DEPARTMENTAL BRIEF

Proposed extensions to the Crouch & Roach Estuaries Special Protection Area (SPA) and Ramsar site

Natural England

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CONTENTS

SUMMARY

- The Crouch and Roach Estuaries Special Protection Area (SPA) and Ramsar site are situated on the Essex coast in the South East of England and incorporate two coastal river estuaries that join before exiting into the North Sea. The SPA and Ramsar site share the same boundaries and were classified/ designated in 1998, with an area of 1,735.58 ha.

- The Crouch and Roach Estuaries SPA was classified for supporting an internationally important population of non-breeding dark-belled brent goose *Branta bernicla bernicla,* as well as being used regularly by over 20,000 waterbirds during the non-breeding season.

- The Crouch and Roach Estuaries Ramsar site was designated for supporting the above waterbird qualifying features and also for supporting an assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, including 13 Nationally Scarce plant species and several Rare and/or Vulnerable invertebrate species.

- In recent years, two additional areas of intertidal mudflat and saltmarsh have been created at two locations adjacent to the SPA and Ramsar site through the use of managed realignment (see Appendix 1 for location maps). In 2002 the Environment Agency created a 14 hectare (ha) realignment site at Brandy Hole to compensate for losses of intertidal habitats resulting from improvements to the flood defences at Hullbridge, about 1 kilometre (km) to the west. In 2006, the Department for Environment, Food and Rural Affairs (Defra) created a 118 ha realignment site at Allfleet's Marsh, along the north side of Wallasea Island, to compensate for losses of intertidal habitats due to development at Lappel Bank (Kent) and Fagbury Flats (Suffolk) during the 1980s and early 1990s.

- These two new areas of compensatory intertidal habitat now support both the non-breeding brent goose population and the waterbird assemblage of the Crouch and Roach Estuaries. It is therefore proposed that the SPA and Ramsar site boundaries are extended to include them. A brackish borrow dyke, pools and grassland immediately adjacent to the new intertidal areas are also included within the proposed extensions because they provide valuable supporting habitats for rare and/or vulnerable invertebrate species (Ramsar site qualifying features) as well as feeding habitat for waterbirds.

1. SITE STATUS AND BOUNDARY

The Crouch and Roach Estuaries SPA and Ramsar site share the same boundaries and were classified/ designated on 29 June 1998, and have an area of 1,735.58 ha. The SPA and Ramsar site boundaries are also the same as those of the Crouch and Roach Estuaries Site of Special Scientific Interest (SSSI). The proposed extensions to the SPA and Ramsar site are also being considered as extensions to the Crouch and Roach Estuaries SSSI because notification under Section 28 of the Wildlife and Countryside Act 1981 (as amended) in effect enacts in UK legislation the provisions of the Birds Directive (Directive 2009/147/EC). Details of the current SPA and Ramsar site citations are given in Appendices 2 and 3.

The SPA qualifying features and relevant bird population figures, as given in the SPA citation, are as follows:

- The site is used regularly by 1% or more of the biogeographical population of a regularly occurring migratory species, other than those listed in Annex 1 of the Birds Directive, in any season: Dark-bellied brent goose *Branta bernicla bernicla*. The five year peak mean for 1989/90 to 1993/94 is 5,509 individual wintering birds which represents 2.2% of the total global population.

- The site is used regularly by over 20,000 waterbirds. The five year peak mean for 1990/91 to 1994/95 is 27,021 individual wintering birds.

The main component species of the assemblage at this SPA (ie those for which the five year peak mean numbers using the site are at or above 1% of the estimated British population or 2,000 individuals) are: dark-bellied brent goose; shelduck *Tadorna tadorna*; wigeon *Anas penelope*; teal *Anas crecca*; shoveler *Anas clypeata*; little egret *Egretta garzetta*; avocet *Recurvirostra avosetta*; ringed plover *Charadrius hiaticula*; golden plover *Pluvialis apricaria*; grey plover *Pluvialis squatarola*; lapwing *Vanellus vanellus*; dunlin *Calidris alpina*; black-tailed godwit *Limosa limosa*; and redshank *Tringa totanus*.

