Ref. 1.15). The Site Improvement Plan (Ref. 1.44) raises a number of issues, with those considered most relevant to the proposed development being:

- hydrological changes – seek alternative habitat provision or enhancement;
- public access and disturbance – reduce bird disturbance and trampling of shingle vegetation;
- inappropriate coastal management – seek long-term sustainable solutions;
- coastal squeeze – ensure scope for natural adaptation or habitat creation to offset sea level rise;
- air pollution – impact of atmospheric nitrogen deposition and establish a Site Nitrogen Action Plan; and
- commercial fisheries pressure – revised approach to fisheries management.

1.3.21 The British Trust for Ornithology Web alerts for the site have raised a "high alert" for white-fronted goose (*Anser albifrons*) and redshank, suggesting a rapid decline in these interest features, and a "moderate alert" for shelduck and lapwing (*Vanellus vanellus*), suggesting a moderate decline in the numbers of these interest features. However, the declines are thought to reflect broad-scale trends rather than being due to local or site-specific factors (Ref. 1.6).

1.3.22 Finally, the Natural England Condition Assessment of the SSSI underpinning the SAC (the Alde–Ore Estuary SSSI) shows with 51% being in "favourable" condition and 34% being "unfavourable but recovering". Only 13% is considered to be in "unfavourable condition with no change". This was last reviewed in 29 September 2009 (Ref. 1.16).

1.3.23 Reasons given for management units not being in favourable status include public access and disturbance, and inappropriate coastal management. Of note is that some of the SSSI units contain vegetated shingle, and tramping of sensitive shingle vegetation by recreational activities is indicated as being a problem in some units, particularly those close to Aldeburgh and Shingle Street. Disturbance due to recreational activities is also implicated in the decline in the breeding success of the lesser black-backed gull colony.

iii. Orfordness to Shingle Street Special Area of Conservation

1.3.24 The Natura 2000 data form highlights that the vegetated shingle within the Orfordness to Shingle Street SAC is a sensitive habitat that is particularly vulnerable to recreational pressure (Ref. 1.10).

1.3.25 The Site Improvement Plan (Ref. 1.40) raises several issues, those considered most relevant to the proposed development being:

- public access and disturbance – reduce bird disturbance and trampling of shingle vegetation;
- inappropriate coastal management– seek long term sustainable solutions;
- coastal squeeze – ensure scope for natural adaptation of intertidal habitat loss to offset impacts of sea level rise; and
- changes in nesting bird species distribution – understand the population dynamics and enable more flexibility and better habitat provision.

1.3.26 Finally, the Natural England Condition Assessment of the SSSI underpinning the SAC is the same as that for the Alde–Ore Estuary (Ref. 1.16), the key point being that recreational activity is implicated in trampling of shingle vegetation.

iv. Sandlings Special Protection Area

1.3.27 The Natura 2000 data form highlights that within the forested areas of the Sandlings SPA, the creation of open ground suitable for woodlark and nightjar is dependent on silvicultural practice. Within the heathland areas, a lack of management has resulted in encroachment of bracken and scrub. Human influences, including disturbance, are also mentioned as a threat (Ref. 1.13).

1.3.28 The Site Improvement Plan (Ref. 1.45) raises several issues, those considered most relevant to the proposed development being:

- public access and disturbance – determine the impacts of recreational pressure, in particular dogs off leads; and
- air pollution – impact of atmospheric nitrogen deposition.

1.3.29 The Sandlings SPA is underpinned by three individual SSSIs: Leiston to Aldeburgh, Snape Warren and the Sandlings Forest. The Natural England condition assessment for the entirety of Snape Warren and the Sandlings Forest SSSIs show that both sites are in “unfavourable but recovering” condition. The units in these two SSSIs were last reviewed in 24 July 2013

and 21 December 2010 respectively (Ref. 1.27) (Ref. 1.25). In contrast, the condition assessment for the Leiston to Aldeburgh SSSI shows with 53% being in "favourable" condition and 44% being "unfavourable but recovering". Whilst 2% is in "unfavourable and declining" condition, this is not related to woodlark or nightjar (the Sandlings SPA qualifying features), but to the trampling of shingle vegetation (not a qualifying feature of the Sandlings SPA). The units were last reviewed between 4 August 2008 and 20 September 2011 (Ref. 1.22).

v. Outer Thames Estuary Special Protection Area

1.3.30 The Natura 2000 data form highlights that red-throated diver are highly sensitive to noise and visual disturbance from a range of activities occurring in the marine environment, including shipping, aggregate extraction and the construction of offshore windfarms. In addition, commercial fishing operations and pollution events from accidental spillage and effluent discharge could potentially affect diver prey species, and red-throated divers could also potentially become entangled in fishing gear (Ref. 1.11).

1.3.31 The Site Improvement Plan (Ref. 1.46) also identifies commercial fisheries as the main issue affecting the SPA.

vi. Individual Sites of Special Scientific Interest (not underpinning a European site designation)

1.3.32 The condition assessment for those individual SSSI not underpinning a European site designation are discussed below in **Table 1.3**.

Table 1.3: Summary of condition assessment of SSSI (not underpinning a European Site).

SSSI	Condition Assessment Summary.
Blaxhall Heath.	Condition assessment indicates that the site is in “unfavourable but recovering” ecological condition. The two criteria where the site failed are too much bracken cover and the heather age structure. The correct management is in place to return the site to favourable condition. The units were last reviewed 2015 (Ref. 1.17).
Cransford Meadow.	Condition assessment indicates that the entire site is in “favourable” ecological condition. The units were last reviewed 2012 (Ref. 1.18).
Gromford Meadow.	Condition assessment indicates that the site is in “unfavourable but recovering” ecological condition. Since the last assessment, annual cutting has been introduced and there is the potential to introduce grazing if the SSSI can be fenced. The target sward height has been exceeded, but this may be down to the unusually wet summer leading to increased vegetation growth. The units were last reviewed 2012 (Ref. 1.19).
Iken Wood.	Condition assessment indicates that the site is in “unfavourable no change” ecological condition. It failed on the Regeneration attribute due to a combination of deer browsing and dense bracken growth. The units were last reviewed 2011 (Ref. 1.21).
Potton Hall Fields.	Condition assessment indicates that the entire site is in “favourable” ecological condition. Despite failing targets for niche availability, sward height and encroachment of negative indicators, the health of the Red-tipped cudweed population means the site cannot be classified as unfavourable. The units were last reviewed 2012 (Ref. 1.24).
Sizewell Marshes.	Condition assessment indicates that the entire site is in “favourable” ecological condition. The units were last reviewed 2009 (Ref. 1.26). Since this time annecdotal evidence from the EDF Biodiversity Manager suggests that a lack of cattle grazing now means that as of 2018/19 Sizewell Marshes would likely be regarded as being in unfavourable condition and EDF and the Suffolk Wildlife Trust have put a recovery package in place through increased cutting and grazing management.
Tunstall Common.	Condition assessment indicates that the site is in “unfavourable but recovering”, ecological condition. A formerly neglected heath is now showing distinct signs of recovery. Work to control invasive trees and bracken undertaken in manageable plots and there is evidence that the heather is recovering. Cleared areas need continued management and further clearance is planned. If the good work is maintained this site will be on course to achieve favourable condition. The units were last reviewed 2014 (Ref. 1.28).

vii. County Wildlife Sites

1.3.33 No information concerning the vulnerabilities and ecological condition of CWSs was available from the SBIS. However, most CWSs in close proximity to the site boundary are within the EDF Energy Estate, and are thus managed by SWT and Freedom Group on behalf of EDF Energy. SWT produce annual monitoring reports for the EDF Energy Estate. This information, together with professional judgement and the results of survey information (presented in **Volume 2, Appendix 14A3** to **Appendix 14A9** of the ecological baseline (Doc Ref. 6.3) has been used to inform an assessment of the condition of each of the individual CWSs. This is presented in **Table 1.4**.

Table 1.4: Summary of non-statutory designated sites.

CWS	Condition Assessment and Rationale.
Leiston Common.	CWS citation indicates that Leiston Common supports species-rich acid grassland and heath. Sizewell land management reviews highlight regular habitat management by SWT, including grazing and bracken control. Leiston Common CWS is therefore assumed to be in good ecological condition.
Suffolk Shingle Beaches.	The citation indicates that the Suffolk Shingle Beaches CWS supports diverse shingle and dune vegetation including a number of rare plant species. Survey work has confirmed that both the flora and invertebrate assemblages are of national importance. Sizewell land management reviews highlight that SWT regularly rope off sections of the beach to reduce trampling of flora, and nesting ringed plover (*Charadrius hiaticula*) have been recorded as present in some years. This CWS is therefore assumed to be in good ecological condition.
Sizewell Rigs.	The CWS citation indicates that the Sizewell Rigs support an important breeding population of kittiwake. Survey work has confirmed that a thriving population of breeding kittiwake are present, and the rigs also support roosting cormorants and other seabird species. This CWS is therefore assumed to be in good ecological condition.
Sizewell Levels and Associated Areas.	A large extent of the area described in the CWS citation is now part of the Minsmere to Walberswick Heaths and Marshes SSSI. The CWS citation indicates that a diverse assemblage of breeding birds is present within the plantations of Goose Hill and Kenton Hills, and this has been confirmed by recent survey work carried out by Arcadis. In addition, survey work by Arcadis has confirmed an important reptile assemblage along the rides. Forestry operations have thinned the conifers, creating open areas suitable for reptiles. This CWS is therefore assumed to be in moderate to good ecological condition.

CWS	Condition Assessment and Rationale.
Southern Minsmere Levels.	SWT have re-established small area of heathland at Retsom's Field, and an introduced population of natterjack toads is present. Sizewell land management reviews highlight regular management intervention to maintain ecological status, and the CWS is therefore assumed to be in moderate to good ecological condition.
Dower House.	No information available to review current ecological condition.
Aldringham to Aldeburgh Disused Railway Line.	No information available to review current ecological condition.

e) Summary of designated site contextual information

1.3.34 The information relating to each designated site has been brought together in **Table 1.5**, which presents a summary of the contextual background for each designated site. This has been used to inform the current baseline valuation against which potential affects arising from the proposed development on each designated site cited interest feature has been assessed in detail within the **ES.**

Table 1.5: Summary of contextual background for designated sites.

Designated Site.	Contextual Summary.
Minsmere to Walberswick Heaths and Marshes SAC, SPA, Ramsar and SSSI.	This site is considered vulnerable to sea level rise and coastal erosion, and to visitor pressure disturbing nesting birds and trampling shingle vegetation. Most the site is considered to be in favourable or recovering condition with coastal management and public pressure cited as reasons for some units not achieving this status. Unit 113, adjacent to the northern edge of the site boundary, has been destroyed due to coastal erosion and no longer supports annual vegetation of drift lines (a qualifying feature of the SAC).
Alde-Ore and Butley Estuaries SAC, SPA, Ramsar and SSSI.	This site is considered vulnerable to sea level rise and coastal squeeze. Recreational disturbance is considered to be minimal as the system is considered reasonably robust; however, this is highlighted as an issue in the Site Improvement Plan, in particular tramping of shingle vegetation at Shingle Street and Aldeburgh. Disturbance due to recreational activity has also been implicated in the decline of breeding success of the lesser black-backed gull colony.

Designated Site.	Contextual Summary.
	British Trust for Ornithology Web Alerts have highlighted declines in a number of bird species, though these are thought to be due to a wider background change as opposed to site-specific factors.
Orfordness-Shingle Street SAC.	This site is also considered vulnerable to recreational pressure; in particular, trampling of shingle vegetation and disturbance to nesting bird species. It is also vulnerable to sea level rise and coastal squeeze, for which adaptation measures are being sought.
Sandlings SPA.	This site is dependent upon management to remove trees and scrub creating the open conditions required by ground-nesting birds. Recreational pressure (from dogs off the lead) and deposition of atmospheric nitrogen are considered to be key threats.
Outer Thames Estuary SPA.	Red-throated diver are highly vulnerable to disturbance from a range of activities occurring in the marine environment. In addition, commercial fishing activities could affect diver prey species, and divers are also at risk of becoming entangled in fishing gear.
Blaxhall heath SSSI.	Condition assessment indicates that the site is in “unfavourable but recovering”, ecological condition. The criteria where the site failed are too much bracken cover and the heather age structure. The correct management is in place to return the site to favourable condition.
Cransford meadow SSSI.	Condition assessment indicates that the entire site is in “favourable” ecological condition.
Gromford meadow SSSI.	Condition assessment indicates that the site is in “unfavourable but recovering”, ecological condition. Lack of management is the cause of failure. Annual cutting has resumed, bringing the site back into more favourable condition.
Iken Wood SSSI.	Condition assessment indicates that the site is in “unfavourable no change”, ecological condition. This is due to a lack of tree regeneration, caused mainly by deer browsing.
Potton Hall Fields SSSI.	Condition assessment indicates that the entire site is in “favourable” ecological condition.
Sizewell Marshes SSSI.	In 2009 the entire site considered to be in “favourable” condition. As of 2018/19 annecdotal evidence from the EDF Biodiversity Manager suggests that a lack of cattle grazing now means that as of 2018/19 Sizewell Marshes SSSI would likley be regarded as being in unfavourable condition and EDF Energy and the SWT have put a recovery package in place through increased cutting and grazing management.
Tunstall Common SSSI.	Condition assessment indicates that the site is in “unfavourable but recovering”, ecological condition. Work to control bracken and scrub encroachment is being undertaken.
Leiston to Aldeburgh SSSI.	2% of this SSSI is in unfavourable and declining condition due to human trampling of shingle vegetation.

Designated Site.	Contextual Summary.
Snape Warren SSSI	The Natural England condition assessment for the entirety of Snape Warren SSSI show that the site condition is “unfavourable but recovering”.
Sandlings Forest SSSI	The Natural England condition assessment for the entirety of Sandlings Forest SSSI show that the site condition is “unfavourable but recovering”.
CWSs	No detailed information relating to ecological vulnerabilities or sensitivities, but majority are assumed to be in moderate to good ecological condition based on existing available information.

1.4 Ecological features and their importance

a) Introduction

1.4.1 The purpose of this final section is to assess the ecological importance of the designated sites that could be affected by the proposed development (as an integrated whole rather than focusing on their individual cited interest features). This assessment has then been used, in conjunction with a description of the extent and magnitude of the predicted impacts of the scheme, to carry out the detailed ecological impact assessment presented in the **ES.**

1.4.2 The identification of which designated sites could be affected by the proposed development does not constitute a detailed impact assessment (which has been presented within the **ES**) but is based on the likelihood of there being a plausible impact pathway.

1.4.3 To comply with both the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (Ref. 1.47) and with the standard EIA methodology used elsewhere within the **ES**, both methodologies have been used to assess the designated sites within the ZOI of the proposed development. Full details of both the CIEEM and standard EIA assessment methodology are outlined in **Volume 1, Chapter 6** (Doc Ref. 6.2) and **Appendix 14A1** – Introduction to the Ecological Baseline (Doc Ref. 6.3).

b) Description and assessment of receptors

1.4.4 This section sets out the designated sites and their importance (as an integrated whole). For each feature, its importance is described by:

- Description and distribution: the qualifying features of the site described in terms of their distribution and abundance locally, regionally and nationally.
- Assessment: the site is described by its protected/nature conservation status, and other measures of value, to determine its relative importance, both in terms of the CIEEM Guidelines (Ref. 1.47) and the wider EIA assessment methodology.

1.4.5 This technical appendix gives a rationale for the value assigned to each designated site and the conclusions reached.

i. Feature: designated sites

Description and distribution

1.4.6 Two Ramsar sites, four SPAs, three SACs, 16 SSSIs and seven CWSs were identified within the ZOI (see **Table 1.1**). Given that:

- the Outer Thames Estuary SPA, Minsmere to Walberswick SPA, Alde-Ore Estuary SPA and the Sandlings SPA and their cited interest features are designated on the basis of internationally and nationally important habitats, plant and/or bird assemblages; and
- that potential impact pathways have been identified;

then these SPAs, and their cited interest features, identified above would:

- be considered an IEF at international level under the CIEEM guidelines; and
- be of high importance, following the EIA-specific assessment methodology.

1.4.7 Given that:

- the Minsmere to Walberswick Heaths and Marshes, Alde, Ore and Butley Estuaries, and Orfordness to Shingle Street SACs and their cited interest features are designated on the basis of internationally and nationally important habitats, plant and/or bird assemblages; and
- that potential impact pathways have been identified;

then these SACs, and their cited interest features, identified above would:

- be considered an IEF at international level under the CIEEM guidelines; and
- be of high importance, following the EIA-specific assessment methodology.

1.4.8 Given that:

- the Minsmere to Walberswick Heaths and Marshes, and Alde-Ore Estuary Ramsar sites and their cited interest features are designated on the basis of internationally and nationally important habitats, plant and/or bird assemblages; and
- that potential impact pathways have been identified;

then these Ramsar sites, and their cited interest features, identified above would:

- be considered an IEF at international level under the CIEEM guidelines; and
- be of high importance, following the EIA-specific assessment methodology.

1.4.9 Given that:

- the Alde-Ore Estuary, Blaxhall Heath, Leiston to Aldeburgh, Minsmere to Walberswick Heaths and Marshes, Sandlings Forest, Sizewell Marshes, Snape Warren, and Tunstall Common SSSIs and their cited interest features are designated on the basis of nationally important habitats, plant and/or bird assemblages; and
- that potential impact pathways have been identified;

then the SSSIs and their cited interest features, identified above would:

- be considered an IEF at the national level under the CIEEM guidelines; and
- be of high importance, following the EIA-specific assessment methodology.

1.4.10 Given that:

- Cransford Meadow, Gromford Meadow, Iken Wood and Potton Hall Fields SSSI, and their cited interest features are designated on the basis of nationally important habitats, plant and/or bird assemblages; but
- potential impact pathways have not been identified;

then the SSSIs and their cited interest features, identified above would:

- be an IEF at national level under the CIEEM guidelines;
- be of high importance, following the EIA-specific assessment methodology; but
- be scoped out of the detailed assessment as there would be no direct or indirect impacts.

1.4.11 Given that:

- Sizewell Levels and Associated Areas, Suffolk Shingle Beaches, Sizewell Rigs, Leiston Common and Southern Minsmere Levels CWSs and their cited interest features are designated on the basis of habitats, plant, reptile and/or bird assemblages of county importance; and
- that potential impact pathways may exist for those sites in close proximity to the site;

then the CWSs and their cited interest features, identified above would:

- be considered an IEF at county level under the CIEEM guidelines; and
- be of medium importance, following the EIA-specific assessment methodology.

1.4.12 Given that:

- Aldringham to Aldeburgh Disused Railway Line, and the Dower House CWSs and their cited interest features are designated on the basis of habitats, plant, reptile and/or bird assemblages of county importance; but
- no potential impact pathways have been identified;

then the CWSs and their cited interest features, identified above would:

- be considered an IEF at county level under the CIEEM guidelines;
- be of medium importance, following the EIA-specific assessment methodology; but
- be scoped out of the detailed assessment as there would be no direct or indirect impacts.

c) Summary of ecological features/receptors

1.4.13 Following a review of the known baseline within the ZOI, **Table 1.6** lists the ecological features/receptors and details which have been carried forward into the detailed assessment. Those carried forward are IEFs of sufficient conservation value that would be sufficiently affected by the proposed development to require material consideration within the assessment.

Table 1.6: Designated sites taken forward into detailed assessment.

Feature/Receptor.	Importance (CIEEM/ EIA Methodology).	Justification	Scope In/Out.
SPAs: Outer Thames Estuary, Minsmere to Walberswick, Alde-Ore Estuary and the Sandlings.	International/ High.	There would be no direct land take from any of these designated sites. There is the potential for indirect effects such as recreational impacts, air quality effects and, for Minsmere to Walberswick, hydrological change. Therefore, potential impact pathways exist, and these sites have been scoped in to the detailed assessment.	Scoped in.
SACs: Minsmere to Walberswick Heaths and Marshes, Alde, Ore and Butley Estuaries, Orforness to Shingle Street.	International/ High.	There would be no direct land take from any of these designated sites. There is the potential for indirect effects such as recreational impacts, air quality effects and, for Minsmere to Walberswick, hydrological change. Therefore, potential impact pathways exist, and these sites have been scoped in to the detailed assessment.	Scoped in.
Ramsar Sites: Mimsmere to Walberswick and Alde-Ore Estuary.	International/ High.	There would be no direct land take from any of these designated sites. There is the potential for indirect effects such as recreational impacts, air quality effects and, for Minsmere to Walberswick, hydrological change. Therefore, potential impact pathways exist, and these sites have been scoped in to the detailed assessment.	Scoped in.
SSSI: Alde-Ore Estuary, Blaxhall Heath, Leiston to Aldeburgh, Minsmere to Walberswick Heaths and Marshes , Sandlings Forest, Sizewell Marshes, Snape Warren, and Tunstall Common.	National/High.	There would be no direct land take from any of these designated sites. There is the potential for indirect effects such as recreational impacts, air quality effects and, for Minsmere to Walberswick and Sizewell Marshes, hydrological change and noise and lighting disturbance. Therefore, potential impact pathways exist, and these sites have been scoped in to the detailed assessment.	Scoped in.
SSSI: Cransford Meadow, Gromford Meadow, Iken Wood, Potton Hall fields.	National/High.	The majority of these are in private ownership so recreational impacts are unlikely and they are sufficient distance from the proposed development for no alteration to hydrological regime or changes to air quality to occur. Therefore, no impact pathways have been identified.	Scoped out.
Non-statutory designated sites:	County/Medium.	There would be direct land take from Sizewell Levels and Associated Areas and Suffolk Shingle Beaches. There is the potential for indirect effects such as recreational impacts,	Scoped in.

Feature/Receptor.	Importance (CIEEM/ EIA Methodology).	Justification	Scope In/Out.
Sizewell Levels and Associated Areas, Suffolk Shingle Beaches, Sizewell Rigs, Leiston Common, Southern Minsmere Levels.		noise and lighting disturbance, air quality effects and hydrological change. Therefore, potential impact pathways exist, and these sites have been scoped in to the detailed assessment.	
Non-statutory designated sites: Aldringham to Aldeburgh Disused Railway Line, and the Dower House.	County/Medium.	No habitat loss and they are sufficient distance from the proposed development for no alteration to hydrological regime or changes to air quality to occur. No obvious impact pathways	Scoped out.

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Annex 14A2.2 Desk Study Designated Sites

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Minsmere to Walberswick Heaths and Marshes
Unitary Authority/County:	Suffolk
SAC status:	Designated on 1 April 2005
Grid reference:	TM468682
SAC EU code:	UK0012809
Area (ha):	1265.52
Component SSSI:	Minsmere to Walberswick Heaths and Marshes SSSI

Site description:
Lowland dry heaths occupy an extensive area of this site on the east coast of England, which is at the extreme easterly range of heath development in the UK. The heathland is predominantly heather – western gorse (*Calluna vulgaris – Ulex gallii*) heath, usually more characteristic of western parts of the UK. This type is dominated by heather, western gorse and bell heather *Erica cinerea*.

Shingle beach forms the coastline at Walberswick and Minsmere. It supports a variety of scarce shingle plants including sea pea *Lathyrus japonicus*, sea campion *Silene maritima* and small populations of sea kale *Crambe maritima*, grey hair-grass *Corynephorus canescens* and yellow horned-poppy *Glaucium flavum*. A well-developed beach strandline of mixed sand and shingle supports annual vegetation. Species include those typical of sandy shores, such as sea sandwort *Honckenya peploides* and shingle plants such as sea beet *Beta vulgaris* ssp. *maritima*.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Annual vegetation of drift lines
- European dry heaths
- Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves)

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0012809
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Alde, Ore and Butley Estuaries

Unitary Authority/County: Suffolk

SAC status: Designated on 1 April 2005

Grid reference: TM444509

SAC EU code: UK0030076

Area (ha): 1561.53

Component SSSI: Alde-Ore Estuary SSSI

Site description:
This estuary, made up of three rivers, is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River originally entered the sea at Aldeburgh, but now turns south along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents.

