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## Basildon Local Plan

### Habitat Regulations Assessment Addendum

Prepared by LUC  
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1.0	07/03/19	Final Report	Rebecca Turner	David Green	Jeremy Owen

# 1 'Holohan' Ruling

- 1.1 This addendum report has been produced in response to the recent *Holohan v An Bord Pleanala* (November 2018) judgement which states that:

*Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that an 'appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.*

*Article 6(3) of Directive 92/43 must be interpreted as meaning that the competent authority is permitted to grant to a plan or project consent which leaves the developer free to determine subsequently certain parameters relating to the construction phase, such as the location of the construction compound and haul routes, only if that authority is certain that the development consent granted establishes conditions that are strict enough to guarantee that those parameters will not adversely affect the integrity of the site.*

*Article 6(3) of Directive 92/43 must be interpreted as meaning that, where the competent authority rejects the findings in a scientific expert opinion recommending that additional information be obtained, the 'appropriate assessment' must include an explicit and detailed statement of reasons capable of dispelling all reasonable scientific doubt concerning the effects of the work envisaged on the site concerned.*

- 1.2 In line with this judgement, LUC always considers the potential for effects on species and habitats, including those not listed as qualifying features, to result in secondary effects upon the qualifying features of European sites, including the potential for complex interactions and dependencies. In addition, the potential for offsite impacts, such as through impacts to functionally linked land, and or species and habitats located beyond the boundaries of European site, but which may be important in supporting the ecological processes of the qualifying features are also fully considered. Nevertheless, in light of the above ruling **this addendum report explicitly highlights that these considerations have been taken into account when undertaking the HRA of the Basildon Local Plan.**
- 1.3 In light of the recent 'Holohan' ruling the following key impacts that were taken to Appropriate Assessment (AA) in the HRA of the Basildon Local Plan have been considered. In addition, the key dependencies for each of the qualifying features are provided **in Appendix 1.**

## *Recreation*

- 1.4 Impacts from recreational pressure could not be ruled out at the screening stage for Essex Estuaries SAC, Crouch and Roach Estuaries SPA and Ramsar, Benfleet and Southend Marshes SPA and Ramsar and Thames Estuary Marshes SPA and Ramsar and were therefore considered at the AA stage.
- 1.5 Essex Estuaries SAC is designated for the presence of coastal and inter-tidal habitats and is vulnerable to physical damage caused by water based recreation and from nutrient enrichment caused by littering, fire and vandalism. This may result in loss and deterioration of habitat present and changes to the characteristic plant communities of these habitats. The AA fully considers the potential impacts from increased recreation from proposed development and concluded that no adverse effects are considered to affect the integrity of this European site.
- 1.6 The SPA and Ramsar sites are designated for a range of qualifying waterbird species. These species are reliant on the coastal and inter-tidal habitats present within the site to forage and roost. Degradation of this habitat from recreation through physical loss and nutrient enrichment has potential to affect the suitability of the habitats for these species. In addition to this, these qualifying bird species are particularly sensitive to recreational disturbance. Increased recreation

within these European sites may also reduce the extent of habitat available for these species to use. The AA considers in full the potential impacts on qualifying bird species and the habitats and features on which they rely on. Overall, it was concluded that with the provision of Recreation and Avoidance and Mitigation Strategy (RAMS), no adverse effects were considered in relation to the qualifying features of these European sites.

- 1.7 **The HRA takes into account the complex relationships between qualifying and non-qualifying habitats and species in relation to recreation and is therefore compliant with 'Holohan' ruling. The findings presented in the HRA remain valid.**

#### *Water Quality*

- 1.8 The following European sites were considered to have potential likely significant effects in relation to water quality and were therefore considered at the AA:

- Essex Estuaries SAC
- Crouch and Roach Estuaries SPA and Ramsar
- Benfleet and Southend Marshes SPA and Ramsar
- Thames Estuary Marshes SPA and Ramsar

- 1.9 Essex Estuaries SAC is designated for the presence of coastal and inter-tidal habitats. Changes to water quality could lead to the deterioration of qualifying habitats, as well as changes to characteristic plant communities and species, which define these habitats.

- 1.10 The SPA and Ramsar sites are designated for a range of qualifying waterbird species. These species are reliant on the coastal and inter-tidal habitats to feed and roost. Any changes to these habitats as a result of reduced water quality could lead to a change in the extent of suitable habitat for these species to overwinter.

- 1.11 The AA fully considers the potential impacts to water quality as a result of the site allocations proposed within the Basildon Local Plan. In particular there is consideration of whether there is sufficient capacity to accommodate growth within the borough and whether there is a need for additional infrastructure and treatment upgrades. The HRA concluded that providing the safeguards detailed in para 3.43-3.45 of the HRA are implemented there would be no adverse effects on the European sites.

- 1.12 **The HRA takes into account the complex relationships between qualifying and non-qualifying habitats and species in relation to water quality and is therefore considered compliant with the recent 'Holohan' ruling. The findings presented in the HRA remain valid.**

#### *Flood Risk*

- 1.13 The following European sites were considered to have potential likely significant effects in relation to water quality and were therefore considered at the AA:

- Essex Estuaries SAC
- Crouch and Roach Estuaries SPA and Ramsar
- Benfleet and Southend Marshes SPA and Ramsar
- Thames Estuary Marshes SPA and Ramsar

- 1.14 As detail above in para 1.9-1.10, Essex Estuaries SAC is designated for the presence of coastal and inter-tidal habitats whilst the SPA and Ramsar sites are designated for a range of qualifying waterbird species, which are reliant on the coastal and intertidal habitats to feed and roost. An increase in flood risk has the potential to reduce the extent and quality of habitat through increased sedimentation and nutrients and alter the aquatic ecosystem. The AA takes into account the potential impacts of increased flood risk from development on greenfield locations on qualifying and non-qualifying habitats and species and was able to conclude there will be no adverse effect on the integrity of the European sites providing mitigation detailed in Para 3.46-3.47 of the HRA report is implemented.

- 1.15 **The HRA takes into account the complex relationships between qualifying and non-qualifying habitats and species in relation to flood risk and is therefore compliant with 'Holohan' ruling. The findings presented in the HRA remain valid.**

*Loss of Offsite Habitat*

- 1.16 The loss of offsite habitat as a result of development within the site allocations was considered to have potential likely significant effects on the lapwing populations of the Thames Marshes and Estuary SPA and was therefore taken to AA. The AA fully considered the potential impacts of offsite habitat loss for which this qualifying species relies on to forage and loaf and was able to conclude that no adverse effects would occur as a result of the Basildon Local Plan.
- 1.17 This conclusion was based on a detailed assessment of the suitability of offsite habitat for target bird species, and therefore recognised the potential for qualifying species to be dependent upon habitats located outside the boundary of the protected site. This approach fully encapsulates a key requirement of the Holohan ruling.
- 1.18 **In light of this it can be concluded that the HRA has taken into consideration the interdependencies of this qualifying species and is therefore compliant with 'Holohan' ruling. The findings presented in the HRA remain valid.**
- 1.19 The site information provided in **Appendix 1** outlines the attributes of each European site, including information on habitats and species for which the qualifying habitats and species rely on. This has been used to inform the addendum.

## Conclusion

- 1.20 As set out above, this addendum report explicitly highlights the key considerations, in light of the Holohan ruling, which have been taken into account when undertaking the HRA of the Basildon Local Plan.
- 1.21 LUC in completing the HRA has considered the potential for effects on species and habitats, including those not listed as qualifying features, to result in secondary effects upon the qualifying features of European sites, including the potential for complex interactions and dependencies. In addition, the potential for offsite impacts, such as through impacts to functionally linked land, and or species and habitats located beyond the boundaries of European site, but which may be important in supporting the ecological processes of the qualifying features was also fully considered.
- 1.22 **In light of the Holohan ruling, the findings of the HRA report remain consistent and accurate and it can be concluded that, subject to the provisions listed in the HRA report, the Basildon Local Plan will not result in adverse effects on European Sites either alone or in-combination.**

# Appendix 1

## Attributes of European sites

This appendix contains information on the European sites scoped into the HRA. Site areas and designated features are drawn from SAC and SPA Standard Data Forms and Ramsar Site Information Sheets<sup>1</sup>. The overviews of sites and their locations are drawn from Natural England's Site Improvement Plans<sup>2</sup>. Site conservation objectives are drawn from Natural England's website and are only available for SACs and SPAs.<sup>3</sup> Non-qualifying habitats for which the qualifying habitats and species rely on was drawn from British Trust for Ornithology<sup>4</sup>, RSPB<sup>5</sup>, and from Buglife<sup>6</sup>.

### Abberton Reservoir SPA

**Site area:** 726.2 ha

#### Overview of site and its location

Abberton Reservoir is a large water storage reservoir close to the Essex coast. It is one of the most important reservoirs in the country for overwintering waterfowl and also supports substantial aggregations of moulting birds in early autumn and a large colony of tree-nesting cormorants. Causeways divide the reservoir into three sections. Currently the water level of the main, eastern section is being raised by 3 metres to increase storage capacity. As part of the level-raising scheme, the original concrete banks have been removed and the shoreline re-profiled, creating extensive new areas of shallow wetland habitat for the site's waterfowl.

#### Qualifying Features

Supports the following internationally important waterbird assemblage:

- *Podiceps cristatus*: Great crested grebe (Non-breeding); *Phalacrocorax carbo*: Great cormorant (Breeding); *Cygnus olor*: Mute swan (Non-breeding); *Anas Penelope*: Eurasian wigeon (Non-breeding); *Anas strepera*: Gadwall (Non-breeding) ; *Anas crecca*: Eurasian teal (Non-breeding); *Anas clypeata*: Northern shoveler (Non-breeding); *Aythya farina*: Common pochard (Non-breeding); *Aythya fuligula*: Tufted duck (Non-breeding); *Bucephala clangula*: Common goldeneye (Non-breeding); *Fulica atra*: Common coot (Non-breeding); *Pluvialis apricaria*: European golden plover (Non-breeding).

#### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

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<sup>1</sup> SAC and SPA Standard Data Forms and Ramsar Site Information Sheets, JNCC, <http://jncc.defra.gov.uk/page-4>

<sup>2</sup> Site Improvement Plans: East of England, Natural England, <http://publications.naturalengland.org.uk/category/4873023563759616>

<sup>3</sup> European Site Conservation Objectives, Natural England, <http://www.naturalengland.org.uk/ourwork/conservation/designations/sac/conservationobjectives.aspx>

<sup>4</sup> British Trust for Ornithology 'About Birds' (<https://www.bto.org/about-birds>).

<sup>5</sup> RSPB 'Bird A-Z' (<https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/>).

<sup>6</sup> Buglife (<https://www.buglife.org.uk/>)

- The distribution of the qualifying features within the site.