The Crouch and Roach Estuaries Ramsar site qualifies for both the waterbird interest features given above. In addition the site qualifies under Ramsar selection criterion 2 because it supports an 'appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species. The Ramsar citation (see Appendix 3) lists 13 Nationally Scarce plant species known from the site and eight aquatic or terrestrial insect species, as examples of the rare and/or vulnerable invertebrates the site supports. Nearly all the plants and invertebrates listed are species of saltmarsh and/or associated brackish coastal habitats such as borrow dykes, grazing marshes and seawalls.

The Crouch and Roach Estuaries SPA and Ramsar site as currently classified/ designated mainly comprise areas of intertidal mudflats, sandflats and saltmarsh along the two estuaries. Where built-up areas lie immediately behind the intertidal zone, the inland boundary of the SPA/ Ramsar site generally runs along the seaward side of the flood defences. However, along most of its length the inland boundary of the site includes habitats landward of the intertidal zone. Several areas of grazing marsh behind the seawalls are included within the site. And where there is a borrow dyke behind the seawall with arable fields beyond, the boundary generally runs along the inland bank of the borrow dyke so that the seawall, the borrow dyke and the berm between them are within the SPA/ Ramsar site.

The changes to the current SPA/ Ramsar site boundaries that are proposed in order to include the two managed realignment sites are explained below.

1.1 Wallasea Island extension

At the Defra Allfleet's Marsh realignment site, a new 3.7 km-long seawall - with a new berm and borrow dyke behind it - was constructed inland of the original seawall along the north side of Wallasea Island in summer 2006. The original wall was breached in six places to create 118 ha of new intertidal habitat on former arable land between the old and new walls.

Currently, the SPA/Ramsar site boundary runs through the realignment site just behind the breached wall, along the line of the original borrow dyke. Since 2006, the new borrow dyke and berm behind the eastern 1.7 km long section of the new seawall has been buried under excavated material imported onto Wallasea Island by Crossrail as part of the RSPB Wallasea Island Wild Coast Project. This material was added to raise the ground level in preparation for an even larger managed realignment on the east side of the island – Jubilee Marsh – which was breached in summer 2015. Further west, the borrow dyke behind the Allfleet's Marsh seawall is intact and will not be significantly affected by later phases of the RSPB project.

It is therefore proposed that the landward boundary of the Wallasea Island Allfleet's Marsh extension should run as follows:

i) In the western part of the extension, where there is a roughly 2 km long borrow dyke and berm behind the new seawall, the SPA and Ramsar site boundary should follow the inland bank of the borrow dyke;

ii) In the eastern part of the extension, where there is no longer a borrow dyke and berm behind the new seawall, the SPA and Ramsar site boundary should run along the north side of the wall at the level of the highest astronomical tide.

Appendix 1 gives a map of the proposed extension area. Sections 2.1 and 3.1 of this brief give more detail about the habitats on Wallasea Island and the SPA and Ramsar site interest. It is envisaged that further extensions to the Crouch and Roach Estuaries SPA and Ramsar site will be necessary within the next 5 to 15 years to incorporate additional areas of intertidal, brackish and grazing marsh habitats currently being created by the RSPB Wallasea Island Wild Coast Project.

1.2 Brandy Hole extension

This small realignment site and a larger area of saltmarsh adjacent to it but within the SPA are owned by the Blackwater Wildfowlers' Association (BWA). Currently, the SPA/Ramsar site boundary runs through the BWA land-holding along an old seawall that was breached in four places during the winter of 2002/3 to create new intertidal habitat. Except on the southwest edge of the realignment site - where a counter wall was constructed to protect adjacent arable land - the upper limit of saline intrusion is not set by a seawall but by gently rising ground, and so is poorly defined. Therefore it is proposed to take the boundary of the BWA land-holding as the inland boundary of the SPA/ Ramsar site extension. This provides a well-defined boundary line, allows for expected landward migration of the saltmarsh edge due to sea level rise, and includes within it the site two pools and an area of brackish grassland which are of value to waterbirds and the non-avian Ramsar site interest.