The smaller Butley River has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats. It flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is still moving south as the Orfordness shingle spit continues to grow through longshore drift from the north. There is a range of littoral sediment and rock biotopes (the latter on sea defences) that are of high diversity and species richness for estuaries in eastern England. Water quality is excellent throughout. The area is relatively natural, being largely undeveloped by man and with very limited industrial activity. The estuary contains large areas of shallow water over subtidal sediments, and extensive mudflats and saltmarshes exposed at low water. Its diverse and species-rich intertidal sand and mudflat biotopes grade naturally along many lengths of the shore into vegetated or dynamic shingle habitat, saltmarsh, grassland and reedbed.

The adjacent shingle and lagoon habitats are designated separately as the Orfordness-Shingle Street SAC.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide. (Intertidal mudflats and sandflats)

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030076
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Benacre to Easton Bavents Lagoons
Unitary Authority/County:	Suffolk
SAC status:	Designated on 1 April 2005
Grid reference:	TM524830
SAC EU code:	UK0013104
Area (ha):	366.93
Component SSSI:	Benacre to Easton Bavents SSSI

Site description:
Benacre to Easton Bavents Lagoons is a series of percolation lagoons on the east coast of England. The lagoons (the Denes, Benacre Broad, Covehithe Broad and Easton Broad) have formed behind shingle barriers and are a feature of a geomorphologically dynamic system. Sea water enters the lagoons by percolation through the barriers, or by overtopping them during storms and high spring tides. The lagoons show a wide range of salinities, from nearly fully saline in South Pool, the Denes, to extremely low salinity at Easton Broad. This range of salinity has resulted in a series of lagoonal vegetation types, including beds of narrow-leaved eelgrass *Zostera angustifolia* in fully saline or hypersaline conditions, beds of spiral tasselweed *Ruppia cirrhosa* in brackish water, and dense beds of common reed *Phragmites australis* in freshwater. The site supports a number of specialist lagoonal species.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Coastal lagoons*

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0013104
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Orfordness – Shingle Street

Unitary Authority/County: Suffolk

SAC status: Designated on 1 April 2005

Grid reference: TM440486

SAC EU code: UK0014780

Area (ha): Suffolk

Component SSSI: Alde-Ore Estuary SSSI

Site description:
Orfordness is an extensive shingle structure consisting of a foreland, a 15 km-long spit and a series of recurves running from north to south. It supports some of the largest and most natural sequences in the UK of shingle vegetation affected by salt spray. The southern end has a particularly fine series of undisturbed ridges, with zonation of communities determined by the ridge pattern. Pioneer communities with sea pea *Lathyrus japonicus* and false oat-grass *Arrhenatherum elatius* grassland occur. Locally these are nutrient-enriched by the presence of a gull colony; elsewhere they support rich lichen communities.

Drift-line vegetation occurs on the sheltered, western side of the spit, at the transition from shingle to saltmarsh, as well as on the exposed eastern coast. The drift-line community is widespread and comprises sea beet *Beta vulgaris* ssp. *maritima* and orache *Atriplex* spp.

The site also includes a series of percolation lagoons that have developed in the shingle bank adjacent to the shore at the mouth of the Ore estuary. The salinity of the lagoons is maintained by percolation through the shingle, although at high tides sea water can overtop the shingle bank. The fauna of these lagoons includes typical lagoon species, such as the cockle *Cerastoderma glaucum*, the ostracod *Cyprideis torosa* and the gastropods *Littorina saxatilis tenebrosa* and *Hydrobia ventrosa*. The nationally rare starlet sea anemone *Nematostella vectensis* is also found at the site.

The adjacent estuarine and intertidal habitats are designated separately as the Alde, Ore and Butley Estuaries SAC.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Annual vegetation of drift lines
- Coastal lagoons*
- Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves)

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0014780
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Dew's Ponds

Unitary Authority/County: Suffolk

SAC status: Designated on 1 April 2005

Grid reference: TM387718

SAC EU code: UK0030133

Area (ha): 6.74

Component SSSI: Dew's Ponds SSSI

Site description:
This site in rural East Suffolk comprises a series of 12 ponds set in an area of formerly predominantly arable land. The ponds range from old field ponds created for agricultural purposes to some constructed in recent years specifically for wildlife. Some of the land has been converted from arable to grassland, with a variety of grassland types present. Other habitats include hedges and ditches. Great crested newts *Triturus cristatus* have been found in the majority of ponds on the site.

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Great crested newt *Triturus cristatus*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030133
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Staverton Park and The Thicks, Wantisden
Unitary Authority/County:	Suffolk
SAC status:	Designated on 1 April 2005
Grid reference:	TM356509
SAC EU code:	UK0012741
Area (ha):	81.45
Component SSSI:	Staverton Park and The Thicks, Wantisden SSSI

Site description:
This site is representative of old oak *Quercus* spp. woods, and its ancient oaks have rich invertebrate and epiphytic lichen assemblages. Despite being in the most 'continental' part of southern Britain, the epiphytic lichen flora of this site includes rare and Atlantic species, such as *Haemotomma elatinum, Lecidea cinnabarina, Thelotrema lepadinum, Graphis elegans* and *Stenocybe septata*. Part of the site includes an area of old holly *Ilex aquifolium* trees that are probably the largest in Britain. The site has a very well-documented history and good conservation of woodland structure and function.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Old acidophilous oak woods with *Quercus robur* on sandy plains. (Dry oak-dominated woodland)

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0012741
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

European Site Conservation Objectives for Minsmere to Walberswick Heaths and Marshes Special Area of Conservation Site Code: UK0012809

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats and habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H1210. Annual vegetation of drift lines

H1220. Perennial vegetation of stony banks; Coastal shingle vegetation outside the reach of waves

H4030. European dry heaths

This is a European Marine Site

This site is a part of the Minsmere–Walberswick European Marine Site. These conservation objectives should be used in conjunction with the Regulation 35 Conservation Advice Package, for further details please contact Natural England's enquiry service at enquiries@naturalengland.org.uk, or by phone on 0845 600 3078, or visit the Natural England website at: http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

European Site Conservation Objectives for Alde, Ore and Butley Estuaries Special Area of Conservation Site Code: UK0030076

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H1130. Estuaries

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

H1330. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

European Site Conservation Objectives for Benacre to Easton Bavents Lagoons Special Area of Conservation Site Code: UK0013104

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H1150. Coastal lagoons*

* denotes a priority natural habitat or species (supporting explanatory text on following page)

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

European Site Conservation Objectives for Orfordness – Shingle Street Special Area of Conservation Site Code: UK0014780

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H1150. Coastal lagoons*

H1210. Annual vegetation of drift lines

H1220. Perennial vegetation of stony banks; Coastal shingle vegetation outside the reach of waves

* denotes a priority natural habitat or species (supporting explanatory text on following page)

This is a European Marine Site

This site is a part of the Alde Ore & Butley European Marine Site. These conservation objectives should be used in conjunction with the Regulation 35 Conservation Advice Package, for further details please contact Natural England's enquiry service at enquiries@naturalengland.org.uk, or by phone on 0845 600 3078, or visit the Natural England website at: http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

European Site Conservation Objectives for Dew's Ponds Special Area of Conservation Site Code: UK0030133

With regard to the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of the habitats of qualifying species**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on which the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

S1166. *Triturus cristatus*; Great crested newt

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 31 March 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

European Site Conservation Objectives for Staverton Park and The Thicks, Waintisden Special Area of Conservation
Site Code: UK0012741

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats**
- **The structure and function (including typical species) of qualifying natural habitats, and**
- **The supporting processes on which qualifying natural habitats rely**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H9190. Old acidophilous oak woods with *Quercus robur* on sandy plains; Dry oak-dominated woodland

* denotes a priority natural habitat or species (supporting explanatory text on following page)

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

EC Directive 79/409 on the Conservation of Wild Birds:
Special Protection Area

MINSMERE-WALBERSWICK (SUFFOLK)

The Minsmere-Walberswick proposed SPA contains areas of grazing marsh, extensive reedbeds, the estuary of the River Blyth, and areas of lowland heath and woodland. The boundaries of the site follows those of the Minsmere-Walberswick Heath and Marshes.SSSI.

Minsmere-Walberswick qualifies under Article 4.1, by supporting, in summer, nationally important breeding populations of the following Annex 1 species: 5 booming male bitterns *Botauris stellaris* (presumed to represent 5 breeding pairs; 22% of the British breeding population) ; 15 breeding female marsh harriers *Circus aeruginosus* (20% of British) ; 47 pairs of avocet *Recurvirostra avosetta* (12% of British) ; 32 pairs of little tern *Sterna albifrons* (1% of British): and 24 pairs of nightjar *Caprimulgus europaeus* (1% of British).

The site qualifies also under Article 4.1 by regularly supporting, in winter, a nationally important wintering population of hen harrier *Circus cyaneus* (15 individuals, 2% of the British wintering population).

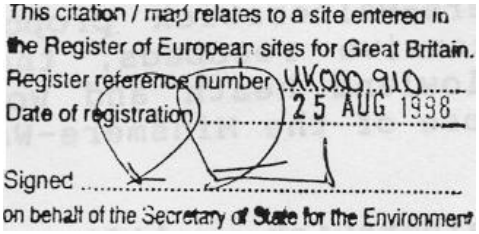
Minsmere-Walberswick qualifies under article 4.2 by supporting, in summer, in recent years, nationally important breeding populations of three regularly occurring migratory species: 24 pairs of gadwall *Anas strepera* (4% of British); 73 pairs of teal *A. crecca* (1% of British): and 23 pairs of shoveler *A. clvpeata* (2% of British) . Also notable is a nationally important breeding population of bearded tit *Panurus biarmicus* (50 pairs, 8% of British).

The site qualifies also under Article 4.2 by supporting nationally important wintering populations of three migratory waterfowl. (average peak counts for the five year period 1985/86 to 1989/90): 100 European white-fronted geese *Anser albifrons albifrons* (2% of the British wintering population); 90 gadwall *Anas strepera* (1% of British) , and 100 shoveler *Anas clypeata* (1% of British).

Minsmere-Walberswick is also of importance for an outstandingly diverse assemblage of breeding birds of marshland and reedbed habitats, including bittern, garganey *Anas querquedula*, marsh harrier, water rail *Rallus aquaticus*, Cetti's warbler *Cettia cetti* and Savi's warbler *Locustella lusciniodes*. Also notable is an assemblage of wintering waterfowl including, in addition to species listed above, Bewick's swan *Cygnus columbianus*, wigeon *Anas penelope*, teal *Anas crecca*, avocet; spotted redshank *Tringa erythropus*; and redshank *Tringa totanus*.

During severe winter weather Minsmere-Walberswick can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by relatively mild climate, compared with continental areas, and the abundant food resources available.

SPA Citation
HTR December 1991



EC Directive 79/409 on the Conservation of Wild Birds

Citation for Special Protection Area (SPA)

Name: Sandlings

Unitary Authority/County: Suffolk

Consultation proposal: All or parts of Blaxhall Heath Site of Special Scientific Interest (SSSI), Leiston - Aldeburgh SSSI, Sandlings Forest SSSI, Snape Warren SSSI, Sutton & Hollesley Heaths SSSI and Tunstall Common SSSI have been recommended as a Special Protection Area because of their European ornithological importance. In particular, for their breeding populations of Nightjars *Caprimulgus europaeus* and Woodlarks *Lullula arborea*.

Site description: The Sandlings SPA lies near the Suffolk Coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath being subject to successional changes, with the consequent spread of bracken, shrubs and trees, although recent conservation management work is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities, with dependant invertebrate and bird communities of conservation value. Woodlark *Lullula arborea* and Nightjar *Caprimulgus europaeus* have also adapted to breeding in the large conifer forest blocks, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.

Size of SPA: The SPA covers an area of 3,391.80 ha.

Qualifying species:
The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex 1 species	Count and Season	Period	% of GB population
Nightjar *Caprimulgus europaeus*	109 males - breeding	Count as a 1992	3.2% GB
Woodlark *Lullula arborea*	154 pairs - breeding	Count as at 1997	10.3% GB

Bird figures from:

Morris, A., Burges, D., Fuller, R.J., Evans, A.D. & Smith, K.W. 1994. The status and distribution of nightjars *Caprimulgus europaeus* in Britain in 1992. A report to the British Trust for Ornithology. *Bird Study* **41**: 181-191.

Wotton, S.R. & Gillings, S. 2000. The status of breeding woodlarks in Britain in 1997. *Bird Study* **47**: 212-224.

Status of SPA
Sandlings was classified as a Special Protection Area on 10 August 2001.

EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Areas

Alde-Ore Estuary (Suffolk)

The Alde-Ore Estuary proposed Special Protection Area (pSPA) is situated on the east coast of Suffolk between Aldeburgh in the north and Bawdsey in the south. The site comprises the estuary complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. The variety of habitats important for breeding and wintering birds includes vegetated shingle, intertidal mudflats, semi-improved grazing marsh, saltmarsh and saline lagoons.

The site includes the entire Alde-Ore Estuary SSSI, notified in 1985 (revised in 1992 under the Wildlife and Countryside Act, 1981). The Alde-Ore Estuary SSSI includes the Orfordness-Havergate NNR, the English Nature owned part of which has already been designated as Orfordness-Havergate SPA.

The site qualifies under Article 4.1 of the EC Birds Directive by sustaining nationally important numbers of the following Annex 1 species, marsh harrier *Circus aeruginosus* (breeding), avocet *Recurvirostra avosetta* (wintering and breeding) ruff *Philomachus pugnax* (wintering), sandwich tern *Sterna sandvicensis* (breeding) and little tern *Sterna albifrons* (breeding). Further Annex 1 species winter on site, including, bittern *Botaurus stellaris*, Bewick's Swan *Cygnus columbianus*, hen harrier *Circus cyaneus*, golden plover *Pluvialis apricaria*, and short-eared owl *Asio flammeus*. Mediterranean gull *Larus melanocephalus*, common tern *Sterna hirundo* and Arctic tern *Sterna paradisaea* breed on Havergate Island.

The site qualifies under Article 4.2 of the Directive by regularly supporting internationally important numbers of two migratory species. The Orfordness colony of breeding lesser black-backed gull *Larus fuscus graellsii*, represented in 1995, 12% of the British population and 8% of the world population of the *graellsii* race. The five year wintering peak mean 1989/90 to 1993/94 for redshank *Tringa totanus*, was 1,662 birds, representing 1.5 % of the British population and 1.1% of the east Atlantic flyway population.

The site supports over 1% of the British wintering population of the following (calculated from five year winter peak means 1989/90 to 1993/94), shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, black-tailed godwit *Limosa limosa*. In addition, the site supports over 1% of the British breeding population of, Gadwall *Anas strepera*, shoveler *Anas clypeata* and herring gull *Larus argentatus*.

The site also supports a notable assemblage of breeding and wintering wetland birds, in addition to the species mentioned above. Breeding species include, oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula*, lapwing *Vanellus vanellus* (also winter) black headed gull *Larus ridibundus* and barn owl *Tyto alba*. Wintering species include, cormorant *Phalacrocorax carbo*, European white-fronted goose *Anser abifrons albifrons*, brent goose *Branta bernicla*, pintail *Anas acuta*, grey plover *Pluvialis squatarola*, dunlin *Calidris alpina* and curlew *Numenius arquata*.

SPA Citation
January 1996

EC Directive 79/409 on the Conservation of Wild Birds:
Special Protection Areas

Benacre to Easton Bavents (Suffolk)

Benacre to Easton Bavents potential Special Protection Area (pSPA) site is situated on the east coast of Suffolk and extends southwards from Kessingland to Southwold. The site comprises the majority of the 526.3 hectare Benacre to Easton Bavents SSSI (notified in 1989 under the Wildlife and Countryside Act, 1981) of which Benacre Broad NNR is a part. The pSPA site includes Benacre, Covehithe and Easton broads and excludes the cliffs at Covehithe and Easton Bavents. The variety of habitats present, include semi-natural broadleaved woodland, tall fen vegetation, shingle, dunes and grassland, saltmarsh and coastal lagoons. These habitats are important for breeding, wintering and passage birds.

The potential SPA qualifies under Article 4.1 of the EC Birds Directive by regularly supporting bittern *Botaurus stellaris,* marsh harrier *Circus aeruginosus* and little tern *Sterna albifrons.* Booming male bittern are heard most frequently at Easton. The five year mean number of booming males, 1991-95, is two, representing 10% of the British 'population'. Marsh harrier breed at Benacre and Easton Broads, the five year mean number of pairs 1990- 94 is 6, representing more than 6% of the British population. Little tern have nested most recently at Easton Broad and Covehithe Broad. The five year mean number of pairs, 1991-95, is 39, representing 1.6% of the British population. Other Annex 1 species are present on the site. Two or three pairs of Avocet *Recurvirostra avosetta* and a few pairs of common tern *Sterna hirundo* occasionally nest. Red-throated diver *Gavia stellata,* black-throated diver *G. arctica,* great northern diver *G. immer,* Slavonian grebe *Podiceps auritus* and Hen harrier *Circus cyaneus* sometimes winter within the SSSI.

The site also supports an important assemblage of breeding birds, in addition to the species mentioned above. These include, little grebe *Tachybaptus ruficollis* (also winter), shelduck *Tadorna tadorna* (also winter), wigeon *Anas penelope* (also winter), gadwall *Anas strepera,* pochard *Aythya ferina* (also winter), tufted duck *A. fuligula* (also winter), Hobby *Falco subbuteo,* water rail *Rallus aquaticus* (also winter), ringed plover *Charadrius hiaticula,* turtle dove *Streptopelia turtur,* barn owl *Tyto alba* (also winter); little owl *Athene noctua,* kingfisher *Alcedo atthis,* lesser spotted woodpecker *Dendrocopos minor,* nightingale *Luscinia megarhynchos,* wheatear *Oenanthe oenanthe,* grasshopper warbler *Locustella naevia,* bearded tit *Panurus biarmicus* and tree sparrow *Passer montanus.*

The site also supports a notable assemblage of other wintering birds, in addition to those mentioned above, including cormorant *Phalacrocorax carbo,* whooper swan *Cygnus cygnus,* pink-footed goose *Anser brachyrhynchus,* white-fronted goose *A. albifrons,* greylag goose *A. anser* , Canada goose *Branta canadensis,* gadwall *Anas strepera,* teal *A. crecca,* pintail *A. acuta,* garganey *A. querquedula,* shoveler *A. clypeata,* scaup *Aythya marila,* eider *Somateria mollissima,* long-tailed duck *Clangula hyemalis,* common scoter *Melanitta nigra,* velvet scoter *M. fusca,* goldeneye *Bucephala clangula,* smew *Mergus albellus,* red-breasted merganser *M. serrator* , gooseander *M. merganser,* buzzard *Buteo buteo,* lapwing *Vanellus vanellus,* dunlin *Calidris alpina,* redshank *Tringa totanus,* little gull *Larus minutus,* great black-backed gull *L. marinus,* guillemot *Uria aalge,* shore lark *Eremophila alpestris,* rock pipit *A. petrosus,* fieldfare *Turdus pilaris,* siskin *Carduelis spinus,* twite C. f*lavirostris,* snow bunting *Plectrophenax nivalis* and reed bunting *Emberiza schoeniclus.*

EC Directive 2009/147/EC on the Conservation of Wild Birds

Special Protection Area (SPA)

Name: *Outer Thames Estuary SPA*

Counties/Unitary Authorities: Norfolk, Suffolk, Essex, Kent

Boundary of the SPA:

The seaward and alongshore extent of the Outer Thames Estuary SPA is defined according to the distribution of non-breeding red-throated divers (O'Brien *et al*. 2012). The site includes coastal areas up to Mean High Water up the coast (to Caister-on-Sea) to provide coverage for little terns from Great Yarmouth North Denes foraging from this SPA, and common terns foraging from Breydon Water SPA. The inclusion of the River Yare channel, to abut the eastern boundary of the existing Breydon Water SPA, and the lower River Bure (to approximately Runham village south of Filby), to provide continuous SPA coverage for common terns foraging from this SPA. The inclusion of coastal areas up to Mean High Water down the coast (to just south of Corton), providing coverage for common terns from Breydon Water foraging from this SPA. The inclusion of the River Blyth to encompass Blythburgh Water, a tidal lagoon directly adjacent to the northern parts of Minsmere-Walberswick SPA in addition to the inclusion of Mean High Water areas up the coast (to Southwold) and down the coast (to Leiston) to provide continuous coverage for little terns foraging from this SPA. The inclusion of the estuarine areas up to Mean High Water within the Crouch and Roach Estuaries, overlapping the existing Crouch and Roach Estuaries SPA in the intertidal area and the inclusion of a small marine area along the south Essex coast and overlapping part of the Foulness SPA for foraging common terns.

Size of SPA: The SPA covers an area of 392,451.66 ha.

Site description:

The Outer Thames Estuary SPA is located on the east coast of England between the counties of Norfolk (on the north side) and Kent (on the south side) and extends into the North Sea. The site comprises areas of shallow and deeper water, high tidal current streams and a range of mobile mud, sand, silt and gravely sediments extending into the marine environment, incorporating areas of sand banks often exposed at low tide. Intertidal mud and sand flats are found further towards the coast and within creeks and inlets inland down the Blyth estuary and the Crouch and Roach estuaries. The diversity of marine habitats and associated species is reflected in existing statutory protected area designations, some of which overlap or abut the SPA.

Qualifying species:

SPA site selection guidelines have been applied to the most up to date information for the site.

The site qualifies under **article 4.1** of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Species	**Season**	**Count (Period)**	**% of population**
Red-throated diver *Gavia stellata*	Non-breeding	6,466 individuals (1989 – 2006/07)[1]	38.0% of GB population
Little tern *Sternula albifrons*	Breeding	746 individuals (2011 – 2015)	19.64% of GB population
Common tern *Sterna hirundo*	Breeding	532 individuals (2011 – 2015)	2.66% of GB population

Assemblage qualification:

The site does not qualify under SPA selection stage 1.3.

Principal bird data sources:

Colony counts from JNCC Seabird Monitoring Programme, Norfolk Bird & Mammal Reports, Foulness Area Bird Survey Group and contributed by colony managers from RSPB.

Data on ringed common terns from national bird ringing scheme.

Red-throated diver data from aerial surveys 1989 - 2006/07: Natural England (2010): Departmental Brief: Outer Thames Estuary Special Protection Area. *Available at*: http://publications.naturalengland.org.uk/publication/3233957

Red-throated diver data from aerial surveys 1989 - 2006/07: O'Brien, S.H., Webb, A., Brewer, M. J. & Reid, J. B. (2012). Use of kernel density estimation and maximum curvature to set Marine Protected Area boundaries: Identifying a Special Protection Area for wintering red-throated divers in the UK. *Biological Conservation,* 156, 15–21.

[1] Value retained from original Outer Thames Estuary SPA standard data form (http://publications.naturalengland.org.uk/publication/3233957)

European Site Conservation Objectives for Minsmere–Walberswick Special Protection Area Site Code: UK9009101

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A021 *Botaurus stellaris*; Great bittern (Breeding)
A051 *Anas strepera*; Gadwall (Non-breeding)
A051 *Anas strepera*; Gadwall (Breeding)
A052 *Anas crecca*; Eurasian teal (Breeding)
A056 *Anas clypeata*; Northern shoveler (Breeding)
A056 *Anas clypeata*; Northern shoveler (Non-breeding)
A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding)
A082 *Circus cyaneus*; Hen harrier (Non-breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
A224 *Caprimulgus europaeus*; European nightjar (Breeding)
A394 *Anser albifrons albifrons*; Greater white-fronted goose (Non-breeding)

This is a European Marine Site

This SPA is a part of the Minsmere–Walberswick European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Regulation 35 Conservation Advice document for the EMS. For further details about this please visit the Natural England website at http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

European Site Conservation Objectives for Sandlings Special Protection Area Site Code: UK9020286

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A224 *Caprimulgus europaeus*; European nightjar (Breeding)

A246 *Lullula arborea*; Woodlark (Breeding)

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

European Site Conservation Objectives for Alde–Ore Estuary Special Protection Area Site Code: UK9009112

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Breeding)
A151 *Philomachus pugnax*; Ruff (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A183 *Larus fuscus*; Lesser black-backed gull (Breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)

This is a European Marine Site

This SPA is a part of the Alde Ore & Butley European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Regulation 35 Conservation Advice document for the EMS. For further details about this please visit the Natural England website at: http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

European Site Conservation Objectives for Benacre to Easton Bavents Special Protection Area Site Code: UK9009291

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A021 *Botaurus stellaris*; Great bittern (Breeding)

A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding)

A195 *Sterna albifrons*; Little tern (Breeding)

This is a European Marine Site

This SPA is a part of the Benacre to Easton Bavents European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Regulation 35 Conservation Advice document for the EMS. For further details about this please visit the Natural England website at: http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

Outer Thames Estuary Special Protection Area

Draft advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010 (as amended) and Regulation 18 of The Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 (as amended)

Cover photograph illustrates red-throated diver in winter.

