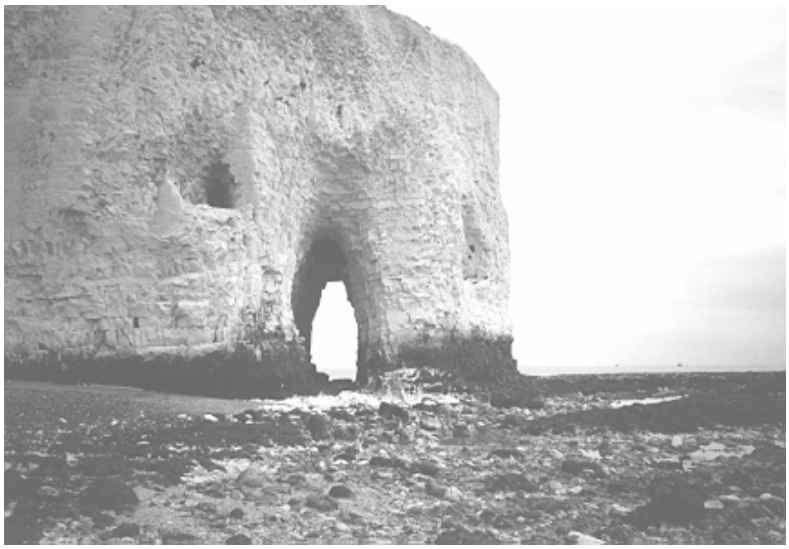
ENGLISH NATURE

North East Kent
European marine sites comprising:

Thanet Coast candidate Special Area of Conservation (cSAC),
Thanet Coast and Sandwich Bay Special Protection Area (SPA),
Sandwich Bay candidate Special Area of Conservation (cSAC)

English Nature's advice given under Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994



Issued 29 March 2000

English Nature's advice for North East Kent European marine sites given under Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994

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Preface

This document provides English Nature's advice to other relevant authorities as to (a) the conservation objectives and (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for the North East Kent European marine sites. This advice is being prepared to fulfill our obligations under Regulation 33(2) of the Conservation (Natural Habitats, &c) Regulations 1994.

Parts of the area referred to as the North East Kent European marine sites are candidate Special Areas of Conservation. It is Government policy that such sites should be protected as if they were already designated and, where appropriate, it is desirable to establish voluntary management schemes at an early stage, before the formal statutory obligations apply, and to act in the spirit of the Directive in the meantime (DETR & The Welsh Office 1998). In light of this policy, we have worked with many of you to develop this advice in advance of statutory obligations applying. It should be noted, however, that amendments to the Habitats Regulations for England are currently before Parliament which will result in the statutory obligations within the Regulations being applied to candidate SACs earlier in the process than currently.

European marine sites are defined in the Conservation (Natural Habitats &c.) Regulations 1994 as any part of a European site covered (continuously or intermittently) by tidal waters or any part of the sea in or adjacent to Great Britain up to the seaward limit of territorial waters. European sites include Special Areas of Conservation under the Habitats Directive, which support certain natural habitats and species of European importance, and Special Protection Areas under the Birds Directive which support significant numbers of internationally important wild birds. In many instances, as in the case of North East Kent European marine sites, these designations may coincide and our advice is being prepared to cover both the SAC and SPA interests.

This 'Regulation 33 package' is designed to help relevant and competent authorities, who have responsibilities to implement the Habitats Directive, to:

- understand the international importance of the site, underlying physical processes and the ecological requirements of the habitats and species involved;

- develop a management scheme to ensure that the ecological requirements of the site's interest features are met; and

- set the standards against which the condition of the site's interest features can be determined and undertake compliance monitoring to establish whether they are in favourable condition.

In addition, the Regulation 33 package will provide a basis to inform the scope and nature of 'appropriate assessment' required in relation to plans and projects (Regulations 48 & 50 and by English Nature under Regulation 20). English Nature will keep this advice under review and may update it every 6 years or sooner, depending on the changing circumstances of the European marine sites. In addition we will be providing more detailed advice to competent and relevant authorities to assess the implications of any given plan or project under the Regulations, where appropriate, at the time a plan or project is being considered. If during the European Union's moderation process qualifying interest features are added to these European marine sites, English Nature will add to this advice, as appropriate.

Tim Bines
English Nature
29 March 2000

English Nature's advice for North East Kent European marine sites given under Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994

1. Introduction

1.1 Natura 2000

The European Union Habitats1 and Birds2 Directives are international agreements which set out a number of actions to be taken for nature conservation. The Habitats Directive aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, and sets out measures to maintain or restore, natural habitats and species of European Union interest at favourable conservation status3. The Birds Directive protects all wild birds and their habitats within the European Union, especially migratory birds and those that are considered rare or vulnerable.

The Habitats and Birds Directives include requirements for the designation of conservation areas. In the case of the Habitats Directive these are Special Areas of Conservation (SACs) which support certain natural habitats or species, and in the Birds Directive, Special Protection Areas (SPAs) which support wild birds of European Union interest. These sites will form a network of conservation areas to be known as ANatura 2000". Where SACs or SPAs consist of areas continuously or intermittently covered by tidal waters or any part of the sea in or adjacent to Great Britain up to the limit of territorial waters, they are referred to as European marine sites.

Further guidance on European marine sites is contained in the Department of the Environment Transport and Regions/Welsh Office document: *European marine sites in England & Wales: A guide to the Conservation (Natural Habitats &c.) Regulations 1994 and to the preparation and application of management schemes.*

1.2 English Nature's role

The Conservation (Natural Habitats &c.) Regulations 1994 translate the Habitats Directive into law in Great Britain. It gives English Nature a statutory responsibility to advise relevant authorities as to the conservation objectives for European marine sites in England and to advise relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites has been designated. This information will be a key component of any of the management schemes which may be developed for these sites.

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1 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

2 Council Directive 79/409/EEC on the conservation of wild birds

3 A habitat or species is defined as being at favourable conservation status when its natural range and the areas it covers within that range are stable or increasing and the specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future.

This document is English Nature's advice for the North East Kent European marine sites issued in fulfilment of Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994 (the 'Regulation 33 package'). Copies of key references quoted in this document are held at English Nature's local office in Kent.

In addition to providing such advice, the Regulation 33 package will inform the scope and nature of 'appropriate assessment' which the Directive requires to be undertaken for plans and projects (Regulations 48 & 50 and by English Nature under Regulation 20). In the future, English Nature will provide more detailed advice to competent and relevant authorities to assess the implications of any such plans or projects.

1.3 The role of relevant authorities

The Conservation (Natural Habitats &c.) Regulations 1994 require relevant authorities to exercise their functions so as to secure compliance with the Habitats Directive. The management scheme which the relevant authorities are drawing up for North East Kent European marine sites under Regulation 34, will provide the framework through which this will be done and it should be based on the advice in this package. In this respect, the relevant authorities must, within their areas of jurisdiction, have regard to both direct and indirect effects on interest features of the site. This may include consideration of issues outside the boundary of the European marine sites.

Relevant authorities should ensure that all plans for the area integrate with the management scheme for the European marine site. Such plans may include shoreline management plans, local Environment Agency plans, SSSI management plans, local BAP plans and sustainable development strategies for estuaries. This must occur to ensure that there is only a single management scheme through which all relevant authorities exercise their duties under the Conservation (Natural Habitats &c.) Regulations 1994.

Relevant authorities also need to have regard to changing circumstances of the SAC and SPA and may therefore need to modify the management scheme and/or the way in which they exercise their functions so as to maintain the favourable condition of interest features concerned in the long term. There is no requirement for relevant authorities to take any actions outside their statutory functions.

Under certain circumstances, where another relevant authority is unable to act for legal reasons, or where there is no other relevant authority, English Nature is empowered to use its bylaw-making powers for Marine Nature Reserves (MNR) for use in European marine sites.

1.4 Activity outside the control of relevant authorities

Nothing within this Regulation 33 package will require relevant authorities to undertake any actions or ameliorate changes in the condition of interest features if it is shown that the changes result wholly from natural causes4. This also applies if the changes, although causing deterioration or disturbance to the interest features, are the result of human or natural events outside their control. Having issued Regulation 33 advice for European marine sites,

4 Determination of what constitutes natural change will be based on the best available information and scientific opinion at the time.

English Nature will work with relevant authorities and others to agree, within a defined time frame, a protocol for evaluating all observed changes to baselines and to develop an understanding of natural change and provide further guidance as appropriate and possible. On the North East Kent European marine sites a management group consisting of nine relevant authorities (Annex C), has already been set up and should be used to alert English Nature to such issues so that they may be assessed and any appropriate measures taken. This does not, however, preclude relevant authorities from taking action to prevent deterioration to the interest features, for example by introducing or promoting codes of practice.

1.5 Responsibilities under other conservation designations

In addition to its candidate SAC status and SPA status, the North East Kent European marine sites are also designated and subject to agreements under other conservation legislation (eg. SSSIs notified under the Wildlife and Countryside Act 1981 as amended 1985). The obligation of relevant authorities and other organisations under such designations are not affected by the advice contained in this document.

1.6 Role of conservation objectives

Section 5 of this document sets out the conservation objectives for the North East Kent European marine sites. They are the starting point from which management schemes and monitoring programmes are to be developed as they provide the basis for determining what is likely to cause a significant effect, and for informing on the scope of appropriate assessments of plans or projects. The conservation objectives set out what needs to be achieved and thus deliver the aims of the Habitats Directive**.**

1.7 Role of advice on operations

The advice on operations set out in Section 7 provides the basis for discussion about the nature and extent of the operations taking place within or close to the site and which may have an impact on its interest features. It is given on the basis of the working assumption that sites have been generally presumed to have been in favourable condition at the time they were identified. This assumption will be tested during the 2000 - 2006 reporting period. The advice should also be used to identify the extent to which existing measures of control, management and use are, or can be made, consistent with the conservation objectives and thereby focus the attention of relevant authorities and surveillance to areas that may need management measures.

This operations advice, issued 29 March 2000, will need to be supplemented through further detailed discussions with the management and advisory groups in formulating and agreeing a management scheme, where required, to agreed timescales for the European marine sites.

2. Identification of interest features under the EU Habitats and Birds Directives

2.1 Introduction

The North East Kent European marine sites are located on the north eastern coast of Kent, on the south side of the mouth of the greater Thames estuary, covering a stretch of coastline from Swalecliffe (but excluding the Herne Bay frontage) to just north of Deal. Apart from certain areas in Denmark, it is the eastern-most outcrop of chalk in Europe, containing one of the best examples of chalk caves in Britain and of chalk reefs in south-east Britain. The Thanet Coast has the longest continuous stretch of coastal chalk in Britain (23 km), representing about 20% of UK coastal chalk and 12% of the coastal exposure in Europe. The chalk cliff face, cave and tunnel habitats and communities here are very uncommon in Europe and therefore important internationally. The intertidal reef, together with the mudflats and sandflats which characterise the remainder of the coastline in North East Kent, provide valuable feeding grounds and roosting areas at low water for wintering waders. In summer, shingle provides an important breeding habitat for little terns.

The North East Kent European marine sites comprise two candidate Special Areas of Conservation (SAC): the Thanet Coast SAC and the Sandwich Bay SAC; and a Special Protection Area (SPA): the Thanet Coast and Sandwich Bay SPA, the boundaries of which are shown in Figure 1. The marine components of each of these three sites qualifies as a European marine site. Accordingly, the advice contained in this document covers both the SAC habitat and SPA bird interests of the European marine sites.

Where these habitats and species occur within the European marine site they are referred to as interest features. Sub-features have also been identified to highlight the ecologically important components of each interest feature. The interest features and sub-features for the Thanet Coast SAC are discussed in Section 3 in more detail and are mapped at Figures 2 and 3, and for the Thanet Coast and Sandwich Bay SPA in Section 4 and mapped at Figures 4,5 and 6.

2.2 Interest features under the EU Habitats Directive

2.2.1 Thanet Coast SAC

The Thanet Coast qualifies as a SAC for the following Annex I habitats as listed in the EU Habitats Directive:

- Reefs
- Submerged or partially submerged sea caves

2.2.2 Sandwich Bay SAC

Sandwich Bay qualifies as a SAC for its fixed dunes with herbaceaous vegetation (grey dunes), embryonic shifting dunes, shifting dunes with *Ammophila arenaria* marram grass (white dunes) and dunes with creeping willow *Salix arenaria* as listed under Annex I of the EU Habitats Directive. These features do not however, occur within the European marine site, and therefore within this document, as they occur above Highest Astronomical Tide.

Objectives to maintain these features in favourable condition are found within English Nature's conservation objectives for the relevant SSSI within the SAC boundary and will be dealt with through procedures outlined in the Conservation (Natural Habitats &c.) Regulations 1994. Relevant authorities need to have regard to such adjacent European interests, as they might be affected by activities taking place within, or adjacent to the European marine site.

2.3 Interest features under the EU Birds Directive

Thanet Coast and Sandwich Bay qualifies as a SPA under the Birds Directive in that it supports:

- **Internationally important populations of regularly occurring bird species listed in Annex 1 of the Birds Directive.**

  Breeding little tern (*Sterna albifrons*)

  Wintering golden plover (*Pluvialis apricaria*)

- **Internationally important populations of regularly occurring migratory species.**

  Wintering turnstone (*Arenaria interpris*)

Thanet Coast and Sandwich Bay was designated as an SPA in June 1992 and it is that citation on which this advice is based. The SPA was subsequently classified in July 1994. The boundaries of the Thanet Coast and Sandwich Bay SPA are illustrated in Figure 1 and the distribution and extent of the SPA interest features in Figures 4 and 5.

3. SAC interest features

3.1 Reefs

3.1.1 General description

Reefs are rocky marine habitats or biological concretions that arise from the sea bed (Brown and others 1997). They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. The types of reef habitat which characterise this interest feature include vertical rock walls, horizontal ledges, broken rock and boulder fields. The species assemblage is characterised by attached algae and invertebrates, usually associated with a range of mobile animals, including invertebrates and fish. The specific communities that occur vary according to a number of factors. Rock type, for example, is particularly important, with distinct communities associated with chalk and limestone rock resulting in a restricted distribution in accordance with the distribution of these rock types. There may be further variety associated with features such as gullies, outcrops and rockpools. The greatest variety of communities is typically found where coastal topography is highly varied, with a wide range of exposures to wave actions and tidal streams.

3.1.2 Importance of Thanet Coast reefs

The Isle of Thanet is a peninsula and chalk outcrop at the extreme north east of Kent. The chalk cliff face, cave and tunnel habitats and communities here are very uncommon in Europe and considered to be the best examples of their kind in the UK and of the highest international nature conservation importance.

Although less than 1% of the UK coastline is chalk, the UK has 75% of the chalk reefs in Europe and the selection of this type of reef in the UK was emphasised in recognition of the UK's special responsibility (Brown and others 1997). The 23 km of chalk cliffs with caves, stacks and arch formations form the longest continuous stretch in Britain. Furthermore, the chalk at Thanet is unusual amongst coastal exposures because it is of upper Cretaceous chalk which is softer than other types of chalk and more easily eroded and bored by animals. The intertidal chalk reef covers approximately 250 ha of foreshore, and represents the largest continuous area of intertidal chalk in the UK.

The coastal area of Kingsgate, North Foreland, Dumpton and Pegwell are particularly important because the coastal profile comprising cliff, foreshore and subtidal reef remains in a natural state and is not interrupted by man-made structures. These unprotected portions of cliff amount to 6 km of the total 23 km.

Thanet is the only major rocky outcrop in the southern North Sea and represents the last significant occurrence of rocky reef on the eastern English coast for 300 km until the hard chalk headland further north at Flamborough Head in Yorkshire.

The reef communities on Thanet are strongly influenced by the turbid seawater which naturally occurs in the southern North Sea and is particularly marked at Thanet as a result of its proximity to the mouth of the Thames estuary complex, and the suspended chalk particles in the water. A further strong influence on the reef communities is the soft nature of the chalk and the species that occur in this area are either adapted to living on soft, easily eroded

rock, or they are opportunistic in nature. Consequently, some communities that are typical of UK reefs are characteristically absent on Thanet, whilst other communities are rare elsewhere in the UK, but widespread on the chalk reef.

Thanet is also important as a location for scarce species, such as the specialist species of the '*Chrysophyceae*' algae (*sensu* Anand, 1937a) which form distinctly coloured bands of gelatinous or filamentous algae around the high water mark and splash zones on cliffs and in chalk caves. The species that make up these communities are rare in Britain and their restricted presence may be due to the porosity and dampness of the chalk.

The site is of historic natural interest with information in older publications, and museum specimens for the area dating back almost two centuries. For the marine flora a good baseline of information has been established during the past three decades. The site is also of scientific interest since it is the type locality for one genus and six species of chalk cave and cliff algae (Tittley and others 1998). Thanet was the first place in Britain where chalk cliff algae were studied. This work took place in the 1930's and further studies have been undertaken over subsequent years by the Natural History Museum in particular.

3.1.3 Sub-features

There are several important structural and/or functional components of the rocky reefs of the Thanet coast and these sub-features of the reef are described in more detail below.

Intertidal chalk cliff algal and lichen communities - Although about 75% of the chalk cliff has been modified by the construction of coastal protection works at the top of the shore, the remaining 25% is available to support internationally important communities. These communities of rock boring algae form distinct orange, brown or black bands at and around the high water mark and the splash zone. These communities are rare in Britain as they are restricted to soft rock (such as chalk) on open cliff faces and in caves & tunnels (see also section 3.2.2).

Intertidal red algal turfs communities - Elsewhere, on many other parts of the British coast, red algal turfs normally form a 'carpet' beneath a canopy of the fucoid brown alga *Fucus serratus*, and the kelp *Laminaria digitata*. In some restricted areas however, this overlying canopy is absent and at Thanet, such biotopes are widespread and make up important components of the mid- to lower-shore reef. This sub-feature includes four distinct biotopes:

- *Chondrus crispus* on lower eulittoral rock. On the Thanet coast this carragheen moss-dominated community is characterised by *Chondrus crispus*. This biotope is scarce in Britain and locally common on Thanet, occurring on piddock-bored rock.

- *Osmundea (Laurencia) pinnatifida* and *Gelidium pusillum* forming a short turf on mid eulittoral rock. This biotope occurs extensively around the Thanet coast although it is scarce in Britain. Large areas of stunted *Osmundea pinnatifida* and *Gelidium pusillum* form an open and patchy turf over the rock. A local variation of this biotope is where *Gelidium* dominates. Also characteristic of this biotope on the Thanet coast is the presence of chalk-boring blue-green algae.

- *Palmaria palmata* on lower eulittoral rock. On the Thanet coast this biotope is characterised by pure stands of *Palmaria palmata* over piddock- and *Polydora*-bored rock. It occurs on the lower littoral parts of the shore and is widespread but patchy in occurrence. In Britain it is an uncommon biotope.