2. LOCATION AND HABITATS

The rivers Crouch and Roach are situated in South Essex. The tidal reaches of the River Crouch occupy a shallow valley between two ridges of London Clay, whilst those of the River Roach are set predominantly between areas of brickearth and loams with patches of sand and gravel.

The intertidal zone along both rivers is 'squeezed' between the sea walls of both banks and the river channel which leaves a relatively narrow strip of tidal mud and small areas of saltmarsh along the main river channels. This is in contrast with other estuaries in the county and results in strong, erosive tidal flows. Consequently, much of the SPA and Ramsar site interest of the intertidal zone is concentrated in more sheltered side creeks and bays. Adjacent to the rivers and behind the seawalls are several areas of reclaimed saltmarsh that are now grazing marsh dissected by freshwater to brackish ditches. These grazing marshes are important for waterbirds and for the plant and invertebrate interest of the Ramsar site. Elsewhere berms and brackish borrow dykes behind the seawalls are also important for the non-avian interest of the Ramsar site.

Habitats within the two proposed extension areas and outside the current SPA/ Ramsar site boundaries are described in more detail below.

2.1 Wallasea Island extension

The Allfleet's Marsh realignment site was designed to create areas of saltmarsh and intertidal mudflat roughly equivalent to those lost to development at Lappel Bank and Fagbury Flats. Along the south side of the site, recharge material was added in a roughly 30 to 80 metre wide strip in front of the new seawall to raise the ground to a level suitable for colonisation by saltmarsh plants. Several islands were also created elsewhere within the site for roosting and breeding water birds. Defra's post-breach monitoring showed that saltmarsh vegetation colonised the raised areas rapidly between 2006 and 2010. By 2011, five years after breaching, the realignment site comprised 33 ha of saltmarsh and 85 ha of mudflat (Defra, 2012). The area of saltmarsh is expected to increase gradually as the site accretes sediment. As well as the intertidal habitats, the western part of the proposed Wallasea Island extension includes approximately 2 kms of new seawall, berm and brackish borrow dyke along its southern edge.

The total area of the proposed extension (103 ha) is less than the 118 ha of new intertidal habitat because along its northern edge the new intertidal area overlaps the current SPA/ Ramsar site boundary, which includes the submerged berm and borrow dyke behind the original seawall.

2.2 Brandy Hole extension

The total area of the proposed extension is 14 ha. When designing the realignment site the Environment Agency estimated that breaching the old seawall would create 7.2 ha of new saltmarsh (Environment Agency, 2002). From aerial photos of the site taken in 2000 and 2006 and more recent site visits, that prediction appears to be accurate. However it is difficult to map the precise extent of the new saltmarsh because the uppermost zone is dominated by sea couch (*Elytrigia atherica*) which grades gradually into a mixed sward of less salt-tolerant grasses and forbs with some scattered scrub on the slightly higher ground.

Below the sea couch community, the new saltmarsh is mainly dominated by sea-purslane

(*Atriplex portulacoides*) and common saltmarsh-grass (*Puccinellia maritima*) mixed with other mid to upper zone saltmarsh species. Just above the sea couch zone there are two brackish ponds with a combined area of about 0.1 ha. These are mainly fringed with emergent *Bolboschoenus maritimus* and, in the less brackish pond, some *Phragmites australis*, *Glyceria maxima* and *Schoenoplectus spp*. Submerged macrophytes are abundant in both ponds. There are some unvegetated saltmarsh channels in the lower parts of the extension area but no open mudflat.

3. JUSTIFICATION FOR THE PROPOSED EXTENSIONS

The Defra Wallasea Island managed realignment site (Allfleet's Marsh) and the Environment Agency Brandy Hole realignment site were both created to compensate for losses of intertidal habitat elsewhere. At both sites, the new intertidal areas and adjacent brackish habitats are now deemed to be valuable for qualifying features of the Crouch and Roach Estuaries SPA and Ramsar site. Evidence for this is outlined below.

