



Existing Users and Management Initiatives Relevant to SEA 5

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1 INTRODUCTION

The SEA 5 area covers parts of the central and northern North Sea to the east of the Scottish mainland, Orkney and Shetland. The area supports different users and activities, many of which are focussed in particular coastal and marine areas.

Information on coastal and marine interests of the Shetland Islands, Orkney Islands and the north coast of the Scottish Mainland were described fully in the SEA 4 underpinning report (*Existing Users and Management Initiatives Relevant to SEA 4 (2003)*) available from www.offshore-sea.org.uk, this information has not been duplicated in full here. For clarity, the accounts and tabular information make reference to these areas and direct the reader to the relevant section in the SEA 4 report.

The North Sea oil and gas industry has been particularly important in shaping the coastal development of the area over the last 30 years both in terms of industrial development and population demographics. Major developments include the receiving terminals on Shetland and Orkney; in the Moray Firth; at St. Fergus and within the Firth of Forth, as well as the substantial industry support network centred on key locations such as Lerwick, Peterhead and Aberdeen amongst others.

In general, significant coastal development is centred upon the large firths which cut into the east coast; Inverness in the Moray Firth, Dundee on the Firth of Tay and Edinburgh and associated towns on the Firth of Forth. The importance of these areas has led to the development of coastal fora which seek to balance the environmental and economic characteristics of these areas.

Outwith these areas much of the SEA 5 coast is rural in nature with little industrial development. The fishing industry, whilst generally in decline, remains a key industry for many small east coast fishing towns and villages as well as industry centres such as Lerwick, Peterhead and Fraserburgh. Aquaculture is an important industry in Orkney and Shetland, the coasts of which abut SEA 4 and SEA 5, however, this industry is relatively unimportant in the rest of the SEA 5 area.

This report presents an initial overview of the coastal population of the SEA 5 area and the industries and activities which utilise the SEA 5 area including:

- Oil and gas activity
- Commercial fishing
- Fisheries for migratory species
- Ports and shipping
- Mariculture
- Military activity
- Telecommunication cables
- Renewable energy
- Aggregate extraction
- Marine disposal
- Tourism and leisure
- Locally important activities
- Coastal and marine archaeology
- Coastal and marine management initiatives

The *Coastal and Marine Management Initiatives* section of this report describes those encompassing initiatives which manage or regulate a number of coastal and marine industries, as well as identifying future initiatives.

2 COASTAL POPULATION

2.1 Introduction

The SEA 5 coastal area is a mixture of sparsely populated rural areas and major centres of population, with some of Scotland's most significant urban and industrial areas located in the region. The coast also supports a number of smaller towns and villages.

The population and socio-economics of the Shetland and Orkney Islands have previously been described in some detail in Section 1.2 of the SEA 4 Existing Users report (http://www.offshore-sea.org.uk/sea/dev/html_file/pdf2.cgi/SEA4_TR_Users_UOA.pdf).

2.2 Demographics and socio-economics

2.2.1 Population

In 2001 the population of the SEA 5 coastal region was greater than 2 million, accounting for over 42% of the Scottish total. Of this, over 21% lived in the City of Edinburgh (448,624), 16% in Fife (349,429) and nearly 10% in Aberdeen (212,871) (Table 2.1).

Council area	1991	2001	% Change	Area (km²)	Density (persons/km²)
Shetland	22,522	21,988	-2.37	1,466.5	15
Orkney	19,612	19,245	-1.87	990	19
Moray	83,616	86,940	3.98	2,237.6	39
Aberdeenshire	215,387	226,871	5.33	6,312.6	36
Aberdeen City	204,885	212,125	3.53	185.8	1,142
Angus	107,866	108,400	0.50	2,181.8	50
Dundee City	149,751	145,663	-2.73	59.8	2,435
Fife	341,199	349,429	2.41	1,324.9	264
Clackmannanshire	47,679	48,077	0.83	158.6	303
Falkirk	141,145	145,191	2.87	297.4	488
West Lothian	143,972	158,714	10.24	427.3	371
City of Edinburgh	418,748	448,624	7.13	263.7	1,701
East Lothian	84,114	90,088	7.10	679.2	133
Scottish Borders	103,881	106,764	2.78	4,731.8	23
Scotland total	4,998,567	5,062,011	1.27	77,924.5	65

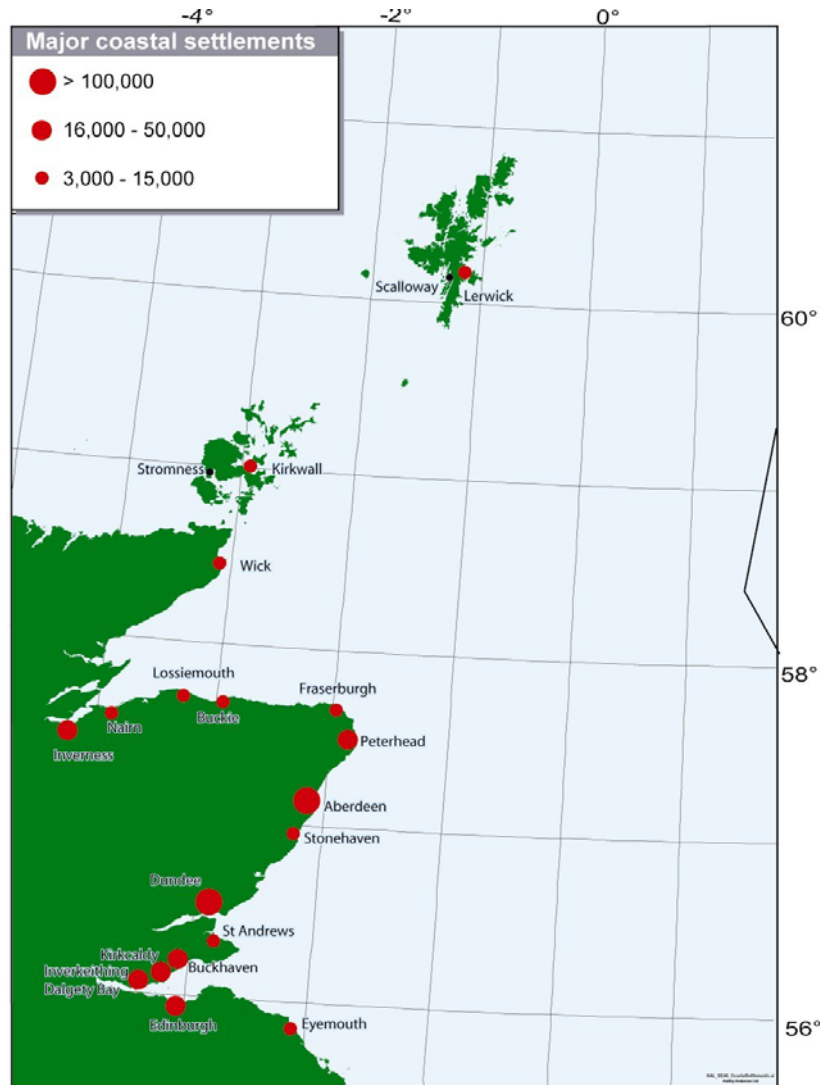
Source: Scottish Census website - <http://www.gro-scotland.gov.uk/grosweb/grosweb.nsf/pages/censushm>

2.2.2 Coastal settlements

Four of Scotland's six cities, including the country's capital (Edinburgh), are located on the SEA 5 coast (see Figure 2.1). In the north, much of the Highland and Moray coastline supports low density small crofting and farming communities and a few larger towns such as Wick, Nairn and Lossiemouth; Inverness being the largest settlement with over 44,000 people. Aberdeenshire has a low population density although there are several large settlements including Fraserburgh, Peterhead and Stonehaven. The main population centre, along this stretch of coastline, is Aberdeen, which is home to more than 200,000 people (Table 2.1). Much of the open coastline between Aberdeen and Eyemouth is relatively sparsely populated although the Firths of Tay and Forth support major population centres; Dundee is home to over 150,000 inhabitants whilst Edinburgh supports over

450,000 people. To the east of Edinburgh, the largest towns include: North Berwick (6,490 inhabitants), Dunbar (6,190) and Eyemouth (3,300) (Table 2.2).

Figure 2.1 - Coastal settlements in the SEA 5 area



Source: Scottish Census website - <http://www.gro-scotland.gov.uk/grosweb/grosweb.nsf/pages/censushm>

Table 2.2 – Major coastal settlements in the SEA 5 area					
Council area	Settlement	Population	Council area	Settlement	Population
Highland	Wick	7,450	Angus, Dundee, Perth & Kinross	Dundee	152,920
	Inverness	44,180		Fife	St Andrews	13,370
	Moray	Nairn	8,190	Buckhaven	26,860
Lossiemouth		6,800	Kirkcaldy	49,220	
Aberdeenshire	Buckie	8,100	Inverkeithing/Dalgety Bay	27,220	
	Fraserburgh	13,650	Alloa	27,010	
	Peterhead	19,220	Falkirk	Bo'ness	14,040
Aberdeen	Stonehaven	9,860	City of Edinburgh, East Lothian	Edinburgh	456,320
	Aberdeen City	199,790	Scottish Borders	Eymouth	3,300

Source: Scottish Census website - <http://www.gro-scotland.gov.uk/grosweb/grosweb.nsf/pages/censushm>

2.2.3 Socio-economics

Industries such as agriculture, fishing and construction are important in the Northern Isles, Highland, Moray and Aberdeenshire areas. Tourism is also a key industry and an estimated one million tourists visit Inverness, the commercial and industrial centre of the Highlands, each year (Inverness - Scotland website - <http://www.inverness-scotland.com/>).

The North East and Aberdeen in particular is important for the offshore oil and gas industry. North Sea oil and gas directly supports 26,000 jobs in the UK with another 244,000 being dependent on the industry. The fishing industry is also important in the area, particularly in Fraserburgh and Peterhead, while the North East produces an estimated one third of Scotland's agricultural output (Scottish Enterprise website - <http://www.scottish-enterprise.com/>).

Engineering and new technology industries have replaced declining traditional industries such as textiles and fishing in the Tayside area. Biotechnology, digital media manufacturing and tourism are now all key industries.

In terms of financial services, Edinburgh is ranked the UK's second largest centre after London. Other key industries include biotechnology, business services, tourism and education and training. The oil and gas industry is another important industry in this area with the oil refinery at Grangemouth contributing to the local economy.

3 OIL & GAS ACTIVITY

3.1 Introduction

North Sea oil and gas reserves remain essential to meeting the UK's energy needs and constitute a valuable resource. Levels of UK production in 2003 reached in excess of 96.7 million tonnes of oil, 38.7 million tonnes of gas and 542 thousand tonnes of condensate (DTI 2004).

Oil and gas activity in the North Sea has primarily centred on the oil and gas fields of the northern and central North Sea (see Figure 3.2) and the gas fields of the southern North Sea. Much of the SEA 5 area has never been licensed or has previously been licensed but has since been relinquished, with the result that there has been little exploration in the area (Figure 3.1).

Figure 3.1 - Schematic of blocks within the SEA 5 area, currently licensed or potentially available for licensing

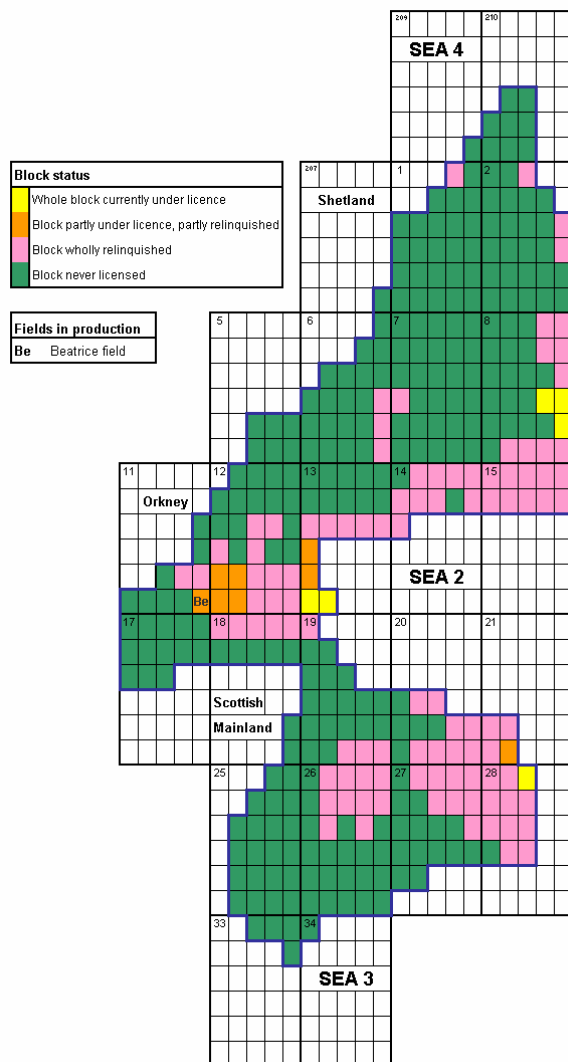
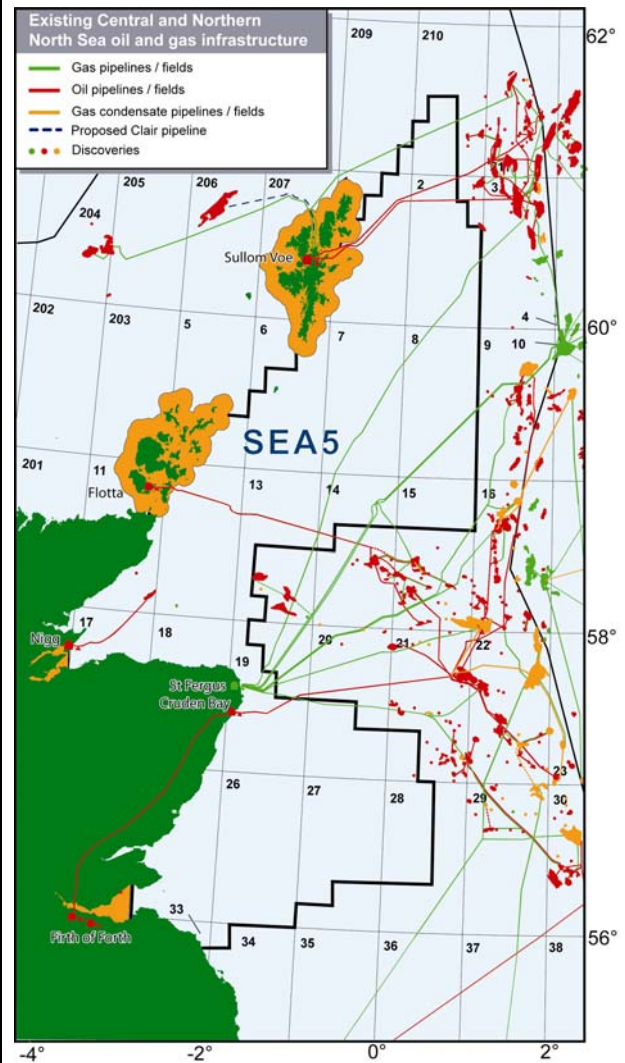


Figure 3.2 - Oil and gas infrastructure in the northern and central North Sea



Source: DTI oil and gas website - <http://www.og.dti.gov.uk/>.

3.2 Activity in SEA 5 area

3.2.1 Wells

In the last decade a large number of exploration, appraisal and development wells have been drilled in the northern and central North Sea (Table 3.1).

Area	Exploration wells	Appraisal wells	Development wells
Northern North Sea	65	93	1051
Central North Sea	189	180	995

Source: DTI oil and gas website - <http://www.og.dti.gov.uk/>.

To date, 44 exploration wells, 12 appraisal wells and 54 development wells have been drilled within the SEA 5 area.

There is currently only one operational field within the SEA 5 area. Operated by Talisman, the Beatrice oil field (Block 11/30a) was discovered in the Moray Firth in 1976 and started production in 1981. Recoverable reserves were estimated at 20.8 million tonnes and peak production of 2.6 million tonnes per year was reached in 1985. In 2003, Beatrice produced approximately 270,000 tonnes of oil (DTI 2004).

3.2.2 Infrastructure

A number of key oil and gas receiving terminals are situated on the SEA 5 coast with associated pipeline networks crossing offshore areas of SEA 5 (Figure 3.2).

Terminals and pipelines

On Shetland and Orkney, Sullom Voe and Flotta are important terminals for oil production in the northern North Sea and to the north and west of Scotland. Terminal receipts for Sullom Voe fell from 25 million tonnes in 2001 to 22 million tonnes in 2002, while Flotta receipts dropped from 6.7 million tonnes in 2001 to 6.4 million tonnes in 2002. Flotta West saw an increase from 3.7 million tonnes in 2001 to 5.3 million tonnes in 2002.

The Nigg terminal in the Cromarty Firth receives oil from the Beatrice field via a 60km pipeline. In 2002, terminal receipts were 385 thousand tonnes.

On the north east coast, the St Fergus gas terminal is the largest single gas importing facility in the UK, receiving gas from a large number of North Sea fields (Table 3.2) via eight pipeline systems (Table 3.3). Following processing, the gas is transmitted southwards through a series of onshore pipelines mainly to feed the National Gas Grid. A small expansion of the terminal to the north is planned in 2004 to process the new supply from the Goldeneye field.

Pipeline system	Terminal receipts (million m ³)	Production from
Frigg	11,611	Alwyn North, Bruce, Captain, Dunbar, Ellon, Frigg (UK), Galley, Grant, Ivanhoe/Rob Roy, Keith, NUGGETS, Piper/Tartan, Renee/Rubie, Ross
FLAGS ¹	10,578	Bittern, Brent, Clyde, Cook, Cormorant (North and South), Curlew, Fulmar, Gannet (A, B, C, D, E, F and G), Guillemot A, Guillemot North West, Guillemot West, Kittiwake, Kyle, Leven, Magnus, Magnus South, Mallard, Medwin, Murchison (UK), Nelson, Orion, Pelican, Statfjord (UK), Strathspey, Teal, Teal South, Thistle.

Table 3.2 – Gas receipts for the St Fergus terminal, 2002

Pipeline system	Terminal receipts (million m ³)	Production from
SAGE ²	15,138	Beinn, Beryl, Brae Area, Britannia, Maclure, Ness, Nevis, Scott, Skene, Thelma, Toni, Tullich.
Miller	233	Gas delivered direct to Boddam (Peterhead) power station by dedicated pipeline.
Total	37,560	

Note: 1. Far North Liquids and Gas System

2. Scottish Area Gas Evacuation

Source: DTI oil and gas website - <http://www.og.dti.gov.uk>

Table 3.3 - Pipelines connected to the St Fergus terminal

From – to	Material conveyed	Length of pipeline (km)	Diameter of pipeline (mm)	Operator	Year commissioned
Frigg to St Fergus #1	Associated gas	354	812.8	Total	1977
Frigg to St Fergus #2	Associated gas	354	812.8	Total	1978
Brent to St Fergus (FLAGS)	Associated gas	452.2	914.4	Shell	1982
Fulmar to St Fergus	Associated gas	289.7	508	Shell	1986
Beryl A to St Fergus (SAGE)	Associated gas	325	762	Mobil	1992
Miller to St Fergus	Associated gas	240	762	Britoil	1992
Britannia to St Fergus	Natural gas	185.3	711	BOL	1998
Goldeneye to St Fergus	Condensate	101.8	508	Shell	2003

Source: DTI oil and gas website - <http://www.og.dti.gov.uk>

The Forties pipeline system was the first major North Sea oil pipeline and was opened in 1973 (Figure 3.3). Oil production from a number of central and northern North Sea fields (Table 3.4) feeds into the main pipeline at the Forties Charlie platform from where it is transported 175km to Cruden Bay, to the north of Aberdeen. An onshore pipeline then continues south to the Grangemouth refinery where some of the crude oil is refined, the remainder flowing to the Houndpoint tanker loading terminal in the Firth of Forth.

Table 3.4 - Details of the Forties pipeline system 2002

Pipeline system	Forties/Cruden Bay
Production from	Andrew, Arbroath, Arkwright, Balmoral, Beaully, Beinn, Birch, Brae (Central, East, North South and West), Bruce, Brimmond, Britannia, Buchan, Cyrus, Drake, Egret, Elgin, Erskine, Everest, Fleming, Forties, Franklin, Glamis, Hannay, Heron, Keith, Kingfisher, Larch, Lomond, Machar, Madoes, Marnock, Miller, Mirren, Monan, Montrose, Mungo, Nelson, Scott, Shearwater, Skua, Stirling, Telford, Thelma, Tiffany and Toni.
Terminal receipts	34 million tonnes of oil

Source: DTI website - <http://www.og.dti.gov.uk>

Figure 3.3 - Pulling the first North Sea pipeline ashore at Cruden Bay from the Forties Field in 1973



Source: Bill Ritchie

Although recent years have seen a decline in rig construction there is a continued need for pipeline construction and maintenance. This need supports a small number of pipeline fabrication businesses in the SEA 5 region: one at Wick and a second at Evanton in the Cromarty Firth (Scottish Coastal Forum 2003a).

3.3 Management issues and initiatives

3.3.1 SEA 5 initiatives

Orkney and Shetland

Section 1.7.3 of the SEA 4 Existing Users report described a number of initiatives relevant to Shetland and Orkney. These include the Shetland Oil Terminal Environmental Advisory Group (SOTEAG), set up in 1977 to monitor the performance and affect the Sullom Voe terminal has on the Shetland environment. Orkney Islands Council also monitors the potential impact of the Flotta terminal on the Orkney marine environment.

Moray Firth

A Shoreline Protection Strategy Plan (Briggs Marine Environmental Services 2000) has been compiled on behalf of a number of Operators covering the Moray Firth area between Duncansby Head and Rattray Head. The document identifies sites where protective booming may be of practical use in reducing the impact of an oil spill. The Plan also identifies environmentally and/or socio-economically vulnerable sites from where a shoreline response can be conducted, and provides

information on the efficient use of oil spill response resources in order to maximise protection of priority areas.

Guidelines for dealing with cetaceans in the event of an oil spill in the Moray Firth have been drawn up (Gubbay & Earll 1999). The guidance covers a number of areas including forward planning; the immediate response following a spill; assessing the presence and risk to cetaceans following a spill; dealing with living cetaceans, and oil spill counter-measures.

Further details of both the Shoreline Protection Strategy Plan and the cetacean guidelines can be found on the Moray Firth Partnership website (<http://www.morayfirth-partnership.org/>).

St. Fergus Terminal

The St. Fergus terminal consists of a number of different terminals which collectively receive much of the gas produced in the North Sea. At landfall, the pipeline corridors cut through the beach and dune systems which front the terminal complex. Since 1977 when the first pipeline was commissioned, extensive site restoration work and ecological monitoring has been carried out at the site to minimise the environmental impact to the coast. Much of this work has been coordinated by the St. Fergus Dunes Management and Technical Committees which represent a range of stakeholders including the terminal operators, the local authority planning department and independent members from the University of Aberdeen (Ritchie & Kingham 1997). This committee publishes annual reports and manages an ongoing series of monitoring programmes and surveys.

Firth of Forth

The Firth of Forth forms a focus for oil and gas activities with the Grangemouth refinery, oil storage and tanker terminals. The Forth, up to the Kincardine Bridge, is covered by the Forth Ports' oil spill contingency plan, *Clearwater Forth*. The plan provides details of the response management structure that would be activated to coordinate the available resources to deal with oil pollution incidents in the Firth of Forth. The plan is exercised every year in conjunction with government departments, local authorities, BP and Shell (Forth Ports website – <http://www.forthports.co.uk/search/index.htm>).