## Pressures and threats

### *Siltation*

Silt entering the reservoir via Layer Brook is gradually accumulating in the western and central sections. This increases water turbidity and reduces light penetration, limiting the growth of the submerged aquatic plants on which the reservoir's fauna – including many of the waterbirds – largely depends. Siltation also reduces the water depth and increases the already high nutrient load. Now that concrete banks have been removed as part of the water-level raising scheme, siltation in the eastern section might also increase as a result of wave action until the earth banks have become vegetated. Essex and Suffolk Water is monitoring water quality, aquatic vegetation and bird numbers and carrying out a programme of work to accelerate vegetation colonisation of the new earth banks.

### *Public access/disturbance*

Human disturbance to feeding and resting waterbirds reduces their energy intake and increases energy expenditure. This can be critical if the birds are already stressed by severe weather or other factors. Disturbance at ground level is well controlled by Essex & Suffolk Water, though there is occasional trespassing. Disturbance from the air by low-flying civilian and military aircraft occurs several times each year and is more difficult to manage.

### *Planning Permission: general*

The reservoir's waterbirds often fly over surrounding farmland on their way to and from the nearby Blackwater and Colne estuaries. Some species also use the surrounding fields for feeding. Inappropriate development in the vicinity could therefore have adverse effects on them. Planning legislation and the Habitats Regulations provide regulatory mechanisms but for some new types of development, published data from well-designed impact studies at comparable sites appears to be limited.

### *Changes in species distributions*

The reservoir's breeding colony of tree-nesting cormorants has declined from a peak of over 500 pairs in the mid-1990s to about 160 pairs in 2010. Reasons for the decline are unknown. Possibilities include a reduction in suitable nest sites, predation (possibly linked to lower water levels in the central section), cormorant control measures at fisheries, or a decline in summer food supply within foraging distance of the colony.

### *Bird strike*

Mute swans, and possibly other species, have been killed as a result of colliding with overhead power lines near the reservoir.

### *Water pollution*

Water stored in the reservoir is high in nutrients (eutrophic) as it comes from intensively farmed catchment areas. As a result, algal blooms are regular in summer. In some years these may include toxic blue-green algae that can kill wildfowl, though no significant mortality has been recorded.

### *Air Pollution: risk of atmospheric nitrogen deposition*

The site is identified as at risk from air pollution as Nitrogen deposition levels exceed the site-relevant critical load for ecosystem protection. However the site's Nitrogen load is likely to be dominated by levels in the water entering the reservoir (mainly from the distant Ouse catchment) rather than direct deposition.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Great crested grebe <i>Podiceps cristatus</i>	Reed-bordered lakes, gravel pits, reservoirs and rivers.  In the winter, they are also found along the coast.	Mostly fish, some aquatic invertebrates especially in summer.
Great cormorant <i>Phalacrocorax carbo</i>	Larger lakes and coastal habitat.	Fish, mostly by diving from surface
Mute swan <i>Cygnus olor</i>	Lakes, ponds & rivers.	Aquatic vegetation (to 1m deep), also grazes on land; occasionally takes insects, molluscs, small amphibians.
Eurasian wigeon <i>Anas Penelope</i>	Marsh, lakes, open moor, on migration estuaries.	Mostly leaves, shoots, rhizomes and some seeds.
Gadwall <i>Anas strepera</i>	Gravel pits, lakes, reservoirs and coastal wetlands and estuaries in winter.	Stems, leaves and seeds.
Eurasian teal <i>Anas crecca</i>	Lakes, marshes, ponds & shallow streams.	Seeds and small invertebrates.
Northern shoveler <i>Anas clypeata</i>	Shallow lakes, marsh, reedbed & wet meadow.	Small insects and plant matter sifted from the water.
Common pochard <i>Aythya farina</i>	Open lakes and gravel pits in the summer and large lakes and estuaries during the winter.	Plants and seeds, snails, small fish and insects.
Tufted duck <i>Aythya fuligula</i>	Marshes, lakes, on migration rivers and estuaries.	Molluscs, insects and some plants.
Common goldeneye <i>Bucephala clangula</i>	Lakes, rivers, and on migration seacoasts.	Insects, molluscs and crustaceans.
Common coot <i>Fulica atra</i>	Lakes, marsh, rivers and seacoast.	Vegetation, seeds, snails and insect larvae.
European golden plover <i>Pluvialis apricaria</i>	Tundra, wet moor, on migration pasture and estuaries.	Worms, beetles and insects.

## Abberton Reservoir Ramsar Site

**Site area:** 726.2 ha.

### Overview of site and its location

As for Abberton Reservoir SPA above.

### Qualifying Features

Supports 23787 waterfowl (5 year peak mean 1998/99-2002/2003), including the following internationally important waterbird assemblage:

- Gadwall, *Anas strepera strepera*; Northern shoveler, *Anas clypeata*; Eurasian wigeon, *Anas penelope*; Mute swan, *Cygnus olor*; Common pochard, *Aythya farina*; Great cormorant, *Phalacrocorax carbo carbo*; Eurasian teal, *Anas crecca*; Tufted duck, *Aythya fuligula*; Common coot, *Fulica atra atra*; Pied avocet, *Recurvirostra avosetta*; Ruff, *Philomachus pugnax*; Black-tailed godwit, *Limosa limosa islandica*; Spotted redshank, *Tringa erythropus*; Common greenshank, *Tringa nebularia*; Common goldeneye, *Bucephala clangula clangula*.

### Conservation objectives

None available.

### Pressures and threats

As for Abberton Reservoir SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

Refer to Abberton Reservoir SPA above.

## Benfleet and Southend Marshes SPA

**Site area:** 2251.31 ha.

### Overview of site and its location

The Greater Thames Complex consists of the Thames Estuary and Marshes SPA, the Medway Estuary SPA, the Swale SPA and Benfleet & Southend Marshes SPA. The Medway Estuary feeds into and lies on the south side of the outer Thames Estuary in Kent, south-east England. It forms a single tidal system with the Swale and joins the Thames Estuary between the Isle of Grain and the Isle of Sheppey. The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland and joins the Medway to the west. Benfleet and Southend Marshes is an estuarine area on the Essex side of the Thames Estuary. These four sites contain a wide diversity of coastal habitats, such as grazing marsh, saltmarsh and mud/sandflat and eelgrass beds that support important numbers of waterbirds throughout the year. Wintering birds that use these estuaries include grebes, geese, ducks and waders whilst in summer breeding birds can be found, such as waders and terns. The area is also important for spring and autumn migration periods.

### Qualifying Features

Site regularly supports 34789 waterfowl over winter, including the following waterbird assemblage:

- Dark-bellied brent goose, *Branta bernicla bernicla*.
- Grey plover, *Pluvialis squatarola*.
- Red knot, *Calidris canutus islandica*.
- Dunlin, *Calidris alpina alpina*.

## Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.
- The distribution of the qualifying features within the site.

## Pressures and threats

### *Coastal squeeze*

Coastal defences exist along much of the coastline here. Sea level rise is also occurring. It is therefore certain that if circumstances do not change, much of the supporting habitats of the SPA birds will be lost/degraded through processes such as: coastal squeeze; sedimentation rates' inability to keep pace with sea level rise; and reduced exposure (the extent and duration) of mudflats and sandflats.

### *Public access/disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities, including: boating and watersports; walking; bait-digging; fishing, and wildfowling. Some activities such as powerboating, may produce physical disturbance to habitats. Public access, (especially dog walking and recreational boating) was identified as a medium risk during the 2009 EMS risk review project and this activity is still occurring. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive. There is inadequate information to provide appropriate management.

### *Invasive species*

Non-native invasive species such as sea squirt and pacific oyster are spreading along the Kent coast and could begin to impact on the Swale. Sea squirt has been found in the Medway, and Pacific oysters are regarded as increasing in the Essex-Southend area. These species threaten habitats due to their ability to smother substrate and other sessile organisms. There is no good understanding of the overall distribution of these species in this site. Assessment is needed in key areas of ports and marinas, where introductions tend to first occur.

### *Changes in species distributions*

There is a decline in population size for some of the bird species on some of the SPAs<sup>7</sup>. These are likely to be influenced by a number of factors which may vary across the four SPAs. Some of these influences are site-based as described in other parts of this Plan and some relate to wider, broad-scale changes such as wintering species distributions and effects from breeding grounds outside the UK. A greater understanding of the relative importance of site-based and wider influences is required in order to identify the potential for further actions that might halt declines, restore populations or identify scenarios where it is thought unlikely that site-based measures will reverse population declines.

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<sup>7</sup> Cook A.S.C.P., Barimore C., Holt C.A., Read W.J. & Austin G.E. 2013. Wetland Bird Survey Alerts 2009/2010: Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 641. BTO, Thetford.

### Fisheries: Commercial marine and estuarine

The extent and impacts of fisheries on private grounds, particularly in the Swale Estuary, needs to be better understood. There are particular concerns regarding the dredging of shellfish within the SPAs which are a food source for the protected birds.

### Invasive Species

Freshwater non-native invasive species such as pennywort, crassula, parrots feather etc. can engulf ditches, leading to loss of habitat for diving ducks. Although there are some mechanisms in place to ensure ditch management, more baseline information is needed, particularly on those species for which ditch management is not the solution

### Invasive Species

*Spartina anglica* may be increasing at the expense of other saltmarsh habitats with adverse implications for SPA bird roost areas in Benfleet & Southend Marshes.

### Vehicles: illicit

The illicit use of motor vehicles (often bikes) occurs across the area. This can cause disturbance to SPA birds. This activity was identified as a medium risk during the 2009 EMS risk review project and is still occurring. Whilst various mechanisms are in place to prevent the use of vehicles they are clearly not entirely effective.

### Fisheries: Commercial marine and estuarine

Commercial fishing activities categorised as 'amber or green' under Defra's revised approach to commercial fisheries in European Marine Sites require assessment and (where appropriate) management. This assessment will be undertaken by Kent & Essex IFCA. For activities categorised as 'green', these assessments should take account of any in-combination effects of amber activities, and/or appropriate plans or projects, in the site

### Air Pollution: risk of atmospheric nitrogen deposition

Nitrogen deposition exceeds site-relevant critical loads.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Grey plover <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Red knot <i>Calidris canutus islandica</i>	Tundra, and on migration coastal habitat.	In summer, insects and plant material, and in winter inter-tidal invertebrates, esp molluscs.
Dunlin <i>Calidris</i>	Tundra, moor, heath, and on migration	Insects, snails and worms.

Species	Habitat Preference	Diet
<i>alpina alpina</i>	estuaries and coastal habitat.	

## Benfleet and Southend Marshes Ramsar site

**Site area:** 2251.31 ha.

### Overview of site and its location

As for Benfleet and Southend Marshes SPA above.