Version 3.7 (March 2013)

Document version control

Version and date	Amendments made	Issued to and date
Thames SPA Cons Obs AOO 190509 .doc	Changes to tables 2.1 and 2.4; additions of Bas-corbiere ruling; changes to sensitivity assessment section; changes to physical loss and physical damage sections; changes to toxic contamination and biological disturbance sections	Internal draft for comment July 3rd 2009
Thames SPA Cons Obs AOO 080709	RTD data collection footnote added; changes to physical damage and non-selective extraction sections; additional references	Internal draft for comment 8th July 2009
Thames SPA Cons Obs AOO 130709	Changes to section 2.2; addition to table 2.2; changes to table 3.1; changes to selective and non-selective extraction; additions to appendix B	JNCC Comments incorporated on 13th July
Thames SPA Cons Obs AOO170709	Changes to Cons Obj table: added habitats and species; added terms used section; changes to sensitivity assessment section; format of advice section changes; physical loss and damage changes; added non-toxic contamination; divided selective and non-selective extraction	Internal draft for comment 17th July 2009
Thames SPA Cons Obs AOO 300709	Added species and habitats to section 2.2.1; example added to 3.4.1; physical damage and loss related to habitat; biological disturbance related to RTD; changes to toxic and non-toxic contamination section and selective and non-selective extraction sections.	JNCC returned 30th July 2009
Thames SPA Cons Obs AOO 310709	Minor changes and addition of references and section	Internal draft for comment July 31st 2009
Thames SPA Cons Obs AOO 050809	All changes and version for proof reading	Internal draft for comment August 5th
Thames SPA Cons Obs AOO 090909	Final (draft) version 2009	Issued for consultation September 2009
Thames SPA Cons Obs CWversion forRAs	Draft version 2011 for QA from Evidence Team, stakeholders comments not included as comments within the text	Final draft version 2011
Thames SPA Cons Obs CWMARCH2011	Final revision post workshop, standardised approach which mirrors Liverpool Bay SPA COs, following discussions with R Caldow and JNCC	Final version March 2011
ThamesSPAConsObsVersion 3.1	Following discussions re FCT and thresholds with RC & JNCC	Final version August 2011
ThamesSPAConsObsVersion 3.2 FINAL	Final version for circulation to relevant authorities	Final version August 2011
TamesSPAConsObsVersion 3.3	Further amendments following JNCC discussions and internal advice. Removal of section 3.2.1 and re-ordering of pagination following this – M	Final Version April 2012

	Knollys	
ThamesSPAConsObsVersion 3.4 FINAL FOR RAs	Final amendments before submitting to technical review panel	August 2012
ThamesSPAConsObsVersion 3.5 FINAL FOR RAs	Final with panel comment amendments	Nov 2012
ThamesSPAConsObsVersion 3.6 FINAL FOR WEB	Final draft document incorporating all comments	Jan 2013
ThamesSPAConsObsVersion 3.7 FINAL FOR WEB	Final document for NE and JNCC website	March 2013

Further information

Please return comments or queries to:

Joint Nature Conservation Committee

Therese Cope
Joint Nature Conservation Committee
Monkstone House
Peterborough
PE1 1JY

Email: offshore@jncc.gov.uk
Tel: +44 (0)1733 866905
Fax: +44 (0)1733 555948
Website: www.jncc.gov.uk

Natural England

Miriam Knollys
Natural England
Hercules House
Hercules Road
London
SE1 7DU

Email: miriam.knollys@naturalengland.org.uk
Tel: +44 (0)300 060 0297
Website: http://www.naturalengland.org.uk

Summary of draft Conservation Objectives and Advice on Operations for the Outer Thames Estuary Special Protection Area (SPA)

This advice is based on information on the Special Protection Area (SPA) presented in Natural England's and the Joint Nature Conservation Committee's (JNCC) 'Departmental Brief: Outer Thames Estuary SPA document (Version May 2010)[1]. Natural England and JNCC's conservation objectives and advice on operations is site and feature specific, and has been developed using the best available scientific information and expert interpretation as at July 2012. The advice is generated through a coarse grading of sensitivity and exposure of the site's interest feature and its supporting habitat to physical, chemical and biological pressures associated with human activity. Sensitivity and exposure have been combined to provide a measure of the vulnerability of the interest feature to operations which may cause damage or deterioration, and therefore may require management.

The exact impact of any operation will be dependent upon the nature, scale, location and timing of events. This advice on operations for the Outer Thames Estuary SPA site will be kept under review and will be periodically updated to reflect changes in both sensitivity and exposure.

The conservation objective for the Outer Thames Estuary Special Protection Area is, subject to natural change[2], maintain[3] or enhance the red-throated diver population (*Gavia stellata*) and its supporting habitats in favourable condition[4]

The interest feature red-throated diver will be considered to be in favourable condition only when both of the following two conditions are met:

(i) The size of the red-throated diver population is at, or shows only non-significant fluctuation around the mean population at the time of designation of the SPA to account for natural change;

(ii) The extent of the supporting habitat within the site is maintained.
Management actions should enable the **Annex I feature *Gavia stellata* (wintering red-throated diver) and its supporting habitat in the Outer Thames Estuary** to

[1] http://www.naturalengland.org.uk/Images/Thames-brief_tcm6-21728.pdf

[2] Natural change" means changes in the species or habitat which are not a result of human influences. Human influence on the red-throated diver population is acceptable provided that it is proved to be/can be established to be compatible with the achievement of the conditions set out under the definition of favourable condition. A failure to meet these conditions, which is entirely a result of natural process will not constitute unfavourable condition, but may trigger a review of the definition of favourable condition.

[3] Maintain" is used here because existing evidence suggests the feature to be in favourable condition, and the objective is for it to remain so. Existing activities are deemed to be compatible with the conservation objectives if current practices are continued at current levels and in the absence of evidence that current activities are significantly affecting the red-throated diver population or its habitat. However, it must be borne in mind that gradually damaging activities can take time to show their effects. If evidence later shows an activity to be undermining the achievement of the conservation objectives, then the red-throated diver population will be deemed to be in unfavourable condition.

[4] Favourable Condition – Relates to the maintenance of the structure, function, and typical species for that feature within the site.

maintain or enhance its population and extent of supporting habitat for the foreseeable future. This will require assessment and management of human activities likely to affect these adversely, and of activities likely to impact the functioning of natural processes upon which the feature is dependent.

To fulfil the conservation objectives for the **Annex I feature *Gavia stellata* and its supporting habitat**, the relevant and competent authorities for this area are advised to manage human activities within their remit such that they do not result in deterioration or disturbance, or impede the restoration of this feature through any of the following:

i) **Physical loss** of habitat by removal (e.g. capital dredging, harvesting, coastal and marine development)

ii) **Physical damage** by physical disturbance or abrasion of habitat (e.g. extraction)

iii) **Non-physical disturbance** through noise or visual disturbance (e.g. shipping, wind turbines)

iv) **Toxic contamination** by introduction of synthetic and/or non-synthetic compounds (e.g. polychlorinated biphenyls (PCBs), pollution from oil and gas industry, shipping);

v) **Non-toxic contamination** to prey species only by changes in e.g. turbidity (e.g. capital and maintenance dredging);

vi) **Biological disturbance** by selective extraction of species (e.g. commercial fisheries) and non selective extraction (eg entanglement with netting and wind turbine strike)

The advice describes the above impacts and activities for both the habitat and prey species of the red-throated divers and on the red-throated divers themselves.

During 2011/12 Government instigated a review of the implementation of the Habitats and Wild Birds Directive. The review concluded that all conservation objectives (marine and terrestrial) should be up-to date, accessible and allow applicants to assess the impact of their proposed development against them. The report[5] requested Natural England with JNCC to develop a new approach to improve the information contained in conservation objectives. Natural England and JNCC published their intended approach in June 2012. Natural England has committed to review and update its conservation objectives for all European Marine Sites to make them more definitive and explicit from 2013 onwards, on a prioritised basis. We will use this review to update the advice contained within this document, to take account of new evidence that subsequently becomes available, and improved scientific understanding.

[5] http://www.defra.gov.uk/publications/2012/03/22/pb13724-habitats-wild-birds-directives/

Outer Thames Estuary Special Protection Area

Draft advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010 and Regulation 18 of The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended)

Contents **Page Number**

1. Introduction

The Outer Thames Estuary has been classified by the UK Government as a Special Protection Area (SPA) and the European Commission has been notified. The site now forms part of the Natura 2000[6] network. The Outer Thames Estuary SPA lies across both English territorial waters and UK offshore waters.

The Outer Thames Estuary SPA is subject to full protection under the Habitats and Birds Directive[7] (transposed through The Conservation of Habitats and Species Regulations 2010 (as amended)[8] and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended)[9] (referred to in this document respectively as the 'Habitats Regulations' and the 'Offshore Regulations'). Amongst other things, the Habitats Regulations and the Offshore Regulations place an obligation on relevant authorities and competent authorities respectively to put in place measures to protect the sites from damage or deterioration.

This advice is given in fulfilment of the duty of Natural England and JNCC under Regulations 35(3)[10], and 18[11] of the respective Habitats Regulations (referred to in this document as "Regulation 35/18 advice"), to provide relevant and competent authorities as to (a) the conservation objectives for the Outer Thames Estuary SPA: and (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the Outer Thames Estuary SPA has been designated.

This advice constitutes one element of NE's/JNCC's advisory role in relation to this site. The current information must be used by relevant authorities[12] to explore and put in place management measures (if required), and by competent authorities[13] to fulfil their duties under the Habitats Regulations in making the necessary determinations on the impact of activities on the site. Developers may also use this advice when operating within a site, and when providing information to relevant/competent authorities as part of an application for new plans and projects. However, should relevant or competent authorities or others require any further advice, they are not limited to taking account of the conservation advice contained here, and would be expected to make further enquiries as required in order to make determinations or implement management measures. Further information/reference should be made to the Departmental Brief for the Outer Thames Special Protection Area[14].

An independent review of Natural England's marine SAC selection process carried out in 2011 made a number of recommendations as to how Defra and Natural England should modify their approach to future evidence based work[15]. This resulted

[6] as defined under Regulation 3 of The Conservation of Habitats and Species Regulations 2010

[7] Council Directive 79/409/EEC on the conservation of wild birds

[8] http://www.legislation.gov.uk/uksi/2010/490/contents/made

[9] http://www.legislation.gov.uk/uksi/2010/491/contents/made

[10] http://www.legislation.gov.uk/uksi/2010/490/regulation/35/made

[11] http://www.legislation.gov.uk/uksi/2007/1842/regulation/18/made

[12] as defined under Regulation 7 of The Conservation of Habitats and Species Regulations 2010

[13] http://www.legislation.gov.uk/uksi/2007/1842/regulation/23/made

[14] http://www.naturalengland.org.uk/Images/Thames-brief_tcm6-21728.pdf

[15] http://www.defra.gov.uk/publications/files/pb13598-graham-bryce-independent-review-marine-sacs-110713.pdf

in Natural England adopting the Government Chief Scientific Adviser"s (GCSA) guidelines on using evidence[16] through the development of a suite of Evidence Standards[17]. Implementation of these standards has included Natural England working with JNCC to develop a protocol[18], which has been subject to independent expert review, setting out the processes and requirements for the development of conservation advice packages, to ensure that these fully comply with the GCSA's guidelines. Whilst the conservation advice provided here was developed prior to the finalisation of the protocol, it has been assessed for compliance with the protocol and a detailed report can be found on the Natural England website[19]

During 2011/12 Government instigated a review of the implementation of the Habitats and Wild Birds Directive. The review concluded that all conservation objectives (marine and terrestrial) should be up-to date, accessible and allow applicants to assess the impact of their proposed development against them. The report[20] requested Natural England with JNCC to develop a new approach to improve the information contained in conservation objectives. Natural England and JNCC published their intended approach in June 2012, with Natural England committing to review and update its conservation objectives for all European Marine Sites to make them more definitive and explicit. We will be consulting with stakeholders on the approach, as well as how we can make our Regulation 35/18 advice more accessible and easier to use. The review of conservation advice will then begin in 2013 on a prioritised basis. We will use this review to update the advice contained within this document, to take account of new evidence that subsequently becomes available, and improved scientific understanding.

2. Roles and Responsibilities

2.1 The role of Natural England and JNCC

The Conservation of Habitats and Species Regulations 2010 (as amended) transpose the Habitats Directive into law on land and in territorial waters of Great Britain (out to 12 nautical miles from the baseline). The Regulations give Natural England a statutory responsibility to advise relevant and competent authorities on the conservation objectives and operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites have been designated, for European marine sites in England.

The Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007 (as amended) transpose the Habitats Directive into law for UK offshore waters (from 12 nautical miles from the coast out to 200 nm or the UK Continental Shelf). These Regulations give JNCC a statutory responsibility to advise competent authorities of the conservation objectives for offshore Special Areas of Conservation and to advise them of operations which may adversely affect the integrity of the site.

[16] http://www.bis.gov.uk/assets/goscience/docs/g/10-669-gcsa-guidelines-scientific-engineering-advice-policy-making.pdf
[17] http://www.naturalengland.org.uk/ourwork/research/default.aspx
[18] http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx
[19] http://publications.naturalengland.org.uk/publication/3233957?category=3212324

This advice is also required under the Offshore Petroleum Activities 2001 (Conservation of Habitats) Regulations (as amended); and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).

Natural England and JNCC will provide additional advice for each site to Relevant and competent authorities in order for them to fulfil their duties under the Habitats Regulations, for example when a Competent Authority wishes to assess the implications of any plans or projects on a candidate Special Area of Conservation (cSAC), Special Area of Conservation (SAC), or Special Protection Area (SPA).

2.2 The role of relevant and competent authorities

2.2.1 Inshore (0 – 12 nautical miles):

The Habitats Regulations require relevant and competent authorities to exercise their functions so as to secure compliance with the Habitats Directive. Under Regulation 36[21] of the Habitats Regulations relevant authorities may use this advice to draw up a management scheme for the SPArelevant authorities must, within their areas of competence, have regard to both direct and indirect effects on interest features of the site. This may include consideration of issues outside the boundary of the site.

2.2.2 Offshore (12 – 200 nautical miles):

Regulations 22, 23, 25 and 27[22] of the Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007 (as amended) outline the responsibilities of competent authorities to ensure compliance with the Habitats Directive. Regulation 22 requires competent authorities to consider appropriate conservation measures for Annex I habitats and Annex II species present within the SAC. Regulation 23 requires competent authorities to take appropriate steps to avoid the deterioration or disturbance of interest features for which the Offshore SAC is designated. Regulation 25 requires competent authorities to consider if a plan or project could be likely to have a significant effect on a European Offshore Marine Site and, if necessary, undertake an appropriate assessment for the plan or project. Regulation 27 requires competent authorities to review existing consents, permissions or authorisations and if necessary, affirm, modify or revoke them, undertaking an appropriate assessment where necessary. Competent authorities must, within their areas of competence, have regard to both direct and indirect effects on interest features of the site. This may include consideration of issues outside the boundary of the SAC.

2.2.3 Activity outside the control of relevant/competent authorities

Nothing within Regulation 35/18 advice will require relevant authorities to undertake any actions or ameliorate changes in the condition of interest features if it is shown that the changes result wholly from natural causes. Having issued Regulation 35/18 advice for this site, Natural England and JNCC will work with relevant and competent authorities and others to agree, within a defined time frame, a protocol for evaluating observed changes in the site's condition and to develop an understanding of natural change and provide further guidance as appropriate and possible. This does not, however, preclude relevant and competent authorities from taking any appropriate action to prevent deterioration to the interest features, and indeed such actions should be undertaken when required.

[21] http://www.legislation.gov.uk/uksi/2010/490/regulation/36/made
[22] http://www.legislation.gov.uk/uksi/2007/1842/contents/made

2.3 The role of conservation objectives

The conservation objectives set out what needs to be achieved for the site to make the appropriate contribution to the conservation status of the features for which the site is designated and thus deliver the aims of the Habitats and Birds Directives.

Conservation objectives are the starting point from which management schemes and monitoring programmes may be developed as they provide the basis for determining what is currently or may cause a significant effect, and they inform the scope of appropriate assessments.

In addition to providing such advice, this advice will inform the scope and nature of any 'appropriate assessment' which the Directive requires to be undertaken for plans and projects (Regulations 61 and 63 and by Natural England under Regulation 21 of the Habitats Regulations).

2.4 The role of advice on operations

The advice on operations set out in Section 4 of this document provides the basis for discussion about the nature and extent of the operations taking place within or sufficiently close to have an impact on the site and which may have an impact on its interest features. The advice should also be used to help identify the extent to which existing measures of control, management and forms of use are, or can be made, consistent with the conservation objectives, and thereby focus the attention of relevant authorities and surveillance to areas that may need management measures.

This advice on operations may need to be supplemented through further discussions with the relevant authorities and any advisory groups formed for the site.

2.5 Precautionary principle

All forms of environmental risk should be tested against the precautionary principle which means that where there are real risks to the site, lack of full scientific certainty should not be used as a reason for postponing measures that are likely to be cost effective in preventing such damage. It does not however imply that the suggested cause of such damage must be eradicated unless proved to be harmless and it cannot be used as a licence to invent hypothetical consequences. Moreover, it is important, when considering whether the information available is sufficient, to take account of the associated balance of likely costs, including environmental costs, and benefits (DETR & the Welsh Office, 1998).

3. Conservation objectives

3.1 Background to conservation objectives

The conservation objectives and definitions of favourable condition for features on the site may inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations[23,24]. An appropriate assessment will also require consideration of issues specific to the individual plan or project.

The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England and JNCC will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in paragraph 20 of ODPM (Office of the Deputy Prime Minister) Circular 06/2005 (DEFRA Circular 01/2005)[25] as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition, at least in the short term.

The conservation objectives for this site are provided in accordance with paragraph 17 of ODPM Circular 06/2005 (DEFRA Circular 01/2005) which outlines the appropriate assessment process. The entry on the Register of European Sites gives the reasons for which a site was classified or designated.

The target for population size is set to take account of the way in which populations fluctuate naturally and the degree of uncertainty in estimating population size. This is done so that in future condition monitoring, a population size estimate that falls within the known natural fluctuations in population size, or has a degree of uncertainty around it that renders it indistinct from the estimate of population size at the time of classification (i.e. the baseline population), can be distinguished from one that does not. This distinction serves to identify those circumstances in which the evidence is consistent with an interpretation that any apparent decline in a population below that at classification is simply a reflection of margins of error in measurement and/or due to a natural fluctuation which is part of a normal and established pattern which can be attributed to natural phenomena such a food availability, weather conditions etc.. In such circumstances it would be inappropriate to trigger further investigation into the causes of the apparent decline or the implementation of remedial actions to reverse it. In contrast, where the decline is of a magnitude that takes it beyond these limits then it is quite possible that, being beyond "expected variation", there is a non-natural cause. Classification of the feature as being in unfavourable condition would then trigger investigation of the cause of the population decline and perhaps trigger

[23] The Conservation of Habitats and Species Regulations 2010: Regulation 61 and 63 by a competent authority and Regulation 21 by Natural England.
[24] Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007 (as amended): Regulation 25 and 27 by a competent authority.
[25] http://www.communities.gov.uk/documents/planningandbuilding/pdf/147570.pdf

remedial management actions if the decline can be attributed to a particular cause (or causes) that can be managed so as to reduce their impact in the future.

This assessment is distinct from that carried out when considering the significance of a specific anthropogenic impact which can be shown to (or is predicted to) reduce a population from its baseline value to a new lower level.

3.2 Outer Thames Estuary SPA conservation objectives

The formal conservation objectives (as at July 2011) for Outer Thames Estuary SPA interest features are provided below. These are high-level objectives for the site features, and Natural England and JNCC may refine them in the future as our understanding of the features improves and further information becomes available, such as survey work.

They should be read in the context of other advice given, particularly:

(i) the Departmental Brief[26] which provides more detailed information about the site and evaluates its interest features according to the Birds Directives selection criteria and guiding principles;

(ii) the favourable condition table (Appendix A) providing information on how to recognise favourable condition for each of the features and which will act as a basis from which the monitoring programme will be developed; and

(iii) the attached maps (Appendix B) which show the known locations of the interest features

3.2.1 Red-throated diver – *Gavia stellata*

Red-throated diver is listed in Annex I to the Birds Directive and is assessed against stage 1(1) of the SPA selection guidelines (Stroud *et al.* 2001)[27]; using the relevant national population estimate the wintering population of red-throated divers in Great Britain is estimated to be 17,116 individuals (O'Brien et al. 2008), representing between 10-19% (depending on the areas included) of the NW Europe non-breeding population. The Great Britain population estimate is derived from shore-based observations together with more specific aerial surveys. Surveys from aeroplanes (and boats) have been responsible for identifying much larger numbers wintering in British coastal waters than previously known (O'Brien *et al*. 2008). Recent evolution of aerial survey methods, using both High Resolution still photography and High Definition video, has revealed that previous estimates of red-throated diver numbers are likely to be under-estimates (APEM 2010).

In the UK, wintering red-throated divers are associated with inshore waters, often occurring within sandy bays, firths and sea lochs, although open coastline is also frequently used (Skov *et al*., 1995; Stone *et al.*, 1995). Knowledge of red-throated diver distribution in the UK was transformed during the 2000s following the advent of aerial and boat surveys for offshore development, particularly renewables development (e.g. Percival *et al.*, 2004; O'Brien *et al*. 2008). The bulk of the UK distribution is in east England, the area between Kent and North Yorkshire supporting 59% of the UK total estimate; 44% of the UK total is in the Greater Thames alone (O'Brien *et al.* 2008), with variable distribution between surveyed sites (APEM 2011).

[26] http://publications.naturalengland.org.uk/file/3264082
[27] http://jncc.defra.gov.uk/page-1405

Liverpool Bay is currently the only other marine area in the UK classified as a SPA for red-throated divers.

Red-throated divers use the Outer Thames Estuary SPA in wintering numbers of European importance (6,466 individuals, 38% of the GB population, 1989 – 2006/07).

Table 3.1 The conservation objectives for the Outer Thames Estuary SPA interest feature: internationally important population of the regularly occurring Birds Directive Annex I species: red-throated diver (*Gavia stellata*)

Subject to natural change[28], maintain[29] or enhance the red-throated diver population and its supporting habitats in favourable condition[30] Relevant habitats include shallow coastal waters and areas in the vicinity of sub-tidal sandbanks The number of red-throated diver using these habitats is given in Table 3.2 below.

The interest feature red-throated diver will be considered to be in favourable condition only when both of the following two conditions are met:

(i) The size of the red-throated diver population is at, or shows only non-significant fluctuation around the mean population at the time of designation of the SPA to account for natural change;

(ii) The extent of the supporting habitat within the site is maintained.

> The favourable condition table (Appendix A) further defines favourable condition for the interest features of the site.

[28] Natural change" means changes in the species or habitat which are not a result of human influences. Human influence on the red-throated diver population is acceptable provided that it is proved to be/can be established to be compatible with the achievement of the conditions set out under the definition of favourable condition. A failure to meet these conditions, which is entirely a result of natural process will not constitute unfavourable condition, but may trigger a review of the definition of favourable condition.

