

DEPARTMENTAL BRIEF:

DUNGENESS, ROMNEY MARSH AND RYE BAY

**Proposed extensions to and change of name of the Dungeness to Pett
Level Special Protection Area and a proposed new Ramsar site**

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Draft pSPA and pRamsar site maps

SUMMARY

The Dungeness, Romney Marsh and Rye Bay SPA, including the proposed extensions detailed in this revised Departmental Brief, qualifies for the following reasons:

- The site regularly supports more than 1% of the GB populations of 12 species listed in Annex I to the EC Birds Directive – see table 1.
- The site regularly supports more than 1% of the biogeographical population of one regularly occurring migratory species (shoveler *Anas clypeata*).
- The site regularly supports more than 20,000 waterbirds during the non-breeding season.

The Dungeness, Romney Marsh and Rye Bay proposed Ramsar site qualifies for the following reasons:

- The site contains representative, rare, or unique examples of the following natural or near-natural wetland types:
 - Annual vegetation of drift lines and the coastal fringes of perennial vegetation of stony banks (Ramsar wetland type E – sand, shingle or pebble shores).
 - Natural shingle wetlands: saline lagoons (Ramsar wetland type J – coastal brackish/saline lagoons), freshwater pits (Ramsar wetland type K – coastal freshwater lagoons) and basin fens (Ramsar wetland type U – non-forested peatlands).
- The site supports vulnerable, endangered, or critically endangered species or threatened ecological communities:
 - The pRamsar site supports threatened ecological communities associated with wetland habitats, including grazing marshes and ditches, saltmarsh, natural freshwater pits, saline lagoons, fens, ponds, gravel pits and margins of water bodies. These communities include rich and diverse assemblages of bryophytes, vascular plants and invertebrates that are rare, threatened, listed as conservation priorities or specially protected.
 - The pRamsar site is considered to be of international importance for nine individual wetland species: greater water-parsnip *Sium latifolium*, Warne's thread-moss *Bryum warneum*, water vole *Arvicola amphibius*, aquatic warbler *Acrocephalus paludicola*, great crested newt *Triturus cristatus*, medicinal leech *Hirudo medicinalis*, a ground beetle *Omophron limbatum*, marsh mallow moth *Hydraecia osseola hucherardi* and De Folin's lagoon snail *Caecum amoricum*.
- The site regularly supports more than 1% of the biogeographical populations of two waterbird species (shoveler and mute swan *Cygnus olor*).
- The site regularly supports more than 20,000 waterbirds during the non-breeding season.

Table 1 Summary of ornithological interest in the Dungeness, Romney Marsh and Rye Bay SPA (including proposed extensions) and pRamsar site

Species	Count (period)	% of subspecies or population	Interest type	SPA or Ramsar
Marsh harrier <i>Circus aeruginosus</i>	4 females – breeding (2004 – 2008)	2.0% GB	Annex I	SPA
Avocet <i>Recurvirostra avosetta</i>	31 pairs – breeding (2004 – 2008)	3.5% GB	Annex I	SPA
Mediterranean gull <i>Larus melanocephalus</i>	56 pairs – breeding (2004 – 2008)	52.2% GB	Annex I	SPA
Sandwich tern <i>Sterna sandvicensis</i>	350 pairs – breeding (2004 – 2008)	3.3% GB	Annex I	SPA
Common tern <i>Sterna hirundo</i>	273 pairs – breeding (2004 – 2008)	2.7% GB	Annex I	SPA
Little tern <i>Sterna albifrons</i>	35 pairs – breeding (1992 – 1996)	1.5% GB	Annex I	SPA
Bewick's swan <i>Cygnus columbianus bewickii</i>	155 individuals – wintering (2002/03 – 2006/07)	1.9% GB	Annex I	SPA
Bittern <i>Botaurus stellaris</i>	5 individuals – wintering (2002/03 – 2006/07)	5.0% GB	Annex I	SPA
Hen harrier <i>Circus cyaneus</i>	11 individuals – wintering (2002/03 – 2006/07)	1.5% GB	Annex I	SPA
Golden plover <i>Pluvialis apricaria</i>	4,050 individuals – wintering (2002/03 – 2006/07)	1.6% GB	Annex I	SPA
Ruff <i>Philomachus pugnax</i>	51 individuals – wintering (2000/01 – 2004/05)	7.3% GB	Annex I	SPA
Aquatic warbler <i>Acrocephalus paludicola</i>	2 individuals – autumn passage (2004 – 2008)	6.1% GB	Annex I	SPA & Ramsar
Shoveler <i>Anas clypeata</i>	485 individuals – wintering (2002/03 – 2006/07)	1.2% NW & C Europe (non-breeding)	Migratory	SPA & Ramsar
Mute swan <i>Cygnus olor</i>	348 individuals – wintering (2002/03 – 2006/07)	1.1% Britain	Non-migratory	Ramsar

1 SITE STATUS AND BOUNDARY

During the period 17 June to 16 July 1993, English Nature, on behalf of the Department of the Environment (DoE), consulted owners, occupiers, statutory authorities and other interested parties on the proposal to classify a Special Protection Area (SPA) and to designate a Ramsar site at Dungeness to Pett Level.

The potential SPA (pSPA) included all or parts of Pett Level Site of Special Scientific Interest (SSSI), Rye Harbour SSSI, Camber Sands and Rye Saltings SSSI, Walland Marsh SSSI, Dungeness SSSI and Romney Warren SSSI. The features listed on the pSPA citation were nationally important breeding populations of four species listed in Annex I to the EC Birds Directive (2009/147/EC) (Mediterranean gull *Larus melanocephalus*, sandwich tern *Sterna sandvicensis*, common tern *S. hirundo* and little tern *S. albifrons*), wintering populations of two Annex I species (Bewick's swan *Cygnus columbianus bewickii* and ruff *Philomachus pugnax*), breeding populations of four migratory species (gadwall *Anas strepera*, garganey *A. querquedula*, shoveler *A. clypeata* and pochard *A. ferina*), wintering or passage populations of five migratory species (shoveler, pochard, smew *Mergellus albellus*, sanderling *Calidris alba* and whimbrel *Numenius phaeopus*), and assemblages of breeding migratory waders and breeding wildfowl.

The proposed Ramsar site (pRamsar site) included the whole of the pSPA and additional areas of Pett Level SSSI, Rye Harbour SSSI, Camber Sands and Rye Saltings SSSI, Walland Marsh SSSI and Dungeness SSSI. The features listed on the pRamsar site citation were rare and nationally scarce plants, Red Data Book wetland invertebrates and an internationally important wintering population of Bewick's swans.

Following the end of the consultation period, English Nature formally recommended to DoE on 10 September 1993 that the pSPA and pRamsar site should be designated as consulted upon, with the exception of a small area adjacent to the railhead on Dungeness Road, which was recommended for exclusion from both designations.

In January 1999, the Department of the Environment, Transport and the Regions (DETR) began to make preparations for the classification of the SPA and designation of the Ramsar site. In February 1999, English Nature provided further advice to DETR on a number of deletions from the lists of qualifying interests and consequent boundary amendments, to reflect changes in bird species distribution and the drafting of the SPA selection guidelines (JNCC, 1999). These recommendations were that several regularly occurring migratory species using the site in nationally important numbers did not meet the (draft) SPA selection guidelines. Deletion of these interests meant that Lade Sands should be excluded from the pSPA and pRamsar site. Changes in the distribution of Bewick's swans and shoveler (especially their increased use of newly created habitats outside the pSPA and pRamsar site) meant that two areas of Walland Marsh were recommended for exclusion from the pSPA (but not from the pRamsar site as they were still considered to be important for wetland plants and invertebrates). English Nature also noted that surveys (at the time still to be completed) had shown the presence of a large population of medicinal leeches *Hirudo medicinalis* which would qualify as an interest feature of the pRamsar site and support further extension of the boundary.

In April 1999, DETR responded to English Nature's advice and recommended a 'two stage submission'. The pSPA would be re-consulted on (incorporating the changes recommended by English Nature) and classified immediately. Re-consultation was felt to be important given the time elapsed since the previous consultation with owners, occupiers and other interested parties. The pRamsar site would be 'set aside' for designation at some future time when the minerals planning situation became clearer (there had been some uncertainty regarding conditions attached to a number of existing permissions), which would also allow consideration of any extensions to include medicinal leeches.

English Nature carried out the further consultation on the pSPA between 27 April and 28 May 1999. The results were submitted to DETR on 15 June 1999. DETR confirmed on 6 July 1999 that the Minister had approved the classification of the site and that the boundary was to be unmodified since the re-consultation. Accordingly, the Dungeness to Pett Level SPA was

classified on 2 August 1999, with an area of 1,474.04 ha. The qualifying interests of the SPA are breeding Mediterranean gull, common tern and little tern, as well as wintering Bewick's swan and shoveler.

Following revision of the qualifying interests, several potential extensions to the SPA are here submitted, and include:

- intertidal sandflats and mudflats at Pett Beach, Winchelsea Beach, Camber Sands, Broomhill Sands, Lydd Ranges, Lade Sands and Romney Sands;
- open waters (flooded gravel pits and agricultural reservoirs) around Camber, Scotney Court, Lydd, Dungeness, Lade and Cheyne Court;
- grazing marsh, reedbeds and drainage channels around Pett Level, Rye Harbour, East Guldeford, Scotney Court, Cheyne Court, Woolpack, Fairfield, Lydd Ranges and Dungeness; and
- the saltmarshes, intertidal mudflats and subtidal channel of the River Rother estuary.

The proposed extensions are described in more detail in section 1.1. A number of small deletions from the classified SPA boundary are also proposed to correct mapping errors and to remove a small area that has been developed as part of an industrial property. All of the proposed deletions are in the vicinity of Rye Harbour and Dungeness and they are described in more detail in section 1.2.

The SPA (including proposed extensions) now qualifies, as it did at time of classification, by regularly supporting numbers of European importance of breeding Mediterranean gull, common tern and little tern, and wintering Bewick's swan and shoveler. In addition to these, the SPA (including proposed extensions) now supports breeding marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and sandwich tern, wintering bittern *Botaurus stellaris*, hen harrier *Circus cyaneus*, golden plover *Pluvialis apricaria* and ruff, and passage aquatic warbler *Acrocephalus paludicola* in numbers of European importance, as well as an assemblage of over 20,000 waterbirds in the non-breeding season.

The proposed Ramsar site is also resubmitted and includes the entire SPA (including proposed extensions) as well as additional areas of grazing marsh, drainage channels, canals, shingle beaches, sand dunes and ponds. The pRamsar site boundary is described in more detail in section 1.3.

The pRamsar site qualifies by containing or regularly supporting:

- internationally important numbers of wintering mute swan *Cygnus olor* and shoveler;
- an assemblage of over 20,000 waterbirds in the non-breeding season;
- representative, rare, or unique examples of annual vegetation of drift lines and the coastal fringes of perennial vegetation of stony banks, and natural shingle wetlands;
- threatened ecological communities associated with wetland habitats, including grazing marshes and ditches, saltmarsh, natural freshwater pits, saline lagoons, fens, ponds, gravel pits and margins of water bodies; and
- nine individual wetland species: greater water-parsnip *Sium latifolium*, Warne's thread-moss *Bryum warneum*, water vole *Arvicola amphibius*, aquatic warbler *Acrocephalus paludicola*, great crested newt *Triturus cristatus*, medicinal leech *Hirudo medicinalis*, a ground beetle *Omophron limbatum*, marsh mallow moth *Hydraecia osseola hucherardi* and De Folin's lagoon snail *Caecum amoricum*.

In addition, it is proposed that the SPA (incorporating the extensions) and pRamsar site should be known as 'Dungeness, Romney Marsh and Rye Bay' to better reflect their geographical extent, which will no longer be restricted to the coastal habitats between Dungeness and Pett Level.

The resulting Dungeness, Romney Marsh and Rye Bay SPA (including proposed extensions) and pRamsar site boundaries have been drawn to include land supporting the features of interest and those areas required to ensure the long-term sustainability of these features. A detailed

description of the boundaries and general principles is as follows:

- Where the boundary follows a road, the inner edge of the road has been used and the road has therefore been excluded from the site. Where the boundary is drawn to a ditch or drain, the outer bank has been used, therefore including the ditch or drain in the site. Where there is no mapped feature that can be used to delineate the extent of an interest feature, the boundary has been drawn as a straight line between points distinguishable on the ground.
- The boundary has been drawn to exclude major roads, railways and permanent buildings. However, where bridges and other structures cross intertidal, subtidal and other wetland habitats, the boundary has not been drawn to exclude these man-made structures. Annotations that appear on the boundary maps confirm that the site excludes permanent structures such as buildings, roads, bridges, culverts, slipways, jetties and houseboats. However, the site does include any exposed bank side, intertidal, subtidal or other wetland habitats beneath the aforementioned structures.

1.1 Description of the SPA boundary (including proposed extensions)

- The seaward boundary in the south-west of the SPA extends to the village of Cliff End. South-west of this point the foreshore becomes rockier. The seaward boundary then follows the Lowest Astronomical Tide (LAT) north-east as far as the River Rother estuary. The boundary crosses the mouth of the River Rother at the East Sussex administrative county boundary. The boundary then continues to follow the LAT; east along Camber Sands and Broomhill Sands before heading along the frontage of Lydd Ranges to Galloways Lookout at national grid reference TR04331705. The boundary at this point turns inland as far as the Green Wall (a coastal defence structure running close to the seaward end of Lydd Ranges), following the track leading from the lookout.
- The boundary through the Ranges includes two landward spurs to encompass the wetland areas at South Brooks/West Ripe and The Wicks/Midrips/The Forelands. The two spurs are connected at their landward end to include the wetlands at Watermanship. The boundary also includes the land between the Green Wall and LAT. The boundary then follows the Green Wall back to Jury's Gap which lies on the western edge of Lydd Ranges.
- West from Jury's Gap the boundary follows the sea wall, seaward edge of Broomhill car park and seaward boundaries of properties in Camber, west to Camber Dunes. The boundary then follows fences and straight lines between fixed points to include the foreshore of Camber Sands westwards to the River Rother.
- The Union Channel and the entire River Rother upstream to Scots Float sluice are included within the SPA. As far as possible, a whole system approach has been taken with the Rother estuary and the boundary here follows sea walls, jetties and other physical features. It includes the subtidal channel of the estuary.
- East of the River Rother the SPA includes several flooded gravel pits to the west of Camber and around Northpoint Beach.
- The boundary at Rye Harbour and Pett Level has been drawn according to the same principles as elsewhere in the SPA, encompassing open water, shingle beach and grazing marsh habitat that supports ornithological interests. The north-eastern boundary of the Rye Harbour section follows the south-western extent of residential and industrial properties on the western bank of the Rother. It then follows the River Brede, ditches and fences south to include areas around Castle Farm and Nook Beach. The boundary follows a road called The Ridge south-west towards the coast and then follows the sea wall fronting Dogs Hill and Pett Level, until it reaches the south-west limit of the SPA at Cliff End.
- The boundary around Pett Level and the Pannel Valley follows drains, the Dimsdale Sewer, the Royal Military Canal and field boundaries.
- Sections of Walland Marsh around East Guldeford Level (including part of the Union

Channel), Cheyne Court and Fairfield, are included, and the boundary around these areas is drawn to encompass grazing marsh areas that are known to support important waterbird interests.

- The SPA also includes a small agricultural reservoir at Little Cheyne Court.
- West of Lydd Ranges and Lydd, the SPA boundary includes all of the flooded gravel pits between Scotney Court and Dering Farm, as well as Oakhill Fleet.
- The SPA boundary encompasses the large area of wetlands that includes the Dungeness RSPB Reserve, the adjoining land in the north west and at the watersports complex on the Denge Marsh Road. There are outlying sections of the SPA at Lade Pit to the north and the Long Pits to the east.
- The seaward boundary in the east of the SPA follows the LAT northwards along Lade Sands and Romney Sands as far as the beach groyne at national grid reference TR08922669. At this point the boundary turns inland to the seawall and then back to the south, following the sea wall, seaward boundaries of properties, the coast road and straight lines between fixed points (including the majority of Greatstone Dunes), south to The Pilot public house. The boundary then continues south towards Dungeness point, following a series of straight lines between fixed points to include the foreshore and coastal shingle beach as far south as the building at national grid reference TR09541736. From here the boundary turns due east to meet the LAT.

1.2 Description of SPA boundary deletions

At Rye Harbour:

- The land contained within the boundary of the sewage treatment works adjacent to the River Brede (national grid reference TQ91851800). This is to more accurately align the boundary with the interest features.
- The trackway running in a south-easterly direction from national grid reference TQ91991985 to TQ92711955. This is to more accurately align the boundary with the interest features.
- The trackway running along the south-west end of Nook Beach Gravel Pit from national grid reference TQ92271726 to TQ92481712. This is to more accurately align the boundary with the interest features.
- Three parcels of land at the rear of industrial units on Harbour Road, Rye Harbour:
 - Land running in a south-easterly direction from national grid reference TQ93001947 to TQ93261933. This is to more accurately align the boundary with the interest features and to remove an area of Rye Harbour Industrial Estate that was developed with planning permission, as follows. In 1999 a planning application (RR/1999/2029/P) was submitted, proposing to extend a building and construct a car park on land at grid reference TQ93141938, to the south of an industrial property. English Nature (as it was then) did not object to the planning application because the land was not considered to contain any of the features of special interest of Rye Harbour SSSI (as notified in 1988) or the Dungeness to Pett Level SPA, and the proposal was not likely to have a significant effect on the SPA. It is considered that the land in question was included in the SSSI and SPA to allow the site boundary to follow a readily identifiable feature on maps and on the ground. The land is now occupied by a building and car park it is now possible to draw the boundary to exclude these whilst still incorporating all the habitats to the south and west that support the interest features.
 - Land that includes hard standings and scrub centred on national grid reference TQ93621889. This is to more accurately align the boundary with the interest features.
 - A strip of land running in a south-easterly direction from national grid reference TQ93751905 to TQ93831891 and from TQ93871895 to TQ93901891. This is to more

accurately align the boundary with the interest features.

At Dungeness:

- A triangular piece of land at the junction of the railhead and Dungeness Road (national grid reference TR07581913). This is to correct a mapping error that was intended to be excluded from the SPA when classified in 1999.
- A strip of land within the boundary fence of the railway line, running in a north-westerly direction from national grid reference TR07671906 to TR06382043. This is to more accurately align the boundary with the interest features.
- A narrow strip of land at Denge Beach running in a northerly direction from national grid reference TR07711771 to TR07681834. This is to align the boundary with more readily identifiable features.
- The corner of an arable field on Dengemarsh at national grid reference TR05451920. This is to more accurately align the boundary with the interest features.

1.3 Description of the pRamsar site boundary

- The seaward boundary in the south-west of the pRamsar site extends to the village of Cliff End. South-west of this point the foreshore becomes rockier. The seaward boundary then follows the Lowest Astronomical Tide (LAT) north-east as far as the River Rother estuary. The boundary crosses the mouth of the Rother at the East Sussex administrative county boundary. The boundary then continues to follow the LAT; firstly east along Camber Sands, Broomhill Sands and Lydd Ranges up to the western edge of the nuclear power stations' compound. The boundary then continues to follow the LAT from the eastern edge of the power stations' compound before rounding Dungeness foreland itself, and continuing north along Lade Sands and Romney Sands as far as the beach groyne at Littlestone (national grid reference TR08922669). The boundary then turns inland to the sea wall.
- A group of outlying sections of the pRamsar site encompass ponds, ditches and associated wetland habitat on Littlestone Golf Course and Romney Warren.
- The landward boundary of the pRamsar site on the coast at Littlestone heads south. It follows the sea wall, seaward boundaries of properties, the coast road and straight lines between fixed points (including the majority of Greatstone Dunes), south to The Pilot public house. The boundary then continues south following the SPA boundary to the lifeboat station where it turns landward to meet the estate road. The boundary follows the seaward edge of the estate road towards Dungeness point, and the seaward boundary of the Old Lighthouse. It then turns seaward along the track running outside the eastern edge of the power stations' compound to the coast to meet with the LAT beside the power station shingle bund.
- There is an outlying section of the pRamsar site at the Long Pits on Dungeness Point. This encompasses wetland and associated habitat that has arisen through past shingle extraction activities. Low lying shingle habitat, subject to seasonal flooding, surrounds the two long, narrow waterbodies.
- To the north there is an outlying section of the pRamsar site around Lade Pits and to the east of Lydd Airport. The boundary follows ditches, tracks and fences, and encompasses the shingle and wetland habitat associated with the two large flooded gravel pits (Lade Pits) and a number of wetlands within the shingle adjacent to Lydd Airport.
- The pRamsar site boundary encompasses the large area of wetlands that includes the Dungeness RSPB Reserve and adjoining land as described for the SPA above. The Dengemarsh sewer forms the southern boundary of this section from the north-west corner of Dengemarsh Farm. The boundary of the pRamsar site extends further south along the sewer than the SPA following its course in a seaward direction to the point where the sewer enters a culvert for the remainder of its course to the coast.

