



**Report to the  
Department of Trade and Industry**

**Existing Users and Management Initiatives  
Relevant to SEA 4**

Final Report  
September 2003

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## *SEA 4 Users Report*

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## 1.1 Introduction

The SEA 4 area supports a range of different users and activities. The predominantly rural nature of much of the coast and unspoilt nature of the surrounding coastal waters has led to the development of an important mariculture industry, especially in Shetland. The fishing industry, whilst in decline, still remains important, both culturally and economically. Similarly, the region has played a central role in the development of the North Sea oil and gas industry over the last 30 years. Tourism is increasingly important with many visitors attracted by the dramatic and spectacular coastal scenery of the area.

This report will describe those industries and activities which utilise the SEA 4 area by examining the importance of the area to a variety of industries, the main management issues and initiatives which affect these industries and finally, the relevance of licensing of the SEA 4 area to these industries.

This report presents an initial overview of the coastal population of SEA 4 which is followed by descriptions of existing users of the area, including:

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

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

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## 1.2 Coastal population

### 1.2.1 Introduction

The vast majority of the SEA 4 coastal region is rural in nature and population density is low with much of the population centred on a few relatively small settlements.

In broad socio-economic terms, the SEA 4 area supports a higher proportion of self-employed people than the Scottish average. Fishing is a more important employer in Shetland and Orkney than in the rest of Scotland and agriculture is an important industry on Orkney. The proportion of people involved in skilled trades occupations is significantly higher within the SEA 4 area than in Scotland as a whole.

Information relating to the demographics of the SEA 4 area comes largely from the results of the 2001 census which can be accessed through the Scotland's Census 2001 website (<http://www.gro-scotland.gov.uk/grosweb/grosweb.nsf/pages/censushm>).

### 1.2.2 Demographics and socio-economics

#### Population

The coastal region of SEA 4 does not support a large population; the combined population of Shetland, Orkney, and Caithness and Sutherland was only 60,000 people in 2000/2001 (Table 1.2.1). Since 1991, population migration has seen the populations of Shetland and Orkney decline, in contrast to the general situation in Scotland. The population density of the SEA 4 area is much lower than the general figure for Scotland.

<b>Council area</b>	<b>1991</b>	<b>2001</b>	<b>% Change</b>	<b>Area (km<sup>2</sup>)</b>	<b>Density (persons/km<sup>2</sup>)</b>
Shetland	22,522	21,988	-2.37	1,466.5	15
Orkney	19,612	19,245	-1.87	990	19
Highland	204,004	208,914	2.41	25,659	8
Caithness and Sutherland <sup>1</sup>	-	18,388 <sup>1</sup>	-	942 <sup>1</sup>	19 <sup>1</sup>
<b>Scotland</b>	<b>4,998,567</b>	<b>5,062,011</b>	<b>1.27</b>	<b>77,924.5</b>	<b>65</b>

Note: <sup>1</sup>2000 figures (Source: Scottish Coastal Socio-Economic Scoping study (2002))

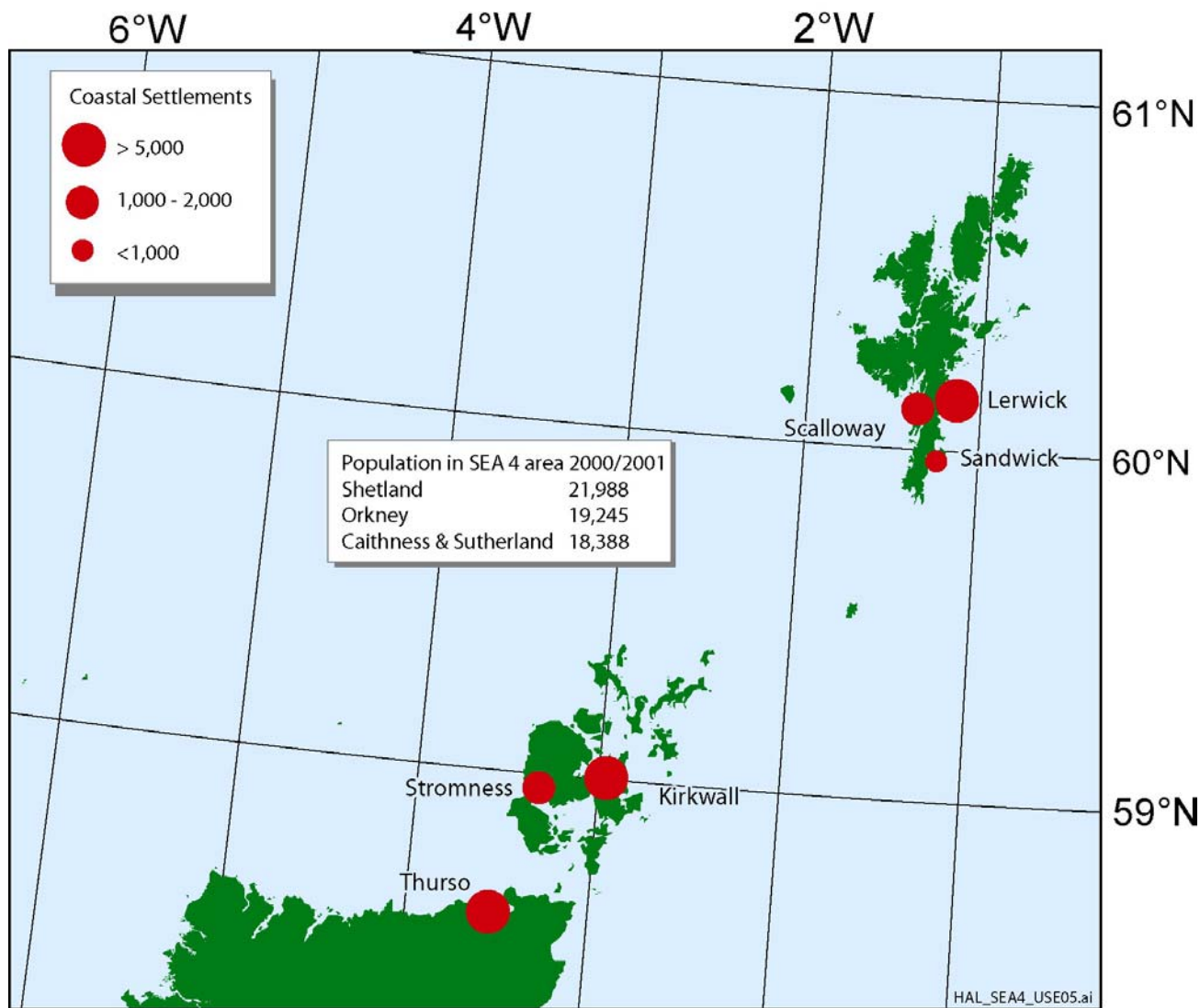
#### Coastal settlements

The coasts of the SEA 4 region are generally rural in nature with a number of relatively small settlements (Table 1.2.2 and Figure 1.2.1). Of these, Lerwick is home to over 33% of the Shetland population. Similarly, Kirkwall is the major population centre on Orkney, supporting 31% of the islands' population. Thurso is the largest settlement on the north coast of Scotland.