[29] Maintain" is used here because existing evidence suggests the feature to be in favourable condition, and the objective is for it to remain so. Existing activities are deemed to be compatible with the conservation objectives if current practices are continued at current levels and in the absence of evidence that current activities are significantly affecting the red-throated diver population or its habitat. However, it must be borne in mind that gradually damaging activities can take time to show their effects. If evidence later shows an activity to be undermining the achievement of the conservation objectives, then the red-throated diver population will be deemed to be in unfavourable condition.

[30] Favourable Condition **–** Relates to the maintenance of the structure, function, and typical species for that feature within the site.

Table 3.2 Information on the population of red-throated diver that qualifies the Outer Thames Estuary as an SPA under the Birds Directive.

Internationally important populations of regularly occurring Birds Directive Annex 1 species	
Species	**Wintering population**
Red-throated diver *Gavia stellata*	6,466 individuals[31]

3.2.2 Explanatory information for the red-throated diver conservation objectives

Key supporting habitats and distribution

In the UK, wintering red-throated divers are associated with shallow inshore waters (between 0-20m deep and less frequently in depths of around 30m), often occurring within sandy bays, firths and sea lochs, although open coastline is also frequently used (Skov *et al*., 1995; Stone *et al.*, 1995). There is some evidence of association with areas of salinity change (e.g. where low salinity river water meets higher salinity sea water: Skov & Prins 2001; Skov *et al.* 2011). Such areas tend to fluctuate with state of tide, volume of river flow and wind conditions.

Other physical and hydrographic factors determining the distribution of red-throated divers have been established for part of the Outer Thames Estuary SPA (Skov *et al.* 2011). This modelling work identified different areas of high habitat quality at different tidal flow phases with variables including current velocity, water levels, eddies, upwellings and shipping found to be important at different tidal stages. As an active fish-feeder (Guse *et al.* 2009 and references therein), the distribution and concentrations of red-throated divers will at least partly be determined by the presence, abundance, and availability of their prey species, which is likely to be linked to at least some of the environmental parameters tested by Skov *et al.* (2011).

Key food

The red-throated diver is considered to be an opportunistic feeder and dietary studies have revealed several different fish species are consumed depending upon the area studied, including members of the cod family, herring, gobies and sand eels (Guse *et al*. 2009 and references therein). The sandbanks of the Outer Thames Estuary

[31] The wintering population estimate was generated from aerial survey data, collected mainly by WWT (Wildfowl and Wetlands Trust) Consulting, commissioned by a number of organisations including UK Government and a consortium of wind energy companies. Other data were collected by the JNCC Marine SPA Team, and by the Natural Environmental Research Institute, Denmark. Data were collected between the months of October to March in 1988/89, and 2002-2007. **JNCC has absolute confidence in the integrity of the data provided.** Population estimates within the boundary are calculated using spatial analysis to estimate RTD density in 1km grid squares. This is the revised figure following the re-drawing (shrinking) of the boundary as a result of the public consultation.

support the nursery and feeding grounds for many fish species, including the small fish that red-throated divers feed on.

Behaviour and Impacts

In a review of the sensitivity of 26 species of 'seabird' to the development of offshore windfarms, Garthe & Huppop (2004) found that red-throated divers had the second highest species sensitivity index score. Furness & Wade (2012) similarly ranked the species of primary concern with regard to disturbance /displacement from offshore wind farms. There is evidence that red-throated divers are displaced from the footprint of offshore windfarms and surrounding sea areas up to 2km distant from the outermost turbines due most likely to the presence of the turbines and the activities of maintenance vessels. Petersen *et al*. (2006) showed a marked post construction avoidance of the Horns Rev offshore windfarm, including also the 2km and 4km zones around it. A similar, though less pronounced avoidance response to the Nysted offshore windfarm by red-throated divers was also recorded (Petersen *et al.* 2006), and emerging data from Kentish Flats offshore wind farm suggest a decreasing displacement effect with distance from the turbine footprints (Percival 2010). Inappropriately sited developments could displace significant numbers of the GB wintering population. Other forms of renewable energy, such as tidal barrages, could also impact on the species' wintering numbers and distribution for disturbance and habitat loss reasons.

Red-throated divers are especially sensitive to disturbance at sea (Garthe & Huppop 2004; Furness & Wade 2012) and usually avoid boats (Schwemmer *et al.* 2011).

Red-throated divers are highly sensitive to the effects of disturbance associated both directly with marine aggregate extraction, and also the resultant increases in shipping activity. As Red-throated divers are highly exposed to marine aggregate extraction areas, they have been assessed as being highly vulnerable to changes to turbidity, sedimentation and impacts to the benthos or associated fish communities (Cook & Burton 2010).

Red-throated divers moult their flight feathers during September and October when they may become flightless for a short period and are vulnerable to oil pollution at this time (Camphuysen, C.J. 1989, Williams et al 1994).

Red-throated diver populations are vulnerable to increased adult mortality as it is a long-lived species with low breeding productivity. Studies have shown entanglement in various types of static fishing gear, netting and marine litter as one of the most frequently identified causes of death in NW European and GB waters (Okill 2002, Erdmann *et al.* 2005, Weston & Caldow 2010). However early indications from a 2011/12 study by Natural England and the Kent and Essex IFCA in the Outer Thames Estuary SPA suggest that occurrence of red-throated diver entanglement in fishing gear is low. Further data is being collected over the 2012/13 winter. At a broader geographic scale, bycatch of red-throated divers in the Baltic Sea and North Sea is estimated to be of the order of 'hundreds' from a population of >100,000 (Zydelis *et al.* 2009).

Herring are key prey species for the red-throated diver (Guse *et al.* 2009). The species may thus also be sensitive to aspects of dredging activity that negatively impact on herring populations, such as increases in sediment deposition (Cook & Burton 2010).

Commercial extraction of the red-throated diver's main fish prey species, as target and/or bycatch species, could impact the birds, but again the extent of this in the Outer Thames Estuary SPA is not well understood.

3.3 Background to favourable condition table

The favourable condition table is the principle source of information that Natural England and JNCC will use to monitor and assess the condition of an interest feature and as such comprises indicators of condition. The favourable condition table can be found at Appendix A.

On many terrestrial European sites, we know sufficient information about the required condition of qualifying habitats to be able to define favourable condition with confidence. In contrast, understanding the functioning of large, varied, dynamic marine and estuarine sites, which experience a variety of pressures resulting from historic and current activities, is much more difficult, consequently it is much harder to define favourable condition so precisely in such sites. In general the conservation objectives provided are based on a *working* assumption that the *current* condition of the features is favourable for most attributes.

Where there are more than one year's observations on the condition of marine features, all available information will need to be analysed to determine, where possible, any natural environmental trends at the site. This will provide the basis for judgements of favourable condition to be determined in the context of natural change. Where it becomes clear that certain attributes may indicate a cause for concern, and if further investigation indicates this is justified, restorative management actions will need to be taken. The aim of such action would be to return the interest feature to favourable condition from any unfavourable state. Future editions of the advice within this document will revise the current assumptions about feature condition in light of ongoing and future monitoring. This will be linked with any developments in our understanding of the structure and functioning of features and the pressures they are exposed to.

This advice also provides the basis for discussions with relevant authorities, and as such the attributes and associated measures and targets may be modified over time. The aim is to have a single agreed set of attributes that will be used as a basis for monitoring in order to report on the condition of features. Condition monitoring of the attributes may be of fairly coarse methodology, underpinned by more rigorous methods on specific areas within the site. Common Standards Monitoring (JNCC 2004) requires mandatory monitoring of some attributes of a designated feature, while other attributes are considered discretionary (or site-specific) and are incorporated to highlight local distinctiveness. Monitoring of both bird populations and the extent of habitats are fundamental to assessing the condition of bird features (JNCC 2004), and are therefore identified as "**mandatory attributes"** in the Favourable Condition Tables (Appendix A). It is not possible to make a robust assessment of the condition of a feature without assessing the mandatory attributes. **For bird features the general rule is that all mandatory attributes must meet their targets for the feature to be in favourable condition**. Priority will be given to measuring attributes that are at risk from anthropogenic pressure and for which changes in management may be necessary. This information may be generated by Natural England/JNCC or collected by other organisations through agreements.

The condition monitoring programme will be developed through discussion with the relevant / competent authorities and other interested parties, ideally as part of the management scheme process. Natural England and JNCC will be responsible for collating the information required to assess condition, and will form a judgement on the condition of each feature within the site.

Targeted monitoring of the attributes identified in the favourable condition table will be an important, but not the only, basis for assessing the condition of the features. Additional sources of information may also be selected to inform our view about the integrity and condition of the site. For example, a part of risk based monitoring activity data (as collected by the relevant/competent authorities and their statutory advisers) could give an indication as to the levels of pressure that may impact on the site features. Any other relevant data, such as data on site integrity, results from compliance monitoring, (for example assessing the conduct of activities in relation to regulations and licence conditions), together with data obtained to inform appropriate assessments, licence applications etc. will also have an important role in informing assessments of feature condition.

Information about the size of the red-throated diver population on the site will also need to be interpreted in the context of any wider changes in the population of this species at a national or biogeographic region level.

4. Advice on operations

4.1 Background

Natural England and JNCC have a duty under Regulation 35(3)(b) of the Habitats Regulations and 18 of the Offshore Marine Conservation Regulations to advise other relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

The process of deriving and scoring relative vulnerability is provided at Appendix C. A summary of the operations which may cause deterioration or disturbance is given at Appendix D, and detailed in Appendix E. Further explanation of the sensitivity of the interest features follows with examples of their exposure and therefore their vulnerability to damage or disturbance from the listed categories of operations. This enables links to be made between the categories of operation and the ecological requirements of the features.

4.2 Purpose of advice

The aim of this advice is to enable all relevant authorities to direct and prioritise their work on the management of activities that pose the greatest potential threat to the favourable condition of interest features at Outer Thames Estuary SPA. The advice is linked to the conservation objectives for interest features and will help provide the basis for detailed discussions between relevant authorities enabling them to formulate and agree a management scheme for the site should one be deemed necessary.

The advice given here will inform, but is given without prejudice to, any advice provided under Regulation 61 or Regulation 63 on operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

4.3 Methods for assessment

To develop this advice on operations Natural England has used a three step process involving:

- an assessment of the **sensitivity** of the interest features or their component sub-features to operations;

- an assessment of the **exposure** of each interest feature or their component sub-features to operations; and

- a final assessment of **current vulnerability** of interest features or their component sub-features to operations.

This three step process builds up a level of information necessary to manage activities in and around the site in an effective manner. Through a consistent approach, this process enables Natural England to both explain the reasoning behind our advice and identify to competent and relevant authorities those operations which pose the most current threats to the favourable condition of the interest features on the site.

All the scores of relative sensitivity, exposure and vulnerability are derived using best available scientific information and informed scientific interpretation and judgement. The process uses sufficiently coarse categorisation to minimise uncertainty in information, reflecting the current state of our knowledge and understanding of the marine environment.

Six broad Pressure 'Categories of Operation' which may cause i) deterioration of natural habitats or the habitats of species, or ii) disturbance of species, (either alone or in-combination), are considered in this document:

- Physical Loss
- Physical Damage
- Non-physical disturbance
- Toxic contamination
- Non-toxic contamination
- Biological disturbance

Example sources of pressures are provided (Appendix D), although these examples are not inclusive of all potentially detrimental activities.

4.3.1. Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features and their supporting habitat in the Outer Thames Estuary SPA to the effects of six broad categories of human activities.

In relation to this assessment, sensitivity has been defined as the "intolerance of a habitat, community or individual (or individual colony) of a species to damage, or death, from an external factor and the time taken for its subsequent recovery" (Hiscock 1996, MarLIN, 2003). For example, a very sensitive species or habitat is

one that is very adversely affected by an external factor arising from human activities or natural events (killed/destroyed, 'high' intolerance) and is expected to recover only over a very long period of time, i.e. >10 or up to 25 years ('low' recoverability). In the case of the SPA, this assessment considers the sensitivity of the red-throated diver population as well as the species and habitats on which that population depends. This includes its prey species and supporting habitats e.g. the condition of the sandbanks is important because they support the food chain on which the divers depend.

The sensitivity assessments are based on current information but may develop with improvements in scientific knowledge and understanding. The sensitivity of interest features or sub-features (and scientific understanding of sensitivity) may change over time; hence an operation that is not currently considered to have a negative effect may be identified as having one in the future. For example the dependence on a particular prey species may change if that species' abundance declines and the birds switch prey species. The subsequent shift may mean dependence on another prey species not previously assessed.

4.3.2. Exposure assessment

This has been undertaken for the Outer Thames Estuary SPA by assessing the relative exposure of the interest features and their supporting habitat on the site to the effects of broad categories of human activities currently occurring on the site (as at July 2012). These assessments were made on the best available information and advice but should be reviewed in light of additional information on activities in the area.

4.3.3. Vulnerability assessment

The third step in the process is to determine the vulnerability of interest features or their component sub-features to operations. This is an integration of sensitivity and exposure. Only if a feature is both sensitive *and* exposed to a human activity is it considered vulnerable (see Appendix C). In this context, therefore, 'vulnerability' has been defined as the exposure of the habitat, community or individual (or individual colony) of a species to an external factor to which it is sensitive (Hiscock, 1996). An assessment of the interest feature's vulnerability (Appendix E) helps to guide site management decisions by highlighting potentially detrimental activities that may need to be managed (or continue to be managed) by the competent authorities.

The vulnerability of the SPA Annex I feature to climate change is not considered in the annexes below, given the uncertainties surrounding the effects of global change on the oceans.

4.4 Format of advice

The advice is provided within six broad categories of operations that may cause deterioration of natural habitats or the habitats of species, or disturbance of species. This approach therefore:

- enables links to be made between human activities and the ecological requirements of the habitats or species, as required under Article 6 of the Habitats Directive;[32]

[32] For full a background summary to the Natura 2000 see http://necmsstage/ourwork/marine/sacconsultation/default.aspx and

- provides a consistent framework to enable relevant authorities to assess the effects of activities and identify priorities for management within their areas of responsibility; and

- is appropriately robust to take into account the development of novel activities or operations which may cause deterioration or disturbance to the interest features of the site and should have sufficient stability to need only infrequent review and updating by Natural England and JNCC.

These broad categories provide a clear framework against which relevant and competent authorities can assess activities under their responsibility.

4.5 Update and review of advice

Information as to the operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated, is provided in light of what Natural England knows about current and recent activities and patterns of usage at Outer Thames Estuary SPA. Natural England and JNCC expects that the information on activities and patterns of usage will be refined as part of the process of developing the management scheme and through discussion with the relevant and competent authorities. As part of this process the option of identifying a number of spatial zones with different activity levels may be appropriate. It is important that future consideration of this advice by relevant authorities and others takes account of changes in the usage patterns that have occurred at the site, over the intervening period, since the information was gathered. In contrast, the information provided in this advice on the sensitivity of interest features or sub-features is relatively stable and will only change as a result of an improvement in our scientific knowledge, which will be a relatively long term process. Advice for sites will be kept under review and will be periodically updated through discussions with relevant and competent authorities and others to reflect significant changes in our understanding of sensitivity together with the potential effects of plans and projects on the marine environment.

5. Specific advice on operations for the Outer Thames Estuary SPA

The following sections provide information to help relate general advice regarding the sensitivity and exposure of the specific interest feature (the overwintering population of red-throated diver, *Gavia stellata*) and its supporting habitat to operations and activities within and adjacent to the Outer Thames Estuary SPA.

This advice relates to the vulnerability of the interest features and sub-features of the Outer Thames SPA to current levels of human usage, as summarised in Appendix D and detailed in Appendix E.

Further explanation of the sensitivity of the interest feature and supporting habitats follows, with examples of its exposure and therefore its vulnerability to damage or disturbance from the listed categories of pressures. This enables links to be made between the categories of operation and the ecological requirements of the features.

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the Departmental brief: http://www.naturalengland.org.uk/Images/Thames-brief_tcm6-11044.pdf

Information regarding the current commercial activities in and around the SPA can be found in the Departmental Brief[33] for the Outer Thames Estuary SPA.

5.1. Detailed advice for the Outer Thames Estuary SPA features

5.1.1. Physical loss of supporting habitat

In the UK, wintering red-throated divers are associated with shallow (between 0-20m deep (less frequently in depths of around 30m)) inshore waters, often occurring within sandy bays, firths and sea lochs, although open coastline is also frequently used (Skov *et al*., 1995; Stone *et al.*, 1995). Red-throated divers are known to be associated with sandbank features, although the exact use of different habitats within the Outer Thames Estuary is complex, and related to both physical and hydrographic variables (Skov *et al.* 2011).

The link between the birds and benthic habitats is not well understood but it probably reflects the association between some of their prey species (small fish such as gadoids, sprat, herring and sandeel between approximately 10 and 25 cm in length; Guse *et al 2009.*, and references therein) and sandbanks (Kaiser *et al*. 2004). Sandbanks may have a functional role (as nursery, spawning, or feeding grounds or in providing shelter) in supporting these fish species. Eddies and upwellings, perhaps reflecting biologically productive components of the marine environment and thus attractive to fish, have been shown to be important on certain tidal phases for explaining red-throated diver distribution in the Outer Thames Estuary (Skov *et al.* 2011).

Physical loss by removal or by smothering of any of the habitats on which red-throated divers depend may result in the loss of foraging sites and therefore the reduction of the food resource for the overwintering population. This would consequently be detrimental to the favourable condition of the interest feature. **Thus the overwintering population is considered to be highly sensitive to physical removal of habitat and moderately sensitive to smothering.** The sensitivity for smothering is considered moderate rather than high because habitats can recover after time with smothering whereas physical removal is likely to destroy the habitat.

Offshore development construction, marine aggregates extraction, capital and maintenance dredging of shipping channels all undertake physical removal of sand from within the SPA boundary. The northernmost extent of the SPA boundary (Norfolk) crosses the 12nm zone and contains some aggregates licences (from 2008) and prospecting areas. The environmental statement for the London Array Windfarm located in the southern area of the SPA (partially overlapping Margate & Long Sands SAC) considered that the resulting habitat loss from the development is very small, and is not considered significant in the context of habitat availability for divers within the SPA and the Thames Estuary as a whole (RPS Group PLC 2005).

The Round 3 development programme for offshore wind farms includes an area overlapping with the northern extent of the SPA. The Crown Estate has awarded a lease to develop the Norfolk Zone (Zone 5) to a consortium known as East Anglia Offshore Wind. This consortium will be required to undertake a zonal assessment of their combined proposals followed by an environmental impact assessment and make an application through the Planning Inspectorate for each windfarm proposal.

[33] http://www.naturalengland.org.uk/Images/Thames-brief_tcm6-11044.pdf

An approximate calculation of turbine base diameter relative to the entire extent of the SPA, indicates that direct physical loss of habitat due to the footprint of windfarm turbines (taking into account Kentish Flats, Gunfleet Sands, Scroby Sands, London Array and the Round 3 zone off Suffolk) would be substantially less than 0.01% of the total SPA area. Whilst this figure does not take into account habitat loss due to scour protection around the turbines or over inter-array and grid connection cables, in the context of the SPA area the total figure for direct habitat loss due to turbine footprints and scour protection is still likely to fall below 1% of the total SPA area (the total area of the Outer Thames Estuary SPA is 379,268.14 ha). Direct loss due to the turbine footprint must be considered alongside 'effective' or indirect loss of habitat (which could be temporary), due to divers avoiding the windfarm area. This is addressed under non physical disturbance in section 5.1.3.

Furthermore, although net habitat loss may be small, it is important to recognise that some habitat areas will be of more importance to red-throated divers than others. Within the Outer Thames Estuary area, Kentish Flats and London Array offshore wind farms are situated in habitat typically described as being of 'high' or 'very high' quality (Skov *et al.* 2011). Displacement from such habitat may lead to density-dependent effects (e.g. increased feeding competition) elsewhere within the SPA.

Black Deep and Fisherman's Gat have never been dredged; the Princes Channel was dredged in 2008 for the first time in 40 years and there will be an ongoing maintenance dredging requirement. Maintenance and / or capital dredging is likely to increase if shipping activity and ship sizes increases. Capital dredging within the site is planned for Shellhaven, a new container port that is being developed on the site of a former oil refinery. In addition planned capital dredging of the Medway Approach Channel will fall partly within the site.

Based on the overall extent of supporting sandbank habitat and the distribution and extent of activities the overall exposure to physical loss due to removal can be considered to be low. This is because although the impacts described above may be relatively geographically dispersed, when considered cumulatively they represent only a small area of the SPA habitat. However, the quality of supporting habitat, as determined by modelling of environmental predictor variables against known diver distributions, is a key consideration in the ultimate effect of such habitat removal (Skov *et al.* 2011). The existing and prospective aggregate extraction areas within the site as well as ongoing maintenance dredging requirements of shipping lanes and potential future capital dredging means that **exposure to physical loss due to smothering can be considered to be moderate.**

Overall the **vulnerability of the Annex I species** within the Outer Thames Estuary SPA and associated habitats to **physical loss** due to both physical removal and smothering is considered to be **low to moderate**.

5.1.2. Physical damage to their supporting habitat

Benthic sandbank communities are in general relatively resilient to physical damage. However, repeated damage to the habitats (through changes in suspended sediment or physical disturbance caused by selective extraction, anchoring or bottom-towed fishing gear) could adversely affect the ability of the habitats to recover, leading to permanent damage and ultimately to loss of prey species. This may result in a reduction in the value of sandbank habitats as foraging sites for the overwintering population of red-throated diver. Therefore, **the overall sensitivity of the red-throated divers to damage to their supporting habitat is considered to be moderate**.

Few ships anchor in the Outer Thames. Marine aggregate extraction activities are mostly in the northern extent of the SPA with some new licence areas in the northerly part of the southern section. Activities are not expected to significantly reduce habitat availability for divers as the areas worked are typically limited spatially and temporally. Commercial fishing activity within the SPA includes: suction dredging for cockles, set and drift-net trammelling, otter trawling, drift gill netting, potting, long-lining and a limited amount of beam trawling for demersal species. While the capacity for the majority of these gear types to cause physical damage to the seabed habitat is low, the interaction between suction dredging, beam trawling and to a lesser extent demersal otter trawling gear components and the seafloor can result in physical disturbance and potentially damage, depending on the intensity of the activity and sediment composition of the habitat (JNCC and Natural England 2011). Significant long-term changes in bathymetry caused by bottom-towed fishing gear that could render habitat unavailable for foraging divers are not anticipated. **The site is therefore considered to have low exposure to physical damage.**

Overall the **vulnerability of the Annex I species** within the Outer Thames Estuary SPA and associated habitats to physical damage is considered to be **low** for siltation, abrasion and selective extraction.

5.1.3. Non physical disturbance of red-throated diver

Red-throated divers are highly sensitive to non-physical disturbance by noise and visual presence during the winter (Garthe & Huppop 2004). They can be disturbed by wind turbine rotors, boat movements, and general activity. Disturbance can cause birds to reduce or cease feeding in a given area or to fly away from an area (i.e. be displaced). Either response could decrease their energy intake rate at their present (disturbed) feeding site or alternative feeding site, which may be less favoured. The latter response would also increase energy expenditure during flight and perhaps during subsequent foraging in less favourable habitat (or favourable habitat with greater intra-specific competition). Both disturbance and displacement can in principle affect the energy budgets and possibly survival of birds. Stillman *et al*. (2007) note that the impacts of disturbance during the non-breeding season on migratory wildfowl should be measured in terms of its effects on two factors: i) the storage of fat reserves needed to fuel migration in spring and to breed successfully after the birds have reached the breeding grounds; and ii) the number of birds that die during the non-breeding season. Impacts on both factors are likely to be a particular problem for diving birds which engage in an energetically expensive mode of foraging (de Leeuw 1997). **Sensitivity can be considered high.**

Disturbance and displacement of prey species arising from construction noise from wind farms could cause disruption to their lifecycles, as herring and sprat are thought to be a prey resource and are sensitive to noise. Benthopelagic fish species have some sensitivity to both construction and operational noise from windfarms. However, the level of certainty regarding the zone of impact and precise response is limited, with estimates of physiological responses, injury and death reported at varying distances from construction/operation. These appear to be more significant as a result of construction noise than operation, within 150m of the source, although impacts may occur up to 1000m away.[34]

[34] http://www.offshorewindfarms.co.uk/Assets/BIOLAReport06072006FINAL.pdf

Locally, significant disturbance and displacement effects are predicted to arise from noise and visual impacts from wind farm construction, maintenance traffic and visually or aurally from the turbines themselves. The calculation for the areas of the consented windfarm footprints relative to the area of the SPA shows that 3.5% of the SPA area could be made unavailable through displacement.[35] If the entire consented London Array development is included this increases to 282.5 km^2 or 7.2% of the SPA area which could potentially be unavailable to red-throated diver. The development of London Array beyond phase 1 is subject to the satisfactory outcome of an ornithological review process demonstrating that there would be no adverse effect on the red-throated diver population from the second phase of the development. Red-throated divers may habituate to wind turbines and therefore any habitat loss due to displacement may diminish over time. However, as yet, survey work has provided little or no evidence of habituation by divers (Petersen & Fox 2007; Percival 2010).