4 COMMERCIAL FISHING

4.1 Data sources

The North Sea fish and fisheries report produced by CEFAS (2001) for SEA 2 provides valuable information on the fish resources of the North Sea and the main fisheries which impact upon them. The report also describes the potential interactions between the fishing industry and the North Sea oil and gas industry.

Information relating to the current status of fish stocks comes from the latest ICES Advisory Committee on Fishery Management report (ICES 2003). The ICES assessment informs the European Commission's allocation of Total Allowable Catches (TACs) to EU member states and any decisions regarding the implementation of management measures (European Commission Fisheries website - <http://www.europa.eu.int/comm/fisheries>).

The shellfish and fisheries of the northern North Sea are described by Chapman (2004) in a report specifically commissioned for SEA 5. The report identifies the main shellfish resources, describes the fisheries which exploit them and the management measures in place to protect stocks. The impact of oil and gas exploration activities on shellfish species are also discussed as are the potential effects of offshore wind farms.

Fishing effort maps (Coull *et al.* 1998) are reproduced from the UKOOA website (<http://www.ukooa.co.uk>).

Additional data has been sourced from a recent inquiry into the future of the Scottish fishing industry (RSE 2004) and a review of the future options for a sustainable UK fishing industry (PMSU 2004).

4.2 Activity in SEA 5 area

Main fisheries

The main finfish stocks and fisheries within the central and northern North Sea are summarised in Figure 4.1.

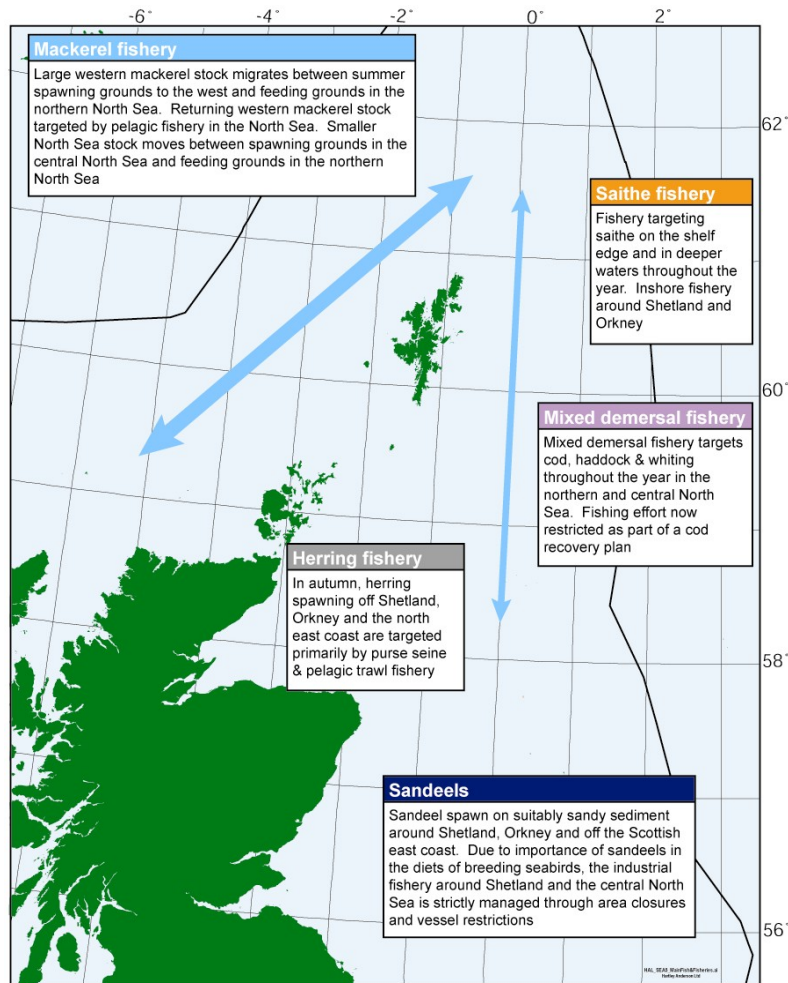
Mixed demersal fishery

One of the most important fisheries in the central and northern North Sea is the mixed demersal fishery that targets cod, haddock and whiting. The fishery also takes a number of important by-catch species including saithe and anglerfish (ICES 2003).

Cod are caught by virtually all demersal gears including trawls, seines, gillnets and lines. The Scottish otter trawl fishery accounted for over 25% of the total North Sea cod catch (55,000 tonnes) in 2002 (ICES 2003). 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 the southern North Sea and throughout the northern North Sea. In the second half of the year a similar fishing pattern remained, but cod were also landed from offshore waters of the central and northern North Sea.

Cod are heavily exploited in the North Sea and ICES has consistently advised that the exploitation rate be reduced. Recruitment has been below average since 1985 and a cod recovery plan has recently been implemented (see Section 4.3).

Figure 4.1 – Main finfish stocks and fisheries in the central and northern North Sea



In 2002, the majority of the North Sea haddock catch (57,000 tonnes) was taken by Scottish otter trawlers (59.6%) and seiners (19.8%) (ICES 2003), with smaller quantities taken by other Scottish vessels including *Nephrops* trawlers. Vessels from other countries including England, Denmark and Norway also participate in the fishery, and haddock are taken as a by-catch by Danish and Norwegian vessels fishing for industrial species. Haddock are caught throughout the year and landings are concentrated in the northwestern North Sea.

In 2002, 22,000 tonnes of whiting were caught in the North Sea by the mixed demersal fisheries of Scotland (seine and otter trawl, 47%), France (otter trawl, 21%) and England (otter trawl, 8.5%) (ICES 2003). They were also taken in the Dutch beam trawl and German trawl fisheries. In addition, French trawlers targeting saithe take a by-catch of whiting as does the industrial fishery for Norway pout. Whiting are caught throughout the year over a wide area, but especially in the northern North Sea, south east of the Shetland Islands, and off the north east coast of England.

Until the mid-1980s monkfish (or anglerfish) was taken mainly as by-catch in the North Sea mixed demersal fishery. Restrictive TACs for other species led to increased fishing pressure on monkfish and they are now also targeted directly in the deeper areas of the northern North Sea. The fishery is dominated by the Scottish fleet, which takes around 80% of the total landings.

The saithe fishery in the North Sea consists largely of a directed Norwegian (otter trawl, 43.1% of total catch in 2002), French (otter trawl, 23.3%) and German (otter trawl, 9.9%) deep water fishery operating on the shelf edge, and a Scottish fishery operating inshore (otter trawl, 4.7%). The fishery

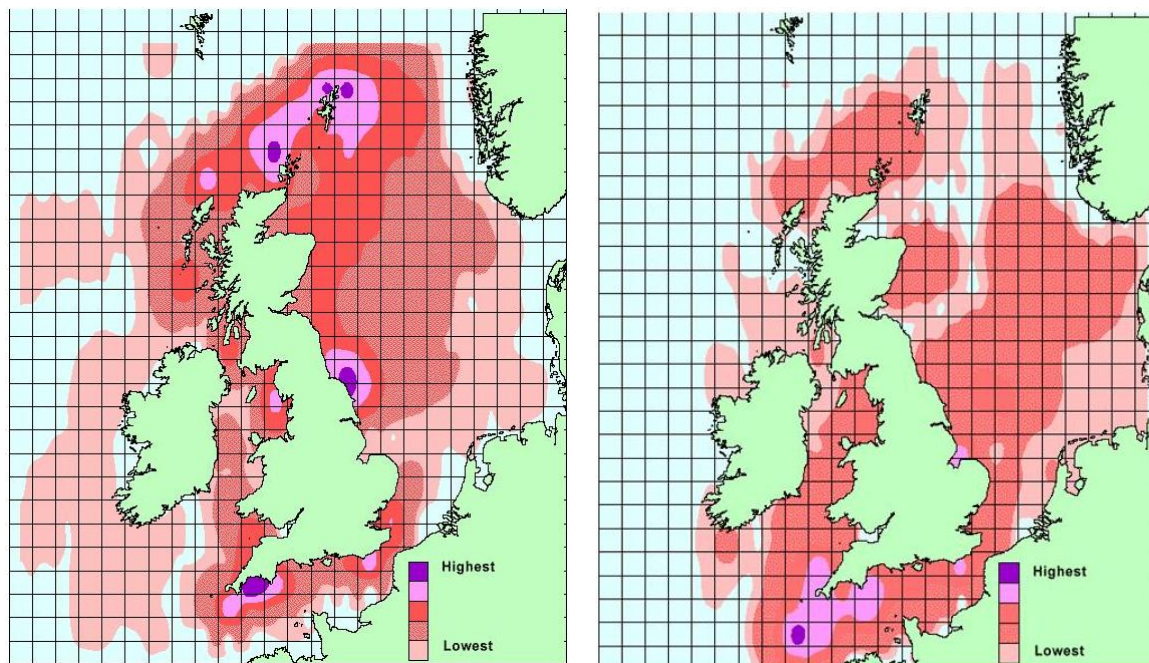
operates all year-round, with peak landings in the final quarter of the year. Total landings for the North Sea and west of Scotland area were 122,000 tonnes in 2002 (ICES 2003).

The distribution of UK, Danish, Norwegian, German and Dutch otter trawlers in the North Sea has been described by Jennings *et al.* (2000, cited by CEFAS 2001). For the six-year period 1990 to 1995, otter trawling accounted for the majority of fishing effort in the northern North Sea. Most otter trawling effort was confined to the north east of Scotland and east of the Shetland Islands. Parts of the Norwegian Deep and the central North Sea were relatively lightly fished. Scottish overflight data suggested that otter trawlers fished the Papa Bank/Otter Bank area to the north and west of the Orkney and Shetland Islands throughout the year. During the first half of the year, effort was concentrated on grounds to the east of the Pentland Skerries and on the Fladen Ground, while later in the year otter trawling appeared to become dispersed to the north of the Fladen Ground (CEFAS 2001). A summary of demersal fishing effort (excluding beam trawling) is provided in Figure 4.2a. Beam trawling is restricted largely to the central and southern North Sea although there is some fishing effort in the SEA 5 area (Figure 4.2b).

The maps of fishing effort are based on information from UK vessel logbooks with effort measured as the time spent fishing (nominal fishing effort) in an ICES rectangle (Coull *et al.* 1998). However, vessels of less than 10 metres that do not report their catches are excluded and no adjustment is made for the varying efficiency of vessels. Further, Gordon (2003) suggested caution in the use of effort data as a result of recording inconsistencies and that consequently effort maps should be considered indicative only.

Figure 4.2 – Demersal fishing effort by UK vessels

a) Demersal excluding beam trawling b) Beam trawling



Source: Coull *et al.* 1998, adapted from UKOOA website – <http://www.ukooa.co.uk>

As part of their recent inquiry into the future of the Scottish fishing industry, the Royal Society of Edinburgh provided analysis of the top five demersal species, cod, haddock, whiting, monkfish and Nephrops taken by Scottish fisheries from the North Sea (ICES Subarea IV). Long term averages were calculated for each stock based on the full ICES time-series for each stock (RSE 2004).

Long term average annual landings by the Scottish fleet of the main demersal species from the North Sea were calculated at 290,000 tonnes. By weight, haddock (65%) dominated these landings followed by cod (23%), whiting (5%), monkfish (4%) and *Nephrops* (3%). In term of value, the landings were haddock (53%), cod (29%), monkfish (9%), *Nephrops* (6%), and whiting (3%) (RSE 2004).

Comparing the long term averages with recent landings data indicates a shift in the balance of the demersal species landed. In 2002, total North Sea landings by the Scottish fleet declined to 83,000 tonnes with haddock representing 47%, cod (19%), whiting (13%), monkfish (12%) and *Nephrops* (9%). There was also a significant change in the value of the landings with haddock declining to 32%, monkfish (23%), cod (20%), *Nephrops* (18%) and whiting (7%) (RSE 2004).

The results highlight the decline in the North Sea demersal fishery over recent years and the increased importance of monkfish and *Nephrops* landings at the expense of haddock and cod.

The main Scottish demersal fishing fleet is based in the North East and Shetland and the decline of the fishery has led to significant downsizing of the fleet. In the North East there were 239 boats in the demersal sector in 2002. The decommissioning round of 2003 reduced the Scottish demersal fleet by a further 70 vessels, the majority of these based in the North East. It is likely therefore that the total number of vessels is now below 200 with further reductions likely if the fleet does not prove profitable (RSE 2004).

In Shetland, there were 27 demersal fishing boats in 2003 employing about 180 fishermen. The fleet is said to have shrunk already by 40% over the last 13 years (approximately in line with the reduction in the demersal fleet generally) with the loss of about 80 jobs, 30% of Shetland's catching employment. Improved catching efficiency can be expected to raise productivity and reduce further the number of vessels the fishery can sustain (RSE 2004). In recognition of the gravity of the situation, Shetland Islands Council has proposed a package of management measures (see Section 4.3 for details).

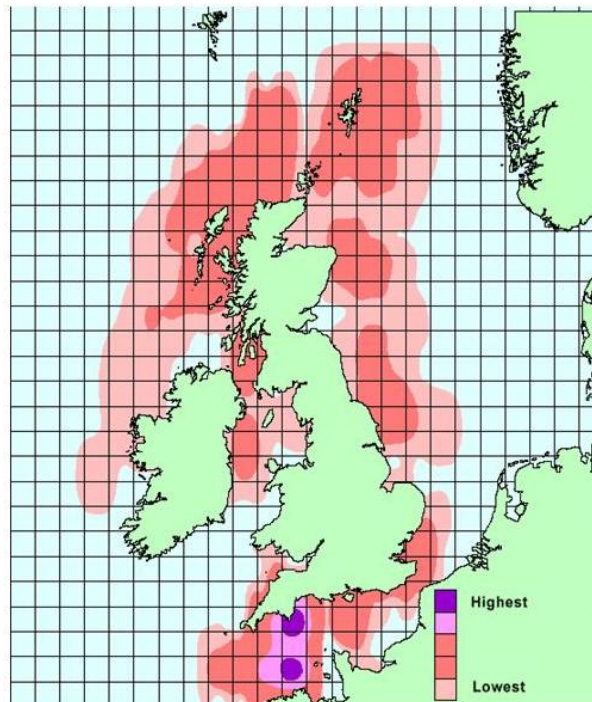
However, the recent decline of the fishery and downsizing of the fleet must be put in context with the rapid expansion of the fleet associated with successful recruitment to gadoid stocks in the 1970s and 1980s. Currently, fleet capacity far outstrips the opportunity that exists, in large part due to over-investment during the gadoid outburst of the 1970/80s (PMSU 2004).

Pelagic fishery

The commercial performance of the pelagic fishing sector suffered a near terminal setback during the 1970s, when the herring fisheries had to be closed. As stocks recovered and it became possible to separate the catching of herring and mackerel, the sector recovered and mackerel became the dominant source of earnings. By 2002, a Scottish pelagic fleet of some 33 vessels (down to 27 towards the end of 2003), based mainly in Fraserburgh and Shetland generated gross earnings of £98m, compared with 45 vessels and gross earnings of £74m in 1997 (RSE 2004).

Fishing for herring is mainly undertaken with purse seines and trawls. While North Sea stocks are fished throughout the year, landings are greatest in the third quarter of the year, predominantly from the Orkney/Shetland area, Buchan, northwest of the Dogger Bank and in coastal waters of eastern England (Figure 4.3). By-catches of juvenile North Sea herring are taken in the industrial fishery for sprat (CEFAS 2001). The herring stock is currently considered to be above 2 million tonnes. In 2002, North Sea catches were 370,000 tonnes (ICES 2003).

Figure 4.3 – Pelagic fishing effort by UK vessels



Source: Coull et al. 1998, adapted from UKOOA website – <http://www.ukooa.co.uk>

The North Eastern Atlantic mackerel is thought to be a single stock with three separate components; North Sea, western and southern, which differ in their spawning location and migration patterns. North Sea and western mackerel spend the winter in the deep water to the east and north of Shetland and on the edge of the Norwegian Deep. In the spring, the North Sea component migrates south into the central part of the North Sea and spawns from May until July. The western component moves along the continental slope migrating south west to mix with the southern component and spawns at the same time as those in the North Sea, in an area stretching northwards from the Bay of Biscay to the Wyville Thompson Ridge. Following spawning, the western mackerel move back to the feeding grounds in the northern North Sea (Simmonds 2001).

An extensive, directed, mackerel fishery by pelagic trawlers occurs in the northern North Sea, taking advantage of the return migration of the western stock to the feeding area. Fishing occurs throughout the year, with peak landings in the 3rd quarter (ICES 2003).

The apparent division into two areas of high effort to the north of Scotland seen in Figure 4.3 is most likely an artefact of misreporting of pelagic catches between ICES Sub-areas IV and VI when quotas become restrictive (Gordon 2003).

Industrial fishery

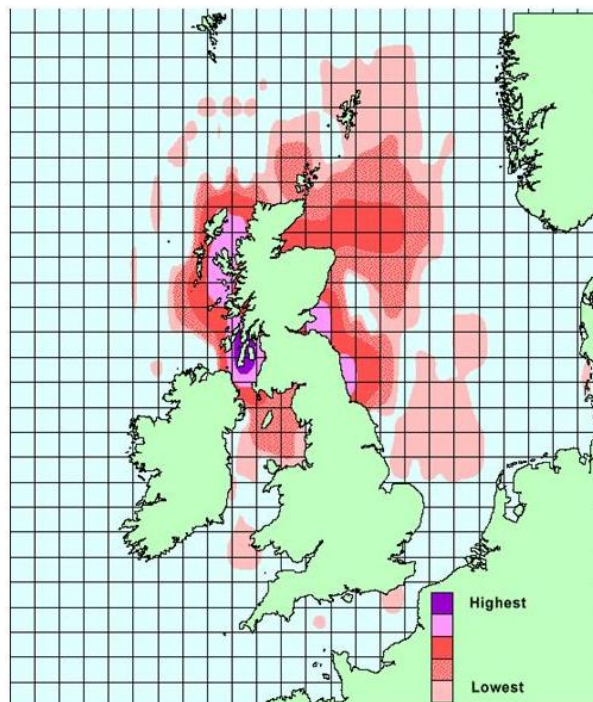
Small-mesh industrial fisheries for sandeel and Norway pout occur separately in the North Sea. The sandeel fishery takes place throughout the North Sea in areas defined by the appropriate sandy seabed sediment (ICES 2003). The majority of sandeel landings come from the central North Sea, with fleets from Denmark and Norway accounting for most of the landings. In 2003 there was a dramatic decline in the fishery, probably due to an extremely weak 2002 year class (STCEF 2003) and a closed area for sandeel fisheries off the east coast of Scotland was recently introduced (see Section 4.3). The Shetland sandeel fishery (which is treated as a separate stock for management purposes) re-opened in 1995 subject to a multi-annual management regime. The regime consists of an annual TAC of 7,000 tonnes and a closure during June and July to avoid direct competition with seabirds during the chick-

rearing season. There is also a limit on vessel size to boats of 20m or less. Fishing for Norway pout, predominantly by Danish and Norwegian vessels takes place in the northern and north-eastern North Sea with a high by-catch of other species such as haddock and whiting (ICES 2003).

Shellfish fishery

Landings of shellfish from the SEA 5 area in 2002 were 15,191 tonnes, valued at £26.4 million and representing 29% of the total value of shellfish landings from Scotland (£92.1 million). *Nephrops* (Norway lobster) was the most important shellfish species exploited with landings from the SEA 5 area estimated to be worth about £18 million (Chapman 2004). In the SEA 5 area, *Nephrops* are fished mainly by trawling.

Figure 4.4 – *Nephrops*/shrimp fishing effort by UK vessels



Source: Coull et al. 1998, adapted from UKOOA website – <http://www.ukooa.co.uk>

Nephrops are located in areas of soft mud or muddy sand in which they excavate and inhabit burrows. Within SEA 5, the main exploited stocks are found to the west of Orkney (Noup), within the Moray Firth, Firth of Forth and Fladen Ground (Figure 4.4).

The Noup ground is relatively small, covering an area of 400km². Between 50 and 80 vessels have exploited this ground in recent years with most landings being made at Buckie, Fraserburgh, Peterhead and Scrabster. For most of these vessels *Nephrops* is the main target species; other vessels target whitefish but land the lobster as a by-catch.

The Moray Firth *Nephrops* ground covers an area of 2,195km² on the south side of the Firth. This area is exploited by up to 150 vessels, the majority of which target *Nephrops* primarily, though 16% of the landings arise as a by-catch of whitefish trawlers. A high proportion of the vessels primarily fish on the Fladen ground and only fish the Moray Firth in bad weather. The main landing ports are Burghead, Fraserburgh, MacDuff, Buckie, Peterhead and Helmsdale.

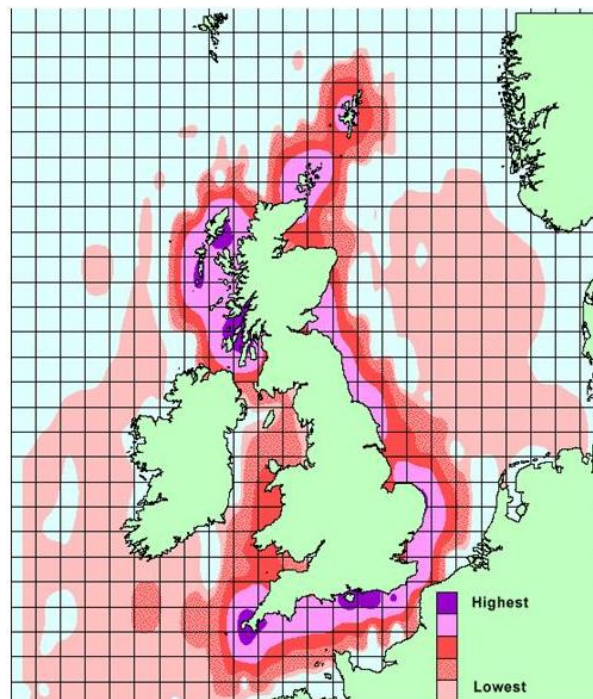
The Firth of Forth ground covers an area of 915km² and is exploited by about 150 vessels; of these, about 80 contribute 80% of the landings. The main landing ports are Eyemouth, Port Seton and Pittenweem.

The Fladen ground is the largest known *Nephrops* ground covering an estimated area of 28,200km². About half of the Fladen ground, in the northwest corner, coincides with the SEA 5 area. It is estimated that up to 215 vessels fish this ground, and about 95% of the landings are made by Scottish based vessels. Although most vessels specifically target *Nephrops*, a higher proportion than elsewhere target whitefish and land *Nephrops* as a by-catch.

Other crustacean species targeted primarily by static gear (creels, pots) in nearshore areas of SEA 5 include European lobster, edible crab, velvet crab and shore crab (Figure 4.5).

Fishing for European lobster takes place all around the east coast of Scotland and in the Orkney and Shetland Islands, wherever suitable rocky and stone habitat is found. Most landings are made at Pittenweem, Wick and the Orkney Islands. The edible crab is fished all round the coast of Scotland, mostly on inshore grounds over-lapping with the European lobster but occasionally in deeper water away from the coast. The main landing ports are Aberdeen, Fraserburgh, Wick and in the Orkney and Shetland Islands. There are small landings of velvet crab from the Moray Firth, at Buckie and Wick, and a substantial fishery in the Orkney Isles. The shore crab is mainly landed as a by-catch species in the inshore creel fishery for velvet swimming crabs (Chapman 2004).

