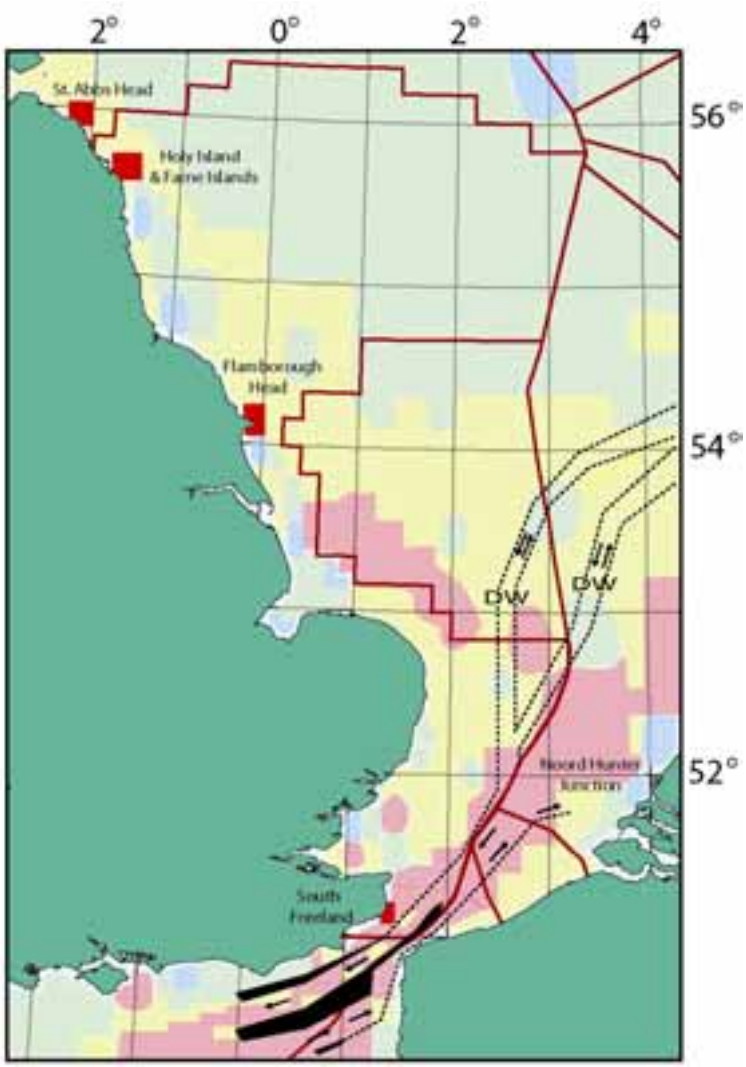
Department of Trade and Industry

HUMAN ACTIVITIES IN THE SEA 3 AREA



August 2002

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CONTENTS

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1 INTRODUCTION

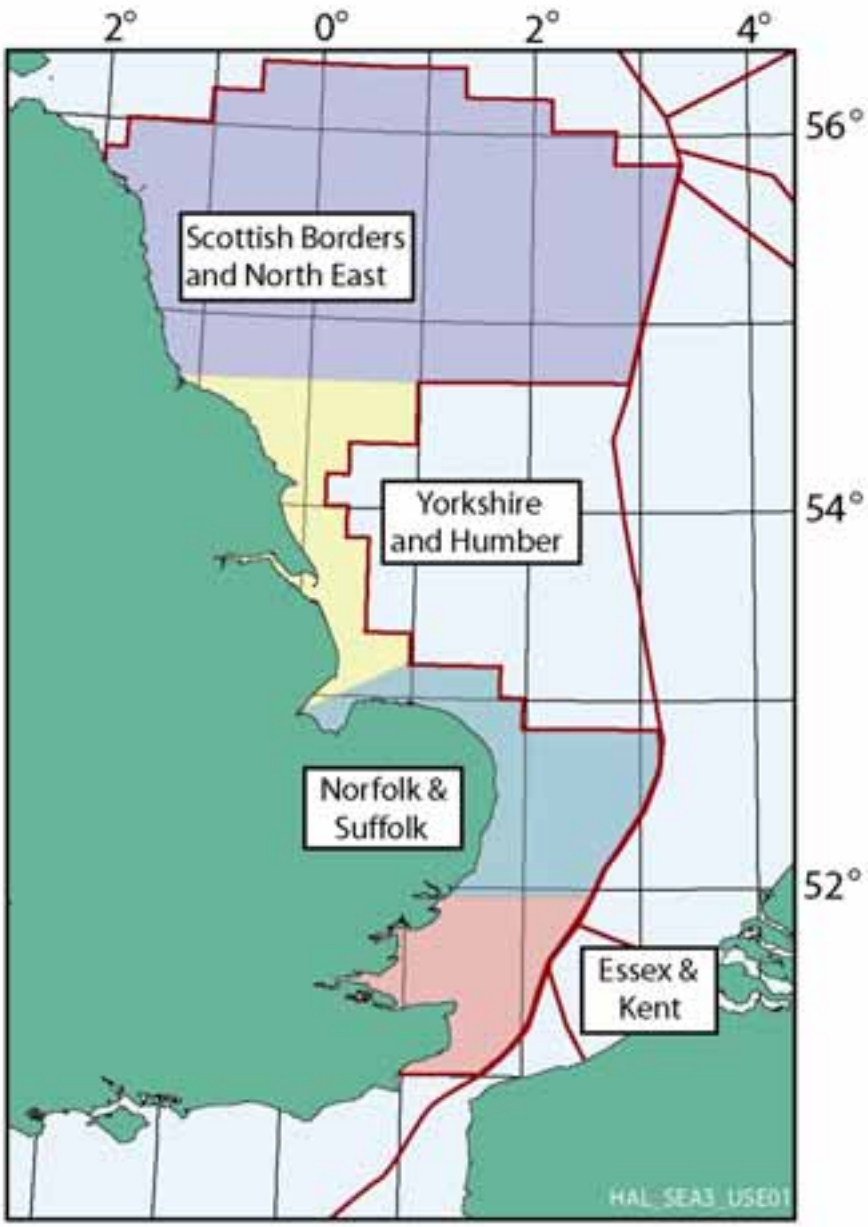
The SEA 3 region provides an important resource for a wide variety of different users. Much of the English east coast is rural in nature and attracts a large number of tourists to its unspoilt scenery. However, the coastal boundary of SEA 3 is also home to many of the UK's major ports and harbours as well as major industrial and population centres. These areas form the focus for shipping and trade and particular regions of SEA 3 experience heavy shipping pressures.

The presence of extensive offshore sand and gravel deposits in coastal waters provides an important source of marine aggregates and, within the same area there are a number of marine disposal sites for spoil from dredging operations. The natural gas reservoirs of the southern North Sea have attracted significant infrastructural development within the SEA 3 region and there are a number of coastal gas terminals and pipelines. A network of subsea communication cables linking the UK with Europe also traverses the SEA 3 region.

For the purpose of this report, the coastal and offshore areas of the SEA 3 region have been divided up into regional sections (see Box 1.1 and Figure 1.1). These regional sections divide the coastline into areas which broadly share a range of economic and environmental issues and activities, as well as providing coastal sections of relatively similar length.

Box 1.1 - SEA 3 regional sections and inclusive counties and unitary authorities	
SCOTTISH BORDERS AND NORTH EAST	The Scottish Borders, Northumberland, Tyne and Wear, Durham, Hartlepool (UA), Stockton-on-Tees (UA), Redcar and Cleveland (UA).
YORKSHIRE AND HUMBER	North Yorkshire, East Riding of Yorkshire, City of Kingston upon Hull (UA), North Lincolnshire (UA), North East Lincolnshire (UA) and Lincolnshire.
NORFOLK AND SUFFOLK	Norfolk and Suffolk
ESSEX AND KENT	Essex, Southend-on-Sea (UA), Thurrock (UA), Medway (UA), Kent.

Figure 1.1 – SEA 3 regional sections



This report shall examine each regional section in turn and determine the extent to which the natural resources of the region are utilised by a range of different industries, organisations and groups (Box 1.2).

Box 1.2 - Coastal and offshore industries and activities	
Fisheries	Telecommunications cables
Ports and shipping	Coastal settlements
Military activity	Tourism and leisure
Aggregate extraction	Bathing waters and marinas
Marine disposal sites	Mariculture
Oil and gas activity	Locally important activities
Alternative energy	

Each regional section is described in a consistent manner that facilitates access to the relevant information. The report can be read in its entirety or as separate regional accounts.

1.1 Coastal and offshore industries and activities

An introduction to the various users of the SEA 3 environment is presented below and a more detailed description is presented in the various regional sections of this report.

1.2 Fisheries

An integral part of the previous SEA 2 process involved an assessment of the North Sea fish and fisheries. The technical report produced by CEFAS/FRS described the fish resources of the North Sea; the major North Sea fisheries; the implications of fisheries management measures for the offshore oil and gas industry and, the impact of oil and gas exploration. CEFAS have deemed this report relevant to SEA 3 and it provides much of the information for this report. The CEFAS/FRS technical report can be found on the DTI's Strategic Environmental Assessment website (http://www.habitats-directive.org/sea/dev/html_file/library_sea2.php).

The North Sea is one of the world's most important fishing grounds. In the central and northern parts there is a mixed demersal fishery that targets cod, haddock and whiting; plaice and sole are trawled in the southern and southeastern North Sea; there are extensive pelagic fisheries for herring and mackerel; crustaceans fisheries for *Nephrops*, crab and scallop; and industrial fisheries for sandeel and Norway pout.

Within the SEA 3 area, there are a number of fishing ports which target fisheries both within the SEA 3 area and further afield. Landings data into these ports by the UK fleet give some indication of the main species targeted in the SEA 3 area (Table 1.1). The data includes both coastal and offshore fishing activity and may also include fish taken from outwith the SEA 3 area.

Table 1.1 – Landing weights (tonnes) in 2000 by the UK fleet at fishing ports in SEA 3

Species	North Shields	Whitby	Scarborough	Bridlington	Hull	Grimsby	Lowestoft
Cod	480	1,230	908	167	5,544	1,027	667
Haddock	226	542	378	69	544	283	14
Lemon Sole	-	144	150	15	-	144	112
Plaice	51	60	77	23	-	806	2,541
Whiting	310	452	350	16	2	30	5
Total demersal	**1,296**	**2,598**	**2,022**	**427**	**8,058**	**3,718**	**3,890**
Table 1.1 – Landing weights (tonnes) in 2000 by the UK fleet at fishing ports in SEA 3							
Crabs	10	281	53	1,311	-	1,413	-
Lobsters	-	72	38	129	-	56	-
Nephrops	1,047	28	69	-	-	46	-

Scallops	-	16	5	54	-	-	8
Shrimps	-	-	-	-	-	174	23
Whelks	-	2	79	2,600	-	1,921	47
Total shellfish	**1,065**	**404**	**340**	**4,110**	**-**	**3,612**	**81**
Total all species	**2,361**	**3,003**	**2,362**	**4,537**	**8,060**	**7,330**	**3,973**

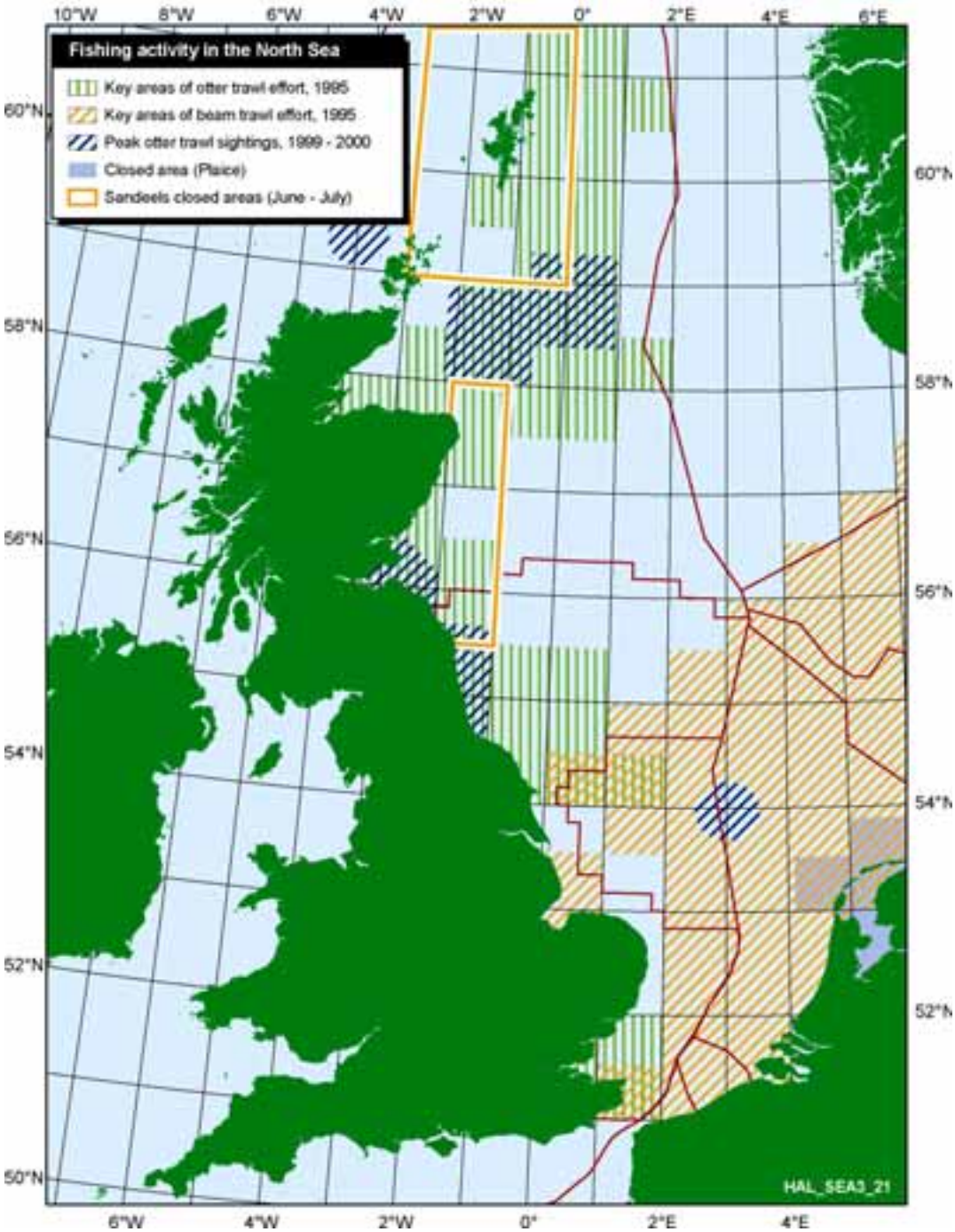
Those ports in the northern part of SEA 3 primarily target the mixed demersal fishery – cod, haddock and whiting whilst further south the plaice fishery is dominant. Shellfish landings are greatest at Bridlington and Hull although *Nephrops* make up an important component of landings into North Shields. There are no major landings of pelagic species into the main fishing ports within the SEA 3 area.

Within this report, the North Sea fisheries are further described in terms of those which operate within offshore areas of SEA 3 and those which target species within coastal or nearshore waters (within 6nm of the coast).

1.2.1 Offshore fisheries

The main areas of fishing activity in the North Sea are described in Figure 1.2.

Figure 1.2 – Fishing activity in the North Sea. Stock management areas are also shown



Mixed demersal fisheries

One of the most important fisheries in the North Sea is the mixed demersal fishery that targets cod, haddock and whiting in the central and northern parts of the region. Usually, otter trawl and seine net vessels catch cod as part of a mixed fishery in which haddock and whiting form an important component of the catch. Cod also form an important by-catch in the beam trawl fisheries targeting plaice and sole.

Recent overflight data (1990-2000) for English waters showed that most otter trawl effort was concentrated in the 1st and 4th quarters of the year on the northeast coast of England in the vicinity of the Farn Deep (off Northumberland), and during the spring and summer months further offshore south and west of the Dogger Bank, and near the Silver Pit. There was relatively little otter trawl effort in the southern SEA 3 area.

International landings of cod by ICES rectangle for 1999 showed that, in the 1st and 2nd quarters of the year, the highest catches were taken in offshore areas of the southern part of SEA 3 including around the coast of Kent. In the second half of the year a similar fishing pattern remained, but cod were also landed from offshore waters of the northern part of SEA 3 although in lower numbers.

Landings of haddock are concentrated in the northwestern North Sea, and although haddock are largely absent from the southern North Sea, they do occur there during years of strong recruitment.

Whiting are caught throughout the year over a wide area, but especially in the northern North Sea and off the north east coast of England.

Plaice and sole fisheries

North Sea plaice and sole are taken in a mixed flatfish fishery by beam trawlers in the southern and southeastern North Sea. There are also directed fisheries for plaice carried out with seine and gill nets and by beam trawlers in the central North Sea. Beam trawl activity is low/moderate throughout much of the SEA 3 area although there are areas off the Lincolnshire and Kent coasts which support greater fishing effort.

Herring and mackerel fisheries

Fishing for herring offshore is mainly undertaken with purse seines and trawls and to a very minor extent by fixed nets in coastal waters. While North Sea stocks are fished throughout the year, landings are greatest in the third quarter of the year, predominantly from northwest of the Dogger Bank and in coastal waters of eastern England. Mackerel are primarily targeted by pelagic trawlers in the northern North Sea.

Industrial fisheries

Sandeel are taken by trawlers using fine-meshed gears. Fishing for sandeel takes place mainly during the summer months, especially throughout May, June and July, and is focussed on the Dogger Bank, and within both offshore and coastal areas of the northern part of SEA 3. Danish and Norwegian fleets accounted for 95% of the international landings of sandeel from the central North Sea in 1999.

Crustacean fisheries

Crustacean fisheries are generally of high value and target specific grounds at different times of the year. A range of gears, such as bottom trawls, prawn trawls, seines and pots are used in these fisheries, as well as scallop dredges.

Norway lobster (*Nephrops norvegicus*) are landed from discrete areas to the north and west of the Dogger Bank, along the northeast coast of England, the eastern coast of Scotland, and on the Fladen ground in the northern North Sea. Whilst there are no strict fishing seasons for Norway lobster effort in the Farn Deeps and Firth of Forth fisheries is concentrated in the autumn and winter.

The edible crab fishery is an important source of income to UK shellfishers. The traditional fishery is seasonal with peak catches in May and June, but many fishermen, supplying both the live continental market and the home processing market, now prosecute the fishery throughout the year. Two distinct types of vessels target the crab fishery: smaller inshore vessels working a mix of crab and lobster pots;

and larger Vivier crabbers (boats equipped to carry their catches live for extended periods) which work the offshore grounds. Crabs are captured in traps, called pots or creels, which are baited with fresh fish. The traps are shot in fleets of 20 or more depending on vessel size and are usually hauled once every 24 hours. Some of the larger vessels will work up to 1000 traps.

Crab fisheries off the English coast are targeted by vessels from Bridlington, Grimsby and ports along the north Norfolk coast. Although crab grounds in this region are mainly inshore, they also extend eastwards into the gas fields beyond the Silver Pit.

Cephalopod fisheries

In general, squid catches in the UK, as in most northern European countries, are a by-catch of demersal trawl and seine net fisheries. There is, however, a limited amount of directed squid fishing, including some use of jigs from small boats in the English Channel. In the North Sea, there is a small directed squid fishery prosecuted close inshore in the Moray Firth.

Cuttlefish are taken by a combination of directed and (mainly) by-catch fishing, the former using traps and the latter based on trawling. The most important fishery area is the English Channel, but cuttlefish catches extend into the Southern North Sea. Octopus fisheries are important in southern Europe, landings from the North Sea are of very minor importance (Pierce, Young and Wang 2000)

1.2.2 Fisheries management

The effects of these fish and shellfish fisheries are widespread and ecologically important, and the removal of target and non-target species impacts the whole North Sea ecosystem. There is concern about the stocks of herring, cod, haddock, whiting, saithe, plaice and sole which are close to or outside Safe Biological Limits. Catch levels for many fish stocks are almost certainly not sustainable (OSPAR 2000, CEFAS website).

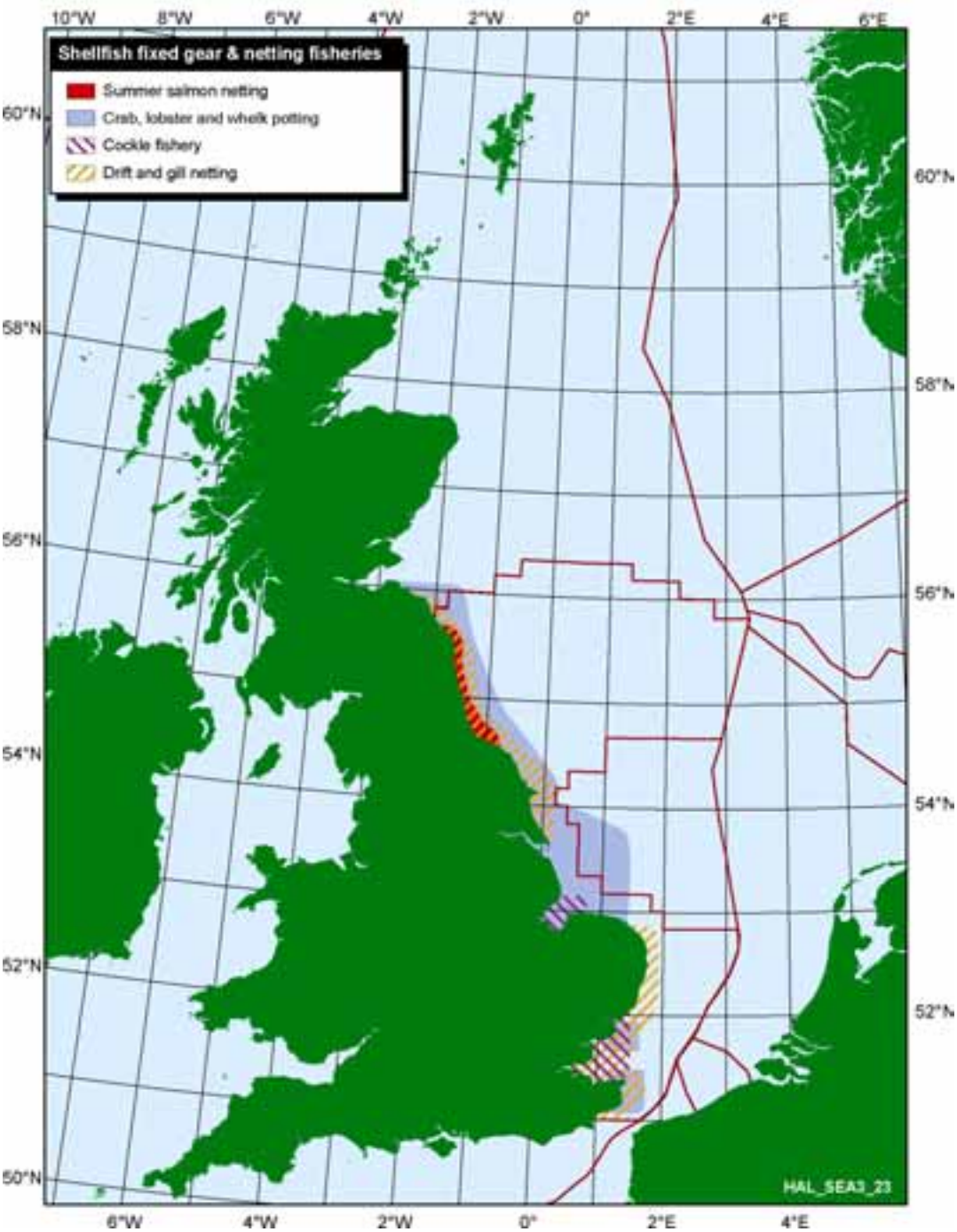
To ensure the sustainability and recovery of these fisheries, a range of fisheries management measures have been implemented by the European Commission, including area and seasonal closures that restrict access to specific fleets in order to offer protection to juveniles and spawning adults and encourage stock recovery (Figure 1.2). For example, during spring 2001, a large closed area was implemented in the southern North Sea and throughout much of Danish and Norwegian waters, which restricted access to cod fisheries. The closure covered the main spawning area and season for mature cod (14 February-30 April 2001). However, the closure has been lifted for 2002 (pers. comm. J Dann, CEFAS) and is unlikely to be repeated. Along the Dutch, German and Danish North Sea coasts, a permanently protected area (the plaice box) has been established to reduce the mortality of juvenile plaice in the beam trawl fishery (Figure 1.2).

Sandeel fisheries off the east coast of Scotland are also closed seasonally. Both the cod closure and plaice box have caused the displacement of fishing activity away from traditional grounds and towards the oil and gas fields of the North Sea. For the otter trawl fleet this represents an increase in existing levels of local effort in regions where the two industries already co-exist. There is some evidence of a slight increase in beam trawl activity in the central and Southern North Sea, since the gear was first used in the southern North Sea during the 1960s. This may have implications for the safety of both the fishing vessels and underwater structures associated with the hydrocarbon industry when they come into contact.