Disturbance and displacement effects may also arise from shipping (including recreational boating) and boat movements associated with marine aggregate and fishing activities (Cook & Burton 2010). Marine aggregates activities tend to be temporary and localised. Dredging and shipping activities are expected to be confined to existing shipping channels, which are already known to be avoided by divers. In the majority of cases it is expected that activity will be lowest during the winter months (when the birds are present) due to the limitations imposed by poor weather conditions (RPS Group PLC 2005). Prince's Channel (which runs through the southern area of the Outer Thames Estuary SPA) carries a significant amount of vessel traffic in and out of ports in the inner Thames Estuary. Fisherman's Gat is also an active commercial shipping channel. In addition, smaller vessels use the shallower inshore channels across the site.

Overall current exposure is considered to be medium.

Overall the **vulnerability of the Annex I species** within the Outer Thames Estuary SPA to **non-physical disturbance** is considered to be **high**.

5.1.4. Toxic contamination of red-throated diver and their supporting habitats

Synthetic compounds such as PCBs can bioaccumulate/ biomagnify through the food chain in the tissues of marine organisms and concentrations could be considerable once they reach the fish on which red-throated divers feed. Thus, **sensitivity to synthetic chemicals such as PCBs is considered moderate.**

Hotspots for synthetic compounds include industrial estuaries and sandy environments offshore, but **as PCBs are currently banned, exposure can be considered low.** If marine pollution were to occur there is the potential for exposure to PCBs to change.

Large oil and chemical spills affecting shallow sandbank habitats can have a detrimental effect on bird populations. Deterioration of invertebrate and small fish populations can have a significant impact on important food sources. Oil on the surface and in the water column would present a direct threat to diving and feeding seabirds particularly during their moulting times, when they are less mobile and

[35] Scroby Sands, Kentish Flats, Gunfleet Sands 1 & 2 plus London Array Phase 1 occupy a total area of 137.5 km^2 equivalent to 3.5% of SPA area

remain at sea. Oil on the feathers of birds could lead to loss of insulation, reduced buoyancy and possible drowning. Consequently red-throated divers may suffer the inability to feed, resulting in starvation and death. Dispersants used to disperse the oil may also be harmful to the species. **Sensitivity to non-synthetic compounds is therefore considered to be high.**

Prince's Channel (which runs through the southern area of the Outer Thames Estuary SPA) carries a significant amount of vessel traffic in and out of ports in the inner Thames Estuary. Fisherman's Gat is also an active commercial shipping channel. In addition, smaller vessels use the shallower inshore channels across the site. This additional small vessel activity means that the risk of contamination by accidental spillages of fuel or cargo is increased, and a small level of contamination will exist as a result of normal shipping activities. Large ports in the area also increase the risk of exposure.

Although the *risk* of a catastrophic event due to vessel traffic (oil tankers, ships with toxic contaminants, etc.) exists, the probability of such an event occurring as a result of "normal" vessel traffic is considered to be very low; in addition the 'background level' of toxic contamination to which the site is exposed in also considered to be low.

However, there are ship-to-ship oil transfers occurring just off Southwold within 12nm. Ship-to-ship (s-t-s) transfers consist of a transfer of a cargo of oil (heavy fuel oil or crude oil, etc.) from one vessel to another. Large tankers are unable to gain access to the Russian/Baltic states and hence smaller tankers bring oil from the region and transfer this oil to larger tankers. From here the large tankers ship the oil internationally. Approximately 15-20 of these s-t-s operations occur annually. Although the Maritime and Coastguard Agency manage the s-t-s operations very well, accidental oil spills can happen at any time and due to the proximity of the s-t-s operations to the SPA it may be considered that there is an elevated risk from an oil spill at this location.

Overall the **vulnerability of the Annex I species (red-throated diver)** within the Outer Thames Estuary SPA to **toxic contamination** is considered to be **low-moderate**.

5.1.5. Non-toxic contamination of red-throated divers and their supporting habitats

Non-toxic contamination through nutrient loading, organic loading and changes to the thermal regime could impact on prey species and distribution. **The sensitivity** of the prey species of red-throated diver, and therefore of the divers themselves**, to non-toxic contamination is considered moderate.**

The dilution effect for this form of contamination (which could also include increased turbidity and changes to the salinity) may reduce the **exposure, which is considered low.**

Overall the **vulnerability** of the prey species and **of the Annex I species (red-throated diver)** within the Outer Thames SPA to non-toxic contamination is considered to be **low**.

5.1.6. Biological disturbance

Introduction of microbial pathogens and non-native species

Sensitivity to the introduction of microbial pathogens and non-native species is considered to be low for red-throated divers, as is their exposure to them in the Outer Thames Estuary SPA. **Vulnerability is therefore low.**

Selective extraction of prey species

Within the site, a variety of fishing gears are used with variable intensity to harvest different quota and non-quota species (CEFAS 2006; des Clers 2010; MMO 2012). Fishing activities include: suction dredging for cockles, set and drift-net trammelling, drift gill netting, potting, and a limited amount of beam and otter trawling for demersal species (mainly in troughs). Limited long-lining and pair-trawling also occurs within the site. Removal of fish species and larger molluscs can have significant impacts on the structure and functioning of benthic communities over and above the physical effects of fishing methods on the seabed, particularly as some fish species fill upper roles in the trophic web (Jennings & Kaiser 1998; Kaiser *et al*. 2006). Moreover, certain types of fishing have the potential to directly remove divers' prey species, either as target species or as bycatch. Thus, the mechanisms for these pressures to impact on red-throated divers may be an indirect or direct reduction in food availability for the overwintering population. **Red-throated divers are judged to be moderately sensitive to biological disturbance through selective extraction of prey species,** as they are known to be 'opportunistic feeders' taking a broad range of fish species, and their diet compositions seem to depend on availability rather than on food specialisation (Guse *et al*., 2009).

The exposure to selective extraction of red-throated divers' prey species by fishing (i.e. the amount of their prey species taken by fishing vessels as target or bycatch) is not clearly understood but **in general is considered low** due to differences in the average size composition of the fish eaten by divers and caught in commercial quantities by fishers, making **vulnerability to selective extraction low.**

Non-selective extraction of red-throated divers

The primary potential causes of non-selective extraction of divers are entanglement in static fishing gear or wind turbine strike.

Entanglement in static nets, fishing lines and general marine litter (of a wide variety) is a major cause of known mortality of red-throated divers (Okill 2002; Schirmeister 2003; Camphuysen 2008). In a study by Okill (2002), the mortality of 35.7% of all recovered ringed red-throated divers could be related to a particular cause of death: 53% of these 'attributable' deaths were caused by accidental capture in fishing nets (fish farms, discarded netting and static nets set for a variety of fish including herring, salmon and skate). It was concluded that 18.9% of all deaths of ringed red-throated divers were attributable to entanglement. Although the sample sizes on which these percentages were based are small, these figures, coupled with the relatively frequent occurrence of red-throated divers amongst netting casualties in other studies (Manville 2005) suggests that their **sensitivity to entanglement can be considered high.**

The three principal fishing methods for the inshore fishery within the SPA are suction dredging, single and multi-rig otter trawling and static netting. Static/passive fishing

gear methods (such as set gill nets and drift netting), which are used throughout the estuary therefore pose the most serious risk to the birds themselves.

Kent and Essex IFCA in partnership with Natural England have been carrying out observations on red-throated diver bycatch within the Outer Thames Estuary SPA. Results from the first winter of monitoring (2011/12) showed that drift netting in the area was not a significant source of mortality for red-throated divers; zero bycatch of the species was recorded. IFCA observations showed that fishing effort for drift netting was low over winter and that fixed netting was not common practice in the area. Further observations are to be carried out over the 2012/13 winter period to increase the evidence base on bycatch and fishing methods within the area.

Information from other sources (e.g. CEFAS 2006; des Clers 2010) indicates that most netting activity, which is widespread across sandbanks, occurs in the summer and autumn, beginning in June and extending into December. In contrast, the wintering red-throated divers are most prevalent from November to March, with peak numbers occurring in January and February[36]. In light of current evidence, **exposure, and subsequently vulnerability, of red-throated divers within the site to non-selective extraction by fishing gear is therefore considered low**

There are many studies which have documented that birds which collide with rotating wind turbine blades are highly likely to be severely injured or killed (reviewed in Drewitt & Langston 2008). Red-throated diver populations are sensitive to increased adult mortality as it is a long-lived species with relatively low annual adult mortality and low breeding productivity. Thus, **sensitivity to non selective extraction through wind turbine strike can be considered high.**

Impacts to red-throated diver may result from collision with wind turbines, if they fly at a height above 20m. It has been observed, however, that they generally fly below the height at which they would be at risk of colliding with rotating turbine blades (Garthe & Huppop, 2004; RPS GROUP PLC 2005; Environmentally Sustainable Systems Ltd, 2008). Cook *et al.* (2012) modelled red-throated diver altitudes from 19 study sites, concluding only 2% of birds in flight were at collision risk height, with high confidence in the result.

In addition, exposure to collision risks is likely to be lowered due to the displacement of red-throated divers from windfarm footprints due to non-physical disturbance (section 5.1.3). These studies, coupled with the current size of the windfarm footprint areas in comparison to the area of the SPA, indicate that the **exposure to non-selective extraction through wind turbine strike is currently low. Vulnerability is therefore moderate.** Any habituation of divers to offshore windfarms in the future or further expansion of such developments may alter this assessment.

Overall the **vulnerability of the Annex I species (red-throated diver)** within the Outer Thames Estuary SPA to **biological disturbance** is considered to be **low-moderate.**

[36] They can be high in December too but tend to be lower in October and November (see Webb et al 2009, JNCC report on the Outer Thames http://www.jncc.gov.uk/page-4923)

6. Risk Assessment

JNCC and Natural England consider ‘risk’ to be the likelihood of deterioration of the feature due to an activity. It is the vulnerability of the feature to an activity, assessed against the level of management of that activity.

High-risk activities are those to which the feature is highly or moderately vulnerable, and for which there is insufficient management. For example, industries or activities which are not location specific and not subject to prior consent procedures or reliable enforcement are more likely to cause damage/disturbance to the interest feature. These industries include fishing. However, clearly not all activities associated with these industries are detrimental to interest features.

Low-risk activities will be those where there is no feature vulnerability (i.e. the activity does not interact with the feature) or where the moderate or high vulnerability is mitigated by management measures. For example, industries that are location specific are always subject to prior consent (often including explicit environmental impact assessment) and have clear reliable methods of enforcement; there is generally a lower likelihood of causing damage or disturbance to interest features.

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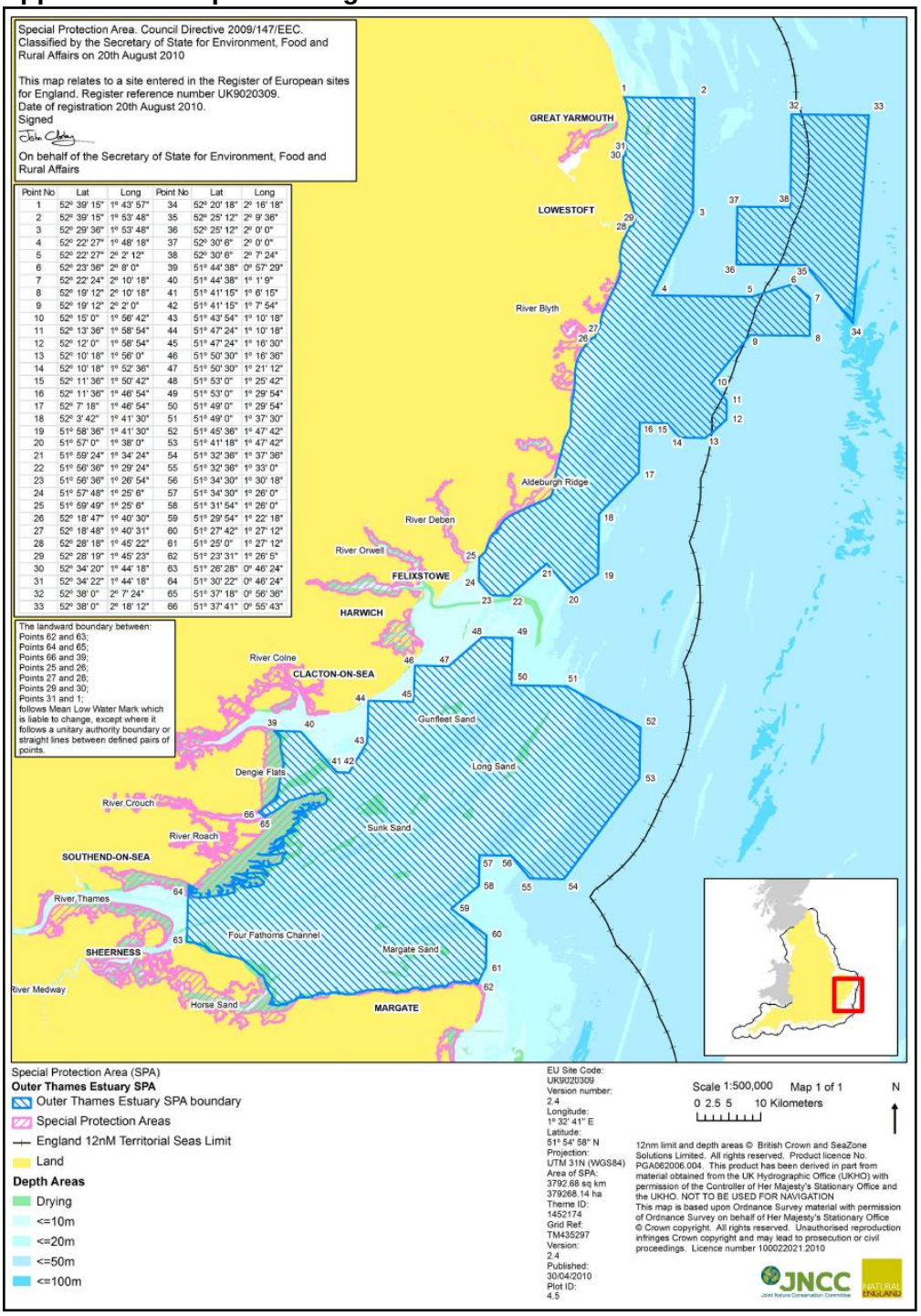
Appendix A
Favourable Condition Table (FCT) for Outer Thames Estuary SPA

Attributes	Measure	Targets	Comments
Red-throated diver population size (Mandatory attribute)	Estimated population size derived from standardised site condition monitoring programme	Maintain population on the site subject to natural fluctuations. There should be no permanent decline, only non-significant fluctuation around the mean to account for natural change: where the limits of natural fluctuations are not well known maintain the population above 50% of that at designation; loss of 50% or more is unacceptable	Survey data used as the basis for deriving the SPA population comprised many incomplete surveys covering different sections of the final SPA boundary in different winters between the months of October to March in 1988/89, and 2002-2007. Derivation of the SPA population size required these partial datasets to be combined. Accordingly, there is limited understanding of the magnitude of inter-annual natural variation in population size across the entire SPA. In the absence of good knowledge of natural fluctuation in population size, the threshold for favourable condition is set, in line with standard practice, as being a population that exceeds 50% of the designated wintering population size. This target will be used to inform future assessments of favourable condition. Improved understanding of the natural dynamics of this population over time will be used to refine the target population size.
Habitat extent (Mandatory attribute)	Area of supporting habitat	No significant decrease in the extent of supporting habitat available for red-throated diver.	Changes in extent will need to take account of the dynamic nature of the sandbank, but a trend of reduction in extent may indicate long-term changes in the physical conditions influencing the feature, whether it be natural processes or anthropogenically driven. Further studies of diver distribution within the site, building on Skov *et al.* (2011) will inform understanding of the habitat usage by the species and help refine the measure and target in future.

Appendix B : Maps showing interest features of the Outer Thames Estuary SPA



Point No	Lat	Long	Point No	Lat	Long
1	52° 39' 15"	1° 43' 57"	34	52° 20' 18"	2° 16' 18"
2	52° 39' 15"	1° 53' 48"	35	52° 25' 12"	2° 9' 36"
3	52° 29' 36"	1° 53' 48"	36	52° 25' 12"	2° 0' 0"
4	52° 22' 27"	1° 48' 18"	37	52° 30' 6"	2° 0' 0"
5	52° 22' 27"	2° 2' 12"	38	52° 30' 6"	2° 7' 24"
6	52° 23' 36"	2° 8' 0"	39	51° 44' 38"	0° 57' 29"
7	52° 22' 24"	2° 10' 18"	40	51° 44' 38"	1° 1' 9"
8	52° 19' 12"	2° 10' 18"	41	51° 41' 15"	1° 6' 15"
9	52° 19' 12"	2° 2' 0"	42	51° 41' 15"	1° 7' 54"
10	52° 15' 0"	1° 56' 42"	43	51° 43' 54"	1° 10' 18"
11	52° 13' 36"	1° 58' 54"	44	51° 47' 24"	1° 10' 18"
12	52° 12' 0"	1° 58' 54"	45	51° 47' 24"	1° 16' 30"
13	52° 10' 18"	1° 56' 0"	46	51° 50' 30"	1° 16' 36"
14	52° 10' 18"	1° 52' 36"	47	51° 50' 30"	1° 21' 12"
15	52° 11' 36"	1° 50' 42"	48	51° 53' 0"	1° 25' 42"
16	52° 11' 36"	1° 46' 54"	49	51° 53' 0"	1° 29' 54"
17	52° 7' 18"	1° 46' 54"	50	51° 49' 0"	1° 29' 54"
18	52° 3' 42"	1° 41' 30"	51	51° 49' 0"	1° 37' 30"
19	51° 58' 36"	1° 41' 30"	52	51° 45' 36"	1° 47' 42"
20	51° 57' 0"	1° 38' 0"	53	51° 41' 18"	1° 47' 42"
21	51° 59' 24"	1° 34' 24"	54	51° 32' 36"	1° 37' 36"
22	51° 56' 36"	1° 29' 24"	55	51° 32' 36"	1° 33' 0"
23	51° 56' 36"	1° 26' 54"	56	51° 34' 30"	1° 30' 18"
24	51° 57' 48"	1° 25' 6"	57	51° 34' 30"	1° 26' 0"
25	51° 59' 49"	1° 25' 6"	58	51° 31' 54"	1° 26' 0"
26	52° 18' 47"	1° 40' 30"	59	51° 29' 54"	1° 22' 18"
27	52° 18' 48"	1° 40' 31"	60	51° 27' 42"	1° 27' 12"
28	52° 28' 18"	1° 45' 22"	61	51° 25' 0"	1° 27' 12"
29	52° 28' 19"	1° 45' 23"	62	51° 23' 31"	1° 26' 5"
30	52° 34' 20"	1° 44' 18"	63	51° 26' 28"	0° 46' 24"
31	52° 34' 22"	1° 44' 18"	64	51° 30' 22"	0° 46' 24"
32	52° 38' 0"	2° 7' 24"	65	51° 37' 18"	0° 56' 36"
33	52° 38' 0"	2° 18' 12"	66	51° 37' 41"	0° 55' 43"

Appendix C: Methods deriving vulnerability.

Sensitivity	
None	-
Low	•
Moderate	••
High	•••

Exposure	
None	-
Low	+
Medium	++
High	+++

Vulnerability
None detectable
Low
Moderate
High

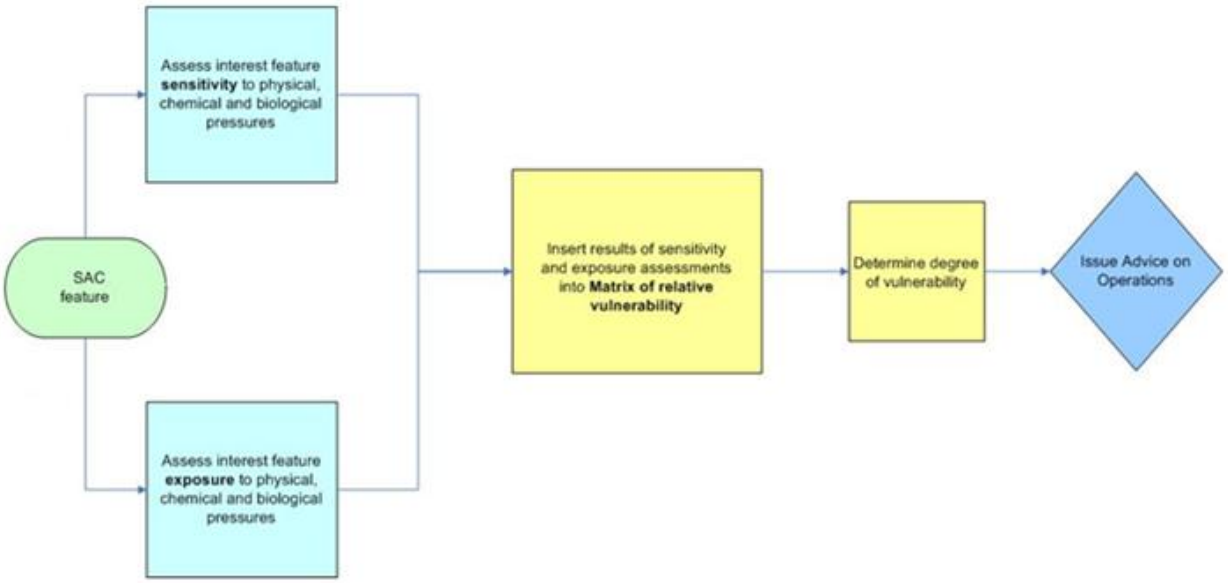
Additional Category for insufficient information = DD (Data Deficient)

The relative vulnerability of an interest feature or sub-feature is determined by multiplying the scores for relative sensitivity and exposure, and classifying that total into categories of relative vulnerability.

		Relative sensitivity of the interest feature			
		High (3)	**Moderate (2)**	**Low (1)**	**None detectable (0)**
Relative exposure of the interest feature	**High (3)**	9	6	3	0
	Medium (2)	6	4	2	0
	Low (1)	3	2	1	0
	None (0)	0	0	0	0

Categories of relative vulnerability	
High	6-9
Moderate	3-5
Low	1-2
None detectable	0

An assessment of interest features' vulnerability helps to guide site management decisions by highlighting potentially detrimental activities that may need to be managed (or continue to be managed) by the relevant authorities.



Appendix D. Summary of operations/pressures that may cause deterioration or disturbance of red-throated diver s and their supporting habitat and prey species in the Outer Thames Estuary SPA at current levels of use

The advice below is not a list of prohibitions but rather a checklist for operations/pressures that may need to be subject to some form of management measure(s) or further measures where actions are already in force. Examples of activities under relevant authority jurisdiction are also provided. Operations marked with a ✓ indicate those to which red throated divers are considered to be **vulnerable** either directly or indirectly as a result of effects on their prey species and supporting habitat.

