

Site name: Dungeness, Romney Marsh and Rye Bay **County:** East Sussex, Kent

District: Ashford, Rother, Shepway

Status: Site of Special Scientific Interest (SSSI) notified under section 28C of the Wildlife and Countryside Act 1981, as inserted by Schedule 9 to the Countryside & Rights of Way Act 2000.

Local Planning Authority: Ashford Borough Council, East Sussex County Council, Kent County Council, Rother District Council, Shepway District Council

National grid reference: TR069201 **Area:** 9,090.00 ha

Ordnance Survey sheets: **1:50,000:** 189, 199 **1:10,000:** TQ81NE, SE; TQ91NE, NW, SW; TQ92NE, NW, SE, SW; TQ93SE; TR01NE, NW; TR02NE, SE, SW; TR03SW

Notification date: 16 August 2006

Reasons for notification:

Dungeness, Romney Marsh and Rye Bay is a nationally important site by reason of a diverse range of biological and geological features, specifically the coastal geomorphology of Dungeness and Rye Harbour and the following nationally important habitats: saltmarsh, sand dunes, vegetated shingle, saline lagoons, standing waters, lowland ditch systems, and basin fens. These habitats and others within the site support the following nationally important species interests: populations of four vascular plant species listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended); an assemblage of Schedule 8, nationally rare and nationally scarce vascular plants; populations of the vulnerable Warne's thread-moss *Bryum warneum*; populations of water voles *Arvicola terrestris*; an assemblage of breeding birds associated with shingle beaches and saltmarsh, lowland damp grasslands, lowland open waters and their margins, and scrub; breeding numbers of 16 species of bird; assemblage of over 20,000 waterfowl in the non-breeding season; wintering numbers of 17 species of bird and three species during passage periods; metapopulations of great crested newts *Triturus cristatus*; endemic species and subspecies of invertebrates; populations of two invertebrate species listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); populations of ten endangered, vulnerable and rare invertebrate species; assemblages of invertebrates occurring on 'dry' coastal habitats; and assemblages of wetland invertebrates.

General description:

Dungeness, Romney Marsh and Rye Bay is a nationally important site 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. The site contains the largest and most diverse area of shingle beach in Britain, with low lying hollows in the shingle providing nationally 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 wetland habitat due to gravel extraction. This highly unusual coastal landscape has varied soils and shingle deposits which help to explain the way in which Romney Marsh and Rye Bay were formed, and may evolve in the future.

Coastal geomorphology

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 major phases of development of the foreland are represented in a series of morphological and sedimentological zones each of which provide distinct and critical evidence.

The surface and subsurface shingle ridges are dominated by flint. The ridges can be directly related to the development of the barrier beach system, formation of which probably began to the west, extending and evolving through a series of beach recurves, and the destruction and rebuilding of barrier beaches. The surface ridges evident today provide only one element of the evidence for the foreland development. The subsurface, or buried, ridges are important as they allow mapping of the foreland evolution. Finer grained material (including peat deposits) occurs between the barrier beaches, representing backwater environments. The presence of palaeo-environmental information from these deposits allows for detailed interpretation of the environmental conditions at the time of deposition. Dating of the deposits allows for a chronology of coastal evolution to be developed. Interpretation of the coastal and environmental changes at the site relies heavily on the relationship of the shingle ridges and associated deposits. The lateral and vertical variations in the deposits, and the ability to correlate and date the backwater and shingle ridge sequences is a key factor in furthering our understanding of the foreland development.

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, recycling for beach management, training walls at Rye Harbour and sea-level rise, including that caused by 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 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.

Saltmarsh

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.

Sand dunes

The site 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. Camber Sands is a ness/cusped foreland dune system that has developed over a series of shingle ridges radiating from its eastern end. The system

supports a typical successional sequence of dune habitats. The foredune vegetation contains a classic sequence of sand couch *Elytrigia juncea* dune and marram *Ammophila arenaria* dune with sand couch and red fescue *Festuca rubra*. The foredune also supports sea buckthorn *Hippophae rhamnoides* scrub, although some of this has been planted as a stabilisation measure. Further from the sea, the semi-fixed marram vegetation leads into fixed dune grassland. Locally this includes small patches of more lichen-rich open dune vegetation. In areas with a taller sward there is a tendency for mesotrophic (moderate nutrient status) grassland to develop with sea couch *Elytrigia atherica* and, on the higher ground, marram.