1.2.3 Coastal fisheries

Information relating to coastal fisheries is incorporated into the relevant regional sections of this report and the main coastal fishing areas are shown on Figure 1.3.

Figure 1.3 – Shellfish, fixed gear and net fisheries



Sources of information

Rogers S & Stocks R (2001) North Sea Fish and Fisheries. CEFAS/FRS

http://www.habitats-directive.org/sea/dev/html_file/library_sea2.php

Lee D Ed. UK Sea Fisheries Statistics 1999 and 2000. DEFRA and National Statistics. The Stationary Office

OSPAR Commission 2000. Quality Status Report 2000. OSPAR Commission. London

CEFAS website

http://www.cefas.co.uk/homepage.htm

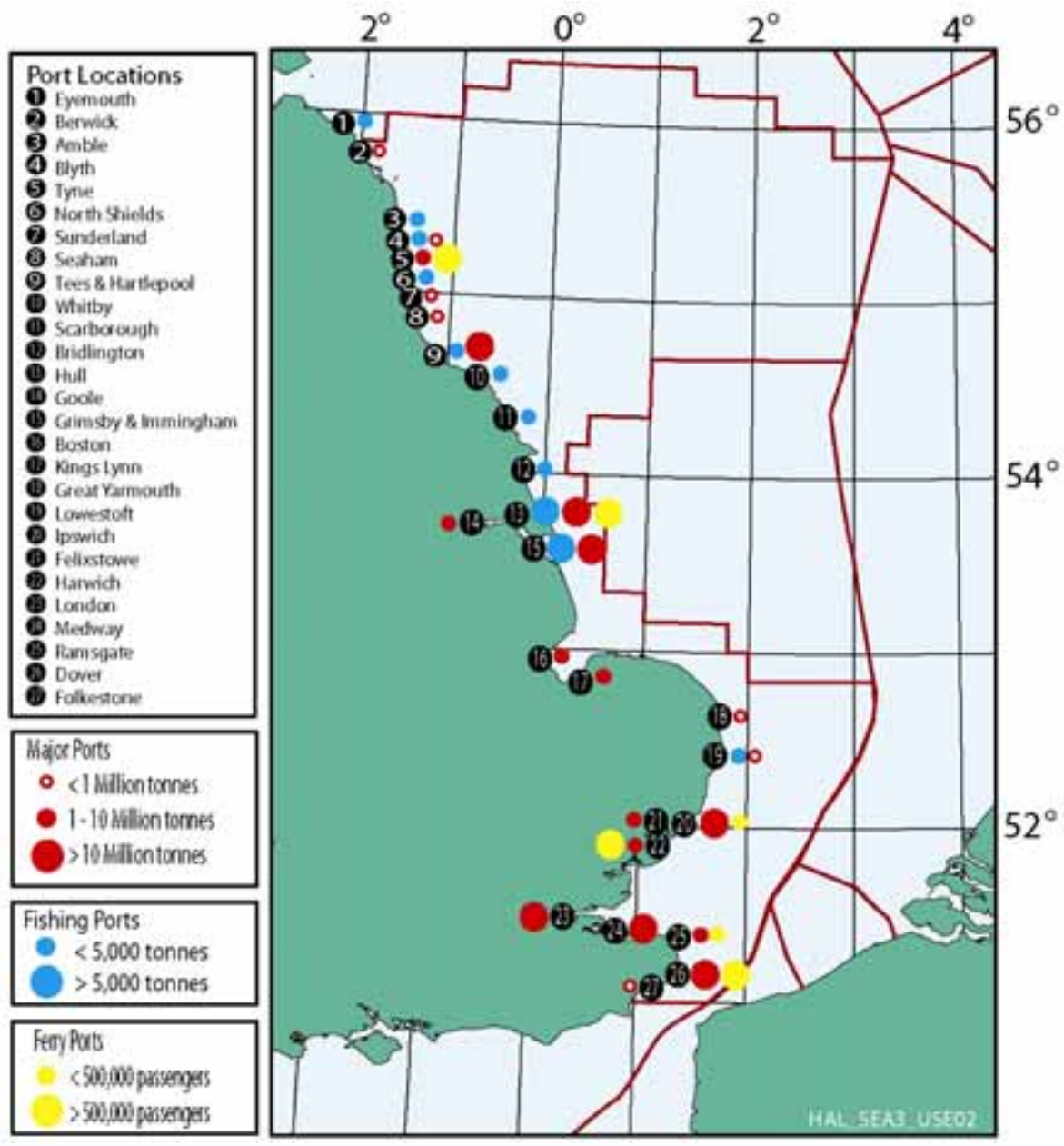
Pierce G, Young I and Wang J (2002). An Overview of Cephalopods Relevant to the SEA 2 and SEA 3 Areas

1.3 Ports and shipping

Shipping and maritime trade are important elements of the UK economy and it is estimated that around 95% of the UK's international trade by volume is transported by sea. Many of the largest ports in the UK are located along the east coast of England and these include Tees and Hartlepool, Grimsby and Immingham, and London. These ports form the focus for many of the major shipping routes throughout the North Sea.

The major commercial ports, fishing ports and ferry ports are described in the relevant regional sections of this report and are highlighted in Figure 1.4.

Figure 1.4 – SEA 3 main ports in SEA 3



For the purpose of this report, shipping density and routeing information has come from the DETR *Identification of Marine Environment High Risk Areas in the UK, 1999* consultation document. This document has utilised information regarding ship routeing and density in UK waters from the COAST database. Developed and maintained by Safetec, the main data sources used to compile the database are summarised in Box 1.3.

Box 1.3 - Sources of shipping data for the COAST database

- Port callings data
- Offshore traffic surveys carried out by standby vessels (> 200 surveys)
- Platform and coastal based radar systems
- Information from offshore operators (standby/supply/shuttle tanker details)
- Information from ferry operators
- Vessel passage plans
- Deep sea pilot route details

The strategic nature of this report means that ship routeing and density within the SEA 3 area are described in a rather broad and general manner (Figure 1.5). However, the COAST database can provide information on a project-specific basis.

1.3.1 Traffic separation schemes

Traffic Separation Schemes exist within areas of high shipping density and consist of two traffic lanes laying either side of a separation zone. Traffic in each lane is one-way with opposing traffic being kept apart by the separation zone.

Traffic separation schemes within the SEA 3 area are described in the relevant regional sections and are highlighted on Figure 1.5.

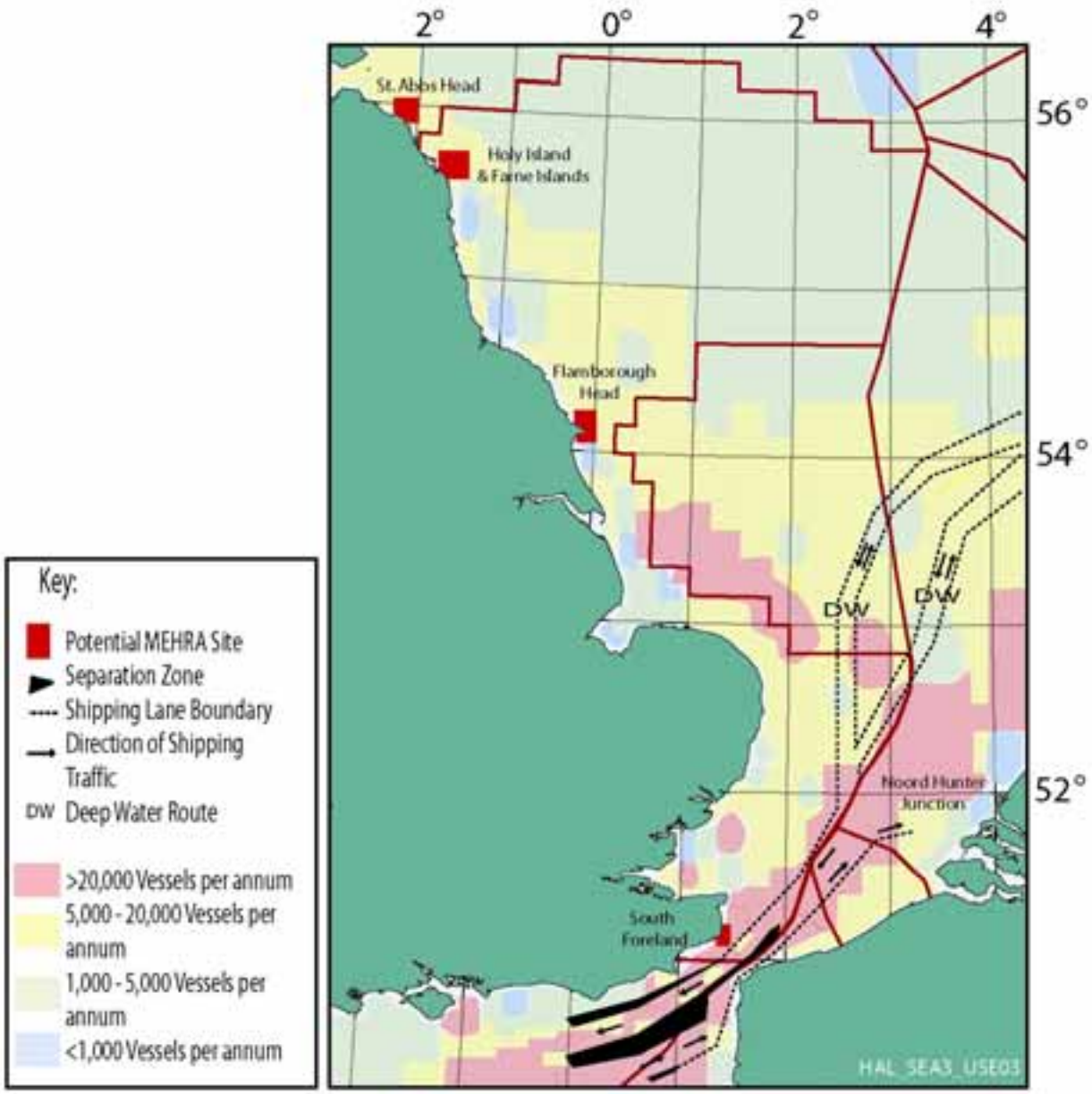
1.3.2 Marine Environment High Risk Areas (MEHRAs)

Following the *Braer* oil spill (5 January 1993), the Donaldson Inquiry of 1994 proposed the establishment of MEHRAs to protect marine areas of high environmental sensitivity at risk from shipping. An assessment was carried out to identify the environmental sensitivity of the UK coastline and coastal waters based on a number of different sensitivity features (e.g. wildlife, landscape, amenity/economy, geology and fishing).

The DTLR are due to publish shortly the identity of UK MEHRAs and these will be incorporated into this report. Once MEHRAs have been formally identified, the location of these sites will be brought to the attention of ship owners and insurers to encourage shipping to plan routeing to avoid these sites and hence reduce the risk of pollution in environmentally sensitive areas.

Those areas of the SEA 3 area that have been highlighted as potential MEHRA's are identified in the relevant regional sections of this report and are shown on Figure 1.5.

Figure 1.5 – Shipping in SEA 3



Sources of information
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document
http://www.transtat.dft.gov.uk/tables/2000/fports/fports.htm
DETR Identification of Marine Environment High Risk Areas in the UK, 1999
Dover Strait Pilot 1997. The UK Hydrographic Office

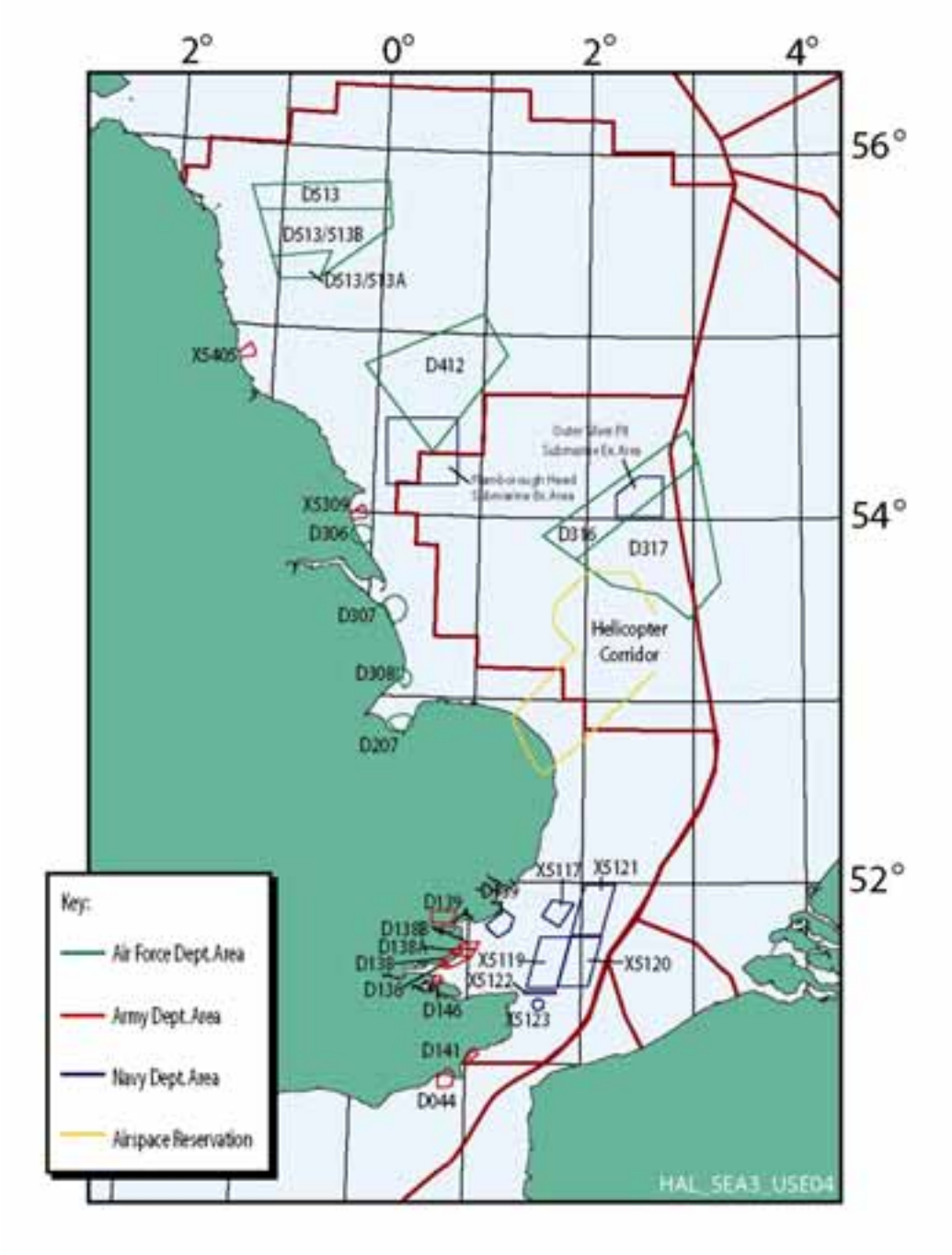
1.4 Military activity

Information relating to military activity in the SEA 3 area comes from Practice and Exercise Areas (PEXA) charts produced by the UK Hydrographic Office. These charts show the sea areas round the UK coast which are in use or available for use by the Ministry of Defence for practice and exercises with or without the use of live ammunition.

The relevant practice and exercise areas within the SEA 3 area are highlighted on Figure 1.6 and described in the relevant regional sections.

The prefix D (Danger) on the site serial number is used for areas which extend above ground/sea level. The prefix X is used for areas in which the activities carried out are at surface or sub-surface level.

Figure 1.6 – SEA 3 military activity



Sources of information
PEXA Chart Q6405 - Clyth Ness to Scarborough. Admiralty Charts and Publications. UK Hydrographic Office
PEXA Chart Q6401 – Scarborough to Poole. Admiralty Charts and Publications. UK Hydrographic Office

1.5 Aggregate extraction

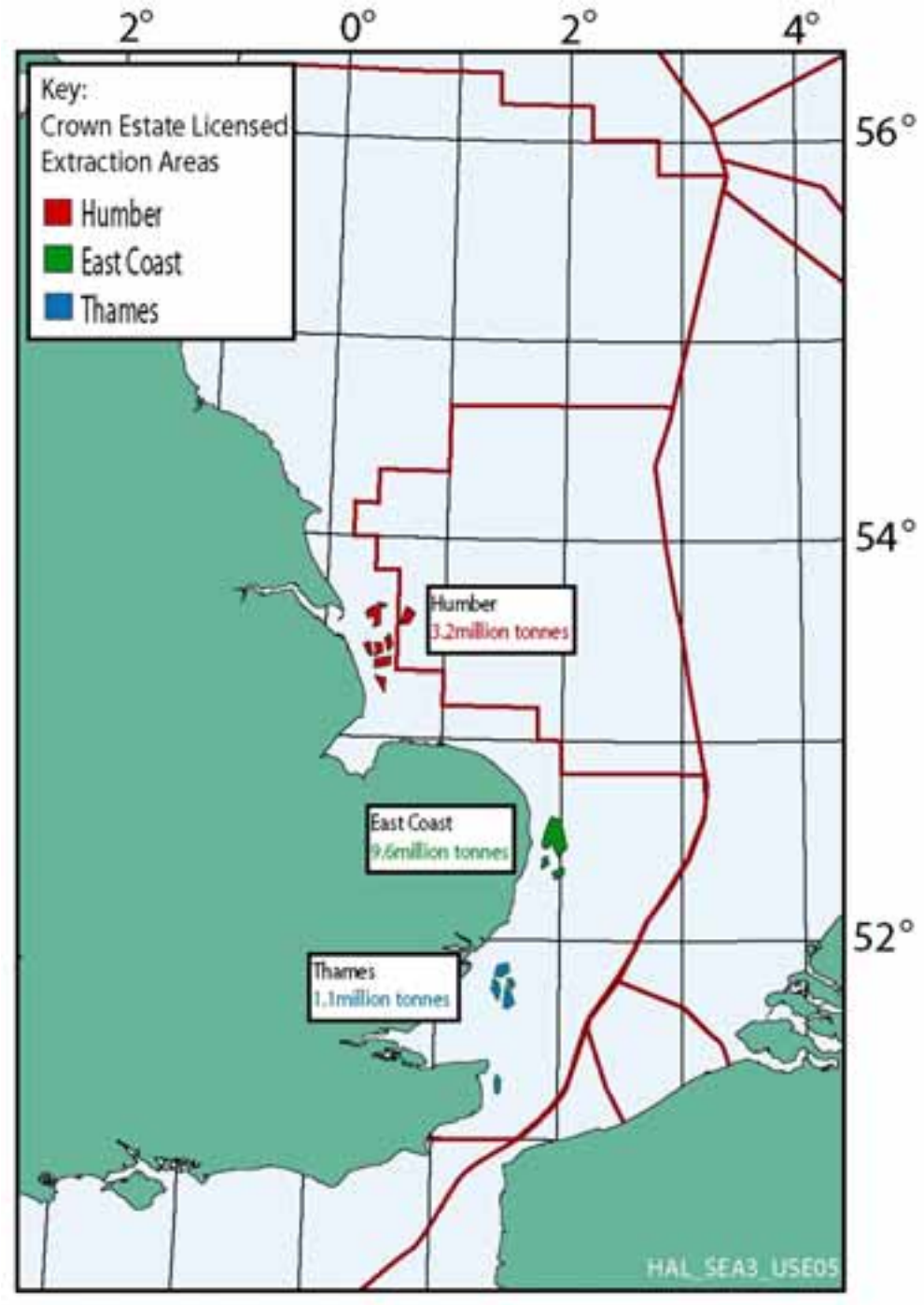
Marine sand and gravel are important sources of industrial aggregates for concrete production for road and buildings construction, the construction industry receiving 58% of the UK's total marine aggregates. Marine aggregates are also used for beach replenishment (22% of UK total) and exported abroad (20%).

The Department of Transport, Local Government and the Regions (DTLR) administer the current procedure for the consent of marine aggregate extraction licenses in England. The Department of the Environment, Food and Rural Affairs (DEFRA) have a responsibility for overseeing and monitoring the effects of dredging whilst the Crown Estate acts as landowner and monitors tonnage removal and compliance with licence conditions.

The presence of extensive offshore sand and gravel deposits has led to a concentration of dredging licences in areas such as the Humber, off Great Yarmouth and the Outer Thames Estuary.

Licensed aggregate extraction areas within the SEA 3 area are identified in the relevant regional sections of this report and are shown on Figure 1.7 with the amount of marine aggregates removed from each region in 2001.

Figure 1.7 – SEA 3 licensed aggregate extraction areas



Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/

1.6 Marine disposal sites

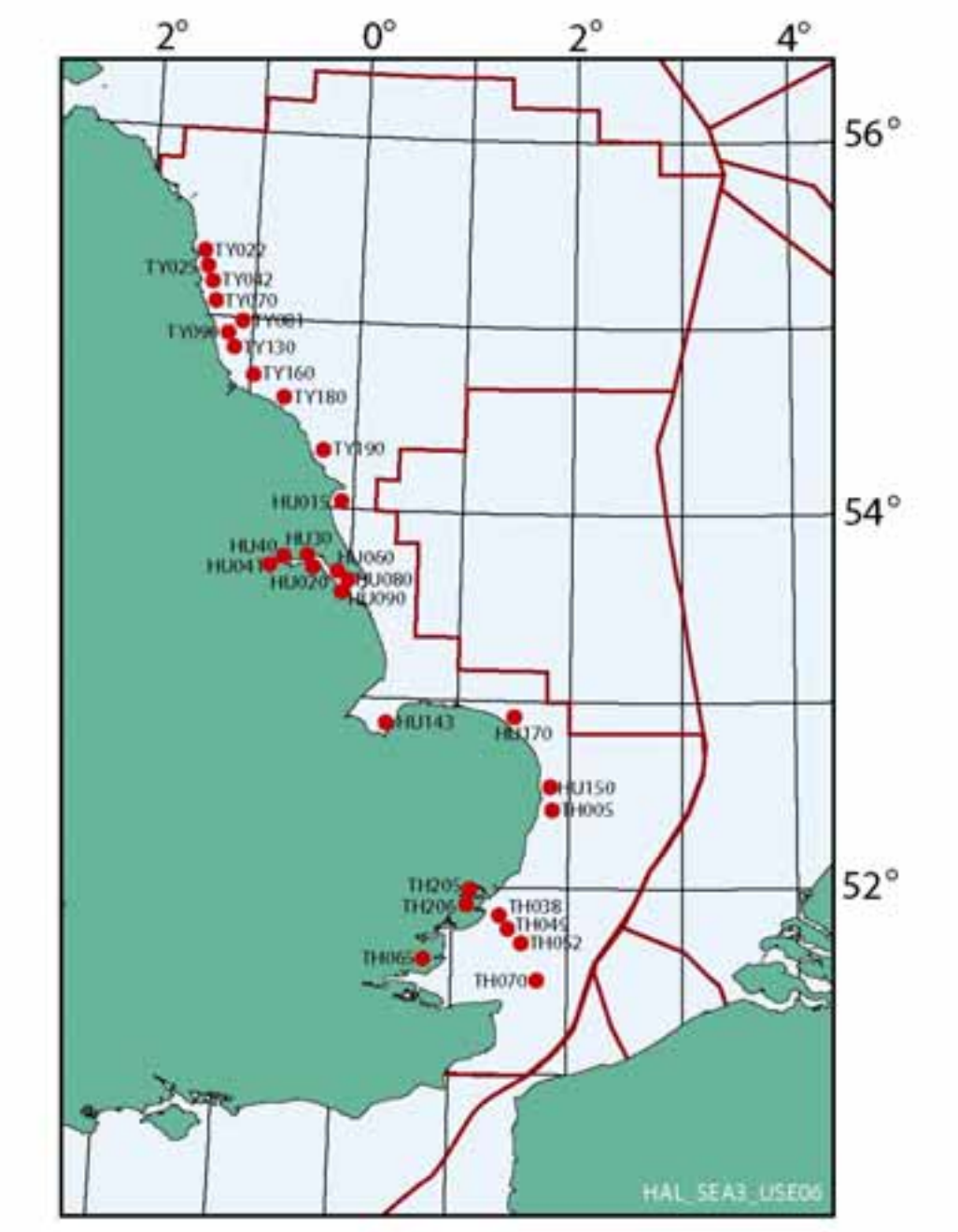
The dumping of most forms of industrial waste at sea has been prohibited since 1994 and the disposal of sewage sludge from the UK was phased out at the end of 1998. The bulk of the material eligible

for sea disposal now comes from dredging operations, an essential activity for ports and navigation channels as well as coastal engineering projects.