- The boundary excludes the foreshore and shingle bund fronting the power station compound, where the regular shingle replenishment and narrow intertidal zone provide little suitable habitat for shingle vegetation or waterbirds.
- From the western end of the power stations' compound, the boundary follows a straight line from the LAT inland to the back edge of the shingle bund. Turning west the landward boundary then takes a straight line in front of the coastguard lookout at Dengemarsh Sewer and continues westward to a track at national grid reference TR06311676. The boundary then turns landward along the trackway and continues along the westward edge of the Denge Marsh Road. The boundary follows ditches, tracks and fences to encompass the wetland habitats on Lydd Ranges and at the watersports complex on the Denge Marsh Road.
- The boundary through the Ranges includes two landward spurs to encompass the wetland areas at South Brooks/West Ripe and The Wicks/Midrips/The Forelands. The two spurs are connected at their landward end to include the wetlands at Watermanship. The boundary also includes the land between the Green Wall and LAT. The boundary then follows the Green Wall back to Jury's Gap which lies on the western edge of Lydd Ranges.
- Landward of Lydd Ranges and Lydd, the pRamsar site includes all of the flooded gravel pits between Scotney Court and Dering Farm, as well as Oakhill Fleet.
- West from Jury's Gap the boundary follows the sea wall, seaward edge of Broomhill car park and seaward boundaries of properties in Camber, west to Camber Dunes. The boundary then follows fences and straight lines between fixed points to include the foreshore of Camber Sands westwards to the River Rother.
- The pRamsar site includes several flooded gravel pits to the west of Camber and around Northpoint Beach.
- Sections of Walland Marsh around East Guldeford Level, Cheyne Court, Fairfield, Snargate, The Dowels and Warehorne are included, and the boundary around these areas is drawn to encompass grazing marshes and associated ditches.
- The pRamsar site also includes a small agricultural reservoir at Little Cheyne Court.
- Parts of the Royal Military Canal, the Union Channel, Highknock Channel and the entire River Rother upstream to Scots Float sluice are included within the site. As far as possible, a whole system approach has been taken with the Rother estuary and the boundary here follows sea walls, jetties and other physical features. It includes the subtidal channel of the estuary.
- The boundary at Rye Harbour and at Pett Level has been drawn according to the same principles as elsewhere in the pRamsar site, encompassing open water, shingle beach and grazing marsh habitats. The north-eastern boundary of the Rye Harbour section follows the south-western extent of residential and industrial properties on the western bank of the Rother. It then follows the River Brede, ditches and fences south to include areas around Castle Farm and Nook Beach. The boundary follows The Ridge south-west towards the coast and then follows the sea wall fronting Dogs Hill and Pett Level, until it reaches the south-west limit of the Ramsar site at Cliff End.
- The boundary around Pett Level and the Pannel Valley follows drains, the Dimsdale Sewer, the Royal Military Canal and field boundaries. Two outlying sections are included adjacent to Pett Level; one at Pewis Marsh, Winchelsea, and the other adjacent to Chickhill Bridge, Cliff End.

2 LOCATION AND HABITATS

The area covered by Dungeness, Romney Marsh and Rye Bay is internationally important with a diverse coastal landscape comprising a number of habitats, which appear to be unrelated to each other. However, all of them exist today because coastal processes have formed and continue to shape a barrier of extensive shingle beaches and sand dunes across an area of intertidal mud and sand flats. This area contains the largest and most diverse area of shingle beach in Britain, with low-lying hollows in the shingle providing important saline lagoons, natural freshwater pits and basin fens. Rivers draining the Weald to the north were diverted by the barrier beaches, creating a sheltered saltmarsh and mudflat environment, which was gradually in-filled by sedimentation, and then reclaimed on a piecemeal basis by man. Today this area still contains relict areas of saltmarsh (the largest areas of this habitat in East Sussex) and an extensive network of ditches which drain areas of grazing marsh, arable farmland and reedbed. Human activities have further modified the site, resulting in the creation of extensive areas of open water due to gravel extraction. This highly unusual coastal landscape has varied soils and shingle deposits that help to explain the way in which Romney Marsh and Rye Bay were formed, and may evolve in the future.

The Dungeness, Romney Marsh and Rye Bay SPA (incorporating proposed extensions of 2,580.06 ha and deletions of 10.00 ha) covers an area of 4,048.63 ha and the proposed Ramsar site covers an area of 6,416.15 ha within the districts of Ashford and Shepway in Kent, and Rother in East Sussex. The majority of both the SPA (including proposed extensions) and pRamsar site are within the Dungeness, Romney Marsh and Rye Bay SSSI, as notified on 16 August 2006. The remaining area is part of the Hastings Cliff to Pett Beach SSSI, as notified on 19 December 1990.

Dungeness and Rye Harbour comprise the largest cusped foreland (a low-lying triangular foreland) in Britain and form part of a system of barrier beaches that can be traced 40 km from Fairlight to Hythe. The foreland represents some 5,000 years of coastal evolution and environmental change, which are well documented through both geological study and historical records. The important features include the eroding and accreting coastline, exposed shingle ridges, buried shingle ridges, cusped foreland (ness) development and associated sediments, such as marsh interface deposits and peat. The shingle beaches at Dungeness and Rye Harbour support a range of vegetated shingle communities and transitions between them.

The area includes three sand dune systems at Camber, Romney Warren and Greatstone, representing different structural types of sand dune and sand dune formation associated with the shingle structures of Dungeness and Rye Harbour. An important feature of these dunes is the transitions they demonstrate between vegetated shingle beach and foredune communities. For some of their length the dunes are also fronted by a strandline community.

The saltmarshes in the estuary of the River Rother show a complete succession from cord-grass *Spartina* spp. saltmarsh and pioneer marsh of glassworts *Salicornia* spp. and annual sea-blite *Suaeda maritima*, through low-mid and mid-upper marsh communities, to a drift line dominated by common couch *Elytrigia repens* and upper marsh common reed *Phragmites australis* swamp. Downstream of the Monk Bretton Bridge in Rye, the site supports higher saltmarsh communities on raised areas adjacent to the river, dominated by common saltmarsh-grass *Puccinellia maritima* and, where the saltmarsh is grazed, red fescue *Festuca rubra*. The nationally scarce sea-heath *Frankenia laevis* occurs in parts of the upper saltmarsh. Low-mid marsh communities of common saltmarsh-grass and sea-purslane *Atriplex portulacoides*, with sea wormwood *Seriphidium maritimum* and sea aster *Aster tripolium*, occupy the inner areas of the marsh. In the immediate vicinity of Rye Harbour, there is a pure stand of sea-purslane. The Rother upstream of the bridge is canalised and there are only narrow strips of saltmarsh habitat along the flood banks. These areas are characterised by the low-mid marsh sea-purslane saltmarsh community, although the sea couch *Elytrigia atherica* drift line community is also represented. The saltmarsh communities are an integral part of the functioning dynamic estuarine system, providing nutrients for the mudflats and sandflats, and feeding and roosting areas for waterbirds.

The extensive mud and sand flats at Romney Sands, Lade Sands, and from Lydd Ranges to Cliff End, support a range of benthic communities, which in turn are an important feeding resource for birds and fish.

There are also extensive areas of open water created by gravel extraction, as well as agricultural reservoirs, particularly around Rye Harbour and Camber, Dungeness and Scotney Court. The variety of sizes, ages, depths, shallow margins and vegetation within these wetlands provides important habitat for waterbirds and wetland plants and invertebrates.

The vast shingle beach at Dungeness contains a number of natural wetlands (unlike the extensive flooded pits created by gravel extraction), referred to as the Open and Fossil Pits, within Dungeness RSPB Reserve and Lydd Ranges. There is at least one similar natural wetland with a more recent origin in the shingle beach at Rye Harbour. These wetlands have been subject to colonisation by vegetation and (the Open Pits at least) display stages of a classic hydroseral succession, from open water and marginal reed-swamp, through a form of marsh or fen, to grey willow *Salix cinerea* carr. Some of the pits have reached a stage in the hydroseral succession where they have little or no open water. Most have floating rafts of vegetation, varying in the degree to which they have stabilised. These floating rafts of vegetation are typical of the "Schwingmoor" type of basin fen, where layers of peat are separated by lenses of water. The pits contain a range of fen types from nutrient-rich to poor fen, with vegetation ranging from single species swamps to more complex communities. The oldest of the pits are now on the eroding south coast of Dungeness (in Lydd Ranges) and have reverted to saline conditions. They are typical, relatively stable, shingle percolation lagoons. The lagoons demonstrate a range of salinities and all show landward transitions to vegetated shingle habitats and to the shingle ridge geomorphology of Dungeness.

The extensive systems of ditches and dykes (such as those draining Walland Marsh and Pett Level) are important examples of lowland, slow-moving and eutrophic (nutrient-rich) waters. There is a brackish influence near the sea and also in some inland ditches, particularly where peat deposits, which leach salt, lie close to the surface. The majority of the ditches are rich in plant species.

The Dowels contains the greatest proportion of freshwater ditches on Walland Marsh and has the highest plant species diversity, with the nationally rare sharp-leaved pondweed *Potamogeton acutifolius* and several nationally scarce species, including greater water-parsnip *Sium latifolium* and marsh-mallow *Althaea officinalis*. Although components of this diverse flora are also found in the adjacent northern end of Snargate, the majority of Snargate is similar to Fairfield, Woolpack and Cheyne Court, where most of the ditches contain a characteristic but less diverse brackish community. The typical aquatic species are soft hornwort *Ceratophyllum submersum*, spiked water-milfoil *Myriophyllum spicatum*, fennel pondweed *Potamogeton pectinatus*, brackish water-crowfoot *Ranunculus baudotii*, thread-leaved water-crowfoot *R. trichophyllus* and horned pondweed *Zannichellia palustris*. The dominant emergent species in these areas are sea club-rush *Bolboschoenus maritimus*, common reed and lesser bulrush *Typha angustifolia*. The ditch banks support a number of upper saltmarsh species, such as saltmarsh rush *Juncus gerardii*, sea-milkwort *Glaux maritima* and sea arrowgrass *Triglochin maritimum*. The large area of grazing marsh at East Guldeford also contains predominantly brackish ditches, although overall it is less brackish than Snargate, Fairfield and Woolpack. The ditch banks which are ungrazed or only lightly grazed are particularly important for marsh-mallow.

The grazing marsh ditches on Pett Level range from freshwater to brackish, and this contributes to the diversity of the fauna and flora. Recently cleared ditches rapidly become invaded by aquatic plants, such as fennel pondweed, soft hornwort and bladderwort *Utricularia australis* in the brackish ditches, and rigid hornwort *Ceratophyllum demersum*, broad-leaved pondweed *Potamogeton natans* and hairlike pondweed *P. trichoides* in those with a freshwater influence. The brackish ditches eventually become invaded by emergent species such as sea club-rush and grey club-rush *Schoenoplectus tabernaemontani*, while arrowhead, lesser bulrush, greater pond-sedge *Carex riparia*, and water dock *Rumex hydrolapathum* are more common in the freshwater ditches. Eventually, the late succession ditches become dominated by common reed.

The continuing evolution of the foreland is itself of interest. The site is responding to a variety of influences including reduction in sediment supply, coastal defence works, shingle recycling for beach management, training walls at Rye Harbour and sea-level rise, including that linked to the predicted effects of climate change. However, despite these influences the site continues to

evolve, and understanding the ongoing evolution, including comparison to historical changes and the influence of human activity, is a key element of the geomorphological interest. In this context, the site is one of a suite of five south-west facing beach systems along the coast of the English Channel, which all show contrasting characteristics in relation to sediment supply, erosion and orientation to the dominant wave direction.

Large areas of the SPA (including proposed extensions) and proposed Ramsar site are owned and managed as nature reserves by a variety of organisations. Dungeness National Nature Reserve (NNR) is situated in and around Dungeness point. The NNR is owned and leased by the Dungeness Estate Trust, Natural England, the RSPB and Shepway District Council.

The Romney Marsh Countryside Project manages land within the NNR (on behalf of Dungeness Estate Trust, Natural England and Shepway District Council) and the Romney Warren Local Nature Reserve (LNR) (Shepway District Council). The Romney Marsh Countryside Project, also undertakes a range of conservation activities within the SSSI and surrounding area, ranging from volunteer days, guided walks and educational visits to ecological survey work, particularly medicinal leech, great crested newts and water vole surveys. Kent Wildlife Trust runs a visitor centre at Romney Warren where they undertake environmental education work with the local community and visitors.

The RSPB is another major landowner providing visitor facilities, including bird hides and interpretation of the area's nature conservation importance. The RSPB manages nearly a thousand hectares to the east of Lydd Ranges as a nature reserve for birds and other wildlife. Established in 1931, Dungeness is the RSPB's oldest reserve. It is centred on a series of flooded gravel extraction pits, but also includes large areas of shingle beach and grazing marsh..

Rye Harbour LNR is managed on behalf of a committee representing a range of bodies, including East Sussex County Council, Rother District Council, Environment Agency and Sussex Wildlife Trust, as well as several private landowners. It is supported by an active Friends group and volunteers, who run the small visitor information point. English Heritage maintains and manages the historic Camber Castle within the LNR.

Running around the landward fringe of Romney Marsh is the Royal Military Canal. This is the third longest defensive monument in the British Isles and was built to defend Britain from Napoleonic invasion. The canal now provides an important wildlife habitat and is a vital component of Romney Marsh's irrigation and drainage network managed by the Environment Agency.

The site also includes two private nature reserves. One at Cheyne Court is owned by the Elmley Conservation Trust and has been managed for its bird interest since 1993. The other is a collection of sites at Pett Level and East Guldeford Levels that are owned and managed by The Wetland Trust.

The proposed extensions to the SPA are further detailed below. These areas are important for a variety of breeding and non-breeding birds, and are used as nesting sites, feeding areas and roosts. They include important open waters, grazing marshes, reedbeds, saltmarshes, intertidal mudflats and sandflats, and subtidal channels. The use of each area by the species and assemblages of European and international importance is described in section 4 (below).

2.1 Lade Sands and Romney Sands (area 1 on location map)

This extension stretches from Littlestone in the North, south past Greatstone and on towards Dungeness point on the eastern foreshore. It consists of extensive intertidal mudflats and sandflats, and forms an important part of the complex of wetland habitats.

2.2 Lade Pits (area 2 on location map)

The extension at Lade Pits lies adjacent to the existing SPA (which already includes the southern pit) and includes the northern flooded gravel pit. This northern pit is a deep open water body created through past mineral extraction which was completed in the early 2000s. The pits lie to the north east of the wide expanse of shingle foreland of Dungeness point. Together these two wetlands form an important part of the extent of open fresh water within the SPA at Dungeness.

2.3 Long Pits (area 3 on location map)

The Long Pits lie to the east of the existing SPA within the area of exposed shingle at Dungeness Point. Created through shingle extraction that ended in the 1940s, the Long Pits are two narrow elongated flooded pits that form part of the wider complex of wetland habitats at Dungeness.

2.4 Dungeness RSPB Reserve (area 4 on location map)

Dungeness RSPB Reserve is mostly within the existing SPA but the extensions proposed include additional areas of open water and other wetland habitats. An area of grazing marsh with a scattered complex of open water bodies from past shingle extraction forms an extension to the north-western boundary of the existing SPA. It extends from the railway line in the north, south over the Dungeness Road and includes land to the south-west and south-east of Boulderwall Farm. Following the western boundary further south, a small extension encloses an area of grazing marsh at Dengemarsh Farm. To the south and east of the RSPB Reserve, the boundary is realigned to follow straight lines between fixed points that are more easily defined on the ground.

2.5 Lydd Watersports (area 5 on location map)

It is proposed to extend the SPA to include the wetland features at the Lydd Watersports complex on the Dengemarsh Road that lies to the north-west of the RSPB Reserve. These mature lakes created by aggregate extraction form part of the wider complex of wetland habitats at Dungeness.

2.6 Scotney Court (area 6 on location map)

The SPA extension covers an area to the west of Lydd Ranges and north of Lydd. This area incorporates a large expanse of wetland habitats, including flooded gravel workings between Scotney Court and Derings farm, as well as reedbeds that lie adjacent to the westernmost pit and at the nearby Oakhill Fleet. The pits have arisen through past aggregate extraction and now offer a complex of open waters. The area is open and the extensive water bodies are surrounded by large areas of grassland.

2.7 Lydd Ranges (area 7 on location map)

The extension at Lydd Ranges covers a range of wetland habitats, including brackish open waters, reedbeds, a flooded gravel pit and intertidal foreshore. The variety and area of habitats found at Lydd Ranges makes it integral to the wider complex of wetlands across Dungeness, Romney Marsh and Rye Bay.

Three areas known as the Midrips, The Wicks and Southbrooks are low-lying wetland and reedbed habitats between the higher shingle ridges that run in a north-south direction towards the coast. In the west, the Midrips offers large, open, shallow waterbodies, where water levels and salinity vary seasonally and due to percolation of seawater through the shingle. There are also reedbeds at the landward end of the Midrips. The Wicks and Southbrooks are mainly reedbed and wet grassland habitat. North of the Midrips is the flooded gravel pit referred to as Watermanships. It lies further inland close to the main Lydd camp. This is an old extraction site, which is now flooded and heavily fringed with willows *Salix* spp.

The extension also includes the intertidal foreshore fronting Lydd Ranges between the lookouts at Jury's Gap in the west and Galloways in the east. The foreshore is shingle with mudflat and sandflats exposed at low tide. The habitats are contiguous with those lying to the west at Broomhill Sands and Cambers Sands.

2.8 Rye Bay

Rye Bay extends along the foreshore from Pett Level in the west to Camber Sands in the east. It includes Pett Level and the Pannel Valley, Rye Harbour LNR, the pits around Camber and Northpoint, and the River Rother and East Guldeford Levels north to Scots Float sluice and the Union Channel. Parts of Rye Bay are already within the SPA; specifically most of Pett Level and Rye Harbour LNR, some of the saltmarsh within the estuary of the River Rother, the western end

of Camber Sands and the eastern portion of Northpoint Pit. The proposed extensions are detailed below.

2.8.1 Camber to Broomhill foreshore (area 8 on location map)

The existing SPA at Camber Sands lies to the east of the mouth of the River Rother. The Camber to Broomhill foreshore extension continues east to include the remainder of Camber Sands and the extensive sandy mudflats at Broomhill Sands. The foreshore immediately east of Broomhill Sands is included within the Lydd Ranges extension.

2.8.2 Northpoint and Camber pits (area 9 on location map)

The Northpoint and Camber pits are a collection of flooded gravel pits that are located along the Camber Road between Rye and Camber. The largest of the pits, Northpoint Pit is located just to the north of the tidal stretch of the River Rother and south of the Camber Road. It is a mature pit with islands and spits, and a relatively open setting. The eastern portion of Northpoint Pit is within the existing SPA. The extension includes the remaining part of this Pit and the surrounding land, as well as the smaller pits to the north of the Camber Road. The smaller pits also have an open setting and are mostly surrounded by areas of grassland.

2.8.3 East Guldeford Levels (area 10 on location map)

This extension of the SPA is in two parts lying north and south of the village of East Guldeford. The larger area of grazing marsh lies between East Guldeford and Camber, with a smaller area to the north of East Guldeford. East Guldeford Levels consist of extensive areas of lowland damp grassland that regularly flood in winter. The grasslands are intersected by a network of drainage ditches.

2.8.4 River Rother and Union Channel (area 11 on location map)

The saltmarsh and intertidal mudflats on the western bank of the Rother Estuary between Rye Harbour village and the river mouth are within the existing SPA. The SPA extension includes the remainder of the tidal Rother upstream to Scots Float sluice, as well as the Union Channel (which enters the Rother from the east, just downstream of Scots Float).

2.8.5 Rye Harbour LNR (area 12 on location map)

The great majority of Rye Harbour LNR and the land around it is within the existing SPA. The extensions proposed here comprise small additional areas of shingle beach and grazing marsh that form part of the same habitat complex. Five extensions are proposed to realign the SPA boundary with identifiable features and to include whole habitat units:

- In the far north-western corner, adjacent to the River Brede and Castle Mill Cottages, the boundary is extended to include a field of similar grazing marsh habitat to that of the surrounding existing SPA.
- Further south, the boundary is extended in the vicinity of Castle Farm and River Brede Farm to align with the grazing marsh habitat and to follow ditches and drains.
- At Nook Beach the boundary is extended to include an area of shingle between a flooded gravel pit and Watch Cottages.
- Also at Nook Beach, the boundary is extended to follow identifiable features around the farm buildings to the north-east of Watch Cottages.
- In the north-east of Rye Harbour, close to Rye Harbour village, the boundary is extended to follow identifiable features around parts of the narrow lakes adjacent to the 'Church of the Holy Spirit'. However, there are also proposed deletions from the SPA boundary in this area, as described in section 1.2 (above).