Greatstone Dunes are a narrow bay dune system and consist largely of a successional sequence of dune habitats from foredune to mobile dune and dune scrub habitats. 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 foredunes support a narrow and discontinuous band of sand couch fronting marram-dominated mobile dunes, which make up the majority of the dune system. There are also areas of sea buckthorn scrub. Where the dunes are broader towards the north of the site, the mobile dunes grade into areas of semi-fixed dune and fixed dune grassland.

Romney Warren is a stable ness/cuspate foreland dune system developed over a series of ancient shingle ridges. There are two main types of fixed dune grassland communities. Grasslands in the south and south-east are dominated by mixtures of red fescue, common bent *Agrostis capillaris*, sea couch, smooth meadow-grass *Poa pratensis*, crested hair-grass *Koeleria macrantha* and sand sedge *Carex arenaria*. In contrast, the northern end supports dense species-poor swards dominated by sand sedge and sheep's fescue *Festuca ovina*, developed over acidic sands. In the south-west, dense mesotrophic grassland has developed over richer soils. This is dominated by false oat-grass *Arrhenatherum elatius* and sea couch, with cock's-foot *Dactylis glomerata* and red fescue.

Vegetated shingle

The shingle beaches at Dungeness and Rye Harbour support a range of vegetated shingle communities and transitions between them. These communities reflect the geomorphological patterns of the shingle structure, reflecting both the time since deposition and the particle size and matrix of finer material present. A wide range of successional communities are present at Dungeness. One of the most unusual pioneer species is prostrate broom *Cytisus scoparius* ssp. *maritimus* which is an important component of the vegetation just inland of the pioneering driftline and false oat-grass grassland communities. On older shingle ridges the broom is eventually replaced by other species such as sweet vernal-grass *Anthoxanthum odoratum*, wood sage *Teucrium scorodonia* and common sorrel *Rumex acetosa*, and a rich lichen sward and 'thin heath' develops, with natural variation occurring where the shingle grades into grazing marsh, and on the eroding south coast of the site. Another important aspect of the vegetation is the range of blackthorn *Prunus spinosa* that occurs on low-lying areas of shingle, varying from 2m high shrubs to prostrate forms. The older blackthorn shrubs have a very rich epiphytic lichen flora dominated by *Usnea* spp., *Evernia prunastri* or *Hypogymnia physodes*. This lichen community is unique to shingle and has its best representation at Dungeness. Lydd Ranges supports the only known example of a "holly *Ilex aquifolium* wood" on shingle. Around the landward edge of the shingle beaches (such as at the northern end of Lydd Ranges) there are relict areas of sandy shingle which probably represent old dune systems. Even the areas of apparently bare shingle are in fact 'vegetated' by encrusting lichens, including the near-threatened species *Rinodina aspersa*.

On naturally bare shingle ridges near the coast at Rye Harbour, soil development is limited and only a few specialised pioneer plant species can colonise, such as sea-kale *Crambe maritima*, sea pea *Lathyrus japonicus* ssp. *maritimus*, sea campion *Silene uniflora* and curled dock *Rumex crispus*. As finer material accumulates within the gravel matrix, more species become established including viper's-bugloss *Echium vulgare*, yellow horned-poppo *Glaucium flavum* and herb-robert *Geranium robertianum* ssp. *maritimum*. After several centuries, a thin, well-drained soil develops on the older

shingle ridges and a variety of grassland species occur, including buck's-horn plantain *Plantago coronopus*, common stork's-bill *Erodium cicutarium*, sand spurrey *Spergularia rubra*, the vulnerable smooth cat's-ear *Hypochaeris glabra* and some fifteen species of vetch and clover. Around Camber Castle there are unique ancient ridges that have an extremely specialised grass flora. Where the shingle has been disturbed or removed in the past to a level above the water table there is a succession of different species to those found elsewhere. Here, species such as Danish scurvygrass *Cochlearia danica*, common bird's-foot-trefoil *Lotus corniculatus*, rue-leaved saxifrage *Saxifraga tridactylites* and the endangered least lettuce *Lactuca saligna* occur.