### Qualifying Features

Comprise an extensive series of saltmarshes, mudflats, and grassland which support a diverse flora and fauna, including internationally important numbers of wintering waterfowl:

- *Branta bernicla bernicla*; Dark-bellied brent goose (non-breeding).
- *Charadrius hiaticula*; Ringed plover (non-breeding).
- *Pluvialis squatarola*; Grey plover (non-breeding).
- *Calidris canutus*; Red knot (non-breeding).
- *Calidris alpina alpina*; Dunlin (non-breeding).

### Conservation objectives

None available.

### Pressures and threats

As for Benfleet and Southend Marshes SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

Refer to Benfleet and Southend Marshes SPA above.

## Blackwater Estuary (Mid-Essex Coast Phase 4) SPA

**Site area:** 4395.15 ha.

### Overview of site and its location

The Essex Estuaries SIP covers the Essex Estuaries SAC and five mid-Essex coast SPAs (Blackwater Estuary, Colne Estuary, Crouch and Roach Estuaries, Dengie and Foulness). The area is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. Sub-tidal areas have a rich invertebrate fauna and there are extensive intertidal mudflats and sandflats. Four different saltmarsh features of European importance are represented as well as large areas of grazing marsh. The site is one of the most important areas for overwintering waterbirds in the UK and is of international importance for several breeding bird species.

### Qualifying Features

Qualifying Features (Waterbird assemblage):

- *Branta bernicla bernicla*: Dark-bellied brent goose (Non-breeding).
- *Aythya ferina*: Common pochard (Breeding).
- *Circus cyaneus*: Hen harrier (Non-breeding).

- *Charadrius hiaticula*: Ringed plover (Breeding).
- *Pluvialis squatarola*: Grey plover (Non-breeding).
- *Calidris alpina alpina*: Dunlin (Non-breeding).
- *Limosa limosa islandica*: Black-tailed godwit (Non-breeding).
- *Sterna albifrons*: Little tern (Breeding).

Additional Qualifying Features Identified by the 2001 UK SPA Review:

- *Tadorna tadorna*: Common shelduck (Non-breeding).
- *Recurvirostra avocetta*: Pied avocet (Non-breeding).
- *Charadrius hiaticula*: Ringed plover (Non-breeding).
- *Pluvialis apricaria*: European golden plover (Non-breeding).
- *Philomachus pugnax*: Ruff (Non-breeding).
- *Tringa totanus*: Common redshank (Non-breeding).

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

### Pressures and threats

#### *Coastal squeeze*

Coastal defences along much of the Essex coastline prevent intertidal habitats from shifting landward in response to rising sea levels. As a result, these habitats are being gradually degraded and reduced in extent, with knock-on effects on the waterbirds and other species they support. 'Managed realignment' schemes and additional intervention measures to create new areas of intertidal habitat and reduce erosion rates are being implemented but more will be needed to offset future losses. Grazing marshes in the SIP area are important for waterbirds and are also threatened by sea level rise because most are near or below mean high tide level, currently protected behind seawalls.

#### *Public Access/Disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities - including boating and watersports, walking, bait-digging, fishing and wildfowling - as well as low-flying aircraft. Some activities, such as powerboating, may produce physical disturbance to habitats. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive.

#### *Fisheries: Commercial marine and estuaries*

Commercial fishing activities categorised as Amber or Green under Defra's revised approach to commercial fisheries in EMSs are being assessed by Kent and Essex Inshore Fisheries and Conservation

Authority (KEIFCA) to determine whether management is required. For activities categorised as Amber and Green these assessments should take account of any relevant in combination effects with other fishing activities. Shellfish dredging over subtidal habitats has been identified as an Amber activity and is considered a high priority for assessment and development of possible management for the site.

#### *Planning permission: General*

Several of the issues affecting the Essex Estuaries and the management of disturbance effects on the sites are related to each other, and addressing them is likely to require an improved overview of the relative sensitivities of different habitats, species and locations to different types of development (perhaps summarised as sensitivity maps and matrices for the SIP area). Difficult issues include:

- (a) Assessing the cumulative effects of numerous, small and often 'non-standard' developments
- (b) Development outside the SPA/SAC boundaries can have negative impacts, particularly on the estuaries' birds
- (c) Assessing the indirect, 'knock-on' effects of proposals
- (d) Pressure to relax planning conditions on existing developments.

#### *Changes in species distributions*

Declines in the numbers of some of the waterbird species using the Essex Estuaries SIP area may be due to changes in their distributions or population levels at a national or continental scale, possibly linked to climate change. For example, milder winters may be allowing birds to overwinter closer to their northern breeding grounds, or changes on the breeding grounds may be reducing breeding success. When assessing SPA condition, distinguishing these types of large-scale effect from effects produced by changes within the site itself is important.

#### *Invasive species*

An increase in Pacific oyster *Crassostrea gigas* settlement and colonisation within the European Marine Site (EMS) may result in areas of foreshore being covered in such numbers as to make them difficult to access and utilise as feeding grounds for overwintering birds. The importance of Pacific oysters for the local shellfish industry is recognised, however we would not like to see an overall increase in the extent of foreshore across the EMS populated by Pacific oysters. Other non-native invasive species such as the American whelk tingle *Urosalpinx cinerea* and Slipper limpet *Crepidula fornicata* are known to occupy subtidal muddy habitats, potentially impacting native communities through competition for resources and predation.

#### *Fisheries: Recreational marine and estuarine*

Recreational bait digging may impact waterbirds by reducing prey availability and creating disturbance in intertidal feeding areas. It could also damage the intertidal mudflats and sandflats and associated sub-features and communities, such as eelgrass beds. The extent of the activity and potential impacts on site features are not currently well understood.

#### *Fisheries: Commercial marine and estuarine*

Bottom towed fishing gear (i.e. any fishing instrument designed to take sea fisheries resources from the seabed) has been categorised as a 'Red' for the interest features listed, specifically the seagrass beds *Zostera* spp, a sub-feature of the SAC, as part of Defra's revised approach to commercial fisheries management in European Marine Sites (EMS). Appropriate management measures will be implemented and enforced by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) who have put in place the 'Bottom Towed Fishing Gear Byelaw' within the SAC to prohibit the above fishing gear being used over the majority of known seagrass beds.

#### *Fisheries: Commercial marine and estuarine*

Marine fisheries carried out under private rights, or under management defined in Several or Hybrid Orders, fall outside Defra's revised approach to commercial fisheries management in EMSs. A variety of fishing gears are used in these fisheries (e.g. Hydraulic and non-hydraulic dredging and shore based activities (e.g. shellfish collection)) which may be applying pressure to site features, including abrasion of the seabed, visual disturbance, and habitat structure changes. Potential impacts need to be better understood and assessed with potential management introduced if required.

### Invasive Species

The invasive Common cord-grass *Spartina anglica* occurs widely within this site, as well as native Small cord-grass *Spartina maritima* in certain locations, and the site is designated for H1320 *Spartina* swards. There is a need to improve understanding of the dynamics of *S.anglica* on the site in order to determine if changes in the species' distribution adversely affect other species and habitats, including feeding and roosting areas of SPA bird species.

### Air Pollution: risk of atmospheric nitrogen deposition

Atmospheric nitrogen deposition exceeds the relevant critical loads for coastal dune habitats used by breeding terns and hence there is a risk of harmful effects. However, on the Essex estuaries declines in the numbers of breeding terns appear to be due mainly to erosion of a man-made cockle-shingle bank (at Foulness) and to disturbance (elsewhere), rather than to over-vegetation of breeding areas caused by nitrogen deposition.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Common pochard <i>Aythya ferina</i>	Open lakes and gravel pits in the summer and large lakes and estuaries during the winter.	Plants and seeds, snails, small fish and insects.
Hen harrier <i>Circus cyaneus</i>	Moor, marsh, steppe and fields.	Mainly small birds and mammals.
Ringed plover <i>Charadrius hiaticula</i>	Sandy areas with low vegetation, and on migration estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Grey plover <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Dunlin <i>Calidris alpina alpina</i>	Tundra, moor, heath, and on migration estuaries and coastal habitat.	Insects, snails and worms.
Black-tailed godwit <i>Limosa limosa islandica</i>	Marshy grassland and steppe, and on migration mudflats.	Insects, worms and snails, but also some plants, beetles, grasshoppers and other small insects during the breeding season.
Little tern <i>Sterna albifrons</i>	Seacoasts, rivers and lakes.	Small fish and invertebrates.
Common	Coasts, estuaries and lakes.	Mostly invertebrates, especially insects,

Species	Habitat Preference	Diet
shelduck <i>Tadorna tadorna</i>		molluscs and crustaceans.
Pied avocet <i>Recurvirostra avosetta</i>	Mudflats, lagoons and sandy beaches.	Aquatic insects and their larvae, crustaceans and worms.
European golden plover <i>Pluvialis apricaria</i>	Tundra, wet moor, on migration pasture and estuaries.	Worms, beetles and insects.
Ruff <i>Philomachus pugnax</i>	Grassy tundra, lakes, farmland, on migration mudflat.	Invertebrates, especially insects, and some plant material (especially in winter).
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).

## Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar site

**Site area:** 4395.15 ha.

### Overview of site and its location

As for Blackwater Estuary (Mid-Essex Coast Phase 4) SPA above.

### Qualifying Features

Represents 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.

Invertebrate fauna includes at least 16 British Red Data Book species: water beetle *Paracymus aeneus*; damselfly *Lestes dryas*; flies *Aedes flavescens*, *Erioptera bivittata*, *Hybomitra expollicata*; spiders *Heliophanus auratus* and *Trichopterna cito*; beetles *Baris scolopacea*, *Philonthus punctus*, *Graptodytes bilineatus* and *Malachius vulneratus*; flies *Campsicemus magius*, *Myopites eximia*; moths *Idaea ochrata* and *Malacosoma castrensis*; spider *Euophrys*.

Supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.

Supports the following internationally important wildfowl assemblage:

- Dark-bellied brent goose, *Branta bernicla bernicla*; Grey plover, *Pluvialis squatarola*; Dunlin, *Calidris alpina alpina*; Black-tailed godwit, *Limosa limosa islandica*; European golden plover, *Pluvialis apricaria*; Common redshank, *Tringa totanus tetanus*.

### Conservation objectives

None available.

### Pressures and threats

As for Blackwater Estuary (Mid-Essex Coast Phase 4) SPA above.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

### *Habitat*

Saltmarsh habitat is reliant a range of coastal factors, in particular sedimentary and tidal processes which influence the pattern and development of vegetation. These factors influence the complex interdependent intertidal, subtidal and terrestrial habitats present along the coast.

### *Invertebrates*

These species are reliant on the saltmarsh habitat and characteristic flora and fauna that are present within the European site. Key sources of food range from flowering plants, organic matter and other invertebrate species.