Figure 4.5 – Static gear fishing effort by UK vessels



Source: Coull et al. 1998, adapted from UKOOA website – <http://www.ukooa.co.uk>

The king scallop is the most important exploited mollusc within the SEA 5 area. The main fisheries take place around the Orkney and Shetland Isles, in the Moray Firth and off the east coast of Scotland. Although most fishing occurs in inshore waters, some exploitation takes place on grounds up to 100 miles off the coast. The main fishing method used consists of arrays of mechanical dredges although recently imposed restrictions limiting the number of dredges may make fishing uneconomic for the larger vessels and lead to a reduction in exploitation on the offshore grounds. Cockles are found in fairly small areas and some have been exploited on a small scale periodically, including several

beaches in the Firth of Forth, Findhorn Bay and the Culbin Bars in the Moray Firth, and at several beaches in the Orkney Islands. Marketable sized mussels are found in the Firth of Forth, near Musselburgh, in the Eden, Tay, Dee and Ythan estuaries, in the Montrose Basin, on the Culbin Bars in the Moray Firth, in the Inverness, Cromarty and Dornoch Firths and in Loch Fleet. Currently, the only significant fishery is located in the Dornoch Firth (Chapman 2004).

Interactions with the offshore oil and gas industry

The importance of the North Sea for both commercial fishing and oil and gas exploration and production means that there are a number of areas where the two industries may interact. These include the potential effects of seismic surveys on fish populations during the spawning season; the impact on the seabed of drill cuttings at well sites, and the exclusion of fishing vessels from subsea wellheads, the area adjacent to the platform, and associated structures which require protection. These issues were described in detail in the CEFAS (2001) report for SEA 2.

The fatal accident involving the *MV Westhaven* in 1997 reinforced the necessity for both industries to work closely together to promote safety at sea. A number of new initiatives have subsequently been launched (UKOOA website – <http://www.ukooa.co.uk>), including:

- Revisions to the warnings on marine charts to stress the potential hazards to fishing vessels.
- The commissioning of a study on pipeline spans to establish the scale of the issue in relation to fishing activity.
- A safety information campaign targeting fishermen to draw attention to the dangers of trawlboards being caught under pipelines and the actions to be taken if snagging occurs.
- Revisions to UKOOA "Fisheries Liaison Guidelines" to incorporate new procedures for dealing with vessels coming fast on subsea equipment and for the consideration of subsequent claims for compensation.

The Seafish Industry Authority through Seafish Technology (Kingfisher) has undertaken to establish and maintain a service regularly providing information about offshore oil and gas installations and industry activities for the benefit of fishing skippers. This information augments existing navigation charts covering the UKCS, and is available to fishing skippers of any nationality who are legally entitled to fish in UK waters.

As a condition of licensing awards, operators have been required since the early 1980s to appoint a Fisheries Liaison Officer to liaise with relevant Government departments and fishing organisations on issues relating to their exploration and production activities. Before Public Works Authorisation is given for any new construction (i.e. platform, pipeline or subsea installation), operators must consult with fishermen whose views are taken into account in the decision to allow work to proceed (UKOOA website – <http://www.ukooa.co.uk>).

4.3 Management issues and initiatives

European initiatives

Total allowable catches (TACs)

Most commercial species are managed by TAC/quota regulations that apply to ICES Subarea IV (North Sea) or a combination of Subarea IV with an adjacent area. TACs and quotas are set by the European Commission based on recommendation and advice from ICES. Details of current status, TACs, UK quotas and management advice for important North Sea species is presented in Table 4.1.

Table 4.1 – Status of North Sea stocks, current TACs and ICES management advice 2004

Species	Status	TAC (tonnes)	UK quota (tonnes)	ICES management advice
Cod	Outside safe biological limits	27,300	10,631	Recommend implementation of a recovery plan and zero catch in 2004
Haddock	Within safe biological limits	50,811	30,673	Fishery to be conducted without by-catch or discards of cod; within a recovery plan for North Sea plaice, and within the biological exploitation limits for all other stocks.
Whiting	Uncertain	16,000	6,484	See advice for haddock above
Saithe ¹	Within safe biological limits	209,713	18,742	See advice for haddock above
Anglerfish ²	Outside safe biological limits	10,180	6,675	Fishing mortality in 2004 to be less than 8,800 tonnes. See advice for haddock above.
Herring	Within safe biological limits	393,902	62,100	Fishing should be within precautionary level and within constraints agreed by EC and Norway.
Mackerel ³	Combined stock harvested outside safe biological limits	545,500	175,179	North Sea component remains severely depleted and still needs maximum possible protection. Fishing mortality in 2004 to be less than 545,000 tonnes
Sandeel ⁴	Fishing mortality well below natural mortality	7,000	-	Closure between June & July. Vessels restricted to 20m or less.

Source: ICES website – <http://www.ices.dk>, FRS website – <http://www.marlab.ac.uk>

- Note:
1. North Sea and west of Scotland saithe stocks.
 2. North Sea and west of Scotland anglerfish stocks.
 3. North east Atlantic mackerel
 4. Sandeels in the Shetland area

Recovery plan for North Sea cod

In the 2002 Common Fisheries Policy reform, the European Commission's Agriculture and Fisheries Council agreed to apply a multi-annual approach to fisheries management. This involves the establishment of recovery plans for the most endangered stocks and multi-annual management plans to prevent other stocks from falling below safe biological limits (European Commission Fisheries website – <http://www.europa.eu.int/comm/fisheries>). In December 2003, the Council adopted a long-term recovery plan for North Sea cod (Council Regulation (EC) No 2287/2003). The plan limits the number of days that vessels spend fishing so as to prevent overshooting of quotas (Table 4.2).

Table 4.2 – Maximum days in the North Sea by fishing gear

Fishing gear type	Maximum days in any month
Demersal trawls, seines or similar towed gears of mesh size 100mm except for beam trawls	10
Beam trawls of mesh size 80mm	14
Static demersal nets	14
Demersal long lines	17
Demersal trawls, seines or similar towed gears of mesh size 70-99mm except beam trawls with mesh size 80-99mm.	22
Demersal trawls, seines or similar towed gears of mesh size 16-31mm except beam trawls.	20

Source: Council Regulation (EC) No 2287/2003

The Regulations also contain special measures concerning the capture, sorting or landing of herring from the North Sea to ensure observance of capture limitations; special conditions for fishing for haddock in the North Sea, including restrictions within a 'cod protection area', and designation of a closed area off the east coast of Scotland for sandeel fisheries (Figure 4.6). Reinforced inspection and control measures have also been adopted (Council Regulation (EC) No 2287/2003, European Commission Fisheries website – <http://www.europa.eu.int/comm/fisheries>).

National initiatives

Regulatory Orders

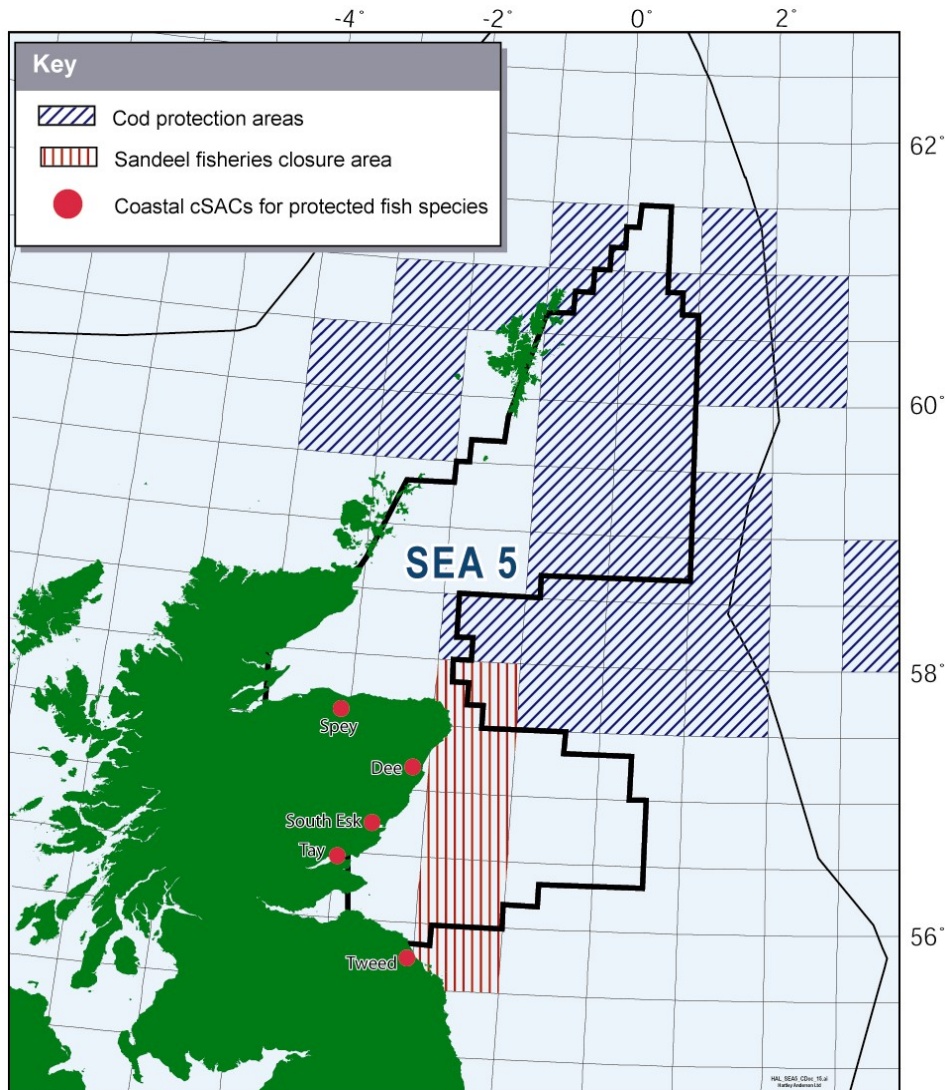
Regulatory Orders (ROs) are relatively common in England but fairly new to Scotland. The first to be introduced was in Shetland, where from 2000, the management of local resources of lobsters, all crab species, giant scallops, queen scallops, whelks, mussels, cockles, oysters and razor-shells was devolved to the Shetland Shellfish Management Organisation (SSMO). The Regulatory Order applies to Shetland inshore waters out to 6 nautical miles from baselines. Since the Shetland Order was granted, several other applications have been, or are being, submitted to the Scottish Executive. Of major significance is an application from an organisation, named the Highland Shellfish Management Organisation (HSMO), for a Regulatory Order to cover the inshore waters out to 6 nautical miles adjacent to the whole Highland Regional Council coastline, stretching from Nairn in the Moray Firth round to Cuil Bay, Loch Linnhe in the west (Chapman 2004).

Shetland initiatives

In addition to the SSMO, Shetland Islands Council and the Islands' fishing interests, in part supported by oil revenues invested in the Shetland Development Trust, have introduced a range of initiatives intended to guarantee the future sustainability of the Shetland fishing industry. These include:

- The building of the North Atlantic Fisheries College, providing the basis for education, research and training in fisheries related disciplines.
- Quota purchase schemes funded by the Shetland Fish Producers' Organisation and by Shetland Leasing and Property Development Ltd (SLAP), a commercial investment agency of SIC.
- The creation of Shetland Oceans Alliance (SHOAL), a partnership between SIC and the fishing industry which serves as a think tank and lobby group for the fishing industry.
- The drafting of The Whitefish Plan – Developing a Long Term Sustainable Fishery for Shetland (2003) by SHOAL.
- Several schemes offering financial assistance to the local fishing and shellfish industries (RSE 2004).

Figure 4.6 – Fisheries management areas and conservation sites



Sustainable fishing strategies

In March 2004 the Royal Society of Edinburgh completed an independent inquiry into the future of the Scottish fishing industry (RSE 2004). The inquiry heard from a wide range of relevant stakeholders including industry representatives, UK and European government departments and agencies, NGOs, and scientists.

The Prime Minister's Strategy Unit (PMSU) was tasked with carrying out a review of options for a sustainable UK fishing industry. The review was carried out in 2003 and a report, *Net Benefits: A sustainable profitable future for UK fishing* detailing the Unit's recommendations to government was produced in March 2004 (PMSU 2004).

Common themes from both reports included the need for:

- Improved stock assessment methods and ecosystem-based management of the fisheries resource.
- Increased regional and local involvement in fisheries management.

- Introduction of a system of environmental assessment for both inshore and offshore fisheries.
- Reduction in the demersal fishing fleet to remove over-capacity and improve long-term profitability and sustainability.
- Increased support for sustainable development of the shellfish fishery to take advantage of large growth opportunities with associated measures aimed at reducing whitefish by-catch.

Of particular relevance to SEA 5 are the implications for fleet reduction in the fishing industry, particularly the demersal sector. The PMSU report indicates that even if demersal stocks recover strongly and prices remain broadly constant a reduction in fleet capacity of at least 13% will be needed. Some communities will lose some or all of their fishing activity, while others will see increases in activity, profits and turnover as the fleet concentrates in fewer ports. Those likely to suffer most are small, highly dependent and remote communities and medium-dependency ports that are not well enough equipped to sustain highly productive fleets (PMSU 2004). These predicted changes could have a marked impact on the fishing fleet and communities within the SEA 5 area given the importance of the area for the Scottish demersal fleet. Whilst the area contains some of the UK's largest fishing ports in which the fleet are likely to concentrate, there are a large number of small, rural ports which may suffer.

Evidence from Scotland suggests that efforts to decommission fishing capacity in the demersal whitefish sector and to restrict quotas have resulted in a shift towards fishing for shellfish. Since different regulations are in place for vessels of 10m and under, and they are generally fishing nearer to shore, an unintended consequence of the decommissioning schemes for the demersal fleet may have been to increase the pressure on the inshore fishing region and, therefore, to increase the near-shore impacts of fishing (RSE 2004). Therefore, whilst reductions in fishing capacity and effort are likely to reduce potential interactions with the offshore oil and gas industry, the increased utilisation of nearshore areas may increase the likelihood of interactions between the fishing industry and potential offshore renewable sites which are at present restricted mainly to nearshore areas (although currently there are no sites within the SEA 5 area).

Changes in stock size and/or composition have a number of important ecological implications. For example, whilst studies have not found wide scale consequences, the effects of the sandeel industrial fishing cannot be fully anticipated – first there have been rather few studies and secondly the depletion of larger fish predators might mean that no effects are discernible at present. This might change should stocks of the larger fish be given the opportunity to recover. Equally, overfishing of the smaller fish carries the risk of inhibiting the return of these larger predatory fish. Changes in predatory fish abundances, especially mackerel and whiting, may influence sandeel stocks more than changes in industrial fishery, at least at the scale of the North Sea as a whole. These interactions imply that seabird and seal food supply in terms of sandeel may be strongly dependent on decisions regarding management of stocks of mackerel and gadoids (Furness 2002).

Marine environment strategy

The UK is currently developing a broad marine environment strategy, to cover all users of the environment. The UK Government published its initial thoughts in the document *Seas of Change* in late 2002. A series of draft goals of the UK marine environment strategy were detailed in the PMSU review:

- To conserve and enhance the overall quality of our seas, their natural processes and biodiversity.
- To use marine resources in a sustainable and ecologically sensitive manner in order to achieve maximum environmental, social and economic benefit from the marine environment.
- To develop proposals for an integrated and ecosystem-based approach to marine management.

- To sustain economic benefits and growth in the marine environment by enabling and encouraging environmentally sustainable employment.
- To increase our understanding of the marine environment, its natural processes and our cultural marine heritage.
- To promote public awareness, understanding and appreciation of the marine environment and seek active public participation in the development of new policies.

Threatened and protected fish species

A number of fish species present in the SEA 5 area have been included on the OSPAR Initial List of Threatened and/or Declining Species and Habitats. Details of the relevant species and the threats they face are described in Table 4.3.

Table 4.3 – OSPAR threatened and/or declining fish species in the SEA 5 area

Fish species	Decline	Threat
Cod	Stocks have declined substantially in the OSPAR area and the status of many individual stocks is poor.	Overfishing in directed fisheries as well as by-catch in mixed fisheries where juvenile cod in particular may be caught and then discarded.
Common skate	Status in the North Sea has changed from a species that was relatively common and commercially important, to being quite rare.	Directed and by-catch fishing mortality. Vulnerable life history makes the threat to population status posed by even only by-catch mortality potentially serious.
Spotted ray	Not particularly rare in SEA 5 area but has declined significantly in other parts of the OSPAR area.	Taken as by-catch in demersal fisheries and it is landed for consumption along with a number of other rays.
Basking shark	The decline in catches of many of the basking shark fisheries, including the NE Atlantic fishery is believed to indicate a decline in the population. Occasionally recorded from SEA 5 area.	Very low fecundity and late age at maturity make them sensitive to additional mortality.
Common sturgeon	Significant decline throughout the OSPAR area. Very rarely recorded from SEA 5 area.	Obstruction of migration routes, pollution of lower river reaches, targeted commercial fisheries, and damage to spawning grounds.
Allis shad	Sporadic distribution around UK coasts, where it is considered to have declined in abundance since the mid-19th century.	Obstruction of migration routes, pollution of lower river reaches, targeted commercial fisheries, and damage to spawning grounds.
Sea lamprey	Declined in many parts of Europe and particularly in the last 30 years. Important numbers in the SEA 5 area (e.g. River Spey).	Poor water quality, obstructions in rivers, and degradation of spawning grounds.
Salmon	Status assessment of salmon populations concluded that 43% categorised as healthy. The remainder are vulnerable, endangered, critical or extinct. Important numbers in the SEA 5 area.	Degradation of freshwater habitat by human activity. Commercial fishing in the marine environment. Salmon farm escapees.

Source: OSPAR Commission (2004).

Brief summaries of the ecology and threats facing a number of protected marine and estuarine fish species including salmon, allis and twaite shad, and river and sea lampreys was provided for SEA 3 (SEA 3 Post Consultation Report) and much of the information is relevant to the SEA 5 area.

At a European level, a number of fish species including the sturgeon are listed on Annex IV of the Habitats Directive (92/43/EEC). Under this Annex, the deliberate capture, killing or disturbance of such species is banned, as is their keeping, sale or exchange. Salmon are listed under Annex II of the Directive as a species of community interest whose conservation requires the designation of Special Areas of Conservation. A number of rivers within the SEA 5 area including the Spey, Dee, South Esk, Tay and Tweed have been designated as cSACs for their salmon populations (Figure 4.6). The River Spey also supports important numbers of sea lamprey and these are also listed as a primary reason for site selection of the River Spey cSAC. Both the sea lamprey and river lamprey are listed as present but not the main reason for site selection for the River Tay cSAC, the Tweed Estuary cSAC and the River Tweed cSAC (JNCC website - <http://www.jncc.gov.uk/idt/>).

Several fish species are also protected in UK waters under Schedule 5 of *The Wildlife and Countryside Act, 1981* including the sturgeon, allis shad, twaite shad and basking shark. The basking shark has also recently been given protection by the Convention on International Trade in Endangered Species (CITES).

The management and monitoring of many protected fish species as well as commercial species, is co-ordinated through the implementation of both local and species action plans under the UK Biodiversity Action Plan (UKBAP website - <http://www.ukbap.org.uk/Plans/index.htm>). A number of protected fish species are included in local BAPs relevant to the SEA 5 area (Table 4.4).

Table 4.4 – Protected fish species listed in LBAPs relevant to the SEA 5 area					
LBAP	Atlantic salmon	Allis shad	Twaite shad	River lamprey	Sea lamprey
North East Scotland Biodiversity Partnership	✓			✓	✓
Edinburgh Biodiversity Partnership	✓			✓	
East Lothian Biodiversity		✓	✓		✓
Working for Wildlife; the Northumberland BAP		✓	✓		

5 FISHERIES FOR DIADROMOUS SPECIES

5.1 Introduction

Scotland supports some of the most important commercial and recreational salmon and sea trout fisheries in the world (Scottish Natural Heritage 2000). Important salmon and sea trout rivers are found along the Scottish North Sea coast with rivers such as the Spey, Tay and Tweed of notable significance. Recreational angling and associated expenditure in these often rural areas is of major economic importance.

Information relating to the fisheries for diadromous species on Shetland and Orkney can be found in Section 1.4 of the SEA 4 Users report. Background information relating to the ecology and migratory movements of relevant fish species, including salmon, sea trout, eels, allis and twaite shads, and river and sea lampreys can be found in the appendix of the SEA 3 post consultation document (http://www.offshore-sea.org.uk/sea/dev/media_file/sea3_postconsult.pdf).

5.2 Activity in SEA 5 area

Salmon and sea trout

Shetland supports a very small rod and line fishery for salmon and sea trout whilst there are no recorded landings of salmon or sea trout within the Orkney region. On the Scottish east coast there are a number of rivers that contain significant numbers of salmon and sea trout and support important fisheries including the Tweed (accounting for over 19% of Scotland's total salmon caught and retained in 2002), the Tay (10.7%), the North Esk and Bervie (9.0%) and the Spey (7.9%) (Table 5.1).

Table 5.1 - Details of fish caught and retained in SEA 5 salmon fishery districts, 2002			
Fishery districts	Salmon (annual¹)	Grilse²	Sea trout
North			
Berriedale to Wick	134	249	21
Helmsdale	314	265	108
Fleet and Brora	245	184	27
Kyle of Sutherland	320	1187	519
Moray Firth			
Conon and Alness	337	993	420
Beaully	270	517	114
Ness	687	624	216
Nairn	107	299	157
Findhorn	575	917	264
Lossie	4	60	218
Spey	2,080	2,295	3,936
Deveron	703	462	725
North East			
Ugie	40	33	861
Ythan	267	139	1,839
Don	825	555	812
Dee (Aberdeenshire)	191	139	851
North Esk & Bervie	2,376	4,708	3,233
South Esk	1,642	2,956	2,729
East			

Table 5.1 - Details of fish caught and retained in SEA 5 salmon fishery districts, 2002			
Fishery districts	Salmon (annual¹)	Grilse²	Sea trout
Tay	2,814	1,487	973
Forth	695	503	843
Tweed	5,222	3,155	3,519
Scottish total³	26,268	31,271	32,804

Source: Fisheries Research Services (2003a)

Note: 1. Annual figure includes spring salmon (multi-winter, taken before 1st May) & summer salmon (multi-winter taken after 30th April)

2. Salmon that spend only one winter at sea before returning to their natal rivers

3. The total for 11 regions (62 districts)

Table 5.2 provides details of the methods of capture used in each region of the SEA 5 area. The Moray Firth supports important rod and line fisheries for salmon, grilse and sea trout whilst the North East region supports a significant net and coble industry for sea trout, accounting for over 54% of the Scottish total as well as supporting an important fixed engine fishery for both salmon and grilse. The East region, particularly the Rivers Tay and Tweed, support the greatest salmon rod and line catch fishery within the SEA 5 area, accounting for nearly 40% of the Scottish total for 2002.

Table 5.2 – Numbers of fish caught and method of capture, 2002			
	Salmon (annual¹)	Grilse	Sea trout
North			
Rod and line	1,644	1,942	1,189
Net and coble	87	309	8
Fixed engine	1,154	4,487	34
Moray Firth			
Rod and line	4,579	5,405	5,979
Net and coble	167	707	61
Fixed engine	17	55	10
North East			
Rod and line	2,026	955	5,088
Net and coble	813	1,617	2,471
Fixed engine	2,502	5,958	2,766
East			
Rod and line	7,872	2,976	3,215
Net and coble	540	1,841	1,610
Fixed engine	319	328	510
All Scotland			
Rod and line	19,853	14,025	23,837
Net and coble	1,761	5,035	4,560
Fixed engine	4,654	12,211	4,407

Source: Fisheries Research Services (2003a)

Note: 1. Annual figures include spring salmon (multi-winter, taken before 1st May) & summer salmon (multi-winter taken after 30th April).