- Mixed red seaweeds on moderately exposed lower eulittoral rock. On the Thanet coast this community is characterised by a range of red seaweeds including *Ceramium nodulosum* and *Polysiphonia fucoides* on the lower littoral levels of the shore. Several species of chalk-boring piddock and *Polydora* commonly occur. This biotope is scarce in Britain.

Kelp dominated communities on animal bored rock - Much of the sublittoral fringe of Thanet between Margate and Ramsgate is characterised by the kelp *Laminaria digitata* growing on piddock- and *Polydora*- bored chalk reef. The biotope is particularly rich as the soft nature of the chalk means that as well as the rock boring animals being present, other invertebrates such as the bivalve *Venerupis saxatilis*, anemones (eg *Sagartia troglodytes*), crabs and polychaete worms occupy empty piddock burrows. An understorey of red and brown algal turfs also characterise this biotope and on Thanet, the species present are those that are tolerant of scour. The extremely turbid water around the Thanet coast has a marked effect on the distribution of this biotope in the subtidal zone. In other parts of Britain, this kelp forest would extend into the subtidal zone where a transition to a larger kelp forest of *Laminaria hyperborea* would occur. On Thanet, however, the turbid water, heavy scouring and/ or friable rock all result in *Laminaria digitata* being uncommon in the sublittoral zone and *L. hyperborea* being absent all together.

Subtidal animal bored chalk communities - Throughout the subtidal part of the site, chalk reef is widespread though in deeper areas further offshore, it may be covered by a layer of sediment. Chalk throughout the site is bored by piddocks (*Barnea* spp., *Pholas dactylus, Hiatella arctica* and *Petricola pholadiformis*), and in shallower, heavily scoured areas, few other species occur. In deeper areas and where the reef is overlain by occasional boulders and cobbles, a wider variety of species occur, including bryozoans (*Alcyonidium diaphanum*), hydroids (*Nemertesia* spp. *Sertularia* spp. and *Halecium* spp.) sponge crusts and ascidians (eg *Molgula manhattensis*). This piddock-dominated biotope is the most widespread biotope on the subtidal reef and is considered to be scarce in Britain.

A variety of other biotopes present on the chalk reef around Thanet, also contain piddocks. These biotopes include the tide-swept and scoured rock with mats of the ascidian *Molgula manhattensis* and boulders and cobbles on chalk bedrock characterised by bryozoan and hydroid turfs.

3.2 Sea caves

3.2.1 General description

The UK has the most varied and extensive sea caves on the Atlantic coast of Europe (Brown and others 1997). SACs have been selected to encompass the range of structural and ecological variation of sea caves and cover their geographic range. Cave systems with extensive areas of vertical and overhanging rock, and those that extend deeply into the rock, are likely to support a wider range and higher diversity of plants and animals.

Cave communities vary considerably depending on the structure and extent of the cave system, their degree of submergence and of exposure to scour and surge, and the nature of their geology. Caves can vary in size, from only a few metres to more extensive systems, which may extend hundreds of metres into the rock. There may be tunnels or caverns with one or more entrance, in which the vertical and overhanging rock faces provide the principal marine habitat. Caves are typically colonised by encrusting animal species but may also support shade-tolerant algae near their entrances

Caves in the intertidal and shallow sublittoral are frequently subject to conditions of strong wave surge and scour by coarse sediment. This rapid change in physical conditions from cave entrance to the inner parts of the cave often leads to a marked zonation in the communities present. The type of bedrock in which the cave is formed has a significant influence on its shape and qualities as a substrate for its associated communities.

3.2.2 Importance of sea caves on the Thanet Coast

The Thanet coast has the second most extensive representation of chalk caves in the UK (after Flamborough Head in Yorkshire). The 23 km of chalk cliffs contain a large number of partly-submerged caves and tunnels in the intertidal area. These caves support very specialised algal and lichen communities, some of which have not been recorded from elsewhere. Although only 25% of the cliff face remains in a natural state Thanet still has a wide range of examples of unprotected north, east and south facing cliffs, caves and tunnels and are of international importance.

3.2.3 Sub-features

Intertidal chalk cliff algal and lichen communities - are the major component of the chalk caves at Thanet and the soft nature of the Upper Cretaceous chalk on the Thanet coast is characterised by a unique range of marine algal and lichen communities which form distinct orange, brown or black bands at and around the high water mark. Although this sub-feature also occurs on nearby areas of open cliff (see section 3.1.3), some of the algal growths are restricted to, or predominantly found, in the caves. For example the red velvety growths of *Audouinella purpurea,* the golden brown velvety growths of *Pilinia maritima* and the green stain-like growths of *Pseudendoclonium submarinum* are all restricted to the shaded, damp walls and ceilings of the caves. These communities are rare in Britain.

4. SPA interest features

4.1 Background and context

A major aim of the Birds Directive is to take special measures to conserve the habitats of qualifying birds in order to ensure their survival and reproduction within the European Union. A key mechanism in achieving this is the classification by Member States of the most suitable sites as SPAs.

English Nature's conservation objectives at a site level focus on maintaining the condition of the habitats used by the qualifying species. Habitat condition will be delivered through appropriate site management including the avoidance of damaging disturbance. In reporting on Favourable Conservation Status, account will need to be taken both of habitat condition and the status of the birds on the SPA.

Accordingly, English Nature will use annual counts, in the context of five year peak means for qualifying species, together with available information on population and distribution trends, to assess whether an SPA is continuing to make an appropriate contribution to the Favourable Conservation Status of the species. Count information will be assessed in combination with information on habitat condition, at the appropriate time within the reporting cycle, in order to report to the European Commission

English Nature's advice focuses on the qualifying species for which the SPA was originally classified despite the fact that numbers and species composition may have changed on this site since that time. Such population and species composition changes are being documented through the UK SPA Network Review, led by JNCC, which will provide advice to Ministers on any changes in SPA citations required. Depending on the review and decisions from DETR, English Nature may reissue this advice on SPAs with updated bird information.

In addition to focusing on avoiding deterioration to the habitats of the qualifying species, the Habitats Directive also requires that actions are taken to avoid significant disturbance to the species for which the site was designated. Such disturbance may include alterations in population trends and/or distribution patterns. Avoiding disturbance to species requirements is mentioned in the favourable condition table underpinning the conservation objectives for the SPA. In this context, five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

Attention is, however, also directed to the inclusion of disturbance in the advice on operations provided in section 6. Where disturbance is highlighted in such advice, relevant authorities need to avoid damaging disturbance to qualifying species when exercising their functions under the Directive.

Reductions in organic inputs

Under the Urban Waste Water Treatment (UWWT) Directive all coastal discharges above a certain size must have secondary treatment installed by the end of 2000. Secondary treatment of sewage will significantly reduce organic loading and to a lesser extent reduce concentrations of dissolved nutrients. The effects of these reductions on coastal birds on the Thanet Coast and Sandwich Bay SPA are difficult to predict. On a local scale cleaner sewage

discharges may cause a redistribution of feeding birds or they may have a much greater effect causing a reduction in the overall capacity of a coastal area to support bird populations.

English Nature supports the cleaning up of coastal discharges. The overall ecological benefits of cleaner discharges will, in general, outweigh any subsequent local decline in bird numbers. However, coastal clean ups may have the potential to significantly effect the features of the SPA. Under the Birds and Habitats Directives, the competent authority (in this case Environment Agency) will therefore be required to undertake an appropriate assessment and establish a monitoring baseline. If adverse effects are anticipated then compensatory measures, such as habitat creation or mitigation in the form of reducing disturbance through the use of refuges at critical times of the year, may be an option.

4.2 General description

The Thanet Coast and Sandwich Bay was designated a Special Protection Area in June 1992 and subsequently classified in July 1994. The site, covering an area of coastline stretching from Swalecliffe to Deal (Figure 1) qualifies under Article 4.1 of the EU Birds Directive by regularly supporting:

- 1% or more of the Great Britain population of the following rare or vulnerable species listed under Annex 1 of the Birds Directive in any season: little tern *Stena albifrons* and golden plover *Pluvialis apricaria.*

The Thanet Coast and Sandwich Bay SPA also qualifies under Article 4.2 of the EU Birds Directive by supporting:

- 1% of more of the biogeographical population of the following regularly occurring migratory species in any season: turnstone *Arenaria interpres*.

The Thanet Coast and Sandwich Bay SPA also supports nationally important wintering populations of a further four species: ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, sanderling *Calidris alba* and Lapland bunting *Calcarius lapponicus*. In addition, large numbers of migratory species pass through the site during the spring and autumn migration periods. These migratory birds have been monitored since 1952 by the Sandwich Bay Bird Observatory.

Details on the population size and thresholds of the qualifying species for which the SPA was classified and on which this advice focuses, are given in Table 1. In recognition that bird populations may change as a reflection of national or international trends or events, this advice on the bird interests of the European marine site focuses on the condition of the habitats necessary to support the bird populations. As with SAC interest features, sub-features are identified which describe the key habitats within the European marine site necessary to support the birds that qualify within the SPA. Detailed information and targets for habitat condition are listed in the favourable condition table in Section 6.

Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. Different bird species exploit different parts of an intertidal area and different prey species. Changes in the habitat may therefore affect their prey availability. The important bird populations therefore require a functional ecosystem

which is capable of supporting intertidal habitat for feeding and roosting. The most important factors related to this are:

- Current extent and distribution of suitable feeding and roosting habitat (eg intertidal mudflats);
- Sufficient prey availability (eg small fish, crustaceans and worms);
- Minimal levels of disturbance; and
- Water quality necessary to maintain intertidal plant and animal communities;

4.3 Internationally important populations of regularly occurring Annex 1 species

Little terns *Stena albifrons* arrive at Sandwich Bay, amongst other areas in Europe, to breed during the summer after spending the winter in the coastal areas of west Africa. In Sandwich Bay, little terns breed at Plum Pudding and Shell Ness in small, single-species colonies on areas of shingle and sand, parts of which are occasionally overtopped by the sea (Figure 4). Little terns feed in the shallow coastal waters in and around the site, foraging on small fish and invertebrates.

In the five year period 1986-90, an average of 30 pairs of little terns bred within the Thanet Coast and Sandwich Bay SPA, representing 1% of the British breeding population. The maximum number of pairs that attempted to breed during this period was 67 in 1986. It has been observed that numbers of little terns have been decreasing in recent years and this is thought to be largely as a result of increased disturbance.

Golden plover *Pluvialis apricaria* arrive in autumn to winter on land around Sandwich Bay. In recent years the golden plover have taken to roosting in large numbers on the intertidal mudflats of the bay. It is likely that whilst there some feeding takes place but this is not their prime feeding habitat.

Their main feeding habitat is on arable fields and grazing marsh located inland of the dunes of Sandwich Bay. This habitat does not occur within the marine part of the SPA and is therefore not described within this document.

During the five year period 1985/86-1989/90, an average peak count of 1,980 golden plover were recorded, representing 1% of the British Wintering Population.

4.3.1 Sub-features

Shingle shores - Sparsely vegetated shingle areas are an important nesting area for little terns within the SPA. The little tern breeding sites are located on areas of sandy shingle at Plum Pudding and Shell Ness which are occasionally overtopped by seawater. These relatively open areas with some sparse vegetation are used by little terns each summer. Successful breeding is largely dependent on relatively little disturbance and limited predation.

Shallow coastal waters - Little tern feed in shallow coastal waters mainly on small fish (eg sandeel, pipefish, and gobies) and also crustacea (shrimps, prawns and crabs). When the tide is in, feeding activity occurs in Sandwich Bay and in the lower reaches of the River Stour. The extent and location of feeding areas around Plum Pudding have not been recorded.

Intertidal mud and sandflats - Mudflats and sandflats in Pegwell Bay and Sandwich Bay provide roosting grounds for Golden Plover.

4.4 Importance of the internationally important populations of regularly occurring migratory species

The Thanet Coast and Sandwich Bay SPA supports an internationally important population of wintering turnstone *Arenaria interpres*. Turnstones feed on sandy beaches and rocky shores along the north-east Kent coast particularly in areas of loose stones or seaweeds (Figure 5). Their preferred food includes peeler crabs, small crustaceans such as shrimps, and barnacles, as well as marine molluscs such as periwinkles, for which they forage with their bills by turning over small stones or pushing aside fronds of seaweeds or probing sand. They may continue to forage at high tide on areas of washed up weed at the tideline. Roosting within the SPA occurs from Swalecliffe to Pegwell Bay mainly on areas of sand and shingle but also on man made structures.

4.4.1 Sub-features

Sand and shingle shores - Turnstones can roost on coarse intertidal sediments as well as areas above the high tide mark. Additionally, some birds roost on fields at the top of the cliffs and other areas of open space landward of the boundary of the SPA. The roost sites are dotted around the coast from Swalecliffe to Pegwell Bay, some of which are used regularly while others are used occasionally when adverse weather conditions and disturbance prevent them from using their preferred roost site.

Intertidal mud and sandflats - Mudflats and sandflats, predominantly located west of Minnis Bay, in Pegwell Bay and in Sandwich Bay, provide feeding grounds for Turnstones, as do the sandy beaches located in the bays between the outcropping chalk platform. Turnstones feed on crustaceans such as shrimps and fauna under stones and within the sediment.

Chalk shores - The chalk foreshore provide important foraging areas for turnstones which forage on loose stones and seaweed for periwinkles and crustaceans. Mussel beds, which support a range of marine invertebrates, also provide an important source of food.

5. Conservation objectives for all interest features

Under Regulation 33(2)(a) of The Conservation (Natural Habitats &c.) Regulations 1994, English Nature has a duty to advise other relevant authorities as to the conservation objectives for the European marine site. The conservation objectives for the North East Kent European marine sites are provided below and should be read in the context of other advice given in this package, particularly:

- the attached maps showing the extent of the various interest features and sub-features;
- summary information on the interest of each of the features; and
- the favourable condition table, providing information on how to recognise favourable condition for each of the features and which will act as a basis from which the monitoring programme will be developed.

5.1 SAC interest features

5.1.1 The conservation objective for the reefs

Subject to natural change, maintain the **reefs** in favourable condition 6, in particular:

- Intertidal chalk cliff algal and lichen communities
- Intertidal red algal turf communities
- Kelp dominated communities on animal bored rock
- Subtidal animal bored chalk communities

5.1.2 The conservation objective for submerged or partially submerged sea caves

Subject to natural change, maintain the **submerged or partially submerged sea caves** in favourable condition, in particular:

- Intertidal chalk cliff algal and lichen communities

6For a detailed definition of how to recognize favourable condition see table 2 (Section 6).

5.2 SPA interest features

5.2.1 The conservation objective for the internationally important populations of Annex 1 bird species

Subject to natural change, maintain the habitats for the **internationally important populations of the regularly occurring Annex 1 species** in favourable condition, in particular:

- Shingle shores
- Shallow coastal waters
- Intertidal mud and sandflats
- Numbers of bird species using these habitats are given in Table 1

5.2.2 The conservation objective for the internationally important populations of regularly occurring migratory species

Subject to natural change, maintain in favourable condition the habitats for the **internationally important population of regularly occurring migratory species**, in particular:

- Sand and shingle shores
- Intertidal mudflats and sandflats
- Chalk shores

Numbers of bird species using these habitats are given in Table 1

Note: These SPA conservation objectives focus on habitat condition in recognition that bird populations may change as a reflection of national or international trends or events. Annual counts for qualifying species will be used by English Nature, in the context of five year peak means, together with available information on UK population and distribution trends, to assess whether this SPA is continuing to make an appropriate contribution to the Favourable Conservation Status of the species across Europe.

Table 1 - Information on populations of internationally important species of birds under the EU Birds Directive that use the Thanet Coast and Sandwich Bay SPA at the time the SPA was designated

Internationally important breeding populations of Annex 1 bird species *		**Mean numbers and population size (1986-1990)**
little tern	*Sterna albifrons*	30 pairs, representing >1% of the British breeding population

Internationally important wintering populations of Annex 1 bird species *		**Mean numbers and population size (1985/86-1989/90)**
golden plover	*Pluvialis arpicaria*	1,980 birds representing >1% of the British wintering population

Internationally important populations of regularly occurring migratory species *		**Numbers and population size (1985/86 -1989/90)**
turnstone	*Arenaria interpres*	1,300 birds, representing 2% of the East Atlantic Flyway population

* SPA citation dated June 1992 held on Register of European Sites for GB.

6. Favourable condition table

The favourable condition table is supplied as part of English Nature's Regulation 33 advice package. It is intended to supplement the conservation objectives only in relation to management of established and ongoing activities and future reporting requirements on monitoring the condition of the site and its features. The table **does not by itself** provide a comprehensive basis on which to assess plans & projects as required under Regulations 20 and 48-50, but it does provide a basis to inform the scope and nature of any 'appropriate assessment' that may be needed. It should be noted that appropriate assessments are, by contrast, a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects. English Nature will provide more detailed advice to competent and relevant authorities to assess the implications of any given plan or project under the Regulations, where appropriate, at the time a plan or project is being considered.

The favourable condition table is the principle source of information that English Nature will use to assess the condition of an interest feature and as such comprises indicators of condition. On many terrestrial European sites, we know sufficient about the preferred or target condition of qualifying habitats to be able to define measures and associated targets for all attributes to be assessed in condition monitoring. Assessments as to whether individual interest features are in favourable condition will be made against these targets. In European marine sites we know far less about habitat condition and find it difficult to predict what favorable condition may look like. Individual sites within a single marine habitat category are also all very different, further hampering the identification of generic indicators of condition. Accordingly, in the absence of such information, condition of interest features in European marine sites will be assessed against targets based on the existing conditions, which may need to be established through baseline surveys in many cases.

The assumption that existing interest features on European marine sites are in favorable condition will be tested in the 2000 - 2006 reporting period and the results subsequently fed back into our advice and site management. Where there is more than one year's observations on the condition of marine habitats, all available information will need to be used to set the site within long-term trends in order to form a view on favourable condition. Where it may become clear that certain attributes are a cause for concern, and if detailed studies prove this correct, restorative management actions will need to be taken to return the interest feature from unfavorable to favourable condition. It is the intention of English Nature to provide quantification of targets in the favorable condition table during the 2000 - 2006 reporting period.

This advice provides the basis for discussions with management and advisory groups, and as such the attributes and associated measures and targets may be modified over time. The aim is to produce a single agreed set of attributes that will then be monitored in order to report on the condition of features. To meet UK agreed common standards, English Nature will be committed to reporting on each of the attributes subsequently listed in the final version of the table, although the information to be used may be collected by other organisations through agreements.

The table will be an important, but not the only, driver of the site monitoring programme. Other data, such as results from compliance monitoring and appropriate assessments, will also have an important role in assessing condition. The monitoring programme will be developed as part of the management scheme process through discussion with the relevant

authorities and other interested parties. English Nature will be responsible for collating the information required to assess condition and will form a judgement on the condition of each feature within the site, taking into account all available information and using the favourable condition table as a guide.