### *Birds*

Refer to Blackwater Estuary (Mid-Essex Coast Phase 4) SPA above for details on qualifying bird species.

## Colne Estuary (Mid-Essex Coast Phase 2) SPA

**Site area:** 2701.43 ha.

### Overview of site and its location

The Essex Estuaries SIP covers the Essex Estuaries SAC and five mid-Essex coast SPAs (Blackwater Estuary, Colne Estuary, Crouch and Roach Estuaries, Dengie and Foulness). The area is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. Sub-tidal areas have a rich invertebrate fauna and there are extensive intertidal mudflats and sandflats. Four different saltmarsh features of European importance are represented as well as large areas of grazing marsh. The site is one of the most important areas for overwintering waterbirds in the UK and is of international importance for several breeding bird species.

### Qualifying Features

Annex I populations of the following species:

- During the breeding season: Little Tern, *Sterna albifrons*.
- Over winter: Avocet, *Recurvirostra avosetta*; Golden Plover, *Pluvialis apricaria*; Hen Harrier, *Circus cyaneus*.

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

- Over winter: Dark-bellied Brent Goose, *Branta bernicla bernicla*; Redshank, *Tringa totanus*

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

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.
- The distribution of the qualifying features within the site.

## Pressures and threats

### *Coastal squeeze*

Coastal defences along much of the Essex coastline prevent intertidal habitats from shifting landward in response to rising sea levels. As a result, these habitats are being gradually degraded and reduced in extent, with knock-on effects on the waterbirds and other species they support. 'Managed realignment' schemes and additional intervention measures to create new areas of intertidal habitat and reduce erosion rates are being implemented but more will be needed to offset future losses. Grazing marshes in the SIP area are important for waterbirds and are also threatened by sea level rise because most are near or below mean high tide level, currently protected behind seawalls.

### *Public Access/Disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities - including boating and watersports, walking, bait-digging, fishing and wildfowling - as well as low-flying aircraft. Some activities, such as powerboating, may produce physical disturbance to habitats. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive.

### *Fisheries: Commercial marine and estuaries*

Commercial fishing activities categorised as Amber or Green under Defra's revised approach to commercial fisheries in EMSs are being assessed by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) to determine whether management is required. For activities categorised as Amber and Green these assessments should take account of any relevant in combination effects with other fishing activities. Shellfish dredging over subtidal habitats has been identified as an Amber activity and is considered a high priority for assessment and development of possible management for the site.

### *Planning permission: General*

Several of the issues affecting the Essex Estuaries and the management of disturbance effects on the sites are related to each other, and addressing them is likely to require an improved overview of the relative sensitivities of different habitats, species and locations to different types of development (perhaps summarised as sensitivity maps and matrices for the SIP area). Difficult issues include:

- (a) Assessing the cumulative effects of numerous, small and often 'non-standard' developments
- (b) Development outside the SPA/SAC boundaries can have negative impacts, particularly on the estuaries' birds
- (c) Assessing the indirect, 'knock-on' effects of proposals
- (d) Pressure to relax planning conditions on existing developments.

### *Changes in species distributions*

Declines in the numbers of some of the waterbird species using the Essex Estuaries SIP area may be due to changes in their distributions or population levels at a national or continental scale, possibly linked to climate change. For example, milder winters may be allowing birds to overwinter closer to their northern breeding grounds, or changes on the breeding grounds may be reducing breeding success. When assessing SPA condition, distinguishing these types of large-scale effect from effects produced by changes within the site itself is important.

### *Invasive species*

An increase in Pacific oyster *Crassostrea gigas* settlement and colonisation within the European Marine Site (EMS) may result in areas of foreshore being covered in such numbers as to make them difficult to access and utilise as feeding grounds for overwintering birds. The importance of Pacific oysters for the local shellfish industry is recognised, however we would not like to see an overall increase in the extent of foreshore across the EMS populated by Pacific oysters. Other non-native invasive species such as the American whelk tingle *Urosalpinx cinerea* and Slipper limpet *Crepidula fornicata* are known to occupy subtidal muddy habitats, potentially impacting native communities through competition for resources and predation.

### Fisheries: Recreational marine and estuarine

Recreational bait digging may impact waterbirds by reducing prey availability and creating disturbance in intertidal feeding areas. It could also damage the intertidal mudflats and sandflats and associated sub-features and communities, such as eelgrass beds. The extent of the activity and potential impacts on site features are not currently well understood.

### Fisheries: Commercial marine and estuarine

Bottom towed fishing gear (i.e. any fishing instrument designed to take sea fisheries resources from the seabed) has been categorised as a 'Red' for the interest features listed, specifically the seagrass beds *Zostera* spp, a sub-feature of the SAC, as part of Defra's revised approach to commercial fisheries management in European Marine Sites (EMS). Appropriate management measures will be implemented and enforced by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) who have put in place the 'Bottom Towed Fishing Gear Byelaw' within the SAC to prohibit the above fishing gear being used over the majority of known seagrass beds.

### Fisheries: Commercial marine and estuarine

Marine fisheries carried out under private rights, or under management defined in Several or Hybrid Orders, fall outside Defra's revised approach to commercial fisheries management in EMSs. A variety of fishing gears are used in these fisheries (e.g. Hydraulic and non-hydraulic dredging and shore based activities (e.g. shellfish collection)) which may be applying pressure to site features, including abrasion of the seabed, visual disturbance, and habitat structure changes. Potential impacts need to be better understood and assessed with potential management introduced if required.

### Invasive Species

The invasive Common cord-grass *Spartina anglica* occurs widely within this site, as well as native Small cord-grass *Spartina maritima* in certain locations, and the site is designated for H1320 *Spartina* swards. There is a need to improve understanding of the dynamics of *S.anglica* on the site in order to determine if changes in the species' distribution adversely affect other species and habitats, including feeding and roosting areas of SPA bird species.

### Air Pollution: risk of atmospheric nitrogen deposition

Atmospheric nitrogen deposition exceeds the relevant critical loads for coastal dune habitats used by breeding terns and hence there is a risk of harmful effects. However, on the Essex estuaries declines in the numbers of breeding terns appear to be due mainly to erosion of a man-made cockle-shingle bank (at Foulness) and to disturbance (elsewhere), rather than to over-vegetation of breeding areas caused by nitrogen deposition.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Little Tern, <i>Sterna albifrons</i>	Seacoasts, rivers and lakes.	Small fish and invertebrates.
Avocet <i>Recurvirostra avosetta</i>	Mudflats, lagoons and sandy beaches.	Aquatic insects and their larvae, crustaceans and worms.
European golden	Tundra, wet moor, on migration	Worms, beetles and insects.

Species	Habitat Preference	Diet
plover <i>Pluvialis apricaria</i>	pasture and estuaries.	
Hen harrier <i>Circus cyaneus</i>	Moor, marsh, steppe and fields.	Mainly small birds and mammals.
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).

## Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site

**Site area:** 2701.43 ha.

### Overview of site and its location

As for Colne Estuary (Mid-Essex Coast Phase 2) SPA above.

### Qualifying Features

Ramsar criterion 1: The site is important due to the extent and diversity of saltmarsh present.

Ramsar criterion 2: The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species.

Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.

Ramsar criterion 5: Assemblages of international importance:

Species with peak counts in winter: 32,041 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6: Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation):

- Species with peak counts in winter: Dark-bellied brent goose, *Branta bernicla bernicla*; Common redshank, *Tringa totanus totanus*.

Species/populations identified subsequent to designation for possible future consideration under criterion 6:

- Species with peak counts in winter: Black-tailed godwit , *Limosa limosa islandica*

### Conservation objectives

None available.

### Pressures and threats

As for Colne Estuary (Mid-Essex Coast Phase 2) SPA above.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

### Habitat

Saltmarsh habitat is reliant a range of coastal factors, in particular sedimentary and tidal processes which influence the pattern and development of vegetation. These factors influence the complex interdependent intertidal, subtidal and terrestrial habitats present along the coast.

### Plants

Plant communities are reliant on the coastal habitats within the Ramsar site. These habitats are dependent on a range of coastal factors and processes, including salinity, sedimentation, sea level, turbidity and elevation.

### Invertebrates

These species are reliant on the saltmarsh habitat and characteristic flora and fauna that are present within the European site. Key sources of food range from flowering plants, organic matter and other invertebrate species.

### Birds

Refer to Colne Estuary (Mid-Essex Coast Phase 2) SPA above. Consideration also needs to be given to black-tailed godwit, for which this Ramsar site is designated for.

Species	Habitat Preference	Diet
Black-tailed godwit <i>Limosa limosa islandica</i>	Marshy grassland and steppe, and on migration mudflats.	Insects, worms and snails, but also some plants, beetles, grasshoppers and other small insects during the breeding season.

## Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA

**Site area:** 1735.58 ha.

### Overview of site and its location

The Essex Estuaries SIP covers the Essex Estuaries SAC and five mid-Essex coast SPAs (Blackwater Estuary, Colne Estuary, Crouch and Roach Estuaries, Dengie and Foulness). The area is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. Sub-tidal areas have a rich invertebrate fauna and there are extensive intertidal mudflats and sandflats. Four different saltmarsh features of European importance are represented as well as large areas of grazing marsh. The site is one of the most important areas for overwintering waterbirds in the UK and is of international importance for several breeding bird species.

### Qualifying Features

Site regularly supports over winter:

- *Branta bernicla bernicla*, Dark-bellied brent goose; *Circus cyaneus*, Hen harrier.

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.
- The distribution of the qualifying features within the site.

## Pressures and threats

### *Coastal squeeze*

Coastal defences along much of the Essex coastline prevent intertidal habitats from shifting landward in response to rising sea levels. As a result, these habitats are being gradually degraded and reduced in extent, with knock-on effects on the waterbirds and other species they support. 'Managed realignment' schemes and additional intervention measures to create new areas of intertidal habitat and reduce erosion rates are being implemented but more will be needed to offset future losses. Grazing marshes in the SIP area are important for waterbirds and are also threatened by sea level rise because most are near or below mean high tide level, currently protected behind seawalls.

### *Public Access/Disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities - including boating and watersports, walking, bait-digging, fishing and wildfowling - as well as low-flying aircraft. Some activities, such as powerboating, may produce physical disturbance to habitats. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive.

### *Fisheries: Commercial marine and estuaries*

Commercial fishing activities categorised as Amber or Green under Defra's revised approach to commercial fisheries in EMSs are being assessed by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) to determine whether management is required. For activities categorised as Amber and Green these assessments should take account of any relevant in combination effects with other fishing activities. Shellfish dredging over subtidal habitats has been identified as an Amber activity and is considered a high priority for assessment and development of possible management for the site.