Operations (pressures) which may cause deterioration or disturbance with example activities	**red-throated diver - Outer Thames Estuary SPA**	**Supporting habitats and prey species - Outer Thames Estuary SPA**
Physical loss of supporting habitat		
Removal of habitat feature (e.g. offshore development, capital dredging, 'active dredging zones')		✓
Smothering (e.g. by artificial structures, disposal of dredge spoil)		✓
Physical damage to their habitats		
Siltation (e.g. run-off, channel dredging, outfalls)		✓
Abrasion (e.g. anchoring, cables)		✓
Selective extraction (e.g. aggregate dredging)		✓

Operations (pressures) which may cause deterioration or disturbance with example activities	red-throated diver - Outer Thames Estuary SPA	Supporting habitats and prey species - Outer Thames Estuary SPA
Non-physical disturbance		
Noise (e.g. boat activity)	✓	✓
Visual (e.g. recreational activity)	✓	
Toxic contamination		
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	✓	✓
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	✓	✓
Introduction of radionuclides	✓	✓
Non-toxic contamination		
Changes in nutrient loading (e.g. agricultural run-off, outfalls)		✓
Changes in organic loading (e.g. mariculture, outfalls)		✓
Changes in thermal regime (e.g. power stations)		✓

Operations (pressures) which may cause deterioration or disturbance with example activities	red-throated diver - Outer Thames Estuary SPA	Supporting habitats and prey species - Outer Thames Estuary SPA
Changes in turbidity (e.g. run-off, dredging)		✓
Changes in salinity (e.g. water abstraction, outfalls)		✓
Biological disturbance		
Introduction of microbial pathogens		
Introduction of non-native species and translocation		✓
Non-selective extraction / removal of bird species (e.g. accidental turbine strike)	✓	
Non-selective extraction / removal of bird species (e.g. entanglement or bycatch)	✓	
Selective extraction and removal of prey species (e.g. commercial and recreational fishing)		✓

Appendix E Assessment of the relative vulnerability of interest features / Annex I Species and its supporting habitat for the Outer Thames Estuary SPA to different categories of operation (for key see appendix C). This aims to provide a 'high level' view of the operations which occur in the Outer Thames SPA and the likely vulnerability of the site's features to these activities. A more detailed assessment of each activity that is likely to occur in the site is provided in the Outer Thames SPA risk review.

Operations which may cause deterioration or disturbance	**internationally important populations of the Annex I species and their supporting habitat and prey species**		
	red-throated diver (Gavia stellata)		
	Sensitivity	Exposure	Vulnerability
Physical loss of supporting habitat			
Removal (e.g. harvesting,offshore development)	•••	+	Moderate
Smothering (e.g. by artificial structures, disposal of dredge spoil)	••	++	Moderate
Physical damage to habitat			
Siltation (e.g. run-off, channel dredging, outfalls)	••	+	Low
Abrasion (e.g. boating, anchoring,)	••	+	Low
Selective extraction (e.g. aggregate dredging)	••	+	Low
Non-physical disturbance			
Noise (e.g. boat activity)	•••	++	High
Visual (e.g. recreational activity)	•••	++	High
Toxic contamination			
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	••	+	Low
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	•••	+	Moderate
Introduction of radionuclides	**DD**	**DD**	**DD**

Operations which may cause deterioration or disturbance	internationally important populations of the Annex I species and their supporting habitat and prey species		
Non-toxic contamination			
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	+	Low
Changes in organic loading (e.g. mariculture, outfalls)	••	+	Low
Changes in thermal regime (e.g. power stations)	••	+	Low
Changes in turbidity (e.g. run-off, dredging)	••	+	Low
Changes in salinity (e.g. water abstraction, outfalls)	••	+	Low
Biological disturbance			
Introduction of non-native species and translocations	•	+	Low
Selective extraction of prey species (e.g. commercial & recreational fishing)	••	+	Low
Non-selective extraction (through entanglement with static gear)	•••	+	Moderate
Non-selective extraction (through wind-turbine strike)	•••	+	Moderate
Introduction of microbial pathogens	•	+	Low

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STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9009101

1.3 Compilation date 199205

1.4 Update 199902

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	2	8	0	9

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Minsmere–Walberswick**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199205
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 38 02 E	52 18 55 N

2.2 Site area (ha) 2018.92

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population					Site assessment		
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A056	*Anas clypeata*		23 P			B		C	
A056	*Anas clypeata*			98 I		C		C	
A052	*Anas crecca*		73 P			B		C	
A051	*Anas strepera*			93 I		C		C	
A051	*Anas strepera*		24 P			B		C	
A041a	*Anser albifrons albifrons*			67 I		C		B	
A021	*Botaurus stellaris*		7 I			A		B	
A224	*Caprimulgus europaeus*		24 P			C		C	
A081	*Circus aeruginosus*		16 P			B		B	
A082	*Circus cyaneus*			15 I		C		C	
A132	*Recurvirostra avosetta*		47 P			B		B	
A195	*Sterna albifrons*		28 P			C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	14.0
Salt marshes. Salt pastures. Salt steppes	8.0
Coastal sand dunes. Sand beaches. Machair	3.0
Shingle. Sea cliffs. Islets	3.0
Inland water bodies (standing water, running water)	4.0
Bogs. Marshes. Water fringed vegetation. Fens	15.0
Heath. Scrub. Maquis and garrigue. Phygrana	23.0
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	7.0
Other arable land	2.0
Broad-leaved deciduous woodland	16.0
Coniferous woodland	5.0
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Acidic, Mud, Nutrient-poor, Peat, Sand, Shingle

Geomorphology & landscape:

Coastal, Estuary, Floodplain, Intertidal sediments (including sandflat/mudflat), Lagoon, Lowland, Open coast (including bay), Shingle bar

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Botaurus stellaris (Europe - breeding)	35% of the GB breeding population 5 year mean, 1993-1997
Caprimulgus europaeus	0.7% of the GB breeding population Count, as at 1990
Circus aeruginosus	10.2% of the GB breeding population 5 year mean, 1993-1997
Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding)	10.4% of the GB breeding population Count, as at early 1990s
Sterna albifrons (Eastern Atlantic - breeding)	1.2% of the GB breeding population 5 year mean, 1992-1996
Over winter the area regularly supports:	
Circus cyaneus	2% of the GB population 5 year peak mean, 1985/6-1989/90

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Anas clypeata (North-western/Central Europe)	2.3% of the population in Great Britain Count, as at 1990
Anas crecca (North-western Europe)	4.9% of the population in Great Britain Count, as at 1990
Anas strepera (North-western Europe)	3.1% of the population in Great Britain Count, as at 1990
Over winter the area regularly supports:	
Anas clypeata (North-western/Central Europe)	1% of the population in Great Britain 5 year peak mean 1991/92-1995/96
Anas strepera (North-western Europe)	1.1% of the population in Great Britain 5 year peak mean 1991/92-1995/96
Anser albifrons albifrons (North-western Siberia/North-eastern & North-western Europe)	1.1% of the population in Great Britain 5 year peak mean 1991/92-1995/96

4.3 Vulnerability

The site is actively managed to prevent scrub and tree invasion of the heathlands grazing marshes amd reedbeds. Much of the land is managed by conservation organisations and positively by private landowners through ESA and Countryside Stewdardship schemes. The coastline is going to be pushed back by natural processes, this is being addressed in the Shoreline Management Plan. Alternative sites for reed bed creation are being sought to help off set the possible future natural losses.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	27.6

UK04 (SSSI/ASSI)	100.0

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FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type K

1.2 Site code UK0012809

1.3 Compilation date 199506

1.4 Update 200101

1.5 Relationship with other Natura 2000 sites

U	K	9	0	0	9	1	0	1

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Minsmere to Walberswick Heaths and Marshes**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	199506
date confirmed as SCI	200412
date site classified as SPA	
date site designated as SAC	200504

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 37 02 E	52 15 22 N

2.2 Site area (ha) 1265.52

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Coastal lagoons	0.1	D			
Annual vegetation of drift lines	0.4	A	B	A	**A**

Perennial vegetation of stony banks	0.3	C	C	C	**C**
European dry heaths	40	B	C	A	**B**

3.2 Annex II species

	Population				Site assessment			
	Resident	Migratory						
Species name		**Breed**	**Winter**	**Stage**	**Population**	**Conservation**	**Isolation**	**Global**
Triturus cristatus	Present	-	-	-	D			

4. Site description

4.1 General site character

Habitat classes	**% cover**
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	5.0
Shingle. Sea cliffs. Islets	15.0
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	20.0
Heath. Scrub. Maquis and garrigue. Phygrana	40.0
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	20.0
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Acidic, Sand, Shingle

Geomorphology & landscape:

Coastal, Lagoon, Lowland

4.2 Quality and importance

Annual vegetation of drift lines

- for which this is one of only four known outstanding localities in the United Kingdom.
- which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 100 hectares.

Perennial vegetation of stony banks

- for which the area is considered to support a significant presence.

European dry heaths

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

Dry heath: These heaths were formed through, and are dependent upon, active management. Without grazing or cutting of heather, scrub and tree invasion onto the heaths is rapid and can be extensive. Bracken can also dominate large areas if suitable management has not been undertaken over the past decade. The heathland at Minsmere forms part of a RSPB reserve. The site management plan includes actions to ensure that open heathland is maintained and areas of scrub and bracken are cleared from former heath. Part of the cSAC is managed as Westleton Heath Nature Reserve.
Annual vegetation of drift lines: This habitat is maintained through the action of natural coastal processes upon the shoreline. The requirement for management is limited and is restricted to ensuring that significant human disturbance of the vegetated shore zone does not occur. This aspect of management is addressed through the RSPB visitor management plan.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	24.0
UK04 (SSSI/ASSI)	100.0

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FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type A

1.2 Site code UK9020286

1.3 Compilation date 200108

1.4 Update

1.5 Relationship with other Natura 2000 sites

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Sandlings**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	200108
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 26 33 E	52 04 44 N

2.2 Site area (ha) 3391.8

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population				Site assessment			
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A224	*Caprimulgus europaeus*		109 P			B		C	
A246	*Lullula arborea*		154 P			B		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	1.5
Bogs. Marshes. Water fringed vegetation. Fens	0.9
Heath. Scrub. Maquis and garrigue. Phygrana	14.6
Dry grassland. Steppes	11.5
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	0.1
Other arable land	
Broad-leaved deciduous woodland	10.6
Coniferous woodland	57.6
Evergreen woodland	
Mixed woodland	1.4
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	1.8
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Geomorphology & landscape:

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Caprimulgus europaeus	3.2% of the GB breeding population Count as at 1992
Lullula arborea	10.3% of the GB breeding population Count as at 1997

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

4.3 Vulnerability

Sandlings SPA comprises six SSSIs. Sandlings Forest SSSI, the largest of these, is dominated by commercial forestry. Within the forest, large areas of open ground suitable for woodlark and nightjar were created by storm damage in 1987. Maintenance of open areas in the future relies on clear felling as the main silvicultural practice and the maintenance of some areas earmarked for woodlark and nightjar habitat. These objectives are included in the East Anglia Forest District Strategic Plan.

On the heathland SSSIs, lack of traditional management has resulted in the heathland being subjected to sucessional changes with the consequent spread of bracken, shrubs and trees. This is being addressed through habitat management work under the Countryside Stewardship Scheme and Tomorrows Heathland Heritage, and is resulting in the restoration of more typical heathland habitat favourable to both nightjar and woodlark.

Human influences on the site include the frequent presence of travellers' caravans. This is a longstanding problem, and a variety of mechanisms are utilised to keep them from the heathland; the digging of trenches and construction of earth barriers around the borders of sites is proving effective.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK04 (SSSI/ASSI)	100.0

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FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9009112

1.3 Compilation date 199610

1.4 Update 199803

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	4	7	8	0

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Alde–Ore Estuary**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199610
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 33 03 E	52 04 58 N

2.2 Site area (ha) 2416.87

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population					Site assessment		
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A081	*Circus aeruginosus*		>3 P			C		B	
A183	*Larus fuscus*		14070 P			A		C	
A151	*Philomachus pugnax*			3 I		C		C	
A132	*Recurvirostra avosetta*			766 I		A		B	
A132	*Recurvirostra avosetta*		104 P			A		B	
A195	*Sterna albifrons*		48 P			C		C	
A191	*Sterna sandvicensis*		170 P			C		C	
A162	*Tringa totanus*			1919 I		C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	50.0
Salt marshes. Salt pastures. Salt steppes	20.0
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	25.0
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	5.0
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Mud, Nutrient-rich, Sedimentary, Shingle

Geomorphology & landscape:

Coastal, Estuary, Intertidal sediments (including sandflat/mudflat), Lagoon, Lowland, Shingle bar

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Circus aeruginosus	at least 1.9% of the GB breeding population 5 year mean, 1993-1997

Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding)	23.1% of the GB breeding population 5 year mean, 1990-1994
Sterna albifrons (Eastern Atlantic - breeding)	2% of the GB breeding population 5 count mean, 1993-4,1996-8
Sterna sandvicensis (Western Europe/Western Africa)	1.2% of the GB breeding population 5 year mean, 1992-1996
Over winter the area regularly supports:	
Philomachus pugnax (Western Africa - wintering)	0.4% of the GB population 5 year peak mean 1991/92-1995/96
Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding)	60.3% of the GB population 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Larus fuscus (Western Europe/Mediterranean/Western Africa)	11.3% of the breeding population 5 year mean 1994-1998
Over winter the area regularly supports:	
Tringa totanus (Eastern Atlantic - wintering)	1.1% of the population 5 year peak mean 1991/92-1995/96

4.3 Vulnerability

The area is vulnerable to sea-level rise and coastal squeeze. These issues are being addressed through The Environment Agency Local Environment Action Plan, the estuary Management Plan and possibly managed retreat. Human disturbance from recreation is minimal as this is a reasonably robust system. Flood defence policy will need to take into account risks to the site from flooding and of flood control alleviation measures. Shooting is controlled through a management plan. A considerable part of the site is managed sympathetically by Suffolk Wildlife Trust, National Trust, Royal Society for the Protection of Birds and English Nature.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	4.5
UK04 (SSSI/ASSI)	100.0

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STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9009291

1.3 Compilation date 199610

1.4 Update

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	3	1	0	4

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Benacre to Easton Bavents**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199610
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 42 37 E	52 23 11 N

2.2 Site area (ha) 516.83

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population				Site assessment			
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A021	*Botaurus stellaris*		1 I			B		B	
A081	*Circus aeruginosus*		8 I			B		B	
A195	*Sterna albifrons*		21 P			C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	30.0
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	5.0
Shingle. Sea cliffs. Islets	5.0
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	50.0
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	10.0
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Sand, Sedimentary, Shingle

Geomorphology & landscape:

Coastal, Lowland, Shingle bar

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Botaurus stellaris (Europe - breeding)	5% of the GB breeding population 5 year mean, 1992-1996
Circus aeruginosus	5.1% of the GB breeding population 5 year mean, 1993-1997
Sterna albifrons (Eastern Atlantic - breeding)	0.9% of the GB breeding population 5 year mean, 1992-1996

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

4.3 Vulnerability

The natural sea level rise will lead to more frequent saltwater innundation of the site, whilst being beneficial for some habitats will lead to loss of others. Sea level rise is causing erosion of the lagoons through the landward movement of the confining shingle barrier. Natural processes if unchecked are likely over time to lead to the loss of these features and the area of reedbed will be reduced. New lagoons have been created further back from the coast and other management actions to decrease the rate of erosion are being addressed through the Shoreline Management Plan.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	76.0
UK04 (SSSI/ASSI)	100.0

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9020309

1.3 Compilation date 201008

1.4 Update 201102

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	3	6	9	0
U	K	0	0	3	0	3	7	1

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Outer Thames Estuary**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	201008
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 32 41 E	51 54 58 N

2.2 Site area (ha) 379268.14

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
0	Marine	100.0%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population				Site assessment			
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A001	*Gavia stellata*			6466 I		A		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	100.0
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Gravel, Mud, Sand

Geomorphology & landscape:

Range of mobile sediments, Tidal current stream

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Gavia stellata (North-western Europe - wintering)	38% of the population in Great Britain peak mean over the period 1989-2006/07

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

4.3 Vulnerability

The northernmost extent of the SPA contains some areas licenced for aggregate extraction and other prospecting areas. The site contains several constructed or consented offshore windfarms. There are proposals for extensions to several such windfarms. Furthermore, there is the possibility that new windfarms will be consented under Round 3. Certain shipping channels within the site have been and will continue to be subject to maintenance dredging. There may be a requirement for capital dredging in association with newly developed and future port developments. The Thames supports important commercial fisheries (as well as estuarine and marine recreational angling). There is also a well-established cockle harvesting industry. The potential impacts of many of these existing or future activities will be addressed through the relevant licence requirements and under the provision of the Habitats Regulations (including the review of consents process). Ongoing research associated with offshore windfarm development will improve understanding of the environmental factors influencing red-throated diver distribution and the extent of apparently suitable seabed habitat within the site.

Red throated divers are highly sensitive to non-physical disturbance by noise and visual presence during the winter. Locally, significant disturbance and displacement effects are predicted to arise from noise and visual impacts from wind farm construction, maintenance traffic and visually from the turbines themselves. Disturbance and displacement effects may also arise from shipping (including recreational boating) and boat movements associated with marine aggregate and fishing activities. Marine aggregates activities tend to be temporary and localised. Dredging and shipping activities are expected to be confined to existing shipping channels, which are already known to be avoided by divers. In all these cases it is expected that activity will be lowest during the winter months (when the birds are present) due to the limitations imposed by poor weather conditions. Prince's Channel (which runs through the southern area of the outer Thames SPA) carries a significant amount of vessel traffic in and out of ports in the inner Thames Estuary. Fisherman's Gat is also an active commercial shipping channel. In addition, smaller vessels use the shallower inshore channels across the site. The impacts of many of these existing or future activities will be addressed through the relevant licence requirements and under the provision of the Habitats Regulations. (including the review of consents process).

A number of operators discharge effluent into freshwater input sources upstream of the site and directly into coastal waters adjacent to the site. Direct discharges into the site include low levels of radionuclides and heavy metals. Deterioration of invertebrate and small fish populations as a result of large oil and chemical spills can have a significant impact on important food resources . Oil on the surface and in the water column would present a threat to diving and feeding seabirds. There is a considerable amount of shipping traffic within the site, mostly confined within recognise shipping channels. A small level of contamination will exist as a result of normal shipping activities. There is however, always the risk of a catastrophic spillage event from normal shipping traffic and there is in additional issue of ship-to-ship (s-t-s) oil transfers just off Southwold within 12nm.

Discharges to the freshwater environment upstream of the site will be subject to the requirements of relevant licencing. All major ports such as the Port of London will have oil spill contingency plans to deal with catastrophic events. All s-t-s transfers are well managed by the Maritime and Coastguard Agency (MCA).

Fishing activities within the site include: suction dredging for cockles, set and drift-net tramelling, drift gill netting, potting and a limited amount of beam trawling. Removal of fish and larger molluscs can have a significant impact on the structure and functioning of benthic communities. Mechanisms for these activities to impact on red-throated divers may be a direct on indirect reduction in food availability. However, the overall level of exposure of red-throated divers to prey species depletion from biological disturbance is currently considered low. Any future significant changes to the way in which certain fishing activities, such as cockle suction dredging, are conducted (eg total catch, timing etc) will be assessed under the provision of the Habitats Regulations, and will in any case likely be subject to licence arrangements and by-law restrictions overseen by the Marine Management Organisation and/or local Inshore Fishery and Conservation Authority.

Entanglement in static fishing nets is an important cause of death for red-throated divers in the UK waters. Thus, static/passive fishing gear methods such as set gillnets and drift netting represent potentially the most serious direct risk from fishing activity to the birds themselves. Netting is widespread across the sandbanks, however this is seasonally focussed and occurs primarily at times of year outwith the period when the red-throated diver population is at its peak. The scale of the by-catch within the site is unknown. Therefore, consideration of any fishery management measures will need to be preceded by monitoring of the scale of the by-catch problem within the site itself.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK00 (N/A)	100.00

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 05 January 1976

3. Country:

UK (England)

4. Name of the Ramsar site:

Minsmere–Walberswick

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii**) an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

52 18 55 N 01 38 02 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Southwold

Composite site situated on the coast of Suffolk, between Southwold in the north and Sizewell in the south.

Administrative region: Suffolk

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 2018.92

Min. -1
Max. 24
Mean 9

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

This composite, Suffolk coastal site contains a complex mosaic of habitats, notably, areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle and driftline, woodland and areas of lowland heath. The site supports the largest continuous stand of reed in England and Wales and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water. The combination of habitats create an exceptional area of scientific interest supporting nationally scarce plants, British Red Data Book invertebrates and nationally important numbers of breeding and wintering birds.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh ditch plants from brackish to fresh water.

Ramsar criterion 2

This site supports nine nationally scarce plants and at least 26 red data book invertebrates.

Supports a population of the mollusc *Vertigo angustior* (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth estuary river walls.

An important assemblage of rare breeding birds associated with marshland and reedbeds including: *Botaurus stellaris, Anas strepera, Anas crecca, Anas clypeata, Circus aeruginosus, Recurvirostra avosetta, Panurus biarmicus*

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, neutral, shingle, sand, peat, nutrient-poor, mud, alluvium
Geomorphology and landscape	lowland, coastal, valley, floodplain, shingle bar, intertidal sediments (including sandflat/mudflat), open coast (including bay), estuary, lagoon
Nutrient status	mesotrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

Minsmere – Walberswick comprises two large marshes, the tidal Blyth estuary and associated habitats. This composite coastal site contains a complex mosaic of habitats, notably areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle, woodland and areas of lowland heath. It supports the largest continuous stand of common reed *Phragmites australis* in England and Wales, and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Minsmere – Walberswick comprises two large marshes, the tidal Blyth estuary and associated habitats. This composite coastal site contains a complex mosaic of habitats, notably areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle, woodland and areas of lowland heath.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
Other	Other	30
U	Peatlands (including peat bogs swamps, fens)	30
G	Tidal flats	12.9
E	Sand / shingle shores (including dune systems)	12.4
H	Salt marshes	7.2
M	Rivers / streams / creeks: permanent	4
F	Estuarine waters	2.5
J	Coastal brackish / saline lagoons	1

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

This composite Suffolk coastal site contains a complex mosaic of habitats notably, areas of marsh with dykes, extensive reedbeds, mud flats, lagoons, shingle, woodland and areas of lowland heath. The site supports the largest continuous stand of reed *Phragmites australis* in England and Wales and nationally rare transition in grazing marsh ditch plants from brackish to fresh water. The combination of habitats create an exceptional area of scientific interest supporting nationally scarce plants, RDB invertebrates and nationally important numbers of breeding and wintering birds.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

This is one of few sites nationally for red-tipped cudweed *Filago lutescens* (RDB2) which occurs on light, sandy soils.
The nationally rare species *Corynephorus canescens* (RDB3) occurs on coastal dune habitat.

The site supports a range of nationally scarce plant species characteristic of heathland, wetland and coastal habitats, and the transitions between them. *Althaea officinalis, Myriophyllum verticillatum, Ruppia cirrhosa, Sium latifolium, Sonchus palustris, Ceratophyllum submersum, Ranunculus baudotii,* and *Carex divisa* (all nationally scarce) are associated with reedbeds, grazing marsh or ditches. *Hordeum marinum* occurs on sea-walls, *Lathyrus japonicus* on coastal shingle, and *Crassula tillaea* on heathland.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Eurasian marsh harrier , *Circus aeruginosus*, Europe	16 pairs, representing an average of 10.5% of the GB population (5 year mean 1993-1997)
Mediterranean gull , *Larus melanocephalus*, Europe	2 apparently occupied nests, representing an average of 1.8% of the GB population (Seabird 2000 Census)
Black-headed gull , *Larus ridibundus*, N & C Europe	2558 apparently occupied nests, representing an average of 1.9% of the GB population (Seabird 2000 Census)
Little tern , *Sterna albifrons albifrons*, W Europe	20 apparently occupied nests, representing an average of 1% of the GB population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Great bittern , *Botaurus stellaris stellaris*, W Europe, NW Africa	3 individuals, representing an average of 3% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian teal , *Anas crecca*, NW Europe	3083 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , *Philomachus pugnax*, Europe/W Africa	10 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	846 individuals, representing an average of 5.4% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Spotted redshank , *Tringa erythropus*, Europe/W Africa	15 individuals, representing an average of 11% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	9 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Greater white-fronted goose , *Anser albifrons albifrons*, NW Europe	212 individuals, representing an average of 3.6% of the GB population (5 year peak mean for 1996/7-2000/01)

Gadwall , *Anas strepera strepera*, NW Europe	261 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , *Anas clypeata*, NW & C Europe	238 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Hen harrier, *Circus cyaneus*, Europe	15 individuals, representing an average of 2% of the GB population (5 year peak mean 1985/6-1989/90)
Water rail , *Rallus aquaticus*, Europe	5 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , *Recurvirostra avosetta*, Europe/Northwest Africa	329 individuals, representing an average of 9.6% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , *Pluvialis apricaria apricaria*, P. a. altifrons Iceland & Faroes/E Atlantic	4503 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	1386 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Lesser black-backed gull , *Larus fuscus graellsii*,	905 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Ethmia bipunctella, Aleochara inconspicua, Philonthus dimidiatipennis, Deltote bankiana, Cephalops perspicuus, Erioptera bivittata, E. meijerei, Gymnancycla canella, Pisidium pseudosphaerium, Archanara neurica, Heliothis viriplaca, Pelosia muscerda, Photedes brevilinea, Senta flammea, Herminea tarsicrinalis, Haematopota grandis, Tipula marginata, Podalonia affinis, Arctosa fulvolineata, Eucosma catroptana, E.maritima, Melissoblaptes zelleri, Pima boisduvaliella, Acrotophthalmus bicolor, Limonia danica, Telmaturus tumidulus, Vertigo angustior (a Habitats Directive Annex II species (S1014)).