Detailed scientific information on the marine biotopes and species which form the basis of this favourable condition table can be found in Appendix II.

Box 1	**Glossary of terms used in the favorable condition table**
Feature	The habitat or species for which the site has been selected.
Sub-feature	An ecologically important sub-division of the feature.
Attribute	Selected characteristic of an interest feature/sub-feature which provides an indication of the condition of the feature to which it applies.
Measure	What will be measured in terms of the units of measurement, arithmetic nature and frequency at which the measurement is taken.
Target	States the favorable condition of an attribute with reference to a baseline. Where no information is available, a description of how the target is to be derived is included.
Comments	The rationale for selection of the attribute.

Table 2 Favourable Condition Table for the North East Kent European marine sites

NB- Many of the attributes will be able to be monitored at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the first reporting cycle in order to characterise the site and establish the baseline.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
Reefs		Extent	Area (ha) of the reef measured periodically (frequency to be determined).	No decrease in extent from an established baseline, subject to natural change.	Extent of reef is a reporting requirement of the Habitats Directive. The extent of reef will not change significantly over time unless due to some human activity but nevertheless needs to be measured periodically.
		Absence of coastal defence	Length of reef without coastal protection, measured periodically (frequency to be determined).	No decrease in length of reef without coastal protection from an established baseline, subject to natural change.	Sections without coastal protection are important to show the natural ecology and zonation and therefore the structure of the chalk biotopes. It is here that the coastal profile comprising cliff, foreshore and tidal reef remain in a natural state uninterrupted by sea walls or other man-made structures.
		Water density - water temperature & salinity	Average water temperature / salinity in the subtidal measured periodically throughout the reporting cycle (frequency to be determined).	Average temperature / salinity should not deviate significantly from an established baseline, subject to natural change.	Temperature and salinity are characteristic of the overall hydrography of the area. Changes in temperature and salinity influences the presence and distribution of species (along with recruitment processes and spawning behaviour) including those at the edge of their geographic ranges and non-natives.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
	Intertidal chalk cliff algal and lichen communities	Extent and distribution of characteristic biotopes	Extent and distribution of intertidal chalk cliff algal and lichen communities. Measured once during reporting cycle.	No decrease in extent and distribution of intertidal chalk cliff algal and lichen communities from an established baseline, (eg Natural History Museum Survey 1998), subject to natural change.	The relative distribution of these specialist algal and lichen communities, are an important structural aspect of the chalk cliff. Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
Reefs (cont.)	Intertidal chalk cliff algal and lichen communities (cont.)	Species composition of characteristic biotope	Presence and abundance of composite species of characteristic biotope.	Presence and abundance of composite species should not deviate significantly from an established baseline, subject to natural change.	Species composition is an important contributor to the structure of this sub-feature. The presence and relative abundance of characterising species gives an indication of the quality of the characteristic biotopes and changes in composition may indicate cyclic change/trend in reef communities.
	Intertidal red algal turf communities	Extent and distribution of characteristic biotopes	Extent and distribution of biotopes listed at Appendix 1. Measured during summer, once during reporting cycle.	Extent and distribution of the biotopes should not deviate significantly from an established baseline (eg Natural History Museum Survey 1998), subject to natural change.	The extent and distribution of the biotopes listed at Appendix 1 are an important structural aspect of the sub-feature and therefore the reef. Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
		Species composition of characteristic biotopes	Presence and abundance of composite species of each biotope, measured during summer, once during reporting cycle.	Presence and abundance of composite species should not deviate significantly from an established baseline, subject to natural change.	Species composition is an important contributor to this sub-feature and therefore the reef as a whole. The presence and relative abundance of characterising species gives an indication of the quality of the biotopes and change in composition may indicate cyclic change/trend in reef communities.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
	Kelp dominated communities on animal bored rock	Extent and distribution of characteristic biotopes	Extent and distribution of biotopes listed at Appendix 1. Measured during summer, once during reporting cycle.	Extent and distribution of the biotopes should not deviate significantly from an established baseline (eg Natural History Museum Survey 1998), subject to natural change.	The relative distribution of MIR.KR.LdigPid. is an important structural aspect of the site. Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
		Species composition of characteristic biotope	Presence and abundance of composite species of characteristic biotope.	Presence and abundance of composite species should not deviate significantly from an established baseline, subject to natural change.	Species composition is an important contributor to this sub-feature and therefore the reef as a whole. The presence and relative abundance of characterising species gives an indication of the quality of the biotopes and change in composition may indicate cyclic change/trend in reef communities.
Reefs (cont.)	Kelp dominated communities on animal bored rock	Extent and distribution of characteristic biotopes.	Extent and distribution of subtidal animal-bored chalk communities. Measured once during reporting cycle.	Extent and distribution of the biotopes should not deviate significantly from an established baseline, subject to natural change.	Changes in extent and distribution may indicate long term changes in the physical conditions at the site. This may be difficult to measure accurately due to high water turbidity and strong currents.
	Subtidal animal-bored chalk communities (cont.)	Species composition of characteristic biotope.	Presence and abundance of composite species from MCR.SFR.Pid. measured once during reporting cycle.	Presence and abundance of composite species should not deviate significantly from an established baseline, subject to natural change.	The presence and relative abundance of characterising species gives an indication of the quality of MCR.SfR.Pid. and change in composition may indicate cyclic change/trend in reef communities. This may be difficult to measure accurately due to high water turbidity and strong currents.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
Sea caves		Extent	Number and location, measured once during reporting cycle.	No decrease in distribution and extent from an established baseline, subject to natural change.	Extent is an attribute on which reporting is required by the Habitats Directive. The extent may alter as a result of natural erosion and collapses as well as a result of human activity, hence the need for periodic measurement.
	Intertidal chalk cliff algal and lichen communities	Extent and distribution of characteristic biotopes	Extent and distribution of intertidal chalk cliff algal and lichen communities. Measured once during reporting cycle.	No decrease in extent and distribution of intertidal chalk cliff algal and lichen communities from an established baseline, (eg Natural History Museum Survey 1998), subject to natural change.	The relative distribution of these specialist algal and lichen communities, are an important structural aspect of the chalk cliff. Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
	Intertidal chalk cliff algal and lichen communities	Species composition of characteristic biotope	Presence and abundance of composite species of characteristic biotope.	Presence and abundance of composite species should not deviate significantly from an established baseline, subject to natural change.	Species composition is an important contributor to the structure of this sub-feature. The presence and relative abundance of characterising species gives an indication of the quality of LR.L.Chr and changes in composition may indicate cyclic change/trend in reef communities.
Internationally important Annex 1 bird populations	Shingle shores	Extent	Area(ha) of shingle shores, measured periodically (frequency to be determined).	No decrease in extent of shingle from an established baseline, subject to natural change.	Important nesting habitat for little terns.
Internationally important Annex 1 bird populations (contd.)	Shingle shores	Vegetation cover/ density	Ratio of open ground with sparse vegetation and bare surfaces, measured periodically (frequency to be determined).	Ratio of open ground with sparse vegetation and bare surfaces should not deviate significantly from an established baseline, subject to natural change.	Important nesting area for little tern. Ratio of open ground with sparse vegetation comprises unrestricted views >200m, with vegetation cover < 10% and the remainder bare during the breeding season.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
	Shingle shores	Disturbance at nesting areas	Reduction or displacement of birds measured using 5 year peak mean information.	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	The breeding success of little tern is particularly sensitive to disturbance.
	Shallow coastal waters	Presence and abundance of prey species	Presence and abundance of prey species measured periodically (frequency to be determined).	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change.	Important prey species for little turns include small fish eg sand eel, pipefish, and gobies, and also small crustacea eg shrimps prawns and crabs.
		Disturbance at feeding areas	Reduction or displacement of birds measured using 5 year peak mean information.	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	Significant disturbance attributable to human activities can result in increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.
	Intertidal mudflats and sand flats	Extent	Area(ha) of intertidal mud and sandflats, measured periodically (frequency to be determined).	No decrease in extent of intertidal mud and sandflats from an established baseline, subject to natural change.	Important roosting habitat for golden plover.
		Disturbance at roosting areas	Reduction or displacement of birds measured using 5 year peak mean information.	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	Significant disturbance attributable to human activities can result in increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.
Internationally important migratory species	Intertidal mud and sand flats	Extent	Area(ha) of intertidal mud and sandflats, measured periodically (frequency to be determined).	No decrease in extent of intertidal mud and sandflats from an established baseline, subject to natural change.	Important feeding habitat for turnstone.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
Internationally important migratory species (contd.)	Intertidal mud and sand flats	Presence and abundance of prey species	Presence and abundance and size of prey species measured periodically (frequency to be determined).	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change.	Important prey species of turnstone include crustacean, molluscs and insects.
		Disturbance at feeding areas	Reduction or displacement of birds measured using 5 year peak mean information.	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	Significant disturbance attributable to human activities can result in reduced food intake and / or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.
	Sand and shingle shores	Extent	Area(ha) of sand and shingle shores, measured periodically (frequency to be determined).	No decrease in extent of sand and shingle from an established baseline, subject to natural change.	Important roosting habitat for turnstone.
		Disturbance at roosting areas	Reduction or displacement of birds measured using 5 year peak mean information	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	Significant disturbance attributable to human activities can result in increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.
	Chalk shores	Extent	Area(ha) of chalk shore measured periodically (frequency to be determined).	No decrease in extent of chalk shores from an established baseline, subject to natural change.	Important feeding habitat for turnstone.
		Presence and abundance of prey species	Presence and abundance of suitable prey species measured periodically (frequency to be determined)	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change.	Important prey species of turnstone include crustacean, molluscs and insects. Prey size is of particular importance to turnstones.

Interest feature	Sub-feature	Attribute	Measure	Target	Comments
		Disturbance at feeding areas	Reduction or displacement of birds measured using 5 year peak mean information	No significant reduction in numbers or displacement of birds from an established baseline, subject to natural change.	Significant disturbance attributable to human activities can result in reduced food intake and / or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

7. Advice on operations

English Nature has a duty under Regulation 33(2)(b) of The Conservation (Natural Habitats, &c.) Regulations 1994 to advise other relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated. Information on how English Nature has developed this advice is given in section 7.2, and on how it may be reviewed and updated in the future, in section 7.4.

The advice is provided in summary form in Table 3 and section 7.5 and with more detail in Table 4 and Appendix 3, including advice in relation to specific interest features and their sub-features.

7.1 Purpose of advice

The aim of this advice is to enable relevant authorities to direct and prioritise their work on the management of activities that pose the greatest potential threat to the favourable condition of interest features on the North East Kent European marine sites. The advice is linked to the conservation objectives for interest features and once issued, will help provide the basis for detailed discussions within the management group to formulate and agree a management scheme to agreed timescales for the site. The advice given here will inform on, but is without prejudice to, any advice to be given subsequently under Regulation 48 or Regulation 50 on operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

7.2 Methods for assessment

To develop this advice on operations English Nature has used a three step process involving:

- an assessment of **sensitivity** of the interest features or their component sub-features to operations;
- an assessment of the **exposure** of each interest feature or their component sub-features to operations; and
- a final assessment of **current vulnerability** of interest features or their component sub-features to operations.

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

All the scores of relative sensitivity, exposure and vulnerability are derived using best available scientific information and informed scientific interpretation and judgement. The process uses sufficiently coarse categorisation to minimise uncertainty in information, reflecting the current state of our knowledge and understanding of the marine environment. Information has been gathered from a range of sources including reports produced for the UK Marine SACs Life Project (ABP Research, 1999; Birkett and others 1998; Hartnoll, 1998;

Hill and others 1998; Gubbay and Knapman, 1999; Saunders and others 1998) and the Marine Habitats Reviews (Jones and others in prep.).

7.2.1 Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features or the component sub-features of the North East Kent European marine sites to the effects of broad categories of human activities. In relation to this assessment, sensitivity has been defined as the intolerance of a habitat, community or individual (or individual colony) of a species to damage, or death, from an external factor (Hiscock, 1996).

The sensitivity assessments are based on current information but may develop with improvements in scientific knowledge and understanding. In particular, English Nature and Scottish Natural Heritage have commissioned the Marine Biological Association of the UK, through its Marine LIFE Information Network (MarLIN) to provide detailed sensitivity information to underpin this advice, over the next three years, and available to all over the World Wide Web (www.marlin.ac.uk).

7.2.2 Exposure assessment

This has been undertaken for the North East Kent European marine sites by assessing the relative exposure of the interest or their component sub-features on the site to the effects of broad categories of human activities currently occurring on the site. For example, the exposure of interest features within the site to radionuclides is negligible but exposure of the interest features to nutrient enrichment is high.

7.2.3 Vulnerability assessment

The third step in the process is to determine the vulnerability of interest features or their component sub-features to operations. This is an integration of sensitivity and exposure (Figure A). Only if a feature is both sensitive and exposed to a human activity will it be considered vulnerable. In this context therefore, 'vulnerability' has been defined as the exposure of a habitat, community or individual (or individual colony) of a species to an external factor to which it is sensitive (Hiscock, 1996). For example intertidal red algal turf communities are sensitive to physical loss which may be caused by activities on the site such as land claim. Currently however, within the Thanet Coast European marine site their exposure to this category of operation is low and hence its vulnerability is also currently low.

7.3 Format of advice

The advice is provided within six broad categories of operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species. These categories are:

- Physical loss
- Physical damage
- Non-physical disturbance
- Toxic contamination
- Non-toxic contamination
- Biological disturbance

This approach therefore:

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

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

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

These broad categories provide a clear framework against which relevant authorities can assess activities under their responsibility. The more detailed information in Table 5 provides relevant authorities with a context against which to consider an assessment of 'significant effect' for any plans or projects which may affect the site and a basis to inform on the scope and nature of appropriate assessments required in relation to plans and projects. It is important to note that this advice is only a starting point for assessing impacts. It does not remove the need for the relevant authorities to formally consult English Nature over individual plans and projects where required to do so under the Regulations.

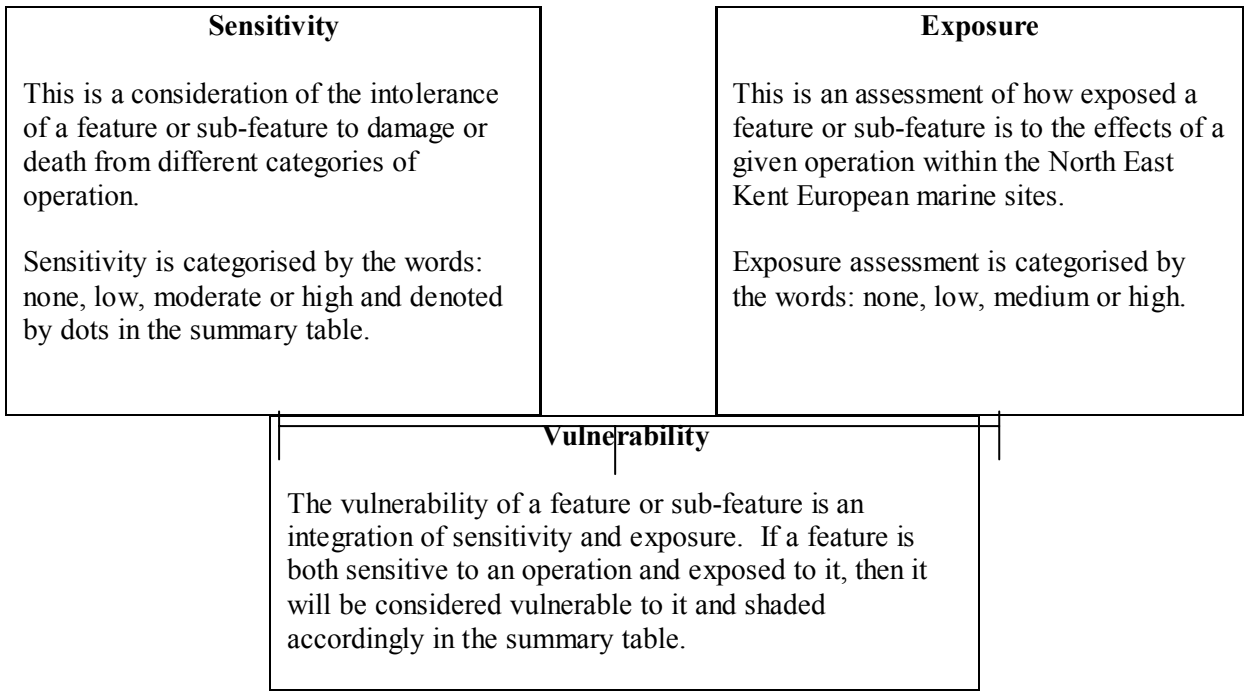

Figure A Flow diagram showing the relationship between sensitivity, exposure and vulnerability

7.4 Update and review of advice

Information as to the operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated, is provided in light of what English Nature knows about current activities and patterns of usage

at the North East Kent European marine sites. English Nature expects that the information on current activities and patterns of usage (which was used to derive Table 4) will be supplemented as part of the process of developing the management scheme through further discussion with the relevant authorities. The option of zoning this information may be appropriate As such, it is important that future consideration of this advice by relevant authorities and others takes account of changes in the usage patterns that have occurred at the site, over the intervening period, since the advice was issued. In contrast, the information provided in this advice on the sensitivity of interest features or sub-features (Table 5) is relatively stable and will only change as a result of an improvement in our scientific knowledge, which will be a relatively long term process. Advice for sites will be kept under review and may be periodically updated through discussions with relevant authorities and others to reflect significant changes in our understanding of sensitivity together with the potential effects of plans and projects on the marine environment.

7.5 Plans and Projects

Under Regulation 48(1), an appropriate assessment needs to be undertaken in respect of any plan or project which:

a. either alone or in combination with other plans or projects would be likely to have a ***significant effect*** on a European Site; and
b. is not directly connected with the management of the site for nature conservation.

An appropriate assessment is required by law for all European Sites (Regulation 48). A European Site is any classified SPA and any SAC from the point where the Union and the Government agree the site as a Site of Community Importance. Appropriate assessment is also required, currently as a matter of Government policy, for potential SPAs, candidate SACs and listed Ramsar Sites for the purpose of considering development proposals affecting them. (PPG 9 paras 13 and C7). It should be noted, however, that amendments to the Habitats Regulations for England are currently before Parliament which will result in a statutory requirement for Appropriate Assessments to be conducted for candidate SACs before they become Sites of Community Importance.

English Nature's 'Habitats regulations guidance note: The Appropriate Assessment (Regulation 48)', is at Appendix II for further information.

Tables 3, 4, and 5 and Appendix 3, provide relevant authorities with a guide against which to initiate an assessment of the 'significance' of any plans or projects (and ongoing operations or activities) proposed for the site although this will only be the starting point for assessing impacts and does not remove the need for relevant authorities to formally consult English Nature over individual plans and projects where required under the Regulations.