<b>SEA 4 region</b>	<b>Settlement</b>	<b>Population</b>
Shetland	Lerwick	7,270
	Scalloway	1,140
	Sandwick	790
Orkney	Kirkwall	6,130
	Stromness	1,850

Table 1.2.2 – Major settlements in the SEA 4 area		
SEA 4 region	Settlement	Population
North coast of Scotland	Thurso	7,880

Figure 1.2.1 – Major settlements in the SEA 4 area



## Socio-economic profile

### Age structure

The age structure of the population within the SEA 4 area is similar to Scotland as a whole (Table 1.2.3). Orkney and the Highlands have a smaller proportion of people aged between 16-30 and the average age of the population is slightly older than for either Shetland or Scotland as a whole.



**Table 1.2.3 – Age structure of the population in the SEA 4 area, 2001**

Council area	Population	Percentage of people aged				Mean age
		0-16	16-30	30-65	>65	
Shetland	21,988	21.9	18.1	48	14	38
Orkney	19,245	19.9	13.7	49.6	16.7	40
Highland	208,914	19.6	14.6	49.1	16.6	40
<b>Scotland</b>	<b>5,062,011</b>	<b>19.2</b>	<b>17.5</b>	<b>47.4</b>	<b>15.9</b>	<b>38</b>

## Economic activity

Table 1.2.4 describes the status of those people within the SEA 4 area who are economically active and inactive (refers to those who are retired, students, looking after home/family, permanently sick/disabled). It is clear that there are more self-employed people within the SEA 4 area than Scotland in general. Unemployment is slightly lower in both Shetland and Orkney and there are also fewer economically inactive people.

**Table 1.2.4 – Economic activity in the SEA 4 area, 2001**

SEA 4 region	All people aged 16-74	Percentage of economically active people aged 16-74					Economically inactive
		Employees		Self-employed	Un-employed	Full-time student	
		Part-time	Full-time				
Shetland	15,698	15.1	45.1	10.6	2.4	1.9	24.9
Orkney	13,912	13.7	35.9	16.4	3	1.9	29.1
Highland	152,684	12.9	38.9	10.2	4.3	1.8	31.9
<b>Scotland</b>	<b>3,731,079</b>	<b>11.1</b>	<b>40.3</b>	<b>6.6</b>	<b>4</b>	<b>3</b>	<b>35</b>

## Industry of employment

In Shetland, the main sources of economic activity are from fisheries (capture and processing), aquaculture (combined fisheries and aquaculture industries valued at £139 million in 1999), and oil-related activities (worth £53.7 million in 1999). The three other key sectors in 1999 were tourism (£14.4 million), agriculture (£11.8 million) and knitwear (£4.9 million).

The Orkney economy has had a traditional reliance on agriculture and fishing. However, over the last 20 years there has been a growth in employment in a number of economic sectors including manufacturing and tourism and more recently, food processing.

In Caithness and Sutherland, tourism is an important industry, employing over 2,000 people (14% of all employment in the area). Other locally important industries include fishing, construction and the ongoing decommissioning programme for Dounreay.

Table 1.2.5 highlights the main industries of employment in the SEA 4 area. It is clear that agriculture employment is more important on Orkney than in other areas of the SEA 4 region, as well as in Scotland. There is also a higher proportion of the working population employed in the fishing industry within the SEA 4 area than in Scotland as a whole.

**Table 1.2.5 – Industry of employment in the SEA 4 area, 2001**

SEA 4 region	All people aged 16-74 in employment	Percentage of people aged 16-74 in employment working in							
		Agriculture	Fishing	Manu- facturing	Con- struction	Wholesale & retail trade, repair of vehicles	Hotels and catering	Business activities	Health and social work
Shetland	11,380	2.6	5.5	9.5	9.5	12.4	5.7	8.7	11.9
Orkney	9,420	10.4	3.4	7.8	10	13.7	5.6	6.6	11.6
Highland	97,190	3.7	1.5	9.1	9.2	14.7	9.3	9.9	12.4
<b>Scotland</b>	<b>2,261,281</b>	<b>2.1</b>	<b>0.3</b>	<b>13.2</b>	<b>7.5</b>	<b>14.4.</b>	<b>5.7</b>	<b>11.2</b>	<b>12.4</b>

### Occupation groups

Industry employees within the SEA 4 area occupy a range of occupational groups (Table 1.2.6). From the table, it is clear that a lower percentage of people are employed as managers or in professional occupations than the Scottish average. The most marked difference between the SEA 4 area and Scotland, as a whole, is the higher proportion of people employed in skilled trades occupations.

**Table 1.2.6 – Occupation groups in the SEA 4 area, 2001**

SEA 4 region	Managers & Professional	Percentage of people aged 16-74 in employment working as						
		Associate professional and technical	Admin and secretarial	Skilled trades	Personal service	Sales and customer service	Process, plant & machine operatives	Elementary
Shetland	19	12.7	9.6	18.8	8	5.7	10.9	15.4
Orkney	17.9	10.9	8.7	22.9	8.5	6.6	9.6	14.9
Highland	21.6	12.7	10.5	16.5	8.2	8	9	13.4
<b>Scotland</b>	<b>23</b>	<b>14</b>	<b>12.7</b>	<b>12.2</b>	<b>7.1</b>	<b>8.6</b>	<b>9.7</b>	<b>12.7</b>

### 1.2.3 Main issues affecting SEA 4 area

In 2002, the University of Aberdeen compiled information relating to the main socio-economic issues that affect coastal populations in Scotland, to inform the production of a national strategy on Integrated Coastal Zone Management (ICZM).