### *Planning permission: General*

Several of the issues affecting the Essex Estuaries and the management of disturbance effects on the sites are related to each other, and addressing them is likely to require an improved overview of the relative sensitivities of different habitats, species and locations to different types of development (perhaps summarised as sensitivity maps and matrices for the SIP area). Difficult issues include:

- Assessing the cumulative effects of numerous, small and often 'non-standard' developments
- Development outside the SPA/SAC boundaries can have negative impacts, particularly on the estuaries' birds
- Assessing the indirect, 'knock-on' effects of proposals
- Pressure to relax planning conditions on existing developments.

### *Changes in species distributions*

Declines in the numbers of some of the waterbird species using the Essex Estuaries SIP area may be due to changes in their distributions or population levels at a national or continental scale, possibly linked to climate change. For example, milder winters may be allowing birds to overwinter closer to their northern breeding grounds, or changes on the breeding grounds may be reducing breeding success. When assessing SPA condition, distinguishing these types of large-scale effect from effects produced by changes within the site itself is important.

### *Invasive species*

An increase in Pacific oyster *Crassostrea gigas* settlement and colonisation within the European Marine Site (EMS) may result in areas of foreshore being covered in such numbers as to make them difficult to access and utilise as feeding grounds for overwintering birds. The importance of Pacific oysters for the local shellfish industry is recognised, however we would not like to see an overall increase in the extent

of foreshore across the EMS populated by Pacific oysters. Other non-native invasive species such as the American whelk tingle *Urosalpinx cinerea* and Slipper limpet *Crepidula fornicata* are known to occupy subtidal muddy habitats, potentially impacting native communities through competition for resources and predation.

*Fisheries: Recreational marine and estuarine*

Recreational bait digging may impact waterbirds by reducing prey availability and creating disturbance in intertidal feeding areas. It could also damage the intertidal mudflats and sandflats and associated sub-features and communities, such as eelgrass beds. The extent of the activity and potential impacts on site features are not currently well understood.

*Fisheries: Commercial marine and estuarine*

Bottom towed fishing gear (i.e. any fishing instrument designed to take sea fisheries resources from the seabed) has been categorised as a 'Red' for the interest features listed, specifically the seagrass beds *Zostera* spp, a sub-feature of the SAC, as part of Defra's revised approach to commercial fisheries management in European Marine Sites (EMS). Appropriate management measures will be implemented and enforced by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) who have put in place the 'Bottom Towed Fishing Gear Byelaw' within the SAC to prohibit the above fishing gear being used over the majority of known seagrass beds.

*Fisheries: Commercial marine and estuarine*

Marine fisheries carried out under private rights, or under management defined in Several or Hybrid Orders, fall outside Defra's revised approach to commercial fisheries management in EMSs. A variety of fishing gears are used in these fisheries (e.g. Hydraulic and non-hydraulic dredging and shore based activities (e.g. shellfish collection)) which may be applying pressure to site features, including abrasion of the seabed, visual disturbance, and habitat structure changes. Potential impacts need to be better understood and assessed with potential management introduced if required.

*Invasive Species*

The invasive Common cord-grass *Spartina anglica* occurs widely within this site, as well as native Small cord-grass *Spartina maritima* in certain locations, and the site is designated for H1320 *Spartina* swards. There is a need to improve understanding of the dynamics of *S.anglica* on the site in order to determine if changes in the species' distribution adversely affect other species and habitats, including feeding and roosting areas of SPA bird species.

*Air Pollution: risk of atmospheric nitrogen deposition*

Atmospheric nitrogen deposition exceeds the relevant critical loads for coastal dune habitats used by breeding terns and hence there is a risk of harmful effects. However, on the Essex estuaries declines in the numbers of breeding terns appear to be due mainly to erosion of a man-made cockle-shingle bank (at Foulness) and to disturbance (elsewhere), rather than to over-vegetation of breeding areas caused by nitrogen deposition.

**Non-qualifying habitats and species upon which the qualifying habitats and/or species depend**

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Dark-bellied brent goose <i>Branta bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.

Species	Habitat Preference	Diet
<i>bernicla</i>		
Hen harrier <i>Circus cyaneus</i>	Moor, marsh, steppe and fields.	Mainly small birds and mammals.

## Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar site

**Site area:** 1735.58 ha.

### Overview of site and its location

As for Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA above.

### Qualifying Features

Supports an appreciable assemblage of rare, vulnerable or endangered including 13 nationally scarce plant species:

- slender hare's ear, *Bupleurum tenuissimum*; divided sedge, *Carex divisa*; sea barley, *Hordeum marinum*; golden-samphire, *Inula crithmoides*; laxflowered sea-lavender, *Limonium humile*; curved hard-grass, *Parapholis incurva*; Borrer's saltmarsh grass, *Puccinellia fasciculata*; stiff saltmarsh grass, *Puccinellia rupestris*; spiral tasselweed, *Ruppia cirrhosa*; one-flowered glasswort, *Salicornia pusilla*; small cord-grass, *Spartina maritime*; shrubby seablight, *Suaeda vera*; sea clover, *Trifolium squamosum*.

Several important invertebrate species also present including

- scarce emerald damselfly, *Lestes dryas*; the shorefly, *Parydroptera discomyzina*; the rare soldier fly, *Stratiomys singularior*; the large horsefly, *Hybomitra expollicata*; beetles *Graptodytes bilineatus*, *Malachius vulneratus*; the ground lackey moth, *Malacosoma castrensis* and *Eucosoma catoprana*.

Also supports the following internationally important waterbird assemblage:

- Dark-bellied brent goose, *Branta bernicla* Bernicla.

### Conservation objectives

None available.

### Pressures and threats

As for Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

#### Plants

Plant communities are reliant on the coastal habitats within the Ramsar site. These habitats are dependent on a range of coastal factors and processes, including salinity, sedimentation, sea level, turbidity and elevation.

#### Invertebrates

These species are reliant on the coastal habitat and characteristic flora and fauna that are present within the European site. Key sources of food range from flowering plants, organic matter and other invertebrate species.

#### Birds

Refer to Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA above.

## Essex Estuaries SAC

**Site area:** 46140.82 ha.

### Overview of site and its location

The Essex Estuaries SIP covers the Essex Estuaries SAC and five mid-Essex coast SPAs (Blackwater Estuary, Colne Estuary, Crouch and Roach Estuaries, Dengie and Foulness). The area is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. Sub-tidal areas have a rich invertebrate fauna and there are extensive intertidal mudflats and sandflats. Four different saltmarsh features of European importance are represented as well as large areas of grazing marsh. The site is one of the most important areas for overwintering waterbirds in the UK and is of international importance for several breeding bird species.

### Qualifying Features

Annex 1 habitats that are a primary reason for selection of this site:

- Estuaries.
- Mudflats and sandflats not covered by seawater at low tide.
- Salicornia and other animals colonising mud and sand.
- Spartina swards (*Spartinion maritimae*).
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).
- Mediterranean and thermo-Atlantic halophilous scrubs.

Annex 1 habitats present as a qualifying feature:

- Sandbanks which are slightly covered by seawater all the time.

### Conservation objectives

With regard to the SAC and the natural habitats and/or species for which the site has been designated, 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.
- The supporting processes on which qualifying natural habitats rely.

### Pressures and threats

#### *Coastal squeeze*

Coastal defences along much of the Essex coastline prevent intertidal habitats from shifting landward in response to rising sea levels. As a result, these habitats are being gradually degraded and reduced in extent, with knock-on effects on the waterbirds and other species they support. 'Managed realignment' schemes and additional intervention measures to create new areas of intertidal habitat and reduce erosion rates are being implemented but more will be needed to offset future losses. Grazing marshes in the SIP area are important for waterbirds and are also threatened by sea level rise because most are near or below mean high tide level, currently protected behind seawalls.

#### *Public Access/Disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities - including boating and watersports, walking, bait-digging, fishing and wildfowling - as well as low-flying aircraft. Some activities, such as powerboating, may produce physical disturbance to habitats. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a

better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive.

#### *Fisheries: Commercial marine and estuaries*

Commercial fishing activities categorised as Amber or Green under Defra's revised approach to commercial fisheries in EMSs are being assessed by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) to determine whether management is required. For activities categorised as Amber and Green these assessments should take account of any relevant in combination effects with other fishing activities. Shellfish dredging over subtidal habitats has been identified as an Amber activity and is considered a high priority for assessment and development of possible management for the site.

#### *Planning permission: General*

Several of the issues affecting the Essex Estuaries and the management of disturbance effects on the sites are related to each other, and addressing them is likely to require an improved overview of the relative sensitivities of different habitats, species and locations to different types of development (perhaps summarised as sensitivity maps and matrices for the SIP area). Difficult issues include:

- (a) Assessing the cumulative effects of numerous, small and often 'non-standard' developments
- (b) Development outside the SPA/SAC boundaries can have negative impacts, particularly on the estuaries' birds
- (c) Assessing the indirect, 'knock-on' effects of proposals
- (d) Pressure to relax planning conditions on existing developments.

#### *Changes in species distributions*

Declines in the numbers of some of the waterbird species using the Essex Estuaries SIP area may be due to changes in their distributions or population levels at a national or continental scale, possibly linked to climate change. For example, milder winters may be allowing birds to overwinter closer to their northern breeding grounds, or changes on the breeding grounds may be reducing breeding success. When assessing SPA condition, distinguishing these types of large-scale effect from effects produced by changes within the site itself is important.

#### *Invasive species*

An increase in Pacific oyster *Crassostrea gigas* settlement and colonisation within the European Marine Site (EMS) may result in areas of foreshore being covered in such numbers as to make them difficult to access and utilise as feeding grounds for overwintering birds. The importance of Pacific oysters for the local shellfish industry is recognised, however we would not like to see an overall increase in the extent of foreshore across the EMS populated by Pacific oysters. Other non-native invasive species such as the American whelk tingle *Urosalpinx cinerea* and Slipper limpet *Crepidula fornicata* are known to occupy subtidal muddy habitats, potentially impacting native communities through competition for resources and predation.

#### *Fisheries: Recreational marine and estuarine*

Recreational bait digging may impact waterbirds by reducing prey availability and creating disturbance in intertidal feeding areas. It could also damage the intertidal mudflats and sandflats and associated sub-features and communities, such as eelgrass beds. The extent of the activity and potential impacts on site features are not currently well understood.

#### *Fisheries: Commercial marine and estuarine*

Bottom towed fishing gear (i.e. any fishing instrument designed to take sea fisheries resources from the seabed) has been categorised as a 'Red' for the interest features listed, specifically the seagrass beds *Zostera* spp, a sub-feature of the SAC, as part of Defra's revised approach to commercial fisheries management in European Marine Sites (EMS). Appropriate management measures will be implemented and enforced by Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) who have put in place the 'Bottom Towed Fishing Gear Byelaw' within the SAC to prohibit the above fishing gear being used over the majority of known seagrass beds.