3.1 Wallasea Island extension

As part of the Allfleet's Marsh managed realignment scheme, Defra commissioned Jacobs UK Ltd to carry out a detailed monitoring programme to evaluate the success of the site and to verify that any changes that occurred in adjacent parts of the estuaries were within the limits predicted by the scheme's Environmental Impact Assessment. This programme included pre-breach baseline surveys and assessed how the morphology and flora and fauna of the site changed in the five years following the breaches which occurred between 2006 and 2011. The results are outlined in an unpublished non-technical summary. Full details are included in appendices to the summary and cover different aspects of the programme (Defra, 2012). These include reports on overwintering, passage and breeding birds; intertidal/subtidal morphology; saltmarsh vegetation; benthic invertebrates of the new intertidal area; and aquatic and terrestrial invertebrates of the new borrow dyke and seawall.

Much of the evidence for the SPA and Ramsar site value of the proposed Wallasea Island extension comes from the Defra monitoring programme. This found that as a result of monitoring of the realignment site's morphology, the mudflats accreted 11cm of sediment in the first year and about 5cm per year after that. Benthic invertebrates were found to have colonised the sediment rapidly. Within five years the mudflat had a varied polychaete worm and bivalve fauna and was at least as valuable for waterbirds (in terms of prey species abundance and variety) as the best areas of mudflat in the adjacent Crouch and Roach estuaries.

The monitoring of overwintering and passage waterbirds showed that the numbers using Allfleet's Marsh increased rapidly after the breaches, with annual peak numbers reaching 7,000 in the 2006/7 winter and 10,400 in 2007/8. Initially the birds mainly used the site for roosting but, as benthic invertebrates colonised the mudflat, it soon became an important feeding area as well.

Waterbird numbers on the realignment site continue to be counted as part of BTO Wetland Bird Survey (WeBS) monitoring of the Crouch and Roach estuaries. The site is a separate core count sector (Wallasea Island Realignment). The most up to date WeBS data we have on the usage of the site by the qualifying bird features of the Crouch and Roach Estuaries SPA/ Ramsar site are shown in the table below.

Annual peak numbers for 2009/10 to 2013/14 within WeBS core count sector 25439 (Wallasea Island Realignment)

SPA qualifying feature	2009/10	2010/11	2011/12	2012/13	2013/14	Mean Peak
Waterbird assemblage	10,665	9,188	9,950	4,383	6,740	**8,185**
Dark-bellied brent goose	216	667	3,350	168	263	**933**

Data from: Holt et al (2015). Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report

The 2009/10 to 2013/14 five year mean peaks for the realignment site shown above compare with equivalent mean peaks for the whole Crouch and Roach Estuaries SPA/ Ramsar site (including the proposed extension) of 31,554 for the whole waterbird assemblage and 3,850 for dark-bellied brent goose. These figures indicate that the proposed extension is now very significant for both SPA qualifying features. In both cases about 25% of the birds overwintering on the Crouch and Roach Estuaries are using the extension area.

Defra's monitoring of aquatic and terrestrial invertebrates along the new borrow dyke and seawall at the southern edge of the realignment site provides good evidence of the value of these non-tidal habitats for the invertebrate interest of the Crouch and Roach Estuaries Ramsar site (Defra 2012, Appendix 3). Sampling was undertaken in 2004 (pre-breach), 2007, 2009 and 2011, with the largest number of species being recorded in 2011. In that year, 52 aquatic species and 81 terrestrial species were identified.

Noteworthy aquatic species in the borrow dyke included larvae of the Nationally Scarce soldier-fly *Stratiomys singularior* (listed in the Crouch and Roach Estuaries Ramsar citation), a sister species *S. longicornis* (Red Data Book 2 and listed in the citation for the nearby Foulness Ramsar site) and five Nationally Scarce water-beetles (Coleoptera spp).