The produced report *Scottish Coastal Socio-Economic Scoping Study* described a number of key socio-economic characteristics of the Scottish coastal area:

- It is an area of significant economic activity – fishing, aquaculture, oil and gas activity, port activity
- It possesses a mixed sectoral economic activity although areas such as Orkney, display reliance upon crafts, trades and manual labour
- There has been a decline in the number of registered unemployed people
- Coastal areas have relatively low income levels
- Coastal populations, along with Scotland as a whole, are predicted to experience a population decline
- Coastal populations are significantly aged
- Pockets of population movement, Orkney and Shetland being among the most fluid areas

Some, or all of these issues, apply to the coastal zone of SEA 4. The report concluded that, in general, the main changes of significance in the coastal area relate to the declining significance of the primary sector; the growth of flexible labour markets; the increase in the age of the population; migration, and peripherality.

### 1.2.4 Relevance for SEA 4

Given the economic importance of the oil and gas industry to many of the communities in the SEA 4 area, licensing of the SEA 4 area, although not predicted to result in significant levels of production may prolong the economic feasibility of the industry in the area.

#### **Sources of information**

Scotland's Census 2001 website

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

Scottish Coastal Socio-Economic Scoping Study (2002). Scottish Executive Social Research group

Orkney Enterprise website

<http://www.hie.co.uk/orkney/economy.html>

Caithness and Sutherland Enterprise website

<http://www.hie.co.uk/case/employment.html>

Shetland Enterprise website

<http://www.hie.co.uk/shetland/welcome.asp.locid-she.htm>

Shetland in Statistics 2001

<http://www.shetland.gov.uk/stats/statsframe.htm>

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## 1.3 Commercial fishing

### 1.3.1 Introduction

Fishing is an important industry in the SEA 4 area in terms of employment and economic revenue. Many of the rural coastal communities rely on small-scale, coastal fishing whilst larger ports in the region, service a sizable offshore fishing fleet (see Section 1.5 - Ports and Shipping for details).

This section provides an overview of the main fisheries in the region as well as details of the main management issues that impinge upon the fishery. The mixed demersal fishery primarily for cod, haddock and whiting is one of the most important fisheries in the area. *Nephrops* trawling and scallop dredging provide a high value catch, and the pelagic fishery primarily targets migrating herring and mackerel.

A number of closed areas are in operation within the SEA 4 area and the recently announced reforms of the Common Fisheries Policy may have particularly far-reaching consequences for fisheries in the region.

Much of the information in this section is taken from the underpinning report on fish and fisheries in the SEA 4 area ([http://www.offshore-sea.org.uk/sea/dev/html\\_file/udsea4\\_fisheries.php](http://www.offshore-sea.org.uk/sea/dev/html_file/udsea4_fisheries.php)), which should be consulted for further details.

### 1.3.2 Activity in the SEA 4 area

#### Demersal fishery

##### Mixed fishery targeting cod, haddock and whiting

This fishery is carried out on the continental shelf by bottom (otter) trawlers and seine netters and is one of the most important fisheries in the SEA 4 area. Although the greatest fishing effort lies to the east of Shetland there is also fishing to the west of the islands throughout the year. The anglerfish (monkfish) is a major by-catch of this fishery. There has also been a trend towards targeting anglerfish using specialised bottom trawls and by fishing in deeper water.

##### Deeper-water fisheries

The trawl fishery for saithe takes place in the deeper water along the shelf edge and upper slope. Anglerfish are also targeted in this area. In recent years a deep-water fishery for Greenland halibut has also developed in the transition zone between the warmer Atlantic and colder Norwegian Sea waters. Below the transition zone (c. 700m) there are no commercial fisheries and it is unlikely that any will develop due to the low fish biomass. There is no equivalent in the SEA 4 area to the deep-water fisheries that have been developed to the west of the Hebrides.

##### *Nephrops* trawl fishery.

The bottom trawl fishery for *Nephrops* (Norway lobster) takes place throughout the year and in areas of muddy seabed. The most important location in SEA 4 is in an area to the west of Orkney called the Noup.

##### Beam trawl

Beam trawling is of relatively minor importance in the SEA 4 area compared with the central and southern North Sea. This is in part due to the availability of suitable fishing grounds and might also be related to the Shetland Box (see below) which excludes or limits vessels of some of the countries that dominate this type of fishing.

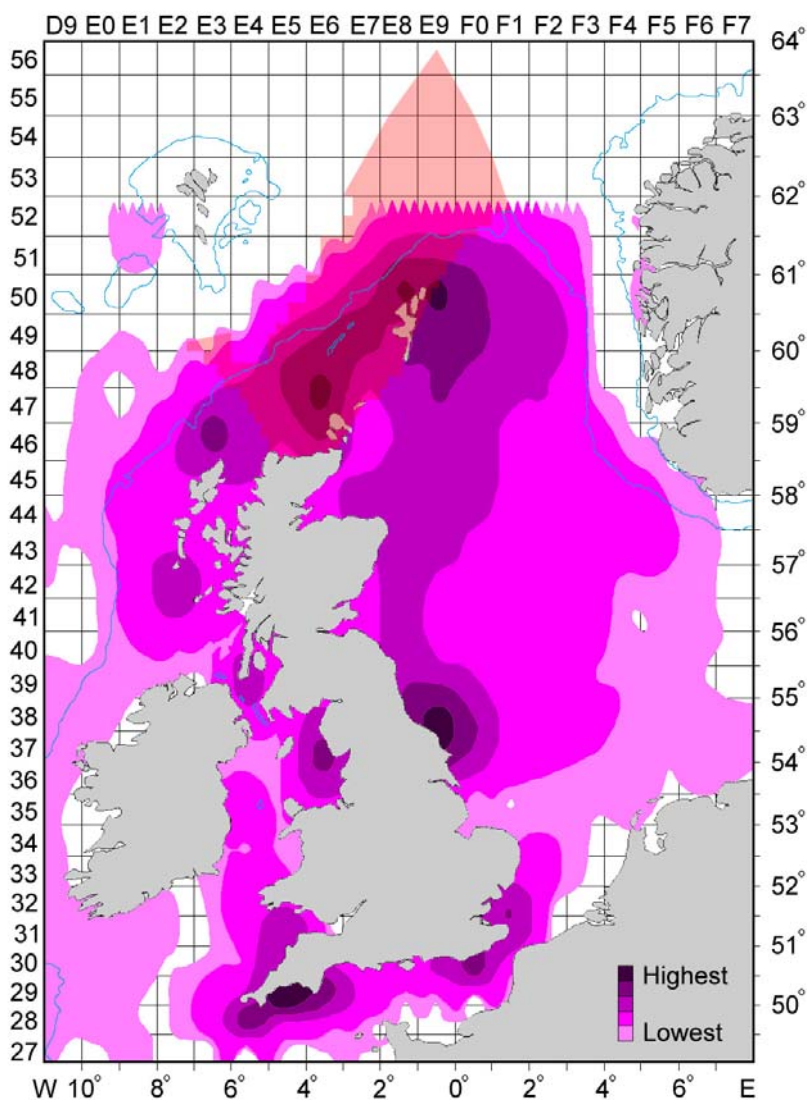
### Scallop dredging

Dredging for scallops (*Pecten maximus*) is an important fishery where there is a suitable seabed of sand and gravel. There are important scallop grounds around both Orkney and Shetland, especially to the north and west of Shetland. The vessels engaged in this fishery range greatly in size and this determines the size and number of the toothed dredges that can be towed. Most fisheries are relatively close inshore. There are also small fisheries for queen scallops.