7.6 Review of consents

Regulation 50 of The Conservation (Natural Habitats, &c.) Regulations 1994 requires competent authorities to undertake a review of all existing consents and permissions affecting SAC and SPAs, as soon as possible after the site officially becomes a Site of Community Importance. This will have implications for discharge and other consents, which will need to be reviewed in light of these objectives and may mean that lower targets for background levels of contaminants etc. will need to be set.

7.7 Summary of advice on operations

7.7.1 Reefs

In pursuit of the conservation objective for 'reefs' (section 5.1.1) the relevant and competent authorities for the North East Kent European marine sites are advised to manage human activities within their remit such that they do not result in deterioration or disturbance through any of the following:

- Physical loss by removal and/or smothering
- Physical damage by abrasion and/or selective extraction
- Toxic contamination by increased input of synthetic and/or non-synthetic compounds
- Non-toxic contamination by organic and/or nutrient enrichment
- Biological disturbance as result of introduction and translocation or spread of non-native species and /or selective extraction of species.

7.7.2 Sea caves

In pursuit of the conservation objective for 'submerged or partly submerged sea caves' (section 5.1.2) , the relevant and competent authorities for the North East Kent European marine sites are advised to manage human activities within their remit such that they do not result in deterioration or disturbance through any of the following:

- Physical loss by removal and/or smothering
- Toxic contamination by increased input of synthetic and/or non-synthetic compounds
- Non-toxic contamination by nutrient enrichment

7.7.3 SPA interest features

In pursuit of the conservation objective for 'internationally important populations of Annex 1 species' (section 5.2.1) , the relevant and competent authorities for North East Kent European marine sites are advised to manage human activities within their remit such that they do not result in deterioration or disturbance through any of the following:

- Physical loss resulting from smothering
- Disturbance from noise or visual presence
- Toxic contamination through increased input of synthetic and/or non-synthetic compounds
- Non-toxic contamination by organic/nutrient enrichment

In pursuit of the conservation objective for 'internationally important populations of migratory species' (section 5.2.2) , the relevant and competent authorities for North East Kent European marine sites are advised to manage human activities within their remit such that they do not result in deterioration or disturbance through any of the following:

- Physical loss resulting from smothering
- Physical damage through abrasion
- Disturbance from noise or visual presence

- Toxic contamination through increased input of synthetic and/or non-synthetic compounds
- Non-toxic contamination by organic/nutrient enrichment
- Biological disturbance through selective extraction of species.

Table 3 showing operations which may cause deterioration or disturbance to the North East Kent European marine sites interest features at current levels of use [7]

The advice below is not a list of prohibitions but rather a checklist for operations for discussion within the management group, which may need to be subject to some form of management measure(s) or further measures where actions are already in force. Examples of activities under relevant authority jurisdiction are also provided. Operations marked with a ✓ indicate those features (or some component of them) that are considered to be highly or moderately vulnerable to the effects of the operations.

Standard list of categories of operation which may cause deterioration or disturbance	Reefs	Sea caves	Internationally important Annex I birds	Internationally important migratory species
Physical loss				
Removal (eg land claim, reprofiling)	✓	✓		
Smothering (eg by artificial structures,, disposal of dredge spoil)	✓	✓	✓	✓
Physical damage				
Siltation (eg dredging, outfalls)				
Abrasion (eg trampling, mobile benthic fishing, anchoring)	✓			✓
Selective extraction (eg aggregate dredging, or incidental damage caused by some other operation)	✓			
Non-physical disturbance				
Noise (eg powered water craft activity)			✓	✓
Visual presence (eg recreational activity)			✓	✓
Toxic contamination				
Introduction of synthetic compounds (eg TBT, PCBs)	✓	✓	✓	✓
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	✓	✓	✓	✓
Introduction of radionuclides				
Non-toxic contamination				
Nutrient enrichment (eg agricultural run-off, outfalls)	✓	✓	✓	✓
Organic enrichment (eg mariculture, outfalls)	✓		✓	✓
Changes in thermal regime (eg power stations)				
Changes in turbidity (eg dredging)				
Changes in salinity (eg water abstraction, outfalls)				

Standard list of categories of operation which may cause deterioration or disturbance	Reefs	Sea caves	Internationally important Annex I birds	Internationally important migratory species
Biological disturbance				
Introduction of microbial pathogens				
Introduction of non-native species & translocation (spread)	✓			
Selective extraction of species (eg commercial & recreational fishing, harvesting of shellfish)	✓			✓

[7] This advice has been developed using best available scientific information and informed scientific interpretation and judgement (as at December 1999). This process has used a coarse grading of relative sensitivity, exposure and vulnerability of each interest feature to different categories of operation based on the current state of our knowledge and understanding of the marine environment. This is shown in Tables 4 and 5 and in Appendix 3. The advice is indicative only, and is given to guide relevant authorities and others on particular operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the site has been designated. The advice, therefore, is not a list of prohibitions but rather a check list for operations which may need to be subject to some form of management measure(s) or further measures where actions are already in force.

The precise impact of any category of operation occurring on the site will be dependent upon the nature, scale, location and timing of events. More detailed advice is available from English Nature to assist relevant authorities in assessing actual impacts and cumulative effects. Assessment of this information should be undertaken in the development of the management scheme by the management group and through wider consultation.

In accordance with Government policy guidance, the advice on operations is feature and site specific, and provided in the light of current activities and patterns of usage at the site (as at December 1999). As such, it is important that future consideration of this advice by relevant authorities, and others, takes account of changes in usage patterns that have occurred at the site over the intervening period. Advice for sites will be kept under review and may be periodically updated through discussions with relevant authorities, and others, to reflect significant changes in our understanding of sensitivity together with the potential effects of plans or projects on the marine environment. The provision of the statutory advice given here, on operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated, under Regulation 33(2), is provided without prejudice to specific advice given under Regulation 48 (3) or Regulation 50 on individual operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

Table 4 Assessment of the relative exposure of interest features and sub-features of North East Kent European marine sites to different categories of operations based on current level of activities (December 1999)[8]

Key Exposure assessment categories: High
Medium
Low
None

Categories of operations which may cause deterioration or disturbance	**Reefs**					**Sea caves**	**Internationally important populations of regularly occurring Annex 1 birds**			**Internationally important populations of regularly occurring migratory birds**
	Intertidal chalk cliff algal and lichen communities	**Intertidal red algal turf communities**	**Kelp dominated communities on animal bored rock**	**Subtidal animal bored chalk communities**	**Intertidal chalk cliff algal and lichen communities**	**Shingle shores**	**Shallow coastal waters**	**Intertidal mudflats and sandflats**	**Sand and shingle shores**	**Intertidal mudflats, sandflats and chalk shores**
Physical loss										
Removal (eg land claim, reprofiling)	Med	None	None	None	Med	None	None	None	None	None
Smothering (eg by artificial structures,, disposal of dredge spoil)	Low	None	None	None	Low	Low	Low	Low	Low	Low
Physical damage										

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Siltation (eg dredging, outfalls)	None	None	None	None	None	None	Low	Low	None	Low
Abrasion (eg trampling, mobile benthic fishing, anchoring)	Low	Med	Low	Low	Med	None	None	Low	Low	Low
Selective extraction (eg aggregate dredging, or incidental damage caused by some other operation)	Med	Med	Low	None	Low	Low	None	None	None	Low
Non-physical disturbance										
Noise (eg powered water craft activity)	High	High	High	Low	None	High	High	High	High	High

Categories of operations which may cause deterioration or disturbance	**Reefs**					**Sea caves**	**Internationally important populations of regularly occurring Annex 1 birds**			**Internationally important populations of regularly occurring migratory birds**
	Intertidal chalk cliff algal and lichen communities	**Intertidal red algal turf communities**	**Kelp dominated communities on animal bored rock**	**Subtidal animal bored chalk communities**	**Intertidal chalk cliff algal and lichen communities**	**Shingle shores**	**Shallow coastal waters**	**Intertidal mudflats and sandflats**	**Sand and shingle shores**	**Intertidal mudflats, sandflats and chalk shores**
Visual presence (eg recreational activity)	High	High	High	Low	None	High	High	High	High	High
Toxic contamination										
Introduction of synthetic compounds (eg TBT, PCBs)	Med	Med	Med	Med	Med	None	Med	Low	None	Low
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	Med	Med	Med	Med	Low	None	Med	Low	None	Low
Introduction of radionuclides	None	None	None	None	None	None	None	None	None	None

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Non-toxic contamination										
Nutrient enrichment (eg agricultural run-off, outfalls)	High	High	High	High	High	None	High	Med	None	High
Organic enrichment (eg mariculture, outfalls)	Med	Med	Med	Med	Low	None	Med	Med	None	Med
Changes in thermal regime (eg power stations)	None	None	None	None	Low	None	None	None	None	None
Changes in turbidity (eg dredging)	Low	Low	Low	Low	Low	None	Low	Low	None	Low

Categories of operations which may cause deterioration or disturbance	**Reefs**					**Sea caves**	**Internationally important populations of regularly occurring Annex 1 birds**			**Internationally important populations of regularly occurring migratory birds**
	Intertidal chalk cliff algal and lichen communities	**Intertidal red algal turf communities**	**Kelp dominated communities on animal bored rock**	**Subtidal animal bored chalk communities**	**Intertidal chalk cliff algal and lichen communities**	**Shingle shores**	**Shallow coastal waters**	**Intertidal mudflats and sandflats**	**Sand and shingle shores**	**Intertidal mudflats, sandflats and chalk shores**
Changes in salinity (eg water abstraction, outfalls)	Low	Low	Low	Low	Low	None	Low	Low	None	Low
Biological disturbance										
Introduction of microbial pathogens	Low	Low	Low	Low	None	None	Low	Low	None	Low
Introduction of non-native species & translocation (spread)	None	Med	Med	Low	Low	None	Low	Low	None	None

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Selective extraction of species (eg commercial & recreational fishing, harvesting of shellfish)	None	Med	Med	Low	Low	None	Low	None	None	High

[8] In accordance with Government policy guidance, the advice on operations is feature and site specific, and provided in the light of current activities and patterns of usage at the site (as at December 1999). As such, it is important that future consideration of this advice by relevant authorities, and others, takes account of changes in usage patterns that have occurred at the site over the intervening period. Advice for sites will be kept under review and may be periodically updated through discussions with relevant authorities, and others, to reflect significant changes in our understanding of sensitivity together with the potential effects of plans or projects on the marine environment. The provision of the statutory advice given here, on operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated, under Regulation 33(2), is provided without prejudice to specific advice given under Regulation 48 (3) or Regulation 50 on individual operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

Table 5 Assessment of the relative vulnerability of interest features and sub-features of North East Kent European marine sites to different categories of operations. Categories of operations to which the features or sub-features of the site are highly or moderately vulnerable are indicated by shading. This table also incorporates relative sensitivity scores used in part to derive vulnerability.

Key

Relative sensitivity of the feature or sub-feature		Relative vulnerability of the feature or sub-feature	
●●●●	High sensitivity		High vulnerability
●●●	Moderate sensitivity		Moderate vulnerability
●●	Low sensitivity		
●	No detectable sensitivity		

Categories of operations which may cause deterioration or disturbance	**Reefs**					**Sea caves**	**Internationally important populations of regularly occurring Annex 1 birds**			**Internationally important populations of regularly occurring migratory birds**
	Intertidal chalk cliff algal and lichen communities	**Intertidal red algal turf communities**	**Kelp dominated communities on animal bored rock**	**Subtidal animal bored chalk communities**	**Intertidal chalk cliff algal and lichen communities**	**Shingle shores**	**Shallow coastal waters**	**Intertidal mudflats and sandflats**	**Sand and shingle shores**	**Intertidal mudflats, sandflats and chalk shores**
Physical loss										
Removal (eg land claim, reprofiling)	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●	●●●●	●●●●	●●●●
Smothering (eg by artificial structures,, disposal of dredge spoil)	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●	●●●●	●●●●	●●●●
Physical damage										

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Siltation (eg dredging, outfalls)	●●	●●	●●	●●	●●●	●	●●●	●●	●	●●●
Abrasion (eg trampling, mobile benthic fishing, anchoring)	●●●	●●●	●●●	●●	●●	●●	●	●	●●	●●●
Selective extraction (eg aggregate dredging, or incidental damage caused by some other operation)	●●●	●●●	●●	●●	●●●	●●●	●●●	●●●	●●●	●●●
Non-physical disturbance										
Noise (eg powered water craft activity)	●	●	●	●	●	●●●●	●●●●	●●●●	●●●●	●●●●
Visual presence (eg recreational activity)	●	●	●	●	●	●●●●	●●●●	●●●●	●●●●	●●●●
Toxic contamination										

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Introduction of synthetic compounds (eg TBT, PCBs)	●●●●	●●●●	●●●●	●●●●	●●●●	●	●●●●	●	●	●●●●
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	●●●	●●●	●●●	●●●	●●●	●	●●●●	●	●	●●●●
Introduction of radionuclides	●	●	●	●	●	●	●	●	●	●
Non-toxic contamination										
Nutrient enrichment (eg agricultural run-off, outfalls)	●●●	●●●	●●●	●●●	●●●	●	●●	●	●	●●●
Organic enrichment (eg mariculture, outfalls)	●●●	●●●	●●●	●●●	●●●	●	●●●	●	●	●●●

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Changes in thermal regime (eg power stations)	●●●	●●●	●●●	●●●	●●●	●	●●●	●	●	●●●
Changes in turbidity (eg dredging)	●●	●●	●●	●●	●●	●	●●	●	●	●●
Changes in salinity (eg water abstraction, outfalls)	●●●	●●●	●●●	●●●	●●●	●	●●●	●	●	●●●
Biological disturbance										
Introduction of microbial pathogens	●	●	●	●	●	●	●	●	●	●
Introduction of non-native species & translocation (spread)	●●●	●●●	●●●	●●●	●●●	●	●	●	●	●

Categories of operations which may cause deterioration or disturbance	Reefs					Sea caves	Internationally important populations of regularly occurring Annex 1 birds			Internationally important populations of regularly occurring migratory birds
	Intertidal chalk cliff algal and lichen communities	Intertidal red algal turf communities	Kelp dominated communities on animal bored rock	Subtidal animal bored chalk communities	Intertidal chalk cliff algal and lichen communities	Shingle shores	Shallow coastal waters	Intertidal mudflats and sandflats	Sand and shingle shores	Intertidal mudflats, sandflats and chalk shores
Selective extraction of species (eg commercial & recreational fishing, harvesting of shellfish)	●●●	●●●	●●●	●●●	●●●	●	●●●	●	●	●●●

[9] English Nature's advice on operations is derived from an assessment combining relative sensitivity of the features or sub-features with information on human usage of the site, to identify relative vulnerability to categories of operations. In accordance with Government policy guidance this advice is provided in the light of current activities and patterns of usage at the site (as at December 1999). It is important therefore that future consideration of this advice by relevant authorities, and others, takes account of changes in the usage patterns at the site. In contrast, the sensitivity of interest features, or sub-features, is relatively stable with alterations reflecting improvement in our scientific knowledge and understanding. To this end, information on sensitivity has been included in this table to assist the management and advisory groups with the future management of the site.

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9. Glossary

Algae	Marine plants including green, red or brown seaweeds and microscopic organisms.
Algal bloom	A massive reproduction and growth of marine algae, usually free floating, in response to the presence of higher than normal level of nutrients.
Annex I habitat type(s)	A natural habitat type listed in Annex I of the Habitats Directive for which Special Areas of Conservation can be selected.
Assemblage	A collection of plants and/or animals characteristically associated with a particular environment but not necessarily interdependent.
Attribute	Characteristic of an interest feature/sub-feature which provides an indication of the condition of the interest feature or sub-feature to which it applies.
Benthos	Those organisms attached to, or living on, in or near, the seabed, including that part which is exposed by tides.
Biodiversity	The total variety of life on earth. This includes diversity within species, between species and of ecosystems.
Biomass	The total living or dry weight of biological life either occupying a level in the food chain, inhabiting a particular area, or in a particular population - depending on the context.
Biota	All the biological life (plants and animals) inhabiting a particular site, area, or period.
Biotope	The physical habitat with its biological community; a term which refers to the combination of physical environment and its distinctive assemblage of conspicuous species.
Chalk aquifer	A geological formation which holds an underground reservoir of water.
Characteristic species	Special to or especially abundant in a particular situation or biotope. Characteristic species should be immediately conspicuous and easily identified.
Circalittoral	The subzone of the rocky sub littoral below that dominated by algae and dominated by animals.

Community	Any naturally occurring group of organisms occupying a common environment.
Competent authority	Any Minister, government department, public or statutory undertaker, public person or person holding a public office that exercises legislative powers
Conservation objective	A statement of the nature conservation aspirations for a site, expressed in terms of the favourable condition required for the habitats and/or species for which the site has been selected
Crustaceans	A class of invertebrates including crabs, shrimps and barnacles.
Demersal fish	Fish which live on the sea bed and in the lowest layer of the sea
Encrusting animals	Marine animals which from colonies - like crusts - on hard surfaces
Ephemeral	Usually of algae, a species that can respond rapidly to optimal growing conditions by growing & reproducing rapidly.
Eulittoral	The main part of the littoral zone characterised by limpets, barnacles, mussels, fucoid algae and red algae on the lower part.
European marine site	A European site - SAC or SPA - which consists of, or in so far as it consists of, areas covered intermittently or continuously by seawater
Fauna	The animal life of the area
Favourable conservation status	A range of conditions for a natural habitat or species at which the sum of the influences acting upon it are not adversely affecting its distribution, abundance, structure or function throughout the biogeographic region**.**
Favourable condition	A range of conditions for a natural habitat or species at which the sum of the influences acting upon it are not adversely affecting its distribution, abundance, structure or function within an individual Natura 2000 site.
Fry	Newly hatched or very young fish.
Genera	Groups of closely related species.
Grazers	Marine animals which feed by scraping off microalgae from rocks and other surfaces.

Habitat	An environment defined by specific biological and non-biological factors in which the species lives at any stage of its life cycle
Habitats Directive	The abbreviated term for *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora*. It is the aim of this Directive to promote the conservation of certain habitats and species within the European Union.
Hydrography	The scientific study of seas, lakes and rivers.
Infralittoral	A subzone of the sublittoral in which upward-facing rocks are dominated by erect algae typically kelps.
Interest feature	A natural or semi-natural feature for which a European site has been selected. This includes any Habitats Directive Annex I habitat or Annex II species and any population of a bird species for which a site has been selected under the Birds Directive (see also sub-feature).
Intertidal	The area of the shore between the highest and lowest tides.
Lichen	An organism which is composed of alga and fungus
Light attenuation	The extent to which light can penetrate water - dependant on the water clarity eg turbid water limits light penetration
Littoral	The area of the shore that is occupied by marine organisms which are adapted to or need alternating exposure to air and wetting by submersion, splashing or spray.
Maintain	The action required for an interest feature when it is considered to be in favourable condition.
Management scheme	The framework established by the relevant authorities under Regulation 34 at a European marine site under which their functions are exercised to secure compliance with the Habitats Directive in relation to that site.
Microalgal	Microscopic marine plants - when grouped together they are visible as a coloured zone on eg cliff faces.
Migratory	Species of animals that move regularly between areas - often movements are between breeding and wintering feeding grounds.
Molluscs	Soft bodied unsegmented animals usually with shells eg limpets, periwinkles. whelks, cockles, muscles, oysters and piddocks.