#### *Fisheries: Commercial marine and estuarine*

Marine fisheries carried out under private rights, or under management defined in Several or Hybrid Orders, fall outside Defra's revised approach to commercial fisheries management in EMSs. A variety of fishing gears are used in these fisheries (e.g. Hydraulic and non hydraulic dredging and shore based

activities (e.g. shellfish collection)) which may be applying pressure to site features, including abrasion of the seabed, visual disturbance, and habitat structure changes. Potential impacts need to be better understood and assessed with potential management introduced if required.

#### *Invasive Species*

The invasive Common cord-grass *Spartina anglica* occurs widely within this site, as well as native Small cord-grass *Spartina maritima* in certain locations, and the site is designated for H1320 *Spartina* swards. There is a need to improve understanding of the dynamics of *S.anglica* on the site in order to determine if changes in the species' distribution adversely affect other species and habitats, including feeding and roosting areas of SPA bird species.

#### *Air Pollution: risk of atmospheric nitrogen deposition*

Atmospheric nitrogen deposition exceeds the relevant critical loads for coastal dune habitats used by breeding terns and hence there is a risk of harmful effects. However, on the Essex estuaries declines in the numbers of breeding terns appear to be due mainly to erosion of a man-made cockle-shingle bank (at Foulness) and to disturbance (elsewhere), rather than to over-vegetation of breeding areas caused by nitrogen deposition.

### **Non-qualifying habitats and species upon which the qualifying habitats and/or species depend**

#### *Habitat*

The qualifying habitats of the SAC are reliant a range of coastal factors, including salinity, sedimentation, tide, sea level, turbidity and elevation, which influence the interdependent intertidal, subtidal and terrestrial habitats. These factors influence the complex interdependent intertidal, subtidal and terrestrial habitats present along the coast.

Additional factors are provided below for each habitat (where relevant).

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

- Reef-building species such as *Sabellaria spinulosa* help to stabilise the sediment, allowing the colonisation of sessile animals.

## **Hamford Water SPA**

**Site area:** 2187.21 ha.

### **Overview of site and its location**

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarshes. The flats are a small, locally sheltered area of medium to low level clay and silt flats. In places, particularly on the seaward side, the London Clay bedrock is exposed, and this area with soft recent muds provides contrasting substrates for inter-tidal algae and invertebrates. The saltmarsh fringe is of varying width outside the sea wall around most of Hamford Water, and the islands, notably Horsey, Skippers, Hedge-End and Garnham's, have substantial saltmarsh on their margins or, locally, within their breached sea walls. Above the saltmarsh there is unimproved and improved grassland (including grazing marsh), scrub, woodland, hedges, ditches, ponds and reedbeds. The site is important for several internationally important populations of overwintering and breeding waterfowl (SPA) as well as being the most important area for Fisher's estuarine moth *Gortyna borelii lunata* in the United Kingdom (cSAC)

### **Qualifying Features**

Annex I species present as a qualifying feature:

During the breeding season:

- Little Tern, *Sterna albifrons*.

Over winter:

- Avocet, *Recurvirostra avosetta*; Golden Plover, *Pluvialis apricaria*; Ruff, *Philomachus pugnax*.

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

- On passage: Ringed Plover, *Charadrius hiaticula*
- Over winter: Black-tailed Godwit, *Limosa limosa islandica*; Dark-bellied Brent Goose *Branta bernicla bernicla*; Grey Plover, *Pluvialis squatarola*; Ringed Plover, *Charadrius hiaticula*; Teal, *Anas crecca*; Common shelduck, *Tadorna tadorna*; Common redshank, *Tringa tetanus*.

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

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

### Pressures and threats

#### *Coastal Squeeze*

Areas of intertidal saltmarsh, mudflats, sand and shingle used by overwintering and breeding birds for feeding, roosting and/or nesting are under threat from coastal squeeze. The consequences of climate change, including sea level rise and an increased frequency in coastal storms and tidal surges, are likely to be contributing factors in coastal squeeze. Tectonic subsidence along the east coast of England and hard sea defences are also likely to exacerbate the issue.

#### *Inappropriate scrub control*

Scrub encroachment results in a loss of habitat for Fisher's Estuarine Moth, as the moth's larval foodplant (Hog's Fennel) is a species of open grassland. Although there are plans in place for scrub reduction/control in several areas, more action is likely to be needed to get/keep it under control.

#### *Changes in species distributions*

The decline in numbers of some species of bird in Hamford Water may be related to international changes in distribution and/or population levels related to climate change. This includes climatic variables and habitat quality issues at breeding grounds outside of the UK

#### *Public Access/Disturbance*

There is some unauthorised public access on foot, from boats and by quad bike/motorbike to sensitive localised areas in Hamford Water.

#### *Air Pollution: risk of atmospheric nitrogen deposition*

Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. This requires further investigation.

#### *Fisheries: Commercial marine and estuarine*

Commercial fishing activities categorised as 'amber or green' under Defra's revised approach to commercial fisheries in European Marine Sites require assessment and (where appropriate) management. This assessment will be undertaken by Kent and Essex Inshore Fisheries Conservation Authority (IFCA). For activities categorised as 'green', these assessments should take account of any in-combination effects of amber activities, and/or appropriate plans or projects, in the site.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Little Tern, <i>Sterna albifrons</i>	Seacoasts, rivers and lakes.	Small fish and invertebrates.
Avocet <i>Recurvirostra avosetta</i>	Mudflats, lagoons and sandy beaches.	Aquatic insects and their larvae, crustaceans and worms.
European golden plover <i>Pluvialis apricaria</i>	Tundra, wet moor, on migration pasture and estuaries.	Worms, beetles and insects.
Ruff <i>Philomachus pugnax</i>	Grassy tundra, lakes, farmland, on migration mudflat.	Invertebrates, especially insects, and some plant material (especially in winter).
Ringed Plover <i>Charadrius hiaticula</i>	Sandy areas with low vegetation, and on migration estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Black-tailed Godwit, <i>Limosa limosa islandica</i>	Marshy grassland and steppe, and on migration mudflats.	Insects, worms and snails, but also some plants, beetles, grasshoppers and other small insects during the breeding season.
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Grey Plover, <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Teal, <i>Anas crecca</i>	Lakes, marshes, ponds & shallow streams.	Seeds and small invertebrates.
Common shelduck, <i>Tadorna tadorna</i>	Coasts, estuaries and lakes.	Mostly invertebrates, especially insects, molluscs and crustaceans.
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).

## Hamford Water Ramsar site

**Site area:** 2187.21 ha.

### Overview of site and its location

As for Hamford Water SPA above.

### Qualifying Features

Species/populations with peak counts in spring/autumn:

- Ringed plover, *Charadrius hiaticula*; Common redshank, *Tringa totanus tetanus*.

Species/populations with peak counts in winter:

- Dark-bellied brent goose, *Branta bernicla bernicla*; Black-tailed godwit, *Limosa limosa islandica*.

Species/populations identified subsequent to designation for possible future consideration under criterion 6:

- Grey plover, *Pluvialis squatarola*

### Conservation objectives

None available.

### Pressures and threats

As for Hamford Water SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

Refer to Hamford Water SPA above.

## Medway Estuary and Marshes SPA

**Site area:** 4684.36 ha.

### Overview of site and its location

The Greater Thames Complex consists of the Thames Estuary and Marshes SPA, the Medway Estuary SPA, the Swale SPA and Benfleet & Southend Marshes SPA. The Medway Estuary feeds into and lies on the south side of the outer Thames Estuary in Kent, south-east England. It forms a single tidal system with the Swale and joins the Thames Estuary between the Isle of Grain and the Isle of Sheppey. The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland and joins the Medway to the west. Benfleet and Southend Marshes is an estuarine area on the Essex side of the Thames Estuary. These four sites contain a wide diversity of coastal habitats, such as grazing marsh, saltmarsh and mud/sandflat and eelgrass beds that support important numbers of waterbirds throughout the year. Wintering birds that use these estuaries include grebes, geese, ducks and waders whilst in summer breeding birds can be found, such as waders and terns. The area is also important for spring and autumn migration periods.

### Qualifying Features

Supports the following Waterbird assemblage/breeding bird assemblage:

- *Branta bernicla bernicla*, Dark-bellied brent goose (Non-breeding); *Tadorna tadorna*, Common shelduck (Non-breeding); *Anas acuta*, Northern pintail (Non-breeding); *Recurvirostra avosetta*, Pied avocet (Breeding); *Recurvirostra avosetta*, Pied avocet (Non-breeding); *Charadrius hiaticula*, Ringed plover (Non-breeding); *Pluvialis squatarola*, Grey plover (Non-breeding); *Calidris canutus*, Red knot (Non-breeding); *Calidris alpina alpina*, Dunlin (Non-breeding); *Tringa tetanus*, Common redshank (Non-breeding); *Sterna albifrons*, Little tern (Breeding).

Additional Qualifying Features Identified by the 2001 UK SPA Review:

- *Limosa limosa islandica*, Black-tailed godwit (Non-breeding).

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

### Pressures and threats

#### *Coastal squeeze*

Coastal defences exist along much of the coastline here. Sea level rise is also occurring. It is therefore certain that if circumstances do not change, much of the supporting habitats of the SPA birds will be lost/degraded through processes such as: coastal squeeze; sedimentation rates' inability to keep pace with sea level rise; and reduced exposure (the extent and duration) of mudflats and sandflats.

#### *Public access/disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities, including: boating and watersports; walking; bait-digging; fishing, and wildfowling. Some activities such as powerboating, may produce physical disturbance to habitats. Public access, (especially dog walking and recreational boating) was identified as a medium risk during the 2009 EMS risk review project and this activity is still occurring. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive. There is inadequate information to provide appropriate management.

#### *Invasive species*

Non-native invasive species such as sea squirt and pacific oyster are spreading along the Kent coast and could begin to impact on the Swale. Sea squirt has been found in the Medway, and Pacific oysters are regarded as increasing in the Essex-Southend area. These species threaten habitats due to their ability to smother substrate and other sessile organisms. There is no good understanding of the overall distribution of these species in this site. Assessment is needed in key areas of ports and marinas, where introductions tend to first occur.

#### *Changes in species distributions*

There is a decline in population size for some of the bird species on some of the SPAs<sup>8</sup>. These are likely to be influenced by a number of factors which may vary across the four SPAs. Some of these influences are site-based as described in other parts of this Plan and some relate to wider, broad-scale changes such as wintering species distributions and effects from breeding grounds outside the UK. A greater understanding of the relative importance of site-based and wider influences is required in order to identify the potential for further actions that might halt declines, restore populations or identify scenarios where it is thought unlikely that site-based measures will reverse population declines.