2.8.6 Pett Level and Pannel Valley (area 13 on location map)

Pett Level and part of the Pannel Valley are within the existing SPA. The extensions proposed are to include additional areas of grazing marsh and open water habitat around Pett Level, the Pannel Valley and an area known as Carter's Flood. The extensions include areas of grazing marsh that lie along the northern boundary alongside the Royal Military Canal on the edges of Pett Level itself. The Pannel Valley lies to the west of Pett Level. The extension follows the profile of the valley to include additional grazing marsh at the base of Wickham Cliff and open water habitat to the south of the existing SPA. The valley consists of farmland that has been partly converted into a series of reedbeds and wetlands. Carter's Flood is an area of grazing marsh, open water and fringing reedbeds on the western boundary (near Carter's Farm) south of Pannel Valley.

2.8.7 Winchelsea Beach to Cliff End foreshore (area 14 on location map)

The existing SPA at Pett level lies landward of the sea wall. The inclusion of the foreshore from Winchelsea Beach to Cliff End extends the boundary to include the extensive intertidal mudflats and sandflats, which are contiguous with those fronting Rye Harbour LNR within the existing SPA to the east.

2.9 Cheyne Court (area 15 on location map)

Cheyne Court lies within Walland Marsh to the south-west of Brookland. This grazing marsh site includes lowland damp grassland with brackish ditches and extensive areas of reedbed, as well as open waters, including a small agricultural reservoir. Part of the area was restored from arable cultivation in 1993 and lies within the Romney Marsh Nature Reserve. Water levels are managed to provide open water conditions for much of the winter period, with this flooding maintained into the early part of the breeding season to encourage the population and diversity of breeding birds.

2.10 Fairfield (area 16 on location map)

The Fairfield extension is on Walland Marsh to the north of Cheyne Court. It is an area of grazing marsh fields between the Royal Military Canal and Brookland. The habitat is made up of lowland damp grassland intersected by drainage ditches.

3 ASSESSMENT OF ORNITHOLOGICAL INTEREST

3.1 Survey information and summary

The counts of most breeding, wintering and passage birds have been derived from Rye Harbour Local Nature Reserve records, the Wetland Trust (Pett Level), Dungeness RSPB Reserve records and Wetland Bird Survey (WeBS) core counts for the years 2002/03 – 2006/07. Additional data sources are cited in the species accounts below. All of the bird data sources are summarised with details of their method of data collection and verification process in Annex 1 to this document. The Dungeness, Romney Marsh and Rye Bay SPA (including proposed extensions) and pRamsar site supports over 1% of the GB populations of 12 species listed in Annex I to the EC Birds Directive (2009/147/EC), over 1% of the biogeographical population of one regularly occurring migratory species, and over 1% of the biogeographical population of one non-migratory species. It also supports a waterbird assemblage of European/international importance during the non-breeding season. The species and assemblages of European and international importance are described below.

3.2 Species listed in Annex I to the EC Birds Directive

3.2.1 Marsh harrier *Circus aeruginosus*

The breeding population of marsh harriers in Great Britain is estimated to be 201 females (Baker *et al.*, 2006), representing about 0.2% of the European breeding population (BirdLife International, 2004). In the UK, the main breeding areas are in eastern England between Kent and the Humber, with particular concentrations in Norfolk and Suffolk (Gibbons *et al.*, 1993). Breeding marsh harriers typically nest in open freshwater wetlands with dense, tall vegetation (particularly reedbeds), although they are increasingly nesting in arable crops in some areas. They favour brackish or freshwater equally and occur on marshes, ponds, lakes, lagoons and riverbanks (Stroud *et al.*, 2001).

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of at least four breeding female marsh harriers (see table 2, below), which represent 2.0% of the GB breeding population. Marsh harriers nest at several locations across Romney Marsh, at Dungeness and in the Rye Bay area.

Table 2 Confirmed breeding female marsh harriers in the SPA, including proposed extensions

Area	Data sources	2004	2005	2006	2007	2008	5 year mean
Romney Marsh	Romney Marsh Harrier Recording Group (Norman 2009)	1	2	2	5	3	
Rye Bay	Wetland Trust and Sussex Ornithological Society	0	0	0	1	2	
Dungeness	RSPB	0	0	0	2	2	
Total		1	2	2	8	7	4

3.2.2 Avocet *Recurvirostra avosetta*

The breeding population of avocets in Great Britain is estimated to be 877 pairs (Baker *et al.*, 2006), representing about 2% of the European breeding population (BirdLife International, 2004). In the UK, the main breeding areas are in East Anglia and Kent, with particular concentrations around the Norfolk, Suffolk and north Kent coasts. The preferred nesting habitat of avocets is shallow, brackish coastal lagoons with bare or sparsely vegetated low islands (Gibbons *et al.*, 1993), although the species has also established nesting at several inland colonies.

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of 31 breeding pairs of avocet, which represent 3.5% of the GB breeding population. The majority of breeding pairs nest at sites around Rye Bay, with small numbers at Dungeness RSPB Reserve and Lydd Ranges.

3.2.3 Mediterranean gull *Larus melanocephalus*

The breeding population of Mediterranean gulls in Great Britain is estimated to be 108 pairs (Baker *et al.*, 2006), representing about 0.1% of the European breeding population (BirdLife International, 2004). In the UK, breeding Mediterranean gulls occur mostly on the south and east coasts of England (Stroud *et al.*, 2001).

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of 56 breeding pairs of Mediterranean gulls, which represents 52.2% of the GB breeding population. The majority of breeding Mediterranean gulls are located at Rye Harbour LNR, with occasional breeding on Pett Level.

3.2.4 Sandwich tern *Sterna sandvicensis*

The breeding population of sandwich terns in Great Britain is estimated to be 10,536 pairs (Baker *et al.*, 2006), representing about 10% of the European breeding population (BirdLife International, 2004). In the UK, the main breeding colonies are on the east coast of Britain and are mostly confined to coastal shingle beaches, sand dunes and offshore islets (Ratcliffe *et al.*, 2000). Feeding takes place mainly in inshore coastal waters and within a few kilometres of the colonies (Cramp *et al.*, 1974).

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of 350 breeding pairs of sandwich terns, which represents 3.3% of the GB breeding population. All breeding sandwich terns in the SPA nest at Rye Harbour LNR.

The feeding grounds of sandwich terns that nest at Rye Harbour (as well as those of common terns and little terns) lie predominantly in marine areas beyond the proposed extended boundary of the SPA. As part of their work to identify possible marine SPAs for breeding terns, the Joint Nature Conservation Committee (JNCC) have been carrying out fieldwork at several colonies around the UK during summer 2009. The data will be integrated, along with various oceanographic variables, into a model to assess which marine habitat features are important for terns, with a view to informing the identification of possible marine SPAs.

3.2.5 Common tern *Sterna hirundo*

The breeding population of common terns in Great Britain is estimated to be 10,134 pairs (Baker *et al.*, 2006), representing about 2% of the European breeding population (BirdLife International, 2004). A significant proportion of the British population breeds in Scotland. Coastal colonies in England are concentrated in the north-east, East Anglia, at a few localities along the south coast, and in the north-west (Stroud *et al.*, 2001). Common terns breed around coasts and beside inland freshwater bodies. They forage over shallow water for small fish and invertebrates near to the surface.

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of 273 breeding pairs of common terns, which represents 2.7% of the GB breeding population. The majority of breeding common terns in the SPA are located on Pett Level and at Rye Harbour LNR, with small numbers at Dungeness RSPB Reserve.

3.2.6 Little tern *Sterna albifrons*

The breeding population of little terns in Great Britain is estimated to be 1,947 pairs (Baker *et al.*, 2006), representing about 4% of the European breeding population (BirdLife International, 2004). Breeding occurs in scattered colonies around much of the coast of Britain, from the north of Scotland to the south coast of England. All British little terns nest on the coast, utilising sand and shingle beaches and spits, as well as tiny islets of sand or rock close inshore (Stroud *et al.*, 2001). The greater part of the population occurs in south and east England from Hampshire to Norfolk

(Lloyd *et al.* 1991).

Little tern is the only species for which the SPA was classified in 1999 where the entire population remains within the classified boundary. It is therefore appropriate to retain the original baseline population of 35 pairs between 1992 and 1996, which represented 1.5% of the GB population at that time. The numbers using the SPA have declined and between 2004 and 2008 the SPA, including the proposed extensions, supported an average of 14 breeding pairs of little terns, which represents 0.7% of the GB breeding population. All breeding little terns during the period 2004 to 2008 have nested at Rye Harbour LNR.

3.2.7 Bewick's swan *Cygnus columbianus bewickii*

The wintering population of Bewick's swans in Great Britain is estimated to be 8,070 individuals (Baker *et al.*, 2006), representing about 40% of the *bewickii* subspecies, NW Europe (non-breeding) population (Wetlands International, 2006). In Britain, the species has a southerly distribution during the winter, with by far the largest concentrations in eastern England, especially the Nene and Ouse Washes. Smaller flocks occur in western England with relatively small numbers in Wales (Stroud *et al.*, 2001).

Between 2002/03 and 2006/07 the SPA, including the proposed extensions, supported an average peak of 155 wintering Bewick's swans, which represents 1.9% of the GB wintering population. Bewick's swans disperse widely to feed in agricultural fields during the day before returning to their favoured roost sites in the SPA, especially Cheyne Court.

3.2.8 Bittern *Botaurus stellaris*

The wintering population of bitterns in Great Britain is estimated to be 50-150 individuals (Baker *et al.*, 2006), representing about 2% of the *stellaris* subspecies, W Europe, NW Africa (breeding) population (Wetlands International, 2006). The wintering distribution is more extensive than in the breeding season (when it is concentrated in East Anglia, Somerset, Yorkshire/Humberside and Lancashire), although few sites regularly hold more than one individual. Wintering bitterns are confined to wetland areas supporting extensive stands of common reed *Phragmites australis* (Stroud *et al.*, 2001).

Between 2002/03 and 2006/07 the SPA, including the proposed extensions, supported an average peak of at least five wintering bitterns, which represent 5.0% of the GB wintering population. The two main locations for bitterns in winter are Rye Harbour LNR and Dungeness RSPB Reserve, although the species is regularly reported at Pett Level and Cheyne Court, and there are occasional records from many wetland areas throughout the site. To avoid the risk of double-counting, the five year mean has been calculated using the highest count from Rye Harbour LNR or WeBS data for each winter (see table 3, below). The five year peak mean of five bitterns therefore represents an absolute minimum.

Table 3 Wintering bitterns in the SPA (including proposed extensions)

Site/source	2002/3	2003/4	2004/5	2005/6	2006/7	Five year peak mean
Rye Harbour LNR	8	6	4	2	2	
WeBS	2	2	3	4	1	
Peak	8	6	4	4	2	5

3.2.9 Hen harrier *Circus cyaneus*

The wintering population of hen harriers in Great Britain is estimated to be 750 individuals (Baker *et al.*, 2006), representing about 9% of the European population (BirdLife International, 2004). Hen harriers are widely distributed in Great Britain in winter, with concentrations in western Scotland, Orkney, East Anglia, and south-east and central southern England (Lack, 1986). Wintering hen harriers typically occupy low-lying coasts, fenland and river valleys, as well as heathland, forestry and downland, although some upland areas are regularly used (Lack, 1986).

Between 2002/03 and 2006/07 the SPA, including the proposed extensions, supported an average

peak of 11 wintering hen harriers (see table 4, below), which represent 1.5% of the GB wintering population. Hen harriers disperse widely (including areas beyond the boundaries of the SPA) to feed during the day. They are recorded as they arrive at communal evening roosts in regularly used traditional sites, typically reedbeds. The most regularly used roosts in the SPA during the data period were Location 1, Location 2, Location 3 and Location 4. Hen harriers were also recorded using occasional roost sites at Location 5, Location 6, Location 7, Location 8 and Location 9.¹

Table 4 Winter roosts of hen harriers in the SPA (including proposed extensions)

Area	2002/3	2003/4	2004/5	2005/6	2006/7	Five year peak mean
Location 4	✓	✓		✓	✓	
Location 7					✓	
Location 3	✓	✓	✓		✓	
Location 8				✓		
Location 6				✓		
Location 2		✓	✓	✓	✓	
Location 1	✓		✓	✓		
Location 5				✓		
Location 9				✓		
Peak number recorded during co-ordinated roost counts	18	13	10	11	5	11

Sources: *Romney Marsh Harrier Recording Group*.

3.2.10 Golden plover *Pluvialis apricaria*

The wintering population of golden plovers in Great Britain is estimated to be 250,000 individuals (Baker et al., 2006). Birds from at least two biogeographical populations use Great Britain in winter (Wetlands International, 2006), although it is not clear what proportion of each of these populations the country regularly supports. Those golden plovers wintering in eastern Britain (including Dungeness, Romney Marsh and Rye Bay) are likely to be members of the *altifrons* subspecies, N Europe, extreme W Siberia (breeding) population. Concentrations occur from the Firth of Forth south to Tyneside, between Morecambe Bay and the Dee across to the Humber, in Lincolnshire and in Fenland, and on the south-west England peninsula. Grassland is the most important feeding habitat, with earthworm-rich permanent pastures preferred over leys and arable. The intertidal zone is also an important feeding habitat, especially in Scotland, Ireland and northern England. Birds roost on arable land, damp grassland and intertidal areas (Stroud et al., 2001).

Between 2002/03 and 2006/07 the SPA, including the proposed extensions, supported an average peak of 4,050 wintering golden plovers, which represents 1.6% of the GB wintering population. Wintering golden plovers are widely distributed amongst the grazing marshes and other wetlands, with particular concentrations at Cheyne Court, Scotney Court and around Rye Bay (including East Guldeford Levels).

3.2.11 Ruff *Philomachus pugnax*

The wintering population of ruff in Great Britain is estimated to be 700 individuals (Baker et al., 2006), representing about 0.1% of the western Africa (non-breeding) population (Wetlands International, 2006). In Great Britain, the species winters in small numbers both inland and on the coast (Lack, 1986). Most sites are on the south and east coasts of Britain, with others in the north-

¹ The specific locations have been removed to protect this vulnerable species from harm e.g. disturbance, persecution. This is covered by the Environmental Information Regulation (12)(5)(g) exception, as the release of this information would adversely affect the protection of the environment to which the information relates.

west. Inland, the main areas are in the eastern half of central England (Lack, 1986). Notable concentrations occur on the coasts of Dorset and Hampshire, in the Cambridgeshire Fens and on the coasts of Essex and north Kent (Lack, 1986). Ruff use a wide range of habitats in the winter, including coastal marshes, intertidal zones, inland flooded fields and the muddy margins of lakes and pools (Lack, 1986). Small numbers even occur on dry farmland with flocks of golden plover and lapwing *Vanellus vanellus* (Stroud *et al.*, 2001).

Between 2000/01 and 2004/05 the SPA, including the proposed extensions, supported an average peak of 51 wintering ruff (see table 5, above), which represents 7.3% of the GB wintering population. The species is widespread in the SPA in winter but particularly high counts have been recorded from Dungeness RSPB Reserve, Cheyne Court, Rye Harbour LNR and Pett Level. Peak counts of wintering ruff are not always recorded by WeBS. Accordingly, the data period reflects the most recent counts that are available from the Kent and Sussex Bird Reports.

Table 5 Wintering ruff in the SPA (including proposed extensions)

Winter	2000/1	2001/2	2002/3	2003/4	2004/5	5 year peak mean
Peak	75	32	60	60	30	51
Data source	Kent Bird Report 2000	WeBS	Kent Bird Report 2003	Sussex Bird Report 2004	Kent Bird Report 2005	
Area	Dungeness	All sectors	Dungeness	Pett Level	Walland Marsh	

3.2.12 Aquatic warbler *Acrocephalus paludicola*

Aquatic warbler is one of only two globally threatened bird species to regularly occur in England. The species is classified as vulnerable due to a rapid population decline in its breeding area of 40% up to the late 1990s (BirdLife International, 2009). The autumn passage population of aquatic warblers in Great Britain is estimated to be 33 individuals (Baker *et al.*, 2006). The vast majority are recorded along the south coast of England. Migrating aquatic warblers occupy a variety of damp vegetated habitats, but principally areas with common reed or rushes (*Scirpus*, *Juncus*).

Between 2004 and 2008 the SPA, including the proposed extensions, supported an average of two aquatic warblers during autumn passage, which represents 6.1% of the GB passage population. These birds occur on Pett Level, where they are recorded by bird ringers. It is likely that the species goes undetected in suitable habitat (reedbeds) elsewhere in the SPA (including proposed extensions).

3.3 Regularly occurring migratory species

3.3.1 Shoveler *Anas clypeata*

The wintering population of shoveler in Great Britain is estimated to be 14,800 individuals (Baker *et al.*, 2006), representing about 37% of the NW & C Europe (non-breeding) population (Wetlands International, 2006). The wintering range of shoveler extends from Britain, south through France and Spain, to the Mediterranean and Black Seas. Birds wintering in Britain originate from Russia, the Baltic States, Fennoscandia and Iceland, and are widely distributed across central and southern England. In north-west and south-west England they are more localised as suitable habitat is less widespread. Shoveler inhabit reservoirs, natural lakes, flooded mineral workings, coastal wetlands and flooded grasslands (Lack, 1986).

Between 2002/03 and 2006/07 the SPA, including the proposed extensions, and the pRamsar site supported an average of 485 wintering shoveler, which represents 1.2% of the NW & C Europe (non-breeding) population. During the winter, shoveler are found in freshwater wetlands throughout the site, with the largest concentrations at Dungeness RSPB Reserve, Cheyne Court and around Rye Bay.

3.4 Non-migratory species

3.4.1 Mute swan *Cygnus olor*

As a non-migratory species that is not listed in Annex I to the EC Birds Directive, mute swan does not fall within the scope of article 4 of the Directive. Therefore, it is only proposed as a qualifying interest feature of the Dungeness, Romney Marsh and Rye Bay pRamsar site. The wintering population of mute swans in Britain is estimated to be 31,700 individuals (Wetlands International, 2006), and it represents a discrete non-migratory biogeographical population. Mute swans occur throughout Great Britain except on higher ground and in areas lacking fertile fresh water (Lack, 1986). Except for the most acid or very large, deep, lakes almost all types of water are used, including estuaries and coastal lagoons.

Between 2002/03 and 2006/07 the pRamsar site supported an average peak of 348 wintering mute swans (see table 6, below), which represents 1.1% of the population in Britain. During the winter, mute swans disperse widely to feed on grazing marshes and arable fields in and around the proposed Ramsar site. They use regular nocturnal roosts within the site, including Rye Harbour LNR, Dungeness RSPB Reserve, the High Knock Channel on Walland Marsh, Royal Military Canal and Cheyne Court. The highest counts are recorded by targeted surveys of roost sites at dusk, which means WeBS counts (usually during the morning) do not record the peak numbers of mute swans. Accordingly, the five year mean based on a combination of roost counts for one part of the Ramsar site and WeBS counts for the whole site, represents an absolute minimum number of mute swans.

Table 6 Wintering mute swans in the proposed Ramsar site

Winter	2002/3	2003/4	2004/5	2005/6	2006/7	Five year peak mean
Peak count	402	432	393	199	312	348
Source	Innogy (2004)		WeBS			
Area covered	Cheyne Court		All sectors			

3.5 Wintering waterbird assemblages

During the period 2002/03 – 2006/07, Dungeness, Romney Marsh and Rye Bay SPA (including proposed extensions) and pRamsar site supported an average peak of almost 35,000 individual waterbirds in the non-breeding season, comprised of almost 16,000 wildfowl and over 19,000 waders. This assemblage is of both European and international importance. In the context of SPA qualification the assemblage includes the wintering and passage species of European importance described above, as well as numbers exceeding 1% of the GB wintering or passage populations (see table 7 and below) of European white-fronted goose *Anser albifrons albifrons*, wigeon *Anas penelope*, gadwall *A. strepera*, pochard *Aythya ferina*, little grebe *Tachybaptus ruficollis*, great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, coot *Fulica atra*, sanderling *Calidris alba*, whimbrel *Numenius phaeopus* and common sandpiper *Actitis hypoleucos*. Lapwings *Vanellus vanellus* are also present in sufficient numbers to warrant their being listed as a major component species of the assemblage, since their numbers exceed 2,000 individuals (10% of the minimum qualifying assemblage of 20,000 individuals). Details of the GB status and the populations present in the SPA (including proposed extensions) and pRamsar site of the main component species of the non-breeding waterbird assemblage are given below.