Nationally scarce/rare	For marine purposes, these are regarded as species or biotopes of limited national occurrence.
Natural change	Changes in the condition of features that result wholly from natural causes. Determination of what constitutes natural change will be based on the best available information and scientific opinion at the time.
Natura 2000 series	The European network of protected sites established under the Birds Directive and the Habitats Directive.
Nutrient enrichment	When a water body has an extra input of organic material and/or plant nutrients such as nitrates, phosphates which under the right conditions cause excessive plant growth and can reduce the oxygen content of the water.
Operations which may cause	Any activity or operation taking place within, adjacent to, or remote from a **deterioration or disturbance** European marine site that has the potential to cause deterioration or disturbance to the habitats or species for which the site has been designated.
Opportunistic species	A species which is able to rapidly exploit chance openings for colonisation in a wide range of habitat conditions. Opportunistic species are often ephemeral.
Pelagic fish	Fish which live in the open waters of the sea.
Photosynthesis	The process plants use to convert sunlight energy into chemical energy for growth.
Piddocks	A type of bivalve mollusc.
Plan or project	Any proposed development that is within a relevant authority's function to control, or over which a competent authority has a statutory function to decide on applications for consents, authorisations, licences or permissions.
Prey species	A species which is the food source for a another.
Reef	Marine rocky surfaces colonized by biological life.
Relevant authority	A body which has powers or functions which have or could have an impact on the marine environment within a European marine site
SAC	Special Area of Conservation. A site of Community importance designated by the Member States where the necessary conservation measures are applied for the

	maintenance of restoration, at a favourable conservation status, of the habitats and/or species for which the site is designated. A candidate SAC is a SAC formally submitted to the European Commission, but yet to be adopted by the Commission and designated as a SAC.
Scour	A process of abrasion of surfaces caused by the action of sandy particles carried in moving water. Usually occurs as a result of tidal water movement or, in shallower areas, by wave action.
Sensitivity	The level of intolerance of a habitat, community or individual to damage or disturbance from an external factor.
SPA	Special Protection Area - a European designation for the protection of birds and their habitats.
Spawning	The activity of producing eggs.
Spore	(Of algae) microscopic reproductive cells produced in vast numbers.
Sub-feature	An ecologically important component of the interest feature.
Sublittoral	Zone of the sea below low water - it is exposed to air only at its upper limit by the lowest spring tides.
Subtidal	Zone of the sea below low water
Surge	A swell of waves moving powerfully forward.
TBT	A chemical, tributyltin, which is toxic to marine life and which is used as an anti-fouling paint on large vessels.
Thermal regime	Regularly changing patterns in the temperature of the sea.
Toxins	Chemicals which are poisonous.
Trophic level	A position within the food chain.
Turbidity	Waters that contain high levels of particulate matter through which light penetration is poor.
Type locality	The locality from which the original specimens used to describe a new species were taken
Typical species	A species that is considered to be a typical component of a feature or sub feature.
Upper Cretaceous	Chalk rocks formed from small sea creatures deposited during the Cretaceous period - a period in time usually dated as 135-

	136 million years before present and lasting about 70 million years
Vulnerability	The likelihood of a habitat, community or individual of being exposed to an external factor to which it is sensitive.
Wintering	A species which has migrated to the area to find adequate food during the winter months

10. List of relevant authorities

Kent & Essex Sea Fisheries Committee
The Ice House
Military Road
Ramsgate, Kent CT11 9LG

Environment Agency
Orchard House
Endeavour Park
London Road
Addington
West Malling, Kent ME19 5SH

Thanet District Council
Council Offices
PO Box 9
Cecil Street
Margate
Kent
CT9 1XZ

Southern Water
Corporate Strategy
Southern House
Yeoman Road
Worthing
BN13 3NX

Kent County Council
Strategic Planning Directorate
Invicta House
County Hall
Maidstone
Kent
ME14 1XX

Sandwich Port & Haven Commissioners
Guildhall
Cattle Market
Sandwich
Kent
CT13 9AH

Dover District Council
White Cliffs Business Park
Dover
Kent
CT16 3PG

Canterbury City Council
Planning Department
Military Road
Canterbury
Kent
CT1 1YW

English Nature
The Countryside Management Centre
Coldharbour Farm
Wye
Ashford
Kent
TN25 5DB

Appendix 1 Summary of key biotopes

The table below lists the component biotopes of each sub-feature in the Thanet cSAC, biotopes are described in greater detail in Connor and others (1997). Other biotopes also occur on the reef (see Tittley *at al.*1998).

Interest Feature	Sub-feature	Biotope code	Biotope name	Notes
Reefs	Chalk cliff algal and lichen communities	LR.L.Chr	Chrysophyceae on vertical upper littoral fringe rock	This biotope is made up of several components (orange, brown, green and red bands) which may in future be described as individual biotopes.
	Red algal turf communities	MLR.R.Mas	*Mastocarpus stellatus* and *Chondrus crispus* on very to moderately exposed lower eulittoral rock	At Thanet, this biotope is dominated by *Chondrus* which grows over piddock bored rock.
		MLR.R.Osm	*Osmundea (Laurencia) pinnatifida* and *Gelidium pusillum* on moderately exposed mid eulittoral rock	
		MLR.R.Pal	*Palmaria palmata* on lower eulittoral rock	Much of this biotope at Thanet occurs over piddock- or *Polydora*-bored chalk.
		MLR.R.XR.	Mixed red seaweeds on lower eulittoral rock	Much of this biotope at Thanet occurs over piddock- or *Polydora*-bored chalk.
		MLR.R.RPid	*Ceramium* sp. and piddocks of lower eulittoral chalk	
		MLR.Eph.Rho	*Rhodothamniella floridula* on sand-scoured lower eulittoral rock	Grows on piddock-bored chalk on Thanet with *Rhodothamniella* forming often dense mats.
		MLR.BF.FserR	*Fucus serratus* and red seaweeds	Mixed fucoids and red algal turfs, also occurs over piddock-dominated rock.
	Kelp-dominated communities on animal bored rock	MIR.KR.Ldig.Pid	*Laminaria digitata* and piddocks on sublittoral fringe soft rock	Chalk also bored by *Polydora*.

Interest Feature	Sub-feature	Biotope code	Biotope name	Notes
	Subtidal animal bored chalk communities	MCR.SfR Pid	Piddocks with a sparse associated fauna in upward-facing circalittoral very soft chalk or clay	
		MCR.As. MolPol	*Molgula manhattensis* and *Polycarpa* spp. with erect sponges on tide-swept moderately exposed circalittoral rock.	At Thanet, dominated by *Molgula* with very few sponges, but on chalk, grows over piddock-bored rock.
		MCR.ByH. FluSerHyd	*Sertularia argentea, s. cupressina* and *Hydralmania falcata* on tide-swept circalittoral cobbles and pebbles.	Over grows piddock -bored chalk.
		MCR.ByH. SNemAdia	Sparse sponges, *Nemertesia* spp. *Alcyonidium diaphanum* and *Bowerbankia* spp. on circalittoral mixed substrata	Over grows piddock -bored chalk.
Sea caves	Chalk cliff algal and lichen communities	LR.L.Chr	Chrysophyceae on vertical upper littoral fringe rock	This biotope is made up of several components (orange, brown, green and red bands) which may in future be described as individual biotopes.

Appendix 2 Matrix of relative vulnerability

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

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

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

Appendix 3 Detailed interest feature and sub-feature specific advice on operations

This section provides information to help relate general advice to each of the specific interest features of the North East Kent European marine sites.

This advice relates to the vulnerability of the interest features and sub-features of the North East Kent European marine sites as set out in Table 5 and summarised in Table 3. An explanation of the sensitivity of the interest features or sub-features follows with an explanation of their exposure and therefore their vulnerability to damage or disturbance from the listed categories of operations. This enables links between the categories of operation and the ecological requirements of the European marine site's interest features, as set out in Section 3, to be made.

Reference to shallow coastal waters within the Thanet Coast and Sandwich Bay SPA has been included in this advice on operations. This habitat is an important feeding area for little terns and is critical for the survival and continued presence of the little tern breeding population within the European marine site.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical loss			
Removal (eg land claim)	Many reef communities are dependent upon the ecological functioning of other communities and the loss of one may have major implications on the condition of others. Removal could be the result of either one-off events or the cumulative effect of activities. The extensive areas of chalk reefs on Thanet Coast are of international marine conservation importance as they support a wide variety and unique range of marine habitats and species. The loss of reefs, or any part of them, may affect the survival of some of these habitats or species which would therefore be detrimental to the favourable condition of the reef. All the reef subfeatures are **highly sensitive** to physical loss by removal because such losses of habitat would be permanent.	Most reef sub-features are not currently considered to be exposed to activities which may result in removal of the habitat. Chalk cliff algae and lichens: Removal of cliff and reef habitat occurs occasionally when coast protection works are constructed. Occasionally sections of cliff are removed down to the base for reasons of human safety. Consequently, the reefs of the Thanet coastline currently have a **med exposure** to removal.	The reefs of the Thanet coastline are currently **highly vulnerable** to physical loss by removal.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Smothering (eg disposal of dredge spoil)	Physical loss through smothering can result in long term or permanent loss of the communities living in or on the reefs as well as inaccessibility of the habitat for future recolonisation. The reefs of the Thanet coastline are considered **highly sensitive** to physical loss through smothering.	Most sub-features of the reef are not currently considered to be exposed to activities which may result in smothering of the reef habitat. Loss of cliffs can occur when sections of cliff are smothered with concrete when for example coast protection works are constructed. In these cases the chalk cliff algal species will be lost. The reefs of the Thanet coastline currently have a **low exposure** to smothering.	Whilst reef communities are highly sensitive to smothering, there is a limited exposure to such operations. As a consequence, the reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to physical loss by smothering.
Physical damage			
Siltation (eg dredging, outfalls)	Siltation can smother or block the feeding/respiratory organs of animals or can affect the ability of juvenile animals and plants to settle onto the rock. Excessive siltation can also lead to smothering of young plants, inhibiting their growth and development. The communities found on the reefs around Thanet are however, naturally tolerant of a degree of siltation due to the relatively high sediment load in the water column. Because of this, the reefs of the Thanet coastline are considered to be of a **low sensitivity** to physical damage through siltation.	The reefs of the Thanet coastline currently have **no known exposure** to siltation.	As a result, the reefs of the Thanet coastline are currently considered **not vulnerable** to physical damage by siltation.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Abrasion (eg trampling, mobile benthic fishing, anchoring)	Intertidal sub-features of the reef are sensitive to the effects of abrasion. Abrasion can lead to dislodging of animals/plants, the loss of newly settled spores and recruits and damage to the structure of the habitat itself. Subtidal reefs are less sensitive to abrasion at Thanet due to existing natural abrasion by mobile coarse sediments. The reefs of the Thanet coastline are considered **moderately sensitive** to physical damage by abrasion.	At Thanet, abrasion of the reef occurs from a variety of sources including: trampling, launching of boats, increased wave-wash off hard sea defences, anchoring of boats and potting. The location and intensity of trampling varies across the site and there are reports of large parties harvesting shellfish from the shore. Likewise, launching and retrieving boats and other water craft may dislodge animals/plants or damage the structure of the habitat. Abrasion of the upper part of the chalk reef also occurs in front of concave sea walls where waves are reflected back across the reef. **Chalk cliff algae and lichens**: Abrasion of vertical reef surfaces occurs through scratching or carving graffiti, however, the main focus of this activity is the sea caves. The cliffs are currently considered to have a **low exposure** to abrasion. **Red algal turfs**: This sub-feature is likely to be affected by trampling at low water, and is therefore currently considered to have a **medium exposure** to abrasion. **Kelp on animal bored rocks**: This sub-feature is only occasionally exposed at low water and therefore currently has **low exposure** to abrasion by trampling. **Subtidal animal bored rock**: This sub-feature currently has a **low exposure** to anchoring, though small craft and potting for shellfish will cause some degree of localised abrasion or damage. The reefs of the Thanet coastline currently have **medium exposure** to physical damage by abrasion.	The reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to physical damage by abrasion, but not all of the sub-features are affected to the same degree by operations which occur.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Selective extraction (eg aggregate dredging, harvesting of species)	Damage to the reef, or any part of it, which is caused by selective extraction, could jeopardise the survival of some of these habitats or species and would therefore be detrimental to the favourable condition of the reef. Selective extraction may result in removal of significant proportions of the local populations of particular animals or plants, or lead to damage to the structure of the habitat. The reefs of the Thanet coastline are considered **moderately sensitive** to physical loss through selective extraction.	At Thanet, physical damage to the reef occurs as a result of a variety of types of selective extraction, including the selective removal or harvesting of rock boring animals, and the selective removal of flints. **Chalk cliff algae and lichens** may be particularly targeted for extraction of flints - more information is needed. Cliff algae and lichen communities currently have **medium exposure** to selective extraction. **Red Algal turfs** are found on the mid and low shore where the target species for selective harvesting also occur (piddocks, winkles). Red algal turfs currently have **medium exposure** to selective extraction. The reefs of the Thanet coastline currently have **medium exposure** to selective extraction.	The reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to physical damage by selective extraction.
Non-physical disturbance			
Noise (eg boat activity) **Visual presence (eg recreational activity)**	The reefs of the Thanet coastline are considered **not sensitive** to non-physical disturbance from noise or visual presence.	Reefs adjacent to the main leisure beaches are highly exposed to noise and it is visually very busy in the summer months. The reefs of the Thanet coastline currently have **high exposure** to noise and **medium exposure** to visual presence.	The reefs of the Thanet coastline are currently assessed as **not vulnerable** to non-physical disturbance from noise and visual presence.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Toxic contamination			
Introduction of synthetic compounds (eg. TBT, PCBs, endocrine disruptors)	Many marine invertebrates (particularly the larval stages) are sensitive to synthetic compounds, even at low concentrations. Many of which may disrupt their reproduction and other biological processes. The effects of such chemicals varies between species and the chemical compound concerned. Molluscs such as dogwhelks for example are particularly sensitive to TBT. Synthetic compounds such as PCBs are also known to bioaccumulate in certain marine species. The reefs of the Thanet coastline are considered **highly sensitive** to toxic contamination from the introduction of synthetic compounds.	Although use of TBT paints on small boats was banned in the late 1980's, they are still used on large vessels. There is considerable shipping traffic using the Thames Estuary and the English Channel, and so passing or anchoring near the Thanet reefs may result in an exposure to synthetic compounds such as TBT. Additionally, the Thames has notably high concentrations of synthetic compounds in the water column and Thanet is potentially subjected to water from the Thames. Dogwhelks, which are known to be particularly sensitive to TBT, have declined in numbers on the Thanet coastline. However, it has been suggested that in recent years the population is beginning to recover. More information is needed to establish linkages between potential cause and effects. The reefs of the Thanet coastline currently have **medium exposure** to toxic contamination from synthetic compounds.	The reefs of the Thanet coastline are currently assessed as **highly vulnerable** to toxic contamination from synthetic compounds.
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	Non-synthetic compounds include heavy metals, complexes with metals such as cadmium, lead, zinc and mercury as well as oil based compounds. Reef communities are sensitive to toxic contamination from many of these compounds as they may affect feeding and reproduction of some species. Changes to the reef communities, or any part of them, could jeopardise the short to medium term survival of some of these communities or species, although if contamination were not too severe, communities may eventually recover. Oil contamination may affect species due both to its toxicity and smothering effects. The reefs of the Thanet coastline are considered **moderately sensitive** to toxic contamination by introduction of non-synthetic compounds.	Sewage discharges are a potential source of toxic contaminants such as heavy metals which may affect limited areas of intertidal and subtidal reef communities at Thanet. Toxic contaminants in the marine environment may originate from diffuse sources and so the route of contamination can therefore often be difficult to identify. Of the large estuaries in England, the Thames has one of the highest concentrations of these substances (WRc 1999) and the communities at Thanet may be potentially affected by such contaminants. The reefs of the Thanet coastline currently have **medium exposure** to toxic contamination from non-synthetic compounds.	The reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to toxic contamination from non-synthetic compounds.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Introduction of radionuclides	The sensitivity of reef communities to the introduction of radionuclides is currently not well understood. However, experience from other sites suggests that the reefs of the Thanet coastline have a **low sensitivity** to toxic contamination by introduction of radionuclides.	The reefs of the Thanet coastline currently have **no known exposure** to toxic contamination from radionuclides.	The reefs of the Thanet coastline are currently assessed as having **no detectable vulnerability** to toxic contamination from introduction of radionuclides.
Non-toxic contamination			
Nutrient enrichment (eg agricultural runoff, outfalls)	Intertidal communities are considered sensitive to nutrient enrichment, because the ecological balance of species may be altered as some species thrive in conditions of nutrient enrichment and may out-compete others. This could lead to a dominance by a single or few species which could change the structural composition of the community, and potentially lead to a reduction in species and biotope diversity. An increase in ephemeral opportunist algae may also reduce the area of reef available for colonisation by other species. The reefs of the Thanet coastline are considered to be **moderately sensitive** to non-toxic contamination by nutrient enrichment.	The reefs at Thanet are currently considered to be exposed to nutrient enrichment. Evidence of this is provided by the filamentous green algal blooms that occur in the spring and summer months. The precise sources of nutrients around the Thanet Coast are not well understood but are thought to include the following: sewage outfalls located on the coast, nutrient rich waters flowing into the Thames estuary from the Thames, Medway and Swale, and from the North Sea. Much of land at top of the cliffs around Thanet is urban and so there is no direct agricultural run-off onto the reef. Inland, however, Thanet is intensively farmed and it is likely that high nutrient loads enter the sea via rivers and possibly also via leakage from the chalk aquifer. The reefs of the Thanet coastline currently have **high exposure** to nutrient enrichment.	The reefs of the Thanet coastline are currently assessed as **highly vulnerable** to non-toxic contamination by nutrient enrichment.
Organic enrichment (eg mariculture, outfalls)	Intertidal algal communities are sensitive to organic enrichment. This is because increases in organics can alter the species composition such as the number of opportunist marine invertebrate species. This results from an enhanced food resource for particular species, which then tend to dominate. The reefs of the Thanet coastline are considered to be **moderately sensitive** to non-toxic contamination by organic enrichment.	The reefs at Thanet are close to a number of sewage outfalls. However effects are localised because dispersion from outfalls is quite high. There are also a number of stormwater overflows. The reefs of the Thanet coastline currently have **medium exposure** to organic enrichment.	The reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to non-toxic contamination from organic enrichment.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Changes in thermal regime (eg power stations)	Changes in temperature may alter the ecological balance of reef communities by favouring growth and development of certain species. The reefs of the Thanet coastline are therefore considered to be **moderately sensitive** to non-toxic contamination by changes in thermal regime.	The reefs of the Thanet coastline currently have **no known exposure** to changes in thermal regime.	The reefs of the Thanet coastline are currently assessed as having **no detectable vulnerability** to non-toxic contamination from changes in thermal regime.
Changes in turbidity (eg run-off, dredging)	Increased water turbidity influences the ability of kelp and other algal species to photosynthesise and determines the maximum depth at which algal species can grow. At Thanet, due to the naturally very turbid waters, there is little or no algal growth below the limits of low spring tides. The reefs on Thanet are therefore considered of **low sensitivity** to non-toxic contamination by increases in turbidity.	Some maintenance dredging is carried out at Ramsgate Harbour and changes in turbidity have been observed as a result. However this is often a short lived effect. Further investigation is necessary. The reefs of the Thanet coastline currently have **low exposure** to changes turbidity.	The reefs of the Thanet coastline are currently assessed as having a **low vulnerability** to non-toxic contamination from changes in turbidity.
Changes in salinity (eg water abstraction, outfalls)	Intertidal communities are naturally tolerant to limited changes in salinity, as such variation occurs naturally on the shore during periods of high precipitation and during the summer. Subtidal marine communities tend to be less tolerant of changes in salinity. **Chalk cliff algae and lichen communities** may be partly dependent on a degree of freshwater run-off/seepage through the rock. Changes to the salinity regime here (such as a cessation of such seepage) may affect the composition of such communities. The reefs of the Thanet coastline are considered to be **moderately sensitive** to non-toxic contamination by changes in salinity.	Localised changes in salinity occur at effluent discharge points such as storm water outfalls located around the Thanet coastline. Mixing with seawater however is often rapid and consequently any effects will be very localised. The reefs of the Thanet coastline currently have **low exposure** to changes in salinity.	The reefs of the Thanet coastline are currently assessed as of **low vulnerability** to non-toxic contamination from changes in salinity.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Biological disturbance			
Introduction of microbial pathogens	The sensitivity of reef communities to the introduction of microbial pathogens is currently not well understood. Invertebrates and algal communities also have different sensitivities to different microorganisms. There is little information however on the biological effects of such pathogens. The reefs of the Thanet coastline are considered to have **low sensitivity** to biological disturbance by introduction of microbial pathogens.	Microbial pathogen inputs may in particular arise from sewage and storm water discharges on the Thanet coastline. The reefs of the Thanet coastline currently have **low exposure** to microbial pathogens.	The reefs of the Thanet coastline are currently assessed as of **low vulnerability** to biological disturbance from introduction of microbial pathogens.
Introduction of non-native species and translocation	Rocky shore communities are sensitive to the introduction or spread of non-native species because if these are aggressive species they can out-compete native species. If this occurs, they may have a major impact on community structure. For example, Japweed *Sargassum muticum* can displace native species from some of the habitats in which it can grow, such as rock pools. Such displacement occurs not only through competition for space, but also through its ability to dominate deep rock pools thereby severely reducing the light availability to the marine algae in the pool. The sub-features affected will depend on the niche requirements of the introduced species. Whilst recovery of the native community is often improved if the non-native is removed, efforts to remove some species (such as *Sargassum muticum*) have proved difficult or impossible. The reefs of the Thanet coastline are considered to be **moderately sensitive** to biological disturbance by introduction of non-native species.	The reefs at Thanet have been colonised by the non-native seaweed Japweed *Sargassum muticum*. At this site, the species currently grows in rock pools, and does not appear to have altered the balance of communities present. Other non-native species are also present at the site. Thanet is located near the major shipping centres of the Thames estuary and Ramsgate and reef communities may potentially be exposed to introduced species from discharged ballast waters from international shipping prior to docking. The reefs of the Thanet coastline currently have **medium exposure** to the introduction of non-native species and translocation.	The reefs of the Thanet coastline are currently assessed as **moderately vulnerable** to biological disturbance from the introduction of non-native species and translocation.