A licence for the disposal of waste at sea is issued only where it can be shown that the material is not seriously contaminated and will not harm the marine environment. Dumping of dredged materials can, nevertheless, introduce contaminants to the marine environment. In the UK, the Department for Environment, Food and Rural Affairs (DEFRA) designates the size and location of dumpsites and the sites are subject to periodic monitoring by CEFAS to ensure that impacts are within approved limits.

Licensed marine disposal sites within the SEA 3 area are identified in the relevant regional sections of this report and are shown on Figure 1.8.

Figure 1.8 – SEA 3 marine disposal sites



Sources of information
Pers. comm. Helen Player, CEFAS
OSPAR Commission 2000. Quality Status Report 2000. OSPAR Commission. London

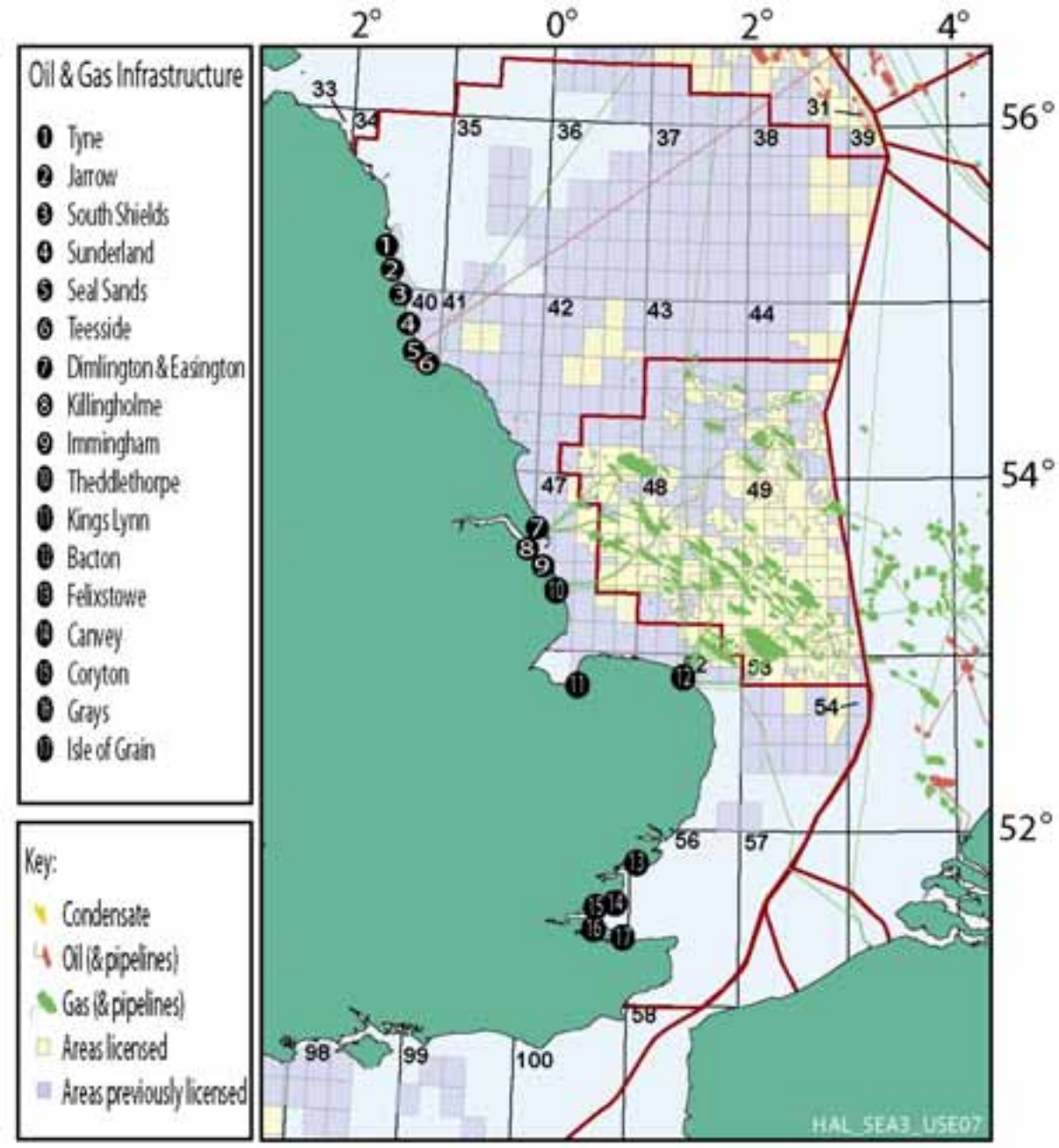
1.7 Oil and gas activity

The oil and gas industry in the North Sea has grown into a major economic industry since the late 1960's. The year 2001 saw record levels of production maintained in the UKCS with 107 million tonnes of oil and natural gas liquids (NGLs) and 112 billion cubic metres of gas (DTI Oil and Gas Directorate website).

Oil and gas activity in the North Sea has primarily centred on the oil and gas fields of the northern and central North Sea and the gas fields of the southern North Sea. Some areas of the SEA 3 area have never been licensed although the majority have historically been licensed but are now relinquished with the result that little exploration has taken place to date.

Oil and gas infrastructure and producing fields within the SEA 3 area are identified and described in the relevant regional sections of this report and are shown on Figure 1.9.

Figure 1.9 – SEA 3 oil and gas activity



Sources of information
DTI Oil and Gas Directorate website
http://www.og.dti.gov.uk/
DTI Brown Book 2001 – Development of UK Oil and Gas Resources 2001. The Stationary Office

1.8 Alternative energy

1.8.1 Renewable energy

Nuclear power has traditionally been the most utilised form of alternative energy production. However, renewable energy production although relatively small-scale at present is set to become an increasingly important means of electricity production in the future (see Box 1.4).

Box 1.4 - Electricity production in the UK (GWh)

	1998	1999	2000
Coal	122,953	106,112	119,960
Oil	6,360	5,685	5,597
Gas	117,858	143,052	146,807
Nuclear	99,486	95,133	85,063
Renewables	9,100	10,191	10,415
Others	5,339	5,289	4,364
Total production	**361,096**	**365,462**	**372,206**

As part of its strategy to reduce emissions of greenhouse gases from burning fossil fuels, the UK Government has set a target to generate 5% of the UK's electricity from renewable sources of energy by 2003 and 10% by 2010. Renewable energy sources in the UK currently generate almost 3% of the total electricity supply.

Potential sources of renewable energy of relevance to the SEA 3 area include wind, wave and tidal power.

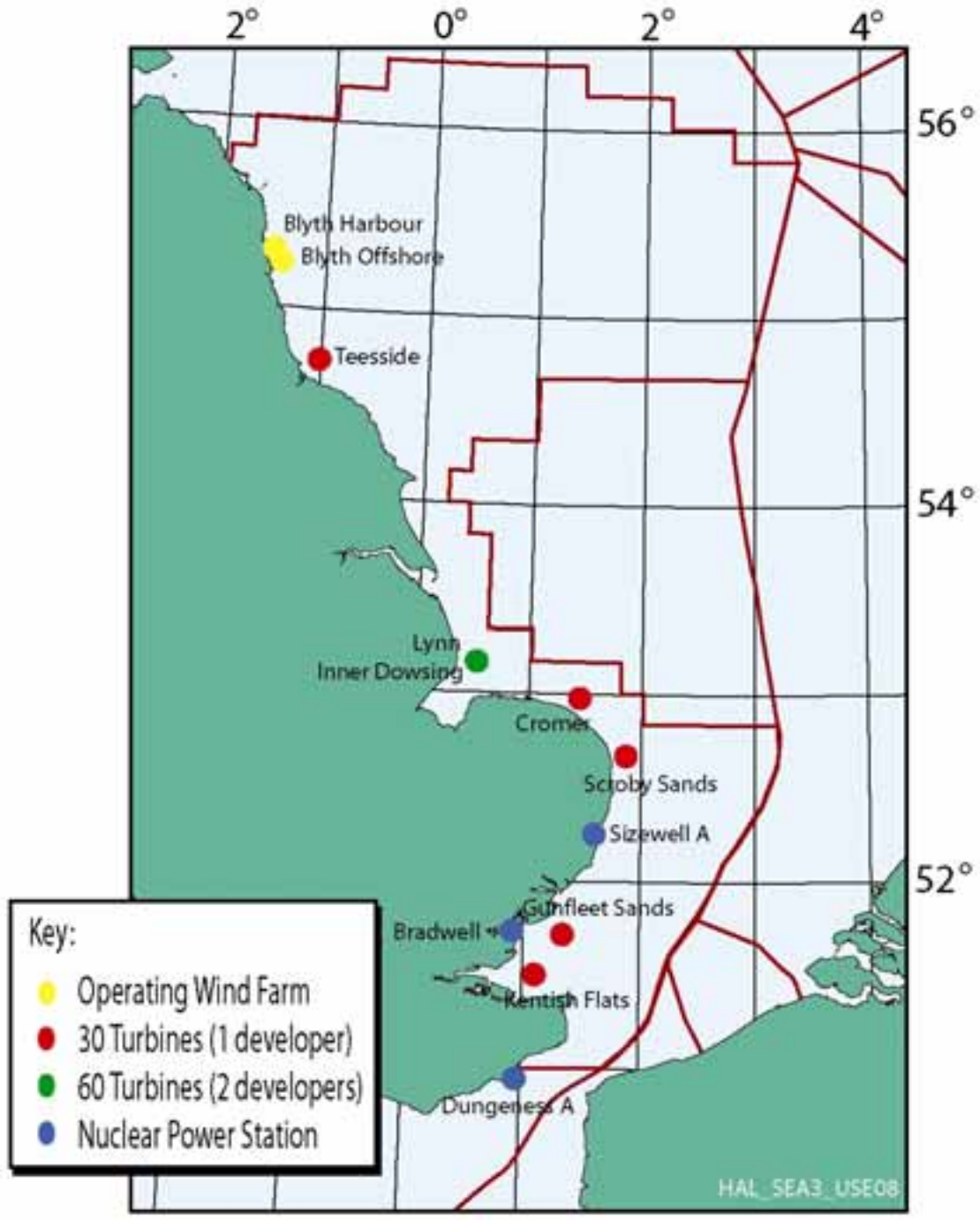
1.8.2 Wind power

The UK has one of the largest wind resources in Europe (40% of Europe's total potential) and therefore the development of wind power in the UK is recognised as being one of the key means of meeting its emissions requirements.

Throughout the UK there are currently 69 wind farm projects (941 turbines) in operation generating 473.6 MW of electricity. Those operating within the SEA 3 area are described in the relevant regional sections and are shown on Figure 1.10.

It is widely acknowledged that the UK has the greatest scope for developing offshore wind energy in Europe. In April 2001 the Crown Estate announced the names of wind farm developers who had successfully pre-qualified to obtain a lease of seabed for the development of offshore wind farms. There are a number of potential offshore wind farm sites within the SEA 3 area which are described in the relevant regional sections of this report and are also shown on Figure 1.10.

Figure 1.10 – SEA 3 other energy sources



1.8.3 Wave and tidal power

There are currently no tidal or wave energy projects in the SEA 3 area.

1.8.4 Nuclear power

Nuclear power is currently an important source of electricity generation accounting for almost 23% of the total electricity produced in the UK in 2000. There are a number of coastal nuclear power stations within the SEA 3 area which are described in the relevant regional sections of this report and are also highlighted on Figure 1.10.

Sources of information
DTI Digest of UK Energy Statistics 2001
Crown Estate website
http://www.crownestate.co.uk/estates/marine/windfarms/wfmap.shtml
British Wind Energy Association website
http://www.britishwindenergy.co.uk/pub.html
British Nuclear Fuels Limited (BNFL) website
http://www.bnfl.co.uk/website.nsf/index.htm

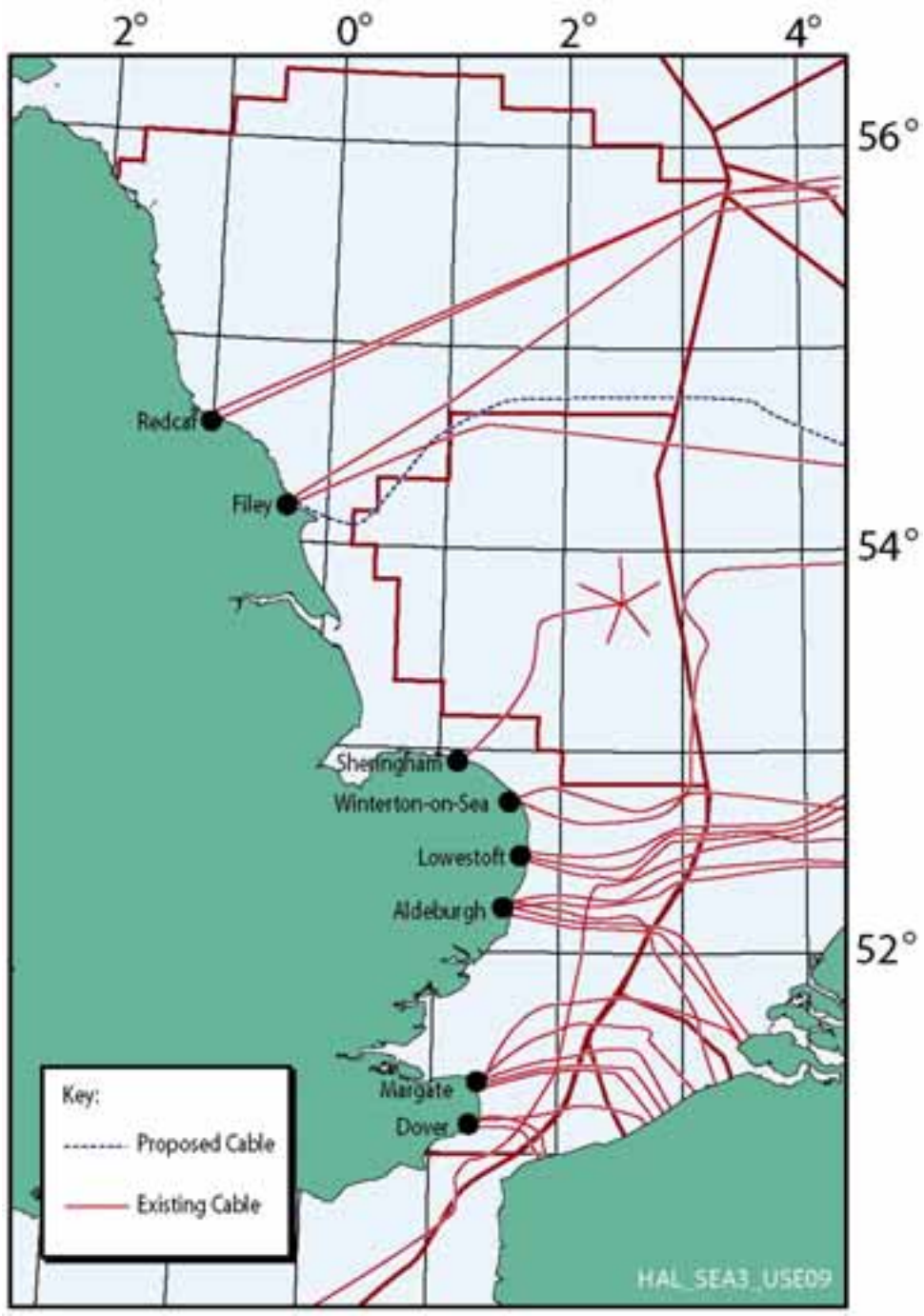
1.9 Telecommunications cables

The growth in Internet use and the development of e-commerce has seen a 500% increase in global electronic data transmission over the past 3 years. Cable numbers are increasing as a result of this increased traffic with many now traversing the North Sea to link the UK with mainland Europe.

In general, most of the cables in operation in the SEA 3 area are trenched to a depth of 40-90cm with rock-dumping used to anchor cables as a last resort. However, older redundant cables are more likely not to be trenched.

Those in-service cables with landfalls on the SEA 3 coast or which traverse the area are highlighted in the relevant regional sections of this report and are shown on Figure 1.11.

Figure 1.11 – SEA 3 Telecommunication Cables



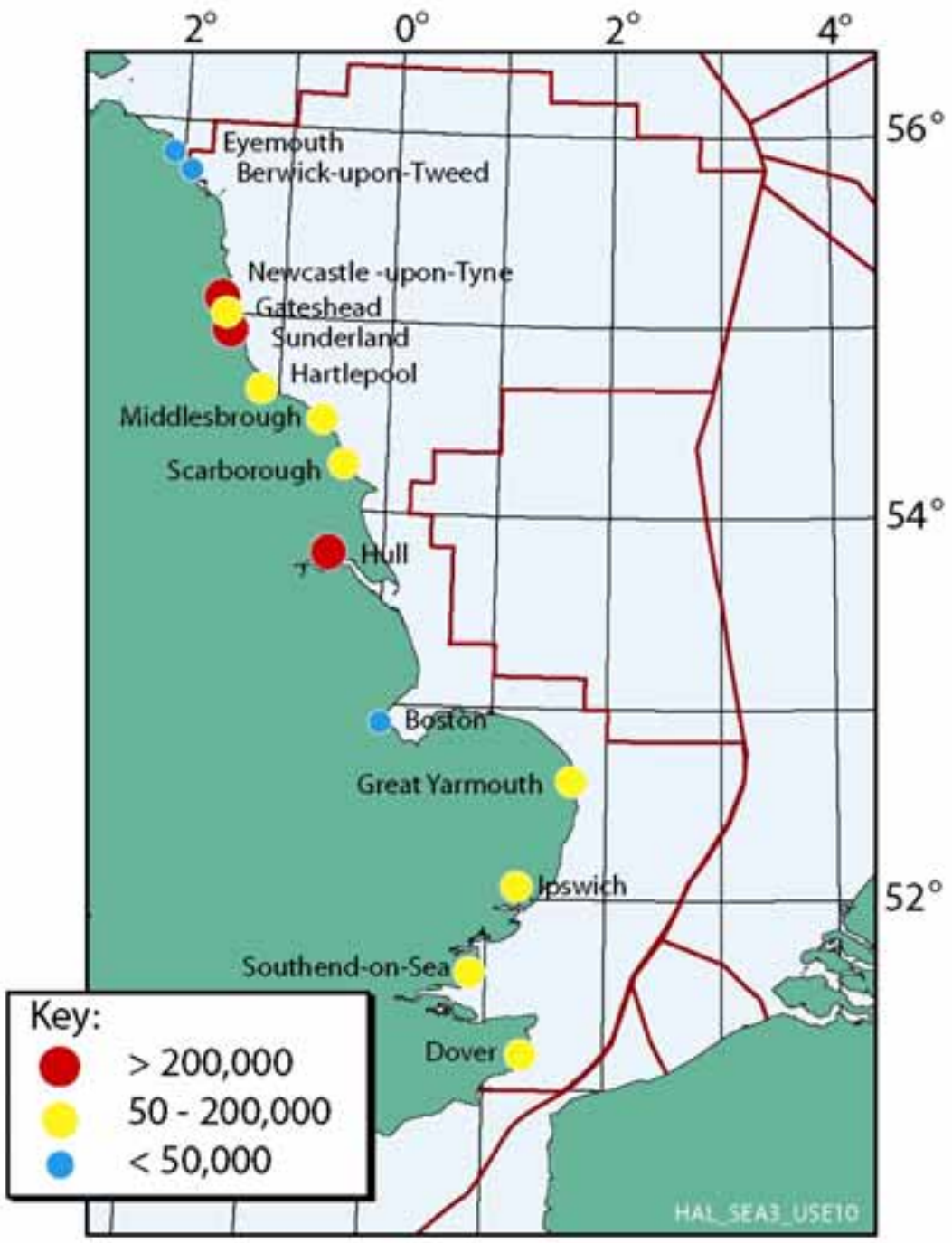
Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/marine/cables/index.shtml
Kingfisher Cable Awareness Charts: Central North Sea, South North Sea, English Channel – East

1.10 Coastal settlements

The coastal region of SEA 3 is predominantly rural along much of its length. The coasts of Northumberland, North Yorkshire, East Riding of Yorkshire, Lincolnshire, Norfolk and Suffolk are sparsely populated compared with the more southern counties of Essex and Kent. Areas of dense population are associated with the industrial centers around Tyneside, the Humber ports and the Thames Estuary.

Coastal settlements within the SEA 3 area are described in the relevant regional sections of this report and are also shown on Figure 1.12.

Figure 1.12 – SEA 3 Coastal Settlements



Sources of information
National Statistics website
http://www.statistics.gov.uk/statbase/
Key population and vital statistics: Local and health authority areas 1999. National Statistics Series VS no.26, PP1 no. 22. The Stationary Office, London

1.11 Tourism and leisure

Tourism is an important source of income and employment for coastal regions of the SEA 3 area with many long established seaside resorts. Activities include walking, bird watching, golf, climbing, camping and wildfowling along the coastline with bathing, sailing, diving, windsurfing, sea angling, water and jet-skiing all popular water sports.

The numbers and expenditure of both UK and foreign tourists to the SEA 3 area are described in the relevant regional sections of this report.

1.12 Bathing waters and marinas

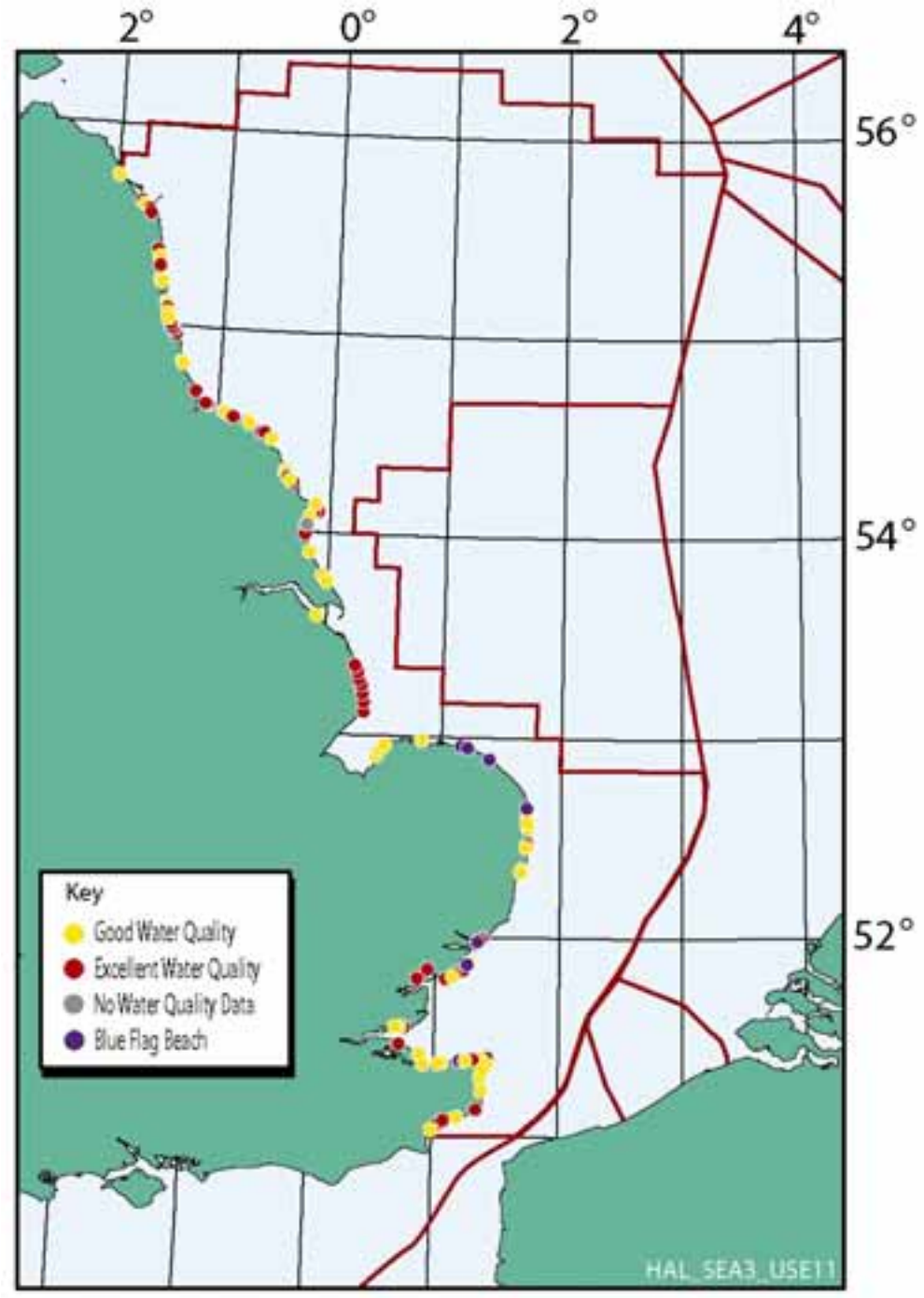
1.12.1 Bathing waters

Within the SEA 3 region there are a large number of bathing waters which have been designated under the EC Bathing Water Directive. These bathing waters have attained certain water quality standards which are described in detail in the SEA 3 Other Designations Report.