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23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Aquatic vegetation (e.g. reeds, willows, seaweed)
Environmental education/ interpretation
Livestock grazing
Non-consumptive recreation
Scientific research
Tourism

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	
National/Crown Estate	+	
Private	+	+
Other	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Cutting of vegetation (small-scale/subsistence)	+	
Permanent arable agriculture		+
Grazing (unspecified)	+	
Flood control	+	
Transport route	+	+
Non-urbanised settlements	+	+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2	Coastal squeeze within the Blyth Estuary	+		+
Recreational/tourism disturbance (unspecified)	2	Trampling damage to vegetated shingle and driftline communities, and disturbance of little tern nesting habitat	+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Erosion - English Nature provides advice to the Environment Agency and coastal local authorities in relation to flood and coastal protection management. This will inform the development of the Suffolk Estuaries strategies and the second generation shoreline management plan.

Recreational/tourism disturbance (unspecified) - English Nature to work with owners/occupiers and regulatory authorities to develop a strategy to manage visitor pressure on Suffolk vegetated shingle. These measures are likely to include temporary fencing and provision of boardwalks as well as measures to increase visitor awareness about the sensitivity of the shingle habitat, for example by interpretation, wardening.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	

Area of Outstanding National Beauty (AONB)	+	+
Environmentally Sensitive Area (ESA)	+	+
Special Area of Conservation (SAC)	+	

b) Describe any other current management practices:
The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.
Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Flora.
NVC and vegetation monitoring, bird and invertebrate surveys/monitoring carried out on EN's NNRs, NT, SWT, RSPB reserves.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Facilities at National Trust and Royal Society for the Protection of Birds reserves.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.
A popular area for tourists as it is an AONB and contains Minsmere bird reserve and Dunwich heath, both with toilets/shop/cafe. There are more visitors in the summer, however it well used throughout the year by walkers and bird watchers.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

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Wiggington, M (1999) *British Red Data Books. 1. Vascular plants*. 3rd edn. Joint Nature Conservation Committee, Peterborough

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 04 October 1996

3. Country:

UK (England)

4. Name of the Ramsar site:

Alde–Ore Estuary

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii**) an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

52 04 58 N 01 33 03 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Woodbridge

Alde-Ore Estuary is located on the east coast of Suffolk, east of Woodbridge, stretching between Aldeburgh to the north and Bawdsey to the south.

Administrative region: Suffolk

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 2546.99

Min. -1
Max. 5
Mean 1

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The site comprises the estuary complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There are a variety of habitats including, intertidal mudflats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and grazing marsh. The Orfordness/Shingle Street landform is unique within Britain in combining a shingle spit with a cuspate foreland. The site supports nationally-scarce plants, British Red Data Book invertebrates, and notable assemblages of breeding and wintering wetland birds.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

2, 3, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 2

The site supports a number of nationally-scarce plant species and British Red Data Book invertebrates.

Ramsar criterion 3

The site supports a notable assemblage of breeding and wintering wetland birds.

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species regularly supported during the breeding season:

Lesser black-backed gull , *Larus fuscus graellsii*, W Europe/Mediterranean/W Africa	5790 apparently occupied nests, representing an average of 3.9% of the breeding population (Seabird 2000 Census)

Species with peak counts in winter:

Pied avocet , *Recurvirostra avosetta*, Europe/Northwest Africa	1187 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	2368 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

See Sections 21/22 for details of noteworthy species

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	shingle, mud, nutrient-rich, sedimentary
Geomorphology and landscape	lowland, coastal, shingle bar, intertidal sediments (including sandflat/mudflat), estuary, lagoon
Nutrient status	mesotrophic
pH	no information
Salinity	saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent

Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

This estuary is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River originally entered the sea at Aldeburgh, but now turns south along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is still moving south as the Orfordness shingle spit continues to grow through longshore drift from the north.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Alde-Ore Estuary comprises the estuarine complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness.

This estuary is the only bar-built estuary in the UK with a shingle bar. This bar has been extending rapidly along the coast since 1530, pushing the mouth of the estuary progressively south-westwards. The eastwards-running Alde River originally entered the sea at Aldeburgh, but now turns south along the inner side of the Orfordness shingle spit. It is relatively wide and shallow, with extensive intertidal mudflats on both sides of the channel in its upper reaches and saltmarsh accreting along its fringes. The Alde subsequently becomes the south-west flowing River Ore, which is narrower and deeper with stronger currents. The smaller Butley River, which has extensive areas of saltmarsh and a reedbed community bordering intertidal mudflats, flows into the Ore shortly after the latter divides around Havergate Island. The mouth of the River Ore is still moving south as the Orfordness shingle spit continues to grow through longshore drift from the north.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
E	Sand / shingle shores (including dune systems)	33.3
H	Salt marshes	23.6
G	Tidal flats	17.7
M	Rivers / streams / creeks: permanent	9.8
Sp	Saline / brackish marshes: permanent	5.9

Tp	Freshwater marshes / pools: permanent	3.9
U	Peatlands (including peat bogs swamps, fens)	3.8
J	Coastal brackish / saline lagoons	2

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The main habitat types of the Alde-Ore Estuary are: intertidal mudflats, saltmarsh, reedswamp, coastal freshwater, brackish lagoons, semi-improved grazing marsh, brackish ditches and vegetated shingle, the second-largest and best-preserved example in Britain.

A unique feature for East Anglian beaches is the abundance on the ground of normally epiphytic lichens.

There is a zonation of shingle vegetation from shifting to more stable areas of grassland and lichen communities.

Areas of saltmarsh succeed to higher saltmarsh and neutral grassland with ditches.

There is a series of brackish lagoons and ditches; and borrow pits.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

A range of nationally scarce plant species characteristic of freshwater, estuarine, and shingle habitats, and their transitions are present. These include: *Althaea officinalis, Frankenia laevis, Lathyrus japonicus, Lepidium latifolium, Medicago minima, Parapholis incurva, Puccinellia fasciculata, Ruppia cirrhosa, Sarcocornia perennis, Sonchus palustris, Trifolium suffocatum, Vicia lutea* and *Zostera angustifolia*.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Eurasian marsh harrier , *Circus aeruginosus*, Europe	3 pairs, representing an average of 1.9% of the GB population (5 year mean 1993-1997)
Mediterranean gull , *Larus melanocephalus*, Europe	6 apparently occupied nests, representing an average of 5.5% of the GB population (Seabird 2000 Census)
Sandwich tern , *Sterna (Thalasseus) sandvicensis sandvicensis*, W Europe	169 pairs, representing an average of 1.6% of the GB population (5 year mean 1991-1995)

Little tern , *Sterna albifrons albifrons*, W Europe	88 apparently occupied nests, representing an average of 4.5% of the GB population (Seabird 2000 Census)
Species with peak counts in spring/autumn:	
Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	283 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , *Tringa erythropus*, Europe/W Africa	44 individuals, representing an average of 32.3% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	29 individuals, representing an average of 4.8% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Greater white-fronted goose , *Anser albifrons albifrons*, NW Europe	186 individuals, representing an average of 3.2% of the GB population (5 year peak mean for 1996/7-2000/01)
Common shelduck , *Tadorna tadorna*, NW Europe	1398 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian wigeon , *Anas penelope*, NW Europe	6851 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian teal , *Anas crecca*, NW Europe	2447 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9-2002/3)
Northern pintail , *Anas acuta*, NW Europe	556 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , *Anas clypeata*, NW & C Europe	224 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

The highly specialised invertebrate fauna of the saline lagoons includes *Nematostella vectensis*, and *Gammarus insensibilis*, both species protected under Schedules 5 and 8 of the Wildlife and Countryside Act 1981 (as amended).

Other notable invertebrates on the site include: *Malacosoma castrensis, Campsicnemus magius, Cheilosia velutina, Empis prodomus, Dixella attica, Hylaeus euryscapus, Pseudamnicola confusa, Euophrys browningi, Baryphyma duffeyi, Haplodrassus minor, Trichoncus affinis*.

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Aquatic vegetation (e.g. reeds, willows, seaweed)
Archaeological/historical site
Environmental education/ interpretation
Fisheries production
Livestock grazing
Non-consumptive recreation

Scientific research
Sport fishing
Sport hunting
Tourism
Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
National/Crown Estate	+	
Private	+	+
Public/communal	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Collection of non-timber natural products: commercial	+	
Fishing: recreational/sport	+	
Marine/saltwater aquaculture	+	
Gathering of shellfish	+	
Permanent arable agriculture		+
Grazing (unspecified)	+	+
Hunting: recreational/sport	+	
Harbour/port		+
Flood control		+
Irrigation (incl. agricultural water supply)		+
Non-urbanised settlements		+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2		+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Erosion - English Nature provides advice to the Environment Agency and coastal local authorities in relation to flood and coastal protection management. This will inform the development of the Suffolk Estuaries strategies and the second generation shoreline management plan.
A Management Scheme is required, taking into account the effects of erosion. A Coastal Habitat Management Plan will be produced for this site.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	+
Site management statement/plan implemented	+	
Other	+	
Area of Outstanding National Beauty (AONB)	+	
Environmentally Sensitive Area (ESA)	+	
Special Area of Conservation (SAC)	+	
Management plan in preparation	+	

b) Describe any other current management practices:
The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.
Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Environment.
Monitoring estuarine processes.
Saline lagoon survey.
Study on the effects of guanofication on shingle flora.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities.
The site is used informally for walking, boating and angling.

Facilities provided.

River moorings.

Seasonality.

Walking and boating activities are predominantly in spring and summer. Seasonal (winter) wildfowling occurs on the estuary.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

Anon. (1995) *Biodiversity: The UK Steering Group Report. Volume 2: Action plans*. HMSO, London

Anon. (2002) *Suffolk Coast and Estuaries Coastal Habitat Management Plan: Executive summary*. English Nature, Peterborough (Living with the Sea LIFE Project) www.english-nature.org.uk/livingwiththesea/project_details/good_practice_guide/HabitatCRR/ENRestore/CHaMPs/SuffolkCoast/SuffolkCHaMP.pdf

Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP, Davidson, NC & Buck, AL (eds.) (1998) *Coasts and seas of the United Kingdom. Region 7 South-east England: Lowestoft to Dungeness*. Joint Nature Conservation Committee, Peterborough. (Coastal Directories Series.)

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

COUNTY: SUFFOLK SITE NAME: ALDEBURGH BRICK PIT

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT

National Grid Reference: TM 452573 Area: 0.84 (ha.) 2.08 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE

Date Notified (Under 1949 Act): 1959 Date of Last Revision: –

Date Notified (Under 1981 Act): 10.9.90 Date of Last Revision: –

Other Information:

Description and Reasons for Notification:

The brick pit is a Quaternary geological locality. It is an important stratigraphic site with a sequence from the top, of Kesgrave Sand and Gravel, Chillesford Clay and Chillesford Crag overlying Coralline Crag. The Chillesford Crag is now recognised to be of Bramertonian age and this is one of the few sites to reveal deposits of this age. Each element of the stratigraphy is of importance. The site has been fundamental in two recent studies on the early Pleistocene Crag; a current re-evaluation of the Chillesford Clay has included a study of this pit, as will further studies of the Kesgrave Sand and Gravel. This site is particularly significant, when considered in conjunction with other Red Crag sites, for showing transgression of the Red Crag sea. At Aldeburgh youngest Red Crag deposits lie directly on Coralline Crag, overlapping the older horizons of the Red Crag.

COUNTY: SUFFOLK SITE NAME: ALDEBURGH HALL PIT

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL

National Grid Reference: TM 453566 Area: 0.8 (ha.) 1.9 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE

Date Notified (Under 1949 Act.): – Date of Last Revision: N/A

Date Notified (Under 1981 Act): 1986 Date of Last Revision: N/A

Other Information:
A new site.

Description and Reasons for Notification:
This shallow pit is of great geological interest. It shows a section in a very fossiliferous facies of the Pliocene Coralline Crag. Aragonitic fossils are absent due to diagenetic (post depositional) solution, but may be preserved as internal and external moulds. The fauna of calcitic bryozoans is extremely rich and diverse. Most conspicuous of these bryozoans are the large spherical colonies of *Meandropora* and *Blumenbachium*. Articulated colonies of *Cellaria* are present, showing unusually good preservation for such coarse bioclastic sediments. Calcitic bivalves are generally encrusted with well preserved bryozoans and serpulids. The small face here shows low angle stratification (current bedding) which may represent the internal structure of an offshore sandbank. This locality yields probably the best Neogene fauna in Britain and is very important in comparison with present day shelf bedforms and faunas.

Citation

County: **Suffolk** **Site name:** **Alde-Ore Estuary**
District: Suffolk Coastal

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended.

Local Planning Authority: Suffolk County Council
Suffolk Coastal District Council

National grid reference: from TM 394 757
to TM 358 402
Area: 2,554.3 (ha) 6,311.7 (acres)

Ordnance Survey sheet: **1 : 50,000**: 156, 159 **1:10,000:** TM 45 SE, TM 44 NW, TM 34 SE, TM 45 SW, TM 34 NE, TM 35 SW, TM 44 NE, TM 45 NE, TM /45 NW

Date notified (Under 1949 Act): 1952 **Date of last revision:** 1980

Date notified (under 1981 Act): 1985 **Date of last revision:** 1992

Other information

The site has been extended at the 1992 revision. It includes the Orfordness-Havergate NNR (part of which is designated as a Special Protection Area), and previously named Orfordness-Havergate SSSI and part of the previously named Snape Warren and Blackheath Wood SSSI. Orfordness and Gedgrave Cliff are listed as being of national importance in the Geological Conservation Review.

Description and reasons for notification

This site stretches along the coast from Bawdsey to Aldeburgh and inland to Snape. It includes Orfordness, Shingle Street, Havergate Island, and the Butley, Ore and Alde Rivers.

The scientific interests of the site are outstanding and diverse. The shingle structures of Orfordness and Shingle Street are of great physiographic importance whilst the cliff at Gedgrave is of geological interest. The site also contains a number of coastal formations and estuarine features including mud-flats, saltmarsh, vegetated shingle and coastal lagoons which are of special botanical and ornithological value.

Geomorphology

Orfordness, together with Shingle Street, is one of three major shingle landforms in the British Isles and is the only one which combines a shingle spit with a cuspate foreland. This large feature comprises a complex sequence of shingle ridges deposited over a long period of time which record stages in the evolution of the landform. The distal end of the spit is still

subject to rapid changes and is dynamically related to events at Shingle Street on the mainland shore. This well documented site is of the highest educational and research value.

Geology

The cliff at Gedgrave is a small but renowned exposure of Coralline Crag about 3 m in height. Here the sandwave facies, which is characterised by large-scale cross stratification, overlies highly fossiliferous silty crag with marked unconformity. Clasts of the lower facies can be found in the sandwave facies and are evidence of contemporaneous erosion. A rich shell fauna is present in the lower facies which includes many species of molluscs and bryozoan. The site is also notable for the occasional occurrence of articulated specimens of the brachiopod *Terebratula maxima*, the world's largest species of terebratulid. The site is of great historical as well as palaeontological interest and is one of the only Coralline Crag localities to show the lower erosional contact of the sandwave facies.

Botany

The botanical interest of this site is enriched by the variety of habitats present, including mudflats, saltmarsh, brackish lagoons, shingle beach, reedbeds, grassland, freshwater and brackish ditches.

Mudflats of mixed clay, silt and shingle border the Ore, Butley and Alde rivers and Havergate Island within a tidal range of up to 2 metres. In places this supports the rare inter-tidal flowering plant *Zostera angustifolia*. Narrow fringes of saltmarsh occur along the length of the rivers with wider expanses at Shingle Street, Havergate Island, Stony Ditch, the upper reaches of the Butley river and in places by the Alde river. These are mostly dominated by sea purslane *Halimione portulacoides* and sea lavender *Limonium vulgare*, but a wide range of other saltmarsh species also occur, including sea-heath *Frankenia laevis*, glasswort *Salicornia pusilla*, small cord-grass *Spartina maritima* and Borrer's saltmarsh-grass *Puccinellia fasciculata*. It is representative of the *Halimione portulacoides* community as described in the National Vegetation Classification. Saltmarsh elements also occur around the lagoons and borrowpits on Shingle Street, Havergate Island and the Kings and Lantern Marshes on Orfordness. These also contain the rare tasselpondweeds *Ruppia spiralis* and *R. maritima.*

The site contains the second largest and best preserved area of vegetated shingle in Britain. This is a nationally rare and delicate habitat which supports a highly specialised flora. Species typical of exposed, shifting shingle such as sea pea *Lathyrus japonicus* and sea kale *Crambe maritima* are abundant whilst extensive areas of sea campion *Silene maritima* and stonecrops *Sedum acre* and *S. anglicum* occur on more stable ground. Orfordness contains one of the best examples of zonation in the shingle vegetation. Above the high water mark *Rumex crispus* and *Glaucium flavum* give a highly distinctive character to the mainly bare shingle, with *Lathyrus japonicus* becoming much more abundant within the matrix further inland. This vegetation gives way in turn to grassland dominated by *Arrhenatherum elatius* and *Silene maritima*. A wide range of rare or local species also occur including yellow vetch *Vicia lutea* and the dwarf clovers *Trifolium suffocatum*, *T. glomeratum, T. striatum, T. scabrum* and bur medick *Medicago minima*. Lichen communities are also well developed here with extensive areas of *Cladonia* heath. A unique feature for East Anglia beach formations is the abundance on the ground of normally epiphytic lichens *Parmelia caperata* and *Evernia prunastre*.

Higher saltmarsh blending to neutral grassland, dominated by sea couch grass, *Elymus pungens*, occurs on former grazing marsh on Havergate Island and Orfordness and on the extensive system of clay embankments throughout the site. There are small areas of reedbed at the head of the Butley River and at Iken.

Ornithology

The site is of national importance for its birdlife. Havergate Island holds the largest breeding colony of avocets in Britain, and they also feed in large numbers of Hazelwood Marshes and the Alde mudflats. Other breeding birds on the Island and elsewhere on the site include gadwall, shoveler, oystercatcher, ringed plover, common tern, Arctic tern, sandwich tern and little tern, common gull, short-eared owl, wheatear and marsh harrier. There are also very large breeding colonies of black-headed gull, lesser-black-backed gull and herring gull on Orfordness.

In winter and during migration the site is visited by nationally important numbers of wildfowl and shore-birds, including Bewick's swan, shelduck, teal, wigeon, redshank and avocet.

Invertebrates

The lagoons at Shingle street are notable for a number of brackish water species particularly the rare anthozoan *Nematostella vectensis* and the site is also noted for a number of rare spiders. Several nationally rare and scarce insects are found within ditches running through Hazelwood Marshes.

COUNTY: SUFFOLK SITE NAME: CRAG PIT, ALDEBURGH

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL

National Grid Reference: TM 458580 Area: 0.8 (ha.) 1.9 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE

Date Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1987 Date of Last Revision: –

Other Information:
A new site.

Description and Reasons for Notification:
This site is of geological interest because it represents the most northerly existing exposure of Pliocene Coralline Crag. The deposit, which is up to 2.5 metres high, is of horizontally bedded Crag with prominent solution pipes in the upper surface.

No aragonite fauna is present (due to post-depositional solution) but the calcitic fauna is both very abundant and exceptionally well preserved. A rich and diverse bryozoan fauna is present and is particularly notable for the abundance of finely preserved encrusting species found growing on the *Chlamys* valves which are common at this locality. The fauna includes other encrusting species such as serpulids and a number of boring forms. Evidence of such extensive bioerosion and encrustation is restricted to the most northerly Coralline Crag exposures. The large bryozoans *Blumenbachium globusum* and *Meandropora* are common at this locality. The site provides one of the most abundant and diverse faunas of the Coralline Crag and is of great palaeontological and sedimentological interest.

COUNTY: SUFFOLK SITE NAME: GROMFORD MEADOW, SNAPE

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL

National Grid Reference: TM 386588 Area: 1.57 (ha.) 3.73 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 35 NE

Date Notified (Under 1949 Act): 1972 Date of Last Revision: –

Date Notified (Under 1981 Act): 1984 Date of Last Revision: –

Other Information:
Reserve managed by Suffolk Trust for Nature Conservation.

Reasons for Notification:
Gromford Meadow is a good example of an unimproved base-rich marsh on an alluvial soil with a high organic content. It borders the River Alde and is fed by springs. It is species-rich and contains a variety of characteristic fen meadow and marshland plants.

The sward is species-rich with Meadowsweet dominant. Other commonly occurring plants include Meadow Foxtail, Ragged Robin, Yellow Rattle, Marsh Thistle and several species of Rush. Lesser Spearwort, Valerians *Valeriana officinalis* and *V dioica*, Devil's Bit Scabious, Bog Bean, Adder's Tongue fern and Marsh Orchids *Dactylorhiza praetermissa* and *D incarnata* also occur. There is also a small colony of Grass of Parnassus on the south-easterly edge of its British distribution.

COUNTY: SUFFOLK SITE NAME: LEISTON-ALDEBURGH

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authorities: SUFFOLK COASTAL DISTRICT COUNCIL, Suffolk County Council

National Grid Reference: TM 461595 Area: 534.34 (ha.) 1,319.82 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE, TM 46 SE

Date Notified (Under 1949 Act): 1955 Date of Last Revision: –

Date Notified (Under 1981 Act): 1986 Date of Last Revision: 1999

Other Information:
Part RSPB and Suffolk Wildlife Trust reserves.
The site was named 'North Warren and Thorpeness Mere', before the 1999 boundary revision.

Description and Reasons for Notification:
Leiston-Aldeburgh contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in close juxtaposition and the associated transition communities between habitats is unusual in the Suffolk Coast and Heaths. The variety of habitats support a diverse and abundant community of breeding and overwintering birds, a high number of dragonfly species and many scarce plants.

The heathland of North Warren, Aldringham Common, The Walks and Thorpeness Common is a fragment of the once extensive Sandlings heaths of coastal Suffolk and is of varying composition. There are patches of sand sedge *Carex arenaria* and heather *Calluna vulgaris* dispersed within acid grassland. Bracken *Pteridium aquilinum* and scrub, notably gorse *Ulex europaeus* and *U. gallii* also form part of the heathland. The short sward acidic grassland is dominated by sheep's-fescue *Festuca ovina* and common bent *Agrostis capillaris* with some bare patches, bryophytes and lichens. There is a varied associated flora including lady's bedstraw *Galium verum*, sheep's sorrel *Rumex acetosella* and the nationally scare mossy stonecrop *Crassula tillea* and clustered clover *Trifolium glomeratum*.