Noteworthy terrestrial species found on the adjacent berm and seawall included three UK BAP species (shrill carder bee *Bombus humilis* and two members of the Order Lepidoptera), two species of Diptera only recently added to the British fauna and a chalcid wasp only known from Essex and Kent. Overall, species richness and rarity did not vary much from year to year, though after the site was breached the salinity of the borrow dyke increased marginally and became more uniform, resulting in a less species-rich but more specialist, salt-tolerant aquatic invertebrate fauna.

3.2 Brandy Hole extension

The managed realignment site at Brandy Hole is much smaller than the Wallasea Island extension (14 ha) and less well recorded. The case for extending the SPA/ Ramsar site boundary to include it is based mainly on the apparent suitability of its habitats for SPA and Ramsar site qualifying features, and the fact that it was created to compensate for losses of intertidal habitat due to flood defence improvements nearby within the SPA/ Ramsar site boundary.

For BTO WeBS count purposes, the realignment site is included within the much larger Upper Crouch count sector. This stretches for over 4 km along the estuary and covers about 870 ha, including a large area of saltmarsh just east of the realignment site and extensive areas of saltmarsh and grazing marsh on the north side of the river. The most recent WeBS data for the sector are summarised below. From the annual peak counts, this sector

supports about 23% of the SPA/ Ramsar site's waterbirds and roughly a third of its brent geese. But it is unlikely that the creation of the relatively small Brandy Hole realignment site has allowed the numbers of birds using the sector to significantly increase.

Annual peak numbers for 2009/10 to 2013/14 within WeBS core count sector 25432 (Upper Crouch Estuary):

SPA qualifying feature	2009/10	2010/11	2011/12	2012/13	2013/14	Mean Peak
Waterbird assemblage	8,867	5,848	9,557	6,993	4,573	7,168
Dark-bellied brent goose	2,500	600	850	(950)	(460)	1,317

Data from: Holt et al (2015). Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report

Although invertebrate survey data for the Brandy Hole extension is not available, its habitat characteristics suggest it is likely to be valuable for the non-avian interest of the Crouch and Roach Estuaries Ramsar site particularly by supporting rare and/or vulnerable invertebrate species of the upper saltmarsh and associated brackish habitats. The characteristics that suggest this include:

- Wide upper and transitional saltmarsh zones on gently sloping ground, very sheltered from wave action and not squeezed against seawalls;
- Grassland with scattered scrub on the slightly higher ground adjacent to the saltmarsh, with a moderately varied structure and a reasonable diversity of nectar sources;
- Two shallow brackish ponds fringed with several species of emergent plants and with a dense growth of submerged macrophytes.

Light grazing of the grassland within and above the upper saltmarsh sea couch zone would improve it for invertebrates and potentially for nationally scarce plants. A fence line has already been erected through the sea couch zone to allow the higher ground to be grazed while keeping stock off the mid-zone saltmarsh.

4. ASSESSMENT AGAINST SPA SELECTION GUIDELINES

4.1 Stage 1

The first stage of the process to select a SPA is to establish whether an area qualifies. The Birds Directive lists four ways in which an area could qualify:

1. An area is used regularly by 1% or more of the Great Britain (or in Northern Ireland, the all-Ireland) population of a species listed in Annex 1 of the Birds Directive (Directive 2009/147/EC) in any season;
2. An area is used regularly by 1% or more of the biogeographical population of a regularly occurring migratory species (other than those listed in Annex 1) in any season;
3. An area is used regularly by over 20,000 waterbirds or 20,000 seabirds in any season;

4. An area which meets the requirements of one or more of the Stage 2 guidelines in any season, where the application of Stage 1 guidelines 1, 2 or 3 for a species does not identify an adequate suite of most suitable sites for the conservation of that species.

The Crouch and Roach Estuaries SPA, including the proposed extensions, qualifies under stage 1(2) because it regularly supports greater than 1% of the biogeographical population of dark-bellied brent goose; and under stage 1(3) in regularly supporting over 20,000 waterbirds.