For the purpose of this report, the relevant bathing waters have been listed in the regional sections and are shown on Figure 1.13 since many form an important focus for tourism and other leisure based activities.

The Environment Agency has classified Bathing Waters according to whether the bathing water is of excellent (‘guideline’), good (‘mandatory’) or poor (‘fail’) quality.

Figure 1.13 - SEA 3 designated bathing waters and Blue Flag beaches



Blue Flag Award

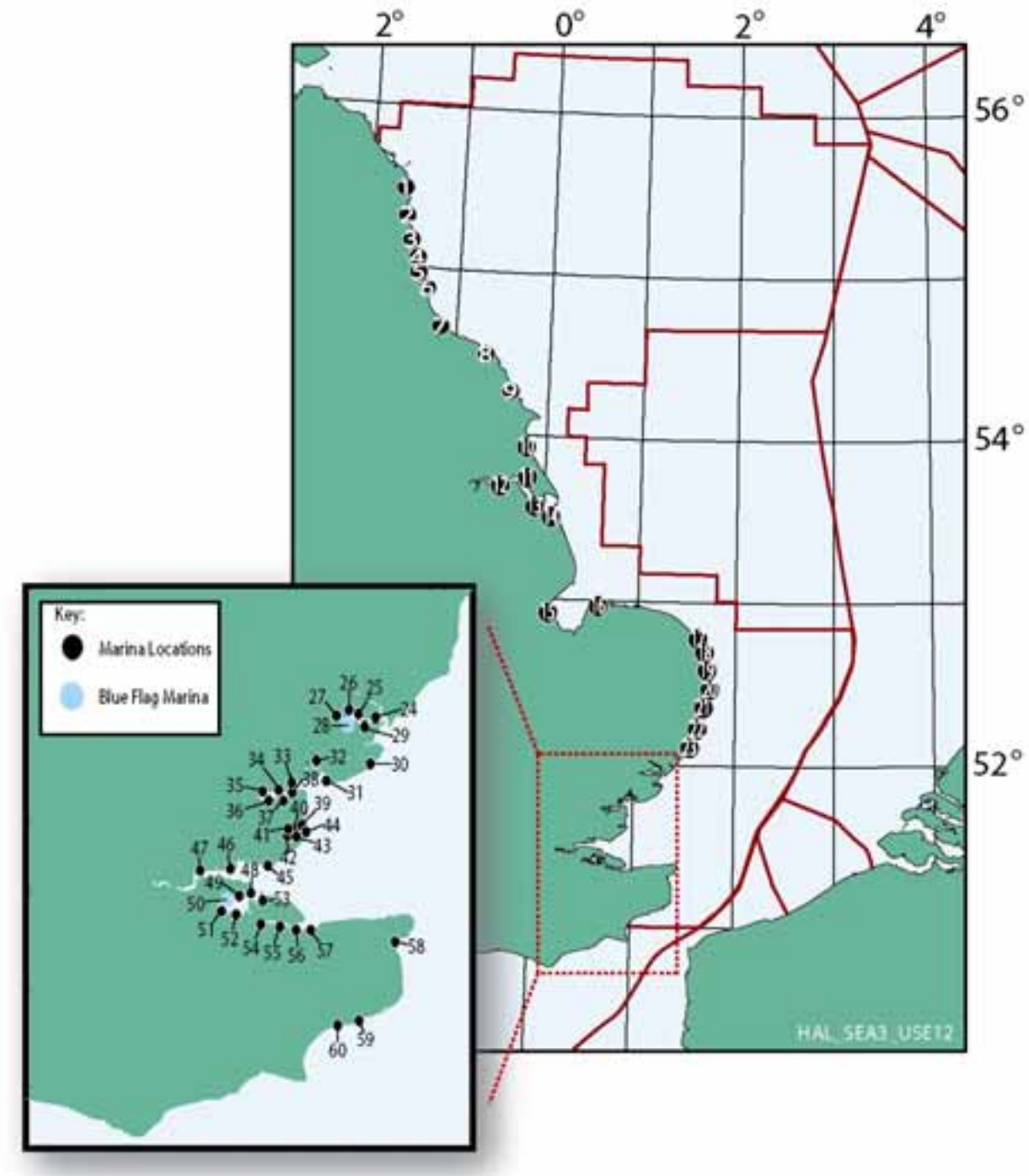
The European Blue Flag Campaign was started in 1987 by the Foundation for Environmental Education in Europe and covers resort bathing beaches only. To qualify, bathing beaches have to meet certain guideline standards of the EC Bathing Water Directive as well as other criteria on beach facilities, cleanliness and safety. In 2001, 55 UK beaches were awarded the Blue Flag award and those within the SEA 3 area are described in the relevant regional sections as well as highlighted on Figure 1.13.

ENCAMS Seaside Award
The ENCAMS Seaside Award scheme was launched by the Tidy Britain Group for resort and rural beaches, to complement the Blue Flag scheme and was based on similar management criteria to those used for Blue Flag beaches but with fewer requirements for rural beaches. All applicants are required to have bathing waters which meet at least the mandatory coliform standards of the Bathing Water Directive. In 2001, 308 UK beaches won Seaside Awards and those within the SEA 3 area are described in the relevant regional sections.

1.12.2 Marinas

Marinas are pontoons and/or jetties for mooring pleasure craft and can form part of a commercial harbour. The popularity of sailing and other water-sports has led to a proliferation of marina developments on the east coast of England and these are described in the relevant regional sections of this report and are shown on Figure 1.14.

Figure 1.14 – SEA 3 marina developments



The Blue Flag is also awarded to licensed marinas and to be eligible, the marina has to fulfil a number of criteria which cover aspects of marina management, such as water quality, environmental education and information, environmental management and, safety and services. Those marinas awarded the Blue Flag in 2001 are described in the relevant regional sections and are also shown on Figure 1.14.

Sources of information
ENCAMS Seaside Awards website
http://www.seasideawards.org.uk/sea2.htm
Blue Flag Campaign website
http://www.blueflag.org/
DEFRA Digest of Environmental Statistics – Coastal and Marine Waters website
http://www.defra.gov.uk/environment/statistics/des/coastwaters/ch040206.htm
Environment Agency website
http://216.31.193.171/asp/bwd_q_simple.asp?language=English
Marina-Info.com
http://www.marina-info.com/minfo/uk/realukindex.htm

1.13 Mariculture

Mariculture is the cultivation of marine species within coastal waters and includes shellfish farming, finfish farming and algae cultivation. Shellfish farming is the only form of mariculture in the SEA 3 area.

In the UK, shellfish for human consumption must be harvested from designated production areas, those areas of relevance to SEA 3 are described in the relevant regional sections and highlighted on Figure 1.15. Further information on designated production areas is provided in the SEA 3 Other Designations Report.

In 2000, there were 112 shellfish farm sites active in England producing 6,718 tonnes of shellfish with an estimated value of £4.5 million (Box 1.6).

Box 1.6 – Production (tonnes) of farmed shellfish in the UK, 2000

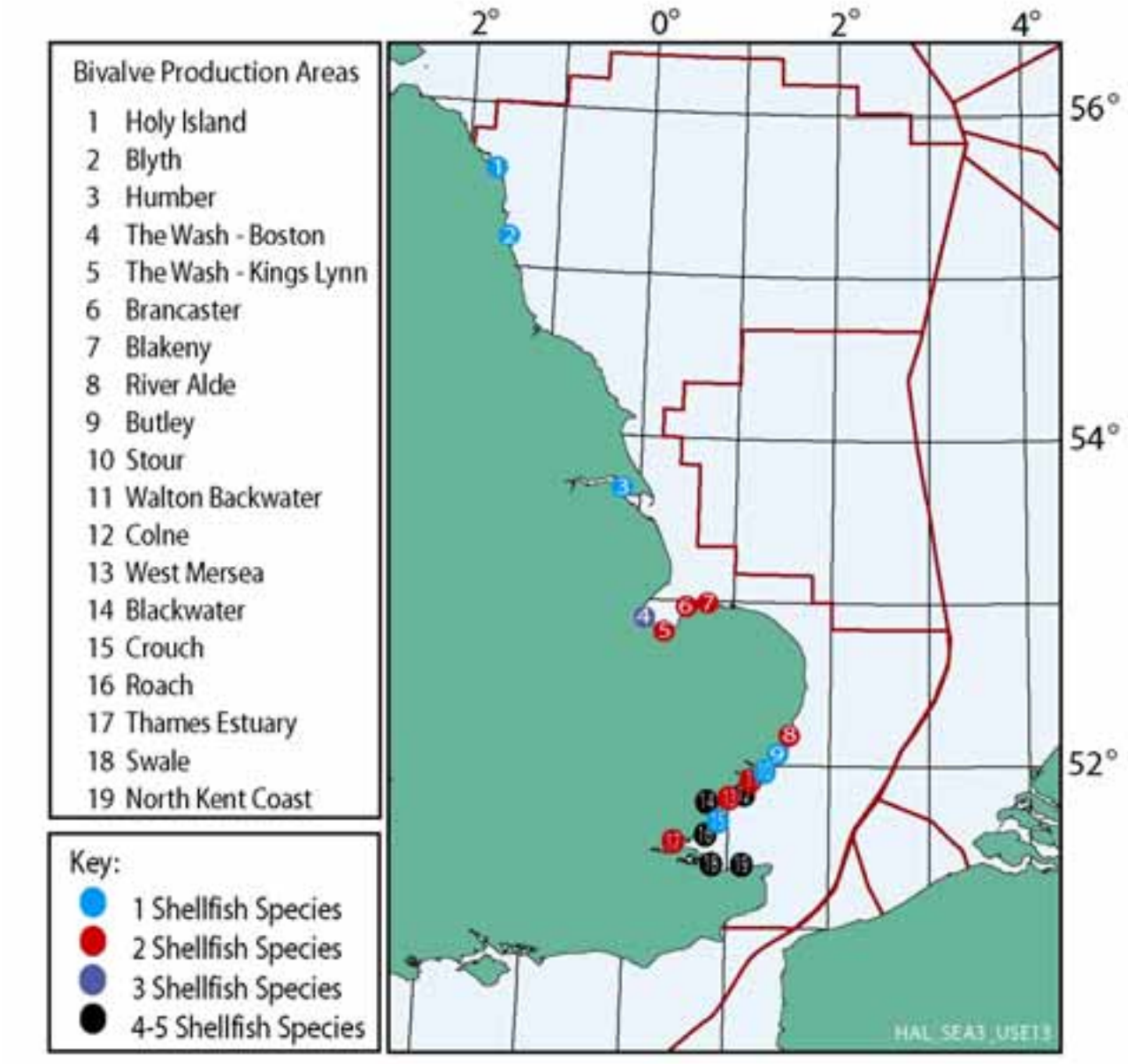
	Scotland	England	Wales	UK Total*
Pacific oyster	247	297	16	
Native oyster	4	115	0	
Oysters (total)	*251*	*412*	*16*	*1,065*
Scallops	39	0	-	39
Queens	58	-	-	58
Mussels	2,003	6,131	5,093	14,322
Clams	-	28	-	30
Cockles	-	147	-	147
Estimated value (£000s)	**3,000**	**4,500**	**2,540**	**11,283**

*Northern Ireland figures included.

Mussel cultivation accounted for a large proportion of England's farmed shellfish production (91%) in 2000. In order to improve the quality of naturally occurring stocks of mussels, young mussels – 'seed' are transplanted from natural beds to man-made 'lays', usually in sheltered inshore waters. In 2000, shellfish farms in East Anglia produced about 40% of the UK's total mussel production.

Pacific oysters are grown from sprat from commercial hatcheries and a variety of methods are used in their cultivation. Some Pacific oysters are put into bags and placed on racks or trestles in the intertidal zone. Others are grown to a certain size in bags then scattered at the beginning of each year directly onto the substrate – 'lays' - for ongrowing. In 2000, shellfish farms in the south east produced approximately 25% of the UK's total Pacific oyster production.

Figure 1.15 – SEA 3 designated bivalve production areas



Sources of information

Food Standards Agency website
http://www.foodstandards.gov.uk/

CEFAS Shellfish News No. 13, May 2002

Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P., & Davidson, N.C., *eds*. 1995. C*oasts and seas of the United Kingdom. Region 6 Eastern England: Flamborough Head to Great Yarmouth.* Peterborough, Joint Nature Conservation Committee.

Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P., Davidson, N.C., & Buck, A.L., *eds*. 1998. *Coasts and seas of the United Kingdom. Region 7 South-east England: Lowestoft to Dungeness*. Peterborough, Joint Nature Conservation Committee. (Coastal Directories Series.)

1.14 Locally important activities

Locally important activities within the SEA 3 area are described below. Much of the information regarding locally important activities comes from management schemes for the various European marine sites within the SEA 3 area.

Along the Berwickshire and Northumberland coast, bait digging occurs throughout the year but mainly during the winter months (September to March), collection of bait from rocky shores mainly occurs during summer months. Periwinkle collection both for consumption and export occurs on rocky shores throughout the year. Food collection is mainly carried out during summer months, with collection of lobsters and edible crabs (cleaking) occurring during spring tides. Wildfowling is also an important activity (Fortune & Quigley 2001).

The intertidal areas around the Flamborough headland have historically been subject to the collection of species for food and bait. The chalk cliffs are geologically internationally important and fossils are regularly exposed and subject to collection. Common rights exist and local acts apply to people collecting a variety of materials for either building/consumption/bait/other purposes. There is no single body, which regulates these activities, and management is usually achieved through voluntary agreements and codes of conduct which are promoted through local or national representatives (Evans 2000).

Further south around the Wash and North Norfolk coast, traditional activities, including common rights, such as samphire gathering, bait digging and wildfowling are widely recognised as a particularly important aspect of the local culture and economy. These activities are generally seasonal in nature, localised in their extent, employ traditional methods and place a strong emphasis on sustainability (Mortimer 2001).

Sources of information

Fortune F & Quigley M (2001). Managing the Berwickshire and North Northumberland Coast European Marine Site

Evans K (2000) Flamborough Head European Marine Site Management Scheme

Mortimer D (2001). Wash and North Norfolk Coast European Marine Site Management Scheme

2 SCOTTISH BORDERS AND NORTH EAST

The Scottish Borders and North East region (see Figure 1.1) includes the Scottish Borders, the counties of Northumberland, Tyne and Wear, Durham, and the unitary authorities of Hartlepool, Stockton-on-Tees and, Redcar and Cleveland.

The region is predominantly rural along much of its length although there are areas, focussed around the Rivers Tyne and Tees of intense industrialisation. Tees and Hartlepool is the second largest port in the UK and there is considerable oil and gas infrastructure in the region, including the Teeside oil and gas terminals. The region also boasts the UK's first operating offshore wind farm at Blyth.

2.1 Coastal fisheries

The Northumberland Sea Fisheries Committee (NSFC) regulates the coastal fisheries between the Scottish border and South Shields, and the North Eastern Sea Fisheries Committee (NESFC) regulates the region from South Shields down to Lincolnshire.

Fishing vessels operating along this stretch of coast traditionally fish inshore, exploiting resources found within daily steaming distance of most ports, such as *Nephrops*, white fish, salmon, crustaceans and, locally, molluscs and pelagic fish. The trawler fleet fish out to 20 miles offshore, targeting *Nephrops* and white fish, often in the 'Farn Deeps' (a deep water trench some 10-20 miles offshore).

Within the region covered by the NSFC there are 128 full-time permits for vessels potting for lobster, crab and velvet crab within coastal waters. A summer salmon fishery using drift nets and T-nets occurs between Holy Island and Whitby with 72 licensed vessels in operation. In winter, there is a small amount of gill-and trammel net fishing for cod. The vast majority (>90%) of trawlers in the region move up to Eyemouth in the winter to take advantage of the prawn fishery in the Firth of Forth returning in September, along with many Scottish boats. The winter prawn fishery in the Northumberland region extends out between 3-24nm of the coast.

The main ports for the coastal fishery in Northumberland are North Shields, Blyth and Amble. Further south, between South Shields and Hartlepool there are a total of 73 potting vessels using over 12,000 pots, 56 netting vessels and 43 trawlers. Hartlepool forms the main focus for vessels in this area.

Sources of information

Pers. comm. AF Coe, Northumberland Sea Fisheries Committee

North Eastern Sea Fisheries Committee website
http://www.neseafish.gov.uk/index2.html

Summary of Fishing Effort 2001. North Eastern Sea Fisheries Committee

Pawson MG, Pickett GD and Walker P (2002). The Coastal Fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

2.2 Ports and shipping

2.2.1 Major ports

The Scottish Borders and North East region contains a number of ports which handle significant quantities of foreign and domestic traffic (Table 2.1 and Figure 1.4). There are no major ports in the Scottish Borders.

Table 2.1 - Foreign and domestic traffic handled by ports in the region			
	1998	1999	2000
		Million tonnes	
Berwick	0.14	0.14	0.15
Blyth	1.14	0.81	0.93
Tyne	2.14	2.21	2.39
Sunderland	1.0	1.04	0.93
Seaham	0.52	0.49	0.51
Tees and Hartlepool	51.45	49.32	51.47
All UK Traffic	**568.5**	**565.6**	**573.1**

In 2000, Tees and Hartlepool was the largest port in the North East region and the second largest in the UK. The Tees and Hartlepool port authority includes the ports of Middlesbrough, Billingham, Redcar and Hartlepool.

In 2000, port traffic through Tees and Hartlepool was in excess of 51 million tonnes (9.0% of UK total) (Box 2.1). There is a major oil and gas terminal on Teeside as well as an oil refinery and tanker terminal (see Section 2.6 - Oil and gas activity) and in 2000, Tees and Hartlepool was responsible for handling 11.7% (32.4 million tonnes) of the UK's foreign and domestic oil and gas traffic and 6.8% (19.1 million tonnes) of the UK's non-oil traffic.

Box 2.1 - Tees and Hartlepool foreign and domestic port traffic 2000	
	Million tonnes
Liquid bulk	
Crude oil	25
Oil products	7.4
All liquid bulk traffic	36.1
Dry bulk	
Ores	3.9
Coal	3.8
All dry bulk traffic	9.3
Other general cargo	1.8
Containers	0.4
Roll-on/roll-off (self-propelled)	0.3
Roll-on/roll-off (non self-propelled)	4.4
All traffic	**51.5**

Sources of information
DTLR Maritime Statistics website
http://www.transtat.detr.gov.uk/shipping/index.htm#ports
DTLR Maritime Statistics 2000. The Stationary Office, London

2.2.2 Fishing ports

The Scottish Borders and North East region contains a number of fishing ports which are listed in Table 2.2 (and highlighted on Figure 1.4), along with the total amount of demersal, pelagic and shellfish species landed by the UK fishing fleet at each port in 2000.

Table 2.2 - Fish landings by UK fleet into major ports in the region 2000						
	Demersal*		Pelagic*		Shellfish*	
Eyemouth	2.1	(2.3)	-	-	0.6	(1.2)
Amble	0.6	(0.6)	-	-	0.4	(0.8)
Blyth	0.7	(0.7)	-	-	0.5	(0.8)
North Shields	1.3	(1.4)	-	-	1.1	(1.6)

Table 2.2 - Fish landings by UK fleet into major ports in the region 2000						
Hartlepool	0.6	(0.6)	-	-	0.2	(0.3)
UK total	**227**	**(248)**	**110**	**(21)**	**127**	**(153)**

*Figure not in brackets = quantity (thousand tonnes), figure in brackets = value (£ million).

Eyemouth and North Shields are the largest fishing ports in the Scottish Borders and North East region although in national terms, they are relatively small.

Sources of information
Lee D Ed. UK Sea Fisheries Statistics 1999 and 2000. DEFRA and National Statistics. The Stationary Office

2.2.3 Principal ferry routes

The Port of Tyne is the only port in the region to offer passenger services, with year round Ro-Ro links to Norway, Sweden and the Netherlands (Table 2.3). A summer-only service also operates to Hamburg. These services are of particular importance to the region's growing tourism industry as are the expanding number of cruise liner calls into the port.

Table 2.3 - Principal ferry routes in the region			
	1998	**1999**	**2000**
	Thousand passengers		
Tyne – Bergen, Kristiansand, Stavanger and Karmsui	184	205	222
Tyne – Goteborg	24	85	88
Tyne – Hamburg	63	54	-
Tyne – Ijmuiden	195	282	357

2.2.4 Ship arrivals

In the Scottish Borders and North East region, Tees and Hartlepool is by far the largest port, followed by the port of Tyne. Table 2.4 indicates the numbers and type of vessels that visited these ports in 1999. Tees and Hartlepool was visited by a total of 5,214 ships in 1999 and of these, the majority were tankers (1-20,000 tonnes) and cargo vessels (1-20,000 tonnes). Tees and Hartlepool also received a relatively large number of vessels over 100,000 tonnes - 30% of the UK's total number of large dry cargo vessels and over 10% of the UK's total number of large tankers.

Table 2.4 - Ship arrivals at major ports in the region, by type and deadweight 1999										
				Ro-ro		**Container**		**Other dry**		
Deadweight	**Tankers**			**vessels**		**vessels**		**cargo vessels**		
tonnes (x1000)	**1-20**	**20-100**	**100+**	**1-20**	**20+**	**1-20**	**20+**	**1-20**	**20-100**	**100+**
Tyne	137	11	-	572	-	151	2	564	40	-
Tees & Hartlepool	2,270	298	69	941	34	99	-	1,371	52	80
All UK ports	**18,123**	**2,841**	**681**	**88,390**	**196**	**3,904**	**3,225**	**35,584**	**1,559**	**266**

Sources of information
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document

2.2.5 Shipping density

The large amount of foreign and domestic traffic handled by some of the ports in the region, in particular Tees and Hartlepool and the regular ferry services from the port of Tyne, ensures that the density of ships in and around these ports is significant (5,000-20,000 ships per annum). Offshore

areas of the region experience lower shipping pressures of between 1-5,000 ships per annum (Figure 1.5).

The main shipping routes off the Scottish Borders and North East coast are plied by oil and shuttle tankers between the Teeside oil terminal and other ports in the UK and Europe. The movement of bulk cargoes between Tees and Hartlepool and Europe as well as the ferry routes from Tyneside to Northern Europe are also major shipping routes.

2.2.6 Traffic separation schemes

There are no traffic separation schemes operating in the waters close to or further offshore from the Scottish Borders and North East coast.

2.2.7 Marine Environment High Risk Areas (MEHRAs)

As mentioned in the introduction, the concept of MEHRAs is to identify comparatively limited areas of high environmental sensitivity, which are also at risk from shipping (i.e. marine pollution). Within the Scottish Borders and North East region, a number of potential MEHRA sites have been identified and these are shown in Box 2.2 and Figure 1.5.

Box 2.2 - Potential Location of MEHRA's in the Scottish Borders and North East region
St. Abbs Head near Berwick Upon Tweed
Holy Island near Berwick Upon Tweed
Farne Islands

Sources of information
DETR Identification of Marine Environment High Risk Areas in the UK, 1999.

2.3 Military activity

There are a number of military activity areas within the Scottish Borders and North East region, the majority of which are for air force training (Table 2.5 and Figure 1.6).

Table 2.5 – Military activity areas in the Scottish Borders and North East region

Serial no.	Name	Type of practice*	Altitude range (feet above surface)
Navy department aeas			
D607	Firth of Forth (Middle)	A/A, S/M, SU, HM Ships, PTA, AAF, TT	55,000
D608	Firth of Forth (Outer)	A/A, S/M, SU, HM Ships, PTA, AAF, TT	55,000

Table 2.5 – Military activity areas in the Scottish Borders and North East region			
Air Force department areas			
D609	St Andrews	Sonabuoy, Missile, Firing	
D412	Staxton	AAF	10,000
D513	Druridge Bay	AAF	10,000
D513A	Druridge Bay	HM Ships, AAF	55,000
D513B	Druridge Bay	AAF	55,000
Army department areas			
X5405	Whitburn	Rifle	

*Type of Practice: A/A (High and Low-angle Gunnery), AAF (Air-to-Air Flying), PTA (Pilotless Target Aircraft), S/M (Submarine Exercises), SU (Firing at surface target), TT (Target Towing).

Sources of information
PEXA Chart Q6405 - Clyth Ness to Scarborough. Admiralty Charts and Publications. UK Hydrographic Office

2.4 Aggregate extraction

There are currently no licensed areas for aggregate extraction in the coastal waters of this region.

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/

2.5 Marine disposal sites

As mentioned in the introduction, the bulk of the material eligible for sea disposal comes from dredging operations, an essential activity for ports and navigation channels.

Table 2.6 indicates that the material deposited in coastal waters of the North East region in 2000 came from maintenance dredging of the various estuaries and harbours of the region in order to keep them clear for shipping. The large amount of dredge spoil (540,570 tonnes, 49.2% of the total deposited in the region) deposited at site TY160 (Figure 1.8) was the result of extensive maintenance operations at the Tees and Hartlepool port.