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<sup>8</sup> Cook A.S.C.P., Barimore C., Holt C.A., Read W.J. & Austin G.E. 2013. Wetland Bird Survey Alerts 2009/2010: Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 641. BTO, Thetford.

### Fisheries: Commercial marine and estuarine

The extent and impacts of fisheries on private grounds, particularly in the Swale Estuary, needs to be better understood. There are particular concerns regarding the dredging of shellfish within the SPAs which are a food source for the protected birds.

### Invasive Species

Freshwater non-native invasive species such as pennywort, crassula, parrots feather etc. can engulf ditches, leading to loss of habitat for diving ducks. Although there are some mechanisms in place to ensure ditch management, more baseline information is needed, particularly on those species for which ditch management is not the solution

### Invasive Species

*Spartina anglica* may be increasing at the expense of other saltmarsh habitats with adverse implications for SPA bird roost areas in Benfleet & Southend Marshes.

### Vehicles: illicit

The illicit use of motor vehicles (often bikes) occurs across the area. This can cause disturbance to SPA birds. This activity was identified as a medium risk during the 2009 EMS risk review project and is still occurring. Whilst various mechanisms are in place to prevent the use of vehicles they are clearly not entirely effective.

### Fisheries: Commercial marine and estuarine

Commercial fishing activities categorised as 'amber or green' under Defra's revised approach to commercial fisheries in European Marine Sites require assessment and (where appropriate) management. This assessment will be undertaken by Kent & Essex IFCA. For activities categorised as 'green', these assessments should take account of any in-combination effects of amber activities, and/or appropriate plans or projects, in the site

### Air Pollution: risk of atmospheric nitrogen deposition

Nitrogen deposition exceeds site-relevant critical loads.

## Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Common shelduck, <i>Tadorna tadorna</i>	Coasts, estuaries and lakes.	Mostly invertebrates, especially insects, molluscs and crustaceans.
Northern pintail <i>Anas acuta</i>	Lakes, rivers, marsh & tundra	A variety of plants and invertebrates.
Avocet <i>Recurvirostra</i>	Mudflats, lagoons and sandy beaches.	Aquatic insects and their larvae, crustaceans and worms.

Species	Habitat Preference	Diet
<i>avosetta</i>		
Ringed Plover <i>Charadrius hiaticula</i>	Sandy areas with low vegetation, and on migration estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Grey Plover, <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Red knot <i>Calidris canutus islandica</i>	Tundra, and on migration coastal habitat.	In summer, insects and plant material, and in winter inter-tidal invertebrates, esp molluscs.
Dunlin <i>Calidris alpina alpina</i>	Tundra, moor, heath, and on migration estuaries and coastal habitat.	Insects, snails and worms.
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).
Little Tern, <i>Sterna albifrons</i>	Seacoasts, rivers and lakes.	Small fish and invertebrates.
Black-tailed Godwit, <i>Limosa limosa islandica</i>	Marshy grassland and steppe, and on migration mudflats.	Insects, worms and snails, but also some plants, beetles, grasshoppers and other small insects during the breeding season.

## Medway Estuary and Marshes Ramsar site

**Site area:** 4684.36 ha.

### Overview of site and its location

As for Medway Estuary and Marshes SPA above.

### Qualifying Features

Site holds several nationally scarce plants, including

- sea barley *Hordeum marinum*; curved hard-grass, *Parapholis incurve*; annual beard-grass, *Polypogon monspeliensis*; Borrer's saltmarsh-grass *Puccinellia fasciculata*; slender hare`s-ear *Bupleurum tenuissimum*; sea clover *Trifolium squamosum*; saltmarsh goose-foot *Chenopodium chenopodioides*; golden samphire *Inula crithmoides*; perennial glasswort *Sarcocornia perennis*; and one-flowered glasswort *Salicornia pusilla*.

A total of at least twelve British Red Data Book species of wetland invertebrates have been recorded on the site including

- ground beetle *Polistichus connexus*; a fly *Cephalops perspicuus*; a dancefly *Poecilobothrus ducalis*; a fly *Anagnota collini*; a weevil *Baris scolopacea*; a water beetle *Berosus spinosus*; a beetle *Malachius vulneratus*; a rove beetle *Philonthus punctus*; the ground lackey moth *Malacosoma castrensis*; a horsefly *Atylotus latistriatus*; a fly *Campsicnemus magius*; a soldier beetle; *Cantharis fusca*; a crane fly *Limonia danica*.

A significant number of non-wetland British Red Data Book species also occur.

The Site also supports the following internationally important waterbird assemblage:

- Grey plover, *Pluvialis squatarola*; Common redshank, *Tringa totanus totanus*; Dark-bellied brent goose, *Branta bernicla bernicla*; Common shelduck, *Tadorna tadorna*; Northern pintail, *Anas acuta*; Ringed plover, *Charadrius hiaticula*; Red knot *Calidris canutus islandica*; Dunlin *Calidris alpina alpina*

Species/populations identified subsequent to designation for possible future consideration under criterion 6:

- Black-tailed godwit, *Limosa limosa islandica*.

### Conservation objectives

None available.

### Pressures and threats

As for Medway Estuary and Marshes SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

#### *Plants*

Plant communities are reliant on the coastal habitats within the Ramsar site. These habitats are dependent on a range of coastal factors and processes, including salinity, sedimentation, sea level, turbidity and elevation.

#### *Invertebrates*

These species are reliant on the saltmarsh habitat and characteristic flora and fauna present within the European site. Key sources of food range from flowering plants, organic matter and other invertebrate species.

#### *Birds*

Refer to Medway Estuary and Marshes SPA above.

## Stour and Orwell Estuaries SPA

**Site area:** 3676.92 ha.

### Overview of site and its location

The Stour and Orwell estuaries straddle the eastern part of the Essex/Suffolk border. The estuaries include extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes areas of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell and at Cattawade Marshes at the head of the Stour. In summer, the site supports important numbers of breeding Avocet *Recurvirostra avosetta*, while in winter it holds major concentrations of waterbirds, especially geese, ducks and waders.

### Qualifying Features

Annex I species:

- Over winter: Hen Harrier, *Circus cyaneus*

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

- Over winter: Black-tailed Godwit, *Limosa limosa islandica*; Dunlin, *Calidris alpina alpina*; Grey Plover, *Pluvialis squatarola*; Pintail, *Anas acuta*; Redshank, *Tringa tetanus*; Ringed Plover, *Charadrius hiaticula*; Shelduck, *Tadorna tadorna*; Turnstone, *Arenaria interpres*

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

- Cormorant, *Phalacrocorax carbo*; Pintail, *Anas acuta*; Ringed Plover, *Charadrius hiaticula*; Grey Plover, *Pluvialis squatarola*; Dunlin, *Calidris alpina alpina*; Black-tailed Godwit, *Limosa limosa islandica*; Redshank, *Tringa tetanus*; Shelduck, *Tadorna tadorna*; Great Crested Grebe, *Podiceps cristatus*; Curlew, *Numenius arquata*; Dark-bellied Brent Goose, *Branta bernicla bernicla*; Wigeon, *Anas Penelope*; Goldeneye, *Bucephala clangula*; Oystercatcher, *Haematopus ostralegus*; Lapwing, *Vanellus vanellus*; Knot, *Calidris canutus*; Turnstone, *Arenaria interpres*.

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

### Pressures and threats

#### *Coastal squeeze*

Coastal defences exist along much of the Orwell coastline. Sea level rise is also occurring. It is therefore certain, that if circumstances do not change, much of the supporting habitats of the SPA birds will be lost/degraded through processes such as coastal squeeze; sedimentation rates inability to keep pace with sea level rise; and reduced exposure (extent and duration) of mudflats/sandflats. Seawalls afford little scope for natural adaption to sea level rise.

#### *Public access/disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities, including: boating and watersports; walking; bait-digging; fishing; wildfowling, and military overflight training. Some activities, such as powerboating, may produce physical disturbance to habitats. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. A better understanding will be required of: which species and habitats are most susceptible; which types of activity are most disturbing; and which locations and times of year are most sensitive in order to manage change, with intervention as necessary in order to minimise the risks of disturbance impacts.

#### *Changes in species distributions*

Numbers of some species of birds are declining on the Stour and Orwell Estuaries. This may be related to international changes in distribution and/or population levels related to climate change. This includes climatic variables and habitat quality issues at breeding grounds outside of the UK.

#### *Invasive species*

The growth in *Spartina anglica* may be impacting on *Spartina maritima* (part of the supporting habitat feature), adversely impacting on bird roosting and feeding areas of saltmarsh and mudflat.

#### *Planning Permission: general*

Several of the issues affecting the Stour and Orwell Estuaries and the management of disturbance effects on the sites are related to each other. Addressing them is likely to require an improved overview of the relative sensitivities of different habitats, species and locations to different types of development (perhaps summarised as sensitivity maps and matrices for the SIP area). Difficult issues include; a) Assessing the cumulative effects of numerous, small and often 'non-standard' developments. b) Development outside the SPA boundary can have negative impacts, particularly on the estuaries' birds. c)

Assessing the indirect, 'knock-on' effects of proposals. d) Pressure to relax planning conditions on existing developments.

*Air Pollution: impact of atmospheric nitrogen deposition*

Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. This requires further investigation.

*Inappropriate coastal management*

Freshwater habitat areas behind failing seawall walls could be inundated by seawater which would remove this habitat from the site

*Fisheries: Commercial marine and estuarine*

Commercial fishing activities categorised as 'amber or green' under Defra's revised approach to commercial fisheries in European Marine Sites (EMS) require assessment and (where appropriate) management. This assessment will be undertaken by Kent & Essex IFCA and Eastern IFCA. For activities categorised as 'green', these assessments should take account of any in-combination effects of amber activities, and/or appropriate plans or projects, in the site.