Table 7 Waterbird species present in nationally important numbers or where their numbers exceed 2,000 individuals during the non-breeding season

Species	5 year peak mean (2002/03 – 2006/07)	% GB population
European white-fronted goose <i>Anser albifrons albifrons</i>	326 individuals - wintering	5.6%
Wigeon <i>Anas penelope</i>	4,899 individuals - wintering	1.2%
Gadwall <i>Anas strepera</i>	300 individuals - wintering	1.8%
Pochard <i>Aythya ferina</i>	815 individuals - wintering	1.4%
Little grebe <i>Tachybaptus ruficollis</i>	93 individuals - wintering	1.2%
Great crested grebe <i>Podiceps cristatus</i>	890 individuals - wintering	5.6%
Cormorant <i>Phalacrocorax carbo</i>	326 individuals - wintering	1.4%
Coot <i>Fulica atra</i>	2,052 individuals - wintering	1.2%
Lapwing <i>Vannellus vanellus</i>	10,880 individuals – wintering	N/A but >2,000 individuals
Sanderling <i>Calidris alba</i>	235 individuals - wintering	1.1%
Whimbrel <i>Numenius phaeopus</i>	282 individuals – spring passage	8.1%
Common sandpiper <i>Actitis hypoleucos</i>	57 individuals – autumn passage	2.2%

3.5.1 European white-fronted goose *Anser albifrons albifrons*

The wintering population of European white-fronted geese in Great Britain is estimated to be 5,790 individuals (Baker *et al.*, 2006), representing about 1% of the *albifrons* subsepecies, Baltic-North Sea population (Wetlands International, 2006). In Britain, large wintering flocks occur in just a few coastal or estuarine areas, but small numbers of passage and wintering birds are recorded throughout England and Wales (Owen *et al.*, 1986; Lack, 1986). The most important wintering areas are in south Wales, including the Severn Estuary, and along the south, south-east and east coasts of England (Lack, 1986). The species tends to forage in grassland, especially low-lying wet pastures bordering coastal marshes and in river valleys (Cramp & Simmons, 1977; Lack, 1986; Owen *et al.*, 1986), and roost on coastal waters, estuarine sandbanks and lakes close to foraging areas (Cramp & Simmons, 1977; Owen *et al.*, 1986).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average peak of 326 wintering European white-fronted geese, which represents 5.6% of the GB wintering population. The majority of wintering geese on the site are located at Scotney Pits and Cheyne Court, with smaller numbers at Dungeness RSPB Reserve. The geese are recorded at their roost sites and disperse more widely to feed on grasslands and arable land during the day, including areas outside the SPA (including proposed extensions) and pRamsar site boundaries.

3.5.2 Wigeon *Anas penelope*

The wintering population of wigeon in Great Britain is estimated to be 406,000 individuals (Baker *et al.*, 2006), representing about 27% of the NW Europe (non-breeding) population (Wetlands International, 2006). Wintering wigeon in Great Britain are concentrated mainly in coastal areas, feeding on mudflats, coastal flooded grassland and saltmarsh pastures, as well as some inland flooded grasslands (Stroud *et al.*, 2001).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 4,899 wintering wigeon, which represents 1.2% of the GB wintering population. During the winter, wigeon are distributed widely across the freshwater wetlands within the site, with particular concentrations at Cheyne Court and Dungeness RSPB Reserve.

3.5.3 Gadwall *Anas strepera*

The wintering population of gadwall in Great Britain is estimated to be 17,100 individuals (Baker *et al.*, 2006), representing about 29% of the *strepera* subspecies, NW Europe (breeding) population (Wetlands International, 2006). Wintering gadwall in Great Britain are found predominantly on freshwater habitats, especially shallow lakes, where they form small flocks (Lack, 1986).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 300 wintering gadwall, which represents 1.8% of the GB wintering population. During the winter, gadwall are found on many of the freshwater wetlands within the site, with particular concentrations at Dungeness RSPB Reserve and around Rye Bay.

3.5.4 Pochard *Aythya ferina*

The wintering population of pochard in Great Britain is estimated to be 59,500 individuals (Baker *et al.*, 2006), representing about 17% of the NE & NW Europe (non-breeding) population (Wetlands International, 2006). They are widespread in the UK in winter, often forming large flocks on lakes, reservoirs, brackish coastal lagoons, tidal estuaries and inshore coastal waters (Scott & Rose, 1996).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 815 wintering pochard, which represents 1.4% of the GB wintering population. During the winter, pochard use a range of open waters across the site, with particular concentrations at Scotney Court, Dungeness RSPB Reserve, Lade Pit and around Rye Bay.

3.5.5 Little grebe *Tachybaptus ruficollis*

The wintering population of little grebes in Great Britain is estimated to be 7,770 individuals (Baker *et al.*, 2006), representing about 2% of the *ruficollis* subspecies (Wetlands International, 2006). Little grebes are widely, but thinly distributed across the UK (Lack, 1986). They occur in a wide variety of wetland types, from inland freshwaters to shallow estuaries. Common features of important sites are muddy substrates and significant growths of emergent vegetation within which birds can conceal themselves (Snow & Perrins, 1998).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 93 wintering little grebes, which represents 1.2% of the GB wintering population. During the winter, little grebes occur on all of the freshwater wetlands within the site, with particular concentrations around Rye Bay and at Dungeness RSPB Reserve.

3.5.6 Great crested grebe *Podiceps cristatus*

The wintering population of great crested grebes in Great Britain is estimated to be 15,900 individuals (Baker *et al.*, 2006), representing about 4% of the *cristatus* subspecies, N & W Europe (non-breeding) population (Wetlands International, 2006). Wintering great crested grebes are principally found on sheltered inland lakes and reservoirs and certain sheltered coastal sites, including shallow inshore waters and estuaries (Lack, 1986).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 890 wintering great crested grebes, which represents 5.6% of the GB wintering population. During the winter, great crested grebes are found on many open fresh and shallow coastal waters within the site, with highest numbers over the intertidal areas of Lade Sands and Rye Bay at high tide.

3.5.7 Cormorant *Phalacrocorax carbo*

The wintering population of cormorants in Great Britain is estimated to be 23,000 individuals

(Baker *et al.*, 2006), representing about 19% of the *carbo* subspecies, NW Europe population (Wetlands International, 2006). Outside the breeding season (i.e. during August to February), some cormorants remain in the vicinity of their colonies, while others move to sheltered, coastal or inland locations – mostly south and east of their breeding sites (Stroud *et al.*, 2001).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 326 wintering cormorants, which represents 1.4% of the GB wintering population. During the winter, cormorants are found in many wetland areas across the site, with particular concentrations at Dungeness RSPB Reserve and around Rye Bay.

3.5.8 Coot *Fulica atra*

The wintering population of coots in Great Britain is estimated to be 173,000 individuals (Baker *et al.*, 2006), representing about 10% of the *atra* subspecies, NW Europe (non-breeding) population (Wetlands International, 2006). Coots are widespread in the UK in both winter and summer; a fact reflected in the small number of sites holding more than 1% of the biogeographical population (Stroud *et al.*, 2001). The non-breeding distribution shows a close similarity to that in summer (Lack, 1986). Coots generally favour large, still or slow-moving eutrophic or mesotrophic waterbodies, such as lakes, ponds, gravel pits, canals, slow-moving rivers, open marshes, and lagoons (Lack, 1986; del Hoyo *et al.*, 1996; Taylor & van Perlo, 1998). They feed primarily on vegetation, such as algae and other aquatic plants, as well as occasionally on terrestrial plants (del Hoyo *et al.*, 1996).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 2,052 wintering coots, which represents 1.2% of the GB wintering population. During the winter, coots are found on all of the open freshwaters in the site, with particular concentrations at Dungeness RSPB Reserve, around Rye Bay and Scotney Court.

3.5.9 Lapwing *Vanellus vanellus*

The wintering population of lapwings in Great Britain is estimated to be 1,500,000-2,000,000 individuals (Baker *et al.*, 2006), representing about 26% of the Europe (breeding) population (Wetlands International, 2006). It is the most widespread wintering wader in Britain (Lack, 1986) and large flocks can be found on a variety of habitats from estuaries and coastal marshes to inland reservoirs and fields.

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 10,880 wintering lapwings, which represents an important component (more than 2,000 individuals) of the non-breeding waterbird assemblage. Lapwings occur widely across the grazing marshes and other wetland habitats within the site, with the highest numbers at Cheyne Court, around Rye Bay (including East Guldeford Levels), Fairfield and Scotney Court.

3.5.10 Sanderling *Calidris alba*

The wintering population of sanderling in Great Britain is estimated to be 20,540 individuals (Baker *et al.*, 2006), representing about 17% of the E Atlantic (non-breeding) population (Wetlands International, 2006). Wintering sanderling occur on estuaries and open coasts all around the UK, with major concentrations in north-west England and the Outer Hebrides (Stroud *et al.*, 2001).

Between 2002/03 and 2006/07 the SPA (including the proposed extensions) and pRamsar site supported an average of 235 wintering sanderling, which represents 1.1% of the GB wintering population. The wintering sanderling in the site are found on Lade Sands and the intertidal foreshore of Rye Bay.

3.5.11 Whimbrel *Numenius phaeopus*

The spring passage population of whimbrel in Great Britain is estimated to be 3,530 individuals (Baker *et al.*, 2006), representing about 1% of the *islandicus* subspecies (Wetlands International, 2006). Spring passage birds tend to be concentrated on the south coast of England, occurring from mid-April and reaching a peak in late April and early May (Stroud *et al.*, 2001).

Between 2003 and 2007 the SPA (including the proposed extensions) and pRamsar site supported an average of at least 282 whimbrel during spring passage (see table 8, below), which represents 8.6% of the GB population. Peak counts of whimbrel are recorded as they go to roost at Rye Harbour LNR, although they use a range of wetland, grassland, intertidal and agricultural habitats (including some outside the SPA/Ramsar site boundary) for feeding during the day.

Table 8 Counts of whimbrel roosting at Rye Harbour LNR during spring passage

	2003	2004	2005	2006	2007	Five year peak mean
Peak number going to roost	353	214	373	222	246	282

Source: Rye Harbour LNR records

3.5.12 Common sandpiper *Actitis hypoleucos*

The autumn passage population of common sandpipers in Great Britain is estimated to be 2,600 individuals (Baker *et al.*, 2006), representing about 0.1% of the N, W & C Europe (breeding) population (Wetlands International, 2006). In Britain, a strong autumn passage of common sandpiper is recorded from mid July to September, when large numbers occur on the east coast of England (Lack, 1986).

Between 2002 and 2006 the SPA (including proposed extensions) and pRamsar site supported an average of 57 common sandpipers during autumn passage, representing 2.2% of the GB passage population. Common sandpipers occur widely in wetland habitats throughout the site during autumn passage, with the highest numbers around Rye Bay.

3.6 Non-qualifying species of interest

The SPA (including the proposed extensions) and pRamsar site as a whole, including the proposed extensions, supports breeding bittern *Botaurus stellaris* and kingfisher *Alcedo atthis* (both species listed in Annex I to the EC Birds Directive) in numbers of less than European importance (less than 1% of the GB population).

4 QUALIFYING BIRD SPECIES' USE OF PROPOSED EXTENSIONS TO SPA

Table 9 (below) shows the use of each WeBS count sector in the SPA (including proposed extensions) and pRamsar site by wintering and passage waterbirds. Sectors regularly used by at least 5% of the total SPA/Ramsar site population of a particular species are highlighted in table 9. The use of the 5% 'threshold' is arbitrary but consistent with assessments of the importance of prospective extensions to other sites in England. The sections below highlight the key ornithological interests in each of the extension areas that justify their proposed inclusion within an extended SPA.

The extension areas where hen harrier occur, and the specific areas where The Romney Marsh Harrier Recording Group have provided survey information, have not been identified. This is covered by the Environmental Information Regulation (12)(5)(g) exception, as the release of this information would adversely affect the protection of the environment to which the information relates

4.1 Lade Sands

The Lade Sands extension (mostly within WeBS core count sector 22403) is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of two species of wintering waterbirds, with 88% (784 individuals) of the great crested grebes and 70% (164 individuals) of the sanderling. Great crested grebes feed in the shallow waters over the intertidal zone at high tide, whilst sanderling feed at low tide on the extensive intertidal mudflats and sandflats. In total, Lade Sands holds 8% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season.

4.2 Lade Pit

Lade Pit (WeBS core count sector 22793) is partly within the existing SPA but also includes a proposed extension to include the northern part of the pit. As a whole, Lade Pit is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of five species of wintering and passage waterbirds, including 11% (32 individuals) of the gadwall, 14% (68 individuals) of the shoveler and 14% (111 individuals) of the pochard. These species use the open water areas for feeding and roosting. In total, Lade Pit holds more than 1,300 waterbirds during the non-breeding season.

4.3 Long Pits

The Long Pits extension (WeBS core count sector 22795) covers a very small area of open water and is not used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of any species. The total of approximately 60 waterbirds (particularly coots) that regularly use the Long Pits during the non-breeding season are a small component of the much larger numbers using the wider Dungeness Gravel Pits complex, of which the Long Pits are a part. Of particular importance is the regular use of the Long Pits by bitterns in winter and early spring, with records in three years during the period 2002/3 – 2006/7 (Dungeness Bird Observatory 2003; 2004; 2006).

4.4 Dungeness RSPB Reserve

Dungeness RSPB Reserve and adjoining land (WeBS core count sector 22791) is mostly within the existing SPA but the extensions proposed here include additional areas of open water and other wetland habitats. As a whole, Dungeness RSPB Reserve is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of 14 species of wintering waterbirds, including 53% (258 individuals) of the shoveler and 64% (208 individuals) of the cormorants. These species use the open waters and other wetland habitats for feeding and roosting. In total, Dungeness RSPB Reserve holds 23% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season. The extensions include areas of grazing marsh at Dengemarsh Farm used as feeding habitat by wigeon and other wetland habitats used by a wide range of waterbirds.

4.5 Lydd Watersports

The Lydd Watersports complex extension (WeBS core count sector 22794, known as 'Bretts Pits') is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of three species of wintering waterbirds, including 8% (27 individuals) of the cormorants. These species use the open water areas for feeding and roosting. In total, Lydd Watersports holds 850-900 waterbirds during the non-breeding season.

4.6 Scotney Court

The Scotney Court extension (WeBS core count sector 22798, known as 'Scotney and Lydd West') is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of eleven species of wintering waterbirds, including 40% (129 individuals) of the European white-fronted geese, 33% (269 individuals) of the pochard and 28% (573 individuals) of the coots. These species use the open water areas and surrounding grassland for feeding and roosting. In total, Scotney Court holds 13% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season.

4.7 Lydd Ranges

The lack of general public access to the Ranges means that they are not regularly surveyed by schemes such as WeBS. Their inclusion is proposed on the basis of information provided by survey work undertaken by the MoD's Lydd Ranges Conservation Group. The collated observations cover wildfowl on South Brooks, the Midrips, the Wicks and Watermanships; waders on the Midrips; and peak counts of waterbirds from the Ranges as a whole.

These data show that the Ranges are used by significant numbers of a variety of wildfowl and waders, including breeding avocets. During the non-breeding season the most numerous species (with peak counts during 2002-2008) are wigeon (300), teal *Anas crecca* (125), mallard *Anas platyrhynchos* (c.200), coot (72), oystercatcher *Haematopus ostralegus* (220), golden plover (565), lapwing (c.150) and dunlin *Calidris alpina* (263). It is likely that many of the waders use the Lydd Ranges foreshore. The data also show 2008 peak counts of 121 cormorants and 126 common scoter *Melanitta nigra*. The common scoters (and probably the cormorants) are recorded in the shallow coastal waters along the Lydd Ranges foreshore. This conclusion is supported by observations made by the Romney Marsh Countryside Project (O. Leyshon, pers. comm.) of up to 800 common scoters, 15 velvet scoters *Melanitta fusca* and 500 great crested grebes at high tide feeding over the foreshore in front of Galloways and South Brooks towards the eastern end of the Ranges.

The Midrips also provide nesting habitat for avocets.

4.8 Rye Bay

Rye Bay (WeBS core count sector 21420) extends along the foreshore from Pett Level in the west to Camber Sands in the east. It includes Pett Level and the Pannel Valley, Rye Harbour LNR, the pits around Camber and Northpoint, and the River Rother and East Guldeford Levels north to Scots Float sluice and the Union Channel. As a whole, Rye Bay is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of 14 species of wintering and passage waterbirds, including 47% (44 individuals) of the little grebes, 45% (148 individuals) of the cormorants, 46% (108 individuals) of the sanderling and 84% (48 individuals) of the common sandpipers. In total, Rye Bay holds 33% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season. These species use the shallow coastal waters, intertidal mudflats and sandflats, saltmarsh, open waters, grazing marshes and other wetland habitats for feeding and roosting. Parts of Rye Bay are already within the SPA; specifically most of Pett Level and Rye Harbour LNR, some of the saltmarsh within the Rother Estuary, the western end of Camber Sands and the eastern half of Northpoint Pit. The proposed extensions are detailed below.

4.8.1 Camber to Broomhill foreshore

The western portion of Camber Sands is within the existing SPA but the remainder of the foreshore east to Jury's Gap at the western end of Broomhill Sands is currently excluded. Camber Sands is included within the Rye Bay WeBS count sector but the short section of foreshore to the east at Broomhill Sands is not subject to any regular bird surveys (east of Broomhill Sands the foreshore is included in counts of Lydd Ranges described in section 4.7 above). Its inclusion is proposed because it is contiguous with the foreshore at Camber Sands, the whole area providing suitable feeding habitat at low tide for wading birds such as oystercatcher, ringed plover *Charadrius hiaticula*, sanderling, dunlin and curlew *Numenius arquata* that are recorded by WeBS at roost sites (including Camber Sands) in Rye Bay and in Lydd Ranges. WeBS data for Camber Sands and counts for Lydd Ranges show this to be true for similar intertidal habitats either side of the short stretch (1.8 km) at Broomhill for which no counts are available. At high tide, the shallow coastal waters over the intertidal flats offer suitable feeding habitat for common scoter, great crested grebe, cormorant and other waterbirds (see section 4.7 above).

4.8.2 Northpoint and Camber pits

The eastern portion of Northpoint Pit is within the existing SPA but the remainder of the lake and the nearby smaller pits between Northpoint and Camber are currently excluded. All of the pits are included within the Rye Bay WeBS count sector. The whole complex is used as feeding and roosting habitat by a wide range of waterbirds, including mallard, pochard, tufted duck *Aythya fuligula*, little grebe, cormorant, coot, lapwing, curlew and redshank *Tringa totanus*. Some of the waders use the site as a roost site and feeding area when nearby estuarine and coastal habitats are covered at high tide.

4.8.3 East Guldeford Levels

East Guldeford Levels are not within the current SPA boundary but part of the area is proposed for inclusion. The majority of the western part is included within the Rye Bay WeBS count sector but the areas to the east and north are not subject to any regular bird surveys. Accordingly, only the western portion of East Guldeford Levels is proposed for inclusion. The area provides suitable habitat for waterbirds, including lapwing, golden plover and curlew. Some of the waders use the Levels as a roost site and feeding area when nearby estuarine and coastal habitats are covered at high tide.

4.8.4 River Rother and the Union Channel

The saltmarsh and intertidal mudflats on the western bank of the Rother Estuary between Rye Harbour village and the river mouth are within the existing SPA. The remainder of the tidal Rother upstream to Scots Float sluice, as well as the Union Channel (which enters the Rother from the east, just downstream of Scots Float) are currently excluded. The whole of the tidal Rother and the Union Channel are included within the Rye Bay WeBS count sector. The saltmarshes, intertidal mudflats and channels are used as a feeding and roosting habitat by a range of waterbirds, including shelduck *Tadorna tadorna*, mallard, lapwing, golden plover, curlew, dunlin, ruff, redshank and common sandpiper. Some of the waders use roost sites (such as Rye Saltings) when feeding areas within the estuary and nearby coastal habitats are covered at high tide.

4.8.5 Rye Harbour LNR

The great majority of Rye Harbour LNR and the land around it is within the existing SPA. The extensions proposed here include small additional areas of shingle beach and grazing marsh that form part of the same habitat complex. The whole of Rye Harbour (including the proposed extension areas) is included within the Rye Bay WeBS count sector. The intertidal mudflats and sandflats, shingle beach, open waters and grazing marshes are used as feeding and roosting habitats by large numbers of a wide range of waterbirds species during the non-breeding season. Parts of Rye Harbour are also important for breeding avocet, Mediterranean gull and terns.

4.8.6 Pett Level and Pannel Valley

Pett Level and part of the Pannel Valley are within the existing SPA. The extensions proposed here are to include additional areas of grazing marsh and open water habitat on the western (near Carter's Farm) and northern (alongside the Royal Military Canal) edges of Pett Level, as well as the southern portion of the Pannel Valley. The whole of Pett Level and Pannel Valley (including the proposed extension areas) is included within the Rye Bay WeBS count sector. The additional areas are used as feeding and roosting habitats by a range of waterbirds, including gadwall, teal, shoveler, curlew and whimbrel. Pett Level is also important for breeding birds, including Mediterranean gull and common tern.

4.8.7 Winchelsea Beach to Cliff End foreshore

The foreshore fronting Winchelsea Beach and Pett Level is included within the Rye Bay WeBS count sector but the short stretch (1 km) west to Cliff End is not subject to any regular bird surveys. Its inclusion is proposed because it is contiguous with the foreshore at Pett Level. West of Cliff End, the foreshore becomes narrower and rockier below Hastings Cliff. The foreshore from Winchelsea Beach to Cliff End provides suitable feeding habitat at low tide and high tide roost sites for wading birds such as oystercatcher, lapwing, golden plover, grey plover *Pluvialis squatarola*, sanderling, dunlin, curlew and turnstone *Arenaria interpres*. At high tide, the shallow coastal waters over the intertidal flats offer suitable feeding habitat for seaducks, grebes and divers, especially common scoters and great crested grebes. They are also used for loafing by flocks of wigeon and other wildfowl that feed on the adjacent grazing marshes.