### Fishing effort

Figure 1.3.1 highlights the demersal (excluding beam trawls) fishing effort by UK vessels. The effort is high over the whole continental shelf area of SEA 4 and is particularly high in areas northwest of Orkney and north of Shetland.

Figure 1.3.1 – Demersal fishing effort by UK vessels



Source: Gordon et al. (2003)

## Pelagic fisheries

The pelagic fisheries are much more international than those for demersal species and they tend to be prosecuted by larger vessels using purse seine and both single and paired boat mid-water trawling. The two largest fisheries, for herring and mackerel, are seasonal. The herring fishery takes place during the summer and autumn. The mackerel migrates northwards through the area in the early part of the year and southwards during the winter. The main mackerel fishery focuses on the winter migration.

## Industrial fisheries

There has been a rapid expansion of the blue whiting fishery in the North East Atlantic and catches reached 1.7 million tonnes in 2001. The fishery targets spawning and juvenile fish along the upper continental slope.

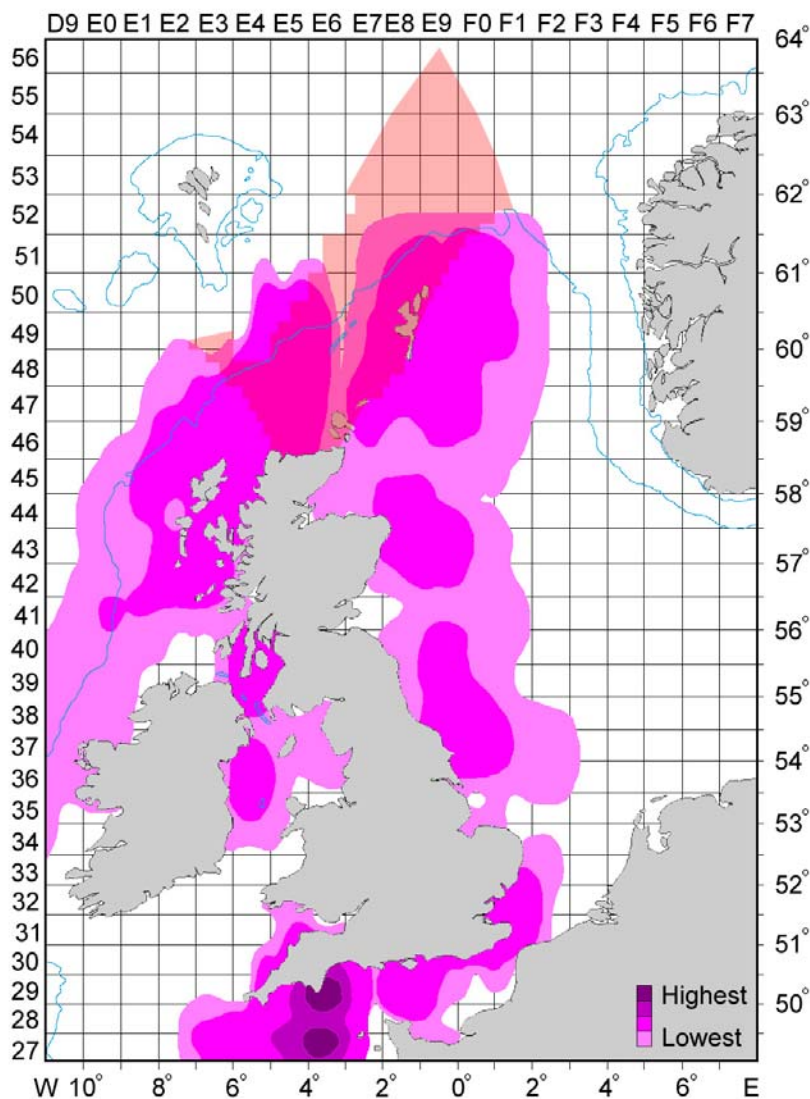
The Norway pout fishery is mainly by Danish and Norwegian vessels and has declined in recent years. The Norway pout box prohibits fishing in areas around Shetland and Orkney.

The sandeel fishery was completely closed between 1991 and 1994 following a decline in recruitment and poor breeding success of sandeel-dependent seabirds. Since 1995 the number of vessels licensed to fish has been limited and the fishery is closed during June and July.

## Fishing effort

The pelagic fishing effort is shown in Figure 1.3.2. It is moderate throughout much of the SEA 4 area. The apparent division into two areas of greater effort is most likely an artefact of misreporting of pelagic catches between ICES Sub-areas IV and VI when quotas become restrictive (see the underpinning fish and fisheries report for details).

Figure 1.3.2 – Pelagic fishing effort by UK vessels



Source: Gordon et al. (2003)

## Static gear fisheries

### Longline fishery for ling and tusk

The Norwegian offshore longline fishery has a long history dating back to the 16th century. The boom in this fleet was in the 1980s when prices for ling and tusk were high. The fleet is mechanised and became more efficient with the introduction of the autoline system in the 1970s. This system automatically baits the hooks and shoots and hauls the lines. The fishery for ling and tusk extends from the continental shelf of Norway, off the Shetlands, the Hebrides, Ireland, the Faroes and the Rockall Bank.

### Inshore creel fisheries

These fisheries target a variety of shellfish. Lobster stocks around Shetland are severely depleted and effort has transferred to other species such as brown, velvet and green crabs.