2. Grilse – salmon that spend only one winter at sea before returning to their natal rivers

Economic importance

The Scottish Executive published recently a report, *The Economic Impact of Game and Coarse Angling in Scotland* (Radford *et al.* 2004), which details the economic importance to Scotland of the rod and line fishery for salmon and sea trout amongst other species.

The report estimated that freshwater angling in Scotland resulted in the Scottish economy producing over £100m worth of annual output, supported around 2,800 jobs and generated nearly £50m in wages and self-employment income to Scottish households. Salmon and sea trout angling made the most significant contribution, producing an estimated £80.9 million worth of annual output, supporting 2,200 jobs and generating nearly £40 million in wages (Radford *et al.* 2004).

Regionally, salmon and sea trout angling is of considerable economic importance, particularly to rural areas. Table 5.3 gives details for relevant regions in the SEA 5 area and provides estimates of the expenditure spent by salmon and sea trout anglers; the predicted best estimates of expenditure loss if salmon and sea trout angling in that region were to cease, and the impact that that would have on regional output and employment (Radford *et al.* 2004).

Region	Impact of cessation of salmon & sea trout angling in region			
	Expenditure (£million)	Expenditure loss (£million)	Output loss (£million)	Employment loss (FTE's)*
Orkney & Shetland	<!	<!	<!	N/A
Highlands	35.4	20.7	24.6	781
North East Scotland	24.3	15.3	18.6	688
Central Scotland	3.4	2.0	2.6	63
The Borders	6.7	4.5	4.6	136
Scottish Total	73.5		80.9	2,200

Note: *FTE's - Full time equivalents

Source: Radford *et al.* (2004)

Other species

The European eel (*Anguilla anguilla*) is catadromous, living in fresh water but returning to the sea to reproduce. It occurs in fresh and brackish waters in most of Europe and in the marine waters of the North Atlantic. Although near the northern edge of its range in Scotland, eels are thought to be present in most if not all river systems along the SEA 5 coast.

In Europe, eels are subject to a variety of capture fisheries and other commercial activities, such as restocking and aquaculture. Data on catches are not very reliable, but some unofficial estimates reach 30,000 tonnes per annum in the 1990s, with a first-sale value of *ca.* €200 million (European Commission Communication (COM (2003) 573 final). However, with the exception of a few long-established traps on rivers, there is no tradition of commercially exploiting eels in Scotland (FRS website – <http://www.marlab.ac.uk>).

ICES consider the eel stock to be outside safe biological limits, and the fishery to be unsustainable. Total yield has declined to around a third of that during the 1960's, with high fishing mortality currently at glass, yellow and silver eel stages. Stock levels are not anticipated to recover in the near future, with the number of new glass eels entering rivers now at 1% of pre-1980 levels. This decline has been Europe wide and caused by a combination of fishing pressure together with habitat loss, pollution, disease and climate change (ICES website – <http://www.ices.dk>). Based on ICES advice, the European Commission is in the process of developing of a Community Action Plan for the management of European eels (see Section 5.3).

There are also records of nationally and internationally important species and species of conservation concern recorded within the SEA 5 area, although these are limited in number. River and sea lamprey are present and certain areas support important populations, there are occasional records of sturgeon (*Acipenser sturio*), while both allis shad (*Alosa alosa*) and twaite shad (*Alosa fallax*) are thought to be more common, but still relatively rare in the area (see Section 4.3 for further details of threatened and protected fish species in the SEA 5 area).

5.3 Management issues and initiatives

Salmon and sea trout

FRS have recorded and analysed salmon and sea trout catches since the early 1950's. During this period there has been a major decline in net fisheries, with a fall in the number of fish intercepted in Scottish coastal and estuarine areas. The reduction is particularly apparent in the numbers of multi-winter fish (those spending two to four winters at sea), which enter rivers before June. Reasons for this decline may include pollution, physical barriers to migration, physical degradation of spawning and nursery habitat, the introduction of non-native salmon stocks, increased marine mortality, temperature, predation, UV radiation and chlorinated organic compounds.

Drift netting for salmon and sea trout off the coast of Northumbria extends back to the 1800s. In 2002, an estimated 27,000 salmon and 15,000 sea trout were caught by drift netmen as the fish headed for rivers in north east England and eastern Scotland (Environment Agency 2003).

In May 2003 a £3.4million buyout saw 52 out of the 68 remaining nets-men accepting voluntary compensation to stop drift netting off the north east coast of England. The compensation fund was generated by contributions from DEFRA and the North Atlantic Salmon Fund (UK). As a result of this buyout agreement, from June 2003 only 16 fishermen are licensed to use drift nets along the coast between the Scottish border and North Yorkshire. It is estimated that this agreement will reduce the number of salmon and sea trout taken by nearly 75%.

There are currently a number of international, European and national protective measures in operation for Atlantic salmon and sea trout. NASCO was established under the Convention for the Conservation of Salmon in the North Atlantic Ocean and aims to contribute to the conservation, restoration, enhancement and management of salmon stocks. The Convention applies to salmon that migrate beyond coastal waters above 36°N – an area that includes all of Europe.

Salmon fishery protection measures in Scotland were recently consolidated by *The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Bill* which received Royal Assent on 1st May 2003. The Act describes legal methods of fishing; close times for salmon and trout fishing; salmon fishery districts (districts extend seaward for 5 km from MLWS), and salmon conservation measures (Her Majesty's Stationery Office website - <http://www.hmso.gov.uk/legislation/scotland/acts2003/30015--a.htm>).

European eel

European Community Action Plan

Following an ICES recommendation that an international rebuilding plan be developed for the whole Western European eel stock, the European Commission adopted a Communication (COM (2003) 573 final) on the development of a Community Action Plan for the management of European eel in October 2003.

The Commission proposes that eel management be built up from a set of local actions to be put in place by the Member States according to an agreed standard. These actions should ensure the survival

and the migration of the eel in all its habitats. While this plan is being developed, the Commission will propose urgent measures to ensure that mature eels can migrate back to the sea to spawn. To secure this end, the Commission intends to urgently address the issues of a prohibition on fishing activities likely to catch silver eel, and facilitation of downriver migrations for silver eel.

Although eel measures are to be developed under the Common Fisheries Policy, the European Commission foresees that some issues will be taken forward in the context of the Water Framework Directive (WFD) (Directive 2000/60).

Under the WFD, European-wide River Basin Management is being introduced together with international coordination. The WFD could be used to promote the objectives of eel management, such as using eels as an indicator of 'good ecological status' of rivers. River basin authorities could also be used for setting targets and implementing eel action programmes.

6 PORTS & SHIPPING

6.1 Introduction

The UK port industry is one of the largest port industries in Europe, handling over 550 million tonnes of goods per year (Department for Transport: Maritime Statistics 2002). An estimated 97% (by volume) of the UK's imports and exports pass through UK ports and the industry provides both communication and trading links fundamental to the British economy.

There are a number of large ports in the SEA 5 area that form an important focus for shipping in the North Sea. Major ports on Shetland and Orkney including Sullom Voe and Flotta, handle much of the crude oil traffic in the northern North Sea. The Firth of Forth supports container and general cargo traffic in addition to oil cargoes at Hound Point and gas cargoes at Braefoot Bay (Scottish Coastal Forum 2002a). The major ports form a focus for shipping with relatively high shipping densities experienced in these areas.

Although fishing in the UK is in general decline, it still represents an important industry in the SEA 5 area and this is reflected in the number of important coastal fishing ports in the region.

6.2 Activity in SEA 5 area

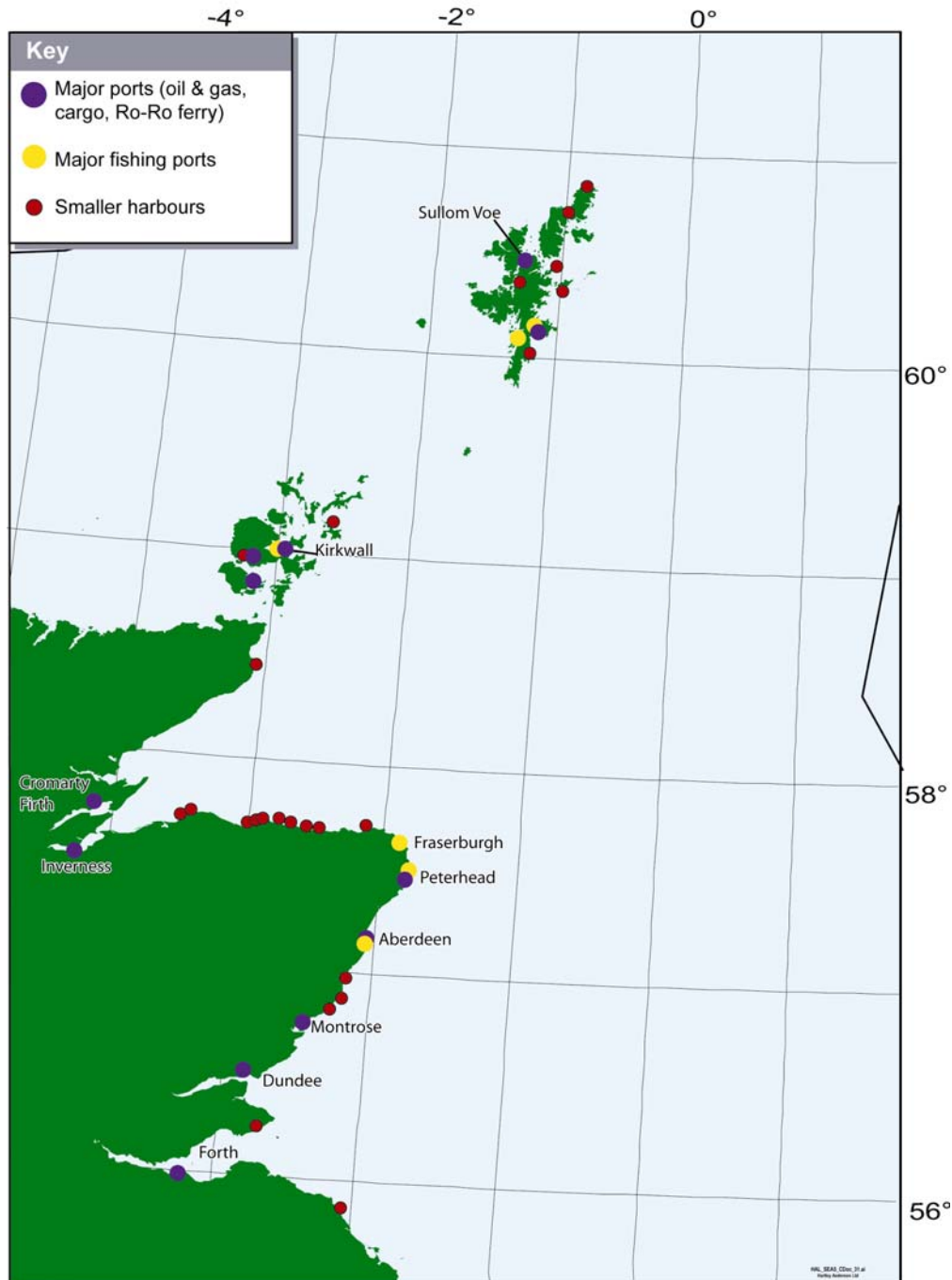
6.2.1 Major ports

Major ports in the SEA 5 area are described in Table 6.1 and Figure 6.1. The most notable of these include Forth, Sullom Voe and Orkneys. In 2002, the Forth was the largest UK port for bulk fuel traffic with 38.2 million tonnes and the fourth largest in terms of foreign and domestic traffic handled (42.2m tonnes).

Table 6.1 - Foreign and domestic traffic handled by major ports in the SEA 5 region			
	2000	2001	2002
	Million tonnes		
Sullom Voe	38.2	31.17	29.38
Orkneys	22.8	18.41	18.81
Cromarty Firth	2.33	2.15	2.66
Inverness	0.72	0.71	0.69
Peterhead	1.12	1.34	1.34
Aberdeen	3.38	3.85	3.65
Montrose	0.72	0.68	0.73
Dundee	1.05	1.10	1.10
Perth	0.27	0.22	0.18
Forth	41.14	41.61	42.20
Other ports (on east coast but not named)	0.64	0.60	0.69
Berwick	0.15	0.11	0.09
All UK Port Traffic	573.1	566.4	558.3

Source: Department for Transport: Maritime Statistics 2002

Figure 6.1 Ports and harbours in the SEA 5 area



The Forth Port Group operates ports at Leith, Granton, Methil, Burntisland, Kirkcaldy, Rosyth and Grangemouth the latter of which is one of Scotland's main container ports. Immediately adjacent to the Port of Grangemouth is BP Grangemouth which has the capacity to handle over 9 million tonnes of hydrocarbons per year. The majority of the facility's hydrocarbon processing capability is derived from its location at the end of the Forties Pipeline System (BP website http://www.bp.com/location_rep/uk/bus_operating/distribution.asp)

Sullom Voe on Shetland was the leading UK port for crude oil traffic (29.2m tonnes) in 2002. The Orkney ports include the tanker terminal facilities at Flotta in addition to general cargo ports at Scapa Flow and Kirkwall. Crude petroleum dominates port traffic into the Orkneys accounting for 98% of the total.

6.2.2 Fishing ports

In 2002, the UK fleet landed 465 thousand tonnes of sea fish (including shellfish), with a value of approximately £141 million into the UK and abroad. Over 67% of the UK total was landed into Scottish ports. Pelagic species represented 43% of the Scottish catch while demersal and shellfish accounted for 41% and 16% of the Scottish catch respectively (DEFRA 2003).

Despite the industry being in general decline, fishing remains an important industry in the SEA 5 region and there are a number of major fishing ports along the Scottish coast. Table 6.2 provides details of fish landings into these ports in 2002.

Table 6.2 - Fish landings by UK fleet into major fishing ports in the SEA 5 region 2002						
	Demersal		Pelagic		Shellfish	
	Quantity (thousand tonnes)	Value (£million)	Quantity (thousand tonnes)	Value (£million)	Quantity (thousand tonnes)	Value (£million)
Lerwick	12.8	6.3	59.5	22.8	0.4	0.7
Scalloway	1.6	1.5	...	...	0.1	0.1
Kirkwall	...	...	-	-	0.7	1.0
Scrabster	15.8	17.3	0.1	...	3.2	4.6
Wick	0.3	0.2	-	-	0.5	0.5
Fraserburgh	12.0	8.6	15.7	5.3	6.4	14.3
Peterhead	37.9	36.9	52.9	17.4	2.0	5.5
Aberdeen	16.3	13.3	...	...	0.7	1.8
Pittenweem	0.1	0.1	-	-	0.8	1.3
Eyemouth	2.7	2.4	-	-	0.6	1.4
Total UK Ports	178.1	198.4	156.8	52.5	130.7	163.8

Note: - means "nil" and ... means "negligible". Source: DEFRA (2003).

In 2002, landings of demersal species into Peterhead accounted for more than 20% of the UK total, while Aberdeen, Scrabster, Lerwick and Fraserburgh all had landings of demersal species in excess of 10 thousand tonnes. Peterhead was also important for landings of pelagic species, coming second only to Lerwick. Pelagic catches in the SEA 5 area are dominated by mackerel and herring, while haddock, cod, whiting, saithe and monkfish (or anglerfish) dominate demersal catches. Shellfish catches are primarily of crab, *Nephrops* and scallop (DEFRA 2003).

In 2002, 4,369 regular and 1,338 part-time fishermen were employed in Scotland, accounting for 42% and 60% of the UK total respectively. Despite its general decline the fishing industry remains an important source of employment for people in the SEA 5 region, with SEA 5 fishing districts employing over 26% of the total number of UK fishermen (Table 6.3).

Table 6.3 - Numbers of fishermen employed by district in the SEA 5 area in 2002			
District	Regular	Part-time	Total
Shetland	236	197	433
Orkney	243	86	329
Scrabster & Wick	200	0	200
Buckie	330	22	352
Fraserburgh	813	162	975
Peterhead	531	48	579

District	Regular	Part-time	Total
Aberdeen	124	61	185
Pittenweem	111	35	146
Eyemouth	164	15	179
England North Eastern	467	156	623
UK Total	10,524	2,222	12,746

Source: DEFRA (2003)

6.2.3 Shipping

Ship arrivals

Table 6.4 describes the numbers and types of vessels visiting the major ports in the SEA 5 area in 2002.

Deadweight tonnes (x1000)	Tankers			Ro-Ro vessels	Container vessels		Other dry cargo vessels		
	1-19.9	20-99.9	100+	1-19.9	1-4.9	5-19.9	1-19.9	20-99.9	100+
Sullom Voe	26	42	201	-	-	-	54	2	9
Lerwick	86	-	2	645	94	-	226	-	-
Orkneys	89	149	77	983	91	-	76	1	1
Cromarty Firth	16	6	11	19	1	-	99	1	-
Inverness	185	-	-	22	-	-	126	-	-
Peterhead	208	3	-	4	3	1	100	-	-
Aberdeen	457	-	1	719	101	25	388	1	-
Montrose	2	-	-	-	-	-	327	-	-
Dundee	58	6	2	3	-	-	305	2	-
Forth	1,778	364	119	88	363	126	929	23	7
Berwick	-	-	-	-	-	-	75	-	-
All UK Ports	17,792	2,240	1,072	86,736	2,485	2,178	34,349	2,019	263

Source: Department for Transport, Maritime Statistics 2002

Table 6.4 highlights the importance of ports in the SEA 5 area for handling tanker traffic, in particularly large tanker vessels (>100,000 tonnes) with Sullom Voe, Orkneys, Cromarty Firth and Forth receiving almost 40% of the UK total in 2002.

Forth Ports operate two marine terminals, Hound Point, a tanker loading terminal in the Firth of Forth and Braefoot Bay on the Forth Estuary. Hound Point receives oil and gas liquids from the Kinneil stabilisation and processing plant for either storage or transport to Grangemouth for refining. On average Hound Point handles around 350 tanker movements per year (Scottish Coastal Forum 2003). The Braefoot Bay marine loading terminal receives Natural Gas Liquid (NGL's) products from underground pipelines from the Mossmorran plant. Oil and gas are fed into tankers and gas carriers for transportation to Europe and the United States. Approximately 120 tankers per year utilise facilities at Braefoot Bay (Scottish Coastal Forum 2003a).

Principal ferry routes

Aberdeen, as well as being an important base for oil and gas supply vessels, is also the principal mainland port for freight, passenger, vehicle and livestock services to the Northern Isles (Aberdeen Harbour Board website - <http://www.aberdeen-harbour.co.uk>). A new ferry service from Rosyth to Zeebrugge was launched in May 2002, creating the first daily direct service linking Scotland to the European continent.

Shipping density

Nearshore areas of SEA 5 experience predominantly low (<1,000 vessels per annum) to moderate (1,000-5,000 vessels) shipping densities, particularly around the Northern Isles, the Moray Firth and the Angus coast (Figure 6.2). Coastal areas around Peterhead and Aberdeen experience relatively high shipping densities (5,000-20,000 vessels) primarily associated with the movement of support vessels for the North Sea oil industry. High shipping densities are also found at the mouth of the Firth of Forth and extend along the south east coast of Scotland. These are associated with the transport of cargo vessels and tankers between the Forth ports and other North Sea ports. Offshore areas of SEA 5 experience moderate to low shipping density (DETR 1999).

Ship routing

There are no traffic separation schemes operating in the SEA 5 area. As described in the SEA 4 Existing Users report, there are several 'Areas to be avoided', designed to keep oil traffic clear of sensitive coastlines. These include a single chartered area that almost entirely encompasses Orkney, a second surrounding Fair Isle, and two chartered areas around Shetland.

6.3 Management issues and initiatives

6.3.1 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.

An inter-departmental group, including representatives of DEFRA, Department for Transport, DTI, the Maritime and Coastguard Agency, the Devolved Administrations, the nature conservation agencies and the UK Hydrographic Office are due to publish the identity of UK MEHRAs for consultation. 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 SEA 5 that have been highlighted as potential MEHRAs are identified in Table 6.5 and Figure 6.2.

Table 6.5 – Potential location of MEHRA's in the SEA 5 area

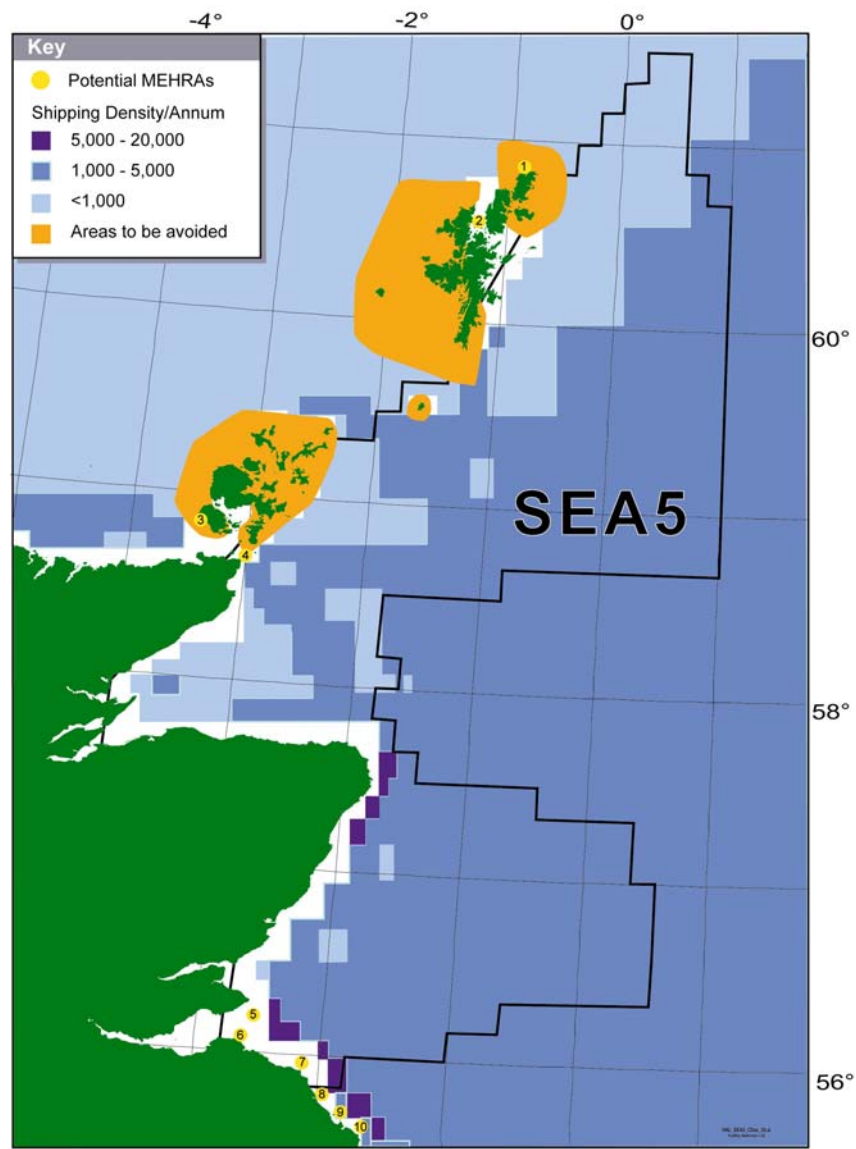
Map ref.	
1	Muckle Flagga (north coast of Unst, Shetland)
2	West of Yell (Shetland)
3	West coast of Hoy (Pentland Firth, Orkney)
4	Duncansby Head (Pentland Firth, north coast of Scotland)
5	Bass Rock

Table 6.5 – Potential location of MEHRA's in the SEA 5 area

Map ref.	
6	Isle of May
7	Holy Island near Berwick upon Tweed
8	Farne Islands
9	Near Berwick upon Tweed
10	St Abbs Head near Berwick upon Tweed

Source: DETR (1999)

Figure 6.2 - Shipping in the SEA 5 area



6.3.2 Proposal for a Western European Waters PSSA

A Particularly Sensitive Sea Area (PSSA) is defined by the International Maritime Organisation (IMO) as an area that needs special protection because of its significance for recognised ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. Specific measures can be used to control the maritime activities in the PSSA, such as vessel routing, and strict application of MARPOL discharge and equipment requirements for ships.