REEFS and their sub features			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Selective extraction of species (eg commercial and recreational fishing)	Extraction of marine plants and animals, whether for food or bait, may potentially affect the resident population of the species collected, but also may affect the ecological balance of the marine communities. If grazing animals (eg periwinkles) are selectively removed, algae may become more dominant. If predators (such as fish or crustaceans) are removed, prey species may become a more dominant part of the community. The method of extraction may also damage or affect non-target species within the community and so affect the feature's physical and ecological integrity. The reefs of the Thanet coastline are considered to be **moderately sensitive** to biological disturbance by selective extraction of species.	Collection of species in the intertidal area for either food or bait is currently thought to be widespread at Thanet. Collection of piddocks, which bore into the rock, often involves removing large pieces of rock, damaging the reef itself, as well as biologically disturbing the reef community. This activity is therefore also considered under the 'physical damage' category within this table. The intertidal area is currently considered to be **highly exposed** to this category of operation with most species targeted in activities which may result in selective extraction (ie for shellfish, worms and crabs) found in the mid- and lower shore areas. **Chalk cliff alga and lichens** - Due to their position on the upper shore, and lack of collectable species within the community, have **low exposure** to selective extraction of species. **Red algal turf communities** and **Kelp on animal bored rock** communities occur low on the shore, and are uncovered by the tide for only a short time. However, many target species for collection (crabs, piddocks, worms) occur within these communities, which are therefore considered to be of **medium exposure** to selective extraction of species. Potting for shellfish occurs in near shore waters on **Subtidal animal bored chalk**. Currently, however, such activity has a low intensity on the site and therefore this community is considered to have **low exposure** to selective extraction of species. The reefs of the Thanet coastline currently have overall **high exposure** to selective extraction of species.	Overall the reefs of the Thanet coastline are currently assessed as **highly vulnerable** to biological disturbance by selective extraction of species. However the most vulnerable sub-features are low on the shore and have been assessed as **moderately vulnerable**

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical loss			
Removal (eg land claim)	The chalk caves on the Thanet Coast are internationally important for their nature conservation. This is because this habitat is scarce in the UK and the sea caves support a range of marine algal species, some of which are nationally rare. The loss of caves, or any part of them, would be a permanent loss of habitat and may impair the survival of some of the nationally rare species they support and this would therefore be detrimental to their favourable condition. The sea caves of the Thanet coastline are **highly sensitive** to physical loss by removal.	Loss of caves can occur when sections of cliff with caves are removed for safety reasons. In these cases the chalk cliff algal species inhabiting the sea caves will be lost. The sea caves of the Thanet coastline therefore currently have **medium exposure** to removal.	The sea caves of the Thanet coastline are currently assessed as **highly vulnerable** to physical loss by removal.
Smothering (eg disposal of dredge spoil)	Caves are considered **highly sensitive** to physical loss through smothering as such losses would be permanent and would result in a loss of this important marine habitat. The sea caves of the Thanet coastline are **highly sensitive** to physical loss by smothering.	Loss of caves can occur when sections of cliff are concreted over when, for example, coast protection works are constructed. In these cases many important marine algal species inhabiting the sea caves may be lost. The sea caves of the Thanet coastline currently have **low exposure** to smothering.	The sea caves of the Thanet coastline are currently assessed as **moderately vulnerable** to physical loss by smothering.

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical damage			
Siltation (eg dredging, outfalls)	Siltation can smother or block the feeding/respiratory organs of animals or can affect the ability of juvenile animals and plants to settle onto the rock. Excessive siltation can also lead to smothering of young algae, potentially inhibiting their growth and development. The communities found in the sea caves around Thanet are however, naturally tolerant of a degree of siltation due to the relatively high sediment load in the coastal water. The sea caves of the Thanet coastline therefore have a **low sensitivity** to physical damage through siltation.	Sea cave communities are located at the top of the shore on vertical surfaces and so are unlikely to be exposed to siltation. The sea caves of the Thanet coastline currently have **no known exposure** to siltation..	The sea caves of the Thanet coastline are therefore currently considered as having **no detectable vulnerability** to physical damage through siltation.
Abrasion (eg trampling, mobile benthic fishing, anchoring)	Sea cave communities are reasonably resilient to physical damage by abrasion because of their adaptation to the highly dynamic physical processes to which they are normally subjected. These adaptations generally result in a rapid recolonisation and growth of marine communities. The sea caves of the Thanet coastline have **low sensitivity** to physical damage by abrasion.	The Thanet coastline receives many visitors during the year and some damage to cave communities from scratching or carving graffiti is known to occur. However such markings are often small and quickly recolonised. The sea caves of the Thanet coastline currently have **medium exposure** to abrasion.	The sea caves of the Thanet coastline are currently considered as of **low vulnerability** to physical damage by abrasion.
Selective extraction (eg aggregate dredging, entanglement)	Physical damage by selective extraction may affect the survival of some of the nationally rare species present and potentially damage the structure of the habitat. The sea cave communities that are characteristic of this site are however, generally able to rapidly recolonise bare surfaces. The sea caves of the Thanet coastline are **moderately sensitive** to physical damage by selective extraction.	It has been suggested that the sea caves are affected by the non-commercial collection of flints. Surveys carried out in 1997 did not note any damage by this activity but more information is needed to assess potential impacts. The sea caves of the Thanet coastline currently have **low exposure** to selective extraction.	The sea caves of the Thanet coastline are currently assessed as of **low vulnerability** to physical damage by selective extraction.

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Non-physical disturbance			
Noise (eg boat activity) Visual presence (eg recreational activity)	The sea cave communities of the Thanet coastline are **not sensitive** to non-physical disturbance from noise or visual presence.	Sea caves adjacent to the main leisure beaches are highly exposed to noise and visual disturbance in the summer months. The sea caves of the Thanet coastline currently have **high exposure** to noise and **medium exposure** to visual presence.	The sea caves of the Thanet coastline are currently assessed as having **no detectable vulnerability** to non-physical disturbance from noise and visual presence.
Toxic contamination			
Introduction of synthetic compounds (eg TBT, PCBs)	Many marine species are sensitive to extremely low concentrations of synthetic compounds, which may disrupt their reproduction and other biological processes. The effects of such chemical compounds varies between the marine species concerned and the chemical contaminant. Marine molluscs such as dogwhelks for example are known to be particularly sensitive to toxic compounds such as TBT. Synthetic compounds such as PCBs are also known to bioaccumulate in certain marine species. The sea caves of the Thanet coastline are therefore considered **highly sensitive** to toxic contamination from the introduction of synthetic compounds.	As for reefs, the sea caves of the Thanet coastline currently have **medium exposure** to introduction of synthetic compounds.	The sea caves of the Thanet coastline are currently assessed as **highly vulnerable** to toxic contamination from the introduction of synthetic compounds.

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	Non-synthetic compounds include heavy metals such as cadmium, lead, zinc and mercury and hydrocarbons such as oil. Sea cave communities such as algal crust communities are sensitive to many of these substances which may arise as a result of acute events, such as oil spills. Such contaminants can have toxic and smothering effects. Recovery time will depend upon recruitment rates of the organism affected and the extent, intensity and nature of the toxic substance involved. As a result sea cave communities are considered to have a **high sensitivity** to non-synthetic toxic substances.	Acute events, such as oil spills are unpredictable and rare and so the exposure of the sea caves to them is considered to be minimal. Sewage discharges are also a potential source of non-synthetic toxic contaminants such as oil but many of these point sources are remote from the sea caves. The seacaves therefore have a **low exposure** to non-synthetic toxic contaminants.	The sea caves of the Thanet coastline are considered **moderately vulnerable** to non- synthetic toxic contamination
Introduction of radionuclides	The sensitivity of sea cave communities to the introduction of radionuclides is currently not well understood and is very much dependent on the nature and dosage of the radionuclide. Sea caves are considered to have a **Low sensitivity** to radionuclides.	There is currently no known input of radionuclides around the Thanet coastline. There is therefore **no known Exposure**.	The is currently **no detectable vulnerability**.
Non-toxic contamination			
Nutrient enrichment (eg agricultural runoff, outfalls)	Microalgal and lichen communities are sensitive to nutrient/organic enrichment, because they have the potential to be altered as some species are more competitive than others. This could lead to a dominance by a single or few species which could change the structural composition and potentially lead to a reduction in species diversity characteristic of the sea caves on the Thanet coast. The sea caves are considered to be **moderately sensitive** to nutrient contamination	As with reefs the sea caves at Thanet are exposed to nutrient enrichment from the sewage outfalls located on the coast and other sources and are considered to have **high exposure** to nutrient enrichment	The sea cave communities are considered to be **highly vulnerable** to nutrient enrichment

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Organic enrichment (eg mariculture, outfalls)	Cave communities are sensitive to organic enrichment because it can alter the species composition including the ratio of grazing marine life to algal species. This is a result of the enhanced food resource available for certain marine invertebrates. Because the sea cave communities would eventually recover from contamination from organic enrichment they are considered to be of **moderate sensitivity.**	Organic matter from outfalls is particulate and so dispersion is not as great as nutrients in solution and the effect is likely to be local to the outfalls. Since the outfalls are some distance from the sea caves the caves are considered to have **low exposure.**	Based on current knowledge the sea caves are considered to be **not vulnerable**.
Changes in thermal regime (eg power stations)	Sea cave communities on the Thanet coastline are considered to be **moderately sensitive** to fluctuations in temperature which may potentially alter their distribution and structure.	There are no known activities, such as dredging, causing a change in thermal regime around the Thanet caves. **Exposure: none**	Overall, the communities are **not vulnerable** to changes in thermal regime.
Changes in Turbidity (eg dredging)	Increased water turbidity influences the ability of algal species to photosynthesise however the sea cave communities are exposed for much of the tidal cycle and are adapted to the levels of sediment in the water here and so are considered to have **low sensitivity** to further changes in turbidity.	There are no known activities, such as dredging, causing a change in turbidity around the Thanet caves. **Exposure: low**	Overall, the communities are **not vulnerable** to changes turbidity.
Changes in salinity (eg water abstraction, outfalls)	**Chalk cliff algae and lichen communities** may be partly dependent on a degree of freshwater run-off/seepage. Changes to the salinity regime here (such as a cessation of such seepage) may affect the composition of such communities. **Moderately sensitive**.	Freshwater run-off and seepage is believed to occur within the sea caves. Sewage and storm water outfalls are of a sufficient distance from the sea caves not to be an issue. **Exposure: low**	Overall, the communities are **not vulnerable** to changes in salinity.

SEA CAVES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Biological disturbance			
Introduction of microbial pathogens	The sensitivity of reef communities to the introduction of microbial pathogens is currently not well understood , but is currently thought to be of **low sensitivity**.	There are no known inputs of microbial pathogens around the Thanet Caves. **Exposure none**	**Not vulnerable**
Introduction of non-native species and translocation	Sea cave communities are sensitive to the introduction or spread of competitive non-native species because of the potential impact on community structure. However if the non-native could be removed or controlled the natural community would re establish and so they are considered to have **moderate sensitivity**.	There is no evidence that the sea caves at Thanet are exposed to this category of operation **Exposure: none**	.The sea caves at Thanet are considered **not vulnerable** to this category or operation
Selective extraction of species (eg commercial and recreational fishing)	Collection of marine plants from sea caves would result in the selective extraction of species which could have the potential to alter the structure and distribution of the community. However if the extraction stopped the natural community would recover and so an assessment of **moderate sensitivity** has been made.	There is no evidence that the sea caves at Thanet are exposed to this category of operation **Exposure: none**	The sea caves at Thanet are considered **not vulnerable** to this category or operation

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical loss			
Removal (eg land claim)	**Breeding areas**: (Little tern) The little tern nest on shingle at high tide and feed in shallow waters on small fish and crustacea. Loss of suitable breeding habitat may reduce the capacity to support the populations of little terns at current levels. Little terns are **highly sensitive** to the loss of breeding grounds. **Feeding areas** (Little terns) feed in the water column and loss of shallow coastal waters (eg as a result of construction) may reduce the availability of important feeding habitats: **low sensitivity**. **Roosting areas:** (Golden Plover)Over the winter months the intertidal mud and sandflats provide a wintering site for roosting golden plover. Loss of these roosting sites, or parts of them, would mean that the European marine site would not have the capacity to support the populations of birds at existing levels. Golden plover are **highly sensitive** to loss of their roosting areas.	There are currently no activities occurring within the European marine site that may result in the loss of breeding or feeding or roosting habitats. **Exposure: none**	As the breeding feeding and roosting areas used by birds are not currently exposed to this category of operation they are **not vulnerable** to removal.
Smothering (eg disposal of dredge spoil)	**Breeding areas: (** Little tern) -Smothering of shingle habitat may reduce the capacity to support the populations of little terns at current levels. Little terns are **highly sensitive** to the loss of breeding grounds. **Feeding areas.** (Littler tern) Loss of shallow coastal waters may reduce the availability of important feeding habitats: **low sensitivity** **Roosting areas** (Golden plover) Loss of roosting areas may reduce the capacity to support the populations of wintering golden plover at current levels. Golden plover are **highly sensitive** to loss of their roosting sites.	Maintenance beach feeding occurs along the North coast as part maintenance coastal protection works. This involves moving shingle from the east and redistributing it to the west. Beach feeding also occur to the south of Sandwich Bay and the effects of this are being monitored. As carried out at present these activities are not known to affect breeding, feeding or roosting habitats. **Exposure low**	Breeding and feeding areas are considered to have **moderate vulnerability** to this category of operation.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical damage			
Siltation (eg dredging, outfalls)	**Breeding areas:** (Little tern) Shingle shores are unlikely to be affected by siltation **Feeding areas:** (Little tern) Siltation may affect marine life which supports and includes the prey species by blocking feeding/respiratory organs an consequently inhibiting their growth and development. It is possible that siltation may also affect the prey spawning areas and the less mobile fry. The communities found within the SPA are however naturally tolerant of some siltation because of the relatively high sediment load in the water: **low sensitivity** **Roosting areas:** (Golden plover) changes in siltation are unlikely to affect the use of the mud and sandflats for roosting. **Low sensitivity**	Sources of siltation include dredging and effluent discharges. Both of these currently occur along the coast although the degree of **exposure is thought to be low**.	Breeding and feeding areas are considered to have **low vulnerability** to this category of operation.
Abrasion (eg trampling, mobile benthic fishing, anchoring)	**Breeding areas:** (Little tern) Abrasion of breeding habitat may affect nesting birds through damage to eggs and suitable habitat. However, due to the nature of the shingle habitat, abrasion does not generally affect the ability of the birds to use the shingle for breeding. This operation is however closely linked to disturbance. **Sensitivity: low** **Feeding areas:** (Little tern)Abrasion is unlikely to effect the availability of prey species for feeding. **Sensitivity: low** **Roosting areas:** (Golden plover). Mud and sandflats are not sensitive to abrasion. **Sensitivity: low**	There is some movement of shingle carried out along the coast but this does not affect the breeding sites. Physical damage through land-based recreation also occurs on the shingle breeding sites although the **Exposure is considered to be low**.	Breeding and feeding areas are considered **low vulnerability** to this category of operation.
Selective extraction (eg	**Breeding areas:** (Little tern) Shingle shores are sensitive to selective extraction if shingle	Maintenance beach feeding occurs along the North coast as part maintenance coastal protection works.	Breeding and feeding and roosting areas are considered **not vulnerable** to this category of