4.9 Cheyne Court

The Cheyne Court extension (WeBS core count sector 22381, known as 'Walland Marsh') is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of 11 species of wintering waterbirds, including 100% (155 individuals) of the Bewick's swans, 78% (3,160 individuals) of the golden plover, 62% (203 individuals) of the European white-fronted geese, 49% (5,300 individuals) of the lapwings and 48% (2,370 individuals) of the wigeon. In total, Cheyne Court holds 36% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season. These species use the damp grasslands, reedbeds and open water areas for feeding and roosting.

Cheyne Court is additionally important as a wintering site for bitterns. .

4.10 Fairfield

The Fairfield extension (WeBS core count sector 22396) is used by greater than 5% of the Dungeness, Romney Marsh and Rye Bay totals of three species of wintering waterbirds, with 6% (275 individuals) of the wigeon, 8% (25 individuals) of the gadwall and 12% (1,339 individuals) of the lapwings. In total, Fairfield holds 6% of the SPA/Ramsar site assemblage of waterbirds during the non-breeding season. These species use the damp grasslands and open water areas for feeding and roosting.

Table 9 Species present in each WeBS count sector within the SPA (including proposed extensions) and pRamsar site based on WeBS core counts during 2002/03 – 2006/07 (figures in bold represent counts for which 5% or more of the total site population occurs in a particular sector)

Species (* Annex I species of European importance and internationally important migratory species)	Total SPA & Ramsar site peak mean 2002/03 – 2006/07	Number of individuals and proportion of the SPA/Ramsar site total present in each sector									
		Rye Bay (sector 21420)		Walland Marsh (sector 22381)		Fairfield (sector 22396)		Scotney and Lydd West (sector 22798)		Bretts Pits (sector 22794)	
		No.	%	No.	%	No.	%	No.	%	No.	%
Winter											
Mute swan (Ramsar site only)	348 ²	52	15%	135	39%	6	2%	46	13%	44	13%
*Bewick's swan	155	0	0%	155	100%	0	0%	0	0%	6	4%
European white-fronted goose	326	5	2%	203	62%	0	0%	129	40%	0	0%
Wigeon	4,899	437	9%	2370	48%	275	6%	908	19%	0	0%
Gadwall	300	104	35%	58	19%	25	8%	13	4%	0	0%
*Shoveler	485	142	29%	113	23%	12	2%	59	12%	5	1%
Pochard	815	215	26%	21	3%	0	0%	269	33%	10	1%
Little grebe	93	44	47%	10	11%	2	2%	21	23%	2	2%
Great crested grebe	890	253	28%	2	0%	0	0%	12	1%	8	1%
Cormorant	326	148	45%	8	2%	2	1%	13	4%	27	8%
Coot	2,052	759	37%	120	6%	12	0%	573	28%	50	2%
*Golden plover	4,050	879	22%	3,160	78%	162	4%	612	15%	65	2%
Lapwing	10,880	4,253	39%	5,300	49%	1,339	12%	1,020	9%	210	2%
Sanderling	235	109	46%	0	0%	0	0%	0	0%	0	0%
*Ruff	51 ³	5	10%	18	35%	2	4%	3	6%	3	6%
Autumn passage											
Common sandpiper	57	48	84%	0	0%	nc	n/a	3	5%	0	0%
Total waterbirds											
SPA assemblage	34,625	11,488	33%	12,510	36%	2,053	6%	4,576	13%	847	2%
Ramsar site assemblage	34,957	11,577	33%	12,682	36%	2,059	6%	4,667	13%	902	3%

² The total Ramsar site population of mute swans is based on counts from several sources – see section 3.15 (above)

³ The total SPA population of ruff is a five year peak mean for the period 2000/01-2004/05 based on counts from several sources – see section 3.12 (above)

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Species (* Annex I species of European importance and internationally important migratory species)	Total SPA & Ramsar site peak mean 2002/03 – 2006/07	Number of individuals and proportion of the SPA/Ramsar site total present in each sector							
		Dungeness RSPB Reserve (sector 22791)		Long Pits (sector 22795)		Lade Pit (sector 22793)		Lade Sands (sector 22403)	
		No.	%	No.	%	No.	%	No.	%
Winter									
Mute swan (Ramsar site only)	348 ⁴	69	20%	2	1%	3	1%	0	0%
*Bewick's swan	155	9	6%	0	0%	0	0%	0	0%
European white-fronted goose	326	50	15%	0	0%	9	3%	0	0%
Wigeon	4,899	1,479	30%	0	0%	9	0%	0	0%
Gadwall	300	136	45%	1	0%	32	11%	0	0%
*Shoveler	485	258	53%	0	0%	68	14%	0	0%
Pochard	815	334	41%	1	0%	111	14%	0	0%
Little grebe	93	30	32%	1	1%	14	15%	0	0%
Great crested grebe	890	24	3%	0	0%	15	2%	784	88%
Cormorant	326	208	64%	0	0%	7	2%	0	0%
Coot	2,052	760	37%	27	1%	133	6%	0	0%
*Golden plover	4,050	262	6%	0	0%	0	0%	0	0%
Lapwing	10,880	855	8%	0	0%	93	1%	0	0%
Sanderling	235	0	0%	0	0%	0	0%	164	70%
*Ruff	51 ⁵	12	24%	0	0%	0	0%	1	2%
Autumn passage									
Common sandpiper	57	9	16%	0	0%	4	7%	0	0%
Total waterbirds									
SPA assemblage	34,625	7,992	23%	57	0%	1,307	4%	2,787	8%
Ramsar site assemblage	34,957	8,162	23%	60	0%	1,342	4%	2,787	8%

⁴ The total Ramsar site population of mute swans is based on counts from several sources – see section 3.15 (above)

⁵ The total SPA population of ruff is a five year peak mean for the period 2000/01-2004/05 based on counts from several sources – see section 3.12 (above)

5 ASSESSMENT AGAINST THE SPA SELECTION GUIDELINES

5.1 Stage 1

The SPA selection guidelines (JNCC, 1999):

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 I to the Birds 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 I) in any season.
3. An area is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) 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.

Dungeness, Romney Marsh and Rye Bay SPA (including the proposed extensions), qualifies under stage 1(1) because it regularly supports greater than 1% of the GB populations of 12 species (marsh harrier, avocet, Mediterranean gull, sandwich tern, common tern, little tern, Bewick's swan, bittern, hen harrier, golden plover, ruff and aquatic warbler) listed in Annex I, and under stage 1(2), as it regularly supports more than 1% of the biogeographical populations of one regularly occurring migratory species (shoveler). The site also qualifies under stage 1(3) by regularly supporting more than 20,000 waterbirds in the non-breeding season. The site has not been selected for any species under stage 1(4).

5.2 Stage 2

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

Table 10 Assessment against stage 2 of the SPA selection guidelines

Feature	Qualification	Assessment
1. Population size & density	✓	In England, the site is the 8 th most important SPA for breeding marsh harrier, 7 th for avocet, 1 st for Mediterranean gull, 4 th for sandwich and common terns and 17 th for little tern. It is the 9 th most important for wintering Bewick's swan, equal 5 th for bittern, 9 th for hen harrier, 10 th for golden plover, equal 8 th for ruff and 8 th for shoveler. It is also the 3 rd most important for passage aquatic warbler. ⁶
2. Species range	✓	The site is at the core of the breeding ranges of marsh harrier, avocet, Mediterranean gull, sandwich tern, common tern and little tern, and the non-breeding ranges of Bewick's swan, bittern, hen harrier, golden plover, ruff and shoveler. It is the only site in south-east England to be regularly used by aquatic warblers on passage.
3. Breeding success	✓	At Rye Harbour LNR during the period 2001-5, breeding Mediterranean gulls fledged 0.42-2 young per pair, sandwich terns 0.13-1.5 young per pair (both only experienced one 'bad' year with <1 young per pair) and common terns 1.39-1.67 young per pair. Little terns at Rye Harbour LNR have variable breeding success depending on weather and level of predation. During 2001-5 success varied from 0.28-1.24 fledged young per pair.
4. History of occupancy	✓	At least eight qualifying species (common and little terns, Bewick's swan, bittern, hen harrier, golden plover, ruff and shoveler) were recorded using the site in 1970 (Sussex Ornithological Society, 1971; Kent Ornithological Society, 1972). 1970 has been chosen as the reference year because it coincides with the survey period of the first national breeding bird atlas (Sharrock, 1976).
5. Multi-species area	✓	One migratory species, twelve species listed in Annex I and a non-breeding waterbird assemblage.
6. Naturalness	✓	The site includes extensive areas of natural and near-natural habitats including saltmarsh, intertidal foreshore, shingle beaches and shingle wetlands). These occur in a complex mosaic with semi-natural habitats, such as grazing marshes and reedbeds, and more recently man-made areas, including gravel pits and agricultural reservoirs.
7. Severe weather refuge	✓	Ridgill and Fox (1990) found that during periods of abnormally cold weather, waterbirds are displaced from the Waddensee coast to refuge areas to the south and west, including the wetlands of eastern Britain. It is likely that similar patterns of displacement are common to many of the waterbird species using the SPA (including proposed extensions), especially given its close proximity to Continental Europe.

⁶ Comparisons with other SPAs are based on Stroud *et al.* (2001), the most recent comprehensive review of SPA bird populations available.

6 COMPARISON WITH OTHER SITES IN ENGLAND

A comparison of Dungeness (including proposed extensions) is made below against other SPAs in England that hold breeding marsh harrier, avocet, Mediterranean gull, sandwich tern, common tern, and little tern, wintering Bewick's swan, bittern, hen harrier, golden plover, ruff and shoveler, and autumn passage aquatic warbler in numbers of European importance. In addition to these English sites, there is a further site for breeding marsh harrier, seven for breeding sandwich tern, 11 for breeding common tern, four for breeding little tern, two for wintering Bewick's swan, four for wintering hen harrier, five for wintering golden plover, and one for wintering shoveler, that hold numbers of European importance in Scotland, Wales and Northern Ireland. There are no further sites in Scotland, Wales or Northern Ireland that are used by breeding avocet and Mediterranean gull, wintering bittern and ruff, or autumn passage aquatic warbler, in numbers of European importance.

Table 11 Comparison with other English SPAs that support similar qualifying species⁷

Site/Species	1991/92 - 1995/96* except where stated	% of population
MARSH HARRIER <i>Circus aeruginosus</i> (breeding)	<i>No. of Females</i>	<i>% GB</i>
The Swale	24	15.3%
Broadland	21	13.4%
Minsmere-Walberswick	16	10.2%
The Wash	15	9.6%
North Norfolk Coast	14	8.9%
Humber Estuary	10 (1998-2002)	6.3%
Benacre to Easton Bavents	6	3.8%
Dungeness, Romney Marsh and Rye Bay	4 (2002-2008)	2.0%
Aldre-Ore-Estuary	3	1.9%
Leighton Moss	2	1.3%
AVOCET <i>Recurvirostra avosetta</i> (breeding)	<i>No. of Pairs</i>	<i>% GB</i>
North Norfolk Coast	177	20.2%
Alde-Ore Estuary	104	11.9%
The Swale	103	11.7%
Minsmere - Walberswick	91	10.4%
Humber Estuary	64 (1998 – 2002)	7.3%
Foulness	46	5.2%
Dungeness, Romney Marsh and Rye Bay	31 (2004-2008)	3.5%
Medway Estuary and Marshes	28	3.2%
Stour and Orwell Estuaries	21 (1995/96-1999/2000)	2.4%
MEDITERRANEAN GULL <i>Larus melanocephalus</i> (breeding)	<i>No. of Pairs</i>	<i>% GB</i>
Dungeness, Romney Marsh and Rye Bay	56 (2004-2008)	52.2%
The Swale	12	11.1%
Poole Harbour	5	4.6%
North Norfolk Coast	2	1.9%
Solent and Southampton Water	2	1.9%

⁷ Comparisons with other SPAs are based on Stroud *et al.* (2001), the most recent comprehensive review of SPA bird populations available.

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Site/Species	1991/92 - 1995/96* except where stated	% of population
SANDWICH TERN <i>Sterna sandvicensis</i> (breeding)	<i>No. of Pairs</i>	<i>% GB</i>
North Norfolk Coast	3,457	32.8%
Farne Islands	2,070	19.6%
Coquet Island	1,590	15.1%
Dungeness, Romney Marsh and Rye Bay	350 (2004-2008)	3.5%
Foulness	320	3.0%
Morecambe Bay	290	2.8%
Solent and Southampton Water	231	2.2%
Duddon Estuary	210	2.0%
Alde-Ore Estuary	169	1.6%
Chichester and Langstone Harbours	158	1.5%
COMMON TERN <i>Sterna hirundo</i> (breeding)	<i>No. of Pairs</i>	<i>% GB</i>
Coquet Island	740	7.3%
North Norfolk Coast	460	4.5%
The Dee Estuary	277	2.7%
Dungeness, Romney Marsh and Rye Bay	273 (2004-2008)	2.7%
Solent and Southampton Water	267	2.6%
Farne Islands	230	2.3%
Foulness	220	2.2%
Ribble and Alt Estuaries	182	1.8%
Breydon Water	155	1.5%
Poole Harbour	155	1.5%
The Wash	152	1.5%
LITTLE TERN <i>Sterna albifrons</i> (breeding)	<i>No. of Pairs</i>	<i>% GB</i>
North Norfolk Coast	377	19.4%
Great Yarmouth North Denes	220	11.3%
Chichester and Langstone Harbours	100	5.1%
The Dee Estuary	56	2.9%
Chesil Beach and The Fleet	55	2.8%
Hamford Water	55	2.8%
Benacre to Easton Bavents	53	2.7%
Humber Estuary	51 (1998-2002)	2.6%
Solent and Southampton Water	49	2.5%
Alde-Ore Estuary	48	2.5%
Northumbria Coast	40	2.1%
Colne Estuary	38	2.0%
Lindisfarne	38	2.0%
Teesmouth and Cleveland Coast	37	1.9%
Blackwater Estuary	36	1.8%
The Wash	33	1.7%
Dungeness, Romney Marsh and Rye Bay	35 (1992-1996)	1.5%
Medway Estuary and Marshes	28	1.4%
Minsmere – Walberswick	28	1.4%
Morecambe Bay	26	1.3%
Foulness	24	1.2%
Gibraltar Point	23	1.2%
Pagham Harbour	12	0.6%

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Site/Species	1991/92 - 1995/96* except where stated	% of population
BEWICK'S SWAN <i>Cygnus columbianus bewickii</i> (wintering)	<i>No. of Individuals</i>	<i>% GB</i>
Ouse Washes	4,639	57.5%
Nene Washes	1,718	21.3%
Martin Mere	449	5.6%
Breydon Water	391	4.8%
Broadland	320	4.0%
Severn Estuary	280	3.5%
Ribble and Alt Estuaries	229	2.8%
Somerset Levels and Moors	191	2.4%
Dungeness, Romney Marsh and Rye Bay	155 (2002/03-2006/07)	1.9%
Avon Valley	135	1.7%
Arun Valley	115	1.4%
Walmore Common	104	1.3%
Lower Derwent Valley	72	0.9%
BITTERN <i>Botaurus stellaris</i> (wintering)	<i>No. of Individuals</i>	<i>% GB</i>
Minsmere – Walberswick	14	14%
Leighton Moss	8	8%
Broadland	6	6%
Lee Valley	6	6%
Dungeness, Romney Marsh and Rye Bay	5 (2002/03-2006/07)	5%
North Norfolk Coast	5	5%
Humber Estuary	4 (1998/99-2002/03)	4%
Lower Derwent Valley	3	3%
Benacre to Easton Bavents	2	2%
Marazion Marsh	2	2%
Stodmarsh	2	2%
HEN HARRIER <i>Circus cyaneus</i> (wintering)	<i>No. of Individuals</i>	<i>% GB</i>
The Swale	23 (Count as at 1996/97)	3.1%
Broadland	22 (1987/88 – 1991/92)	2.9%
Dorset Heathlands	20 (Count as at 1991/92)	2.7%
North Norfolk Coast	16 (1993/94 – 1997/98)	2.1%
Minsmere – Walberswick	15 (1985/86 – 1989/90)	2.0%
New Forest	15 (Count pre-1992)	2.0%
Salisbury Plain	14 (Count as at 1996/97)	1.9%
Ouse Washes	12 (1982 – 1987)	1.6%
Dungeness, Romney Marsh and Rye Bay	11 (2002/03-2006/07)	1.5%
Stodmarsh	9 (1987/88 – 1991/92)	1.2%

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Site/Species	1991/92 - 1995/96* except where stated	% of population
GOLDEN PLOVER <i>Pluvialis apricaria</i> (wintering)	<i>No. of Individuals</i>	<i>% GB</i>
Humber Estuary	30,709 (1996/7-2000/1)	12.3%
The Wash	11,037	4.4%
Blackwater Estuary	7,247	2.9%
Upper Solway Flats and Marshes	6,121	2.5%
Lower Derwent Valley	6,000	2.4%
Lindisfarne	5,300	2.1%
Breydon Water	5,040	2.0%
Hamford Water	4,118	1.7%
Morecambe Bay	4,097	1.6%
Dungeness, Romney Marsh and Rye Bay	4,050 (2002/03-2006/07)	1.6%
Abberton Reservoir	3,714	1.5%
Ribble and Alt Estuaries	3,598 (1993/94-1997/98)	1.4%
Foulness	3,359	1.3%
Mersey Estuary	3,040 (1993/94-1997/98)	1.2%
Somerset Levels and Moors	3,029	1.2%
The Swale	2,862	1.1%
North Norfolk Coast	2,667	1.1%
Colne Estuary	2,530	1.0%
RUFF <i>Philomachus pugnax</i> (wintering)	<i>No. of Individuals</i>	<i>% GB</i>
Pagham Harbour	160	22.9%
Ouse Washes	137	19.6%
Lower Derwent Valley	133	19.0%
Broadland	96	13.7
Nene Washes	91	13.0%
North Norfolk Coast	54	7.7%
Hamford Water	53	7.6%
Dungeness, Romney Marsh and Rye Bay	51 (2000/01-2004/05)	7.3%
Blackwater Estuary	51	7.3%
SHOVELER <i>Anas clypeata</i> (wintering)	<i>No. of Individuals</i>	<i>% NW & C Europe (non-br)</i>
South West London Waterbodies	1,075	2.7%
Lee Valley	748	1.9%
Ouse Washes	681	1.7%
Abberton Reservoir	654	1.6%
Rutland Water	526	1.3%
Chew Valley Lake	503	1.3%
Somerset Levels and Moors	501	1.3%
Dungeness, Romney Marsh and Rye Bay	485 (2002/03-2006/07)	1.2%
The Swale	471	1.2%
Nene Washes	413	1.0%
Broadland	401	1.0%
AQUATIC WARBLER <i>Acrocephalus paludicola</i> (autumn passage)	<i>No. of Individuals</i>	<i>% GB</i>
Poole Harbour	11	33.3%
Marazion Marsh	6	18.2%
Dungeness, Romney Marsh and Rye Bay	2 (2004-2008)	6.1%

*Source: Stroud *et al.*, 2001.

7 ASSESSMENT OF THE RAMSAR SITE INTERESTS

The site qualifies as a Wetland of International Importance under the Ramsar Convention because it meets the following criteria:

7.1 Criterion 1

'A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.'

7.1.1 Sand, shingle or pebble shores – Ramsar type E

Dungeness and Rye Harbour comprise the largest cusped foreland (a low-lying triangular foreland) in Britain and form part of a system of shingle barrier beaches that can be traced 40 km from Fairlight in East Sussex to Hythe in Kent. This is ideal habitat for annual vegetation of drift lines which occurs on naturally functioning shingle beaches. It is one of the scarcest habitats in the UK, with perhaps less than 100 hectares. The frontage at Rye Harbour and Dungeness is one of the most important areas in the country for this habitat, with approximately 15 km of shingle foreshore.

The annual vegetation of drift lines grows on the seaward and landward sides of the beach ridge where waves deposit seed. The habitat can grade into or even overlap with the more stable perennial vegetation of stony banks that grow on ridges inland from the beach. Growing plants on the strandline get their nutrients from the decay of material like seaweed debris on the tide line, which is thrown up by the action of the sea. There are only a few plants that are able to survive these harsh conditions. The annual species produce numerous seeds every year to have the best chance of survival. They are drought resistant and gain most fresh water from rain and dew and survive substantial temperature fluctuations. The annual plants are not long-rooted and are therefore easily washed away by high tides and summer storms. Germination is usually in July and after a very fast growth and flowering period, seeds are set through September to October. These are largely dispersed by the sea, although some may fall into gaps where the plants grow. Seeds are transported by waves and longshore drift to other parts of the shingle beaches, eventually settling in amongst the gaps between the shingle sediment through the winter and spring. The length of shingle foreshore available at Rye Harbour and Dungeness is particularly important as it extends for approximately 15 km.