A number of European states including the UK have submitted a proposal to the 49th session of the IMO Marine Environment Protection Committee (MEPC) (July 2003) for an area of North Western European waters stretching from east of the Orkney and Shetland Isles to Portugal to be designated as a PSSA (IMO website - <http://www.imo.org/home.asp>).

The MEPC approved in principle the proposal for the Western European Waters PSSA, subject to the area being reduced to bring the easterly line off the Shetlands Isles to the Greenwich meridian. The states proposing the measure also withdrew an earlier proposal to ban carriage of heavy fuel oil in single hull tankers in the PSSA and instead agreed that the Associated Protective Measures linked to the PSSA would, at this stage, concern a proposed 48-hour reporting rule for ships carrying certain cargoes entering the PSSA.

The Western European Waters PSSA will be considered for potential final designation by the MEPC in October 2004.

6.3.3 Pollution control initiatives

The UK has obligations under two key international conventions concerned with protecting the marine environment from pollution. The 1973 International Convention for the Prevention of Pollution from Ships (the "MARPOL Convention") aims to control pollution of the sea by oil, chemical and other harmful substances that might be discharged during the course of a ship's operations or when a ship is damaged. Signatories to the Convention are required to inspect ships in port and at sea, trace and prosecute polluting ships and ensure there are adequate port facilities for receiving waste from ships.

The 1990 International Convention on Oil Pollution Preparedness, Response and Co-operation (the "OPRC Convention") requires signatories to inspect ships, maintain a national contingency plan for responding to oil pollution incidents and provide technical assistance to other signatories in the event of such incidents. Ports and harbours, ships and offshore installations are required to have their own approved oil pollution contingency plans and to report pollution incidents when they occur.

National Contingency Plan

The Maritime and Coastguard Agency have put in place a new National Contingency Plan for dealing with pollution incidents, in consultation with the relevant government departments and other stakeholders. The plan sets out a framework for dealing with major oil or chemical pollution incidents that threaten UK interests, and the roles and responsibilities of a wide range of national and local bodies in responding to an incident.

Oil spill response contingency plans

In accordance with the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998, there is a requirement in the UK for ports, harbours and oil handling facilities, to prepare and submit oil spill response contingency plans to the Maritime and Coastguard

Agency (MCA) for approval. This must be carried out if the port, harbour or oil handling facility falls into one of the following categories:

- Any harbour for which there is a statutory harbour authority having an annual turnover of more than £1million.
- Any other harbour or oil handling facility offering berths alongside to ships of over 400GT or oil tankers of over 150GT.
- Any other harbour or oil handling facility where there is a significant risk of spillage of over 10 tonnes of oil.
- Any other harbour or oil handling facility located in an area of significant environmental sensitivity, or in an area where a discharge of oil or other substances could cause significant economic damage.

A National Audit Office survey of UK ports and harbours found that, by May 2002, all ports and harbours subject to the OPRC regulations had contracts in place for dealing with a medium sized spill (National Audit Office 2002).

7 MARICULTURE

7.1 Introduction

Mariculture, the cultivation of marine species such as shellfish, finfish and seaweed within coastal waters, principally takes place along the west coast of Scotland, the Inner and Outer Hebrides and the Northern Isles. With the exception of Shetland and Orkney, the SEA 5 area is relatively unimportant for mariculture, with very few sites along the Scottish east coast.

The majority of information relating to mariculture in the SEA 5 area has been obtained from Fisheries Research Services finfish and shellfish farm production surveys (FRS 2003b, c), and the Food Standards Agency classification of shellfish harvesting areas in Scotland (<http://www.foodstandards.gov.uk>). Mariculture activities on both Shetland and Orkney were described previously in Section 1.6 of the SEA 4 Existing Users Report.

7.2 Activity in SEA 5 area

7.2.1 Finfish

Salmon farming is an important source of income to rural communities in Scotland and since the early 1990's the industry has steadily grown, with production rising from 32,000 tonnes in 1990 to over 145,000 tonnes in 2002 (Table 7.1). In 2001, an estimated £300 million was generated from salmon production with salmon farming and ancillary industries providing around 6,500 jobs (SEERAD 2003), 75% of which were in the Highlands and Islands (Scottish Coastal Forum 2002b). Other finfish species farmed in Scotland include rainbow trout, sea trout, halibut, turbot and cod.

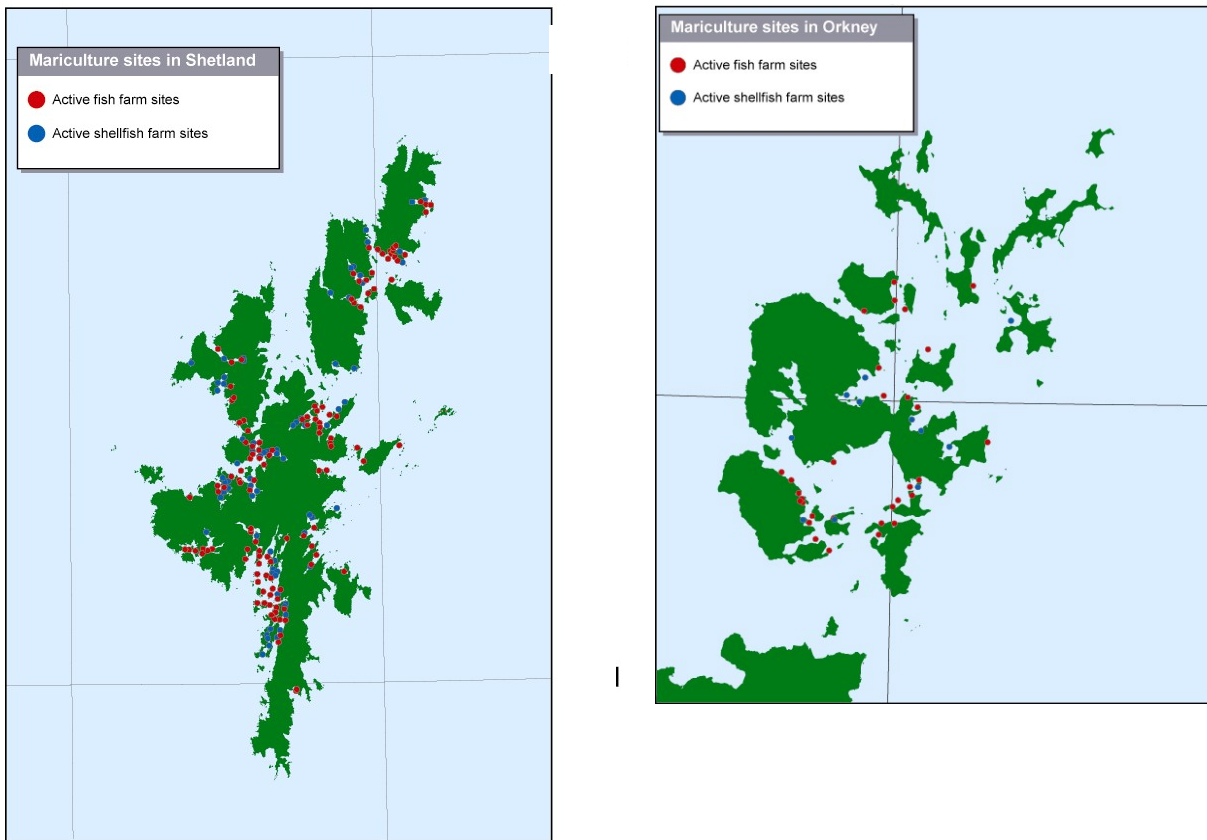
Table 7.1 – Total production (tonnes) of farmed finfish in Scotland, 2001 – 2002		
Species	2001	2002
Atlantic salmon smolts (put to sea)	48.6 ¹	50.1 ¹
Atlantic salmon (<i>Salmo salar</i>)	138,519	145,609
Rainbow trout (<i>Oncorhynchus mykiss</i>)	5,466	6,659
Other Species	203.8	370.1
Total production (tonnes)	144,188.8	154,638.1

*Note: Figures for smolts are in millions of fish
Source: FRS (2003b)*

Within the SEA 5 area, Shetland and Orkney support a large number of salmon farms with the coastal voes, inlets and firths providing good shelter and adequate water exchange for mariculture operations. There are approximately 174 finfish sites in Shetland (Pers. comm. M Holmes, Shetland Islands Council) and 33 in Orkney (Pers. comm. A Montgomery, Orkney Fish Farmers Association) (Figure 1.7.1 and 1.7.2), and in 2002 they produced almost 60,000 tonnes of salmon (39% of the Scottish total) (Fisheries Research Services 2003b).

There are no active finfish sites along the rest of the SEA 5 coast with the salmon and trout farms of the Cromarty Firth having been inactivated (Pers. comm. K Douglas, FRS Marine Laboratory, Aberdeen).

Figure 7.1 – Active finfish and shellfish production sites in Shetland and Orkney



Source: Pers. comm. K Douglas, FRS Marine Laboratory, Aberdeen, 2004

7.2.2 Shellfish

In 2002 over 17,700 tonnes of shellfish, with an estimated value of £12.67 million was produced in the UK for human consumption. Shellfish produced in Scotland accounted for 20% of the UK total and represented an estimated 39% of the total UK value. Production in Scotland is dominated by mussels and pacific oysters while small volumes of scallops, queens and native oyster are also produced (Table 7.2).

Table 7.2 – Production (tonnes) of farmed shellfish in the UK, 2002				
	Scotland	England	Wales	UK total *
Pacific oyster	249	380	12	976
Native oyster	15	116	-	156
Scallops	39	0	-	39
Queens	19	-	-	19
Mussels	3,236	1,424	10,962	16,350
Clams	-	42	-	56
Cockles	-	147	-	147
Estimated value (£ Million)	5.0	1.28	4.94	12.67

Note: *Northern Ireland figures included

The importance of Shetland and Orkney for shellfish production was noted in the SEA 4 Existing Users report. In 2002, Shetland produced almost 39% of the 3,236 tonnes of mussels produced for the table and all of the 38 tonnes produced for on-growing (Fisheries Research Services 2003c).

Table 7.3 – Production¹ (thousands) of farmed shellfish in the SEA 5 area, 2002				
	Shetland	Orkney	Highland	Scottish total³
Pacific oyster	-	16	1,984	4,692
Scallops	20	-	247	470
Queen scallops	50	-	442	1,792
Mussels ²	1,284	-	432	3,274

Source: FRS (2003c)

Note: 1. Includes those produced for table and for on-growing.

2. Mussel figures in tonnes

3. Total includes values for Strathclyde and Western Isles

In 2002 there were 72 active shellfish production sites on Shetland and 12 on Orkney (Figure 7.1 and 7.2). On the Scottish east coast, there were two sites, one in the Dornoch Firth and the other in the Cromarty Firth (FRS 2003c, Pers. comm. K Douglas FRS, Marine Laboratory, Aberdeen).

7.2.3 Seaweed harvesting

In recent years the seaweed industry in Scotland has virtually collapsed. Despite this, seaweed remains an abundant plant resource in Scotland and has the potential to provide small scale employment in coastal areas through the establishment of small or medium size enterprises producing fertilisers, animal feeds, seaweed-based foods, medicines and cosmetic products (Scottish Executive Central Research Unit 2001).

Small scale seaweed harvesting is predominantly found in Orkney, and the recently established Orkney Seaweed Company utilises locally harvested seaweed for a range of products. There is, however, no known commercial harvest of seaweed in other parts of the SEA 5 area.

7.3 Management issues and initiatives

Management issues and initiatives relevant to aquaculture in Shetland and Orkney were described in the SEA 4 Existing Users report. This section will describe initiatives not mentioned in the previous report and information relevant to the rest of the SEA 5 area.

7.3.1 Legislation

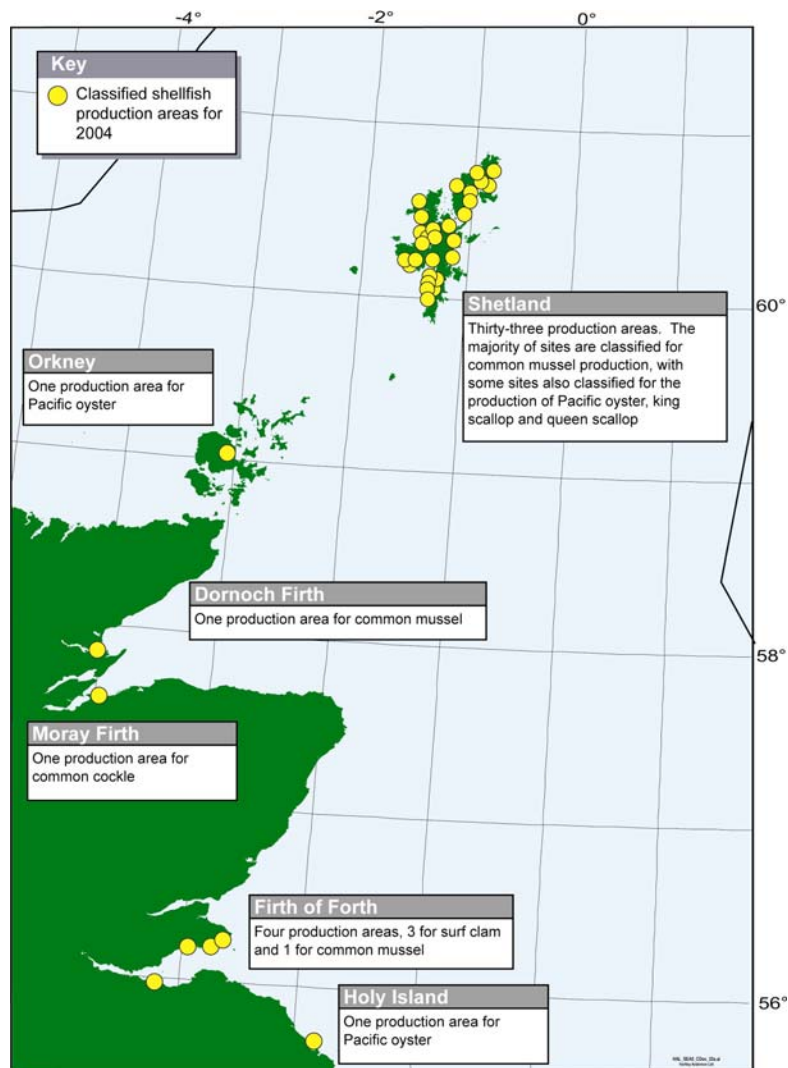
Water Environment and Water Services (Scotland) Act

The Water Environment and Water Services (Scotland) Act received Royal Assent in March 2003 and transposes the EC Water Framework Directive (2000/60/EC) into national legislation. Section 24 of the Act provides for amendment to the *Town and County Planning (Scotland) Act 1997* to the effect that local authorities will be given planning control over marine fish farms. Fish farms within the 3-mile limit of UK territorial waters adjacent to Scotland will require planning permission.

Shellfish harvesting classifications

The classification scheme used to identify shellfish production areas was described in Section 1.6.3 of the SEA 4 Existing Users report. Table 7.4 describes shellfish production areas in the SEA 5 area for 2004. The sites are also highlighted on Figure 7.3.

Figure 7.3 - Classified shellfish production areas in the SEA 5 area



Source: Food Standards Agency website – <http://www.foodstandards.gov.uk>

Table 7.4 – Classified shellfish production areas in the SEA 5 area, 2004

Production Area	Species	Class
Shetland Islands		
Baltasound	Pacific Oyster (<i>Crassostrea gigas</i>)	A – March to May B – June to February
	Mussels (<i>Mytilus edulis</i>)	A – January to December
Busta Voe and Linga	Mussels	A – July to May B - June
Catfirth	Mussels	A – January to December
Clift Sound: Stream Sound	Mussels	A – January to December
Culivoe, Southwick	Mussels	A – January to December
Dales Voe: Scarva Ayre	Mussels	A – January to December
Dales Voe: Muckle Ayre	Mussels	A – January to December
East Burra Firth	Mussels	A – December to July B – August to November
Gruting Voe, Seli Voe,	Mussels	A – October to June B – July to September
Gruting Voe, Braewick Voe	Mussels	A – January to December

Table 7.4 – Classified shellfish production areas in the SEA 5 area, 2004

Gruting Voe, Quilse	Mussels	A – October to May B – June to September
Gruting Voe, Browland Voe	Mussels	A – September to July B – August
Inner Whalefirth	Mussels	A – January to December
Mid Yell Voe	Mussels	A – November to July B – August to October
North Uyea	Mussels	A – January to December
Olna Firth	Mussels	A – January to October B – November to December
Ronas Voe	Mussels	A – October to May B – June to September
Sandsound Voe	Mussels	A – January to December
Stromness Voe	Mussels	A – September to July B – August only
South Uyea	Mussels	A – November to April B – May to October
Ura Firth	Scallops (<i>Pecten maximus</i>)	A – April to February B – March only
Vaila Sound	Mussels	A – January to December
Vaila Sound: Riskaness	Mussels	A – January to December
Vementry	Mussels	A – January to December
Wadbister Voe	Mussels	A – January to December
Basta Voe	Mussels	A – January to December
Papa Little Voe	Mussels	A – September to July B – August only
Langsound	Mussels	A – June to December B – January to May
South of Houss Holm	Mussels	A – January to December
Burra Voe	Pacific oyster	A – April to September B – October to March
Clift Sound, Whal Wick	Mussels	A – August to December B – January to July
South Voe	Pacific oyster	A – September to April B – May to August
Muckle Roe, Burki Taing	Mussels	A – September to April B – May to August
Orkney Islands		
Bay of Firth	Oysters	A – March to August B – September to February
Mainland east coast		
Dornoch Firth	Mussels	A – February to December B – January only
Ardersier, White Ness Sands	Common Cockle (<i>Cerastoderma edule</i>)	B – January to December
Forth Estuary, Anstruther	Surf clam (<i>Spisula solidus</i>)	A – August to September B – October to July
Forth Estuary, Largo Bay	Surf clam	A – October only B – November to September
Forth Estuary, Pittenweem	Surf clam	A – January to February B – March to December
Granton East Breakwater	Mussels	B – January to December
Holy Island (Ross Links – R9)	Pacific oyster	B

Source: Food Standards Agency website – <http://www.foodstandards.gov.uk>

7.3.2 European aquaculture strategy

The European Commission strategy for sustainable development of European aquaculture (COM (2002) 511 final) (http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002_0511en01.pdf) was published in September 2002 with several key objectives:

- Creating long-term secure employment, in particular in fisheries dependent areas.
- Assuring the availability to consumers of products that are healthy, safe and of good quality, as well as promoting high animal health and welfare standards.
- Ensuring an environmentally sound industry.

The strategy describes the Commission's proposed action plan for a number of key areas within the industry including increasing production; competition for space; market development, marketing and information; training; governance; safety of aquaculture products; animal welfare; environmental aspects, and research.

7.3.3 Strategic framework for Scottish aquaculture

The Strategic framework for Scottish aquaculture was produced by the Scottish Executive Environment and Rural Affairs Department (SEERAD) in March 2003 and outlines SEERAD's strategy for the aquaculture industry in Scotland. The document (<http://www.scotland.gov.uk/library5/environment/sfsa-00.asp>) describes the importance of sustainability in aquaculture, aquaculture policy developments, and outlines the framework for the future development of the industry to maintain Scotland's largest food-exporting sector.

8 MILITARY ACTIVITY

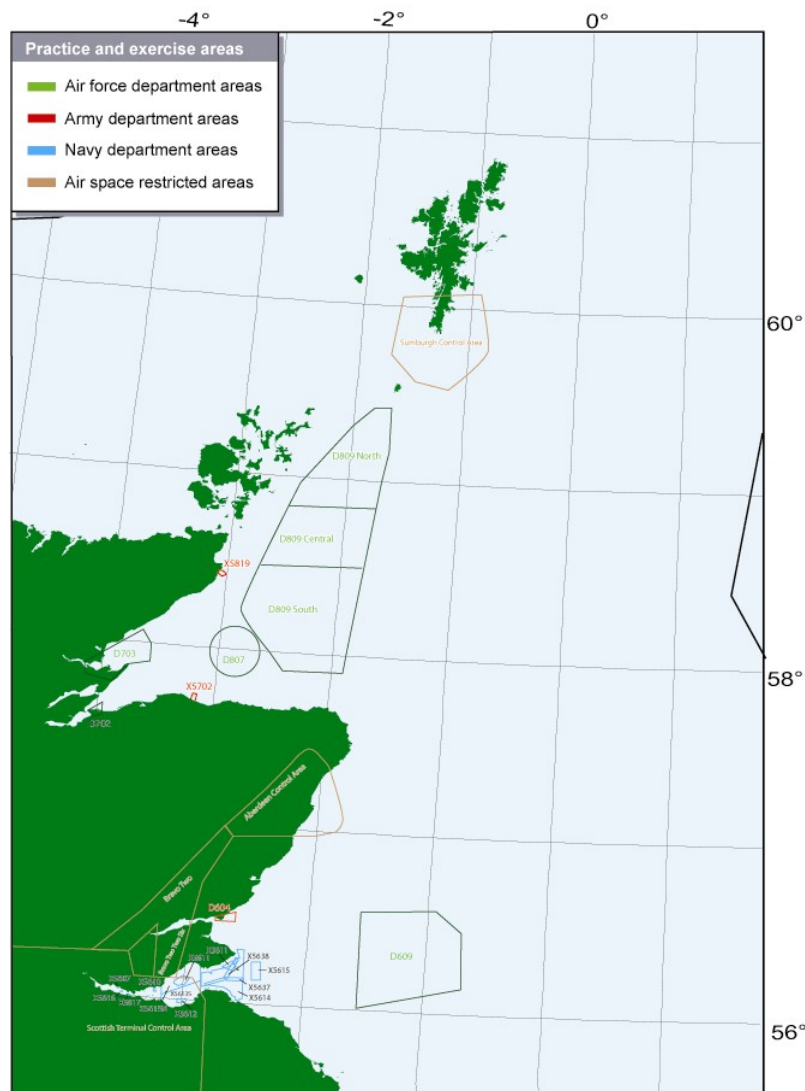
8.1 Introduction

Practice and Exercise Areas (PEXA) charts, produced by the UK Hydrographic Office, provide information relating to military activity in the SEA 5 area. These are kept up to date through the Admiralty Notices to Mariners (NMs) service and show areas which are in use, or available for use by the Ministry of Defence for military practice and exercises.

8.2 Activity in SEA 5 area

Several areas of the inner and outer Moray Firth, including an extensive area to the east of Orkney are utilised by the Air Force for activities which include radar training, high and low-angle gunnery and air to sea or ground firing. Areas in and around the Firth of Forth are predominantly utilised by the Navy for submarine exercises, mine countermeasures and minesweeping, and explosive trials (Figure 8.1 and Table 8.1).