**Non-qualifying habitats and species upon which the qualifying habitats and/or species depend**

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Hen harrier <i>Circus cyaneus</i>	Moor, marsh, steppe and fields.	Mainly small birds and mammals.
Black-tailed Godwit, <i>Limosa limosa islandica</i>	Marshy grassland and steppe, and on migration mudflats.	Insects, worms and snails, but also some plants, beetles, grasshoppers and other small insects during the breeding season.
Dunlin <i>Calidris alpina alpina</i>	Tundra, moor, heath, and on migration estuaries and coastal habitat.	Insects, snails and worms.
Grey Plover, <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Northern pintail <i>Anas acuta</i>	Lakes, rivers, marsh & tundra	A variety of plants and invertebrates.
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).
Ringed Plover <i>Charadrius hiaticula</i>	Sandy areas with low vegetation, and on migration estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Common shelduck,	Coasts, estuaries and lakes.	Mostly invertebrates, especially insects,

Species	Habitat Preference	Diet
<i>Tadorna tadorna</i>		molluscs and crustaceans.
Turnstone, <i>Arenaria interpres</i>	On migration beaches and rocky coasts.	Insects, crustaceans and molluscs.
Cormorant, <i>Phalacrocorax carbo</i>	Larger lakes and coastal.	Fish.
Great Crested Grebe, <i>Podiceps cristatus</i>	Reed-bordered lakes, gravel pits, reservoirs and rivers.  In the winter, they are also found along the coast.	Mostly fish, some aquatic invertebrates especially in summer.
Curlew, <i>Numenius arquata</i>	Marsh, grassland and on migration mudflats.	Worms, shellfish and shrimps.
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	Tundra, and on migration marshes and estuaries.	Vegetation, especially eel-grass.
Wigeon, <i>Anas Penelope</i>	Marsh, lakes, open moor, on migration estuaries.	Mostly leaves, shoots, rhizomes and some seeds.
Goldeneye, <i>Bucephala clangula</i>	Lakes, rivers, and on migration seacoasts.	Insects, molluscs and crustaceans.
Oystercatcher, <i>Haematopus ostralegus</i>	Sandy, muddy and rocky beaches.	Mussels and cockles on the coast, mainly worms inland.
Lapwing, <i>Vanellus vanellus</i>	Pasture, arable land, wet meadow, on migration estuaries	Worms and insects.
Red knot <i>Calidris canutus islandica</i>	Tundra, and on migration coastal habitat.	In summer, insects and plant material, and in winter inter-tidal invertebrates, esp molluscs.
Knot, <i>Calidris canutus</i>	Coastal habitat.	Insects and plant material during the summer; and inter-tidal invertebrates, especially molluscs during the winter.

## Stour and Orwell Estuaries Ramsar site

**Site area:** 3676.92 ha.

### Overview of site and its location

As for Stour and Orwell Estuaries SPA above.

### Qualifying Features

Species/populations with peak counts in spring/autumn:

- Ringed plover, *Charadrius hiaticula*; Common redshank, *Tringa totanus tetanus*.

Species/populations with peak counts in winter:

- Dark-bellied brent goose, *Branta bernicla bernicla*; Black-tailed godwit, *Limosa limosa islandica*

Species/populations identified subsequent to designation for possible future consideration under criterion 6:

- Grey plover, *Pluvialis squatarola*

### Conservation objectives

None available.

### Pressures and threats

As for Stour and Orwell Estuaries SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

Refer to Stour and Orwell Estuaries SPA above.

## Thames Estuary and Marshes SPA

**Site area:** 4838.94 ha.

### Overview of site and its location

The Greater Thames Complex consists of the Thames Estuary and Marshes SPA, the Medway Estuary SPA, the Swale SPA and Benfleet & Southend Marshes SPA. The Medway Estuary feeds into and lies on the south side of the outer Thames Estuary in Kent, south-east England. It forms a single tidal system with the Swale and joins the Thames Estuary between the Isle of Grain and the Isle of Sheppey. The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland and joins the Medway to the west. Benfleet and Southend Marshes is an estuarine area on the Essex side of the Thames Estuary. These four sites contain a wide diversity of coastal habitats, such as grazing marsh, saltmarsh and mud/sandflat and eelgrass beds that support important numbers of waterbirds throughout the year. Wintering birds that use these estuaries include grebes, geese, ducks and waders whilst in summer breeding birds can be found, such as waders and terns. The area is also important for spring and autumn migration periods.

### Qualifying Features

Supports the following internationally important waterbird assemblage:

- *Circus cyaneus*, Hen harrier (Non-breeding); *Recurvirostra avosetta*, Pied avocet (Non-breeding); *Charadrius hiaticula*, Ringed plover (Non-breeding); *Pluvialis squatarola*, Grey plover (Non-breeding); *Calidris canutus*, Red knot (Non-breeding); *Calidris alpina alpina*, Dunlin (Non-breeding); *Limosa limosa islandica*, Black-tailed godwit (Non-breeding); *Tringa tetanus*, Common redshank (Non-breeding).

### Conservation objectives

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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.

## Pressures and threats

### *Coastal squeeze*

Coastal defences exist along much of the coastline here. Sea level rise is also occurring. It is therefore certain that if circumstances do not change, much of the supporting habitats of the SPA birds will be lost/degraded through processes such as: coastal squeeze; sedimentation rates' inability to keep pace with sea level rise; and reduced exposure (the extent and duration) of mudflats and sandflats.

### *Public access/disturbance*

Breeding and overwintering waterbirds are susceptible to human disturbance from a range of land- and water-based activities, including: boating and watersports; walking; bait-digging; fishing, and wildfowling. Some activities such as powerboating, may produce physical disturbance to habitats. Public access, (especially dog walking and recreational boating) was identified as a medium risk during the 2009 EMS risk review project and this activity is still occurring. Moderate levels of disturbance in less sensitive locations may have no significant effect on the numbers of birds using the SIP area but the types, levels and locations of potentially disturbing activities are constantly changing. Managing the changes to minimise the risk of disturbance impacts will require a better understanding of which species and habitats are most susceptible, which types of activity are most disturbing, and which locations and times of year are most sensitive. There is inadequate information to provide appropriate management.

### *Invasive species*

Non-native invasive species such as sea squirt and pacific oyster are spreading along the Kent coast and could begin to impact on the Swale. Sea squirt has been found in the Medway, and Pacific oysters are regarded as increasing in the Essex-Southend area. These species threaten habitats due to their ability to smother substrate and other sessile organisms. There is no good understanding of the overall distribution of these species in this site. Assessment is needed in key areas of ports and marinas, where introductions tend to first occur.

### *Changes in species distributions*

There is a decline in population size for some of the bird species on some of the SPAs (Cook et al. 2013\*). These are likely to be influenced by a number of factors which may vary across the four SPAs. Some of these influences are site-based as described in other parts of this Plan and some relate to wider, broad-scale changes such as wintering species distributions and effects from breeding grounds outside the UK. A greater understanding of the relative importance of site-based and wider influences is required in order to identify the potential for further actions that might halt declines, restore populations or identify scenarios where it is thought unlikely that site-based measures will reverse population declines.

\*Cook A.S.C.P., Barimore C., Holt C.A., Read W.J. & Austin G.E. 2013. Wetland Bird Survey Alerts 2009/2010: Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 641. BTO, Thetford.

### *Fisheries: Commercial marine and estuarine*

The extent and impacts of fisheries on private grounds, particularly in the Swale Estuary, needs to be better understood. There are particular concerns regarding the dredging of shellfish within the SPAs which are a food source for the protected birds.

### *Invasive Species*

Freshwater non-native invasive species such as pennywort, crassula, parrots feather etc. can engulf ditches, leading to loss of habitat for diving ducks. Although there are some mechanisms in place to ensure ditch management, more baseline information is needed, particularly on those species for which ditch management is not the solution

### Invasive Species

*Spartina anglica* may be increasing at the expense of other saltmarsh habitats with adverse implications for SPA bird roost areas in Benfleet & Southend Marshes.

### Vehicles: illicit

The illicit use of motor vehicles (often bikes) occurs across the area. This can cause disturbance to SPA birds. This activity was identified as a medium risk during the 2009 EMS risk review project and is still occurring. Whilst various mechanisms are in place to prevent the use of vehicles they are clearly not entirely effective.

### Fisheries: Commercial marine and estuarine

Commercial fishing activities categorised as 'amber or green' under Defra's revised approach to commercial fisheries in European Marine Sites require assessment and (where appropriate) management. This assessment will be undertaken by Kent & Essex IFCA. For activities categorised as 'green', these assessments should take account of any in-combination effects of amber activities, and/or appropriate plans or projects, in the site

### Air Pollution: risk of atmospheric nitrogen deposition

Nitrogen deposition exceeds site-relevant critical loads.

- *Tringa tetanus*, Common redshank (Non-breeding).

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

In general, the qualifying bird species of the SPA rely on:

- The sites ecosystem as a whole (see list of habitats below).
- Maintenance of populations of species that they feed on (see list of diets below).
- Off-site habitat, which provide foraging habitat for these species.
- Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat.

A summary of each species preferences and diet have been provided below.

Species	Habitat Preference	Diet
Hen harrier <i>Circus cyaneus</i>	Moor, marsh, steppe and fields.	Mainly small birds and mammals.
Avocet <i>Recurvirostra avosetta</i>	Mudflats, lagoons and sandy beaches.	Aquatic insects and their larvae, crustaceans and worms.
Ringed Plover <i>Charadrius hiaticula</i>	Sandy areas with low vegetation, and on migration estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Grey Plover, <i>Pluvialis squatarola</i>	Tundra, and on migration pasture and estuaries.	In summer, invertebrates and in winter primarily marine worms, crustaceans and molluscs.
Red knot <i>Calidris canutus islandica</i>	Tundra, and on migration coastal habitat.	In summer, insects and plant material, and in winter inter-tidal invertebrates, esp molluscs.
Dunlin <i>Calidris alpina alpina</i>	Tundra, moor, heath, and on migration estuaries and coastal habitat.	Insects, snails and worms.
Black-tailed Godwit, <i>Limosa</i>	Marshy grassland and steppe, and on	Insects, worms and snails, but also some plants, beetles, grasshoppers and other

Species	Habitat Preference	Diet
<i>limosa islandica</i>	migration mudflats.	small insects during the breeding season.
Common redshank <i>Tringa totanus</i>	Rivers, wet grassland, moors and estuaries.	Invertebrates, especially earthworms, crane fly larvae (inland) crustaceans, molluscs, marine worms (estuaries).

## Thames Estuary and Marshes Ramsar site

**Site area:** 4,838.94 ha.

### Overview of site and its location

As for Thames Estuary and Marshes SPA above.

### Qualifying Features

The site supports one endangered plant species and at least 14 nationally scarce plants of wetland habitats.

The site also supports more than 20 British Red Data Book invertebrates. Assemblages of international importance 45118 waterfowl including the following species:

- Ringed plover, *Charadrius hiaticula*; Black-tailed godwit, *Limosa limosa islandica*; Grey plover, *Pluvialis squatarola*; Red knot, *Calidris canutus islandica*; Dunlin, *Calidris alpina alpina*; Common redshank, *Tringa totanus tetanus*.

### Conservation objectives

None available.

### Pressures and threats

As for Thames Estuary and Marshes SPA above.

### Non-qualifying habitats and species upon which the qualifying habitats and/or species depend

#### Plants

Plant communities are reliant on the coastal habitats within the Ramsar site. These habitats are dependent on a range of coastal factors and processes, including salinity, sedimentation, sea level, turbidity and elevation.

#### Birds

Refer to Thames Estuary and Marshes SPA above.