Table 2.6 – Marine disposal in the region 2000							
Deposit site	**Origin**	**Type of areas dredged**			**Dredging operation**		**Quantity**
	Watersystem	Harbour	Estuary	Sea	Capital	Maintenance	**(tonnes)**
TY022	Coquet River	X				x	1,262
TY025	Coquet River	X	x			x	30,730
TY042	Northumberland Coast	X				x	112,843
TY070	Tyne River	X				x	144,012
TY081	Tyne River	X	x			x	143,337
TY090	Wear River	X			X	x	108,054
TY130	Durham Coast	X				x	17,105
TY160	Tees River/Hartlepool Bay	X	x	x		x	540,570
Total							**1,097,913**

To comply with OSPAR guidelines, the levels of various heavy metals in the dredge spoil is monitored by CEFAS. The heavy metal contamination of the dredge spoil deposited off the North East coast is shown in Box 2.3. It is clear that the greatest contamination was associated with the large amount of dredge spoil (540,570 tonnes) from maintenance dredging of the Tees River/Hartlepool Bay area.

Box 2.3 - Heavy metal contamination (tonnes) of disposed dredged material 2000

Deposit site	Cadmium	Mercury	Arsenic	Chromium	Copper	Lead	Nickel	Zinc
TY022	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.02
TY025	0.01	0.00	0.30	1.20	1.92	0.81	0.53	2.41
TY042	0.02	0.00	0.97	2.42	1.45	2.74	2.10	6.13
TY070	0.40	0.08	2.56	10.11	15.69	50.67	6.10	108.40
TY081	0.39	0.08	2.55	10.00	15.57	50.34	6.05	106.11
TY090	0.04	0.04	2.50	5.12	4.26	16.14	2.79	17.93
TY130	0.01	0.00	0.28	0.50	0.42	1.02	0.46	1.72
TY160	0.96	0.92	11.62	105.50	144.75	128.80	22.08	383.96
Total	**1.83**	**1.12**	**20.79**	**134.86**	**184.06**	**250.53**	**40.12**	**626.68**

Sources of information
Pers. comm. Helen Player, CEFAS

2.6 Oil and gas activity

The North East plays an important role in infrastructural support for the oil and gas industry and there are a number of installations on the North East coast, including oil and gas terminals, storage facilities, refineries and a tanker terminal (Table 2.7 and Figure 1.9).

As mentioned in Section 2.2 - Ports and Shipping, the presence of this infrastructure is partly responsible for the relatively high shipping densities in the surrounding coastal waters.

Table 2.7 - Location of Oil and Gas infrastructure in the region

	Oil Terminal	Gas Terminal	Oil Storage	LNG Storage	Oil Refinery	Tanker Terminal
Tyne			✓			
Jarrow	✓					
South Shields	✓					
Sunderland	✓					
Seal Sands			✓			
Teeside	✓	✓			✓	✓

Offshore areas of the Scottish Borders and North East region are traversed by both oil and gas pipelines, the details of which are presented in Box 2.4 and 2.5. The Norpipe and CATS pipelines connect fields outwith the SEA 3 area with the Teeside terminal and the SEAL pipeline runs from north to south through the northern part of the SEA 3 area before landfall at Bacton in Norfolk. (Section 4.6 - Oil and gas activity).

Box 2.4 - Teeside gas terminal and connecting pipelines

Gas terminal:	Teeside
Fields connected:	Andrew, Amanda Complex (Drake and Fleming), Egret, Erskine, Eastern Trough Area Project (Heron, Machar, Marnock, Monan and Mungo), Everest, Janice, Joanne, Judy, Lomond
Receipts (billion cubic metres):	13.6

Gas pipelines connecting to terminal

Box 2.4 - Teeside gas terminal and connecting pipelines	
Central Area Transmission System (CATS)	
From:	Central Graben to Teeside
Length:	402km
Diameter:	914mm
Material conveyed:	Associated Gas
Operator:	BP-Amoco
Year commissioned:	1993
Gas pipelines traversing offshore area	
Shearwater-Elgin Area Line (SEAL)	
From:	Shearwater to Bacton
Length:	473.1km
Diameter:	863.6mm
Material conveyed:	Natural Gas
Operator:	Elf
Year commissioned:	1999

Box 2.5 - Teeside oil terminal and connecting pipelines	
Oil terminal:	Teeside
Fields connected:	Auk, Clyde, Fulmar, Gannet A, B, C, D, F, G, Janice, Joanne, Judy, Leven, Medwin, Orion
Receipts (million tonnes):	7.4
Oil pipelines connecting to terminal	
Norpipe	
From:	Ekofisk to Teeside
Length:	354km
Diameter:	864mm
Material conveyed:	Crude Oil
Operator:	Phillips
Year commissioned:	1975

Sources of information
DTI Brown Book 2001 – Development of UK Oil and Gas Resources 2001. The Stationary Office

2.7 Alternative energy

2.7.1 Wind power

Throughout the UK there are currently 69 wind farm projects (941 turbines) in operation generating 473.6 MW of electricity. Of these, the only offshore wind farm project in operation is positioned 1km off Blyth in Northumberland. The only other operating wind farm of current relevance to SEA 3 is along Blyth's harbour wall. The details of these wind farms are presented in Box 2.6 and Figure 1.10.

In April 2001 the Crown Estate announced the names of wind farm developers who had successfully pre-qualified to obtain a lease of seabed for the development of offshore wind farms. Within the offshore area covered by the Scottish Borders and North East region there is one proposed wind farm, the details of which are given in Box 2.6 and Figure 1.10.

Box 2.6 – Wind farms in the Scottish Borders and North East region

Operating wind farms:

Site name:	Blyth Harbour
Start date:	January 1993
Number of turbines:	9
Power capacity (MW):	2.7
Operating company:	AMEC Wind
Site name:	Blyth Offshore
Start date:	December 2000
Number of turbines:	2
Power capacity (MW):	3.8
Operating company:	Blyth Offshore Wind Ltd

Proposed offshore farms:

Site name:	Teeside
Likely site location:	1.5km north east of Teesmouth and Redcar
Proposed start date:	2004
Number of turbines:	30
Potential capacity (MW):	100
Operating company:	Northern Offshore Wind Ltd

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/marine/windfarms/wfmap.shtml
British Wind Energy Association website
http://www.britishwindenergy.co.uk/pub.html

2.7.2 Wave and tidal power

There are currently no tidal or wave energy projects in the Scottish Borders and North East region.

2.7.3 Nuclear energy

There are currently no nuclear power installations in the Scottish Borders and North East region.

Sources of information
DTI New and Renewable Energy website
http://www.dti.gov.uk/renewable/index.html
BNFL website
http://www.bnfl.co.uk/website.nsf/index.htm

2.8 Telecommunications cables

On the north east coast of England, there are landfalls close to Redcar of two cables crossing to Denmark (Box 2.7 and Figure 1.11).

Box 2.7 - Telecommunication cables in the Scottish Borders and North East region

Cable land fall	Cable	Operator
Redcar	CANTAT 3	CONCERT
	PANGEA 1 UK-DENMARK	CONCERT

Sources of information
Kingfisher Cable Awareness Charts: Central North Sea, South North Sea, English Channel – East

2.9 Coastal settlements

The Scottish Borders and North Northumberland contain sparsely populated areas with scattered small towns and villages, which contrast with the heavily populated centres in Tyne and Wear, Durham and Cleveland (Table 2.8 and Figure 1.12). The areas of dense urban development in the region are similar in scale to those around many of the other major industrial estuaries of Britain (the Forth, Humber, Severn and Solent areas).

Table 2.8 - Population demographics of the Scottish Borders and North East region 1999

		Population	
	Area (km^2)	Per km^2	Total (thousands)
Scottish Borders (C)	4,818	22	106
Eyemouth	-	-	3*
Northumberland (C)	5,026	62	310
Northumberland (C)	5,026	62	310
Berwick-upon-Tweed	972	27	26
Tyne and Wear (C)	540	2,053	1,108
Newcastle-upon-Tyne	112	2,438	273
Gateshead	143	1,385	198
Sunderland	138	2,106	291
Durham (C)	2,232	227	506
Hartlepool (UA)	94	979	92
Redcar and Cleveland (UA)	245	560	137
Middlesbrough (UA)	-	-	144
United Kingdom	**242,910**	**245**	**59,501**

Note: *1991, C = County, UA = Unitary Authority

Sources of information
National Statistics website
http://www.statistics.gov.uk/statbase/
Key population and vital statistics: Local and health authority areas 1999. National Statistics Series VS no.26, PP1 no. 22. The Stationary Office, London

2.10 Tourism and leisure

The Berwickshire coastline, with its small villages of St. Abbs, Coldingham and Burnmouth, provides a fascinating and beautiful range of scenery - from high cliffs and deep clear water to sandy coves and quaint fishing harbours offering recreational pursuits such as birdwatching, walking, fishing and diving. The wild natural scenery and unspoilt coastal environment in the north and south of the region attracts many tourists in pursuit of open-air leisure activities including walking, bird watching, wildfowling and golf. Coastal fortresses line the coastline such as Tynemouth, Dunstanburgh and Bamburgh Castles. The Christian seat of learning once found at Lindisfarne and the seal colony on the Farne Islands also attract further tourists to the area.

2.10.1 Tourism Statistics

The numbers and expenditure of both UK and foreign tourists in the Scottish Borders and North East region is presented in Table 2.9.

Table 2.9 - Number and Expenditure of UK and Overseas Tourists in the Region, 2000

	Scottish Borders	Northumbria	UK total
UK residents			
Number of trips to the region (million):	0.5	5.6	175.4
Expenditure (£ million):	64	738	26,132
Overseas residents			
Number of tourists (million):	0.03	0.44	25.2
Expenditure (£ million):	3	169	12,672

In the Scottish Borders in 2000, 56% of the UK residents came from England and of the foreign tourists, 23% were from the USA. The most popular activity whilst in the Scottish Borders was visiting castles, monuments and churches (54% of UK tourists and 83% of foreign tourists).

Of the 5.6 million trips to Northumbria by UK residents in 2000, 21% were taken by residents of the North East. Of the foreign visitors, 16% came from Norway and 10% from Germany, emphasising the importance of the ferry routes between the Tyne and Northern Europe (see *Ports and Shipping* for details). The most popular activities in the North East were visiting heritage sites and historic properties (21% of UK and 15% of foreign tourists).

Sources of information
Tourism in Scottish Borders 2000. Visit Scotland website
www.scotexchange.net
Northumbria Tourist Board website
http://www.northumbria-tourist-board.org.uk/
Star UK - Statistics on tourism and research website
http://www.staruk.org.uk/

2.11 Bathing waters and marinas

2.11.1 Bathing waters

Within the Scottish Borders and North East region there are a number of designated bathing waters (Table 2.10 and Figure 1.13). A number of beaches have been awarded Seaside Awards but there are no Blue Flag beaches.

Table 2.10 - Designated bathing waters in the region 2001

Bathing waters	Water quality			Beach award
	E	G	P	
Pease Bay	✓			
St. Abbs		✓		
Coldingham	✓			
Eyemouth		✓		
Spittal		✓		
Bamburgh Castle	✓			ENCAMS Seaside Award 2002
Seahouses North		✓		ENCAMS Seaside Award 2002
Beadnell	✓			ENCAMS Seaside Award 2002
Low Newton	✓			ENCAMS Seaside Award 2002
Warkworth	✓			ENCAMS Seaside Award 2002
Amble Links		✓		ENCAMS Seaside Award 2002
Druridge Bay	✓			
Newbiggin North		✓		
Newbiggin South	✓			
Blyth South Beach		✓		
Seaton Sluice		✓		
Whitley Bay	✓			ENCAMS Seaside Award 2002
Tynemouth Cullercoats	✓			ENCAMS Seaside Award 2002
Tynemouth Long Sands North		✓		
Tynemouth Long Sands South	✓			ENCAMS Seaside Award 2002
Tynemouth King Edwards Bay	✓			ENCAMS Seaside Award 2002
South Shields	✓			ENCAMS Seaside Award 2002
Marsden	✓			
Whitburn North	✓			ENCAMS Seaside Award 2002
Roker/ Whitburn South	✓			ENCAMS Seaside Award 2002
Seaham Beach		✓		
Seaham Hall Beach (Remand Home)	✓			
Crimdon	✓			
Seaton Carew North	✓			
Seaton Carew Centre	✓			
Seaton Carew North Gare	✓			
Redcar Coatham	✓			
Redcar Lifeboat Station	✓			ENCAMS Seaside Award 2002
Redcar Granville		✓		
Redcar Stray	✓			
Sea at Marske Sands	✓			
Saltburn	✓			ENCAMS Seaside Award 2002

*Water Quality = E (Excelllent), G (Good) and P (Poor). See Introduction for details.

2.11.2 Marinas

Marina developments within the Scottish Borders and North East region are indicated on Table 2.11. The left-hand number indicates the location of the marina on Figure 1.14.

Table 2.11 - Marina developments in the region

		Location
1	Amble Marina Limited	Amble
2	Royal Northumberland Yacht Club	Blyth
3	St. Peters Marina	Newcastle-on-Tyne
4	Royal Quays Marina	North Shields
5	Friars Goose	Gateshead
6	Sunderland Marina	Sunderland
7	Hartlepool Marina	Hartlepoool

For the purpose of this report, the number of Royal Yachting Association members has been used to give an indication of the popularity of sailing in the region. For the RYA North East region there are 1950 members.

Sources of information
ENCAMS Seaside Awards website
http://www.seasideawards.org.uk/sea2.htm
Blue Flag Campaign website
http://www.blueflag.org/
DEFRA Digest of Environmental Statistics – Coastal and Marine Waters website
http://www.defra.gov.uk/environment/statistics/des/coastwaters/ch040206.htm
Environment Agency website
http://216.31.193.171/asp/bwd_q_simple.asp?language=English
Marina-Info.com
http://www.marina-info.com/minfo/uk/realukindex.htm
Royal Yachting Association website
http://www.rya.org.uk/Regions/
Pers. comm. Gaynor Sawyer, Royal Yachting Association Media Relations Officer

2.12 Mariculture

Designated bivalve production areas within the region are shown in Table 2.12 and Figure 1.15. The only mariculture operation in the region is the cultivation of Pacific oysters at Ross Links, close to Holy Island.

Table 2.12 – Designated bivalve production areas 2001

Map ref.	Production area	Species
1	Holy Island	*Pacific Oyster (Crassostrea gigas)*
2	Blyth	C. gigas

Sources of information
Food Standards Agency website
http://www.foodstandards.gov.uk/
Pers. comm. AF Coe, Northumberland Sea Fisheries Committee

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3 YORKSHIRE AND HUMBER

The Yorkshire and Humber region (Figure 1.1) includes the county of North Yorkshire and the unitary authorities of the East Riding of Yorkshire, the City of Kingston upon Hull, and the authorities of North Lincolnshire and North East Lincolnshire as well as the county of Lincolnshire.

The region is predominantly rural along much of its length although areas of the Humber Estuary, including the unitary authorities of the City of Kingston upon Hull and North East Lincolnshire are more industrialised and densely populated. Much of this industry focuses around the port of Grimsby and Immingham, the largest commercial port in the UK. The Humber Estuary also supports considerable oil and gas infrastructure which includes storage units, gas and tanker terminals.

3.1 Coastal fisheries

Much of the coastal fisheries of the Yorkshire and Humber region fall within the jurisdiction of the North Eastern Sea Fisheries Committee (NESFC). The Lincolnshire coastal fishery is regulated by the Eastern Sea Fisheries Joint Committee (ESFJC).

White fish provide the mainstay for the trawler fleet, a small number also dredge for queen scallops, and beam trawls are used for shrimp in the Humber and along the Lincolnshire coast. In addition to pots and nets, longlines are still occasionally used off the Yorkshire coast, mainly for cod. A large crab and lobster fishery is exploited in the region and considerable landings of whelks are made, particularly at Bridlington. The winter cod fishery is important to both trawlers and static gear boats and in addition to cod, trawlers land whiting, saithe, haddock, lemon sole, plaice and rays. Whiting are caught virtually all year round, haddock are normally caught in deeper waters, appearing closer inshre in spring, and flatfish are caught in the greatest quantities from spring through summer.

Within the NESFC District (which stretches as far north as South Shields on Tyneside), there were over 326 boats involved in potting for crabs, lobster and whelks in 2001. These vessels utilised 89,971 lobster/crab pots and 16,300 whelk pots. The main home ports for the crab and lobster potting vessels were Grimsby Offshore (39 boats), Bridlington (37 boats), Hartlepool (27 boats), Whitby (24 boats), and Scarborough (22 boats). Bridlington was the main port for whelk boats (11 boats). Many of those vessels involved in crab/lobster potting worked outside the six-mile limit of the Committee's District. In 2000, landings of lobster in the NESFC District amounted to over 260 tonnes (£2.5 million) and of edible crab, 1150 tonnes (£1.1 million).

There are 54 boats engaged in trawling with Scarborough (20 boats) and Grimsby (18 boats – 5 for finfish and 9 for shrimp) being the main trawler ports. There is also a fleet of vessels utilising nets (167 boats) and lines (27 boats).

The port of Boston is the main centre of the Lincolnshire coastal fishery although there are crab-potting vessels working out of Skegness and a trawler at Gibraltar Point. Boston receives significant landings from the mussel fishery in the Wash and this is described in Section 3.12 - Mariculture. There are up to 7 vessels trawling for shrimp throughout the year and landings into Boston in 2000 amounted to 5,432 tonnes (£80,703). The Boston cockle fishery involves 11 vessels and is primarily a summer activity. Three thousand tonnes (£406,269) of cockles were landed into the port in 2000.

Sources of information
North Eastern Sea Fisheries Committee website
http://www.neseafish.gov.uk/index2.html
Summary of Fishing Effort 2001. North Eastern Sea Fisheries Committee
Fishing Activity Reports Section 2: Northern Area – Donna Nook to Fosdyke. Eastern Sea Fisheries Joint Committee website
http://www.esfjc.org/
Pawson MG, Pickett GD and Walker P (2002). The Coastal Fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

3.2 Ports and shipping

3.2.1 Major ports

The Yorkshire and Humber region contains a number of major ports which handle a large amount of traffic (77.7 million tonnes in 2000, almost 14% of all UK traffic) (Table 3.1 and Figure 1.4).

Table 3.1 - Foreign and domestic traffic handled by ports in the region

	1998	1999	2000
		Million tonnes	
Hull	10.25	10.12	10.72
Goole	2.65	2.65	2.71
Rivers Hull and Humber (excluding Killingholme)	10.2	8.83	9.15
Grimsby and Immingham (including Killingholme)	48.39	49.76	52.5
Boston	1.26	1.18	1.27
All UK traffic	**568.5**	**565.6**	**573.1**

In 2000, Grimsby and Immingham was the largest port in the UK, handling 52.5 million tonnes of port traffic (9.2% of UK total) (Box 3.1). The port was responsible for handling 9.8% (27.1 million tonnes) of the UK's foreign and domestic oil and gas traffic and 9.1% (25.4 million tonnes) of the non-oil traffic. There are also numerous freight Ro-Ro services and container services with Belgium, Netherlands, Germany and Scandinavia. A significant new deep-water multi-purpose terminal, the Humber International Terminal, became operational in June 2000 capable of accommodating vessels carrying up to 100,000 tonnes of cargo.

Box 3.1 - Grimsby and Immingham foreign and domestic port traffic 2000

	Million tonnes
Liquid bulk	
Crude oil	10
Oil products	16.5
All liquid bulk traffic	28.2
Dry bulk	
Ores	4.8
Coal	1.1
All dry bulk traffic	13.7
Other general cargo	3.8
Containers	0.7
Roll-on/Roll-off (self-propelled)	0.9
Roll-on/Roll-off (non self-propelled)	7.1
All traffic	**52.5**

Sources of information
DTLR Maritime Statistics website
http://www.transtat.detr.gov.uk/shipping/index.htm#ports
DTLR Maritime Statistics 2000. The Stationary Office, London

3.2.2 Fishing ports

The Yorkshire and Humber region contains a number of important fishing ports which are listed in Table 3.2 (and highlighted on Figure 1.4), along with the total amount of demersal, pelagic and shellfish species landed by the UK fishing fleet at each port in 2000.

Table 3.2 - Fish landings by UK fleet into major ports in the region 2000

	Demersal*		Pelagic*		Shellfish*	
Whitby	2.6	(3.2)	-	-	0.4	(1.0)
Scarborough	2.0	(2.4)	-	-	0.3	(0.6)
Bridlington	0.4	(0.5)	-	-	4.1	(3.6)
Hull	8.0	(8.1)	-	-	-	-
Grimsby	3.7	(4.3)	-	-	3.6	(3.1)
UK total	**227**	**(248)**	**110**	**(21)**	**127**	**(153)**

*Figure not in brackets = quantity (thousand tonnes), figure in brackets = value (£ million).

Hull and Grimsby are not only the largest fishing ports in the Yorkshire and Humber region but also within the SEA 3 area. Fish landings in Hull have fallen over the last few years from 21.7 thousand tonnes (£16.4 million) in 1997 to 8 thousand tonnes (£8.1 million) in 2000.

Sources of information
Lee D Ed. UK Sea Fisheries Statistics 1999 and 2000. DEFRA and National Statistics. The Stationary Office

3.2.3 Principal ferry routes

The principal ferry routes in the region are from Hull to Rotterdam (Netherlands) and Zeebrugge (Belgium). In 2000, 972,000 ferry passengers (3.4% of UK total) passed through the port of Hull (Table 3.3).

Table 3.3 - Principal ferry routes in the region

	1998	1999	2000
	Thousand passengers		
Hull – Rotterdam	643	652	592
Hull – Zeebrugge	383	370	380

3.2.4 Ship arrivals

In the Yorkshire and Humber region, Grimsby and Immingham is the largest port, followed by the port of Hull. Table 3.4 indicates the numbers and type of vessels that visited these ports in 1999. Grimsby and Immingham was visited by a total of 6,211 ships in 1999 and of these, the majority were Ro-ro vessels (1-20,000 tonnes), dry cargo vessels (1-20,000 tonnes) and tankers (1-20,000 tonnes). Grimsby and Immingham also received a relatively large number of vessels over 100,000 tonnes – 30% of the UK's total number of large dry cargo vessels and 7.5% of the UK's total number of large tankers.

Table 3.4 - Ship arrivals at major ports in the region, by type and deadweight 1999										
		Tankers		Ro-ro vessels		Container vessels		Other dry cargo vessels		
Deadweight tonnes (x1000)	1-20	20-100	100+	1-20	20+	1-20	20+	1-20	20-100	100+
Hull	801	25	-	1,483	8	326	-	1,084	36	-
Grimsby & Immingham	1,428	389	51	2,013	-	213	-	1,918	119	80
All UK ports	**18,123**	**2,841**	**681**	**88,390**	**196**	**3,904**	**3,225**	**35,584**	**1,559**	**266**

Sources of information
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document

3.2.5 Shipping density

The presence of Grimsby and Immingham, as well as the regular ferry services from Hull means that shipping density in the coastal waters leading into the Humber Estuary is very high (>20,000 ships per annum). Offshore areas of the region experience a shipping density of between 5,000-20,000 ships per annum (Figure 1.5).

Cargo ship movements between Grimsby and Immingham and Northern Europe create major shipping routes through the SEA 3 area. The tanker terminal at Immingham also forms a focus for oil and shuttle tanker routes between the terminal and other ports in the UK and Northern Europe.

3.2.6 Traffic separation schemes

There are no traffic separation schemes operating in the waters close to or further offshore from the Yorkshire and Humber.

3.2.7 Marine Environment High Risk Areas (MEHRAs)

As mentioned in the introduction, the concept of MEHRAs is to identify comparatively limited areas of high environmental sensitivity, which are also at risk from shipping (i.e. marine pollution). Within the Yorkshire and Humber region, Flamborough Head has been selected as a potential MEHRA (Figure 1.5).

Sources of information
DETR Identification of Marine Environment High Risk Areas in the UK, 1999

3.3 Military activity

There are a number of military activity areas within the Yorkshire and Humber region, the majority of which are for air force training (Table 3.5 and Figure 1.6). There are also two submarine exercise areas within the region.