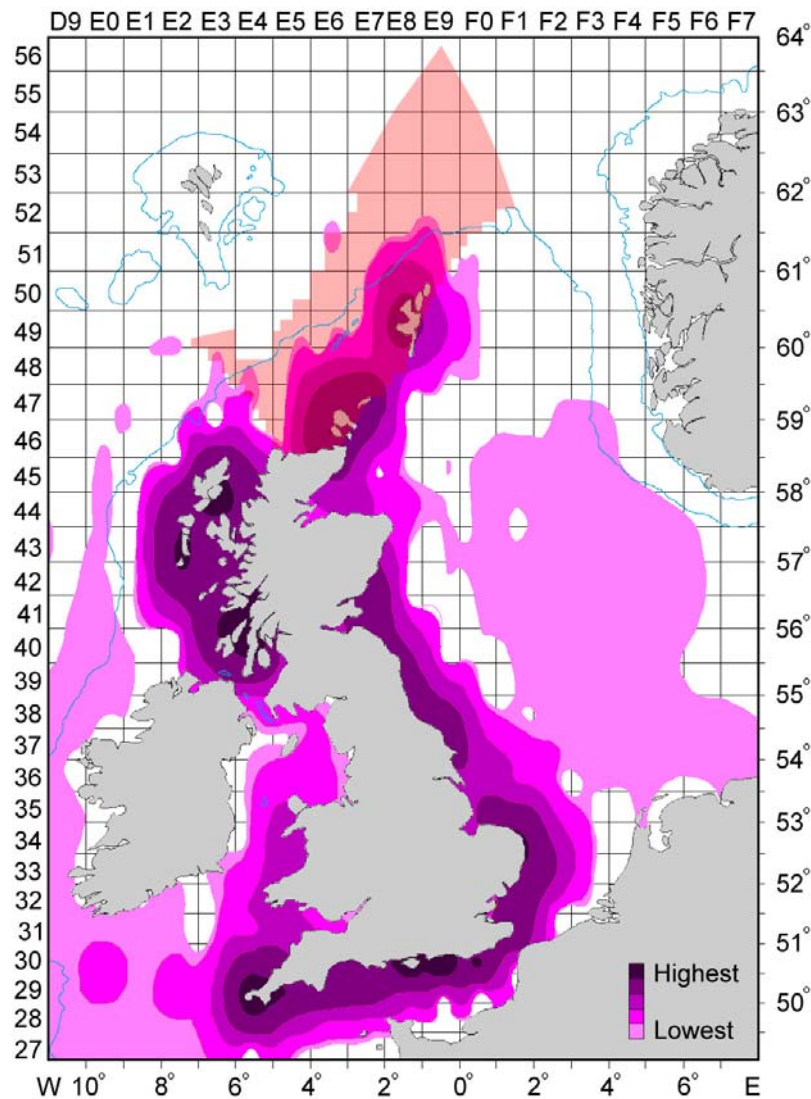
## Gill net fishery

There is a small gill net fishery for anglerfish around Shetland.

## Fishing effort

The total fishing effort by static gear is high around both Orkney and Shetland (Figure 1.3.3).

*Figure 1.3.3 – Static gear fishing effort*



Source: Gordon et al. (2003)

Note: Static gear fishing effort includes longline, bottom-set gill net and creel fisheries

## 1.3.3 Main issues and management initiatives

### Closed areas

#### Shetland Box

The Shetland Box (Figure 1.3.4a) was established in 1983 to protect commercially important local fisheries. It restricts the number of vessels of 26m and over in length that fish for demersal species

(excluding Norway pout and blue whiting). Four countries, Belgium, France, Germany and the United Kingdom, have an allocation of vessels that are licensed to fish within the box. The activities of vessels of less than 26m are unimpaired by the existence of the box.

### Norway pout

The extent of the Norway pout box is shown in Figure 1.3.4b. The aim of the box is to protect juvenile haddock and whiting by prohibiting fishing with small mesh trawls for Norway pout.

### Sandeels

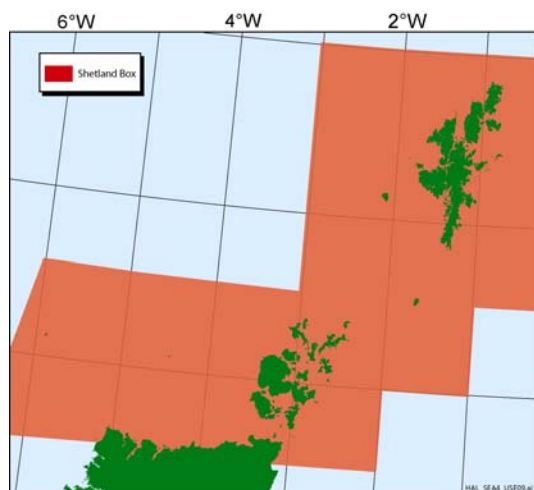
The sandeels around Shetland are managed as a separate unit. The fishery was completely closed between 1991 and 1994 following a decline in recruitment and poor breeding success of sandeel dependent seabirds. Since 1995 a restricted fishery has been allowed. The number of vessels licensed to fish is limited and the fishery is closed during the months of June and July.

### Cod closed areas

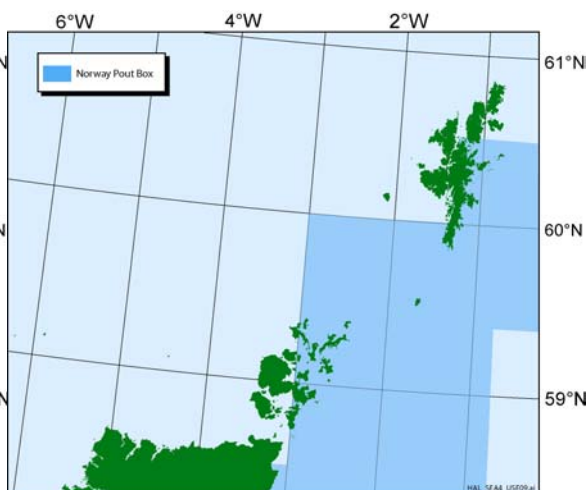
Following the advice that both North Sea and West of Scotland cod stocks were in an imminent state of collapse the European Commission introduced emergency measures to protect the spawning stocks of cod in both areas. These included the closure of cod spawning areas to all vessels using fishing gears likely to catch cod and technical measures for vessels engaged in pelagic and sandeel fishing to ensure that they do not endanger cod recovery. A large part of the SEA 4 shelf was temporally closed from mid-February to the end of April 2001 and these closures continue on an annual basis as part of a wider cod recovery plan. The North Sea and West of Scotland closed areas are highlighted on Figure 1.3.4c.