Based on five year mean peak numbers for 2009/10 to 2013/14, the main component species of the assemblage at this SPA (i.e. those for which numbers using the site are at or above 1% of the estimated British population or 2,000 individuals) are: dark-bellied brent goose; shelduck; wigeon; teal; shoveler; little egret; avocet; ringed plover; golden plover; grey plover; lapwing; dunlin; black-tailed godwit; and redshank.

Annual peak numbers for 2009/10 to 2013/14 for the Crouch and Roach Estuaries SPA and Ramsar site, including the proposed extensions:

SPA qualifying feature	2009/10	2010/11	2011/12	2012/13	2013/14	Mean Peak
Waterbird assemblage	34,855	32,287	34,056	25,325	31,249	**31,554**
Dark-bellied brent goose *	3,149	3,109	5,742	2,968	4,282	**3,850**

* Current international threshold for dark-bellied brent goose: 2,400.
Data from: Holt et al. (2015). Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report

4.2 Stage 2

Under Stage 2 of the SPA selection guidelines, the site is assessed as follows:

Feature	Qualification	Assessment
1. Population size & density	✓	In England, the site is the 8th most important for wintering dark-bellied brent goose.
2. Species range	✓	The site contributes to the maintenance of the UK non-breeding range of dark-bellied brent goose.
3. Breeding success	**X**	Not applicable - the site has no breeding bird SPA qualifying features.
4. History of occupancy	✓	Non-breeding dark-bellied brent goose has been using the site in internationally important numbers since at least 1969-75 (Prater, 1981). For the same period, teal, shelduck and redshank have been using the site in nationally important numbers (Prater, 1981).
5. Multi-species area	✓	The site now supports a non-breeding assemblage of over 30,000 waterbirds. Though only dark-bellied brent goose occurs in internationally important numbers, based on 2009/10 – 2013/14 five-year mean peaks, 13 other species overwinter in nationally important numbers.
6. Naturalness	**(✓)**	The overall character of the site's habitats is natural or semi-natural but the Crouch and Roach estuaries are

		more constrained between seawalls and further from their equilibrium forms than other Essex estuaries. As a result, the adverse effects of coastal squeeze are accentuated. The proposed extension areas and further managed realignments on Wallasea Island will mitigate those effects.
7. Severe weather refuge	✓	A study by Ridgill and Fox (1990) suggests that during periods of abnormally cold weather, shelduck, wigeon and pintail are displaced from the Waddenzee coast in the Netherlands to refuge areas to the south and west, including the estuaries of eastern Britain. It is likely that similar patterns of displacement are common to other species of waterbird using the site.

5. ASSESSMENT OF THE RAMSAR INTEREST

The site, including the proposed extensions, qualifies as a Wetland of International Importance under the Ramsar Convention because it meets the following selection criteria (Ramsar Convention Secretariat, 2010):

Criterion 5: "*A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds*"

During the winters 2009/10 – 2013/14, the site supported a mean peak of 31,554 individual waterbirds.

Criterion 6: "*A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird*."

During the winters 2009/10 – 2013/14, the site supported an average peak of 3,850 dark-bellied brent geese representing 1.6% of the estimated world population of this subspecies.

Criterion 2: "*A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.*"

Rare and/or vulnerable species of plants and invertebrates supported by the site include:

(i) Thirteen nationally scarce plant species: Slender Hare's Ear *Bupleurum tenuissimum*, Divided Sedge *Carex divisa*, Sea Barley *Hordeum marinum,* Golden-samphire *Inula crithmoides*, Lax-flowered 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 maritima*, Shrubby Sea-blite *Suaeda vera* and Sea Clover *Trifolium squamosum*.

(ii) Several rare and/or vulnerable invertebrate species eg: Scarce Emerald Damselfly *Lestes dryas*, the shorefly *Parydroptera discomyzina*, the soldierfly *Stratiomys singularior*, the large horsefly *Hybomitra expollicata*, the beetles *Graptodytes bilineatus* and *Malachius vulneratus,* Ground Lackey Moth *Malacosoma castrensis* and *Eucosma catoptrana*.