The annual vegetation of drift lines found at Rye Harbour and Dungeness is predominately Babington's orache *Atriplex glabriuscula*.

Species that are found further back on the shingle ridge are those typical of the early stages of perennial vegetation of stony banks found in the main out of the reach of waves. These include sea kale *Crambe maritima*, sea pea *Lathyrus japonicus*, Babington's orache, sea beet *Beta vulgaris* and sea campion *Silene uniflora*; species that can withstand exposure to salt spray and some degree of burial or erosion.

The presence of the annual drift line vegetation is a strong indication that the coastline is healthy, responding to the active coastal processes that lead to seasonal changes in distribution of beach sediments. These foreshore species respond to the seasonal changes and periodic natural disturbance and show adaptability to highly stressful conditions. Activities that mix this shingle at inappropriate times (such as trampling, vehicles or artificial movement of beach sediments) are damaging as they destroy interstitial spaces and microhabitats for seed dispersal and disturb young seedlings.

7.1.2 Natural shingle wetlands

The vast shingle beach at Dungeness contains two large and a number of smaller pits, referred to as the Open and Fossil Pits (within Dungeness RSPB Reserve and Lydd Ranges). The following descriptions of the wetlands and the process of their formation are drawn very largely from Ferry &

Henderson (1984) and Ferry & Waters (1988), with more recent vegetation surveys of the basin fens from Dobson (2006). These natural wetlands are situated 60 to 70 shingle ridges inland from the coast. Those in the RSPB Reserve are thought to have been formed over a relatively short period approximately 800-1000 years ago, whilst those on Lydd Ranges are older. During this period new shingle spits occasionally extended unusually far seawards (perhaps as a result of unusual climatic conditions) and then coalesced further along the coast with pre-existing ridges. This process formed isolated lagoons which were filled with saline water, as evidenced by the marine silt deposits which line the base of the current wetland sediments. The transition to freshwater conditions as the pits became further from the coast (as more shingle ridges were deposited) appears to have been rapid. The oldest of these pits are now on the eroding south coast of Dungeness and have reverted to saline conditions once more (see below). At least one natural shingle wetland has been formed by similar processes at Rye Harbour. This wetland is much younger than those at Dungeness and still retains a brackish character. It complements the older examples at Dungeness by displaying an earlier stage in the evolution and succession of these unique natural wetlands.

Freshwater pits (Ramsar wetland type K – coastal freshwater lagoons)

The pits have been subject to natural colonisation by vegetation and (the Open Pits at least) display stages of a classic hydrosereal succession, from open water and marginal reed-swamp through a form of marsh or fen to carr. The main wetland habitats present in the pits are sedge *Carex*-rich marsh (which, although absent for a number of years due to lack of management, is recovering in some areas following recent management to clear carr and graze the fen habitats), reedswamp and grey willow *Salix cinerea* carr. Although some contain permanent open water, others have accumulated large amounts of organic matter and now have only temporary standing water or, in extreme cases, damp peat. The open water areas support soft hornwort *Ceratophyllum submersum*, blunt-fruited water-starwort *Callitriche obtusangula* and small or lesser pondweeds *Potamogeton berchtoldii* or *P. pusillus*. It is clear that much of the botanical interest of the natural freshwater pits arises from the diversity of physical habitat, in particular the shallow sloping shorelines that are generally missing from analogous artificial habitats.

The natural freshwater pits amongst the extensive shingle ridges of Dungeness and Rye Harbour are unique in the British Isles and probably also in Europe. This is true of both the geomorphology of the habitats and the communities of plants and animals that they support. The origin of the pits combined with the undisturbed nature of the habitats (including the underlying sediments) gives these waterbodies considerable palaeolimnological and geological significance.

The site as a whole demonstrates a transition from saline water bodies (see below) to freshwater. Additionally, the pits display various stages of seral succession from open water through to fen vegetation (see below). There is a mix of species and communities associated with eutrophic (nutrient-rich), mesotrophic (intermediate nutrient content) and oligotrophic (nutrient-poor) conditions within the wetlands, and there is a tendency to form ombrotrophic (rain-fed) surfaces where vegetation builds above the groundwater. This represents classic transition mire. The complete transition from early open water stages with saline conditions through to infilled waterbodies with 'terrestrialised' wetland vegetation adds to the interest of the site in terms of understanding the formation and natural succession of the waterbodies. Examples showing the transition from saline to freshwater are very rare nationally, given the extent of coastal defences and resulting modification of the interface between coastal and terrestrial habitats.

Saline lagoons (Ramsar wetland type J – coastal brackish/saline lagoons)

The lagoons at the seaward end of the Lydd Ranges were surveyed in 2005 (Bamber *et al.*, 2005). Three lagoons lying seaward of the sea defence embankment are typical, relatively stable, shingle percolation lagoons and cover a total area of 1.73 ha. Salinity ranged from 14 (in one lagoon, owing to freshwater inflow from a stream) to 40 parts per thousand (sea water is 35-36 ppt). The fauna is comparatively diverse and includes the lagoonal specialist snail *Ventrosia ventrosa*. The periwinkles in one lagoon appeared to be of the lagoonal form *Littorina saxatilis lagunae* and a number of shells of the lagoon cockle *Cerastoderma glaucum* were present in another lagoon but no live specimens were found. The maritime influence of these three pools is shown by the

presence of the bivalve mollusc *Abra tenuis* and the polychaete worm *Capitella capitata*. A recent survey in one of these lagoons (Pain *et al.*, 2009) recorded live individuals of De Folin's lagoon snail *Caecum amoricum*. This species is listed in Schedule 5 to the Wildlife and Countryside Act 1981 and was previously unknown in the UK outside the Fleet in Dorset.

There are also three typical shingle percolation lagoons landward of the sea defence embankment, although they appear to have formed in artificial depressions. They cover a total area of 3.38 ha and salinity ranged from 26 to 38 parts per thousand. The pools are surrounded by grassland with sea-purslane *Atriplex portulacoides* and sea aster *Aster tripolium* and have a dense submerged flora of tasselweed *Ruppia* sp. The *Ruppia* is well colonised by the lagoonal specialist snail *Ventrosia ventrosa*, whilst the benthos predominantly comprises oligochaetes and opportunistic insects. Ragworms *Nereis diversicolor* are also common.

Basin fens (Ramsar wetland type U – non-forested peatlands)

A number of the Open Pits at Dungeness have reached a stage in the hydrosere succession where they have little or no open water remaining and are now typical basin fens. The majority of the Open Pits have little or no open water and most have floating rafts of vegetation, varying in the degree to which they have stabilised. These floating rafts of vegetation are typical of the 'Schwingmoor' type of basin fen, where layers of peat are separated by lenses of water. The structure of the vegetation in pits with a floating raft follows a 'castle and moat' pattern, though the 'castle' is not necessarily in the centre of the depression. This occurs because the centre is furthest away from groundwater seepage, and most easily becomes predominantly influenced by atmospheric water, leading to ombrotrophy. This is a small-scale version of how raised bogs are formed. Accumulating dead vegetation (peat) raises the surface above the ground water, leading to a change from neutral or alkaline pH and high base ion status, to one of acid pH and low base status. The pits differ from a raised bog in that complete separation from occasional ground water inundation is unlikely, so the apparently 'ombrotrophic' parts should still be described as nutrient-poor fen rather than bog.

The pits contain a mix of vegetation types from single species swamps to more complex communities. Between the 1960s and 1997 the pits lost most of their open communities and became dominated by grey willow *Salix cinerea* in the absence of grazing, lowered water levels, and a peat fire in one of the pits. Since then there has been a programme of scrub clearance, grazing and mowing which has resulted in the recovery of some nutrient-poor fen communities. Areas of nutrient-poor fen support a number of plant species that are rare in Kent such as common cottongrass *Eriophorum angustifolium*, great fen-sedge *Cladium mariscus*, marsh cinquefoil *Potentilla palustris* and the nationally scarce marsh fern *Thelypteris palustris*. Other species have reappeared following recent management, including bog pondweed *Potamogeton polygonifolius*, bottle sedge *Carex rostrata*, common sedge *C. nigra*, star sedge *C. echinata*, brown sedge *C. disticha*, marsh willowherb *Epilobium palustre*, marsh speedwell *Veronica scutellata* and bog pimpernel *Anagallis tenella*. There are also several species of bog-moss, with large patches of blunt-leaved bog-moss *Sphagnum palustre* and spiky bog-moss *S. squarrosum* in particular.

Easily distinguished is the National Vegetation Classification (NVC) type S4 *Phragmites australis* swamp, and at the other end of the trophic scale, the S27 *Carex rostrata-Potentilla palustris* tall-herb fen, as indicated primarily by the extent and cover of the marsh cinquefoil *Potentilla palustris*. Much of the 'moat' vegetation may be assigned to the reed-dominated S4b *Phragmites australis* swamp, *Galium palustre* sub-community. The composition of S27 is variable and while the vegetation in the centre of the pits also shows affinities to other types, S27 provides the best fit for these nutrient-poor fen communities.

Vegetation transitional between these two more clearly defined communities has similarities to the more species-rich reed-fen, S24d *Phragmites australis-Peucedanum palustre* tall herb-fen. There are other possible affinities indicated by the presence of particular species, but these are localised and poorly developed. For example, pointed spear-moss *Calliergonella cuspidata* with bottle sedge suggests the M9 *Carex rostrata-Calliergon cuspidatum* mire, and the mix of bottle sedge and spiky bog-moss suggests M5 *Carex rostrata-Sphagnum squarrosum* mire. The latter community may indicate the development of ombrotrophic conditions in the centre of some of the basins. The stand of great fen-sedge *Cladium mariscus* in one of the pits is so small that it is

difficult to give much weight to it as the separate NVC community S2 *Cladium mariscus* swamp. Nevertheless, the occurrence of great fen-sedge is of considerable significance within Kent.

In summary, the basins contain a range of fen types from nutrient-rich to nutrient-poor fen, with some elements of rich fen, such as great fen-sedge. It is not easy to place the vegetation communities within definitive NVC types, but much falls within S4, particularly S4b, and within S27 for the nutrient-poor fen. The Open Pits support the only known examples of basin fen in Kent.

Many of the Open Pits demonstrate a 'castle and moat' pattern, which is representative of a classic transition from the nutrient-rich groundwater-fed conditions dominated by the S4 swamp communities in the 'moat', to the nutrient-poor conditions dominated by the S27 tall-herb fens in the 'castle'. There are no other known examples of this classic 'transition mire' in Kent.

7.2 Criterion 2

'A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.'

7.2.1 Threatened ecological communities

There are no guidelines for determining what should be considered as a 'threatened ecological community'. However, communities that contain a large number of threatened or restricted range species are themselves presumably subject to some degree of threat or vulnerability. Accordingly, the assessments that follow are based on consideration of the communities of rare, scarce and threatened bryophytes, vascular plants and invertebrate species that are found in the wetland habitats of the pRamsar site.

The pRamsar Site supports threatened ecological communities associated with wetland habitats, including grazing marshes and ditches, saltmarsh, natural freshwater pits, saline lagoons, fens, ponds, gravel pits and margins of water bodies. These communities include at least three bryophytes (see table 12, below) and a large number of vascular plant species (see table 13, below) that are nationally scarce (occupying 16-100 10km squares in GB), nationally rare (1-15 10 km squares in GB), GB red-listed (according to IUCN criteria), and/or priority species in the UK Biodiversity Action Plan (BAP). In addition, the communities include more than 150 species of invertebrate that are nationally scarce, Red Data Book (RDB), GB red-listed (according to IUCN criteria), or listed in Schedule 5 to the Wildlife and Countryside Act 1981 (see table 14, below). Annex 2 provides a summary explanation of the various species status categories used in this section.

Mosses

The pRamsar site supports at least three species of nationally rare, nationally scarce and red-listed wetland thread-mosses *Bryum* species (see table 12, below), one of which is also listed as a priority species in the UK BAP. These mosses are colonists of unshaded calcareous sand that must be persistently damp all year but not inundated by standing water. They occur on wet sand beside large freshwater gravel pits and small pools in Dungeness RSPB Reserve.

Table 12 Mosses included within threatened ecological communities

Scientific name	Common name	Main habitats	Nationally rare/nationally scarce	GB Red list category	UK BAP Priority species
<i>Bryum dyffrynense</i>	A thread-moss	Gravel pit margins	Nationally rare	Near-threatened	No
<i>Bryum intermedium</i>	Many-seasoned thread-moss	Gravel pit margins	Nationally scarce	Data deficient	No
<i>Bryum warneum</i>	Warne's thread-moss	Gravel pit margins	Nationally scarce	Vulnerable	Yes

Sources: Dungeness RSPB Reserve surveys 2000-2008 (D. Holyoak); Holyoak (2001)

Vascular plants

The extensive areas of natural and semi-natural wetland habitats, including saltmarsh, grazing marsh, waterbodies, fens and shingle beaches (strandline and other areas regularly influenced by the sea), support a large assemblage of nationally rare, nationally scarce and red-list vascular plant species (see table 13, below). Foremost amongst this assemblage are the suites of species associated with grazing marsh and saltmarsh (including brackish ditches and wetlands associated with low-lying depressions within shingle areas). Saltmarshes and other brackish wetlands are particularly rich, with at least eight nationally scarce species, including the vulnerable sea barley *Hordeum marinum*, Borrer's saltmarsh-grass *Puccinellia fasciculata* and Slender hare's-ear *Bupleurum tenuissimum*, and the near-threatened sea-heath *Frankenia laevis*. Grazing marshes, especially the extensive ditch systems of Walland Marsh, Denge Marsh and Pett Level, support the nationally rare (and critically endangered) sharp-leaved pondweed *Potamogeton acutifolius* and at least six nationally scarce species, including the endangered greater water-parsnip *Sium latifolium*, and the vulnerable divided sedge *Carex divisa* and rootless duckweed *Wolffia arrhiza*. The remaining species are chiefly associated with gravel pits and their margins, saline lagoons, shingle beaches and fens.

Table 13 Vascular plants included within threatened ecological communities

Scientific name	Common name	Main habitats	Nationally rare/ scarce	GB Red-list category	BAP Priority
<i>Althaea officinalis</i>	Marsh-mallow	Grazing marsh	Nationally scarce	Least Concern	No
<i>Baldellia ranunculoides</i>	Lesser water-plantain	Gravel pits	-	Near Threatened	No
<i>Bupleurum tenuissimum</i>	Slender hare's-ear	Saltmarsh, grazing marsh	Nationally scarce	Vulnerable	Yes
<i>Callitriche truncata</i>	Short-leaved water-starwort	Gravel pits	Nationally scarce	Least Concern	No
<i>Carex divisa</i>	Divided sedge	Grazing marsh	Nationally scarce	Vulnerable	Yes
<i>Chenopodium chenopodioides</i>	Saltmarsh goosefoot	Grazing marsh	Nationally scarce	Least Concern	No
<i>Frankenia laevis</i>	Sea-heath	Saltmarsh, shingle beaches	Nationally scarce	Near Threatened	No
<i>Hordeum marinum</i>	Sea barley	Saltmarsh, gravel pit margins	Nationally scarce	Vulnerable	Yes
<i>Hydrocharis morsus-ranae</i>	Frogbit	Grazing marsh ditches	-	Vulnerable	No
<i>Lathyrus japonicus</i>	Sea pea	Shingle beaches	Nationally scarce	Least Concern	No
<i>Myriophyllum verticillatum</i>	Whorled water-milfoil	Grazing marsh ditches	-	Vulnerable	No
<i>Oenanthe fistulosa</i>	Tubular water-dropwort	Grazing marsh, ditches	-	Vulnerable	Yes
<i>Parapholis incurva</i>	Curved hard-grass	Saltmarsh	Nationally scarce	Least Concern	No
<i>Polypogon monspeliensis</i>	Annual beard-grass	Gravel pit margins	Nationally scarce	Least Concern	No
<i>Potamogeton acutifolius</i>	Sharp-leaved pondweed	Grazing marsh ditches	Nationally rare	Critically Endangered	Yes
<i>Puccinellia fasciculata</i>	Borrer's saltmarsh-grass	Saltmarsh, grazing marsh	Nationally scarce	Vulnerable	Yes
<i>Puccinellia rupestris</i>	Stiff saltmarsh-grass	Saltmarsh, grazing marsh	Nationally scarce	Least Concern	No
<i>Ruppia cirrhosa</i>	Spiral tasselweed	Saline lagoons, brackish ditches	Nationally scarce	Near Threatened	No
<i>Salicornia pusilla</i>	One-flowered glasswort	Saltmarsh	Nationally scarce	Least Concern	No
<i>Salsola kali</i> subsp. <i>kali</i>	Saltwort	Sand/shingle driftline	-	Vulnerable	Yes
<i>Sarcocornia perennis</i>	Perennial glasswort	Saltmarsh	Nationally scarce	Least Concern	No
<i>Sium latifolium</i>	Greater water-parsnip	Grazing marsh ditches	Nationally scarce	Endangered	Yes
<i>Stellaria palustris</i>	Marsh stitchwort	Grazing marsh ditches	-	Vulnerable	Yes
<i>Suaeda vera</i>	Shrubby sea-blite	Shingle beaches, saltmarsh	Nationally scarce	Least Concern	No
<i>Thelypteris palustris</i>	Marsh fern	Fens	Nationally scarce	Least Concern	No
<i>Wolffia arrhiza</i>	Rootless duckweed	Grazing marsh ditches	Nationally scarce	Vulnerable	No

Sources: Anon. (2000); B. Banks, English Nature, personal observations; Banks (2007); J. Dear, English Nature, personal observations; Dungeness Bird Observatory (1980-1985, 2003); 2003; Ferry & Henderson (1984); Harmes *et al.* (2003); O. Leyshon, Romney marsh Countryside Project, personal observations; Leyshon (2001); McGlathery (1980); Nature Conservancy Council (1980-1982); Palmer (2009); E. Philp, Kent Field Club, personal observations; Philp, (1996, 1997); Shardlow & Gilliland (1998); Smith & Thomas (1983); J. Smith & P. Williams, English Nature, personal observations.

Invertebrates

Dungeness, Romney Marsh and Rye Bay pRamsar site is permeated by a complex network of wetland habitats including saltmarsh, natural freshwater pits, fens, ponds, gravel pits, and grazing marsh and ditches. They support a number of assemblages of Red Data Book and nationally scarce invertebrates (see table 14, below). Important areas for these assemblages include the gravel pits, ditches and shingle wetlands at Dungeness and Rye Harbour, the grazing marsh and ditches of Walland Marsh, Dengemarsh and Pett Level, ponds throughout the site, and the saltmarshes of the River Rother.

The freshwater wetlands (with the exception of the deep, cold and largely sterile open waters of the main gravel pits) exhibit a number of similar characteristics. Shallow open water and emergent vegetation, largely comprising common reed *Phragmites australis* and bulrush *Typha latifolia*, supports a rich water beetle assemblage. Other noteworthy aspects of the invertebrate assemblage include a suite of reed beetles *Donacia*, snail-killing flies (Sciomyzidae) and soldier-flies (Stratiomyidae) that are typical of coastal marshes. Much of this assemblage is found within the ditch systems. The saline and brackish gradients of the saltmarsh, saline lagoons, brackish ditches and damp brackish hollows in the shingle beaches also share many characteristics in terms of the habitats they provide for invertebrates.

The prototype Invertebrate Species-habitat Information System (ISIS)⁸ was used to examine the full lists of nationally scarce and RDB wetland invertebrates recorded in Dungeness, Romney Marsh and Rye Bay. This analysis suggests that, when taken together, the wetland habitats support a number of assemblages of invertebrates, particularly assemblages of species indicative of the following five types: rich fen, vegetated water margins, open water on disturbed mineral sediments, upper saltmarsh (including species associated with transitional saltmarsh, freshwater seepages over saltmarsh, brackish lagoons and brackish ditches) and, to a lesser extent, tussock fen with moss edges – an assemblage more normally associated with pingo systems.

Taken individually, the ISIS Prototype suggests that each of the broad wetland types supports invertebrate assemblages indicative of the following specific wetland habitats:

- Grazing marsh and ditches – includes all five high scoring assemblage types revealed by the analysis of all wetlands combined (see above).
- Ponds score highly for vegetated water margins, rich fen and open water on disturbed mineral sediments.
- Gravel pits score highly for vegetated water margins, rich fen and open water on disturbed mineral sediments but also include species representative of water's edge habitats, such as riparian sand and damp silt. Although there is no riparian sand in the SSSI, it appears that situations where sand deposits arising from the gravel extraction industry occur at the margins of water bodies provide suitable habitat for species that are typically associated with riparian sand.
- Fen and marsh scores highly for the rich fen assemblage only.