Figure 1.3.4 – Fisheries management in the SEA 4 area

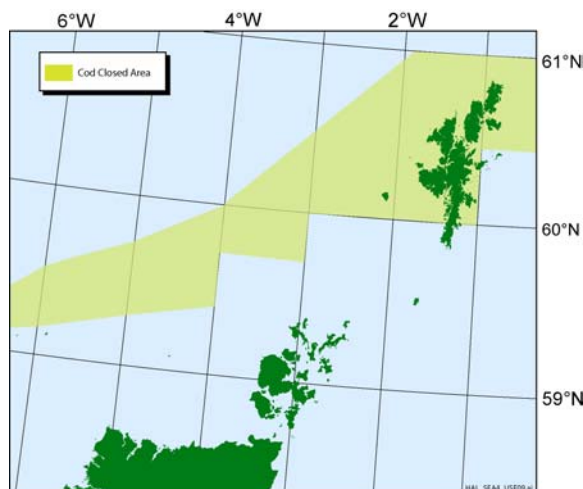
a) Shetland Box



b) Norway Pout Box



### c) Cod Closed Areas



### Regulatory Orders

The inshore fisheries for shellfish around Shetland are managed by the Shetland Shellfish Management Organisation. It was established under Scottish Statutory Instrument 1999 No. 194, The Shetland Islands Regulated Fishery (Scotland) Order 1999. This gives the organisation the right to regulate the fisheries for oysters, mussels, clams, lobsters, scallops, queens, crabs, whelks and razorshells for a period of 10 years from 31 January 2000. The *Nephrops* fisheries are not included in the order.

The management area is from low-water springs to six miles from the coast. Before the order came into place there was no effective management of these fisheries, which were a valuable asset to the large number of small vessels, that fish around the islands. At the present time, management is essentially by effort control such as licensing of vessels, limitations on the size of vessel and on the types of fishing gear and their size. Discussions are in progress to enable similar regulation for Orkney and the Highland Region.

### Review of Common Fisheries Policy

In December 2002, the European Commission Agriculture and Fisheries Council agreed to significant reforms of the Common Fisheries Policy (CFP). The new measures entered into force on 1 January 2003 and replace the basic rules governing the CFP since 1993. In general terms, the reforms include:

- The setting of multi-annual recovery plans for stocks outside safe biological limits and of multi-annual management plans for other stocks
- Temporary recovery measures for cod and associated species which include fishing effort limitations (Table 1.3.1)
- A range of measures for limiting the fishing capacity of the EU fleet
- A package of aid measures for fishermen who have to stop fishing

**Table 1.3.1 – Fishing effort limitations in the North Sea and west of Scotland**

Gear	Days out of port per month	
	North Sea	West of Scotland
Demersal trawls, seines or similar towed gears of mesh size equal to or greater than 100mm except for beam trawls	9	9
Beam trawls of mesh size equal to or greater than 80mm	15	15
Static demersal nets including gill nets, trammel nets and tangle	16	16

<b>Table 1.3.1 – Fishing effort limitations in the North Sea and west of Scotland</b>		
nets		
Demersal long lines	19	19
Demersal trawls, seines or similar towed gear of mesh size between 70mm and 99mm except beam trawls	25	25
Demersal trawls, seines or similar towed gear of mesh size between 16mm and 31mm except beam trawls	23	23

Further details of the CFP reforms can be found on the European Commission Fisheries website ([http://europa.eu.int/comm/fisheries/reform/index\\_en.htm](http://europa.eu.int/comm/fisheries/reform/index_en.htm)).

### **1.3.4 Relevance for SEA 4**

The limited exploration and production predicted as a result of licensing of the SEA 4 area is unlikely to significantly interfere with commercial fishing operations in the area. The use of ‘fisher-friendly’ subsea structures and consultation with the fishing industry throughout the development process will help to minimise interference.

#### **Sources of information**

European Commission Fisheries website

[http://europa.eu.int/comm/fisheries/reform/index\\_en.htm](http://europa.eu.int/comm/fisheries/reform/index_en.htm)

Gordon JDM (2003). Fish and fisheries in the SEA 4 area. Report to the DTI. Scottish Association of Marine Science

[http://www.offshore-sea.org.uk/sea/dev/html\\_file/udsea4\\_fisheries.php](http://www.offshore-sea.org.uk/sea/dev/html_file/udsea4_fisheries.php)

## 1.4 Fisheries for migratory species

### 1.4.1 Introduction

Salmon and sea trout are anadromous species that migrate from the sea to breed in freshwater. In Scotland, the fisheries for these species are of both commercial and recreational importance, with the most significant fisheries principally taking place out-with the SEA 4 area. Scotland's north coast supports a moderate salmon fishery, in contrast to the small rod and line catch fishery present in Shetland.

Both species are subject to a number of environmental pressures, and declines in fish numbers have led to increased concerns over fish stocks. In an effort to halt declines and improve stocks, a range of international, European and national legislation has been introduced, in addition to the implementation of a range of management initiatives.

Further information relating to the biology and migratory movements of salmon and sea trout 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](http://www.offshore-sea.org.uk/sea/dev/media_file/sea3_postconsult.pdf)).

### 1.4.2 Activity in the SEA 4 area

#### Salmon and sea trout

Scotland supports some of the most important commercial and recreational salmon fisheries in the world, with Scottish salmon and sea trout fisheries falling into one of three broad categories:

- Fixed engine fisheries largely operate in coastal waters, employing bag nets, stake nets, jumper nets, poke nets and haaf nets
- Net & Coble fisheries are beach seine operations, generally restricted to estuaries and lower reaches of rivers
- Rod & Line fisheries generally take place within river systems and covers recreational angling

Both netting and rod and line fisheries support employment in rural communities, either directly through employment in the fishing industry, or indirectly, through association with support industries. In 2000, the estimated value of rod and line fishing in Scotland was in the range £315-£478 million.

Shetland supports a small rod and line fishery for salmon and sea trout from the sea lochs in the region including the Loch of Spiggie, Loch of Cliff and Loch of Strom. No net methods are used. There are no recorded landings of salmon or sea trout within the Orkney region, although populations of sea trout are present in the Loch of Stenness. The north coast of Scotland supports a moderate salmon and sea trout fishery (Table 1.4.1).

<b>Table 1.4.1 - Numbers of wild salmon, grilse<sup>1</sup> and sea trout caught and retained in salmon fishery regions 2001</b>			
	<b>Salmon (annual<sup>2</sup>)</b>	<b>Grilse</b>	<b>Sea trout</b>
<b>Shetland</b>			
Rod and line	-	-	144
<b>Orkney</b>	-	-	-
<b>North</b>			
Rod and line	2,722	2,484	1,045
Net and coble	309	490	9

**Table 1.4.1 - Numbers of wild salmon, grilse<sup>1</sup> and sea trout caught and retained in salmon fishery regions 2001**

	Salmon (annual <sup>2</sup> )	Grilse	Sea trout
Fixed engine	1,257	3,392	21
<b>All Scotland</b>			
Rod and line	26,045	18,552	21,059
Net and coble	2,021	5,212	5,188
Fixed engine	6,577	18,464	5,267

Note: <sup>1</sup>Grilse – salmon that spend only one winter at sea before returning to their natal rivers. <sup>2</sup>Annual figures include spring salmon (multi-winter, taken before 1<sup>st</sup> May) & summer salmon (multi-winter taken after 30<sup>th</sup> April)

Salmon are not abundant in Shetland and Orkney as there is a shortage of large rivers where they can spawn. There are a number of main rivers in the north of Scotland that contain salmon and sea trout populations and support fisheries (Table 1.4.2).