Table 3.5 – Military activity areas in the Yorkshire and Humber region			
Serial no.	**Name**	**Type of practice***	**Altitude range (feet above surface)**
Navy department areas			
	Flamborough Head Submarine Exercise Area		
	Outer Silver Pit Submarine Exercise Area		
Air Force department areas			

Table 3.5 – Military activity areas in the Yorkshire and Humber region			
D412	Staxton	AAF	10,000
D306	Cowden	Ordnance demolition within on-shore area	5,000
D307	Donna Nook	Firing, Bombing, ASF	10,000 & 23,000
		Ordnance demolition within on-shore area	5,000
D308	Wainfleet	Bombing	23,000
		Ordnance demolition within on-shore area	5,000
D316	Neatishead	Air Combat Training, HEM	5,000-55,000
D317	Neatishead	Air Combat Training, HEM	5,000-55,000
Army department areas			
X5309	Rowiston	Rifle	

*Type of Practice: AAF (Air-to-Air Flying), ASF (Air-to-Surface Firing), HEM (High Energy Manoeuvres)

Sources of information
PEXA Chart Q6405 - Clyth Ness to Scarborough. Admiralty Charts and Publications. UK Hydrographic Office
PEXA Chart Q6401 – Scarborough to Poole. Admiralty Charts and Publications. UK Hydrographic Office

3.4 Aggregate extraction

Areas of the seabed within the coastal waters of the Yorkshire and Humber region support the commercial extraction of marine aggregates mainly for the UK construction market and coastal protection schemes. There are a number of licensed areas within the region and these are shown on Figure 1.7. Details of the amount of aggregate extracted from the region are presented in Box 3.2.

Box 3.2 - Marine aggregate extraction in the Yorkshire and Humber region			
Total area licensed	478.4km^2		
Total area dredged	57.5km^2		
>90% of material dredged from	1.36km^2		
	1999	**2000**	**2001**
Amount extracted (million tonnes)	3.56	3.81	3.17
UK total	**23.68**	**23.06**	**22.76**

Marine aggregate extraction in the Yorkshire and Humber region in 2001 accounted for approximately 14% of the total extracted in the UK.

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/

3.5 Marine disposal sites

The bulk of the material eligible for sea disposal comes from dredging operations, an essential activity for ports and navigation channels.

Table 3.6 indicates that the majority of material deposited in the coastal waters of the Yorkshire and Humber region came from maintenance dredging of the various estuaries and harbours of the region in order to keep them clear for shipping. The largest amount of dredge spoil was deposited at sites HU060 (1.05 million tonnes, 26% of total) and HU080 (1.88 million tonnes, 46% of total) (Figure 1.8) and came largely from maintenance dredging of the area around the Grimsby and Immingham port.

Table 3.6 – Marine disposal in the region 2000

Deposit site	Origin Watersystem	Type of areas dredged Harbour	Estuary	Sea	Dredging operation Capital	Maintenance	Quantity (tonnes)
TY180	Esk River	X		x		x	24,573
TY190	North Yorkshire Coast	X				x	9,556
	Humberside	X				x	
HU015	Coast						8,236
HU020	Humber River	X	x		x	x	131,903
HU030	Humber River	X	x	x		x	728,926
HU040	Humber River	X				x	3,241
HU041	Humber River	X				x	3,298
HU060	Humber River	X	x	x	x	x	1,046,841
HU080	Humber River	X	x			x	1,878,174
HU090	Humber River	X	x			x	256,472
Total							**4,091,220**

To comply with OSPAR guidelines, the levels of various heavy metals in the dredge spoil is monitored by CEFAS. The heavy metal contamination of the dredge spoil deposited off the Yorkshire and Humber coast is shown in Box 3.3. It is clear that the greatest contamination was associated with the large amount of dredge spoil (1.88 million tonnes) deposited as a result of maintenance dredging of the Grimsby and Immingham port area.

Box 3.3 - Heavy metal contamination (tonnes) of disposed dredged material 2000

Deposit site	Cadmium	Mercury	Arsenic	Chromium	Copper	Lead	Nickel	Zinc
TY180	0.01	0.00	0.38	1.25	0.71	1.50	0.71	3.38
TY190	0.00	0.00	0.14	0.38	0.36	0.54	0.18	1.33
HU015	0.00	0.00	0.11	0.42	0.46	0.22	0.20	4.33
HU020	0.10	0.04	5.10	15.54	6.23	14.15	6.73	33.34
HU030	0.53	0.22	28.20	85.86	34.56	79.19	37.20	184.28
HU040	0.00	0.00	0.14	0.45	0.22	0.52	0.18	1.12
HU041	0.00	0.00	0.15	0.45	0.22	0.53	0.18	1.14
HU060	0.73	0.31	39.46	118.43	48.30	109.43	52.03	257.29
HU080	1.37	0.57	72.67	221.32	88.72	201.50	95.80	474.73
HU090	0.18	0.07	9.92	29.20	12.83	28.25	13.85	65.27
Total	**2.81**	**1.21**	**156.27**	**473.3**	**192.61**	**434.83**	**207.06**	**1,026.21**

Sources of information
Pers. comm. Helen Player, CEFAS

3.6 Oil and gas activity

The Yorkshire and Humber region plays an important role in infrastructural support for the oil and gas industry. There are a number of installations on the coast which include oil and gas terminals, storage facilities, refineries and a tanker terminal (Table 3.7 and Figure 1.9).

As mentioned in the Section 3.1 - Ports and Shipping section, the presence of this infrastructure is partly responsible for the very high shipping densities in the surrounding coastal waters of this region.

Table 3.7 - Location of oil and gas infrastructure in the region						
	Oil Terminal	Gas Terminal	Oil Storage	LNG Storage	Oil Refinery	Tanker Terminal
Dimlington and Easington		✓	✓			
Killingholme			✓		✓	
Immingham						✓
Theddlethorpe		✓				

Within offshore areas of the Yorkshire and Humber region there are a number of producing gas fields, the details of which are presented in Box 3.4 and Figure 1.9.

Box 3.4 - Producing offshore gas fields in the Yorkshire and Humber region	
Gas field:	Rough*
Operator:	BG Group plc
Date of discovery:	1968
Production start:	1985
First year of peak production:	1994
Peak production (billion cubic metres per year):	2.80
Water depth:	36m
Gross gas production 2000 (million cubic metres):	204
Cumulative total to end 2000 (million cubic metres):	4,574

Box 3.4 - Producing offshore gas fields in the Yorkshire and Humber region	
Gas field:	Amethyst West
Operator:	BP-Amoco
Date of discovery:	1970
Production start:	1992
First year of peak production:	1992
Peak production (billion cubic metres per year):	1.5
Water depth:	21m
Gross gas production 2000 (million cubic metres):	471
Cumulative total to end 2000 (million cubic metres):	3,377

*Converted for use as an offshore storage unit from mid-1985

Offshore areas of the Yorkshire and Humber region are traversed by a number of gas pipelines connecting offshore gas fields with the coastal terminals of Dimilington, Easington and Theddlethorpe. Details of the gas terminals and the connecting pipelines are given in Boxes 3.5, 3.6 and 3.7.

Box 3.5 - Dimlington gas terminal and connecting pipelines	
Gas terminal:	Dimlington
Fields connected:	Johnston, Mercury, Neptune, Ravenspurn North, Ravenspurn South
Receipts (billion cubic metres):	4.5
Gas pipelines connecting to terminal	
From:	Cleeton to Dimlington
Length:	58.1km
Diameter:	914mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco
Year commissioned:	1988

Box 3.6 - Easington gas terminal and connecting pipelines	
Gas terminal:	Easington
Fields connected:	Amethyst East**, Amethyst West**, Hyde, Newsham, **Rough**, West Sole
Receipts (billion cubic metres):	4.5
Gas pipelines connecting to terminal	
From:	West Sole to Easington
Length:	67.6km
Diameter:	406.4mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco
Year commissioned:	1967
From:	West Sole to Easington
Length:	70km
Diameter:	610mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco
Year commissioned:	1982
From:	Rough to Easington

Box 3.6 - Easington gas terminal and connecting pipelines	
Length:	29.6km
Diameter:	406.4mm
Material conveyed:	Natural Gas
Operator:	British Gas
Year commissioned:	1975 (mothballed/no longer in use)
From:	Rough to Easington
Length:	29.9km
Diameter:	914mm
Material conveyed:	Natural Gas
Operator:	British Gas
Year commissioned:	1984
From:	Amethyst to Easington
Length:	48km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	Britoil
Year commissioned:	1990

Note: Those fields in bold are within the SEA 3 region.

Box 3.7 - Theddlethorpe gas terminal and connecting pipelines	
Gas terminal:	Theddlethorpe
Fields connected:	Alison, Anglia, Ann, Audrey, Bell, Boulton, Caister B, Caister C, Callisto, Europa, Ganymede, Ketch, KX, Murdoch, Pickerill, Schooner, Sinope, Valiant North, Valiant South, Vampire, Vanguard, Victor, Viking, Vixen, Vulcan
Receipts (billion cubic metres):	13.3
Gas pipelines connecting to terminal	
From:	Murdoch to Theddlethorpe
Length:	180km
Diameter:	660mm
Material conveyed:	Natural Gas
Operator:	Conoco
Year commissioned:	1993

Box 3.7 - Theddlethorpe gas terminal and connecting pipelines	
From:	Pickerill to Theddlethorpe
Length:	63.2km
Diameter:	610mm
Material conveyed:	Natural Gas
Operator:	Arco
Year commissioned:	1992
Lincolnshire Offshore Gas Gathering System (LOGGS)	
From:	North Valiant to Theddlethorpe
Length:	118.7km
Diameter:	914mm
Material conveyed:	Natural Gas
Operator:	Conoco
Year commissioned:	1988

Sources of information
DTI Brown Book 2001 – Development of UK Oil and Gas Resources 2001. The Stationary Office.

3.7 Alternative energy

3.7.1 Wind power

There are no coastal wind farm projects currently in operation in the Yorkshire and Humber region.

In April 2001 the Crown Estate announced the names of wind farm developers who had successfully pre-qualified to obtain a lease of seabed for the development of offshore wind farms. Within the offshore area covered by the Yorkshire and Humber region there are two proposed wind farms, the details of which are given in Box 3.8 and Figure 1.10.

Box 3.8 - Proposed offshore wind farms in the Yorkshire and Humber region	
Site name:	Lynn
Likely site location:	5.2km off Skegness
Proposed start date:	2004/5
Number of turbines:	30
Potential capacity (MW):	60-90
Operating company:	AMEC Offshore Wind Power Ltd.
Site name:	Inner Dowsing
Likely site location:	5.2km off Ingoldmells
Proposed start date:	2005
Number of turbines:	30
Potential capacity (MW):	100
Operating company:	Offshore Wind Power Ltd.

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/marine/windfarms/wfmap.shtml
British Wind Energy Association website
http://www.britishwindenergy.co.uk/pub.html

3.7.2 Wave and tidal power

There are currently no tidal or wave energy projects in the Yorkshire and Humber region

3.7.3 Nuclear energy

There are currently no nuclear power installations in the Yorkshire and Humber region.

Sources of information
DTI New and Renewable Energy website
http://www.dti.gov.uk/renewable/index.html
BNFL website
http://www.bnfl.co.uk/website.nsf/index.htm

3.8 Telecommunications cables

On the Yorkshire and Humber coast, there are landfalls close to Filey of two cables crossing to Denmark and Germany, and a third proposed cable to Germany (Box 3.9 and Figure 1.11).

Box 3.9 - Telecommunication cables in the Yorkshire and Humber region

Cable land fall	Cable	Operator
Filey	UK-DENMARK 4	CONCERT
	UK-GERMANY 6	CONCERT
Proposed cable		
Filey	TGN NORTH EUROPE	TYCOM Global Network

Sources of information
Kingfisher Cable Awareness Charts: Central North Sea, South North Sea, English Channel – East

3.9 Coastal settlements

The East Riding of Yorkshire coast from Flamborough Head to Spurn Head is mainly rural, with little residential or industrial development. However, the Humber estuary is a very busy waterway and its shores are heavily populated and industrialised. Lincolnshire is predominantly rural, with a small coastal population and, especially in the north and south of the county, very little coastal development (Table 3.8 and Figure 1.12).

Table 3.8 - Population demographics of the Yorkshire and Humber region 1999			
		Population	
	Area (km^2)	Per km^2	Total (thousands)
North Yorkshire (C)	-	-	569.8
East Riding of Yorkshire (UA)	2,415	131	316
Scarborough	817	133	109
City of Kingston upon Hull (UA)	71	3,632	258
The Humber	3,511	251	882
North East Lincolnshire (UA)	192	812	156
North Lincolnshire (UA)	833	182	152
Lincolnshire (C)	5,921	106	629
Boston	362	150	54
United Kingdom	**242,910**	**245**	**59,501**

Note: C = County, UA = Unitary Authority

Sources of information
National Statistics website
http://www.statistics.gov.uk/statbase/
Key population and vital statistics: Local and health authority areas 1999. National Statistics Series VS no.26, PP1 no. 22. The Stationary Office, London

3.10 Tourism and leisure

Traditional coastal resorts include Scarborough (acclaimed as Britain's first seaside holiday resort), Whitby, Filey, Bridlington, Cleethorpes, Hornsea and Withernsea. Yorkshire itself has over 120 miles of coastline; much of it designated Heritage Coast. Coastal tourism is important in Lincolnshire with important resorts found at Mablethorpe and Skegness.

3.10.1 Tourism statistics

The numbers and expenditure of both UK and foreign tourists in the Yorkshire and Humber region are presented in Table 3.9.

Table 3.9 - Number and expenditure of UK and overseas tourists in the region 2000				
	North Yorkshire	East Yorkshire/ N Lincolnshire	Lincolnshire*	UK total
UK residents				
Number of trips to the region (million):	5.7	1.6	2.8	175.4
Expenditure (£ million):	842	200	343	26,132
Overseas residents				
Number of trips to the region (million):	0.43	0.05	0.15	25.2
Expenditure (£ million):	89	9	43	12,672

*Figures for 1999

In Yorkshire in 2000, 31% of the UK residents came from the Yorkshire and Humber region and of the foreign tourists, 19% were from the USA. The most popular activity whilst in Yorkshire for UK and overseas visitors was visiting museums and art galleries (26%) and historic properties (23%).

Sources of information
Facts of Tourism - Yorkshire Tourist Board website
http://www.yorkshirevisitor.com/
Lincolnshire Tourism Model 1999, Heart of England Tourist Board 2001
Star UK - Statistics on tourism and research website
http://www.staruk.org.uk/

3.11 Bathing waters and marinas

3.11.1 Bathing waters

Within the Yorkshire and Humber region there are a number of designated bathing waters (Table 3.10 and Figure 1.13). A number of beaches have been awarded Seaside Awards but there are no Blue Flag beaches.

Table 3.10 - Designated bathing waters in the region 2001

Bathing waters	Water quality*			Beach award
	E	G	P	
Staithes		✓		ENCAMS Seaside Award 2002
Runswick Bay		✓		ENCAMS Seaside Award 2002
Sandsend	✓			ENCAMS Seaside Award 2002
Whitby	✓			ENCAMS Seaside Award 2002
Robin Hoods Bay		✓		ENCAMS Seaside Award 2002
Scarborough North Bay	✓			ENCAMS Seaside Award 2002
Scarborough South Bay		✓		ENCAMS Seaside Award 2002
Cayton Bay	✓			ENCAMS Seaside Award 2002
Filey		✓		ENCAMS Seaside Award 2002
Reighton	✓			
Flamborough North Landing		✓		
Flamborough South Landing	✓			
Danes Dyke, Flamborough	✓			
Bridlington North Beach		✓		
Bridlington South Beach	✓			
Wilsthorpe		✓		
Fraisthorpe		✓		
Earls Dyke	Not Classified			
Barmston	✓			
Skipsea	✓			
Hornsea		✓		
Tunstall		✓		
Withernsea		✓		
Cleethorpes		✓		
Mablethorpe Town	✓			
Sutton-on-Sea	✓			
Moggs Eye	✓			
Anderby	✓			
Chapel St. Leonard	✓			
Ingoldmells South	✓			
Skegness	✓			

*Water Quality = E (Excelllent), G (Good) and P (Poor). See Introduction for details.

3.11.2 Marinas

Marina developments within the Yorkshire and Humber region are indicated on Table 3.11. The left-hand number indicates the location of the marina on Figure 1.14.

Table 3.11 - Marina developments in the region

		Location
8	Whitby Marina	Whitby
9	Scarborough Harbour	Scarborough
10	Bridlington Harbour	Bridlington
11	Hull Marina	Hull
12	South Ferriby Marina	Barton-on-Humber
13	Humber Cruising Association	Grimsby
14	Meridian Quay	Grimsby
15	Boston Marina	Boston

For the purpose of this report, the number of Royal Yachting Association members has been used to give an indication of the popularity of sailing in the region. For the RYA Yorkshire and Humberside region (includes old counties of Yorkshire and Humberside) there are approximately 2000 members. The RYA East Midlands region which includes Lincolnshire has 2758 members.

Sources of information
ENCAMS Seaside Awards website
http://www.seasideawards.org.uk/sea2.htm
Blue Flag Campaign website
http://www.blueflag.org/
DEFRA Digest of Environmental Statistics – Coastal and Marine Waters website
http://www.defra.gov.uk/environment/statistics/des/coastwaters/ch040206.htm
Environment Agency website
http://216.31.193.171/asp/bwd_q_simple.asp?language=English
Marina-Info.com
http://www.marina-info.com/minfo/uk/realukindex.htm
Royal Yachting Association website
http://www.rya.org.uk/Regions/
Pers. comm. Gaynor Sawyer, Royal Yachting Association Media Relations Officer

3.12 Mariculture

Designated bivalve production areas in the region are shown in Table 3.12 and Figure 1.15. At present there are no mariculture operations within the Yorkshire and Humber area.

Table 3.12 – Designated Bivalve Production Areas 2001

Map Ref.	Production area	Species
3	Humber	Cockles *(Cerastoderma edule)*
4	The Wash – Boston	Mussels *(Mytilus edulis)*, Cockles, *C. gigas*

At Boston, mussel landings in 2000 almost entirely consisted of stocks taken from private lay holdings. The mussel season was split into two sections, from January to April and from September to December. In the first part of the season some 960 tonnes were landed into Boston, their value at first sale being approximately £302,000. After the mussel season re-opened in September landings into Boston for the remainder of the year were 840 tonnes (£335,200).

Sources of information
Food Standards Agency website
http://www.foodstandards.gov.uk/
Pers. comm. G Bartlett, North East Sea Fisheries Committee

4 NORFOLK AND SUFFOLK

The Norfolk and Suffolk region includes the counties of Norfolk and Suffolk (Figure 1.1).

The region is predominantly rural along much of its length and there are no significant areas of dense population. Felixstowe is the largest port in the region and the largest container port in the UK. Coastal areas of the region support extensive aggregate extraction and the Bacton gas terminal on the Norfolk coast received over 20% of the UKCS natural gas in 2000.

4.1 Coastal fisheries

Within the Norfolk and Suffolk region, coastal fisheries provide an important source of income for a number of coastal fishing communities. Natural stocks of cockles and brown shrimp are fished within the region and in 2000, landings from the Wash fishery amounted to 6,666 tonnes of cockles (£904,854) and 786 tonnes of brown shrimp (£1,173,560).

Wild and cultivated stocks of molluscs are important throughout the region; mussels and cockles in the Wash, and mussels and oysters which are grown-on in harbours along the north Norfolk coast. Brown shrimp, mussels and cockles provide the mainstay for vessels at Boston and King's Lynn which fish throughout the Wash. Chalk reefs off the north Norfolk coastal waters support crab, lobster and whelk fisheries. Sprats are trawled in the Wash, herring are taken in drift nets in April and May, with sea trout, bass, mullet, sprats and mackerel taken in summer and autumn south of Sheringham. Finfish provide the mainstay along the Suffolk coast.

Crab and lobster potting is employed by vessels from Brancaster, Wells, Blakeney, Cromer and Sheringham. Total reported crab landings for the North Norfolk coast during 2000 were 41,518 tonnes (£565,231) and lobsters, 1,678 tonnes (£121,175).

Great Yarmouth and Lowestoft are the largest fishing ports in the region and the coastal fishery here targets a variety of species including cod, plaice, bass, shrimp, skate, herring and sole. Drift and fyke netting is employed to catch herring, and cod are taken on long-lines. A number of vessels trawl for sole and shrimp. Although having declined in recent years, the plaice fishery constituted the most valuable catch into Lowestoft in 2000 (254,100 tonnes - £3.4 million). Cod landings amounted to 66,600 tonnes (£1.1 million).

Sources of information

Fishing Activity Reports. Eastern Sea Fisheries Joint Committee website http://www.esfjc.org/

Pawson MG, Pickett GD and Walker P (2002). The Coastal Fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

4.2 Ports and shipping

4.2.1 Major ports

The Norfolk and Suffolk region contains a number of ports (Figure 1.4), of which Felixstowe handles the greatest amount of foreign and domestic traffic (Table 4.1).

Table 4.1 - Foreign and domestic traffic handled by ports in the region			
	1998	1999	2000
		Million tonnes	
King's Lynn	0.88	0.95	1.07
Great Yarmouth	1.87	1.22	0.76
Lowestoft	0.27	0.46	0.44
Felixstowe	30.03	31.47	29.69
Ipswich	2.18	2.39	2.93
All UK traffic	**568.5**	**565.6**	**573.1**

In 2000, Felixstowe handled almost 30 million tonnes of port traffic (5.2% of UK total) (Box 4.1). It is the largest container port in the UK and in 2000 handled 42.9% of the UK's foreign and coastwise container traffic (1.9 million container units). In 2000, Felixstowe was the second largest UK port, after London for non-oil traffic, handling 10.6 % of the UK total (29.6 million tonnes) and the second largest, after Dover for the number of road goods vehicles transported on Ro-Ro services (7.6%, 0.44 million units).

Box 4.1 - Felixstowe foreign and domestic port traffic	
	Million tonnes
Liquid bulk	
All liquid bulk traffic	0.19
Dry bulk	
All dry bulk traffic	0.05
Other general cargo	1.0
Containers	22.8
Roll-on/Roll-off (self-propelled)	0.98
Roll-on/Roll-off (non self-propelled)	5.2
All traffic	**29.69**

Sources of information
DTLR Maritime Statistics website
http://www.transtat.detr.gov.uk/shipping/index.htm#ports
DTLR Maritime Statistics 2000. The Stationary Office, London

4.2.2 Fishing ports

The largest fishing port in the Norfolk and Suffolk region is Lowestoft (Figure 1.4). Table 4.2 lists the total amount of demersal, pelagic and shellfish species landed by the UK fishing fleet at Lowestoft in 2000.

Table 4.2 - Fish landings by UK fleet into major ports in the region 2000						
	Demersal*		Pelagic*		Shellfish*	
Lowestoft	3.9	(5.9)	-	-	-	-
UK total	**227**	**(248)**	**110**	**(21)**	**127**	**(153)**

*Figure not in brackets = quantity (thousand tonnes), figure in brackets = value (£ million).

Fish landings in Lowestoft have fallen slightly over the last few years from 5.7 thousand tonnes (£8.7 million) in 1996 to 3.9 thousand tonnes (£5.9 million) in 2000.

Sources of information
Lee D Ed. UK Sea Fisheries Statistics 1999 and 2000. DEFRA and National Statistics. The Stationary Office

4.2.3 Principal ferry routes

There are ferry services between Felixstowe and Europoort (Netherlands) and Zeebrugge (Belgium) (Table 4.3).

Table 4.3 - Principal ferry routes in the region

	1998	1999	2000
	Thousand passengers		
Felixstowe – Europoort	57	58	65
Felixstowe – Zeebrugge	6	5	5

4.2.4 Ship arrivals

In the Norfolk and Suffolk region, Felixstowe is by far the largest port, followed by the port of Ipswich. Table 4.4 indicates the numbers and type of vessels that visited these ports in 1999. Felixstowe was visited by a total of 7,661 ships in 1999 and of these, the majority were Ro-ro vessels (1-20,000 tonnes), container vessels (over 20,000 tonnes) and dry cargo vessels (1-20,000 tonnes). Felixstowe received over 55% of the UK's total number of large container vessels (over 20,000 tonnes) and 12.7% of the UK's total of large Ro-ro vessels (over 20,000 tonnes).

Table 4.4 – Ship arrivals at major ports in the region, by type and deadweight 1999

	Tankers			Ro-ro vessels		Container vessels		Other dry cargo vessels		
Deadweight tonnes (x1000)	**1-20**	**20-100**	**100+**	**1-20**	**20+**	**1-20**	**20+**	**1-20**	**20-100**	**100+**
Felixstowe	52	2	-	3,195	25	907	1,779	1,627	74	-
Ipswich	141	-	-	9	-	2	-	848	-	-
All UK ports	**18,123**	**2,841**	**681**	**88,390**	**196**	**3,904**	**3,225**	**35,584**	**1,559**	**266**

Sources of information
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document

4.2.5 Shipping density

Offshore areas of the North Norfolk coast are exposed to shipping densities of between 1-5,000 ships per annum although there are areas of increased traffic (>20,000 ships per annum) on southern shipping routes out of the Humber towards the English Channel. Nearshore areas off the east coast of Norfolk and Suffolk experience relatively heavy shipping densities of between 5,000-20,000 ships per annum and further offshore, the busy shipping lanes entering the English Channel cause very high shipping densities (>20,000 ships per annum) (Figure 1.5). Cargo ship movements from Felixstowe form the focus for many of the shipping routes in the area.