Natural shingle wetlands: saline lagoons, standing waters and basin fens

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. These wetlands have been subject to colonisation by vegetation and (the Open Pits at least) display stages of a classic hydrosere 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 hydrosere 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. Much of the vegetation comprises common reed swamp but poor fen communities are dominated by tall-herb fen, with marsh cinquefoil *Potentilla palustris*, the nationally scarce marsh fern *Thelypteris palustris*, common cottongrass *Eriophorum angustifolium* and bottle sedge *Carex rostrata*. Some pits have hummocks of bog-moss, including blunt-leaved bog-moss *Sphagnum palustre* and spiky bog-moss *S. squarrosum*, and one pit contains a small stand of great fen-sedge *Cladium mariscus*.

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 fauna of the pools that lie seaward of the embankment is comparatively diverse and includes the lagoonal specialist mud-snail *Ventrosia ventrosa*. The maritime influence of these pools is shown by the presence of the bivalve mollusc *Abra tenuis* and the polychaete worm *Capitella capitata*. The remaining pools lie landward of the embankment. They are surrounded by grassland with sea-purslane and sea aster, and have a dense submerged flora of tasselweed *Ruppia* spp. The tasselweed is well colonised by *Ventrosia ventrosa*, whilst the benthos predominantly comprises oligochaetes and opportunistic insects, but ragworms *Nereis diversicolor* are also common. The lagoons demonstrate a range of salinities and all show landward transitions to vegetated shingle habitats and to the shingle ridge geomorphology of Dungeness.

Lowland ditch systems

The extensive systems of ditches and dykes (such as those which drain 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 inland in the large ditches or where peat deposits, which leach salt, lie close to the surface. The majority of the ditches have high plant species richness.

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.

Plants

The site supports populations of four plant species that are listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended): Jersey cudweed *Gnaphalium luteoalbum* grows on the margins of gravel pits in Dungeness RSPB Reserve; least lettuce occurs in vegetated shingle at Rye Harbour Local Nature Reserve (LNR); there is a small colony of the early spider-orchid *Ophrys sphegodes* growing on an area of disturbed shingle adjacent to the nuclear power stations at Dungeness; and there are colonies of lizard orchids *Himantoglossum hircinum* (further details about the locations of these colonies are confidential due to the threat posed by illegal plant collectors).

The extensive areas of natural and semi-natural habitats, including shingle beaches, sand dunes, saltmarsh, grazing marsh, waterbodies and fens, support a large assemblage of nationally rare and nationally scarce vascular plant species (including the four Schedule 8 species listed above). Foremost amongst this assemblage are the suites of species associated with shingle beaches, grazing marsh and saltmarsh (including brackish wetlands in the shingle beaches and brackish ditches). The shingle beaches of Dungeness and Rye Harbour support at least six nationally scarce species (in addition to least lettuce and early spider-orchid), including the critically endangered red hemp-nettle *Galeopsis angustifolia*, and the near-threatened Nottingham catch-fly *Silene nutans* and yellow-vetch *Vicia lutea*. Saltmarshes and other brackish wetlands are equally rich, with at least eight nationally scarce species, including the vulnerable sea barley *Hordeum marinum* and Borrer's saltmarsh-grass *Puccinellia fasciculata*, and the near-threatened sea-heath. 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 and at least six nationally scarce species, including the endangered greater water-parsnip, and the vulnerable divided sedge *Carex divisa* and rootless duckweed *Wolffia arrhiza*.

The vulnerable Warne's thread-moss *Bryum warneum* is a colonist of unshaded calcareous sand that must be persistently damp all year but not inundated by standing water. Warne's thread-moss occurs on wet sand beside a large freshwater gravel pit in Dungeness RSPB Reserve. Several smaller satellite colonies have become established beside small pools to the north of the main colony.