**Table 1.4.2 - Numbers of wild salmon, grilse and sea trout caught and retained in salmon fishery districts on the north coast of Scotland 2001**

	Salmon (annual <sup>1</sup> )	Grilse	Sea trout
<b>North</b>			
Thurso and Forss	1,021	201	-
Halladale and Strathy	1,238	3,161	27
Naver and Kinloch	228	359	16
Hope and Grudie	37	80	1045
<b>North total</b>	<b>4,288</b>	<b>6,366</b>	<b>1,075</b>
<b>Scottish total<sup>2</sup></b>	<b>34,643</b>	<b>42,228</b>	<b>31,514</b>

Note: <sup>1</sup>Annual figure includes spring salmon (multi-winter, taken before 1<sup>st</sup> may) & summer salmon (multi-winter taken after 30<sup>th</sup> April). <sup>2</sup>The total for 11 regions (62 districts)

The Halladale is a highland spate river which runs north for 22 miles entering the Pentland Firth at Melvich Bay, while the River Strathy enters the Firth at Strathy Bay. The rivers Halladale and Strathy were the most important rivers on the north coast in terms of salmon (1,238 fish) and grilse (3,161 fish) catches in 2001, with the Hope and Grudie rivers the most important for sea trout (1,045 fish).

The river Thurso enters the Pentland Firth at the town of Thurso. The river with its cooler ambient water temperature, supports a larger proportion of multi-sea winter salmon than that found in rivers further south in the species' range and in 2001, 1,021 salmon were caught and retained in the area.

With its major tributary, the Mallart, the river Naver flows from a large peatland catchment and supports a high quality salmon population. Grilse, spring and summer salmon are all present in this river system and the annual catch for salmon in 2001 amounted to 228 fish, with an additional 359 grilse caught in the same year.

## Other fish species

Eels are found in river systems throughout the SEA 4 area. However, the eel fishery in Scotland is on a small scale and targets elvers, yellow eels and silver eels, with the elver fishery primarily for export to mainland Europe. In general, yellow eels are caught during summer, while silver eels are caught in autumn on their downstream migration. There are no records of commercial eel catches within the SEA 4 area.

There are records of nationally and internationally protected marine and estuarine fish species within the SEA 4 area although these are limited in number. The Shetland region has records of species including allis shad (*Alosa alosa*), twaite shad (*Alosa fallax*), sturgeon (*Acipenser sturio*) and sea lamprey (*Petromyzon marinus*). Orkney has individual records of sea lamprey and sturgeon. Individual records of sturgeon have also been recorded off the north coast of Scotland. However, the status of all these species in the SEA 4 area is not yet fully determined.

### 1.4.3 Management issues and initiatives

#### Salmon and sea trout

The Scottish Executive Environment and Rural Affairs Department (SEERAD) is responsible for assessing the status of Scottish salmon stocks.

The Fisheries Research Services (a SEERAD Executive Agency) 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.

To combat this decline a number of management initiatives have been introduced. SEPA currently monitor and classify the water quality of estuaries, part of which includes measurements of biological quality, of which the suitability for passage of migratory fish through the estuary is an important element. In 2001, SEPA classified 266.9km<sup>2</sup> of estuarine waters in the Highlands, Islands and Grampian area, of which almost 96% was classified as excellent, 3% good and 1% unsatisfactory. No areas were classified as seriously polluted.

The implementation of the Water Framework Directive (2000/60/EC) will also help to protect and restore the structure and function of aquatic ecosystems. Additional legislative protection has also been introduced to improve salmon and sea trout numbers.

Further details of the SEPA classification scheme and the Water Framework Directive can be found in Section 1.16.3.

#### Legislative protection

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.

The Habitats Directive (92/43/EEC) lists salmon as a species of community interest whose conservation requires the designation of Special Areas of Conservation. The importance of Scotland's north coast for salmon is reflected in the designation of several rivers as cSACs including the Rivers Thurso, Naver and Mallart.

The salmon fisheries in Scotland are protected by the Salmon Act 1986, as amended by the Salmon Conservation (Scotland) Act 2001. This contains provisions for the conservation and sustainable management of salmon and sea trout through regulating permissible methods and times during which fishing is permitted. Both species are protected by annual close seasons. Salmon is afforded

additional weekly close seasons outwith the annual close season. In addition, this statute regulates the introduction of non-native salmon and salmon eggs into salmon fishery districts. Under the provisions of the Salmon Act 1986, the definition of salmon also refers to sea trout.

There are moves by the Scottish Parliament to consolidate fishery protection measures, scattered through various different statutes, under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Bill. This Bill was passed on 26<sup>th</sup> of March 2003 and is awaiting Royal Assent.

## Additional protective initiatives

In Scotland, the management of the salmon fishery is entrusted to the District Salmon Fishery Boards, which have the authority to do such acts as they deem necessary to protect or improve salmon fisheries. These may include removal of obstructions to migration, controlling predatory seal and bird populations, controlling poaching and the management of local coastal net fisheries.

Additional measures encouraged by the District Salmon Fishery Boards, Fisheries Trusts and proprietors, is the practice of catch and release. In 2001, a total of 27,699 salmon and grilse were reported caught and released by the rod and line fishery, an increase of 31% from 2000.

### 1.4.4 Relevance for SEA 4

The timing and location of coastal movements into and out of rivers of salmon and sea trout is fairly well understood. Knowledge of the migration and geographic distribution of salmon in the North Sea is sparse although as post-smolts, their distribution appears to be related to the main surface currents. Given the migratory nature of salmon and sea trout and considering the projected location and scale of potential exploration and production activities, it is difficult to envisage that further licensing for oil and gas developments would have a detrimental effect on either species.

Within the SEA 4 area, records for allis shad, twaite shad, sturgeon, and sea lamprey are few in number suggesting that these species are rare. However, their status in the area, including population size and migratory routes has yet to be fully determined. Despite this, given the low numbers recorded in the SEA 4 area, it is unlikely that there would be any detrimental effects of licensing on these species.