Note: Invertebrate sampling of the new borrow dyke and seawall adjacent to the Wallasea Island realignment site (Defra, 2012) revealed seven Nationally Scarce invertebrate species, a Red Data Book species and three UK BAP species not currently listed in the Ramsar citation for the Crouch and Roach Estuaries. This suggests that more extensive invertebrate surveys of this Ramsar site would produce records of several other rare and/or vulnerable species.

6. REFERENCES

Defra (2012). Allfleet's Marsh (formerly Wallasea Wetland) Monitoring Programme (April 2006 to August 2011): Non-Technical Summary and Appendices 1 to 7. Unpublished report prepared for Defra by Jacobs UK Ltd.

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APPENDICES

Appendix 1 – Location Maps

See separate attachments

Appendix 2 – Draft pSPA citation

Directive 2009/147/EC on the Conservation of Wild Birds Special Protection Area (SPA)

Name: Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)

Unitary Authority/County: Essex

Consultation proposal: The proposed extensions to the SPA encompass areas of intertidal, saltmarsh and wetland habitat at Allfleet's Marsh, on the north side of Wallasea Island, and at Brandy Hole, in the upper Crouch north-east of Hullbridge, because of these areas' usage by the species and assemblage of European importance. Both of the proposed extension areas are managed realignments, where the sea defences have been set back to allow tidal inundation and the development of intertidal and coastal vegetation communities. The existing SPA contains all of the previously notified Crouch and Roach Estuaries Site of Special Scientific Interest (SSSI). The proposed extensions are coincident with the boundaries of extensions to the SSSI. See map for detail of boundary. The qualifying interests of the SPA remain as classified in 1998 (see below).

Site description: The Crouch and Roach Estuaries are located on the coast of south Essex in eastern England. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls along both banks and the river channel. Unlike more extensive estuaries elsewhere in Essex, this leaves a relatively narrow strip of tidal mud which, nonetheless, is used by significant numbers of birds. The site is of importance for wintering waterbirds, especially dark-bellied brent goose *Branta bernicla bernicla*.

The Crouch and Roach Estuaries is an integral component of the phased Mid-Essex Coast SPAs (see overleaf).

Size of SPA: 1,847.87 ha, incorporating proposed extensions of 118.75 ha.

Qualifying species:
The site qualifies under **article 4.2** of the Directive (2009/147/EC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Non-Annex 1 migratory bird species	Season	5-yr peak mean (1989/90-1993/94)
Dark-bellied brent goose *Branta bernicla bernicla*	Winter	5,509 individuals (2.2% World)[I]

Assemblage qualification:
The site qualifies under **article 4.2** of the Directive (2009/147/EC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

- the area is regularly used by 27,021 individual waterbirds over winter (5 year peak mean 1990/91 – 1994/95).

Bird counts from:
Cranswick, P.A., Walters, R.J., Evans, J. & Pollitt, M.S. 1995. The Wetland Bird Survey 1993-94: Wildfowl and Wader Counts. BTO/WWT/RSPB/JNCC, Slimbridge

Status of SPA:
1) River Crouch Marshes SPA was classified under Directive 79/409/EEC on 24 March 1995
2) Extensions to the River Crouch Marshes SPA were classified under Directive 79/409/EEC on 29 June 1998 and the site was re-named Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA.

The Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA is a component part of the linked series of Mid-Essex Coast SPAs. These are:

SPA	Date classified	Component SSSI	Area (ha)
Dengie (Mid-Essex Coast Phase 1)	24 March 1994	Dengie	3127.22
Colne Estuary (Mid-Essex Coast Phase 2)	28 July 1994	Colne Estuary	2701.37
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)	29 June 1998	Crouch and Roach Estuaries	1729.13
Blackwater Estuary (Mid-Essex Coast Phase 4)	12 May 1995	Blackwater Estuary	3657.1
Foulness (Mid- Essex Coast Phase V)	4 October 1996	Foulness	10968.97

Appendix 3 – Draft pRamsar site citation

Ramsar Convention on Wetlands of Importance Especially as Waterfowl Habitat

Name: Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)