On the vegetated shingle there is a gradual transition between the strandline community and the shingle heath resulting from increasing stability and distance from tidal influence. On the open shingle, sea-kale *Crambe maritima* and yellow horned-poppy *Glaucium flavum* are frequent with the irregularly occurring sea spurge *Euphorbia paralias.* The stable shingle areas support many species including early hair-grass *Aira praecox*, the nationally scarce sand catchfly *Silene conica*, dune fescue

Vulpia fasciculata, bur medick *Medicago minima*, suffocated clover *Trifolium suffocatum* and sea pea *Lathyrus japonicus*.

Thorpeness Mere is a shallow, eutrophic water body on a peat substrate. The adjacent areas of swamp and carr woodland are hydrologically dependant on the mere. To the south of the mere, grey willow *Salix cinerea* woodland surrounds a fragmentary mosaic of fen communities, mostly reed dominant *Phragmites australis* with nettle *Urtica dioica*, hemp-agrimony *Eupatorium cannabinum* and wild parsnip *Pastinaca sativa*. In the fen meadow areas there is a richer suite of species including a large colony of adder's tongue *Ophioglossum vulgatum*.

Church Farm Marshes south of the mere consists of grassland that is mostly a mix of creeping bent *Agrostis stolonifera*, Yorkshire-fog *Holcus lanatus* and perennial rye-grass *Lolium perenne* with frequent crested dog's-tail *Cynosurus cristatus*. It is dissected by ditches dominated by spiked water-milfoil *Myriophyllum spicatum* and fennel pondweed *Potamogeton pectinatus* with water-crowfoot *Ranunculus baudotii* in the shallow margins.

The Fens area is dominated by common reed *Phragmites australis* with occasional lesser bulrush *Typha angustifolia*, yellow iris *Iris pseudacorus*, great willowherb *Epilobium hirsutum*, purple-loosestrife *Lythrum salicaria* and nationally scarce marsh sow-thistle *Sonchus palustris*. Water mint *Mentha aquatica* is present in the understorey with cleavers *Galium aparine* and bittersweet *Solanum dulcamara* frequent in the drier areas. Surrounding, and in many places merging into the fen, is grey willow *Salix cinerea* woodland and alder *Alnus glutinosa* woodland with a field layer containing a mix of remnant swamp species.

Many species of bird regularly breed using the great mix of habitats available. These include nightjar, woodlark and skylark on the dry grassland and heath. The scrub and woodland supports tree pipit, turtle dove, bullfinch and nightingale. The marshes, the open water and their margins, in particular, support a diverse range of breeding birds, including water rail, marsh harrier, gadwall and grasshopper warbler. The site is also attractive to wintering waterfowl including Bewick's swan and bittern and regularly supports important populations of white-fronted goose, gadwall and teal.

The variety of water bodies and terrestrial habitats provides suitable breeding and hunting areas for many species of dragonfly and damselfly, including the nationally scarce hairy dragonfly *Brachytron pratense.*

COUNTY: SUFFOLK SITE NAME: MINSMERE-WALBERSWICK HEATHS AND MARSHES

DISTRICT: SUFFOLK COASTAL/WAVENEY

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981, as amended

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL, Waveney District Council, Suffolk County Council

National Grid Reference: TM 475645 Area: 2325.89 (ha.) 5747.27 (ac.)
TM 467772

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 46 NE-NW-SW
TM 47 NE-NW-SE-SW

Date Notified (Under 1949 Act): See below Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1989 Date of Last Revision: 1993

Other Information:
This site amalgamates Minsmere Level SSSI (notified in 1954), Walberswick SSSI (notified in 1954) and Brick Kiln Walks SSSI (notified in 1972).

Much of this site has been designated a Special Protection Area under EC Directive 79/409 on the Conservation of Wild Birds, and as a Wetland of International Importance under the Ramsar Convention.

Much of the site is included within 'A nature conservation review' by Ratcliffe (1977). It is within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.

Parts of the site are owned and/or managed as nature reserves and are listed below

Walberswick National Nature Reserve (English Nature)
Westleton Heath National Nature Reserve (English Nature)
Minsmere Reserve (Royal Society for the Protection of Birds)
Dunwich Heath (National Trust)
Norman Gwatkin Reserve (Suffolk Wildlife Trust)

Description and Reasons for Notification:
This composite site is situated on the coast of Suffolk between Southwold in the north and Sizewell in the south. It contains a complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh, which combine to create an area of exceptional scientific interest.

The tidal mudflats of the River Blyth estuary form sheltered feeding grounds for wildfowl and shorebirds, notably wigeon, shelduck, redshank and dunlin. Saltmarsh, dominated by sea purslane *Halimione portulacoides*, but also composed of sea

lavender *Limonium vulgare*, sea aster *Aster tripolium* and common cord-grass *Spartina anglica* fringes the southern shore of the estuary. Other saltmarsh species include glasswort *Salicornia* spp., sea rush *Juncus maritimus*, common saltmarsh grass *Puccinellia maritima* and sea couch-grass *Elymus pycnanthus*.

Shingle beach forms the coastline at Walberswick and Minsmere. This is subject to sea erosion and human disturbance but, nevertheless, it supports a variety of scarce shingle plants including sea pea *Lathyrus japonicus*, sea campion *Silene maritima* and small populations of sea kale *Crambe maritima*, grey hair-grass *Corynephorus canescens* and yellow horned-poppy *Glaucium flavum*. A narrow strip of yellow dune extends southwards at Minsmere behind which is a strip of dune grassland. A series of shallow, brackish lagoons and saltmarsh occurs behind the shingle beach between Walberswick and Dunwich.

Extensive reedbeds, consisting largely of pure stands of reed *Phragmites australis*, occur at Minsmere and Walberswick. These developed on former grazing marshes which were flooded as a war-time defence measure in 1940. Both marshes contain shallow pools of open water and are intersected by deep water channels. The reedbeds are an important habitat for birds and insects. There are large breeding populations of reed warbler and bearded tit. Other notable breeding species include marsh harrier, bittern, cetti's warbler, garganey and water rail. The marshes have a rich insect fauna; particularly moths, which includes a number of rare species: notably *Archanara neurica*, *Photedes brevilinea* and *Senta flammea*.

At Minsmere, a 20 hectare area of shallow lagoons and islands has been created for wading birds and wildfowl. This area is renowned for its breeding colony of avocets; shoveler, gadwall, teal and shelduck also breed.

Large blocks of grazing marsh are found near Eastbridge and Southwold. These marshes support a high number of species of breeding waterfowl such as snipe, redshank, gadwall, shoveler and black-tailed godwit. Dykes within the marshes contain very diverse aquatic plant communities, with brackish and freshwater types represented. Many nationally rare and scarce invertebrates such as the soldier fly *Odontomyia ornata* are found east of Eastbridge, as are a number of nationally scarce plants including sea barley *Hordeum marinum* and whorled water-milfoil *Myriophyllum verticillatum*. The marshes west of Eastbridge support a mosaic of different unimproved wetland communities including fen-meadow characterised by blunt-flowered rush *Juncus subnodulosus* and marsh thistle *Cirsium palustre*, reed beds, swamps dominated by lesser pond sedge *Carex acutiformis*, marshes dominated by meadowsweet *Filipendula ulmaria* with some angelica *Angelica sylvestris*, and alder *Alnus glutinosa* woodland.

High land at Minsmere, Westleton and Walberswick forms part of the East Suffolk Sandlings and is composed of infertile sands and gravels. This supports large areas of lowland heath, bracken, dry acidic grassland, woods and scrub.

Lowland heath, dominated by ling *Calluna vulgaris* but also containing bell heath *Erica cinerea* and cross-leaved heath *E. tetralix*, occupies a large continuous tract of about 400 ha at Minsmere, Dunwich and Westleton Heath with smaller areas at

Walberswick. This heathland provides a valuable habitat for two nationally decreasing birds, the. nightjar and woodlark.

Patches of unimproved acid grassland in which red fescue *Festuca rubra* and common bent *Agrostis capillaris* predominate, occur through the site but areas dominated by wavy hair-grass *Deschampsia flexuosa*, purple moor-grass *Molinia caerulea* and sand sedge *Carex arenaria* also occur. A variety of other acid grassland plants is also present, of which heath bedstraw *Galium saxatile* and sheep's sorrel *Rumex acetosella* are common. Scarce species include bird's-foot clover *Trifolium ornithopodioides* and mossy stonecrop *Crassula tillaea* together with a small colony of red-tipped cudweed *Filago lutescens*. There are also substantial areas dominated by bracken *Pteridium aquilinum* or gorse *Ulex europaeus* and *U. gallii*.

Mature plantation woodland, chiefly of oak *Quercus robur* or Scots pine *Pinus sylvestris* but also including sycamore *Acer pseudoplatanus* and sweet chestnut *Castanea sativa*, occur at Minsmere and Walberswick. Naturally regenerated woods of birch *Betula pendula* and Scots pine have arisen on former heathland and alder *Alnus glutinosa*, sallow *Salix* spp. and birch woodlands are also present on wet ground. This woodland and scrub provides important additional habitat diversity for birds and invertebrates.

COUNTY: SUFFOLK SITE NAME: POTTON HALL FIELDS, WESTLETON

DISTRICT: SUFFOLK COASTAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: SUFFOLK COUNTY COUNCIL, Suffolk Coastal District Council

National Grid Reference: TM 457706 Area: 16.91 (ha.) 41.78 (ac.)

Ordnance Survey Sheet 1:50 000: 156 1:10000: TM 47 SE

Data Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1992 Date of Last Revision: –

Other Information:
A new site.

Description and Reasons for Notification:
Potton Hall Fields are of special interest for their populations of the nationally rare Red-tipped Cudweed *Filago lutescens*, several thousand of which have been recorded there. The plant occurs in only two other counties in Britain and, being listed on Schedule 8 of the Wildlife and Countryside Act 1981, is protected under the provisions of Section 13 of the Act.

The site comprises two gently sloping fields with a narrow watercourse running between them. The soils, being derived from glaciofluvial drift, are well drained and sandy.

The land has been utilised for arable cropping until recently and is still predominantly bare ground. The Red-tipped Cudweed occurs in large patches throughout the site along with various ruderals including Scarlet Pimpernel *Anagallis arvensis*, Common Ragwort *Sencio jacobea* and Hare's-foot Clover *Trifolium arvense*.

COUNTY: SUFFOLK SITE NAME: RED HOUSE FARM PIT

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL

National Grid Reference: TM 435547 Area: 0.55 (ha.) 1.36 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 SE

Date Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1985 Date of Last Revision: –

Other Information:
A new site.

Reasons for Notification:
This pit is of geological interest for its exposure of Pliocene Coralline Crag. A section of 3.5 metres in the sandwave facies of the Crag is exposed and it shows well-defined large-scale cross-stratification (current-bedding) in the sediments (limestones). These rocks have been affected by the selective dissolution of the mineral aragonite. The sediments are rich in the skeletal remains of bryozoans, (colonial fossils). This is a characteristic only of the northern most localities in the sandwave facies where the rich fauna has been derived from the north-west. This locality thus provides important information on the processes of transportation and on facies relationships in the Coralline Crag.

COUNTY: SUFFOLK SITE NAME: SIZEWELL MARSHES

DISTRICT: SUFFOLK COASTAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: SUFFOLK COUNTY COUNCIL, Suffolk Coastal District Council

National Grid Reference: TM 466638 Area: 104.33 (ha.) 257.80 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 46 SE

Data Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1987 Date of Last Revision: 1992

Other Information:
The site has been extended at the 1992 revision.

Description and Reasons for Notification:
Sizewell Marshes are important for their large area of lowland, unimproved wet meadows which support outstanding assemblages of invertebrates and breeding birds. Several nationally scarce plants are also present.

The site occupies a low-laying basin of deep fen peat. The water table is permanently high, with the area being prone to flooding, and there is an extensive network of ditches across the site.

In the areas of unimproved wet meadow the principal grass species are Sweet Vernal-grass *Anthoxanthum odoratum*, Crested Dog's-tail *Cynosurus cristatus*, Rough-stalked Meadow-grass *Poa trivialis* and Yorkshire-fog *Holcus lanatus*. There are many other typical species including Marsh Pennywort *Hydrocotyle vulgaris*, Ragged Robin *Lychnis flos-cuculi*, Large Bird's-foot-trefoil *Lotus uliginosus*, Marsh-orchids *Dactylorhiza* spp., Bogbean *Menyanthes trifoliata*, Bog Pimpernel *Anagallis tenella*, Yellow Iris *Iris pseudacorus*, sedges *Carex spp*. and rushes *Juncus spp*. The nationally scarce Marsh Dock *Rumex palustris* and Greater Water-parsnip *Sium latifolium* are also present. It is considered that these communities are representative of the *Juncus subnodulosus – Cirsium palustre* fen-meadow and the *J. effusus/acutiflorus – Galium palustre* rush-pasture, as described in the National Vegetation Classification. In addition, several areas of reedbed dominated by Common Reed *Phragmites australis* and alder carr occur.

The extensive ditch system supports a diverse aquatic flora which includes the nationally scarce Soft Hornwort *Ceratophyllum submersum*, Fen Pondweed *Potamogeton coloratus* and Whorled Water-milfoil *Myriophyllum verticillatum*. The variety of ditch depths and widths, together with their fringing vegetation provide an important contribution to the site's habitat value for invertebrates and birdlife.

Sizewell Marshes are of exceptional interest for their invertebrate fauna, supporting a wide range of taxa and many nationally rare or scarce species. These include terrestrial and aquatic beetles (Coleoptera), flies (Diptera), moths (Lepidoptera), dragonflies (Odonata) and spiders (Araneae).

The breeding bird assemblage is also of national significance with many species that are typical of wet grassland and associated habitats, including Shoveler, Gadwall, Teal, Snipe and Lapwing.

COUNTY: SUFFOLK SITE NAME: SNAPE WARREN

DISTRICT: SUFFOLK COASTAL

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

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL

National Grid Reference: TM 404577 Area: 47.2 (ha.) 116.6 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NW

Date Notified (Under 1949 Act): 1954 Date of Last Revision: 1965

Date Notified (Under 1981 Act): 8.11.89. Date of Last Revision: –

Other Information:

Description and Reasons for Notification:
Snape Warren

Snape Warren is an important remnant of the once extensive 'Sandlings' heaths of coastal Suffolk. It is situated on sandy soils sloping down to the Alde Estuary and lies about one mile east of the village of Snape.

The site is a fine example of the lowland heathland of eastern England, which has been subject to considerable loss in the last 40 years. The vegetation is characterised by extensive areas of *Calluna* heath interspersed with acid grass-land dominated by Common Bent *Agrostis capillaris*.

The heather areas are dominated by Ling *Calluna vulgaris* which has a varied age structure and includes pioneer, building, mature and degenerate stages of development. The latter stages support a variety of *Cladonia* lichens and mosses. However, Bell Heather *Erica cinerea* and Western Gorse *Ulex gallii* also occur occasionally.

The acid grassland present is dominated by Common Bent *Agrostis capillaris* and Sheep's Fescue *Festuca ovina*, with characteristic species such as Heath Bedstraw *Gilium saxatile*, Sheep's Sorrel *Rumex acetosella* and Harebell *Campanula rotundifolia*. Where this grassland adjoins the Alde Estuary, the saline influence can be seen in the presence of species such as Bucks-horn Plantain *Plantago coronopus* and Common Saltmarsh-grass *Puccinellia maritima*.

The heathland shows some invasion by Bracken *Pteridium aquilinum*, Gorse *Ulex europaeus* and secondary Birch *Betula* sp. and Pedunculate Oak *Quercus robur* woodland, which now occupy substantial areas.

Trackways across the site support populations of the uncommon Mossy Stonecrop *Crassula tillaea*.

The site supports a number of reptile and bird species characteristic of heathland, including Common Lizard, Adder and Nightjar.

County Wildlife Site Citations

CWS Number Suffolk Coastal

104

Site Name BUCKLES WOOD

Parish LEISTON

District Suffolk Coastal

NGR TM431635

Description

Buckle's Wood has a good coppice with standards structure, several rides and a track for vehicular access. The coppice stools are old, mainly hazel, with ash, field maple and hornbeam also present. The standards are oak and even-aged. The wood appears to be managed at present, with a large new pond under excavation and game bird rearing pens and beehives are also present. There is a good ditch and bank boundary with a mixed species hedge, which together with the old coppice stools, indicates a woodland of some considerable age.

RNR Number 0

Area 4.62

County Wildlife Site Citations

CWS Number	Suffolk Coastal 105
Site Name	LEISTON COMMON
Parish	LEISTON
District	Suffolk Coastal
NGR	TM458633
Description	Leiston Common is a small but important site for wildlife conservation in Suffolk. It was the site of extensive studies of heathland ecology carried out by Lee Chadwick, which were later published. Bell heather, a rare plant in Suffolk, grows on Leiston Common together with more widespread plants for example harebell, heath bedstraw and tormentil. Another notable and uncommon feature of the site is the presence of an extensive and diverse lichen flora
RNR Number	0
Area	1.37

County Wildlife Site Citations

CWS Number	Suffolk Coastal 106
Site Name	SIZEWELL LEVELS & ASSOCIATED AREAS
Parish	LEISTON
District	Suffolk Coastal
NGR	TM463640
Description	A large area of land, consisting of woodland, plantation, wet meadow, osier beds and scrub situated behind Sizewell power station is considered to be of both regional and national importance for wildlife conservation. The area not within the Site of Special Scientific Interest (SSSI) boundary, which comprises wet meadow, sallow scrub and birch/alder woodland is of conservation importance. The flora of the marshes includes a number of uncommon plants, for example ragged robin and purple loosestrife. A recent survey however, has shown that the main importance of the grazing marshes lies in the diversity and abundance of the birds which inhabit the area. The ground remains waterlogged through the winter and numerous dykes provide good cover for high numbers of swan, teal, mallard and moorhen. Also of ornithological importance are the plantations situated to the north of Sizewell Belts; Goose Hill, Nursery Covert and Kenton Hills. The areas support breeding populations of a number of nationally rare birds which are specially protected (Schedule 1 of Wildlife and Countryside Act). Good numbers of migrant birds also frequent the area. The whole site therefore, with its diversity of habitats, is considered to be one of the most important County Wildlife Sites in the county. In 1994 the area designated as a Site of Special Scientific Interest was extended to include a large proportion of this County Wildlife Site.
RNR Number	0
Area	105.35

County Wildlife Site Citations

CWS Number	Suffolk Coastal 107
Site Name	SOUTHERN MINSMERE LEVELS
Parish	LEISTON
District	Suffolk Coastal
NGR	TM470658
Description	This site contains all the marshes east of Eastbridge to the sea, south of Minsmere New Cut. It abutts the internationally important Minsmere-Walberswick SSSI, which contains the Minsmere RSPB reserve. The entire valley is of great importance for wildlife forming perhaps the last unspoilt and least improved of Suffolk's larger marshland river valleys. This eastern portion of the valley is of interest principally for breeding wader and wildfowl and for overwintering birds. The extensive area of open marsh, managed in the traditional manner with cattle grazing and high water levels provides ideal conditions for feeding birds. Botanically the marshes are not of the same quality as those further up the valley. Many of them are improved, although some of the dykes retain a reasonable flora with plants such as broad-leaved pondweed, frogbit and water violet. Additional interest is given by a few small areas of scrub and woodland on the site. In 1994 a large proportion of this County Wildlife Site was confirmed as part of the extended Minsmere-Walberswick SSSI.
RNR Number	0
Area	14.94

County Wildlife Site Citations

CWS Number	Suffolk Coastal 127
Site Name	MINSMERE VALLEY;EASTBRIDGE to RECKFORD BRIDGE
Parish	WESTLETON
District	Suffolk Coastal
NGR	TM446673
Description	This area of marshland is situated in the central portion of the Minsmere Valley. The entire valley is of extreme importance for wildlife, forming the last unspoilt and least improved of Suffolk's larger marshland river valleys. Part of the valley forms the internationally important Minsmere/Walberswick SSSI. The marshes which form the central portion of the valley are botanically the richest marshes of the whole of the valley. Most of the area consists of herb rich, unimproved marshes which are becoming increasingly rare in Suffolk. Those which are managed either by grazing or cutting or both, maintain conditions suitable for typical plants such as southern marsh orchid, ragged robin and bog stitchwort, whilst rarities such as bogbean, early marsh orchid and water violet are also present. Other areas which have not been grazed for many years are slowly turning into reed fen, sedge swamp and carr woodland. Here the flora has declined. However as an alternative habitat, they provide valuable areas for breeding birds and invertebrates. Part of this site is owned by RSPB and is part of their Minsmere reserve. Otters are known to use the valley. In 1994 the majority of this County Wildlife Site was confirmed as part of the Minsmere-Walberswick SSSI.
RNR Number	0
Area	24.92

County Wildlife Site Citations

CWS Number	Suffolk Coastal 210
Site Name	SIZEWELL RIGS
Parish	Leiston
District	Suffolk Coastal
NGR	TM478630
Description	These two rigs are situated offshore from Sizewell A Power Station. Since 1995 the rigs have been home to a growing breeding colony of kittiwakes and is the most southerly colony in the North Sea. Nationally overall breeding numbers of kittiwake have declined in recent years. In 2003 the national average fledging success was 0.66 chicks per nest. Colonies in the north of Scotland averaged 0.43 whilst those in Suffolk averaged 0.93. Nationally, the Suffolk colonies at Lowestoft and Sizewell are therefore important examples of successful breeding colonies.
RNR Number	0
Area	0.04

County Wildlife Site Citations

CWS Number	Suffolk Coastal 216
Site Name	DOWER HOUSE
Parish	Aldringham cum Thorpe
District	Suffolk Coastal
NGR	TM47586514
Description	Grassland on the cliff top of the Dower House is a valuable example of unimproved dry acid/dry maritime grassland. The sward composition includes species typically associated with acid grasslands and heaths such as heath violet – Viola canina and heath speedwell – Veronica officinalis, but also species tolerant of, or preferring more calcareous conditions such as harebell – Campanula rotundifolia, thyme – Thymus pulegioides , meadow saxifrage – Saxifraga granulata, eyebright Euphrasia sp. However the key factors influencing the type and diversity of grassland species present is the free - draining, nutrient – poor soil and rabbit grazing. Areas of bare ground and rabbit scrapings are important for drought tolerant annuals such as corn salad – Valerianella locusta and early forget-me not – Myosotis ramosissima as well as the nationally scarce mossy stonecrop –Crassula tillea. Small areas of ling – Calluna vulgaris and bell heather – Erica cinerea are established on parts of the site gradually grading into blackthorn scrub. In addition to the sites botanical interest it is important for reptiles including slow-worm and adder. The surrounding blackthorn scrub is also important for birds, particularly as feeding stations for migrants.
RNR Number	0
Area	2.13

County Wildlife Site Citations

CWS Number	Suffolk Coastal 3
Site Name	DISUSED RAILWAY LINE(ALDRINGHAM - ALDEBURGH)
Parish	ALDRINGHAM CUM THORPE
District	Suffolk Coastal
NGR	TM461619
Description	This section of disused railway line which serves as a public footpath supports a species-diverse flora both on the line of the old track and on the gently sloping embankments. Plants typical of lightly trampled conditions were recorded on the footpath itself and these include the nationally rare species mossy stonecrop and an unusual species of clover; suffocated clover.Colourful wild flowers such as knapweed and bird's-foot trefoil which grow amongst scattered scrub on the embankments, attract butterflies in good numbers. The majority of this site was designated as part of the Leiston - Aldeburgh SSSI on 19.1.99.
RNR Number	0
Area	4.63

County Wildlife Site Citations

CWS Number	Suffolk Coastal 4
Site Name	SUFFOLK SHINGLE BEACHES
Parish	ALDRINGHAM CUM THORPE
District	Suffolk Coastal
NGR	TM3338
Description	Vegetated shingle is a rare and decreasing habitat, both in the British Isles and in Europe. The plant community which survives in this environment is prone to damage from visitor pressure. The stretches of shingle beach along the Suffolk coast are of a national conservation importance for the range of shingle plants that grow there. Sea pea, which is a nationally scarce plant, grows in profusion on many stretches of beach; other typical shingle flora includes sea kale, sea spurge, sea sandwort and sea bindweed can also be found. There are also rare invertebrates species found in these coastal sites. All of the shingle beaches are of high conservation value and most are already covered as SSSIs the remaining areas have been designated as CWS.
RNR Number	0
Area	38.83