Figure 8.1 – Military activity in the SEA5 and surrounding area



Source: PEXA Chart Q 6404, Q 6405

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

Table 8.1 – Military activity in the SEA 5 area

Serial no.	Name	Type of practice*	Altitude range (feet above surface)
Navy department areas			
X5607	Crombie Stub Pier	Light proof firing	
X5610	Burntisland	DG	
X5611	Kirkcaldy Bay (F)	Mine countermeasures	
X5612	Aberlady Bay	Mine countermeasures	
X5613(N)	Firth of Forth	General practice, mine countermeasures	
X5613(N)	Firth of Forth	General practice, mine countermeasures	
X5614	May Island	S/M, A/S	
X5615	Forth Deep	Mine countermeasures	
X5616	Blackness	Explosive Trials	
X5617	Society Bank	Explosive Trials	
X5625	Anstruther	Mine countermeasures	
X5637	Firth of Forth	Mine countermeasures, minesweeping	
X5638	Firth of Forth	Mine countermeasures, minesweeping	
Air Force department areas			
D412	Staxton	AAF	10,000
D513	Druridge Bay	AAF	10,000
D513A	Druridge Bay	H.M. Ships, AAF	55,000
D513B	Druridge Bay	AAF	55,000
D609	St Andrews	Sonobuoy, missiles, firing	1,000-55,000
D703	Tain	LB	1,500
D807	Moray Firth	Radar training buoy, B, firing	1,500
D809(N)	Moray Firth (North)	A/A, ASF, A/C, S/M, T, A/S, PTA, AAF, H.M. Ships	55,000
D809(C)	Moray Firth (Central)	A/A, ASF, A/C, S/M, T, A/S, PTA, AAF, H.M. Ships	55,000
D809(S)	Moray Firth (South)	A/A, A/C, A/S, AAF, ASF, S/M, T, PTA, H.M. Ships	55,000
Army department areas			
X5819	Wick	Rifle, A/A (light)	
D604	Barry Buddon	Parachute dropping, firing	9,000
D702	Fort George	Firing	1,000
X5702	Binn Hill	Rifle	
X5703	Aberdeen (Black Dog)	Infantry weapons	
X5705	Dingwall	Rifle	

Note: *Type of Practice: A/A (High and Low-angle Gunnery), AAF (Air-to-Air Flying), PTA (Pilotless Target Aircraft), S/M (Submarine Exercises), A/S (Anti Submarine Practice), T (Torpedo from ships or shore), A/C (Aircraft), ASF (Air to sea or ground firing), LB (Live Bombing), TA (Torpedo from Aircraft), NGS (Naval Gunfire Support). Source: PEXA Chart Q 6404, Q 6405

Military operations in Scottish waters include the triennial exercises run jointly by the Royal Navy and the Royal Air Force. The exercises, called Joint Maritime Courses (JMCs), provide collective training for the warships and aircraft of the UK and allied forces (including German, Canadian and Scandinavian units). JMCs take place mainly off the west coast, but include operations to the north and east of Scotland as well (ETS News website - <http://www.ets-news.com/maritime.htm>).

9 TELECOMMUNICATION CABLES

9.1 Introduction

The rapid development of the internet, coupled with growing demands for telecommunication services and improvements in communication technology, have led to an increase in the number of new subsea telecommunication cables being planned and laid, with many now traversing the North Sea to link the UK with mainland Europe and North America.

9.2 Activity in SEA5 area

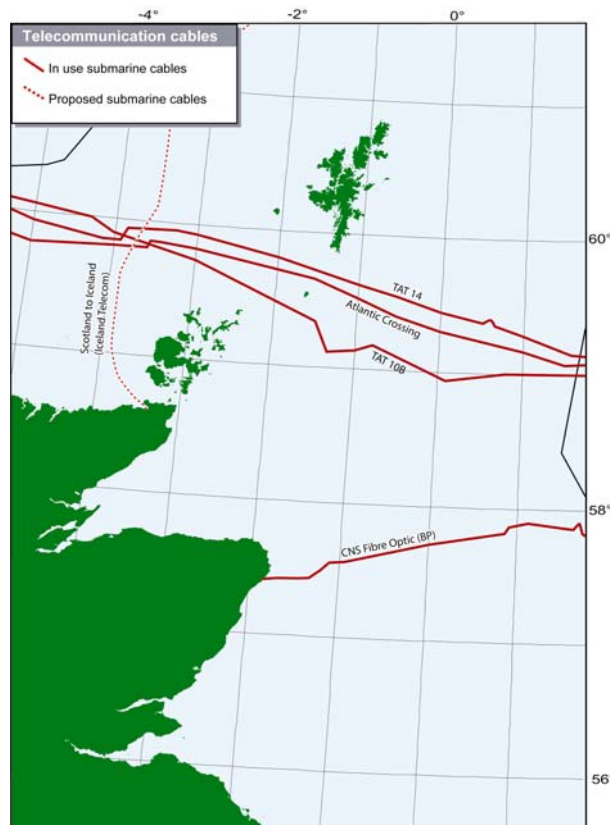
There are three telecommunication cables which currently cross the SEA 5 area before reaching landfall on mainland Europe. A proposed BP fibre optic cable (from the Forties Field) will make landfall at Cruden Bay on the north east coast (Table 9.1 and Figure 9.1)

Table 9.1 - Telecommunication cables in the SEA 5 area		
Cable land fall	Cable	Operator
Iceland	Scotland to Iceland (Iceland Telecom) ¹	Iceland Telecom
Mainland Europe	TAT 14	BT
Mainland Europe	Atlantic Crossing	Global Crossing
Mainland Europe	TAT 10B	T-Systems International
Cruden Bay	CNS Fibre Optic	BP

Note: ¹ Proposed submarine telecommunications cable.

Source: Kingfisher cable awareness charts – North Sea – central, north and north west approaches.

Figure 9.1 – Telecommunication cables in the SEA 5 area



Source: Kingfisher cable awareness charts – North Sea – central, north and north west approaches.

10 RENEWABLE ENERGY

10.1 Introduction

The UK Government has proposed that by 2010, 10% of UK electricity needs should be met from renewable sources, however in Scotland, where the promotion of renewable energy is devolved, the Executive have proposed a target for renewable energy of 18% by 2010 and 40% by 2020 (Scottish Executive 2003).

Interest in energy developments in Scotland's coastal waters and offshore locations has grown in recent years and while wave and tidal devices are predominantly still at the experimental stage in the UK and not yet commercially viable, offshore wind farms currently represent the best developed form of offshore renewable technology.

10.2 Activity in SEA 5 area

Scotland is rich in potential sources of offshore renewable energy including wind, wave and tidal and it is estimated that the combined potential for offshore and onshore wind generation is in the region of 36.5GW, while wave power could produce 14GW and tidal 7.5GW (Scottish Enterprise website <http://www.scottish-enterprise.com>)

This section will describe current commercial and experimental projects utilising wind, wave or tidal power in the SEA 5 area.

10.2.1 Wind

Offshore wind from both relatively shallow and sheltered territorial waters and deeper waters on the continental shelf could provide opportunities for renewable developments. Much of the UK's potential offshore wind resource, an estimated 33% of Europe's total, lies off the coast of Scotland (Gerrad Hassan and Partners 2001).

Currently, there are no operational offshore wind farms in the SEA 5 area although there are a number of conceptual plans. The most prominent of these is the potential offshore wind farm development in the vicinity of the Beatrice oilfield, approximately 12 miles off the Moray Firth coast.

In 2001, the operator of the Beatrice oilfield, Talisman, undertook a study to investigate the feasibility of utilising the existing oil infrastructure as a hub for a wind farm. However, although the project was technically feasible, the costs involved rendered the development nonviable at that time. In 2003 the Scottish Executive awarded a grant of up to £194,000 to Talisman and its research partner Scottish and Southern Energy to develop the project further. The proposal is to install up to 120 wind turbines, generating approximately 500MW, which would provide approximately 5% of the UK's renewable energy needs (Talisman Energy).

Another, more conceptual idea, has been proposed by Aberdeen City Council for the construction of 20 wind turbines one kilometre off Aberdeen beach, which would be linked to an energy centre on the beachfront. A study into the feasibility and environmental impact of the proposal is yet to be commissioned and if approval was granted it would take at least a further seven years to put the turbines in place (BBC News archive website <http://news.bbc.co.uk/1/hi/scotland/3109206.stm>).

10.2.2 Wave

Gerrad Hassan and Partners (2001) described the best areas for utilising wave energy resources as westward of the Western Isles, from Mull up to the Outer Hebrides, as well as west of the Orkney and Shetland Islands, with the most viable thought to be those located in the vicinity of the Outer Hebrides. However this report excluded the eastern seaboard of Scotland, since the available energy is an order of magnitude less than that of the western (Atlantic) seaboard.

Whilst not as developed as offshore wind technology, the exploitation of wave (and tidal) energy offers considerable promise for the long term. In the UK, three projects have already been awarded contracts under the Third Scottish Renewables Order (the first Renewables Order open to wave power). Of these Seapower International's FWPV is expected to be constructed 500m off Mu Ness in Shetland after initial testing in Sweden and further testing in Scotland and the prototype Pelamis offshore wave convertor, is expected to be tested at the European Marine Energy Centre in Orkney. The third contract was awarded to Wavegen for the LIMPET device, the world's first commercial wave power station located on the shoreline of Islay.

10.2.3 Tidal

Tidal systems, which utilise the natural ebb and flow of tides and currents to power turbines, are believed to be one of the world's greatest untapped energy resources. The UK has a particular good marine current resource with at least 40 possible locations with suitable fast currents (DTI, The World Offshore Renewable Energy Report 2002-2007).

However, despite the considerable advances made in tidal energy technology over the last decade, the ability to commercially utilise tidal energy remains some way behind other renewable energies. There remains a significant amount of work required to move tidal energy devices from crucial early development stages, through into large scale testing and verification.

Stingray, the world's first large scale tidal stream generator system, was deployed in Yell Sound off the Shetland coast in 2002 for preliminary testing. The success of these tests has led to the redeployment of *Stingray* for additional testing, with plans for installing the *Stingray* power station, connected to the local network, in 2004. In September 2003, testing began on a prototype tidal energy turbine, the EXIM* Tidal Turbine, developed by Seapower Scotland and the Lerwick company Delta Marine. Testing will be at 10 sites in the Bluemull Sound, a stretch of water between Yell and Unst (Highlands and Islands Enterprise website: <http://www.hie.co.uk/welcome.asp.LocID-newaa7.htm>). The project has attracted funding from both Shetland Enterprise and Shetland Islands Council and the testing will be used to refine the prototype with a view to setting up a full scale manufacturing base for the turbines in Shetland. Data from the testing will also be used to evaluate the island's potential for producing renewable energy.

10.3 Management issues and initiatives

The renewable energy issues and initiatives described in the SEA 4 Existing Users report are also relevant to the SEA 5 area and should be referenced. This section describes further initiatives.

10.3.1 Energy Bill

The Energy Bill, introduced to the House of Lords on 27th November 2003, will establish a comprehensive legal framework to support renewable energy developments beyond territorial waters (12 nautical miles) and augment the regime for inshore waters. The Bill will allow for the designation of Renewable Energy Zones outside of territorial waters (UK Parliament website - <http://www.parliament.the-stationery-office.co.uk/pa/ld200304/ldbills/002/2004002.htm>).

10.3.2 Renewables Obligation

The Renewables Obligation and associated Renewables (Scotland) Obligation came into force in April 2002 as part of the Utilities Act (2000). It requires power suppliers to supply a specified and growing proportion of their electricity sales from renewable sources. The level of the Renewables Obligation was 3% in 2003, and will increase each year to reach 10.4% in 2010-11. It was announced in December 2003 that the Renewables Obligation would be extended to rise to 15.4% by 2015, requiring the installation of an additional 5,000MW of new renewables capacity (DTI Renewables website - <http://www.dti.gov.uk/energy/renewables/>).

10.3.3 Offshore windfarm developments

In July 2003 The Crown Estate invited developers to apply for leases for the second round of UK offshore wind farm developments. The results of the tendering process were announced in December with fifteen projects, representing between 5.4 and 7.2GW of new wind capacity, being offered leases to develop projects off the coast of the UK.

The sites will be built in three strategic areas of shallow sea - the Thames Estuary, Greater Wash and the North West. Of the 15 wind farms, three are fully outside territorial waters and include the world's largest proposed offshore wind farm, in the Greater Wash area, which will provide up to 1.2GW of generating capacity (DTI Renewables website - <http://www.dti.gov.uk/energy/renewables/>).

10.3.4 Forum for Renewable Energy Development in Scotland (FREDS)

The Forum for Renewable Energy Development in Scotland (FREDS) is tasked with promoting and encouraging the renewable energy sector and helping Scotland realise its potential to become a world leader in the industry. FREDS includes members of the Scottish Executive, business leaders, academics and industry experts and met for the first time in October 2003.

The Forum's remit is to:

- Set targets and milestones for generation, technology development, jobs and exports
- Produce an action plan for the promotion and development of marine energy
- Produce an action plan for the promotion and development of biomass technology
- Build on synergies between Scotland's existing offshore expertise and the commercialisation of offshore wind, wave and tidal technologies

It will also keep a watching brief on UK wide developments, and advise on any action it believes necessary to develop economic opportunities for Scotland in the renewables sector (Scottish Executive website - <http://www.scotland.gov.uk/pages/news/2003/10/SEEL109.aspx>).

10.3.5 Enterprise Committee Inquiry into Renewable Energy

The Enterprise Committee of the Scottish Parliament launched a wide ranging inquiry into the development of renewable energy in Scotland in November 2003. The Committee will examine a number of issues including the Scottish Executive's targets for renewable energy and how they relate to the UK; opportunities and implications for the Scottish economy; current barriers; global and local issues, and an assessment of the various renewable sectors (Scottish Parliament website - <http://www.scottish.parliament.uk/news/news-03/cent03-002.htm>).

11 AGGREGATE EXTRACTION

11.1 Introduction

Sand and gravel are essential materials for coastal protection, beach replenishment and private and industrial construction work. The main area for aggregate extraction in the UK is the south east of England with only limited commercial deposits located in Scottish waters (Crumpton & Goodwin 1996).

It is widely accepted that in such areas as Shetland and Orkney local crofters have traditional rights to remove small quantities of sand and shingle from local formations for use on the croft. Little use seems to be made of this right at this time.

11.2 Activity in the SEA 5 area

Within the SEA 5 area there are currently two licensed sites for aggregate dredging, one in the Tay Estuary and the other in the Firth of Forth. Both Scottish licences are active dredge areas (Pers. comm. K O'Shea, Crown Estate).

12 MARINE DISPOSAL

12.1 Introduction

The dumping at sea of most forms of industrial waste has been prohibited since 1994, with the disposal of sewage sludge phased out in 1998. Dredged waste from excavated ports and navigation channels now forms the majority of the remaining material eligible for disposal at sea. In Scotland the licensing function for disposal at sea of dredged material, is administered by SEERAD through the Fisheries Research Services under the *Food and Environment Protection Act 1985*.

12.2 Activity in the SEA 5 area

12.2.1 Disposal of dredged material

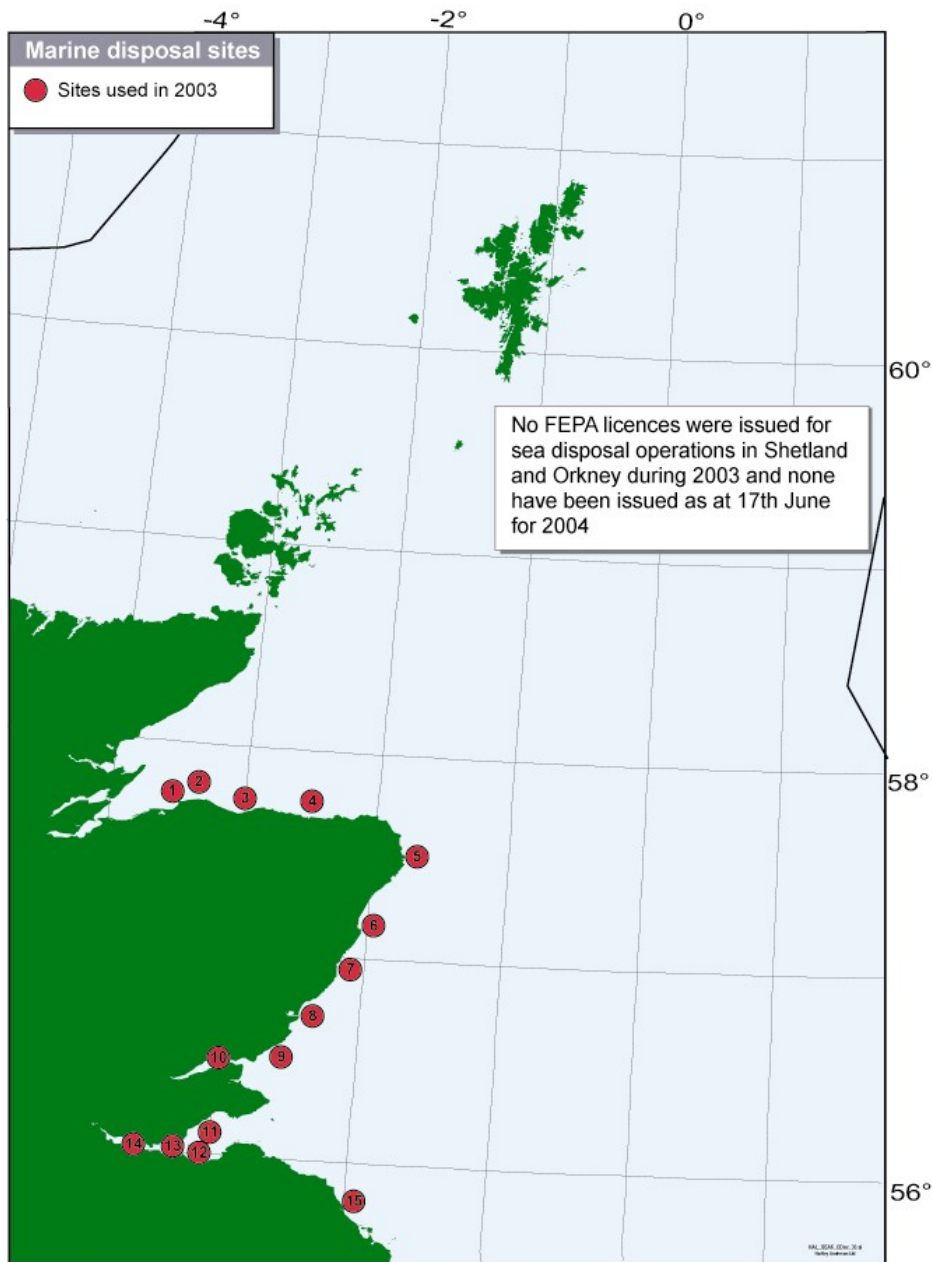
In 2003 there were a number of sites in the SEA 5 area that were licensed for the disposal of dredge spoil (Table 12.1 and Figure 12.1). There were no licensed sites on Orkney and Shetland in 2003. Considerable amounts of dredge spoil were disposed of at sites close to Aberdeen, Montrose, and within the Firths of Tay and Forth (Pers. comm. P Hayes, FRS, Marine Laboratory, Aberdeen).

Table 12.1 - Annual returns for sites used in 2003 within the SEA 5 area

Map ref.	Disposal sites codes	Disposal site name	Annual return (tonnes).	Most recent licence
1	CR030	Burghead	10,419	01/09/04 – 31/08/04
2	CR031	Lossiemouth	1,700	02/04/03 – 01/04/04
3	CR040	Buckie (Findochty)	8342	01/09/02 – 31/08/03
4	CR050	Macduff	6,946	03/04/02 – 02/04/03
5	CR070	Peterhead	4,517	27/03/03 – 26/03/04
6	CR110	Aberdeen	243,393	23/09/03 – 07/01/04
7	FO007	Stonehaven	1,872	31/03/02 – 30/03/03
8	FO010	Montrose	146,511	19/04/03 – 18/04/04
9	FO020	Arbroath	25,647	15/06/03 – 14/06/04
10	FO28	Middle Bank (Tay)	129,448	04/07/02 – 03/07/03
11	FO048	Methil	17,679	06/03/03 – 05/03/04
12	FO038	Leith	249,485	26/08/03 – 31/01/04
13	FO041 & FO036	Granton & Rosyth	405,439	01/08/03 – 31/07/04 & 17/05/03 – 16/05/04
14	FO044	Bo'ness	944,171	10/10/03 – 09/10/04
15	FO080	Berwick	5,005	21/07/03 – 20/07/04

Source: Pers. Comm., P Hayes, Fisheries Research Services.

Figure 12.1 – Marine disposal sites in the SEA 5 area



Source: Pers. Comm., Peter Hayes, Fisheries Research Services

12.2.2 Munitions dumping

Chemical weapons and munitions have been dumped at sea since the end of the First World War. As recovery of these munitions is not technically feasible at the present time, it is important that accurate records of the extent, location and present condition of dumped material are kept and regularly reviewed (OSPAR Commission 2002). To this end, contracting parties to the OSPAR Convention have supplied information in order to determine the location and extent of marine dumped chemical weapons and munitions.

In 2002, there were few recorded chemical weapons and munitions dump sites in or around the SEA 5 area (Table 12.2)

Table 12.2 - Marine munitions dumpsites nearest to the SEA 5 area			
Latitude	Longitude	Type of munitions	Notes
62.97	1.46	CW ¹	4,500 tons scuttled vessels
57.15	-1.97	Conventional	
56.19	-2.48	Conventional	
56.17	-2.5	Conventional	

Note: ¹CW means chemical weapons
Source: OSPAR Commission 2002

13 TOURISM AND LEISURE

13.1 Introduction

Scotland has some of the best and most attractive coastal resources in Europe for sport and recreation with tourism one of Scotland's largest industries, growing by 43% over the last thirty years (Scottish Executive: A new strategy for Scottish tourism, Scottish Coastal Forum 2003b).

Although dominated by the visitor attractions of Edinburgh the east coast of Scotland contains important tourist destinations for visitors interested in wild scenery and outdoor sports including walking, camping, caravanning, bird watching and horse riding. Wildfowling is a traditional coastal activity in the region and the south east of Scotland is of international significance for golf tourism, with around 52 coastal golf courses (Everett 1997). The region is also important to the internal Scottish tourist industry by virtue of its location within some of the most populous regions of Scotland including Edinburgh, Aberdeen and Dundee. Although the region is not as highly developed for beach-based tourism compared to other areas in the UK, there are a number of sandy beaches in scenic locations and in sheltered areas.

The tourism and leisure activities of the Shetland and Orkney Islands have previously been described in some detail in Section 1.13 of the SEA 4 Existing Users report.

13.2 Activity in SEA 5 area

In 2002, over 20 million tourists and holidaymakers took overnight trips in Scotland and spent almost £4.5 billion. In the same year, a total of 41.4m visits were made to Scottish visitor attractions (Scotexchange website - <http://www.scotexchange.net>). Table 13.1 describes the numbers and expenditure of UK and foreign tourists to tourist boards in the SEA 5 area in 2002.