Water voles

The extensive network of grazing marsh ditches, some in association with areas of wet reedbed, provides habitat for large populations of water voles *Arvicola terrestris*. The SSSI contains the core areas of an extensive distribution of this species in the Romney Marsh and Rye Bay area. The densest and most persistent population occurs at the southern end of Walland Marsh, between East Guldeford and Jury's Gap. Water voles also occur in large numbers further north on Walland

Marsh at Woolpack, Fairfield and The Dowels, as well as in Rye Harbour LNR and on Pett Level. The population fluctuates in numbers and range, largely dependent on summer water levels. The area is particularly favourable for water voles because many of the ditches hold water in the summer, stretches of ungrazed ditch bank provide vegetation cover, and predatory mink *Mustela vison* occur at a low density.

Breeding, wintering and passage birds

The SSSI is regularly used by an assemblage of at least 40 breeding bird species typical of shingle beaches and saltmarshes, lowland damp grasslands, lowland open waters and their margins, and scrub. This assemblage regularly includes nationally important breeding numbers (exceeding 1% of the Great Britain breeding populations) of gadwall *Anas strepera*, garganey *A. querquedula*, shoveler *A. clypeata*, pochard *Aythya ferina*, tufted duck *A. fuligula*, little grebe *Tachybaptus ruficollis*, water rail *Rallus aquaticus*, avocet *Recurvirostra avosetta*, black-headed gull *Larus ridibundus*, sandwich tern *Sterna sandvicensis*, common tern *S. hirundo*, little tern *S. albifrons*, Cetti's warbler *Cettia cetti* and bearded tit *Panurus biarmicus*. Whilst many breeding birds use habitats throughout the SSSI, there are four areas that support particular concentrations associated with different combinations of habitats: Dungeness (particularly the RSPB Reserve); Rye Harbour LNR; Pett Level (particularly the Pannel Valley); and Cheyne Court. In addition to the assemblage, the SSSI supports nationally important breeding numbers of cormorant *Phalacrocorax carbo*, in two colonies at Dungeness RSPB Reserve and Rye Harbour LNR, and Mediterranean gull *Larus melanocephalus*, primarily at Rye Harbour LNR.

The extensive areas of open water, grazing marsh, reedbed and intertidal habitat in the SSSI provide safe feeding and roosting sites for nationally important numbers of waterfowl, together regularly supporting in excess of 20,000 individuals of more than 60 species. As well as the waterbird species listed below, which individually occur in nationally important numbers (exceeding 1% of the Great Britain populations), this assemblage regularly includes large numbers (greater than 12,000 individuals) of lapwing *Vanellus vanellus*. Sixteen species of waterfowl regularly winter here in nationally important numbers: mute swan *Cygnus olor*, Bewick's swan *C. columbianus bewickii*, European white-fronted goose *Anser albifrons albifrons*, wigeon *Anas penelope*, gadwall *A. strepera*, teal *A. crecca*, shoveler *A. clypeata*, pochard *Aythya ferina*, little grebe *Tachybaptus ruficollis*, great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, bittern *Botaurus stellaris*, coot *Fulica atra*, golden plover *Pluvialis apricaria*, ruff *Philomachus pugnax* and sanderling *Calidris alba*. Two species of waterfowl regularly occur in nationally important numbers during migration periods: whimbrel *Numenius phaeopus* in spring and common sandpiper *Actitis hypoleucos* in autumn. The SSSI also supports nationally important numbers of hen harrier *Circus cyaneus* in winter and aquatic warbler *Acrocephalus paludicola* on autumn passage.

Great crested newt

The particular combination and distribution of aquatic and terrestrial habitats in the SSSI provide exceptional breeding, foraging and hibernation conditions for great crested newts *Triturus cristatus*. The SSSI supports three metapopulations: one centred on Lydd Ranges; one extending from Dungeness RSPB Reserve to Lydd Airport; and one at Romney Warren. The newts depend on water for breeding, which takes place in spring, and particularly favour moderately deep, well-vegetated pools without fish. During the first two or three years of life before breeding starts, and outside the breeding season, great crested newts are dependent on terrestrial habitats to provide foraging areas and places to hibernate. The habitats which occur around and between the waterbodies are therefore as important as the presence of suitable breeding ponds.