In summary, the wetland areas of Dungeness, Romney Marsh and Rye Bay hold a number of important invertebrate assemblages. However, few of these assemblages are exclusive to any one wetland feature, which demonstrates the importance of the wide range and large extent of wetlands in the pRamsar site for supporting a range of invertebrate assemblages. The grazing marsh and ditches, ponds, and gravel pits provide suitable habitat for assemblages chiefly associated with rich fen, vegetated water margins and open water on disturbed mineral sediments, whereas the grazing marsh and ditches and saltmarsh are both very important for upper saltmarsh assemblages. The exceptions are:

⁸ The Invertebrate Species-habitat Information System (ISIS) is the prototype of a habitat-based classification system for English terrestrial and freshwater invertebrate assemblages in order to provide a context for assessing the quality and condition of sites for nature conservation purposes (see Webb & Lott, 2006). As the system is a prototype under development, it was only used here to assist in describing the assemblages and not specifically to assess their importance.

- The gravel pits have a number of assemblages normally associated with sediments disturbed by flowing water, such as riparian sand and soft rock seepages. These two habitats do not occur in any obvious situation in the pRamsar site but it appears that some of the water margins provide suitable conditions for species typically associated with sediments disturbed by flowing water).
- The grazing marsh and ditches includes an assemblage of species normally associated with tussock fen with moss edges.

Whilst there are other areas with grazing marsh and ditches, ponds, gravel pits, fen and marsh, and saltmarsh within both Kent and East Sussex, it is the extent of these habitats and their juxtaposition within the pRamsar site that is unique within both counties. The exceptional richness of the wetland invertebrate assemblages in the pRamsar site is indicated in the conclusions of Drake (2004), who ranked grazing marshes on the basis of representation of nationally rare and nationally scarce species, the quality of the water beetle fauna, and fidelity scores (indicating closeness of association with grazing marsh) for uncommon species.

Drake (2004) included three areas of grazing marsh in his analyses that fall within Dungeness, Romney Marsh and Rye Bay pRamsar site. Walland Marsh and Rye Harbour were both given an overall ranking of national significance, placing them in the top 16 grazing marsh sites in Great Britain for grazing marsh invertebrates, whilst Pett Level was regionally significant and one of the top 45 sites. In 2005 (Drake, 2005), invertebrate surveys were carried out in four areas of Walland Marsh (Snargate, Fairfield, Cheyne Court and Broomhill Level). These confirmed the earlier conclusions of Drake (2004) as the water beetle fauna of Cheyne Court was found to be outstanding, whilst the area as a whole was considered exceptionally species-rich for water beetles.

Table 14 Invertebrates included within threatened ecological communities

Species	Status	Margins of water-bodies	Shallow water-bodies ⁹	Fens	Grazing marsh/ditches	Salt-marsh
Annelida						
<i>Hirudo medicinalis</i>	Sch. 5	✓	✓		✓	
Coleoptera						
<i>Gyrinus suffriani</i>	Vulnerable				✓	
<i>Hydrochus ignicollis</i>	Vulnerable				✓	
<i>Hydrophilus piceus</i>	Vulnerable		✓		✓	
<i>Agabus labiatus</i>	Near Threatened				✓	
<i>Dytiscus dimidiatus</i>	Near Threatened		✓		✓	
<i>Enochrus (isotae) nigrinus</i>	Near Threatened		✓			
<i>Haliphus variegatus</i>	Near Threatened				✓	
<i>Hydrochus carinatus</i>) <i>crenatus</i>	Near Threatened				✓	
<i>Hydrochus elongatus</i>	Near Threatened				✓	
<i>Nebrioporus depressus</i>	Near Threatened	✓	✓		✓	
<i>Badister (Baudia) collaris</i>	RDB1				✓	
<i>Omophron limbatum</i>	RDB1	✓				
<i>Bagous (Cyprus) tubulus</i>	RDB2		✓		✓	
<i>Dyschirius (Dyschirius) obscurus</i>	RDB2	✓				
<i>Agriotes sordidus</i>	RDB3					✓
<i>Augyles hispidulus</i>	RDB3	✓				
<i>Cantharis fusca</i>	RDB3				✓	

⁹ Shallow waterbodies include ponds and the shallower areas of flooded gravel pits. They show similarities with ditches in the opportunities they provide for invertebrates.

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Species	Status	Margins of water-bodies	Shallow water-bodies ⁹	Fens	Grazing-marsh/ditches	Salt-marsh
<i>Dyschirius (Dyschirius) angustatus</i>	RDB3	✓				
<i>Ptinus lichenum</i>	RDB3				✓	
<i>Telmatophilus brevicollis</i>	RDB3		✓		✓	
<i>Badister (Badister) meridionalis</i>	RDBI				✓	
<i>Lathrobium (Tetartopeus) rufonitidum</i>	RDBI	✓				
<i>Bledius (Hesperophilus) occidentalis</i>	RDBK				✓	
<i>Hister quadrimaculatus</i>	RDBK					✓
<i>Neobisnius procerulus</i>	RDBK				✓	
<i>Ocyusa nigrata</i>	RDBK			✓	✓	
<i>Telmatophilus schoenherri</i>	RDBK				✓	
<i>Acupalpus maculatus</i>	RDBK	✓	✓			
<i>Agabus conspersus</i>	Nationally scarce	✓	✓		✓	
<i>Cercyon bifenestratus</i>	Nationally scarce				✓	
<i>Enochrus bicolor</i>	Nationally Scarce				✓	
<i>Enochrus halophilus</i>	Nationally scarce				✓	
<i>Graptodytes bilineatus</i>	Nationally Scarce				✓	
<i>Gyrinus paykulli</i>	Nationally Scarce		✓		✓	
<i>Haliphus apicalis</i>	Nationally Scarce		✓		✓	
<i>Helophorus alternans</i>	Nationally scarce		✓		✓	
<i>Helophorus fulgidicollis</i>	Nationally scarce					✓
<i>Hydaticus seminiger</i>	Nationally scarce				✓	
<i>Hydrovatus clypealis</i>	Nationally scarce				✓	
<i>Hydrovatus cuspidatus</i>	Nationally scarce				✓	
<i>Hygrotus decoratus</i>	Nationally scarce		✓			
<i>Hygrotus nigrolineatus</i>	Nationally scarce		✓			
<i>Hygrotus parallelogrammus</i>	Nationally scarce		✓		✓	
<i>Nebrioporus canaliculatus</i>	Nationally scarce		✓		✓	
<i>Ochthebius pusillus</i>	Nationally scarce		✓			
<i>Ochthebius viridis</i>	Nationally Scarce				✓	
<i>Rhantus frontalis</i>	Nationally Scarce				✓	
<i>Badister peltatus</i>	NA				✓	
<i>Bagous subcarinatus</i>	NA	✓			✓	
<i>Bembidion ephippium</i>	NA				✓	✓
<i>Bembidion semipunctatum</i>	NA	✓				
<i>Coelambus novemlineatus</i>	NA		✓			
<i>Scirtes orbicularis</i>	NA				✓	
<i>Stenolophus skrimshiranus</i>	NA			✓	✓	
<i>Tachys micros</i>	NA			✓		
<i>Tachys scutellaris</i>	NA	✓				
<i>Badister dilatatus</i>	NB				✓	
<i>Badister unipustulatus</i>	NB				✓	
<i>Bagous limosus</i>	NB		✓		✓	
<i>Bembidion fumigatum</i>	NB	✓				
<i>Bembidion pallidipenne</i>	NB	✓	✓			
<i>Bembidion quadripustulatum</i>	NB	✓				

DUNGENESS, ROMNEY MARSH AND RYE BAY SPA AND PROPOSED RAMSAR SITE
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Species	Status	Margins of water-bodies	Shallow water-bodies ⁹	Fens	Grazing marsh/ditches	Salt-marsh
<i>Bembidion stephensi</i>	NB	✓			✓	✓
<i>Berosus affinis</i>	NB		✓		✓	
<i>Berosus luridus</i>	NB				✓	
<i>Berosus signaticollis</i>	NB				✓	
<i>Cassida nobilis</i>	NB	✓				✓
<i>Chaetarthria seminulum</i>	NB				✓	
<i>Chlaenius nigricornis</i>	NB				✓	
<i>Coccidula scutellata</i>	NB			✓	✓	
<i>Demetrias imperialis</i>	NB	✓		✓	✓	
<i>Dicheirotrichus obsoletus</i>	NB					✓
<i>Donacia cinerea</i>	NB				✓	
<i>Donacia thalassina</i>	NB				✓	
<i>Eubrychius velutus</i>	NB				✓	
<i>Hydroglyphus pusillus</i>	NB				✓	
<i>Hydronomus alismatis</i>	NB		✓		✓	
<i>Limnebius nitidus</i>	NB		✓		✓	
<i>Limnoxenus niger</i>	NB		✓		✓	
<i>Litodactylus leucogaster</i>	NB				✓	
<i>Noterus crassicornis</i>	NB		✓		✓	
<i>Ochthebius nanus</i>	NB				✓	
<i>Odacantha melanura</i>	NB	✓		✓	✓	
<i>Olibrus affinis</i>	NB				✓	
<i>Paederus fuscipes</i>	NB				✓	
<i>Panagaeus bipustulatus</i>	NB	✓				
<i>Pelenomus canaliculatus</i>	NB		✓		✓	
<i>Peltodytes caesus</i>	NB				✓	
<i>Philonthus fumarius</i>	NB				✓	
<i>Phytobius leucogaster</i>	NB				✓	
<i>Pogonus littoralis</i>	NB					✓
<i>Porhydrus lineatus</i>	NB				✓	
<i>Pselactus spadix</i>	NB					✓
<i>Pterostichus anthracinus</i>	NB	✓				
<i>Quedius pallipes</i>	NB					✓
<i>Sitona cambricus</i>	NB				✓	
<i>Stenus fornicatus</i>	NB				✓	
<i>Stenus fuscicornis</i>	NB				✓	
<i>Stenolophus teutonius</i>	NB	✓				
<i>Stenus butrintensis</i>	NB				✓	
<i>Tachys bistriatus</i>	NB				✓	
Diptera						
<i>Erioptera bivittata</i>	Vulnerable				✓	
<i>Odontomyia ornata</i>	Vulnerable		✓		✓	
<i>Pherbellia argyra</i>	Vulnerable	✓			✓	
<i>Pteromicra pectorosa</i>	Vulnerable	✓		✓		
<i>Tachydromia terricola</i>	Vulnerable	✓				
<i>Lejops vitattus</i>	Near Threatened			✓	✓	
<i>Poecilobothrus ducalis</i>	Near Threatened				✓	
<i>Atylotus rusticus</i>	RDB1				✓	
<i>Cercagnota collini</i>	RDB2			✓	✓	
<i>Erynnia ocypterata</i>	RDB2				✓	
<i>Stratiomys longicornis</i>	RDB2				✓	
<i>Atylotus latistriatus</i>	RDB3					✓

DUNGENESS, ROMNEY MARSH AND RYE BAY SPA AND PROPOSED RAMSAR SITE
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Species	Status	Margins of water-bodies	Shallow water-bodies ⁹	Fens	Grazing marsh/ditches	Salt-marsh
<i>Hybomitra ciureai</i>	RDB3				✓	
<i>Chersodromia alata</i>	Nationally scarce	✓				
<i>Platypalpus articulatus</i>	Nationally scarce			✓		
<i>Dolichopus signifer</i>	Nationally scarce				✓	
<i>Neoascia interrupta</i>	Nationally Scarce		✓		✓	
<i>Anagnota bicolor</i>	NB				✓	✓
<i>Anthomyza bifasciata</i>	NB		✓			
<i>Colobaea punctata</i>	NB	✓			✓	
<i>Eribolus slesvicensis</i>	NB			✓		
<i>Lispe loewi</i>	NB				✓	✓
<i>Paroxyna absinthii</i>	NB					✓
<i>Phalacrocerca replicata</i>	NB		✓			
<i>Colobaea bifasciella</i>	N		✓		✓	
<i>Lejogaster tarsata</i>	N		✓		✓	
<i>Odontomyia tigrina</i>	N		✓		✓	
<i>Pherbellia dorsata</i>	N	✓	✓		✓	
<i>Pherbellia griseola</i>	N			✓		
<i>Pherbellia grisescens</i>	N				✓	
<i>Speccafrons halophila</i>	N			✓		
<i>Stratiomys singularior</i>	N				✓	
<i>Vanoyia tenuicornis</i>	N	✓		✓	✓	
Hemiptera						
<i>Saldula arenicola</i>	NA	✓				
<i>Hebrus pusillus</i>	NB	✓			✓	
<i>Saldula opacula</i>	NB	✓				✓
<i>Sigara striata</i>	NB		✓		✓	
<i>Stenodema trispinosum</i>	NB				✓	
Heteroptera						
<i>Microvelia pygmaea</i>	NB			✓	✓	
Hymenoptera						
<i>Passaloecus clypealis</i>	RDB3			✓	✓	
<i>Colletes halophilus</i>	NA					✓
<i>Lasioglossum puncticolle</i>	NB					✓
Isopoda						
<i>Trichoniscoides albidus</i>	NB					✓
Lepidoptera						
Marsh mallow moth <i>Hydraecia osseola hucherardi</i>	pRDB1				✓	
Crescent striped moth <i>Apamea oblonga</i>	NB					✓
Webb's wainscot moth <i>Archanara sparganii</i>	NB	✓	✓			
<i>Bactra robustana</i>	NB					✓
<i>Calamotropha paludella</i>	NB		✓	✓		
Silky wainscot moth <i>Chilodes maritimus</i>	NB		✓	✓		
Mere Wainscot moth <i>Chortodes fluxa</i>	NB		✓		✓	
Star-wort moth <i>Cucullia asteris</i>	NB					✓
<i>Machrochilo cribrumalis</i>	NB			✓		

Species	Status	Margins of water-bodies	Shallow water-bodies ⁹	Fens	Grazing-marsh/ditches	Salt-marsh
Mathew's wainscot moth <i>Mythimna favicolor</i>	NB					✓
Obscure Wainscot moth <i>Mythimna obsoleta</i>	NB			✓	✓	
<i>Pediasia aridella</i>	NB					✓
<i>Schoenobius gigantella</i>	NB		✓	✓		
Rosy wave moth <i>Scopula emutaria</i>	NB					✓
Reed dagger moth <i>Simyra albovenosa</i>	NB		✓	✓	✓	
Water ermine moth <i>Spilosoma urticae</i>	NB		✓		✓	
<i>Epichnopteryx (Whittleia) retiella</i>	NB					✓
Mollusca						
De Folin's lagoon snail <i>Caecum amoricum</i>	Sch. 5	✓				

Sources: Allen (2001); Allen & Owen (2001); B. Banks, English Nature, personal observations; Barclay (1997); Beebee (2004); Butterfly Conservation (2003); Carr (1998); Clancy (2000, 2002, 2003-2005, 2007, 2008); Clemons & Heal (2000); Cresswell Associates (1998); Denton (1991); Drake (2004, 2005); Drake & Kindemba (2008); Dungeness Bird Observatory Trust (2000-2009); English Nature (*Invertebrate Site Register* reports); Godfrey (2007, 2008); Henderson & Henderson (1984); Hodge (1991, 1999, 2003a, 2003b, 2004); Hodge & Hance (1996a, 1996b); Hodge & Yates (2000); Leyshon & Tate (2004a, 2004b); McConnell (2000, 2002); Morris & Parsons (1992); Nixon (1999); National Biodiversity Network (2010); Pain *et al.* (2009); Paul (2002); Philp (2001); Pinchen (2003, 2004); Redshaw (2000, 2001); Roper (2003); RSPB (2005, 2008); Rye Harbour LNR (Annual Reports); Smith (2000); Telfer (1998, 2006); Walters (2004); Whitton (2002).

7.2.2 Vulnerable, endangered and critically endangered species

The Ramsar criteria note that the application of criterion 2 should include species identified as vulnerable, endangered or critically endangered under national endangered species legislation/programmes or within international frameworks such as the IUCN Red Lists. Accordingly, the assessment of this site has included species that are threatened in Great Britain (as well as internationally) and those included in legislation (such as the Wildlife and Countryside Act) and programmes such as the UK BAP. All such species are considered to form part of the 'threatened ecological communities' (see section 7.2.1, above), but only those with particularly large and important occurrences in a national context are selected as individual qualifying features in their own right under criterion 2.

Dungeness, Romney Marsh and Rye Bay pRamsar site is considered to be of international importance for the nine individual wetland species detailed below.

Greater water-parsnip *Sium latifolium*

Greater water-parsnip is an endangered UK BAP priority species of wet ditches and tall-herb fens and swamps. In England there have been substantial losses, mainly due to drainage, over-zealous (or lack of) management of ditches and outright habitat loss. It has gone from about three-quarters of its recorded 10-km squares in England, and is apparently extinct in many counties, including Wiltshire, Dorset, Hampshire, Essex, Middlesex, Bedfordshire, Gloucestershire, Worcestershire, Staffordshire, Shropshire, Leicestershire, Nottinghamshire and SW and NE Yorkshire.

When the area of the pRamsar site was systematically surveyed in 2000, six locations around Warehorne contained populations ranging from 10 to 100 plants and seven locations in The Dowels contained populations ranging from 12 to 50 plants (Anon., 2000). Romney Marsh

continued to support 'a remarkably strong population' in 2008 (Palmer, 2009).

Warne's thread-moss *Bryum warneum*

The vulnerable UK BAP priority species Warne's thread-moss is a colonist of unshaded or partly-shaded calcareous sand that must be persistently damp all year but not inundated by standing water, or only inundated in winter (Holyoak, 2002). The species is thought to become established initially from spores and the relatively large size of the spores (mainly >40 µm in diameter) suggests that dispersal distances may be less than for most mosses, although strong coastal winds may still distribute them widely (Holyoak, 2002). The open habitats in which Warne's thread-moss initially becomes established correspond closely to National Vegetation Classification (NVC) type SD13 *Sagina nodosa* – *Bryum pseudotriquetrum* dune-slack community, although it is only able to occupy these habitats for a few years until vegetation succession and accumulation of leaf litter covers areas of unshaded, bare, damp sand. Warne's thread-moss also occurs in man-made habitats that mimic the conditions in its natural habitats.

This is one of a number of coastal *Bryum* species that have undergone catastrophic declines since the 19th century because of the loss or degradation of their habitats, and Warne's thread-moss is accordingly listed as 'vulnerable' in the British Red Data Book for mosses and liverworts (Church *et al.*, 2001). Factors contributing to this include reclamation for agriculture, urban and leisure development, and dune stabilisation, both by construction of sea defences and lack of grazing pressure, promoting the growth of coarse vegetation (Church *et al.*, 2001).

Dungeness is one of only four sites with confirmed extant populations of Warne's thread-moss in England, the others being the Sefton Coast in Lancashire, Sandscale Haws in Cumbria (Holyoak, 2002) and the Lincolnshire coast (recently discovered, Plantlife report in prep.). Warne's thread-moss has also recently been reintroduced to Braunton Burrows (Devon). At Dungeness, Warne's thread-moss occurs as a colonist on wet sand beside the northern margin of a large freshwater gravel pit (the ARC Pit) at approximately TR066198 (Holyoak, 2002). There are no natural dune slacks in the region so Warne's thread-moss is presumed to have colonised from some distance away, perhaps from the closest known colonies in north-west France (Holyoak, 2002). Several smaller satellite colonies have become established beside small pools on higher disturbed ground to the north of the main colony at approximately TR064199, providing evidence of rapid spread within the site (Holyoak, 2002). Both locations are within Dungeness RSPB Reserve. Ongoing survey work at Dungeness RSPB Reserve has shown persisting populations of Warne's thread-moss at the ARC pit (RSPB reserve data or survey by Holyoak 2004, 2006 and 2008). The main colony centres around TR064197. Away from the main colony the moss has spread along the edges of the pit and has formed an almost continuous extent. There are many strong patches along the top of the inundation zone on the east side of the shingle spit (TR066199). The moss is also expanding its distribution westwards into new areas, with rabbit grazing and *Salix repens* limiting its spread.

Water vole *Arvicola amphibius*

Water vole *Arvicola amphibius* is a UK BAP priority species and is also listed in Schedule 5 to the Wildlife and Countryside Act 1981. The pRamsar site contains the core of an extensive distribution of water voles dependent on the network of ditches that drain the grazing marsh and arable habitats of the Romney Marsh and Rye Bay area. Walland Marsh has been subject to a programme of survey and monitoring, funded by the Environment Agency, since 1998, and a similar programme of work has recently started on Pett Level. Factors that favour water voles include the extensive network of ditches with sufficient vegetation cover along the ditch banks, and control of the introduced predatory mink by a network of farmers. Water vole populations fluctuate erratically, with numbers of animals being strongly influenced by the extent of flooded ditches in July. Accordingly, drought years are accompanied by a collapse in the size of the population and a corresponding range contraction, with arable ditches suffering most. However, this appears to be temporary and it is likely that water voles quickly re-colonise these ditches from areas (mostly in grazing marshes) that remain flooded.