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
aggregate dredging, entanglement)	or sand is selectively removed. This can affect the suitability of the habitat for breeding: **moderate sensitivity** **Feeding areas:** (Little tern)Selective extraction in feeding areas may affect the marine life which supports and includes the prey species. Such damage may consequently reduce the capacity of the habitat to support the populations of little terns at current levels: **moderate sensitivity** **Roosting areas:** (Golden plover) would be sensitive to selective extraction if they were targeted for their sand resources	This involves moving shingle from the east and redistributing it to the west. Beach feeding also occur to the south of Sandwich Bay and the effects of this are being monitored. As carried out at present these activities are not known to affect breeding, feeding or roosting habitats. **Exposure low**	operation.
Non-physical disturbance			
Noise (eg boat activity)	**Breeding areas:** (Little tern) Noise disturbance at the beginning of the breeding season may affect the pair bonding and deter the little tern from nesting. Disturbance to nesting little terns may also cause breeding failure with eggs or chicks being abandoned. If birds are disturbed and leave the nest the eggs or chicks are more likely to be predated by gulls, rats, foxes and dogs. **Feeding areas:** (Little tern) and **Roosting areas:** (Golden plover) Birds may be disturbed by sudden increases in noise. This can have the effect of displacing birds from their feeding or roosting areas this has an energy demand that can affect the birds body weight. Little tern and Golden plover are **highly sensitive** to noise	**Breeding areas:** (Little tern) The poor breeding success of the little tern colonies in recent years is thought to be the result of disturbance by various recreational activities which occur on the site. Little tern have a **high exposure** to noise disturbance **Feeding areas:** (Little tern) and **Roosting areas:** (Golden plover). The proximity of urban development and the high use of the coast for recreation pursuits means that the birds are **highly exposed** to noise disturbance whilst feeding or roosting	Birds and their habitats are considered **highly vulnerable** to noise.
Visual presence (eg recreational activity)	Birds are highly sensitive to visual disturbance. Sensitivity is greater to fast activities and that involve sudden movement. Little tern and golden plover are **highly**	As for noise Little tern have a **high exposure** to disturbance to visual presence	Birds and their habitats are considered **highly vulnerable** to visual disturbance.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	sensitive to visual presence.		
Toxic contamination			
Introduction of synthetic compounds (eg TBT, PCBs)	**Feeding areas:** (Little tern)Synthetic compounds include: pesticides, PCB's, tributyltin (TBT) and endocrine disruptors. Prey species are considered as being **highly sensitive** to toxic contamination resulting from the introduction of synthetic compounds because many marine invertebrates (particularly the larval stages) are sensitive to such compounds, even at low concentrations. The effects of such chemicals varies between the marine species and the chemical compound concerned. Many synthetic compounds such as PCB's also have a high bioaccumulation capacity, and can accumulate in birds through the food chain. The birds' ability to feed can also be affected by changes in the palatability of prey items caused by toxic contamination. Consequently, shallow coastal waters are considered to be **highly sensitive** to toxic contamination	Sewage discharge points are a potential source of toxic contaminants which may affect localised areas within the site. In addition, the Thames estuary which has notably high concentrations of many of these substances is inclose proximity to the Thanet Coast. The shallow coastal waters are therefore currently considered to have a **medium exposure** to toxic contamination from synthetic compounds.	The fauna of the breeding and feeding grounds are considered to be have **high vulnerability** to toxic contamination from synthetic compounds.
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	**Feeding areas:** (Little tern)Non-synthetic compounds include heavy metals such as cadmium, lead, zinc and mercury as well as oil. Prey species are thought to be sensitive to toxic contamination. Algae, invertebrates and fish are particularly sensitive to these substances. Shallow water prey species are also sensitive to the potential effects from oil spills, due to both their toxicity and smothering effects. Recovery may take many years for some species, depending upon recruitment rates and dispersal of toxic substance. These areas	Sewage discharge points are a potential source of toxic contaminants such as heavy metals which may affect limited areas of intertidal communities around the coast. Toxic contaminants in the marine environment are, however, often the result of diffuse sources and so the precise source can therefore be difficult to identify. Of the large estuaries in England, the Thames has one of the highest concentrations of these substances and it is likely that the NE Kent coast is exposed to this. Based on currently available knowledge it is thought that the NE Kent coast has a **medium exposure** to toxic contaminants.	The fauna in the feeding areas are considered to have **moderate vulnerability** to toxic contamination from non-synthetic compounds.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	are considered to be of **moderate sensitivity.**		
Introduction of radionuclides	The effect of radionuclides either directly on the birds or via their food chain is poorly understood.	There are no known discharges of radionuclides around the Coast. **Exposure none.**	The feeding areas are **not vulnerable** to radionuclides
Non-toxic contamination			
Nutrient enrichment (eg agricultural runoff, outfalls)	**Feeding areas:** (Little tern)Nutrient enrichment can cause a reduction in water clarity from the increase in amount of plankton in the water column, thereby reducing the visibility of prey items for little terns. However the water here is naturally turbid and so any further reduction in water quality is unlikely to have an effect on the small fish and shrimps which form the diet of the little tern or their ability to hunt them. Little tern are considered to have a **low sensitivity** to nutrient contamination	**Feeding areas:** (Little tern)The feeding grounds are exposed to nutrient enrichment from the sewage discharge points located along the coast and potentially from the hatchery (more information is needed). Some agricultural run-off may occur along the northern facing coastline. Most of the nutrients are likely to originate from sources outside the sites' boundary. **Exposure: high**	Feeding areas have a **high vulnerability** to the consequences of nutrient enrichment
Organic enrichment (eg mariculture, outfalls)	**Feeding areas:** (Little tern)Organic enrichment may increase the food available to birds. This may mean that larger populations of little tern could be supported than would naturally occur. Organic enrichment may also cause a reduction in the water clarity again reducing the visibility of prey items for birds feeding in shallow coastal waters. As stated previously reduction in water clarity is not likely to be an issue as the water here is already turbid. Little tern are thought to have a **moderate sensitivity** to organic matter contamination	**Feeding areas:** (Little tern)The shallow water feeding areas are exposed to organic material close to the sewage discharge points located along the coast and potentially form the hatchery, but particulate organic matter does not disperse as readily as chemicals in solution and the effect is localised. **Exposure medium**	Feeding areas are **moderately vulnerable** to the consequences of organic matter enrichment
Changes in thermal regime (eg power stations)	**Feeding areas:** (Little tern) Changes to the thermal regime may indirectly affect bird populations as a result of changes to the range and abundance of particular prey items. Little tern are thought to have a **moderate sensitivity** to thermal change	There are no known activities resulting in changes to the thermal regime around the coastline. **Exposure: none**	The feeding areas are **not currently vulnerable** to changes in the thermal regime

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Changes in Turbidity (eg dredging)	**Feeding areas:** (Little tern)As the waters around the NE Kent coast are naturally turbid changes to turbidity that might affect prey items is unlikely to be an issue. Little tern are thought to have a **low sensitivity** to changes in turbidity	Some maintenance dredging is carried out at Ramsgate Harbour and changes in turbidity have been observed as a result. However this is a temporary impact. **Low exposure**.	The feeding areas are **not currently vulnerable** to changes in the thermal regime
Changes in salinity (eg water abstraction, outfalls)	**Feeding areas:** (Little tern) Changes to the salinity may indirectly affect bird populations as a result of changes to the range and abundance of particular prey items in shallow waters. Little tern are thought to have a **low sensitivity** to changes in salinity	**Feeding areas:** (Little tern)Localised changes in salinity occur at discharge points such as the storm water outfalls located around the coastline but these are not known to have any effect on the prey species of the Little tern. **Exposure low**	The feeding areas have a **low vulnerability** to changes in salinity.
Biological disturbance			
Introduction of microbial pathogens	**Breeding areas:** (Little tern) **and feeding areas:** (Little tern) The is little information on the effects of microbial pathogens on breeding and feeding habitats is little understood. A precautionary sensitivity of **low** is therefore given.	**Feeding areas:** (Little tern)Microbial pathogen inputs may in particular arise from sewage and storm water discharges on the Thanet coastline. The feeding areas therefore have a **low exposure** to microbial pathogens.	**Vulnerability is currently considered to be low**
Introduction of non-native species and translocation	**Breeding areas:** (Little tern) Shingle communities have a low sensitivity to the introduction or spread of non-native species. Shingle habitat is relatively barren and its suitability for breeding is likely to be little affected by this category of operation. **Low sensitivity**.	The reefs at Thanet have been colonised by Japweed *Sargassum muticum*. **Exposure: low.**	Breeding and feeding areas currently have **no detectable vulnerability** to introduction of non-natives.
Selective extraction of species (eg commercial and recreational fishing)	**Feeding areas:** (Little tern) Little information exists on the effect of selective extraction of the food supply of little terns and so this is an issue which requires further investigation. Over-extraction of the fish which support the breeding little tern, within the European marine site and adjacent waters, could adversely affect the favourable condition of the interest feature. Feeding	**Feeding areas:** (Little tern)Commercial fishing occurs off the coast as part of much larger fishing grounds. This is unlikely to result in the extraction of crustaceans and small fish in shallow inshore waters. Shore netting also occurs and the effect of this on the prey species is unclear. Recreational shore fishing is another form of selective extraction which occurs within the site.	The breeding, feeding and roosting areas have a **low vulnerability** to selective extraction.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING ANNEX 1 SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	areas are considered to have a **moderate sensitivity** to selective extraction.	**Exposure: low**	

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Physical loss			
Removal (eg land claim)	The North East Kent European marine sites provides roosting and feeding grounds for nationally important numbers of wintering birds. The high tide roost sites for these birds include areas of shingle on the shore and they feed on shellfish, shrimps and insects and peeler crabs in the intertidal area particularly amongst rotting seaweed. Loss of either the **roosting areas** or the **feeding areas**, or parts of them, would mean that the European marine site would not have the capacity to support the populations of birds at existing levels. Wintering birds are **highly sensitive** to loss of their roosting or feeding grounds	There are currently no known activities occurring within the European marine site within this category of operation that would cause loss of roosting or feeding grounds**. Exposure: none**	As the roosting and feeding areas used by birds are not currently exposed to this category of operation they are **not vulnerable** to physical loss.
Smothering (eg disposal of dredge spoil)	The effects of this would be as above for physical loss via removal. Wintering birds are **highly sensitive** to loss of their roosting or feeding grounds	Maintenance beach feeding for coastal protection along the North coast. This involves moving shingle from the east and redistributing it to the west. As carried out at present this is not known to affect on the wintering birds **Exposure low**	Feeding areas are considered to have **moderate vulnerability** to this category of operation.
Physical damage			
Siltation (eg dredging, outfalls)	Roosting sites are not generally affected by activities resulting in siltation. **No detectable sensitivity** Siltation can affect marine life which supports and includes the prey species by: smothering or blocking feeding/respiratory organs, inhibiting growth and development, and preventing juvenile plants and animals from settling. The communities found within the SPA are however naturally tolerant of some siltation because of the relatively high sediment load in the water: **low sensitivity**	Causes of siltation would be dredging and outfalls. Both occur along the coast but there is currently no known effect on the feeding areas. **Exposure low**	Feeding areas are considered to have **low vulnerability** to this category of operation.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Abrasion (eg trampling, mobile benthic fishing, anchoring)	Abrasion from activities such as trampling or vehicular use is only going to disturb the birds if they are using these sites at the time of the operation. If the birds are not present at the time of the operation then abrasion does not generally affect the ability of the birds to use the roosting site at a later time and so the **sensitivity is low** Abrasion of the main feeding grounds on the reef shore can result in the dislodgement of species and potential loss of a food supply. The sand and mud flats are not sensitive to abrasion. **sensitivity: moderate**	The areas of shingle used for roosting sites are not known to be exposed to any particular abrasive activity**. Low exposure** Abrasion of the shore occurs from a variety of sources including: trampling from the many visitors, launching of craft, wave wash off hard defences and anchoring of boats. These activities on the reef will cause the crushing and dislodgement of prey species. The effect of incidental crushing and dislodgement of prey species on the wintering birds is not known. Based on current knowledge it is thought that the cumulative effect of these activities gives a **medium exposure**	Wintering bird habitats are thought to be **moderately vulnerable** to this operation.
Selective extraction (eg aggregate dredging, entanglement)	**Roosting sites** would be sensitive to selective extraction if these sites were targeted for their shingle or sand resource. **Sensitivity: moderate** **Feeding grounds** may be affected as an incidental result of some form of selective extraction which causes dislodgement of species and damage to the habitat structure, however, since this would be reversible**: Sensitivity: moderate**	**Roosting sites**. There is currently no known selective extraction of material from roosting sites. **Feeding grounds** Damage to feeding grounds on the chalk reef occurs as a result of the selective removal or harvesting of shellfish and worms for bait and food which is carried out by breaking open the rocks. The effect of incidental damage to prey species on the Wintering birds is not thought to be significant. Maintenance beach feeding for coastal protection occurs along the North coast . This involves moving shingle from the east and redistributing it to the west. As carried out at present this is not known to have and adverse affect on the wintering birds **Exposure low**	Roosting and feeding areas are considered **not vulnerable** to this category of operation
Non Physical disturbance			
Noise (eg boat activity)	Birds are disturbed by sudden movements of objects and increases in noise disturbance. This can have the effect of displacing the birds from their roosting or feeding grounds. Birds may be disturbed by a variety of	The proximity of urban development and the use of the coast for recreational pursuits means that wintering birds are subject to various activities resulting in noise or visual disturbance. The birds have a **high exposure** to noise disturbance	Wintering birds and their habitats are considered **highly vulnerable** to noise disturbance.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	activities. There is currently a range of roost sites (although limited in number) available to wintering birds for them to move between within the European marine site Disturbance in one bay, which displaces the birds to another bay, can have a knock on effect to the birds there as flocks come into conflict and are distracted from feeding activity or roosting. This has an effect on their energy budget with a consequent effect on body weight. Disturbance to wintering birds particularly during adverse weather conditions, or when they need to build up extra body fat just prior to migration, can affect the survival of individuals as a result of the disruption to their energy budget. Wintering birds are considered to have a **high sensitivity** to disturbance		
Visual presence (eg recreational activity)	For the reasons set out under noise above the wintering birds are considered to be **highly sensitive** to visual disturbance. They are most sensitive to activities on or in the near shore which involve fast, sudden, and unpredictable movement. They are also more sensitive in enclosed bays and at tide states which reduce the area of available shore.	For the reasons set out under noise above the wintering birds are considered to have a **high exposure** to visual disturbance	Wintering birds and their habitats are considered **highly vulnerable** to visual disturbance.
Toxic contamination			
Introduction of Synthetics Compounds (eg TBT, PCBs)	**Feeding grounds** Synthetic compounds include pesticides, PCB's, tributyltin (TBT) and endocrine disruptors. Prey species are recognised as being **highly sensitive** to toxic contamination resulting from the introduction of synthetic compounds because many	**Feeding grounds** Sewage discharge points are a potential source of toxic contaminants which may affect limited areas. In addition, of the large estuary in England, the Thames estuary has one of the highest concentrations of these substances and it is likely that the NE Kent coast is affected	The wintering bird feeding grounds are considered to be have **high vulnerability** to toxic contamination from synthetic compounds.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	marine invertebrates (particularly the larval stages) are sensitive to extremely low concentrations of such chemicals. The effects of such chemicals varies between species and the chemical concerned. TBT's for example are considered very toxic to algae, molluscs, crustaceans and fish. As well as being toxic in their own right, many compounds such as PCB's also have a high bioaccumulation capacity, leading to accumulation in birds through the food chain. The birds ability to feed can also be affected by changes in the palatability of prey items caused by toxic contamination. Wintering birds are considered to be **highly sensitive** to toxic contamination	The feeding grounds are considered to have a **medium exposure** to toxic contamination from synthetic compounds.	
Introduction of non-synthetic compounds (eg heavy metals, hydrocarbons)	**Feeding grounds** Non-synthetic compounds include heavy metals such as cadmium, lead, zinc and mercury as well as oil. Prey species are recognised as being sensitive to toxic contamination because faunal communities primarily consist of filter feeders and marine species which rely on larval dispersion for recruitment. Algae, invertebrates and fish are particularly sensitive to these substances. Changes to the shore communities, or any part of them, could jeopardise the short to medium term survival of some of these communities or species. Shore communities are also sensitive to the effects from oil spills, due to both their toxicity and smothering effects. Recovery may take many years for some species, depending upon recruitment rates and dispersal of toxic substance but communities	Sewage discharge points are a potential source of toxic contaminants such as heavy metals which may affect limited areas of intertidal communities around the coast. Toxic contaminants in the marine environment are, however, often the result of diffuse sources and so the precise source can therefore be difficult to identify. Of the large estuaries in England, the Thames has one of the highest concentrations of these substances and it is likely that the NE Kent coast is affected. Based on currently available knowledge it is thought that the NE Kent coast has a **medium exposure** to toxic contaminants.	The wintering bird feeding areas are considered to have **moderate vulnerability** to toxic contamination from non-synthetic compounds.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	would eventually recover from toxic contamination they are considered to be of Wintering birds are considered to be **moderately sensitivity** to toxic contamination.		
Introduction of radionuclides	The effect of radionuclides either directly on the birds or via the good chain is **not known**.	There is no known discharge of radionuclides around the Coast. **Exposure none.**	The wintering birds are **not vulnerable** to radionuclides
Non toxic contamination			
Nutrient enrichment (eg agricultural runoff, outfalls)	**Feeding grounds** Nutrient enrichment affects the intertidal marine life by altering the balance of species and increasing algal growth. This effect is passed up the food chain and could either increase of decrease the food available to wintering birds with consequent effects to population size. Nutrient enrichment may reduce the availability of food for birds by increasing growth of algal mats on the intertidal area. Wintering birds are considered to be **moderately sensitive** to nutrient enrichment	The intertidal feeding grounds are exposed to nutrient from the sewage discharge points located along the coast and potentially from the hatchery. Some agricultural run-off may occur along the northern facing coastline. **Exposure high**	Wintering bird populations are **highly vulnerable** to the consequences of nutrient enrichment
Organic enrichment (eg mariculture, outfalls)	**Feeding grounds** Increased amounts of organic matter alters the species composition of the intertidal including the ratio of grazers(marine invertebrates) to algae. The wintering birds feed on shellfish, shrimps and insects in the intertidal area. If the numbers of these species increases it will mean that the number of birds can be supported will be higher than would occur naturally. Wintering birds are considered to be **moderately sensitive** to organic matter enrichment	The intertidal feeding grounds are exposed to organic matter from the sewage discharge but particulate organic matter does not disperse as readily as chemicals in solution and the effect is likely to be localised. **Exposure medium**	Wintering bird populations are **moderately vulnerable** to the consequences of organic enrichment

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
Changes in thermal regime (eg power stations)	**Feeding grounds** Changes to the thermal regime may indirectly affect bird populations as a result of changes to the range and abundance of particular prey items. Wintering birds are considered to be **moderately sensitive** to thermal change	There are no known current activities resulting in changes to the thermal regime around the coastline **Exposure none**	Wintering birds are **not vulnerable** to changes in thermal regime
Changes in Turbidity (eg dredging)	**Feeding grounds** As the coastal waters around the NE Kent coast are naturally turbid changes to turbidity that might affect prey items is not an issue Wintering birds are considered to have **low sensitivity** to turbidity.	Some maintenance dredging is carried out at Ramsgate Harbour and changes in turbidity have been observed as a result. However this is a temporary phenomena and is not known to affect the feeding areas **low exposure**.	Wintering birds are **not vulnerable** to changes in turbidity
Changes in salinity (eg water abstraction, outfalls)	**Feeding grounds** Changes to the salinity may indirectly affect bird populations as a result of changes to the range and abundance of particular prey items. Wintering birds are considered to be **moderately sensitive** to changes in salinity	Localised changes in salinity occur at discharge points such as the storm water outfalls located around the coastline. Changes could also result if the flow of the local rivers is altered by abstraction but there is no known information to suggest this is a problem at present. **Exposure low**	Wintering birds are **not vulnerable** to changes in salinity
Biological disturbance			
Introduction of microbial pathogens	The is little information on the effects of microbial pathogens on roosting and feeding habitats is little understood. A precautionary sensitivity of **low** is therefore given.	Microbial pathogen inputs may in particular arise from sewage and storm water discharges on the Thanet coastline. The roosting and feeding of wintering birds therefore have a **low exposure** to microbial pathogens.	**Vulnerability is currently considered to be low**
Introduction of non-native species and translocation	Shore communities are sensitive to the introduction or spread of non-native species because if competitively superior to the native species, they can have a major impact on community structure. Displacement of native species can occur through competition for space, food and light. Some non-native	The reefs at Thanet have been colonised by Japweed *Sargassum muticum*. At this site, the species currently only grows in rock pools and unlikely to affect the wintering bird prey species to a significant degree. None of the other non-native species present at the site are known to have any major ecological impact**, Exposure: low.**	Wintering birds are **low vulnerable** the introduction and spread of non-native species.