Invertebrates

The invertebrate fauna of Dungeness, Romney Marsh and Rye Bay is extremely unusual in a UK context, comprising a range of assemblages of thermophilic (warmth-loving) and wetland species. Foremost amongst these is the assemblage associated with vegetated shingle. The assemblage includes nationally important populations of seven endangered, vulnerable and rare species: the

jumping spiders *Pellenes tripunctatus* and *Euophrys browningi* that can often be found inhabiting old whelk shells; the case-moth *Coleophora galbulipenella* and white-spot moth *Hadena albimacula* whose larvae feed on Nottingham catchfly; the spider *Apostenus fuscus* that occurs in open false oat-grass grassland around the Long Pits; and the flea beetle *Dibolia cynoglossi* which is associated with red hemp-nettle at Dungeness and Rye Harbour. Some of this assemblage is thought to be endemic to Dungeness, including the leafhopper *Aphrodes duffieldi*. Several subspecies and forms are also known solely from Dungeness, including the pale grass egg moth *Lasiocampa trifolii flava*. The vegetated shingle also supports a nationally important population of the Sussex emerald moth *Thalera fimbrialis*, which is listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Sussex emerald is restricted as a British resident to Dungeness, where larval populations of the species occur mostly on areas of disturbed sandy shingle within and around the perimeter fence encircling Dungeness Nuclear Power Stations.

Sand dunes support a nationally important population of the rare click beetle *Melanotus punctolineatus*, which breeds in areas of sparsely vegetated coastal dune, and are also noteworthy for a range of bees, wasps and ants. These assemblages include the spider-hunting wasp *Evagetes pectinipes*, a species that is restricted in the UK to this site and just one other on the Kent coast. The sand dunes share many features in common with some of the man-made shingle workings in which fine sands and silts have been deposited to form banks and shallow edges. In drier areas, assemblages of solitary bees and wasps, including the bee *Dasypoda altercator*, can be substantial and in places are accompanied by nest parasites, such as the bee-fly *Bombylius discolor* (which also occurs in grazing marsh), and typical sand dune species such as the tiny bee-fly *Phthiria pulicaria*. Where fine open sandy material interfaces with open water, assemblages of species normally associated with dune slacks include a nationally important population of the endangered ground beetle *Omophron limbatum*, along with the ground beetle *Dyschirius obscurus*, and the flies *Tachydromia terricola* and *Chersodromia alata*.

The SSSI is permeated by a complex network of water bodies ranging from the natural shingle wetlands to gravel pits and ditches. These wetlands exhibit a number of similar characteristics, apart from the deep, cold and largely sterile open waters of the main gravel pits. Shallow open water and emergent vegetation largely comprising common reed and bulrush *Typha latifolia* supports a rich water beetle assemblage including four species of *Dytiscus* and the great silver diving beetle *Hydrophilus piceus*. It also supports a substantial dragonfly assemblage. Other noteworthy aspects of the invertebrate assemblage include a suite of reed beetles *Donacia* spp., snail-killing flies (Sciomyzidae) and soldier-flies (Stratiomyidae) that are typical of coastal marshes. Much of this assemblage is to be found within the ditch systems of Walland Marsh, Pett Level, Rye Harbour and Denge Marsh. Walland Marsh supports a nationally important population of the endangered marsh mallow moth *Hydraecia osseola hucherardi*, and is one of just two localities in Great Britain for this specialist whose larvae feed within the roots of marsh-mallow. The range of shallow, well-vegetated waterbodies provide ideal conditions for a nationally important metapopulation of medicinal leeches *Hirudo medicinalis*, a species listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Assemblages associated with particular plants are also noteworthy, foremost of which are the moths and beetles whose larval stages feed on viper's bugloss *Echium vulgare*. This assemblage includes a nationally important population of the (provisionally) vulnerable micro-moth *Ethmia terminella*, as well as the moths *Ethmia bipunctella* and *Cynaeda dentalis*, and the spectacular weevil *Ceutorrhynchus geographicus*. Other noteworthy plant associations include the extensive population of dodder *Cuscuta epithimum* which supports two tiny weevils *Smicronyx coecus* and *S. jungermanniae*, yellow horned-poppy in whose roots lives the weevil *Ceutorrhynchus verrucatus*, and prostrate broom which has a distinctive fauna both as live plants and dead stems.