The site supports water vole populations predominantly associated with grazing marsh habitat and reedbeds. Although the populations extend into extensive areas of adjacent arable farmland, the pRamsar site boundary includes those areas which support the highest densities of water voles, and the more stable populations that persist in drought years.

Table 15 (below) shows the total ditch length regularly occupied since 1998 by each of the main water vole populations in the pRamsar site on Walland Marsh. Within the area of the pRamsar site in East Sussex, the sections of grazing marsh between East Guldeford and Jury's Gap contain 24 km of ditches supporting the species, which is the greatest known length of bankside habitat at any site in the county showing signs of water voles. In addition, to this a total of 10.1 km of ditches support water voles within the pRamsar site in the section of Walland Marsh that is within Kent. Information is not available on the lengths of ditch with signs of water voles elsewhere in the pRamsar site but on Pett Level water voles have been recorded in over 50 locations and at Rye Harbour LNR they have been recorded in more than 25 locations.

Water vole populations in Romney Marsh increased in 2007-8 in comparison with the five year mean 2002-6, with the overall ditch length occupied also increasing (Schnorr 2008). Most notable in 2008 were an increase of 21% from 2007 numbers seen at Jury's Gap and 18% at Moneypenny and generally their distribution continues to be widespread amongst the numerous ditches and watercourses of the Romney Marsh and Rye Bay area. The increased ditch occupancy rate in the 2007-8 relative to the five year (2002-2006) mean may be attributed to recent ditch works improving the habitat condition and probable reductions in the predatory American mink.

Table 15 Length of ditch on Walland Marsh in the Dungeness, Romney Marsh and Rye Bay pRamsar site within each county regularly occupied by water voles since 1998

Site	County	Ditch length
Walland Marsh (East Guldeford – Jury's Gap)	East Sussex	24 km
Walland Marsh (Woolpack, Fairfield and The Dowels)	Kent	10.1 km

Sources: McConnell (2001; 2002); Tate (2003; 2004); Tate (pers. comm.)

Aquatic Warbler *Acrocephalus paludicola*

The globally vulnerable (IUCN, 2009) and declining aquatic warbler is a UK BAP priority species. It is a regular but scarce autumn migrant to certain areas in southern Britain. Between 2004 and 2008 the pRamsar site supported an average of two aquatic warblers during autumn passage, which represents 6.1% of the GB passage population. In the pRamsar site, aquatic warblers occur on Pett Level, where they are recorded by bird ringers. In addition to the birds recorded on Pett Level, it is likely, due to its secretive nature, that the species goes undetected in other areas of suitable habitat (reedbeds) elsewhere in the site.

Great crested newt *Triturus cristatus*

Great crested newt is a UK BAP priority species that is listed in Schedule 5 to the Wildlife and Countryside Act 1981 and Annex II to the EC Habitats Directive (92/43/EEC). The particular combination and distribution of aquatic and terrestrial habitats in Dungeness, Romney Marsh and Rye Bay pRamsar site provide exceptional breeding, foraging and hibernation conditions for great crested newts. The site contains three metapopulations of great crested newts of which two are in the Dungeness area and one is at Romney Warren.

A metapopulation is a group of associated populations. Great crested newt populations are centred on breeding ponds and can be considered to form a metapopulation when there is some interchange of newts between ponds, even though the ponds may be some distance apart. Dispersal and re-colonisation within a metapopulation gives great crested newts the ability to cope with changes in the quality of breeding habitat. If a pond deteriorates and becomes unsuitable for breeding due to siltation, colonisation by fish, shading from scrub, or drought, then dispersal from other breeding ponds can re-establish breeding if conditions again become suitable.

The only direct evidence of movements of newts between the individual ponds at Dungeness that are considered to be used by each metapopulation concerns two instances where newly created

ponds, 330m and 170m respectively from the nearest ponds supporting the species, were colonised by great crested newts. Furthermore, published capture/recapture studies have demonstrated movements of up to 1.3 km by individual great crested newts (Duff, 1989; Franklin, 1993; Kupfer & Kneitz, 2000). Movements of several hundred metres are regularly recorded for newts moving to high quality terrestrial habitats or dispersing to alternative breeding ponds.

The distances between the ponds in each metapopulation are well within the above dispersal distances of individual newts. There are no particular barriers to the movements of great crested newts between the ponds that make up each cluster. The counts undertaken for individual ponds in the breeding season have therefore been combined to derive an overall total for each metapopulation in each year (see table 16, below).

A number of studies (Duff, 1989; Franklin, 1993; Kupfer & Kneitz, 2000) on the utilisation of terrestrial habitat by great crested newts have shown that the majority of adults usually stay within approximately 250 m of breeding ponds (although they may move much greater distances), dispersing through suitable habitat to forage and hibernate. A further conclusion from these studies is that great crested newts do not use all types of land in the vicinity of ponds equally but prefer grassland, scrub, woodland and hedgerows rather than land used for intensive agriculture. The ponds used by the two metapopulations in the Dungeness area sit within extensive areas of vegetated shingle, grassland, scrub and woodland. The ponds at Romney Warren are adjacent to areas of scrub, grassland and sand dune vegetation. These areas incorporate sufficient suitable terrestrial habitat for foraging and hibernation by the great crested newts from each pond cluster.

The two metapopulations of great crested newts in the Dungeness area are as follows:

- West Ripe, Lydd Ranges. Although there is potentially suitable habitat between the RSPB Reserve and Lydd Ranges, the shortest distance between ponds known to be used by newts in each area is approximately 2 km. As this exceeds the highest recorded movements by adult great crested newts, the ponds on Lydd Ranges are best considered a separate metapopulation.
- Dungeness RSPB Reserve and Lydd Airport. These two areas are separated by only approximately 800m at the closest point and the intervening habitat (mostly vegetated shingle) is suitable for adult great crested newts.

The first thorough surveys of great crested newts at Dungeness were undertaken in 1995, following the discovery of large numbers of newts at Lydd Airport in 1994. To date, 117 ponds and ditches have been surveyed for the species and this large number of sites, combined with the difficulty of access by vehicle, has meant that only a sample of ponds have been surveyed in any one year. In 1995, 1999, 2002, 2005 and 2009 extensive surveys were undertaken at sites known to support large numbers of newts, and the results of these are shown in table 16 (below). In the intervening years, surveys have concentrated on other less well-known ponds to fill gaps in the known distribution of great crested newts at Dungeness.

These counts should be treated as under estimates. In particular:

- On the RSPB reserve eggs and adults have been found in the Open Pits, but no thorough surveys have been undertaken. The pit margins are thickly vegetated and the bases of the ponds consist of deep, unconsolidated peat that cannot be surveyed safely. Numbers here are likely to be large.
- Several of the breeding sites were not known about in 1995 and only a limited range of the ponds were surveyed in 2005.

The numbers have fluctuated quite widely, which is not unusual for this species. Reasons for these fluctuations are likely to include the following factors:

- Increased numbers of ponds on Lydd Ranges since 1995, with infilling by bulrushes *Typha* (now rectified) of the main pond making counts difficult in 2005.
- Invasion of small ponds on the RSPB Reserve by common reed *Phragmites australis*, making night-time counts difficult.

- Creation of new ponds in the north of the RSPB Reserve, resulting in a genuine increase in numbers by 2005.
- Loss of open water due to reed invasion at Lydd Airport combined with an as yet unexplained reduction in numbers of adults in the main pond.
- Invasion of some ponds by sticklebacks in 2001, a year in which there were unusually high water levels. Sticklebacks are known to have a drastic impact on great crested newt populations in many circumstances, and evidence suggests that adults breed preferentially in fish-free ponds.

The flooded sand and gravel pits at Romney Warren support the third metapopulation and are an ideal great crested newt habitat, similar to those at Dungeness. Romney Warren has only been thoroughly surveyed for great crested newts three times, in 1999, 2000 and 2009, by the Romney Marsh Countryside Project (see table 16, below). Romney Warren is separated from the Lydd Airport ponds by less suitable (predominantly arable) habitat.

In addition to the internationally important metapopulations of great crested newts at Dungeness and Romney Warren, there are also scattered populations within the pRamsar site across Walland Marsh and at Rye Harbour. No counts from these areas have exceeded 100 individuals.

Table 16 Total numbers of great crested newts counted in each of three metapopulations in the pRamsar site, 1994 – 2009

Metapopulation	1994	1995	1998/9	2000	2002	2005	2009
Dungeness 1: Lydd Ranges	NS	74	110	NS	285	99	115
Dungeness 2: RSPB Reserve & Lydd Airport	118	197	524	NS	388	343	324
<i>Number of ponds surveyed at Dungeness</i>	<i>4</i>	<i>9</i>	<i>34</i>	<i>0</i>	<i>57</i>	<i>17</i>	<i>58</i>
Romney Warren LNR and golf course	NS	NS	103	280	NS	NS	122

Sources: Banks (unpublished surveys); Banks (2009); Nixon (1999); Schnorr (2009).

Medicinal leech *Hirudo medicinalis*

The rare (RDB3) medicinal leech is listed in Schedule 5 to the Wildlife and Countryside Act 1981. It is Britain's largest species of leech and was once very common within the British Isles and the rest of Europe. In the early part of the 19th century, many millions were taken from the wild for use in phlebotomy (blood-letting) and this, combined with habitat loss due to changes in farm practices and draining of marshland, led to a rapid decline in Britain. At the start of the 20th century, the medicinal leech was considered extinct in the British Isles. Since 1970 scattered populations have been found across Great Britain, with concentrations in Cumbria, Anglesey and the New Forest. The species was first confirmed at Dungeness in 1978, when it was recorded in Lade Pit, and it has subsequently been found at a wide range of localities between Dungeness and Rye. Dungeness, Romney Marsh and Rye Bay pRamsar site is a stronghold for the medicinal leech in Great Britain.

Medicinal leeches tend to occur in nutrient-rich waters with abundant water plants, and a high proportion of shallow water is also important. This is because shallows warm more rapidly, particularly if water plants are present to reduce circulation and mixing with deeper, colder water. Warm water is important for initiating leech activity, particularly breeding (Nixon, 1998). Dungeness, Romney Marsh and Rye Bay includes a range of shallow, well-vegetated waterbodies that provide ideal conditions for medicinal leeches, including ponds, ditches and shallow areas in flooded gravel pits.

The Romney Marsh Countryside Project (RMCP) surveyed medicinal leeches in the Dungeness, Romney Marsh and Rye Bay area in 1998 (Nixon, 1998), 1999 (Nixon, 1999), 2000 (McConnell, 2000) and 2001/02 (McConnell, 2002). The initial 1998/99 surveys found medicinal leeches in 81 of the 153 waterbodies surveyed, including 53 ditches (mostly in grazing marsh areas) and 23 gravel pits. The 2000-2002 surveys concentrated on monitoring a sample of 6-10 of the sites identified in the earlier surveys but also found leeches in an additional 11 sites. A subsequent RMCP survey (Leyshon & Tate, 2004) also recorded medicinal leeches in two waterbodies at Lydd

Watersports. In 2005, medicinal leeches were found at Fairfield (Drake, 2005). In total, medicinal leeches have been recorded in over 100 waterbodies across the Dungeness, Romney Marsh and Rye Bay area. Key areas with the largest number of individuals recorded and the most waterbodies with records in apparently suitable habitat include Lade Pit, Lydd Airport, Dungeness RSPB Reserve, Rye Harbour LNR and East Guldeford Levels.

A ground beetle *Omophron limbatum*

This endangered (RDB1) ground beetle lives in burrows in sand at the margins of freshwater, where it is active at dusk and at night. The species has been recorded from the margins of waterbodies at Dungeness and Rye Harbour (Ferry & Waters, 1985; Morris & Parsons, 1992; Carr, 1998; Telfer, 1998; Whitton, 2002; Walters, 2004). Except for recent records in Suffolk, it is not known from any other sites in Great Britain.

Marsh mallow moth *Hydraecia osseola hucherardi*

This (provisionally) endangered (pRDB1) (Waring, 1993) UK BAP priority species is restricted to two main population centres: one on the River Medway south of Rochester, Kent, where it is recorded from a 3 km stretch of the river; the other in and around Walland Marsh on the Kent/East Sussex Border (Clancy, 2003). The Walland Marsh population centre comprises three discrete colonies at Moneypenny Farm near Rye, Old Cheyne Court near Brookland, and Woodruff's Farm, Fairfield. There are also two more recently colonised outliers at Saltbarn Lane (west of the River Rother north of Rye) and Corkwood Farm (in the Rother valley north-east of Iden) (Clancy, 2007). As its name suggests, the marsh mallow moth is associated with the nationally scarce marsh-mallow *Althaea officinalis*, which is the larval food plant. Marsh-mallow grows along ditches at Old Cheyne Court, Woodruff's Farm and Moneypenny Farm, and also occurs in damp areas away from standing water at the last-named site (Clancy, 2003). A small decline in numbers has been noted in recent years (Clancy 2007; 2008) which may be due to an increase in grazing of ditches. Initiatives through agri-environment schemes reducing the amount of heavy grazing of ditches should aid recovery. Butterfly Conservation is planning to transplant marsh mallow plants to affected areas to increase the moth's larval food plant (M. Parsons pers. comm.).

De Folin's lagoon snail *Caecum amoricum*

This species is listed in Schedule 5 of the Wildlife and Countryside Act 1981. Until recently, its only known locality in the UK was the Fleet in Dorset where it was discovered in 1986. In the Fleet, De Folin's lagoon snail lives in 'springs' formed by seawater seeping through the shingle of Chesil Beach into the Fleet. Now, some 20 years later, the species has been discovered at a further two locations, one of which is the saline lagoons at the seaward end of Lydd Ranges (Pain *et al.*, 2009), and the other is within Pagham Harbour SSSI (West Sussex). The saline lagoons lie between a seaward shingle ridge that is approximately 3-4 metres in height and a ridge (known as the Green Wall) some 200 metres inland topped by a path. The lagoons are described in section 7.1.2 (above). Pain *et al.* (2009) noted that sea water could be seen seeping through the seaward ridge into the lagoons. It may be that this replicates the micro-habitat conditions where the species occurs in the Fleet. Shells (including live-taken individuals) of De Folin's lagoon snail were sieved from a sample of pebbles mud and shingle taken from the bottom of one of the lagoons (Pain *et al.*, 2009).

7.3 Criterion 5

'A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.'

During the period 2002/03 – 2006/07, the pRamsar site supported an average peak of almost 35,000 individual waterbirds in the non-breeding season, comprised of almost 16,000 wildfowl and over 19,000 waders (see section 3.5, above).

7.4 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.'

Between 2002/03 and 2006/07, the pRamsar site supported 1.2% of the Northwestern & Central Europe (non-breeding) population of wintering shoveler (see section 3.3.1, above) and 1.1% of the Britain population of mute swans (see section 3.4.1, above).

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Annex 1 – Sources of bird data

Source of data	Data provider	Subject	Date produced	Method of data collection	Verification
Dungeness Bird Observatory Annual Reports	Dungeness Bird Observatory	Breeding, wintering and passage birds in the Observatory recording area	Annually	Organised survey and ad hoc observations	All records considered by Independent Board of Trustees and submitted to Kent Ornithological Society
Dungeness RSPB Reserve Records – Annual Reports	Dungeness RSPB Reserve	Breeding, wintering and passage birds in the RSPB Reserve	Annually	Organised survey and ad hoc observations	All records submitted to RSPB Headquarters and Kent Ornithological Society
Little Cheyne Court Wind Farm – Ornithological Assessment: update on wintering birds	Innogy	Wintering mute swans in the Little Cheyne Court wind farm area	2004	Organised survey	No independent verification
Kent Bird Reports	Kent Ornithological Society	Breeding, wintering and passage birds in the parts of the sites that lie within Kent	Annually	Organised survey and ad hoc observations	Kent Ornithological Society
Lydd Ranges Conservation Group surveys	MoD Lydd Ranges Conservation Group	Breeding, wintering and passage birds in Lydd Ranges	Annually	Organised survey and ad hoc observations	All records submitted to British Trust for Ornithology
Breeding and Wintering Bird Survey of Proposed Wind Farm Area at Little Cheyne Court	Marsh Environmental	Breeding and wintering birds in the Little Cheyne Court wind farm area	2003, 2004, 2008	Organised survey	No independent verification
Number of Roosting Hen Harriers in the Dungeness-Walland Marsh Area	Romney Marsh Harrier Recording Group	Winter Roost Counts of Hen Harriers	Annually	Coordinated survey	All records submitted to British Trust for Ornithology
Records of breeding marsh harriers in the Romney Marsh Area	Romney Marsh Harrier Recording Group	Records of breeding marsh harriers	2009	Coordinated survey	All records submitted to British Trust for Ornithology
Rye Harbour Local Nature Reserve Records – Annual Reports	Rye Harbour Local Nature Reserve	Breeding, wintering and passage birds in Rye Harbour LNR and the wider Rye Bay area	Annually	Organised survey and ad hoc observations	All records submitted to Sussex Ornithological Society

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Source of data	Data provider	Subject	Date produced	Method of data collection	Verification
Sussex Bird Reports	Sussex Ornithological Society	Annual Reports	Annually	Organised survey and ad hoc observations	Sussex Ornithological Society
Wetland Bird Survey (WeBS)	British Trust for Ornithology	Wintering and passage waterbirds	Annually	Coordinated survey	British Trust for Ornithology
Wetland Trust records	The Wetland Trust	Breeding, wintering and passage birds on Pett Level	Annually	Organised survey and ad hoc observations	All records submitted to the British Trust for Ornithology

Annex 2 – Species status categories

The information below provides definitions for the bryophyte, vascular plant and invertebrate species status categories, as listed in tables 12-14 and elsewhere in this document. Current assessments are made according to criteria developed by IUCN in 1994. Where species have not been assessed since 1994, pre-1994 British Red Data Book, nationally rare and nationally scarce categories are used.

1994 IUCN threat categories

Full descriptions are available on the IUCN website.

Critically endangered

A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in Great Britain in the immediate future, as defined by any one of five criteria based on population reduction, extent of occurrence, population size and quantitative analysis of extinction risk.

Endangered

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in Great Britain in the near future, as defined by any one of five criteria based on population reduction, extent of occurrence, population size and quantitative analysis of extinction risk.

Vulnerable

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in Great Britain in the medium-term future, as defined by any one of five criteria based on population reduction, extent of occurrence, population size and quantitative analysis of extinction risk.

Near Threatened

A taxon is Lower Risk when it has been evaluated but does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories. One of the subcategories is Near Threatened, which is defined as taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.

Pre-1994 British Red Data Book, nationally rare and nationally scarce categories

Full descriptions are available in any of the British Red Data Books (e.g. Shirt, 1987).

Red Data Book Category 1. RDB1 – Endangered

Taxa in danger of extinction in Great Britain and whose survival is unlikely if the causal factors continue operating.

Red Data Book Category 2. RDB2 – Vulnerable

Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating.

Red Data Book Category 3. RDB3 – Rare

Taxa with small populations in Great Britain that are not at present Endangered or Vulnerable, but are at risk.

Red Data Book Category I. RDBI – Indeterminate

Taxa considered to be Endangered, Vulnerable or Rare, but where there is not enough information to say which of the three categories (RDB 1 to 3) is appropriate.

Red Data Book Category K. RDBK – Insufficiently known

Taxa that are suspected, but not definitely known, to belong to any of the other Red data Book categories, because of lack of information.

Provisional Red Data Book pRDB

The prefix 'p' before any Red Data Book category implies that the grading is provisional. In the

majority of cases this means that the species' status has been reconsidered and changed in a Species Group Review produced subsequent to the publication of the relevant Red Data Book. These statuses are however, based on a greater amount of evidence than was available for the original Red Data Book and therefore more likely to be a true representation of the species' actual status.

Nationally rare

Taxa that are thought to occur within 15 or fewer 10 km squares of the National Grid in Great Britain.

Nationally scarce (notable) category A – NA

Taxa which do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain and thought to occur in between 16 and 30 10 km squares of the National Grid or, for less well recorded groups, within seven or fewer Vice Counties.

Nationally scarce (notable) category B – NB

Taxa which do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain and thought to occur in between 31 and 100 10 km squares of the National Grid or, for less well recorded groups, within between eight and 20 Vice Counties.

Nationally scarce (notable) – N or 'nationally scarce'

Taxa which are estimated to occur in 16 to 100 10 km squares of the National Grid in Great Britain. The subdividing of this category into Nationally Scarce A and Nationally Scarce B has not been attempted for some species because of either the degree of recording that has been carried out in the group to which the taxa belongs, or because there is some other reason why it is not sensible to be so exact.

[insert 'Area location map' here – 1 x A3 landscape in colour]

[Insert SPA citation here – 2 pages A4]

[Insert Ramsar site citation here – 3 pages A4]

[Insert SPA maps here as follows:

1 x 1:100,000 location map

2 x 1:50,000 summary maps

17 x 1:10,000 detail maps

All on A3 black and white]

[Insert Ramsar site maps here as follows:

1 x 1:100,000 location map

3 x 1:50,000 summary maps]