Unitary Authority/County: Essex

Consultation proposal: The proposed extensions to the Ramsar site encompass areas of intertidal, saltmarsh and wetland habitat at Allfleet's Marsh, on the north side of Wallasea Island, and at Brandy Hole, in the upper Crouch north-east of Hullbridge, because of these areas' usage by the wetland features of international importance. Both of the proposed extension areas are managed realignments, where the sea defences have been set back to allow tidal inundation and the development of intertidal and coastal vegetation communities. The existing Ramsar site contains all of the previously notified Crouch and Roach Estuaries Site of Special Scientific Interest (SSSI). The proposed extensions are coincident with the boundaries of extensions to the SSSI. See map for detail of boundary. The qualifying interests of the Ramsar site remain as designated in 1998 (see below).

Site description: The Crouch and Roach Estuaries are located on the coast of south Essex in eastern England. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls along both banks and the river channel. Unlike more extensive estuaries elsewhere in Essex, this leaves a relatively narrow strip of tidal mud which, nonetheless, is used by significant numbers of birds. The site is of importance for wintering waterbirds, especially dark-bellied brent goose *Branta bernicla bernicla*.

The Crouch and Roach Estuaries is an integral component of the phased Mid-Essex Coast Ramsar sites (see overleaf).

Size of Ramsar site: 1,847.87 ha, incorporating proposed extensions of 118.75 ha.

International importance of Ramsar site: The Ramsar site is a Wetland of International Importance because (Montreux 1990 criteria):

(a) it regularly supports 20,000 waterbirds. (Ramsar site selection criterion 3a):

- the area is regularly used by 27,021 individual waterbirds over winter (5 year peak mean 1990/91 – 1994/95).

(b) it regularly support 1% of the individuals in a population of waterbirds (Ramsar site selection criterion 3c):

Waterbird species	Season	5-yr peak mean (1989/90-1993/94)
Dark-bellied brent goose *Branta bernicla bernicla*	Winter	5,509 individuals (2.2% World)[l]

(c) They support an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species (Ramsar site selection criterion 2a). These are:

(i) 13 nationally scarce plant species: Slender Hare's Ear *Bupleurum tenuissimum*, Divided Sedge *Carex divisa*, Sea Barley *Hordeum marinum,* Golden-samphire *Inula crithmoides*, Lax-flowered 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 maritima*, Shrubby Sea-blite *Suaeda vera* and Sea Clover *Trifolium squamosum*.

(ii) Several rare and/or vulnerable invertebrate species, *e.g*.: Scarce Emerald Damselfly *Lestes dryas*, the shorefly *Parydroptera discomyzina*, the soldierfly *Stratiomys*

singularior, the large horsefly *Hybomitra expollicata*, the beetles *Graptodytes bilineatus* and *Malachius vulneratus,* Ground Lackey Moth *Malacosoma castrensis* and *Eucosma catoptrana*.

Bird counts from:
Cranswick, P.A., Walters, R.J., Evans, J. & Pollitt, M.S. 1995. The Wetland Bird Survey 1993-94: Wildfowl and Wader Counts. BTO/WWT/RSPB/JNCC, Slimbridge

Status of Ramsar site:

1) River Crouch Marshes Ramsar site was designated on 24 March 1995.
2) Extensions to the River Crouch Marshes Ramsar site were designated on 29 June 1998 and the site was re-named Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar site.

The Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar site is a component part of the linked series of Mid-Essex Coast Ramsar sites. These are:

Ramsar site	**Date classified**	**Component SSSI**	**Area (ha)**
Dengie (Mid-Essex Coast Phase 1)	24 March 1994	Dengie	3127.22
Colne Estuary (Mid-Essex Coast Phase 2)	28 July 1994	Colne Estuary	2701.37
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)	24 March 1995	River Crouch Marshes (now part of Crouch & Roach Estuaries)	1729.13
Blackwater Estuary (Mid-Essex Coast Phase 4)	12 May 1995	Blackwater Estuary	3657.1
Foulness (Mid-Essex Coast Phase 5)	4 October 1996	Foulness	10968.97