INTERNATIONALLY IMPORTANT POPULATIONS OF REGULARLY OCCURRING MIGRATORY SPECIES			
	Sensitivity to category of operation	**Exposure to category of operation**	**Vulnerability to category of operation**
	species are known to be present around the NE Kent Coast but the effect of these on the prey species is not known, **moderate sensitivity**.		
Selective extraction of species (eg commercial and recreational fishing)	**Feeding areas** . Collection of bait or food or seaweed removes wintering birds prey species. The extent to which this is in direct competition with the birds is unclear. An example of where there is likely to be competition is over shellfish harvesting. The birds ability to feed on shellfish is dependant on the size of the prey and harvesting by humans also selects larger shellfish. An assessment of **moderate sensitivity** has been given.	Species are collected from the intertidal chalk reef for food or bait The noise and visual disturbance of this and the abrasion caused by trampling are discussed above. The local authority is concerned that large parties of people are harvesting across the reef for food. How early in the year this activity starts (ie prior or post the wintering bird migrations) is yet to be ascertained. Bait digging occurs on sand and mud flats along the coast and particularly in Pegwell Bay although numbers are low at present. Peeler crabs are also collected. In places Seaweed is harvested from the shore but more information is needed as to the time of year and extent. Overall **Exposure: high**	Wintering bird populations may be **highly vulnerable** to the reduction in food supply caused through collection of species for bait or food but more information is needed over sustainable levels of harvesting and whether or not these are being exceeded.

Appendix 4 English Nature's Habitats regulations guidance note: The Appropriate Assessment (Regulation 48)

ENGLISH NATURE

Habitats regulations guidance note

NATURA 2000

HRGN 1

Issued by Greg Smith, Environmental Impacts Team, English Nature. Tel: 01733 455210

The Appropriate Assessment (Regulation 48) The Conservation (Natural Habitats &c) Regulations, 1994

Introduction

1. This Guidance Note has been prepared to assist competent authorities and English Nature staff when undertaking the ***"appropriate assessment"*** required by Regulation 48 of the *Habitats Regulations 1994* implementing Article 6(3) of the *Habitats Directive* (92/43/EEC). Only the Courts can provide authoritative interpretation of the Regulations, but these notes have been developed in the light of practical experience and a close examination of the Regulations, the Habitats Directive and central government guidance, particularly in PPG 9.

When Does An 'Appropriate Assessment' Need To Be Undertaken?

Types of Proposal

2. Under Regulation 48(1), an appropriate assessment needs to be undertaken in respect of any plan or project which:

a. either alone or in combination with other plans or projects would be likely to have a ***significant effect*** on a European Site, and
b. is not directly connected with the management of the site for nature conservation.

3. Appropriate assessment is required by law for all European Sites (Regulation 48). A European Site is any classified SPA and any SAC from the point where the Commission and the Government agree the site as a Site of Community Importance. Appropriate assessment is also required, as a matter of Government policy, for potential SPAs, candidate SACs and listed Ramsar Sites for the purpose of considering development proposals affecting them. (PPG 9 paras 13 and C7).

Timing of the Assessment

4. An appropriate assessment needs to be undertaken in respect of a plan or project described above **before** any ***"competent authority"***:

a. decides to undertake the plan or project, in cases where no consent, permission or other authorisation is required. (Reg. 48(1));
b. decides to give any consent, permission or other authorisation for the plan or project. (Regs. 48(1) *et al*);
c. reviews the decision to undertake a plan or project or reviews consents, permissions or other authorisations for plans or projects that are incomplete. (Regs. 50(2) *et al* - see also English Nature Habitats Regulations Guidance Note No. 2);
d. decides whether to approve an application for development that would otherwise be permitted development. (Reg. 62(6)).

Significant Effects

5. The plan or project does not have to be located within the designated area. Significant effects may occur even if the plan or project is some distance away and even outside any consultation area defined by English Nature (PPG 9 paras 30-32). The effects may be direct or indirect, temporary or permanent, beneficial or harmful to the site, or a combination of these.

6. The initial determination of likely significance is intended to ensure that all relevant plans and projects likely to have a material effect on these internationally important sites are subject to an appropriate assessment. In all but the most clear cut cases, competent authorities are likely to need advice. English Nature will advise, on request, as to whether any particular plan or project may be likely to have a significant effect on any of these sites. If the decision as to whether or not the development would have a significant effect on the designated site is inconclusive, on the information available, the competent authority should make a fuller assessment; in doing so they may ask the developer or other parties for more information. (PPG 9 para C10).

Who Undertakes the Appropriate Assessment?

7. The appropriate assessment must be undertaken by the *competent authority*, as defined in Regulation 6(1) of the Habitats Regulations, which includes any Minister, Government Department, public or statutory undertaker, public body of any description or person holding a public office. The developer or proposer of the plan or project is required to provide relevant information. English Nature must be consulted, during the course of the assessment, but it is the duty of the competent authority to undertake the assessment itself.

8. Most competent authorities will not have the technical expertise "in house" to assess the effects of the plan or project on the international nature conservation interests. Most will

need to rely heavily on the advice, guidance and recommendations of English Nature, at each stage, including the scope and content of the assessment, the site's conservation objectives, the information required from the developer or proposer and the effects on the integrity of the site, all of which are discussed below. The appropriate assessment, in many cases, is likely to be an iterative process. In the simplest cases a general statement in a single consultation response from English Nature may suffice to enable the competent authority to complete the assessment. However, in most cases, it is envisaged that a more detailed response from, and dialogue with, English Nature is likely to be necessary.

What is an 'Appropriate Assessment'

9. It is a self contained step in a wider decision making process, required by the Habitats Regulations and described more fully in PPG 9, Annex C. Its conclusions must be based only on the scientific considerations under steps laid out in the Habitats Regulations. The assessment should not be influenced by wider planning or other considerations.

10. The Regulations do not specify how the assessment should be undertaken but describe it simply as "an appropriate assessment". This is taken to mean that the assessment must be appropriate to its purpose under the Regulations (and also the Directive, which originated the use of the term). Its purpose is to assess the implications of the proposal in respect of the site's "***conservation objectives***". The conclusions of the assessment should enable the competent authority to ascertain whether the proposal would adversely affect the integrity of the site.

Scope and Content

11. PPG 9 indicates that the scope and content of an appropriate assessment will depend on the location, size and significance of the proposed plan or project (PPG 9 box C10). The PPG indicates that English Nature will advise on a case-by-case basis. According to the nature conservation interests of the site, English Nature will identify particular aspects that the appropriate assessment should address. Examples given are hydrology, disturbance and land-take, but there are clearly many other potential matters that may need to be addressed in particular cases.

12. Procedures under the Habitats Regulations should be confined to the effects on the internationally important habitats or species for which the site is or will be internationally designated or classified, including any indirect effects on these interests, for example, via their supporting ecosystems and natural processes. Notwithstanding a favourable assessment in respect of the plan or project's effects on the international nature conservation interests for which the site was classified or designated, decisions to undertake or give consent to the plan or project may need to take account of other international, national, regional or local nature conservation interests in the light of other policy and legislative provisions. (PPG 9 paras 4, 18 and 27).

Environmental Assessment

13. The appropriate assessment is not the same as an environmental assessment under the provisions of the various *Environmental Assessment (EA) Regulations* (1988-95), in compliance with the Directive 85/337/EEC. In many cases, plans or projects that will be subject to an appropriate assessment will need an Environmental Statement (ES) to be prepared under the EA Regulations. (PPG 9 paras 38 and 39).

14. The ES will address all significant environmental effects. It will be appropriate to use the information assembled for the ES when carrying out the appropriate assessment under the Habitats Regulations. In view of this it would be helpful if the relevant ES clearly identified, under a specific subject heading, the likely significant effects on the internationally important habitats and/or species.

How is an Appropriate Assessment Undertaken?

Key Steps

15. Having established that an appropriate assessment is required, the following conclusions may be drawn (from the foregoing considerations and Government guidance) in respect of how it should be undertaken.

The Key Steps in an Appropriate Assessment

The competent authority:

I
Must consult English Nature

II
May consult the general public

III
Should clearly identify and understand the site's conservation objectives having regard to the advice of English Nature

IV
Should require the applicant to provide such information as may reasonably be required for the purposes of the assessment

V
Should identify the effects of the proposal on the habitats and species of international importance and how those effects are likely to affect the site's conservation objectives

VI
Should decide whether the plan or project, as proposed, would adversely affect the integrity of the site in the light of the conservation objectives

VII
Should consider the manner in which the plan or project is proposed to be carried out, whether it could be modified, or whether conditions or restrictions could be imposed, so as to avoid adverse effects on the integrity of the site

VIII
Should conclude whether the proposal, as modified by conditions or restrictions, would adversely affect the integrity of the site

IX
Should record the Assessment and notify English Nature of the conclusions

The Key Steps Explained

These key steps are explained in more detail below.

I. Consulting English Nature

16. Under Regulation 48(3) the competent authority must consult English Nature and must have regard to any representations made by English Nature. It may be inferred from PPG 9 (box C10 and para C9) that the competent authority would be expected to follow the advice of English Nature and normally to decide the case "*in accordance with the recommendations of English Nature*". If it does not do so,

the competent authority should be prepared to explain its reasons. In cases where it proposes to agree to a plan or project notwithstanding a negative assessment, the competent authority is required to notify the Secretary of State in advance of any decision.

II. Consulting the General Public

17. Under Regulation 48(4) the competent authority may (if it considers it appropriate) take the opinion of the general public, on the implications of the proposal for the site's conservation objectives, using whatever steps they consider necessary. This may usefully include taking the opinion of others with relevant knowledge or expertise.

III. The Site's Conservation Objectives

18. The Regulations do not define what is meant by the site's conservation objectives but PPG 9 box C10 describes them as:

"*the objectives.... / the reasons for which the site was classified or designated*"

English Nature will be able to give a clear statement of the site's conservation objectives in the light of its European Site Register entry (compiled by Government under Regulation 11), its citation, its reasons for recommendation, English Nature's knowledge of the site, national and international objectives for the international nature conservation interests (such as may be contained in the UK Biodiversity Action Plan) and any Management Plan or Management Statement for the site in so far as they relate to the interests for which the site was selected.

19. The site may also host habitats and/or species of Community interest (see Article 1 of the Habitats Directive) which are not mentioned in the European Site Register, the citation or the reasons for recommendation because they were not, at the time, a reason for classification or designation. Such features are not relevant to the appropriate assessment itself. Nevertheless their presence may be material to the decision as to whether or not to undertake or to consent to the plan or project.

IV. Requiring Further Information

20. The competent authority, taking the advice of English Nature where necessary, should require the applicant to provide such information as the competent authority may reasonably require for the purposes of making the assessment (Reg.48(2)). The information required may relate to any environmental information, or information about the proposal, relevant to the assessment and may include:

i. information already available, or
ii. new information from surveys that may need to be carried out, or
iii. data analysis, predictions, comparisons or assessments of a technical nature.

V. Identifying the Effects

21. Having regard to English Nature's advice and other consultation responses and, where relevant, taking account of the ES or any other information supplied by the developer/proposer, or otherwise available, the competent authority should identify what the effects of the proposal are likely to be. The effects considered should be those of the plan or project, either alone or in combination with other plans or projects, on the habitats and species of international importance and how those effects are likely to affect the site's conservation objectives. This will involve considering, for example, the nature, scale, geographic extent, timing, duration and magnitude of direct and indirect effects; considering the degree of certainty in the prediction of effects; considering all mitigating measures already contained in the proposal and the extent to which these measures are likely to avoid, reduce or ameliorate adverse effects on the international nature conservation interests. It is the residual effects, after mitigation, that are considered at this stage.

VI. Integrity of the Site

22. Having regard to English Nature's advice, other consultation responses and any other information available, the competent authority should decide whether the plan or project, as proposed, would adversely affect the integrity of the site, in the light of its conservation objectives. That is, whether the plan or project would adversely affect the "*coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified*" (PPG 9 box C10). An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of its designation.

23. The form of words used in Regulation 48(5) implies that a precautionary approach should be taken in considering effects on integrity, in line with the Government's principles for sustainable development (see *Sustainable Development: the UK strategy* page 33). Regulation 48(5) says that (subject to Regulation 49) projects may only proceed if the competent authority has ascertained that it **will not adversely affect** the integrity of the European site.

VII. Considering How To Avoid Adverse Effects

24. If the proposal would adversely affect the integrity of the site then, having regard to English Nature's advice, the competent authority should consider the manner in which it is proposed to be carried out and whether the plan or project could be modified, or whether conditions or restrictions could be imposed, so as to avoid the adverse effects. This may include, for example, changes to the siting, layout, timing or use of the proposal and the use of obligations or legal agreements. (Reg. 48(6)).

25. Compensatory measures that may be offered in the proposal at this stage, seeking to redress but not remove residual harm to the international interests (such as the provision of land for habitat creation purposes), should not be considered in the appropriate assessment, but may be considered later in the decision making process. (See Reg. 53).

VIII. Conclusion on Effects In The Light of Conditions and Restrictions

26. The competent authority should reassess the conclusions in the light of any such modifications, conditions or restrictions that may be agreed or imposed.

IX. Recording the Assessment

27. It would be advisable for this conclusion, and the reasons for it, to be recorded. English Nature should be notified of the conclusion of the appropriate assessment and the authority's

decision as to the effects on the integrity of the site, before the authority undertakes the plan or project or issues any permission, consent or other authorisation (PPG 9 para 30).

28. The subsequent courses of action open to a competent authority are set out in Regulations 48(5) - (7), 49 and 54(3). The Regulations prohibit a competent authority from undertaking or giving consent to any plan or project unless the appropriate assessment concluded that it would not have an adverse effect on the integrity of the site, or specific criteria are met and the Secretary of State has been informed.

Good Practice Outline of an Appropriate Assessment Record

29. A suggested model or good practice outline record of an appropriate assessment is set out below. It may be contained in, for example, a planning officer's committee report or the minutes of a competent authority's decision. In other cases it may be a file note, clearly recording compliance with the Regulations. The record may take many different forms because each assessment needs to be appropriate to the type, scale, location and significance of the proposal and to the relevant nature conservation interests. It is provided here as a guide to assist competent authorities and English Nature staff, not as an authoritative legal formula. Any record made of an appropriate assessment should be copied to English Nature and to any other parties who were consulted on the assessment.

Title of Plan or Project/Application
Location of Plan or Project/Application
[With location plan attached showing relationship to the international designation]
International Nature Conservation Site
Nature/Description of Plan or Project/Application
[Including brief description of manner in which plan or project is proposed to be carried out]
Date Appropriate Assessment Recorded

This is a record of the appropriate assessment, required by Regulation 48 of the Habitats Regulations 1994, undertaken by [name of competent authority] in respect of the above plan/project, in accordance with the Habitats Directive (Council Directive 92/43/EEC). Having considered that the plan or project would be likely to have a significant effect on the [name of international site] and that the plan or project was not directly connected with or necessary to the management of the site, an appropriate assessment has been undertaken of the implications of the proposal in view of the site's conservation objectives.

*English Nature was consulted under Regulation 48(3) on [date] and their representations, to which this authority has had regard, are attached at Annex 1. The conclusions of this appropriate assessment * are/are not in accordance with the advice and recommendations of English Nature.*

**The applicant was required to submit further information reasonably necessary for this assessment on [date] under Reg.48(2) * and replied with the information on [date]/but did not supply the information.*

** The opinion of the general public was taken under Reg. 48(4) by way of *public advertisement/further consultation etc and the views expressed (attached at Annex 2) have been taken into account.*

The site's conservation objectives have been taken into account, including consideration of the citation for the site and information supplied by English Nature (see Annex 1). The likely effects of the proposal on the international nature conservation interests for which the site was designated may be summarised as:
[List of Effects]

The assessment has concluded that:
a) the plan or project **as proposed would not adversely affect the integrity of the site,*
or
b) the plan or project **as proposed would adversely affect the integrity of the site.*
[If (b):]
The imposition of conditions or restrictions on the way the proposal is to be carried out has been considered and it is ascertained that:
**a) conditions or restrictions cannot overcome the adverse effects on the integrity of the site.*
or
**b) the following conditions and/or restrictions would avoid adverse effects on the integrity of the site. [list conditions/restrictions]*

Signed ..... Date ..... (delete as appropriate)*
Annexes to also include relevant correspondence, minutes or meetings with English Nature, the applicant etc.