4.2.6 Traffic separation schemes

There are two deep water routes in offshore waters of the Norfolk and Suffolk region which extend from the Noord Hinder Junction in Dutch waters, into UK waters in a northerly and north easterly

direction (Figure 1.5). The routes run parallel to the east coast of Suffolk and Norfolk before crossing back into Dutch waters.

4.2.7 Marine Environment High Risk Areas (MEHRAs)

Within the Norfolk and Suffolk region, no potential MEHRA sites have been identified.

Sources of information
DETR Identification of Marine Environment High Risk Areas in the UK, 1999

4.3 Military activity

There are relatively few military activity areas within the Norfolk and Suffolk region (Table 4.5 and Figure 1.6). The majority of the two navy department areas fall within the Essex and Kent region.

Table 4.5 – Military activity areas in the Norfolk and Suffolk region

Serial no.	Name	Type of practice*	Altitude range (feet above surface)
Navy department areas			
X5117	Outer Gabbard	ML, MS	
X5121	North Galloper	ML, MS	
Air Force department areas			
D207	Holbeach	Bombing, ASF	23,000
		Ordnance demolition within on-shore area	5,000

*Type of Practice: ASF (Air-to-Surface Firing), ML (Minelaying), MS (Mine Sweeping).

Sources of information
PEXA Chart Q6401 – Scarborough to Poole. Admiralty Charts and Publications. UK Hydrographic Office

4.4 Aggregate extraction

Areas of the seabed within coastal waters of the Norfolk and Suffolk region support the greatest amount of commercial extraction of marine aggregates in the UK. The licensed extraction areas are centred off the coast close to Great Yarmouth and Lowestoft and are shown on Figure 1.7. Details of the amount of aggregate extracted from the region are given in Box 4.2.

Box 4.2 - Marine aggregate extraction in the Norfolk and Suffolk region

Total area licensed	361.7km^2		
Total area dredged	80km^2		
>90% of material dredged from	9.78km^2		
	1999	**2000**	**2001**
Amount extracted (million tonnes)	9.13	10.54	9.64
UK total	**23.68**	**23.06**	**22.76**

Marine aggregate extraction in the Norfolk and Suffolk region in 2001 accounted for almost 42% of the total extracted in the UK.

Aggregate extraction figures for the Norfolk and Suffolk region do not include aggregates extracted from the area to the west of Felixstowe. The Crown Estate includes this area as part of the Thames Estuary dredging area and as such extraction from this area is included in the figures for Essex and Kent (Section 5.4 - Aggregate extraction).

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/

4.5 Marine disposal sites

The bulk of the material eligible for sea disposal comes from dredging operations, an essential activity for ports and navigation channels.

Table 4.6 indicates that the majority of material deposited in the coastal waters of the Norfolk and Suffolk region (Figure 1.8) came from maintenance dredging of the various estuaries and harbours of the region. However, compared to the large amount of dredge spoil deposited in other regions of the SEA area, the amount deposited was low.

Table 4.6 – Marine disposal in the region 2000

Deposit site	Origin	Type of areas dredged			Dredging operation		Quantity
	Watersystem	Harbour	Estuary	Sea	Capital	Maintenance	(tonnes)
HU143	Great Ouse River	x	x			x	28,835
HU150	Yare River	x	x	x	x	x	15,317
HU170	Witham River	x	x	x		x	39,178
TH005	Waveney River	x				x	27,726
Total							**111,056**

To comply with OSPAR guidelines, the levels of various heavy metals in the dredge spoil is monitored by CEFAS. The heavy metal contamination of the dredge spoil deposited off the Norfolk and Suffolk coast is shown in Box 4.3. It is clear that the limited amount of dredge spoil deposition in the region has led to relatively low levels of heavy metal contamination.

Box 4.3 - Heavy metal contamination (tonnes) of disposed dredged material 2000

Deposit site	Cadmium	Mercury	Arsenic	Chromium	Copper	Lead	Nickel	Zinc
HU143	0.01	0.00	0.39	1.26	0.49	1.43	0.71	2.72
HU150	0.00	0.00	0.06	0.05	0.05	0.16	0.09	0.31
HU170	0.05	0.00	0.58	1.93	0.66	1.38	1.01	3.56
TH005	0.03	0.00	0.61	3.52	0.80	1.29	2.36	3.23
Total	**0.09**	**0.00**	**1.64**	**6.76**	**2.00**	**4.26**	**4.17**	**9.82**

Sources of information
Pers. comm. Helen Player, CEFAS

4.6 Oil and gas activity

The Norfolk and Suffolk region plays an important role in infrastructural support for the oil and gas industry. There are a number of installations on the Norfolk and Suffolk coast which include oil and gas terminals, storage facilities, and a tanker terminal (Table 4.7 and Figure 1.9).

Table 4.7 - Location of oil and gas infrastructure in the region						
	Oil Terminal	Gas Terminal	Oil Storage	LNG Storage	Oil Refinery	Tanker Terminal
King's Lynn	✓		✓			
Bacton		✓				
Felixstowe			✓			✓

A major contributing factor to the relatively high shipping densities (5,000-20,000 ships per annum) found in the region's waters (Section 4.1 – Ports and shipping) are the large number of oil and shuttle tanker routes which pass between the east coast tanker terminals and the English Channel.

Within offshore areas of the Norfolk and Suffolk region there are a number of producing gas fields, the details of which are presented in Box 4.4.

Box 4.4 - Producing offshore gas fields in the Norfolk and Suffolk region	
Gas field:	Hewett*
Operator:	Phillips
Date of discovery:	1966
Production start:	1969
First year of peak production:	1977
Peak production (billion cubic metres per year):	8.60
Water depth:	37m
Gross gas production 2000 (million cubic metres):	1,484[†]
Cumulative total to end 2000 (million cubic metres):	116,907[†]
Gas field:	Dawn
Operator:	Phillips
Date of discovery:	1994
Production start:	1995
First year of peak production:	1995
Peak production (billion cubic metres per year):	0.16
Water depth:	36m
Gross gas production 2000 (million cubic metres):	29[#]
Cumulative total to end 2000 (million cubic metres):	488

*The Hewitt field includes accumulations formerly known as Big Dotty, Little Dotty and Deborah. [†]Figure given for Hewett and Della fields. [#]Production ceased in 2000.

Offshore areas of the Norfolk and Suffolk region are traversed by a number of gas pipelines connecting offshore gas fields with the large gas terminal at Bacton (Figure 1.9). Bacton received over 20% of the UKCS natural gas in 2000 making it the largest gas terminal in the UK. Details of the gas terminal and the connecting pipelines are given in Box 4.5.

Box 4.5 - Bacton gas terminal and connecting pipelines	
Gas terminal:	Bacton
Fields connected:	Baird, Barque, Barque South, Bell, Bessemer, Bure, Bure West, Camelot C and S, Camelot N, Clipper, Corvette, Davy, Dawn, Deben, Delilah, Excalibur, Galahad, Galleon, Gawain, Guinevere, **Hewett**, Indefatigable, Indefatigable SW, Lancelot, Leman,

Box 4.5 - Bacton gas terminal and connecting pipelines	
	Malory, Mordred, Orwell, Sean, Sean East, Shearwater, Skiff, Thames, Trent, Tristan, Tyne North, Tyne South, Waveney, Welland NW, Welland S, Wensum, Yare
Receipts (billion cubic metres):	21.6
Gas pipelines connecting to terminal	
Bacton-Zeebrugge Gas Interconnector	
From:	Bacton to Median Line UK-Belgium
Length:	24.5km
Diameter:	508mm
Material conveyed:	Natural Gas
Operator:	British Gas
Year commissioned:	1998
From:	Clipper to Bacton
Length:	72.6km
Diameter:	610mm
Material conveyed:	Natural Gas
Operator:	Shell
Year commissioned:	1990
From:	Hewitt to Bacton
Length:	27.7km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	Phillips
Year commissioned:	1969
From:	Hewitt to Bacton
Length:	32.8km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	Phillips
Year commissioned:	1969

Box 4.5 - Bacton gas terminal and connecting pipelines	
From:	Lancelot A to Bacton
Length:	62km
Diameter:	508mm
Material conveyed:	Natural Gas
Operator:	Mobil
Year commissioned:	1993
From:	Leman Bank to Bacton
Length:	55.7km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	Shell/Esso
Year commissioned:	1968
From:	Leman Bank to Bacton
Length:	61.5km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco
Year commissioned:	1969
From:	Leman Bank to Bacton
Length:	64.9km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco/Shell/Esso
Year commissioned:	1970
From:	Leman Bank to Bacton*
Length:	57.8km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	BP-Amoco/Shell/Esso
Year commissioned:	1971
Shearwater-Elgin Area Line (SEAL)	
From:	Shearwater to Bacton
Length:	473.1km
Diameter:	863.6mm
Material conveyed:	Natural Gas
Operator:	Elf
Year commissioned:	1999

Box 4.5 - Bacton gas terminal and connecting pipelines	
From:	Sean to Bacton
Length:	106km
Diameter:	762mm
Material conveyed:	Natural Gas
Operator:	Shell
Year commissioned:	1986
From:	Thames to Bacton
Length:	89.4km
Diameter:	610mm
Material conveyed:	Natural Gas
Operator:	Arco
Year commissioned:	1986

Note: Those fields in bold are within the SEA 3 region. *Pipeline mothballed/no longer in use.

Sources of information
DTI Brown Book 2001 – Development of UK Oil and Gas Resources 2001. The Stationary Office

4.7 Alternative energy

4.7.1 Wind power

There are no coastal wind farm projects currently in operation in the Norfolk and Suffolk region.

In April 2001 the Crown Estate announced the names of wind farm developers who had successfully pre-qualified to obtain a lease of seabed for the development of offshore wind farms. Within the offshore area covered by the Norfolk and Suffolk region there are two proposed wind farms, the details of which are given in Box 4.6 and Figure 1.10.

Box 4.6 - Proposed offshore wind farms in the Norfolk and Suffolk region	
Site name:	Cromer
Likely site location:	6.5km off Mundesley (Foulness)
Proposed start date:	2005
Number of turbines:	30
Potential capacity (MW):	100
Operating company:	Beaufort Consortium
Site name:	Scroby Sands
Likely site location:	2.3km off Caister
Proposed start date:	2003
Number of turbines:	38
Potential capacity (MW):	76
Operating company:	Powergen Renewables Offshore Wind Ltd.

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/marine/windfarms/wfmap.shtml
British Wind Energy Association website
http://www.britishwindenergy.co.uk/pub.html

4.7.2 Wave and tidal power

There are currently no tidal or wave energy projects in the Norfolk and Suffolk region.

4.7.3 Nuclear energy

The Magnox power station, Sizewell A was opened in 1966 and is located near Leiston, Suffolk (Figure 1.10). Sizewell A has a power capacity of 420MW but is due to close in 2006 after completion of its licensed lifetime.

Sources of information
DTI New and Renewable Energy website
http://www.dti.gov.uk/renewable/index.html
BNFL website
http://www.bnfl.co.uk/website.nsf/index.htm

4.8 Telecommunications cables

Cable density increases further south in the SEA 3 region with eleven cable landfalls in Norfolk and Suffolk, close to Sheringham, Winterton-on-Sea, Lowestoft and Aldeburgh, primarily linking the UK and the Netherlands (Box 4.7 and Figure 1.11).

Box 4.7 - Telecommunication cables in the Norfolk and Suffolk region

Cable land fall	Cable	Operator
Sheringham	NORTH SEA OFFSHORE	BA/BT
Winterton-on-Sea	UK-NETHERLANDS 14	CONCERT
	UK-GERMANY 5	CONCERT
Lowestoft	PANGEA 2 UK-NETHERLANDS	PANGEA
	ULYSSES 2	WORLDCOM
	No cable name	-
Aldeburgh	CONCERTO 1N	FLUTE
	CONCERTO 1S	FLUTE
	HERMES NORTH	GTS
	UK-NETHERLANDS 12	CONCERT
	FARLAND	BT
Cables traversing region		
	ATLANTIC CROSSING 1	GLOBAL CROSSING

Sources of information
Kingfisher Cable Awareness Charts: Central North Sea, South North Sea, and English Channel – East

4.9 Coastal settlements

Norfolk has a largely undeveloped, rural coastline. Industry being centred around King's Lynn and the larger commercial centre of Great Yarmouth (Figure 1.12). There are numerous other smaller settlements along the coast, such as Hunstanton, Wells, Sheringham and Cromer. The open coast of Suffolk has little residential development, with the exception of Lowestoft and Felixstowe. Ipswich, the largest town in the county, is situated some 12km from the open coast at the head of the Orwell Estuary (Table 4.8).

Table 4.8 - Population demographics of the Norfolk and Suffolk region 1999

		Population	
	Area (km^2)	Per km^2	Total (thousands)
Norfolk (C)	5,372	148	796
Broadland	552	216	119
Great Yarmouth	174	517	90
Suffolk (C)	3,798	178	675
Suffolk Coastal	892	136	121
Ipswich	39	2,920	114
United Kingdom	**242,910**	**245**	**59,501**

Note: C = County, UA = Unitary Authority

Sources of information
National Statistics website
http://www.statistics.gov.uk/statbase/
Key population and vital statistics: Local and health authority areas 1999. National Statistics Series VS no.26, PP1 no. 22. The Stationary Office, London

4.10 Tourism and leisure

Many of this region's coastal towns have had a long association with the tourism industry, most notably Great Yarmouth. Many tourists are attracted to Hunstanton for its powerboat and water skiing facilities. The Norfolk Coast Path National Trail, in addition to many other coastal footpaths and the region's rich wildlife popular for birdwatching and wildfowling alike, attract further visitors. The North Norfolk coast is a popular destination for dinghy sailors and windsurfers.

Suffolk's tourism industry is oriented around its small towns and villages with Lowestoft being the major seaside resort in the county. There is a busy leisure boating industry which links up with the Broads. Wildfowling, birdwatching and walking are important leisure pursuits.

4.10.1 Tourism statistics

The numbers and expenditure of both UK and foreign tourists in the Norfolk and Suffolk region are presented in Table 4.9.

Table 4.9 - Number and expenditure of UK and overseas tourists in the region 2000

	Norfolk	Suffolk	UK total
UK residents			
Number of trips to the region (million):	3.4	2.1	175.4
Expenditure (£ million):	510	225	26,132

Overseas residents			
Number of trips to the region (million):	0.14	0.19	25.2
Expenditure (£ million):	53	50	12,672

The Pleasure Beach at Great Yarmouth is one of the most popular free admission attractions in the Norfolk and Suffolk region with 1.5 million visits in 2000.

Sources of information
East of England Tourist Board website
http://www.eastofenglandtouristboard.com/
Star UK - Statistics on Tourism and Research website
http://www.staruk.org.uk/

4.11 Bathing waters and marinas

4.11.1 Bathing waters

Within the Norfolk and Suffolk region there are a number of designated bathing waters (Table 4.10 and Figure 1.13). A large number of beaches have been awarded Seaside Awards and there are six Blue Flag beaches, the largest number found in any of the SEA 3 regional sections.

Table 4.10 - Designated bathing waters in the region 2001

Bathing waters	**Water quality***			**Beach award**
	E	G	P	
Snettisham				ENCAMS Seaside Award 2002
Heacham, North		✓		ENCAMS Seaside Award 2002
Heacham, South				ENCAMS Seaside Award 2002
Hunstanton Main Beach		✓		ENCAMS Seaside Award 2002
Hunstanton Beach		✓		
Wells		✓		
Sheringham	✓			**Blue Flag**, ENCAMS Seaside Award 2002
Cromer	✓			**Blue Flag**, ENCAMS Seaside Award 2002
Mundesley		✓		**Blue Flag**, ENCAMS Seaside Award 2002
Sea Palling				ENCAMS Seaside Award 2002
Hemsby	✓			
Caister Point		✓		
Great Yarmouth North	✓			
Great Yarmouth Central		✓		**Blue Flag**, ENCAMS Seaside Award 2002
Great Yarmouth South			✓	
Gorleston Beach		✓		ENCAMS Seaside Award 2002
Suffolk				
Lowestoft, Gunton Denes				ENCAMS Seaside Award 2002
Lowestoft North	✓			ENCAMS Seaside Award 2002
Victoria Beach		✓		
Lowestoft South	✓			ENCAMS Seaside Award 2002
Kessingland				ENCAMS Seaside Award 2002
Southwold The Pier	✓			**Blue Flag**, ENCAMS Seaside Award 2002
Southwold The Denes		✓		ENCAMS Seaside Award 2002
Thorpeness				ENCAMS Seaside Award 2002
Aldeburgh				ENCAMS Seaside Award 2002
Felixstowe North	✓			
Felixstowe South	✓			**Blue Flag**, ENCAMS Seaside Award 2002

*Water Quality = E (Excelllent), G (Good) and P (Poor). See Introduction for details.

4.11.2 Marinas

Marina developments within the Norfolk and Suffolk region are indicated on Table 4.11. Within the region, there is one Blue Flag marina – Woolverstone Marina. The left-hand number indicates the location of the marina on Figure 1.14.

Table 4.11 - Marina developments in the region

		Location
16	Wells Harbour	Wells-next-to-Sea
17	Burgh Castle Marina	Great Yarmouth
18	Royal Norfolk and Suffolk Yacht Club	Lowestoft
19	Lowestoft Yacht Marina	Lowestoft
20	Lowestoft Cruising Club	Lowestoft
21	Southwold Harbour	Southwold
22	Slaughden Quay	Aldeburgh
23	Orford Quay	Orford
24	Suffolk Yacht Harbour	Ipswich
25	Debbage Yachting	Ipswich
26	Neptune Marina Ipswich	Ipswich
27	Foxs Marina Ipswich	Ipswich
28	Woolverstone Marina **(Blue Flag marina)**	Ipswich
29	Shotley Marina Limited	Ipswich

For the purpose of this report, the number of Royal Yachting Association members has been used to give an indication of the popularity of sailing in the region. For the RYA East region (includes Norfolk, Suffolk and Essex) there are 11,353 members.

Sources of information
ENCAMS Seaside Awards website
http://www.seasideawards.org.uk/sea2.htm
Blue Flag Campaign website
http://www.blueflag.org/
DEFRA Digest of Environmental Statistics – Coastal and Marine Waters website
http://www.defra.gov.uk/environment/statistics/des/coastwaters/ch040206.htm
Environment Agency website
http://216.31.193.171/asp/bwd_q_simple.asp?language=English
Marina-Info.com
http://www.marina-info.com/minfo/uk/realukindex.htm
Royal Yachting Association website
http://www.rya.org.uk/Regions/
Pers. comm. Gaynor Sawyer, Royal Yachting Association Media Relations Officer

4.12 Mariculture

Designated bivalve production areas in the region are shown in Table 4.12 and Figure 1.15. The Wash is the main focus of mariculture operations and within it, a total of 47 lays are leased to 35 different lay holders, the total area of layholdings being 156ha.

Table 4.12 – Designated bivalve production areas 2001

Map ref.	Production area	Species
5	The Wash – Kings Lynn	Mussels, Cockles
6	Brancaster	Mussels, *C. gigas*
7	Blakeny	Mussels, Cockles
8	River Alde	*C. gigas*, Mussels
9	Butley	C. gigas

In 2000 intertidal mussels within the Wash public fishery were relayed and together with seed mussels brought in from other parts of the UK some 2,400 tonnes were restocked onto the lays during the year.

The mussel season in 2000 was split into two sections, from January to April and from September to December. In the first part of the season some 185 tonnes were landed through King's Lynn valued at approximately £83,450. After the mussel season re-opened in September landings into King's Lynn for the remainder of the year were 642 tonnes (£285,800).

There is currently one operation cultivating Pacific oysters in mesh bags on trestles within the Wash.

Sources of information
Food Standards Agency website
http://www.foodstandards.gov.uk/
Pers. comm. J Turner, Eastern Sea Fisheries Joint Committee
Eastern Sea Fisheries Joint Committee website
http://www.esfjc.org/

5 ESSEX AND KENT

This region covers the coastline of the counties of Essex and Kent (Figure 1.1), and includes the unitary authorities of Southend-on-Sea, Thurrock and Medway.

Of all the regions covered by the SEA 3 area, Essex and Kent is the most densely populated although there are coastal areas which are rural in nature. A number of large commercial ports operate in the region, of which the Port of London handles the greatest volume of traffic. Within the Thames Estuary there is significant oil and gas infrastructure including oil terminals, storage facilities and a tanker terminal.

5.1 Coastal fisheries

The numerous estuaries along the Essex coast, together with the Thames Estuary, provide rich fishing grounds for both finfish and shellfish, and shelter that allows small boats to fish most of the year. Here, the larger boats trawl for sole, cod, sprats, herring, thornback ray, eels and shrimp, and dredge for whiteweed and cockles. The smaller boats work oyster lays, use fixed and drift nets for sole, cod, bass and mullet, longlines for cod and occasionally bass, handlines for bass, eel fyke nets and whelk and lobster pots. There are no large fishing ports on the Essex coast and fish are landed into small ports such as Leigh-on-Sea and Walton-on-the-Naze.

Within the Thames Estuary, the cockle fishery is the largest in the UK and makes up approximately half of the UK landings of this species. The fishery is closely regulated and stock densities are controlled in order to maximise growth rates. There is also some relaying of stock. The cockle fishery extends to 6nm offshore and the majority of the fishing vessels involved come from the Essex side of the Thames Estuary, 10 vessels compared to 4 on the Kent coast.

For north Foreland southwards along the English Channel coast, most boats over 9m use otter trawls for sole and plaice during the warmer months, and for cod and whiting in winter. The static gear fleet set gill, tangle and trammel nets for the same species and use drift nets for bass and herring in season. Pots are set for lobster on rocky grounds close inshore, with brown crab becoming more important on cleaner grounds further offshore. Whelks are also taken in pots at scattered localities.

On the Kent coast, netting for sole is the most valuable fishery with most of the vessels in the area taking part. Ramsgate is the main focus of the coastal fishery in Kent and is home to 20 fishing vessels. Queenborough, Folkestone (both home to 12 vessels), Whitstable (11 vessels), Herne Bay and Dungeness (both home to 9 vessels) are also important fishing ports.

Sources of information

Pers. comm. J Wiggins, A Millwain and J Stroud. Kent and Essex Sea Fisheries Committee

Pawson MG, Pickett GD and Walker P (2002). The Coastal Fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

5.2 Ports and shipping

5.2.1 Major ports

The Essex and Kent region contains a number of major ports which combined, handle the greatest amount of port traffic in the UK (over 83 million tonnes in 2000) (Table 5.1). In the region, the three primary ports are London, Medway (including Thamesport and Sheerness) and Dover (Figure 1.4).

Table 4.1 - Foreign and domestic traffic handled by ports in the region			
	1998	**1999**	**2000**
		Million tonnes	
Harwich	3.28	4.06	3.99
London	57.31	52.21	47.89
Medway	15.53	13.97	15.29
Ramsgate	1.87	1.21	1.24
Dover	17.69	19.39	17.43
Folkestone	0.63	0.46	0.56
All UK traffic	**568.5**	**565.6**	**573.1**

The Port of London comprises the tidal Thames between Teddington Lock in West London and the North Sea, a distance of 150 kilometres. London is the third largest port in the UK, handling 47.9 million tonnes of port traffic in 2000 (8.4% of UK total) (Box 5.1). In 2000, London was responsible for handling the greatest amount of non-oil traffic in the UK (10.8% of the UK total, 30.1 million tonnes). London is the third largest container port in the UK and in 2000 handled 9.0% of the UK's foreign and coastwise container traffic (0.4 million container units).

Significant Port of London facilities in Essex and Kent include Tilbury, Purfleet, Dartford and the Coryton oil refinery. Shellhaven closed as a fuel terminal in 1999, however there are plans to redevelop the Shellhaven site over the next five years to handle other types of traffic possibly Ro-Ro and container traffic.

Box 5.1 - London foreign and domestic port traffic	
	Million tonnes
Liquid bulk	
Crude oil	7.3
Oil products	10
All liquid bulk traffic	18.6
Dry bulk	
Ores	0.5
Coal	1.4
All dry bulk traffic	14.2
Other general cargo	7.7
Containers	5.3
Roll-on/Roll-off (self-propelled)	1.0
Roll-on/Roll-off (non self-propelled)	5.3
All traffic	**47.9**

Sources of information
DTLR Maritime Statistics website
http://www.transtat.detr.gov.uk/shipping/index.htm#ports
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document

5.2.2 Fishing ports

There are no major fishing ports in the Essex and Kent region.

Sources of information
Lee D Ed. UK Sea Fisheries Statistics 1999 and 2000. DEFRA and National Statistics. The Stationary Office

5.2.3 Principal ferry routes

The principal ferry routes in the Essex and Kent region are presented in Table 5.2. Dover is the UK's principal international ferry port and the biggest ferry port in Europe. In 2000, over 16 million ferry passengers passed through the port, the Dover to Calais route being by far the most popular with almost 15 million passengers. Dover has also become an important cruise port and in 2000, there were around 120,000 passengers commencing or ending a cruise at the port.