Table 13.1 Number and expenditure of UK and overseas tourists in the SEA 5 area 2002				
Tourist board	UK residents		Overseas residents	
	Number of trips (million)	Expenditure (£ million)	Number of trips (million)	Expenditure (£ million)
Highlands of Scotland	2.44	409	0.36	95
Aberdeen & Grampian	1.83	399	0.15	47
Angus and the City of Dundee	0.56	78	0.05	16
Kingdom of Fife	0.73	128	0.09	39
Edinburgh & Lothian	3.96	798	0.87	286
Scottish Borders	0.52	82	0.04	9
Total Scotland	18.5	3683	1.6	811

Source: Scotexchange website - <http://www.scotexchange.net>

The coastal region of SEA 5 has an abundance of wild landscapes, high and varied cliff formations, historical and archaeological sites and spectacular seabird colonies. The unspoilt coastal environments and the wild natural scenery attract tourists in pursuit of a wide range of activities and interests including walking, bird and cetacean watching, wildfowling, sailing, fishing, diving and the maritime and wartime history of the region.

Foremost attractions in Shetland include the Fair Isle bird observatory, the National Nature Reserve on the Isle of Noss, Fetlar Nature Reserve and Sumburgh Head RSPB Nature Reserve. Wildlife interests are also important in Orkney and include a popular bird observatory at North Ronaldsay and several popular RSPB and Scottish Wildlife Trust reserves. Scapa Flow is a focus for waterskiing, windsurfing, motorised watersports and wreck diving, while there are a number of coastal paths on the north coast of Scotland, including those at Duncansby Head, John O'Groats and Sandside Bay.

Coastal paths are popular elsewhere in the region. For example, the Fife coastal path, the majority of which has been completed will be the first strategic coastal path of its kind in Scotland and will extend approximately 125km from the Forth Bridges to the Tay Bridge (Fife Coastal Path website - <http://www.fifecoastalpath.co.uk/>). The North Sea Coastal Path (NORTRAIL) project aims to regenerate a network of landscapes and pathways linking footpaths and sites in recreational areas of the coastal countries encompassing the North Sea. Participants in a feasibility study launched in 2000 included Aberdeenshire Council, East Lothian Council and Northumberland County Council. The first phase of the project will focus on an area in Hordaland County, Norway (Nortrail website - <http://www.hordaland-f.kommune.no/kls/nortrail/default.htm>).

There are a number of castles, historic and archaeological sites along the coast which draw tourists and holidaymakers. Visitor attractions in the north of the region include, Fort George at Ardersier, Slains Castle, a ruined castle on the coast of Cruden Bay, and Dunnottar Castle, less than two miles south of Stonehaven. To the south, attractions include, St Andrews Castle the ruins of which date from the 13th century and Inchcolm Abbey, the "Iona of the east" located on Inchcolm Island in the Firth of Forth and built in 1223.

Some of the main coastal towns are popular with tourists including Montrose, Arbroath, St Andrews, Dunbar and North Berwick, with many of the smaller fishing ports also attracting visitors (Fowler 1996, Everett 1997). In addition to Edinburgh, Aberdeen continues to be an important holiday destination and is the only major city in Scotland with a well developed beach front and esplanade. Caravan parks and campsites can generally be found all along Scotland's eastern coastline with sites found at Dunbeath; the Dornoch, Beaully and Cromarty Firths; Nairn; Rosemarkie Bay; Spey Bay; Aberdeen; Arbroath; Dunbar; Eyemouth and Pease Bay, to name but a few.

Figure 13.1 - Dunbar Harbour



Source: Bill Ritchie

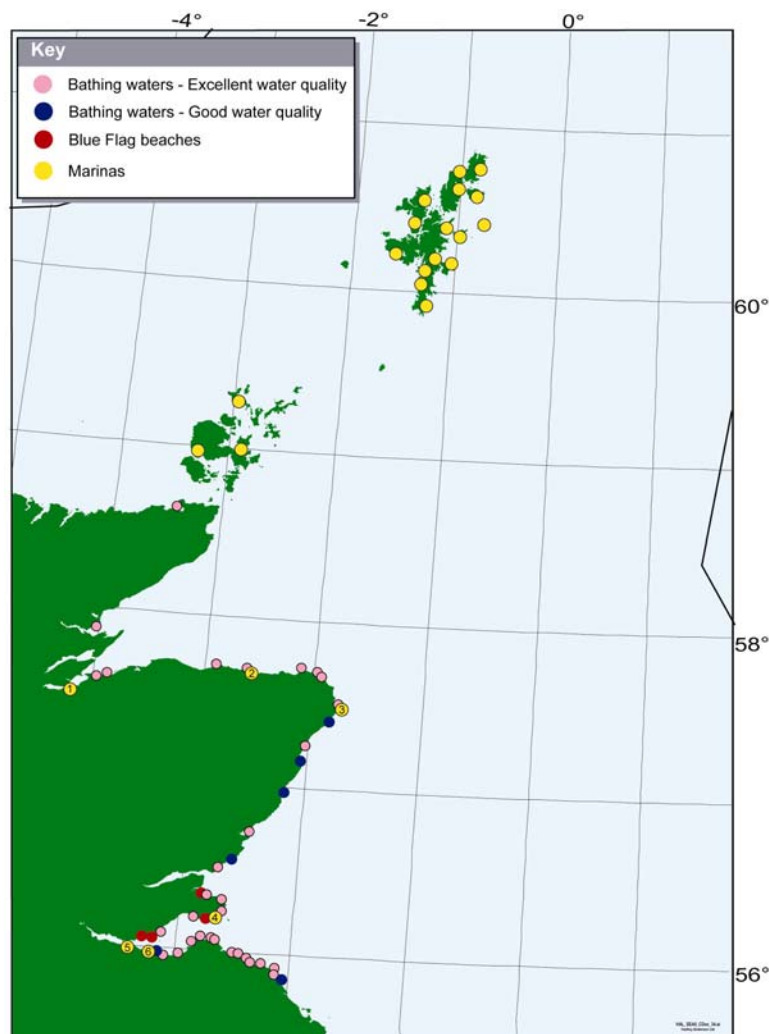
The harbour at Dunbar (Figure 13.1) is typical of the many small harbours in the SEA 5 area formally important for fishing and now attracting visitors.

The region, particularly the south east, is of international significance for golf tourism. A concentration of golf courses are found along the Angus coast, in the East Neuk of Fife and along the East Lothian coast, the most notable of which are those at Carnoustie, Dornoch, Cruden Bay, Muirfield and St Andrews (Everett 1997). Bird watching is popular at many coastal locations including the Cromarty and Dornoch Firths, Fowlsheugh and the Montrose Basin as are boat trips for bird, seal and marine mammal watching at Cromarty and the Isle of May, Bass Rock and Fidra Island in the Firth of Forth.

Bathing waters

Bathing waters which have attained certain water quality standards are designated under the EC Bathing Water Directive which, in Scotland is enforced through the *Bathing Waters (Classification) (Scotland) Regulations 1991*. Within the SEA 5 area there were forty-two designated coastal bathing water areas in 2003 (Figure 1.13.2).

Figure 13.2 – Designated bathing waters, Blue Flag beaches and marinas in the SEA 5 area



Source: SEPA website – <http://www.sepa.org.uk/>, Blue Flag website <http://www.blueflag.org/>, Sail Scotland website <http://www.sailscotland.co.uk>, Royal Yacht Association website <http://www.rya.co.uk>

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 the SEA 5 area there were four Blue Flag beaches in 2003 (Table 13.2 and Figure 13.2).

Table 13.2 - Blue flag beaches in the SEA 5 area, 2003	
Beach name	Council area
St Andrews, West Sands	Fife
Elie Harbour	Fife
Burntisland	Fife
Aberdour Silver Sands	Fife

Source: Blue Flag website - <http://www.blueflag.org/>

The ENCAMS Seaside Award scheme for resort and rural beaches complements the Blue Flag scheme and is based on similar management criteria but with fewer requirements for rural beaches. The 2004 Seaside Awards have recently been announced and 27 resort and rural beaches within the SEA 5 area were given the award. Further details can be found on the organisation's website (<http://www.seasideawards.org.uk>).

Marinas

Approximately 5 million people in the UK sail on a regular basis with Scotland the location for 4% of all sailing and water sports holidays in the UK. The number of sailing holidays taken in the UK is forecast to rise by 11% over the next few years (Scotexchange website - <http://www.scotexchange.net>).

The east coast of Scotland supports relatively few marina developments in comparison to the west coast. Notwithstanding this, there are a number of marinas of relevance to the SEA 5 area (Table 1.13.3 and Figure 1.13.2). Marina developments in the Northern Isles were described in the SEA 4 Existing Users report, the main developments being in Lerwick and Kirkwall.

Table 13.3 – Marinas in the SEA 5 area		
Map ref	Marina	Location
1	Longman Yacht Haven	Inverness
2	Whitehills marina	Whitehills, near Banff
3	Peterhead Bay Marina	Peterhead
4	Anstruther Harbour	Anstruther
5	Port Edgar marina and sailing school	Port Edgar, Edinburgh
6	Royal Forth Yacht Club	Firth of Forth, Edinburgh

Source: Sail Scotland website <http://www.sailscotland.co.uk>, Royal Yacht Association website - <http://www.rya.co.uk>

14 LOCALLY IMPORTANT ACTIVITIES

Within the SEA 5 area, a number of coastal industries and activities provide important local sources of employment and economic value.

14.1 Power stations

Four power stations were operational in the SEA 5 area in 2003: Peterhead; Cockenzie; Longannet and Torness (DTI Energy website - <http://www.dti.gov.uk/energy/inform>).

The Peterhead oil and gas power station is located at Boddam, 3km south of Peterhead and opened in 1980 with the initial intention of utilising North Sea oil. However, a rise in the oil price saw the station convert to gas, which can be piped directly from the Brent Field. The station draws cooling water direct from the sea and the nearby harbour, facilitates the unloading of fuel-oil. An estimated 160 people are employed at the power station.

Cockenzie is a coal fired power station located at Prestonpans, East Lothian, on the south shore of the Forth Estuary. Built in 1967/1968, the station is used primarily to guarantee security of electricity supply during seasonal or peak periods or the non-availability of other plants (Scottish Power website - <http://www.scottishpower.com>).

Longannet, a coal-fired power station built in 1970, is located on the edge of the River Forth near Kincardine Bridge. The station is involved in a project to achieve useful energy recovery from waste derived fuel (Scottish Power website - <http://www.scottishpower.com>).

Torness is a nuclear power station located on the east Lothian coast, 5 miles south east of Dunbar. The station is operated by British Energy PLC and is one of the largest employers in East Lothian, employing over 600 staff. The station opened in 1988 and has an installed capacity of 1,250 MW.

14.2 Other activities

Historically, other locally important activities include wildfowling on estuaries and coastal marshes, bait collecting from suitable inter-tidal areas and salt marsh grazing for livestock (Buck 1993). The current extent of these activities is unknown.

15 COASTAL AND MARINE ARCHAEOLOGY

15.1 Overview

A review of the coastal and submarine prehistoric archaeology of the SEA 5 area was commissioned for SEA 5 (Flemming 2004). Similar reviews were also produced for the SEA 3 and SEA 4 areas (Flemming 2002, 2003).

Coastal archaeology

Shetland and Orkney contain a wealth of coastal archaeological sites dating back to prehistoric times, including standing stones, burial chambers (cairns), Iron Age forts (brochs) and neolithic farms. The sophistication of many of these sites suggests that earlier coastal settlements are likely to have existed in areas that have since been drowned by the sea. Archaeological evidence of these sites may exist in suitable areas of the present seabed (Flemming 2003).

Surveys of the inner Moray Firth uncovered evidence of Mesolithic shell middens in the Inverness area (Hale & Cressey 2003). The remains of a number of late Bronze Age and Iron Age marine crannogs in the Beaulieu Firth represent almost 50% of the total number of known crannogs in intertidal waters (Hale 2000, cited by Hale & Cressey 2003). There are a large number of Pictish Age symbol stones in the area; the Clach A'Mheirlich, which stands on the northern shore of the Cromarty Firth dates to between the 7th and 9th century AD. Fishtraps built during the 17th-19th century to catch salmon are relatively common in the intertidal zone and concentrated in the Beaulieu Firth and Cromarty Firth. Early 20th century monuments include WWI and WWII military complexes on the North and South Sutors, the remains of an airfield at Evanton and the RAF seaplane base at Alness Point. The heavy military presence attests to the importance of the Cromarty Firth, especially as a naval base during both wars (Hale & Cressey 2003).

The Fife survey found evidence of fossilised trees on the shore near Crail as well as prehistoric land exposures on the muddy foreshore of the Tay Estuary between Birkhill Lodge and Flisk Point which may date to around 5,500 years ago. A series of temporary camps discovered at Fife Ness (Wickham Jones & Dalland 1998, cited by Robertson 2003) and at Tentsmuir (Coles 1971, cited by Robertson 2003) provide evidence of the earliest Mesolithic settlement of the Fife coast. Prehistoric shell and pottery middens as well as fishtraps may also be present. Evidence of Roman activity along the Fife shore is limited to scattered finds (e.g. Boat Haven pottery and finds from Constantine's Cave) (Hunter 1996, cited by Robertson 2003). Pictish burial sites (e.g. Old Haiks Long Cist; Lundin Links) and carvings within cave systems (Constantine's Cave; Randerston Castle Cave; Kinkell Cave) have been found in raised beach deposits to the south-east of St Andrews. Salmon fishing on the Tay has probably taken place since at least Roman times and evidence of structures associated with the industry are commonplace, particularly on the south shore of the Tay. The majority of sites identified during the Fife survey were of post-medieval date reflecting the considerable development and industrialisation which has taken place since the 19th century. The majority of 20th century coastal sites were military defences from World War I or II (Robertson 2003).

Similarly, the majority of coastal sites found during a survey of the Firth of Forth were attributed to the post-medieval period and included industrial, commercial and domestic buildings, harbours, docks, piers, wartime defences, designed landscapes, wooden structures, wrecks, sea-wall defences, and outdoor swimming pools (James 2003). Prehistoric sites found included a Mesolithic shell midden (Kinneil Kerse) and an antler implement; Neolithic pottery and a stone axe; Bronze Age burial chambers and Iron Age forts, caves, burial sites, middens and jewellery. A number of Roman forts and other structures as well as a brooch and a Roman coin have been described as have Early Christian burial sites, chapels and monastic settlements. A number of medieval castles, religious sites, battle sites, harbours, and settlements have also been recorded (James 2003).

Offshore archaeology

The discovery of a single flint tool off the Viking Bank (150km north-east of Lerwick) has been the only deep water prehistoric find close to SEA 5. The discovery is unique not just for its depth, but also for its distance from the shore. The flint could be as old as 11,000BP and implications of such a find are discussed in Dr Flemming's report (2003).

Flemming (2004) indicates that prehistoric submarine archaeological remains back to a date of about 12,000 years ago could occur with low probability anywhere in the SEA 5 area between the northern mainland coast and the eastern boundary of SEA 5. The existence and possible survival of prehistoric sites is complicated by the rapid and continuing uplift of the east coast of Scotland and the immediately adjacent shelf in the Moray Firth, the fact that ice sheet covered part of the seabed obliterating most artefacts earlier than about 20,000 years BP, and that the seabed towards the median line has subsided, and was associated with extensive sea-water lakes and floating sea ice during the glacial maximum (Flemming 2004).

Known submerged prehistoric sites in Orkney, Shetland, Viking Bank, the Yorkshire coast, and Denmark, show that prehistoric sites from the last 5-10,000 years can survive marine transgression. However, the strong current conditions in the SEA5 area, the exposure to North Atlantic storms, the thin sediment cover in many places, and the large areas of exposed bedrock, make the exposed areas of the shelf statistically poor prospects for the survival of prehistoric deposits *in situ*, other than in submerged caves and gullies. Within sheltered sea lochs and enclosed bays of the east coast of the Shetlands, Orkney and Fair Isle, in submerged gullies, and locally thick sediments, survival is quite likely. Deposits in open shelf gullies are likely to have been transported and re-deposited (Flemming 2004).

The strategic importance of the SEA 5 area to the navy during WWI and WWII; the concentration of much of the North Sea fishing fleet in coastal ports; the importance of maritime trade routes in the area, and the treacherous nature of nearshore waters has led to a large number of ship and aircraft wrecks in the area. Many of these wrecks have been identified and the UK Hydrographic Office maintains a register of their locations; the Wrecks Database contains over 60,000 records, of which approximately 20,000 are named vessels (<http://www.hydro.gov.uk/wrecks.html>). However, the locations of many more remain uncharted.

The identification of known aircraft and ship wreck sites and the potential locations of as yet undiscovered sites forms an important part of the project-specific EIA process. Site survey at the EIA stage would be expected to mitigate against disturbance of any wreck site.

15.2 Archaeological sites in the SEA 5 area

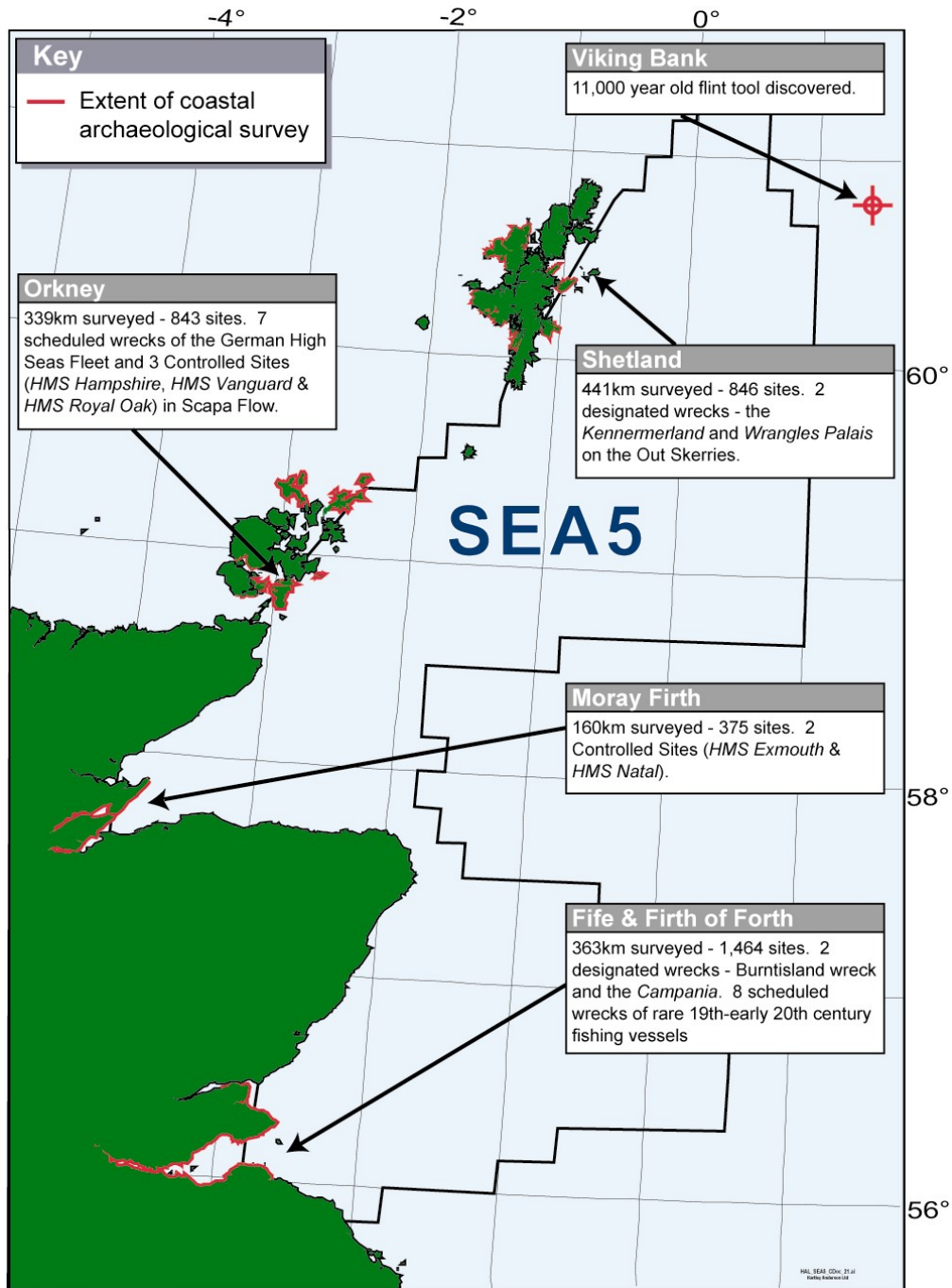
A series of archaeological assessment surveys of the Scottish coast were commissioned by Historic Scotland between 1996 and 1999 to provide information on the state of the coastal archaeological resource and its sensitivity to coastal erosion. Details of the surveys and discussion papers are provided in the paper, *Coastal archaeology and erosion in Scotland* (Historic Scotland 2003). The surveys covered about 2,350km of the Scottish coast and details of the sites surveyed within the SEA 5 region are provided in Table 15.1 and Figure 15.1.

Table 15.1 – Number of sites found in Historic Scotland coastal assessment surveys					
Survey	Length (km)	Sites	Period uncertain	Pre-medieval	Medieval to modern
Shetland	441	846	251	169	426
Orkney	339	843	266	166	411
Moray Firth	160	375	141	6	228

Table 15.1 – Number of sites found in Historic Scotland coastal assessment surveys

Survey	Length (km)	Sites	Period uncertain	Pre-medieval	Medieval to modern
Fife	193	1041	138	26	877
Firth of Forth	170	423	-	61	362

Source: Ashmore (2003), James (2003).

Figure 15.1 - Marine and coastal archaeological sites in SEA 5

National Monuments Record

The National Monuments Record of Scotland can be accessed through the CANMORE database which contains details of many thousands of archaeological sites, monuments, buildings and maritime sites in Scotland. The database can be found on the Royal Commission on the Ancient and Historical Monuments of Scotland website (<http://www.rcahms.gov.uk/canmoreintro.html>).

For the purpose of this report, a CANMORE search of the ‘Maritime’ records of relevant Council areas revealed a large number of matches (Table 15.2). The records are diverse and include a large number of sunken cargo, fishing and whaling vessels as well as military vessels and coastal defences.

Table 15.2 – Maritime national monuments and scheduled monuments in the SEA 5 area		
Council area	Maritime NMR records	Scheduled monuments
Shetland Islands	200	363
Orkney Islands	200	361
City of Aberdeen	200	36
City of Dundee	26	14
Fife	200	259
Falkirk	26	93
City of Edinburgh	120	69
Scottish Borders	200	725

Source: Royal Commission on the Ancient and Historical Monuments of Scotland website - <http://www.rcahms.gov.uk/canmoreintro.html>, Historic Scotland website - http://www.historic-scotland.gov.uk/www_ancientmonuments.

Scheduled monuments

Historic Scotland is an Agency within the Scottish Executive which safeguards the nation's built heritage by scheduling monuments of national importance and by listing historic buildings of special architectural or historic interest. Scheduled monuments are protected under the *Ancient Monuments and Archaeological Areas Act 1979* and consent is normally required before any alteration or development can take place.

A search of Historic Scotland’s online database of scheduled monuments (http://www.historic-scotland.gov.uk/www_ancientmonuments) revealed a large number of monuments within the SEA 5 area, although the majority of these are terrestrial in nature (Table 15.2).

Protected wrecks

This section will describe those wreck sites which for various reasons have been protected. A summary of relevant protective legislation is provided in Section 3 of the SEA 5 consultation document.

There are currently approximately 93 wreck sites around the UK coast that are designated as protected wrecks, a number of which are within the SEA 5 area (Maritime and Coastguard Agency website - <http://www.mcga.gov.uk>).

Designated wrecks

A number of wrecks within the SEA 5 area are protected under section 1 of *The Protection of Wrecks Act 1973*; these are described in Table 15.3 and Figure 15.1.

Table 15.3 – Designated wrecks in the SEA 5 area

Name of wreck	Location	Year of sinking	Year designated	Exclusion zone (m)
<i>Kennemerland</i>	Out Skerries, Shetland 60°25"12'N 0°45"0'W	1664	1978	250
<i>Wrangles Palais</i>	Out Skerries, Shetland 60°25"30'N 0°43"16.2'W	1687	1990 (redesignated 1991)	100
Burntisland wreck	Firth of Forth, Fife 56°02"24.42'N 03°14"51.36'W	1633	1999	-
<i>Campania</i>	Firth of Forth, Fife 56°02"24.48'N 03°13"24.72'W	1918	2001	-

Source: MCA website - <http://www.mcga.gov.uk>

Military remains

The strategic importance of the SEA 5 area for naval operations during the First and Second World Wars, in particularly the naval base at Scapa Flow on Orkney is reflected in the number of known military ship and aircraft wrecks in the area. It is likely that a large number of wrecks have yet to be located.

The Protection of Military Remains Act 1986 makes it an offence to interfere with the wreckage of any crashed, sunken or stranded military aircraft or designated vessel without a licence. This is irrespective of loss of life or whether the loss occurred during peacetime or wartime. There are two levels of protection offered by this Act, designation as a Protected Place or as a Controlled Site.

Protected Places include the remains of any aircraft which crashed while in military service or any vessel designated (by name, not location) which sank or stranded in military service after 4th August 1914. Controlled Sites are specifically designated areas which encompass the remains of a military aircraft or a vessel sunk or stranded in military service within the last two hundred years. A number of Controlled Sites have been identified in the SEA 5 area, details are presented in Table 15.4 and Figure 15.1.

Table 15.4 – Controlled Sites in the SEA 5 area

Name of wreck	Location	Year of sinking	History
<i>HMS Hampshire</i>	Scapa Flow	1916	The armoured cruiser hit a mine and sank with the loss of 650 lives.
<i>HMS Vanguard</i>	Scapa Flow	1917	Blew up whilst at anchor. Unknown cause of explosion. Loss of 667 lives.
<i>HMS Royal Oak</i>	Scapa Flow	1939	Battleship sunk by U-Boat with the loss of 833 lives.
<i>HMS Exmouth</i>	Moray Firth	1940	Destroyer sunk by U-Boat with the loss of 189 lives.
<i>HMS Natal</i>	Cromarty Firth	1915	Fire onboard the armoured cruiser whilst in Cromarty harbour led to explosion. Sank with the loss of 421 lives.

Source: MCA website - <http://www.mcga.gov.uk>

Scheduled wrecks

The seven remaining wrecks of the German High Seas Fleet, scuttled at Scapa Flow on 21st June 1919 have been protected as maritime Scheduled Ancient Monuments. Also within the SEA 5 area, the remains of eight Fifie fishing vessels have been scheduled as they represent boats engaged in the Scottish fishing industry at the turn of the 20th Century (see Table 15.5 and Figure 15.1 for details).

Table 15.5 – Wrecks designated as scheduled monuments in the SEA 5 area

Name of wreck	Type of vessel	Location
<i>Brummer</i>	Light cruiser	Scapa Flow. 58°53.815N 03°09.207W + 500m diameter area encompassing debris field
<i>Dresden</i>	As above	Scapa Flow. 58°52.943N 03°08.455W + 500m diameter area
<i>Karlsruhe</i>	As above	Scapa Flow. 58°53.350N 03°09.181W + 500m diameter area
<i>Koln</i>	As above	Scapa Flow. 58°53.830N 03°09.181W + 500m diameter area
<i>Konig</i>	Battleship	Scapa Flow. 58°53.198N 03°09.181W + 500m diameter area
<i>Kronprinz Wilhelm</i>	As above	Scapa Flow. 58°53.622N 03°09.904W + 500m diameter area
<i>Markgraf</i>	As above	Scapa Flow. 58°53.475N 03°10.010W + 500m diameter area
Kilspindie Hulk No.1	Rare 19 th -early 20th century 'Fifie' sailing fishing vessel	Kilspindie, Aberlady Bay, Lothian NT46063 80293 (+/-10m)
Kilspindie Hulk No.2	As above	Kilspindie, Aberlady Bay NT45971 80343 (+/-11m)
Kilspindie Hulk No.3	As above	Kilspindie, Aberlady Bay NT45973 80271 (+/-13m)
Kilspindie Hulk No.4	As above	Kilspindie, Aberlady Bay NT45960 803289 (+/-11m)
Kilspindie Hulk No.5	As above	Kilspindie, Aberlady Bay NT45930 80317 (+/-13m)
Kilspindie Hulk No.6	As above	Kilspindie, Aberlady Bay NT45911 80305 (+/-14m)
Kilspindie Hulk No.7	As above	Kilspindie, Aberlady Bay NT45908 80319 (+/-12m)
Kilspindie Hulk No.8	As above	Kilspindie, Aberlady Bay NT45877 80338 (+/-14m)

Source: MCA website - <http://www.mcga.gov.uk>

16 COASTAL AND MARINE MANAGEMENT INITIATIVES

16.1 Introduction

The SEA 5 area includes the entire east coast of Scotland, a large area of the central and northern North Sea as well as abutting onto the eastern coasts of Shetland and Orkney. It supports a range of important habitats and species and provides an important resource for a variety of different coastal and maritime users.

A number of management initiatives and schemes seek to balance the environmental sensitivity of the coastal and marine area with its resource potential. These initiatives apply to a range of coastal users rather than the more specific management initiatives described previously and include a range of:

- Coastal planning initiatives
- Coastal water quality initiatives
- Coastal and marine nature conservation initiatives
- Integrated Coastal Zone Management initiatives

A similar review produced for SEA 4 (Section 1.16 of the SEA 4 Existing Users report) contains information that is also relevant to the SEA 5 area. Given that details of relevant initiatives were described for SEA 4, this current section will provide a brief summary of the main initiatives expanding on areas not covered previously.

16.2 Coastal planning initiatives

The SEA 5 coast is rural along much of its length although there are centres of industry and population associated with the firths of Forth and Tay as well as Aberdeen and Inverness. Coastal planning is essential to managing and maintaining the current character of the coastal environment and to this end, a number of statutory and non-statutory mechanisms guide development within the coastal zone.

National Planning Policy Guidelines (NPPG) 13 which set out the Scottish Executive's policy on coastal planning matters and are transposed into a strategic planning policy through development plans.

Development plans are made up of two parts - a structure plan and a local plan. The structure plan for an area takes a long-term strategic view of development while local plans set out more detailed policies and proposals to guide development. All the relevant local authorities within the SEA 5 area have structure plans in place (Table 16.1).

Table 16.1 – Current status of structure plans in the SEA 5 area		
Structure plans	Local Authority	Adopted
Shetland Structure Plan 2001-2016 (http://www.shetland.gov.uk/splan/intro.htm)	Shetland Islands Council	2001
Orkney Local Plan Finalised Draft ¹ (http://www.orkney.gov.uk/hqcontent.cfm?a_id=168)	Orkney Islands Council	2002
Highland Structure Plan (http://www.highland.gov.uk/plintra/devplans/splan_new.htm)	Highland Council	2001
Moray Structure Plan (http://www.moray.gov.uk/devplan2000/)	Moray Council	1999
Aberdeen and Aberdeenshire Structure Plan 2001-2016 (http://www.nest-uk.net/)	Aberdeen City Council Aberdeenshire Council	2001

Table 16.1 – Current status of structure plans in the SEA 5 area

Dundee and Angus Structure Plan 2001-2016 (http://www.dundee.gov.uk/structureplan/index.html)	Dundee City Council Angus Council	2002
Fife Structure Plan (www.fife.gov.uk)	Fife Council	2002
Edinburgh and the Lothians Structure Plan 2015 (www.edinburgh.gov.uk)	City of Edinburgh Council East Lothian Council Midlothian Council West Lothian Council	2003
Scottish Borders Structure Plan 2001-2011 (http://www.scotborders.gov.uk/)	Scottish Borders Council	2002

Note: In January 2000, Orkney Islands Council published the Orkney Development Plan 2000 - Consultative Draft (comprising a review of the 1993 Structure Plan and a new Local Plan for Orkney). Having considered all the representations received, the Local Plan has been revised and a finalised draft was approved in December 2001.

Shoreline Management Plans (SMPs) provide large scale assessment of the risks associated with the coastal processes of erosion and flooding and present a policy framework to reduce these risks to people and the environment (DEFRA 2001). SMPs are based upon natural divisions of the shoreline, sedimentary cells and sub-cells, rather than administrative boundaries (Scottish Coastal Forum 2002). Whilst there is no statutory requirement for Scottish authorities to prepare SMPs, a number of local authorities relevant to the SEA 5 area have done so (Table 16.2).

Table 16.2 – SMPs relevant to the SEA 5 area

Coastline	Lead authority	Completion date
Burghead to Inner Moray Firth	Highland Council	1996
Angus (St Cyrus to Broughty Ferry)	Angus Council	2002
Fife (Newburgh to Kincardine)	Fife Council	1999
East Lothian (Musselburgh to Cockburnspath)	East Lothian Council	2002
St Abbs to the Tyne	Wansbeck Council (Northumberland)	1998

Source: Scottish Coastal Forum (2002c), Angus Council website - <http://www.angus.gov.uk/>, Fife Shoreline Management Plan – summary document.

16.3 Coastal water quality initiatives

Within SEA 5, the management and maintenance of water quality is an important issue for coastal industries, conservation interests and public health. There are specific classification schemes for shellfish harvesting areas and bathing waters that are monitored and regulated in Scotland by SEPA. In addition, SEPA operate more general classification schemes for coastal and estuarine waters. Table 16.3 provides details of the classification of estuarine and coastal waters relevant to SEA 5 (details of the classification method were described in Section 1.16.3 of the SEA 4 Existing Users report).

Table 16.3 –Estuarine and coastal water quality in SEA 5 (2002)

Region	Excellent (km ²)	Good (km ²)	Unsatisfactory (km ²)	Seriously polluted (km ²)	Total (km ²)
Estuarine water					
Highland	257.93	6.14	2.85	0	266.9
South East	102.9	97.1	6.1	0	206.1
Coastal water					
Highland	8,208.7	196.1	83.1	14.15	8,502
Coastal water					
South East	159	131.9	24	1	315.9

Source: SEPA website - http://www.sepa.org.uk/data/classification/water_qual_class_2002.pdf

Perhaps the most important development regarding water quality initiatives is the introduction of the Water Framework Directive, which will introduce fundamental changes to the way in which the water resource is managed.

The Water Framework Directive (Directive 2000/60/EC) was adopted by the European Parliament and the Council of the European Union in December 2000 and has been transposed into Scottish law through the passing of the *Water Environment and Water Services (Scotland) Bill* in January 2003.

The Directive introduces two key changes as to the way the water environment will be managed:

- New, broader ecological objectives, designed to protect and where necessary, restore the structure and function of aquatic ecosystems.
- A river basin management planning system which will be the key mechanism for ensuring the integrated management of groundwater, rivers, canals, lochs, reservoirs, estuaries and other brackish waters, and coastal waters.

In Scotland, a single Scottish River Basin Management Plan is likely to be supplemented by sub-basin plans. These will introduce a statutory basis to the strategic management of catchments and coastal zones. The Directive will also replace or integrate a range of previous water directives (e.g. on urban wastewater, freshwater quality for fish, bathing water quality, shellfish water quality, nitrates), and strengthen linkages with the aquatic and wetland aspects of the Birds and Habitats Directives (SEPA website - <http://www.sepa.org.uk/wfd/index.htm>).

16.4 Coastal and marine nature conservation initiatives

Presently, there are a number of initiatives underway which may influence conservation management of the SEA 5 coastal and marine resource. Appropriate reference is made to those initiatives that have been described previously for SEA 4. Relevant initiatives include:

- Continued development of management plans for marine SACs.
- Initiatives to establish offshore conservation sites including the Offshore Natura 2000 Project and OSPAR's Marine Protected Areas programme.
- The Review of Marine Nature Conservation (RMNC) was set up in 1999 to examine the effectiveness of the system for protecting nature conservation in the marine environment. The Review's recommendations have been tested through the Irish Sea Pilot, the outcomes of which have recently been published.
- The development of a framework for mapping European seabed habitats (MESH).
- A number of biodiversity and sustainability initiatives including Biodiversity Action Plans, and the 'Sustainable Scottish Marine Environment Initiative', which aims to develop and test the benefits of new management frameworks for the sustainable development of Scotland's marine resources (see Section 1.16.4 of the SEA 4 Existing Users report for details).

Further details of these initiatives can be found in Section 8 of the SEA 5 Conservation report.

16.5 Integrated Coastal Zone Management (ICZM)

16.5.1 Overview

An overview of integrated coastal zone management within Scotland was provided in Section 1.16.5 of the SEA 4 Existing Users Report.

Integrated Coastal Zone Management is a process that brings together all those involved in the development, management and use of the coast within a framework that facilitates the integration of their interests and responsibilities. The objective is to establish sustainable levels of economic and social activity in coastal areas while protecting the coastal environment.

The 'Focus on Firths' Project, later to become the 'Firths Initiative' was set up in 1992 by Scottish Natural Heritage (SNH) in response to the growing awareness of the need for better management, to promote and co-ordinate ICZM of these areas. Focus on Firths had two main aims (Atkins 1994, cited by Atkins 2004):

- To secure integrated management strategies for the Solway, Forth and Moray firths and other significant firths by facilitating consensus and co-operation among all users and statutory authorities
- To increase appreciation and understanding of the vital importance of the natural heritage of firths, through information collation and dissemination, the production of educational and interpretative materials, promoting community involvement and local ownership.

Local partnerships have since been established, some of which operate within the SEA 5 area. A European Commission Demonstration Programme on ICZM has given further support with the Forth Estuary Forum being the site of one of its demonstration projects.

In May 2002 the European Union adopted a Recommendation on Integrated Coastal Zone Management (ICZM), which the UK Government has committed itself to implement. It calls for national coastal strategies to be developed and a progress report to be made to the European Commission in early 2006 (EC Council Directive 2002/413/EC website - <http://web.uct.ac.za/depts/pbl/jgibson/iczm/legis/ec/20020413.pdf>)

The first stage in preparing a UK strategy took the form of a national stock-take to analyse which major groups, laws and institutions influence the management of the coastal zone. Following extensive consultation with key coastal organisations (including statutory agencies, local authorities, industry, conservation bodies and recreational groups), a stocktake report was published in March 2004 which:

- Described the environmental, social and economic characteristics and natural resources of the UK's coast.
- Identified the different laws, agencies and other stakeholders that influence the planning and management of activities on the coast.
- Analysed how these bodies integrate with each other and identified any gaps, overlaps or opportunities.

The main findings of the report were that:

- The current coastal management framework is spread across many organisations and tends to operate on a sectoral basis. This provides clarity to specific user groups but comes at a risk of not achieving the bigger picture and integrating the requirements of all activities at the coast.
- Even without an integrated national framework, local ICZM initiatives have developed around the UK to address specific issues. This local commitment has been driven by the need to find a practical way of resolving conflicts in the coastal zone. However, this progress has been uncoordinated and many initiatives have been constrained by the lack of long term resources and commitment by some stakeholders.
- There is a need for stronger leadership at all levels (national, regional and local) and a more secure funding arrangement to support ICZM.
- More coastal stakeholders at all levels need to engage in ICZM activity.

The national stocktake will inform the overall UK vision for the coast and the strategies for Scotland, England, Wales and Northern Ireland that will be developed during 2004 and 2005 (Scottish Coastal Forum website - <http://www.scotland.gov.uk/environment/coastalforum/strategy.asp>). Further details and a copy of the stocktake report can be found on the DEFRA ICZM website (<http://www.defra.gov.uk/environment/marine/iczm/index.htm>).

16.5.2 ICZM initiatives in SEA 5

The SEA 4 Existing Users report described a number of ICZM initiatives within the SEA 4 area that are also relevant to SEA 5, including the Fair Isle Marine Environment and Tourism Initiative; the Orkney Marine and Coastal Forum; the Scapa Flow Management Strategy, and the Highlands and Islands Enterprise Marine Science Strategy Group. Other relevant initiatives are described below.

Moray Firth Partnership

The Moray Firth Partnership (launched in August 1996) is a voluntary organisation made up of representatives or partners from industry, the local authorities, conservation bodies, recreational users, and local residents. The Partnership focuses on the coast and sea from Duncansby Head in Caithness to Fraserburgh in Aberdeenshire and its main objective is the improvement and facilitation of communication amongst all those with an interest in the area, to help ensure more integrated and informed management of the Firth. To this end, the Partnership published management guidelines and a three year action programme in September 1999, the implementation of which was completed in March 2003.

In relation to oil and gas development within the Moray Firth, Guideline 12 indicates that the Partnership supports the sensitive development of oil and gas exploration and production backed by effective contingency planning (Moray Firth Partnership website - <http://www.morayfirth-partnership.org>).

The Cromarty Firth Liaison Group (CFLG) was set up in 1992 as a voluntary local partnership that brought together private industry, statutory organisations and public agencies with an interest in the Cromarty Firth. The CFLG became fully integrated within the Moray Firth Partnership (MFP) in January 2002. As a result, the Cromarty Firth Management Group now operates as part of the MFP but with a focus on local issues and initiatives concerning the Cromarty Firth alone (Moray Firth Partnership website - <http://www.morayfirth-partnership.org>).

Tay Estuary Forum

The Tay Estuary Forum is a voluntary partnership which was formed in late 1997 to help promote a sustainable, integrated and co-ordinated approach towards management and use of the Firth of Tay and local coastline. The Forum focuses on a region that extends from the tidal limit of the Firth of Tay at Scone, to Fife Ness and the River North Esk on the open coastline, and covers a minimum distance of three miles offshore. The Forum co-ordinates the development of a management strategy for the coastal zone and further information can be found on the Forum's website (<http://www.dundee.ac.uk/crsem/Tef.htm>).

Forth Estuary Forum

The Forth Estuary Forum is also a voluntary partnership, established in 1993, comprising members from industry, commerce, local government, recreation and conservation bodies, as well as interested individuals. The Forum's remit extends from the tidal limit at Stirling to a line drawn from Fifeness to Dunbar, including the Isle of May although it has an interest in areas outwith this boundary if activities taking place within such areas have the potential to impact upon the Forth.

The Forth Integrated Management Strategy was published in 1999 and forms the basis for the management of the Forth providing reference for all users, planners, managers and developers in deciding how best to balance competing resource demands with environmental needs. The Strategy seeks to address the many issues facing the Forth by basing future use and management on a series of 'Guidelines' and 'Actions'. Since the publication of the strategy the Forth Estuary Forum management group have been working towards implementing the action points. Further information, can be found on the Forum's website (<http://www.forthestuaryforum.co.uk>).

17 INTEGRATED COASTAL ZONE MANAGEMENT (ICZM)

17.1 Introduction

An overview of integrated coastal zone management within Scotland was provided in Section 1.16.5 of the SEA 4 Existing Users Report.

Integrated Coastal Zone Management is a process that brings together all those involved in the development, management and use of the coast within a framework that facilitates the integration of their interests and responsibilities. The objective is to establish sustainable levels of economic and social activity in coastal areas while protecting the coastal environment.

The 'Focus on Firths' Project, later to become the 'Firths Initiative' was set up in 1992 by Scottish Natural Heritage (SNH) in response to the growing awareness of the need for better management, to promote and co-ordinate ICZM of these areas. Focus on Firths had two main aims (Atkins 1994, cited by Atkins 2004):

- To secure integrated management strategies for the Solway, Forth and Moray firths and other significant firths by facilitating consensus and co-operation among all users and statutory authorities
- To increase appreciation and understanding of the vital importance of the natural heritage of firths, through information collation and dissemination, the production of educational and interpretative materials, promoting community involvement and local ownership.

Local partnerships have since been established, some of which operate within the SEA 5 area. A European Commission Demonstration Programme on ICZM has given further support with the Forth Estuary Forum being the site of one of its demonstration projects.

In May 2002 the European Union adopted a Recommendation on Integrated Coastal Zone Management (ICZM), which the UK Government has committed itself to implement. It calls for national coastal strategies to be developed and a progress report to be made to the European Commission in early 2006 (EC Council Directive 2002/413/EC website - <http://web.uct.ac.za/depts/pbl/jgibson/iczm/legis/ec/20020413.pdf>)

The first stage in preparing a UK strategy took the form of a national stock-take to analyse which major groups, laws and institutions influence the management of the coastal zone. Following extensive consultation with key coastal organisations (including statutory agencies, local authorities, industry, conservation bodies and recreational groups), a stocktake report was published in March 2004 which:

- Described the environmental, social and economic characteristics and natural resources of the UK's coast.
- Identified the different laws, agencies and other stakeholders that influence the planning and management of activities on the coast.
- Analysed how these bodies integrate with each other and identified any gaps, overlaps or opportunities.

The main findings of the report were that:

- The current coastal management framework is spread across many organisations and tends to operate on a sectoral basis. This provides clarity to specific user groups but comes at a risk of not achieving the bigger picture and integrating the requirements of all activities at the coast.

- Even without an integrated national framework, local ICZM initiatives have developed around the UK to address specific issues. This local commitment has been driven by the need to find a practical way of resolving conflicts in the coastal zone. However, this progress has been uncoordinated and many initiatives have been constrained by the lack of long-term resources and commitment by some stakeholders.
- There is a need for stronger leadership at all levels (national, regional and local) and a more secure funding arrangement to support ICZM.
- More coastal stakeholders at all levels need to engage in ICZM activity.

The national stocktake will inform the overall UK vision for the coast and the strategies for Scotland, England, Wales and Northern Ireland that will be developed during 2004 and 2005 (Scottish Coastal Forum website - <http://www.scotland.gov.uk/environment/coastalforum/strategy.asp>). Further details and a copy of the stocktake report can be found on the DEFRA ICZM website (<http://www.defra.gov.uk/environment/marine/iczm/index.htm>).

17.2 ICZM initiatives in SEA 5

The SEA 4 Existing Users report described a number of ICZM initiatives within the SEA 4 area that are also relevant to SEA 5, including the Fair Isle Marine Environment and Tourism Initiative; the Orkney Marine and Coastal Forum; the Scapa Flow Management Strategy, and the Highlands and Islands Enterprise Marine Science Strategy Group. Other relevant initiatives are described below.

17.2.1 Moray Firth Partnership

The Moray Firth Partnership (launched in August 1996) is a voluntary organisation made up of representatives or partners from industry, the local authorities, conservation bodies, recreational users, and local residents. The Partnership focuses on the coast and sea from Duncansby Head in Caithness to Fraserburgh in Aberdeenshire and its main objective is the improvement and facilitation of communication amongst all those with an interest in the area, to help ensure more integrated and informed management of the Firth. To this end, the Partnership published management guidelines and a three year action programme in September 1999, the implementation of which was completed in March 2003.

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17.2.2 Tay Estuary Forum

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The Forum co-ordinates the development of a management strategy for the coastal zone and further information can be found on the Forum's website (<http://www.dundee.ac.uk/crsem/Tef.htm>).

17.2.3 Forth Estuary Forum

The Forth Estuary Forum is also a voluntary partnership, established in 1993, comprising members from industry, commerce, local government, recreation and conservation bodies, as well as interested individuals. The Forum's remit extends from the tidal limit at Stirling to a line drawn from Fifeness to Dunbar, including the Isle of May although it has an interest in areas outwith this boundary if activities taking place within such areas have the potential to impact upon the Forth.

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