Table 5.2 - Principal ferry routes in the region

	1998	1999	2000
	Thousand passengers		
Harwich – Esbjerg	191	184	161
Harwich – Goteborg	162	1	-
Harwich – Hamburg	183	167	188
Harwich – Hook of Holland	849	920	893
Ramsgate – Ostend	161	50	76
Dover – Boulogne	2	12	3
Dover – Calais	18,137	17,152	14,970
Dover – Dunkerque	1	4	75
Dover – Ostend	958	944	814
Dover – Zeebrugge	231	213	216
Folkestone – Boulogne	905	653	440

Freight ferry services also operate from Harwich to Holland, Germany, Belgium and Sweden, whilst passenger/freight ferry services operate to Holland, Germany, Denmark and Sweden. In 2000, 1.24 million ferry passengers (4.4% of UK total) passed through the port of Harwich.

Since 1994 Channel Tunnel services have competed with ferry services for freight and passenger traffic in the South East. In 2000 over 17 million passengers passed through the tunnel.

5.2.4 Ship arrivals

In the Essex and Kent region, the port of London is the largest port followed by the ports of Dover and Medway. Table 5.3 indicates the numbers and type of vessels that visited these ports in 1999. The port of London was visited by a total of 10,421 ships in 1999 and of these, the majority were Ro-ro vessels (1-20,000 tonnes) and dry cargo vessels (1-20,000 tonnes). The port of London received a number of large vessels including 28% of the UK's total number of large Ro-ro vessels (over 20,000 tonnes), 8.6% of the UK's total number of large container vessels (over 20,000 tonnes) and 4.7% of the UK's total number of large tankers (over 100,000 tonnes).

The port of Medway received 3,850 vessels in 1999 and of these, 16% of the UK's total number of large container vessels (over 20,000 tonnes). The port of Dover is also of note as it received 24,261 vessels in 1999, 15.7% of the total received by all of the UK's ports.

Table 5.3 - Ship arrivals at major ports in the region, by type and deadweight 1999

				Ro-ro vessels		Container vessels		Other dry cargo vessels		
Deadweight		**Tankers**								
tonnes (x1000)	**1-20**	**20-100**	**100+**	**1-20**	**20+**	**1-20**	**20+**	**1-20**	**20-100**	**100+**
London	1,845	327	32	3,862	55	638	279	3,163	219	1
Medway	80	35	-	387	6	85	517	2,532	207	1
Dover	-	-	-	24,039	-	1	-	221	-	-
All UK ports	**18,123**	**2,841**	**681**	**88,390**	**196**	**3,904**	**3,225**	**35,584**	**1,559**	**266**

Sources of information
DTLR Maritime Statistics 2000. The Stationary Office, London.
DTLR Focus on Ports 2000. PDF document

5.2.5 Shipping density

The large amount of traffic (over 83 million tonnes) handled by ports of the Essex and Kent region means that many offshore areas of the region are heavily shipped. Much of the Thames Estuary, home to the Ports of London and Medway experiences shipping densities of between 5,000-20,000 ships per annum and further offshore, where the southern North Sea runs into the English Channel, shipping densities are very high (>20,000 ships per annum). The Kent coast also experiences very high levels of shipping (>20,000 ships per annum) (Figure 1.5).

Within the region there are many shipping routes which funnel into the English Channel from the southern North Sea. Much of the traffic is the result of oil and shuttle tankers from terminals in the Thames Estuary (Isle of Grain) as well as those from other UK ports. The Port of Dover also forms a focus for many ferry routes between the UK and Europe. Cargo routes between the large ports of the region and Europe also add to the high shipping pressures of the region.

5.2.6 Traffic separation schemes

The Dover Strait Traffic Separation Scheme runs in a north east direction through the Dover Strait and up to the Noord Hinder Junction Precautionary Area (52°00'N, 2°50'E) in Dutch waters, in all a distance of 170 miles (Figure 1.5).

5.2.7 Marine Environment High Risk Areas (MEHRAs)

As mentioned in the introduction, the concept of MEHRAs is to identify comparatively limited areas of high environmental sensitivity, which are also at risk from shipping (i.e. marine pollution). Within the Essex and Kent region, the area around the chalk cliffs of South Foreland, Kent has been identified as a potential MEHRA (Figure 1.5).

Sources of information
DETR Identification of Marine Environment High Risk Areas in the UK, 1999
Dover Strait Pilot 1997. The UK Hydrographic Office

5.3 Military activity

There are a large number of military activity areas within the Essex and Kent region (Table 5.4 and Figure 1.6). Of these, the minelaying, mine sweeping and mine disposal areas off the Essex and north Kent coast are of most relevance.

Table 5.4 – Military activity areas in the Essex and Kent region

Serial no.	Name	Type of practice*	Altitude range (feet above surface)
Navy department areas			
X5117	Outer Gabbard	ML, MS	
X5121	North Galloper	ML, MS	
X5119	Kentish Knock	ML, MS	
X5120	South Galloper	ML, MS	
X5121	North Galloper	ML, MS	
X5122		MS	

Table 5.4 – Military activity areas in the Essex and Kent region			
X5123		MD	
Army department areas			
D044	Lydd Ranges		
D139	Fingringhoe/Middlewick	Firing, Demolition firing	1,000 & 2000
D141	Hythe Ranges	Firing, Demolition firing	2000
D146	Yantlet	Demolition firing	3,000
Ministry of Defence (procurement executive) areas			
D136	Shoeburyness	Firing	10,000
D138	Shoeburyness	Firing	35,000 & 60,000
D138A	Shoeburyness	Firing	35,000 & 60,000
D138B	Shoeburyness	Firing	5,000

*Type of Practice: MD (Mine Disposal), ML (Minelaying), MS (Mine Sweeping).

Sources of information
PEXA Chart Q6401 – Scarborough to Poole. Admiralty Charts and Publications. UK Hydrographic Office

5.4 Aggregate extraction

Aggregate extraction occurs in several areas within the coastal waters of Essex and Kent (Figure 1.7). Details of the amount of aggregate extracted from the region are given in Box 5.2.

Licensed extraction areas to the west of Felixstowe (Section 4.4 Aggregate extraction) are included in extraction figures for the Essex and Kent region.

Box 5.2 - Marine aggregate extraction in the Essex and Kent region			
Total area licensed	194.4km^2		
Total area dredged	26km^2		
>90% of material dredged from	1.26km^2		
	1999	**2000**	**2001**
Amount extracted (million tonnes)	1.69	0.85	1.12
UK total	**23.68**	**23.06**	**22.76**

Marine aggregate extraction in the Essex and Kent region in 2001 accounted for 5% of the total extracted in the UK.

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/

5.5 Marine disposal sites

The bulk of the material eligible for sea disposal comes from dredging operations, an essential activity for ports and navigation channels.

Table 5.5 indicates that much of the material deposited in the coastal waters of the Essex and Kent region came from capital dredging, in particular the 3.2 million tonnes deposited at site TH049 (Figure 1.8), the largest deposition of dredge spoil in the SEA 3 area. The source of much of this material (3,193,451 dry weight tonnes) was from a channel deepening project at Harwich Haven.

Table 5.5 – Marine disposal in the region 20001							
Deposit site	Origin Watersystem	Type of areas dredged Harbour	Estuary	Sea	Dredging operation Capital	Maintenance	Quantity (tonnes)
TH038	Orwell River	x				X	4,334
TH205	Orwell River	x				X	1,980
TH206	Orwell River	x				X	2,970
TH049	Orwell/Stour Rivers + Essex/Suffolk Coast	x		x	x		3,204,142
TH052	Orwell/Stour Rivers + Essex/Suffolk Coast	x	X	x	x	X	619,723
TH070	Thames River	x	X	x	x		37,619
Total							**3,870,768**

To comply with OSPAR guidelines, the levels of various heavy metals in the dredge spoil is monitored by CEFAS. The heavy metal contamination of the dredge spoil deposited off the Essex and Kent coast is shown in Box 5.3. It is clear that the large amount of dredge spoil deposited at site TH049 was responsible for the heaviest contamination.

Box 5.3 - Heavy metal contamination (tonnes) of disposed dredged material 2000								
Deposit site	Cadmium	Mercury	Arsenic	Chromium	Copper	Lead	Nickel	Zinc
TH038	0.00	0.00	0.07	0.32	0.31	0.24	0.16	0.67
TH205	0.00	0.00	0.02	0.06	0.02	0.03	0.03	0.09
TH206	0.00	0.00	0.03	0.09	0.03	0.05	0.05	0.13
TH049	0.76	0.08	40.03	145.42	69.09	29.23	78.41	164.23
TH052	0.12	0.06	0.00	40.75	1.12	21.28	20.04	59.98
TH070	0.07	0.07	0.52	3.29	2.49	4.17	1.16	8.52
Total	**0.95**	**0.21**	**40.67**	**189.93**	**73.06**	**55.00**	**99.85**	**233.62**

Sources of information
Pers. comm. Helen Player, CEFAS

5.6 Oil and gas activity

There are a number of installations on the Essex and Kent coast including oil terminals at Canvey and Coryton, storage facilities at Grays and the Isle of Grain, an oil refinery at Coryton and a tanker terminal at the Isle of Grain (Table 5.6 and Figure 1.9).

Table 5.6 - Location of oil and gas infrastructure in the region						
	Oil Terminal	Gas Terminal	Oil Storage	LNG Storage	Oil Refinery	Tanker Terminal
Canvey	✓					
Coryton	✓				✓	
Grays			✓			
Isle of Grain				✓		✓

A major contributing factor to the relatively high shipping densities (5,000-20,000+ ships per annum) found in the region's waters (Section 5.1 - Ports and shipping) are the large number of oil and shuttle

tanker routes which pass between the tanker terminals of the English east coast and the English Channel.

Within offshore areas of the Essex and Kent region there are no producing oil or gas fields and no oil or gas pipelines.

Sources of information
DTI Brown Book 2001 – Development of UK Oil and Gas Resources 2001. The Stationary Office

5.7 Alternative energy

5.7.1 Wind power

There are no coastal wind farm projects currently in operation in the Essex and Kent region.

In April 2001 the Crown Estate announced the names of wind farm developers who had successfully pre-qualified to obtain a lease of seabed for the development of offshore wind farms. Within the offshore area covered by the Essex and Kent region there are two proposed wind farm, the details of which are given in Box 5.4 and Figure 1.10.

Box 5.4 - Proposed offshore wind farms in the Essex and Kent region	
Site name:	Gunfleet Sands
Likely site location:	7km
Proposed start date:	2004
Number of turbines:	30
Potential capacity (MW):	100
Operating company:	Enron Wind Gunfleet Ltd

Box 5.4 - Proposed offshore wind farms in the Essex and Kent region	
Site name:	Kentish Flats
Likely site location:	8km off Whitstable/Herne Bay
Proposed start date:	-
Number of turbines:	30
Potential capacity (MW):	60-90
Operating company:	NEG Micon

Sources of information
Crown Estate website
http://www.crownestate.co.uk/estates/marine/windfarms/wfmap.shtml
British Wind Energy Association website
http://www.britishwindenergy.co.uk/pub.html

5.7.2 Wave and tidal power

There are currently no tidal or wave energy projects in the Essex and Kent region.

5.7.3 Nuclear energy

There are two Magnox power stations currently generating electricity in the Essex and Kent region (Figure 1.10). Bradwell, opened in 1963 is located at Bradwell-on-Sea, Essex. The station has a power capacity of 246MW and is due to close in 2002 after completion of its licensed lifetime. The other station, Dungeness A in Kent was opened in 1966 with a power capacity of 450MW and is due to close in 2006 after completion of its licensed lifetime.

Sources of information
DTI New and Renewable Energy website
http://www.dti.gov.uk/renewable/index.html
BNFL website
http://www.bnfl.co.uk/website.nsf/index.htm

5.8 Telecommunications cables

In Kent, eight cable landfall sites close to Margate and Dover connect the UK with Belgium and north east France (Box 5.5 and Figure 1.11). In addition, a trans-Atlantic cable originating in the Netherlands traverses the southern half of the region lying offshore from Lowestoft, Suffolk and running along the Kent coast in a south westerly direction into the English Channel. A cable originating from Belgium runs in a south westerly direction and enters UK territorial waters off Kent before passing back into French waters.

Box 5.5 - Telecommunication cables in the Essex and Kent region		
Cable land fall	**Cable**	**Operator**
Margate	REMBRANDT 2	KPN TELECOMS BV
	HERMES SOUTH	GLOBAL TELESYSTEMS
	TANGERINE	LEVEL 3 GLOBAL SUBMARINE
	PEC	GLOBAL CROSSING
	No cable name	-
Dover	UK-BELGIUM 6	CONCERT
	ULYSSES 1	WORLDCOM

Box 5.5 - Telecommunication cables in the Essex and Kent region		
	UK-FRANCE 4	CONCERT
Cables traversing region		
	ATLANTIC CROSSING 1	GLOBAL CROSSING
	RIOJA 2	CONCERT

Sources of information
Kingfisher Cable Awareness Charts: Central North Sea, South North Sea, English Channel – East

5.9 Coastal settlements

Along the open coast of north Essex, the port of Harwich and coastal holiday resorts of Frinton-on-Sea and Clacton-on-Sea are major settlements. However, to the south, the region contains some of the most heavily populated parts of the UK, notably the Thames Estuary and the Medway towns of north Kent. Along the southern Kent coast, Dover supports a significant local population (Table 5.7 and Figure 1.12).

Table 5.7 - Population demographics of the Essex and Kent region 1999

		Population	
	Area (km^2)	Per km^2	Total (thousands)
Essex (C)	3,469	377	1,306
Southend-on-Sea (UA)	42	4,206	177
Thurrock (UA)	164	822	135
Kent (C)	3,543	379	1,344
Medway (UA)	192	1,267	243
Swale	373	322	120
Thanet	103	1,240	128
Dover	315	347	109
United Kingdom	**242,910**	**245**	**59,501**

Note: C = County, UA = Unitary Authority

Sources of information
National Statistics website
http://www.statistics.gov.uk/statbase/
Key population and vital statistics: Local and health authority areas 1999. National Statistics Series VS no.26, PP1 no. 22. The Stationary Office, London

5.10 Tourism and leisure

Coastal areas of Essex and Kent are major areas for tourism with a number of highly developed traditional seaside resorts, particularly Southend-on-Sea, Clacton-on-Sea, Margate and Ramsgate. This region has seen a dramatic increase in water-based activities in the last 20 years and boating is now a significant industry in some areas, most notably within the Essex estuaries e.g. Blackwater and the Crouch, along the Thames Estuary and off popular beaches. Windsurfing, sea angling and wildfowling are also popular activities.

5.10.1 Tourism statistics

The numbers and expenditure of both UK and foreign tourists in the Essex and Kent region are presented in Table 5.8.

Table 5.8 - Number and expenditure of UK and overseas tourists in the region 2000

	Essex	Kent	UK total
UK residents			
Number of trips to the region (million):	3.1	4.4	175.4
Expenditure (£ million):	307	512	26,132
Overseas residents			
Number of trips to the region (million):	0.42	0.76	25.2
Expenditure (£ million):	144	195	12,672

In Essex some of the most popular free admission attractions include Adventure Island at Southend-on-Sea (2.5 million visits, 2000) and Clacton Pier, Clacton-on-Sea (1.0 million visits, 2000). In Kent, the White Cliffs of Dover are the most visited free admission attraction (0.5 million visits, 2000).

Sources of information
East of England Tourist Board website
http://www.eastofenglandtouristboard.com/
South East England Tourist Board website
http://www.tourismsoutheast.com/
Star UK - Statistics on tourism and research website
http://www.staruk.org.uk

5.11 Bathing waters and marinas

5.11.1 Bathing waters

Within the Essex and Kent region there are a number of designated bathing waters (Table 5.9 and Figure 1.13). A large number of beaches have been awarded Seaside Awards and there are two Blue Flag beaches.

Table 5.9 - Designated bathing waters in the region 2001

Bathing waters	Water quality*			Beach award
	E	G	P	
Dovercourt	✓			**Blue Flag**, ENCAMS Seaside Award 2002
Walton		✓		
Frinton		✓		
Holland	✓			
Bathing waters	**Water quality***			**Beach award**
	E	G	P	
Clacton	✓			ENCAMS Seaside Award 2002
Clacton (Groyne 41)		✓		
Jaywick	✓			
Brightlingsea	✓			ENCAMS Seaside Award 2002
West Mersea	✓			
Southend, Shoebury East	✓			ENCAMS Seaside Award 2002
Southend, Shoebury Common				ENCAMS Seaside Award 2002
Southend, Three Shells				ENCAMS Seaside Award 2002
Southend Thorpe Bay		✓		
Southend Westcliff Bay		✓		

Table 5.9 - Designated bathing waters in the region 2001				
Leigh on Sea, Bell Wharf				ENCAMS Seaside Award 2002
Sheerness	✓			ENCAMS Seaside Award 2002
Leysdown		✓		ENCAMS Seaside Award 2002
West Beach		✓		
Herne Bay Central		✓		ENCAMS Seaside Award 2002
Herne Bay, West		✓		ENCAMS Seaside Award 2002
Reculver				ENCAMS Seaside Award 2002
Minnis Bay, Birchington	✓			**Blue Flag,** ENCAMS Seaside Award 2002
Westgate Bay		✓		
St Mildred`s Bay		✓		
Westbrook Bay		✓		ENCAMS Seaside Award 2002
Margate The Bay			✓	
Margate Fulsam Rock	✓			
Walpole Bay		✓		
Botany Bay	✓			
Joss Bay	✓			
Stone Bay		✓		
Broadstairs		✓		ENCAMS Seaside Award 2002
Ramsgate Main Sands		✓		ENCAMS Seaside Award 2002
Ramsgate		✓		
Sandwich Bay		✓		
Deal Castle		✓		
St Margaret`s Bay	✓			
Folkestone		✓		
Sandgate	✓			
Hythe	✓			
Dymchurch		✓		ENCAMS Seaside Award 2002
St. Mary's Bay		✓		
Littlestone		✓		

*Water Quality = E (Excelllent), G (Good) and P (Poor). See Introduction for details.

5.11.2 Marinas

There are a large number of marina developments within the Essex and Kent region, as shown on Table 5.10. Within the region, there is one Blue Flag marina – Chatham Maritime Marina. The left-hand number indicates the location of the marina on Figure 1.14.

Table 5.10 - Marina developments in the region		
		Location
30	Titchmarsh Marina Limited	Walton-on-Naze
31	West Mersea Marine	West Mersea
32	Brightlingsea Harbour	Brightlingsea
33	Tollesbury Marina	Tollesbury
34	Tollesbury Saltings Limited	Tollesbury
35	River Blackwater	Maldon
36	Heybridge Basin	Maldon
37	Blackwater Marina	Maylandsea
38	Bradwell Marina	Bradwell-on-Sea
39	Burnham Yacht Harbour	Burnham-on-Crouch
40	Bridgemarsh Marina	Althorne
41	North Fambridge Yacht Centre Limited	North Fambridge
42	West Wick Marina Limited	North Fambridge
43	Brandy Hole Yacht Station	Hullbridge, Essex
44	Priors Boatyard	Burnham-on-Crouch
45	Halcon Marina Limited	Canvey Island
46	Dauntless Yacht Company	Canvey Island
47	Gravesham marina	Gravesend

48	Hoo Marina	Hoo
49	Medway Bridge Marina	Rochester
50	Chatham Maritime Marina **(Blue Flag marina)**	Chatham
51	Medway Pier Marina Limited	Gillingham
52	Gillingham Marina	Gillingham
53	Queenborough Harbour	Queenborough
54	Conyer Marina	Sittingbourne
55	Iron Wharf Boatyard	Faversham
56	Youngboats Marine Services	Faversham
57	Hollowshore Services	Faversham
58	Ramsgate Marina	Ramsgate
59	Dover Marina	Dover
60	Folkestone Harbour	Folkestone

For the purpose of this report, the number of Royal Yachting Association members has been used to give an indication of the popularity of sailing in the region. For the RYA South East region (includes Kent and Sussex) there are 7,495 members.

Sources of information
ENCAMS Seaside Awards website
http://www.seasideawards.org.uk/sea2.htm
Blue Flag Campaign website
http://www.blueflag.org/
DEFRA Digest of Environmental Statistics – Coastal and Marine Waters website
http://www.defra.gov.uk/environment/statistics/des/coastwaters/ch040206.htm
Environment Agency website
http://216.31.193.171/asp/bwd_q_simple.asp?language=English
Marina-Info.com
http://www.marina-info.com/minfo/uk/realukindex.htm
Royal Yachting Association website
http://www.rya.org.uk/Regions/
Pers. comm. Gaynor Sawyer, Royal Yachting Association Media Relations Officer

5.12 Mariculture

Designated bivalve production areas within the region are shown in Table 5.11 and Figure 1.15, and are associated with the major estuaries of the region.

Table 5.11 – Designated bivalve production areas 2001

Map ref.	Production Area	Species
10	Stour	Native oyster (*Ostrea edulis)*
11	Walton Backwater	*C. gigas, O. edulis*
12	Colne	*C. gigas, O. edulis*, Cockles, Mussels
13	West Mersea	O. edulis, C. gigas
14	Blackwater	*C. gigas*, Mussels, *O. edulis*, Cockles
15	Crouch	O. edulis
16	Roach	*C. gigas, O. edulis*, Mussels, Hard-shelled clams (*Mercenaria mercenaria)*
17	Thames Estuary	Cockles, Mussels,
18	Swale	*O. edulis, C. gigas*, Cockles, Mussels
19	North Kent Coast	Mussels, *C. gigas,* Manila clams *(Tapes philippinarum)*, Cockles, *O. edulis*

Mariculture operations within Essex focus primarily on cultivation of both native and Pacific oysters with the Blackwater estuary supporting high intensity cultivation of both species. The estuaries of the Colne, Crouch and Hamford Water also support oyster mariculture. Mussel cultivation is limited in the region although seeding of mussels has started in the Crouch and Roach rivers.

In Kent, the Medway and Swale support the cultivation of native oysters as well as the ongrowing of Pacific oysters from the oyster hatchery at Reculver.

Sources of information
Food Standards Agency website
http://www.foodstandards.gov.uk/
Pers. comm. J Wiggins, Kent and Essex Sea Fisheries Committee

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http://www.bnfl.co.uk/website.nsf/index.htm
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http://www.britishwindenergy.co.uk/pub.html
CEFAS Shellfish News No. 13, May 2002
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http://www.cefas.co.uk/homepage.htm
Crown Estate website
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DTI Digest of UK Energy Statistics 2001
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www.scotexchange.net

APPENDIX 1: GLOSSARY AND ABBREVIATIONS

Term	Definition
A/A	High and Low-angle Gunnery
AAF	Air-to-Air Flying
ASF	Air-to-Surface Firing
C	County
CATS	Central Area Transmission System
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
COAST	Computer Assisted Shipping Traffic – vessel movement database, developed by Safetec on behalf of UKOOA, DETR and HSE
DEFRA	Department for Environment, Food and Rural Affairs
Demersal	Living at or near the bottom of the sea
DETR	Department of Environment, Transport and the Regions (functions now split between the Department for Environment, Food and Rural Affairs (DEFRA) and the Department for Transport and the Office of the Deputy Prime Minister which replaced the Department for Transport, Local Government and the Regions (DTLR))
DTI	Department of Trade and Industry
DTLR	Department for Transport, Local Government and the Regions (now replaced by the Department for Transport and the Office of the Deputy Prime Minister)
E	Excellent
ENCAMS	Environmental Campaigns – operating company for Tidy Britain Group and Going for Green environmental charities
FRS	Fisheries Research Services
G	Good
GWh	Giga Watts per hour
HEM	High Energy Manoeuvres
HSE	Health and Safety Executive
ICES	International council for the Exploration of the Sea
Km	Kilometre
LOGGS	Lincolnshire Offshore Gas Gathering System
MD	Mine Disposal
MEHRA	Marine Environment High Risk Area – area of high environmental sensitivity at risk from shipping
ML	Minelaying
MS	Mine Sweeping
MW	Mega Watt
NGLs	Natural Gas Liquids
OSPAR	Oslo and Paris Commission
P	Poor
Pelagic	Organisms living in the water column of the sea
PEXA	Practice and Exercise Areas for the military
PTA	Pilotless Target Aircraft
Ro-ro	Roll on-roll off
RYA	Royal Yachting Association
S/M	Submarine Exercises
SEA	Strategic Environmental Assessment
SEAL	Shearwater-Elgin Area Line
Strategic Environmental	An appraisal process through which environmental protection and

Assessment	sustainable development is considered in decisions on policy, plans and programmes
SU	Firing at surface target
TT	Target Towing
UA	Unitary Authorities
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
USA	United States of America