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SEPA classification schemes

[http://www.sepa.org.uk/data/classification/classification\\_scheme\\_estuaries\\_and\\_coasts.htm](http://www.sepa.org.uk/data/classification/classification_scheme_estuaries_and_coasts.htm)

<http://www.sepa.org.uk/guidance/wfd/introduction.htm>



## 1.5 Ports and Shipping

### 1.5.1 Introduction

Shipping and maritime trade are key to the UK economy and it is estimated that around 95% of the UK's international trade by volume is transported by sea. Whilst many of the largest ports in the UK are situated on the eastern coast of the central and southern North Sea, there are a number of large ports in the SEA 4 area that form an important focus for shipping in the northern North Sea. The ports of Sullom Voe and the Flotta Terminal in Orkney handle much of the crude oil traffic in the northern part of the North Sea.

Fishing, whilst in general decline, still represents an important industry in the SEA 4 area with important coastal fishing ports, particularly in Shetland and also at Scrabster on the north coast of Caithness.

Together with the regular ferry services among and between the islands and the mainland, areas of SEA 4 can experience moderate shipping pressures. Since many of the vessels are involved in the transport of petroleum products, the risk of marine pollution has led to the designation of a number of exclusion zones for tanker traffic.

The sensitivity of the marine and coastal environment of SEA 4 is also reflected by the potential designation of a number of Marine Environment High Risk Areas (MEHRAs) designed to protect marine areas of high environmental sensitivity at risk from shipping (DETR 1999).

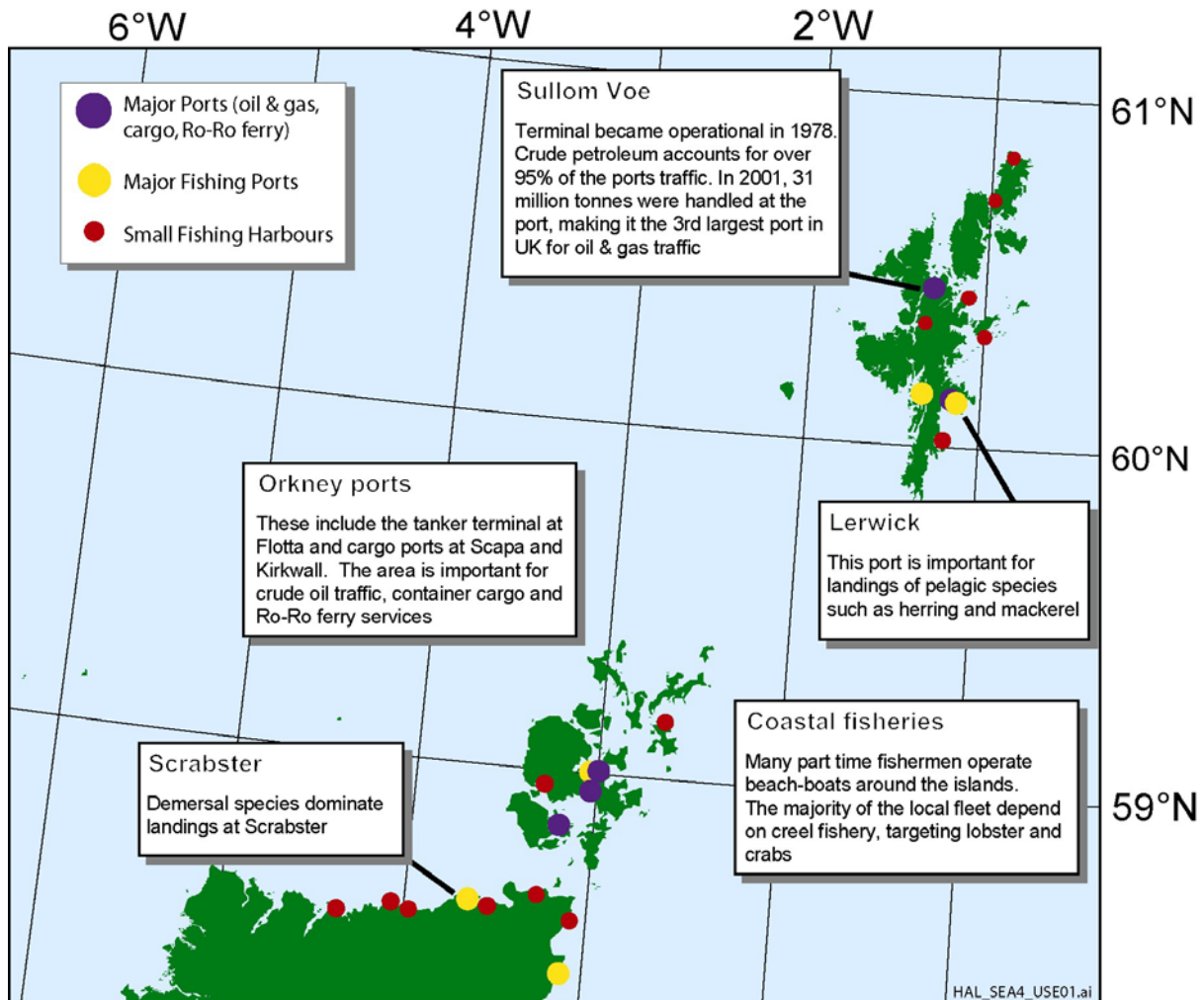
### 1.5.2 Activity in the SEA 4 area

#### Major ports

Shetland and Orkney have a number of ports that handle significant quantities of domestic and foreign traffic and these are described in Table 1.5.1 and highlighted on Figure 1.5.1. Almost all the tonnage is some type of oil product. There are no major ports in terms of commercial tonnage on the North coast of Scotland.

<b>Table 1.5.1 – Foreign and domestic traffic handled by ports in the SEA 4 region</b>				
<b>Map ref</b>	<b>SEA 4 ports</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
		<b>Million tonnes</b>		
1	Sullom Voe	37.68	38.20	31.17
2	Lerwick	0.49	0.52	0.98
3	Orkneys	16.70	22.80	18.41
	<b>All UK Traffic</b>	<b>565.6</b>	<b>573.1</b>	<b>566.4</b>

Figure 1.5.1 – Ports and harbours in the SEA 4 area



Sullom Voe in Shetland is one of the leading ports in the UK in terms of tonnage (31.0m tonnes in 2001) and was the third largest UK port for oil and gas traffic in 2001. Crude petroleum accounts for 99% of the port's total traffic. The Orkney ports include the tanker terminal facilities at Flotta in addition to general cargo ports at Scapa Flow and Kirkwall. Similarly, crude petroleum dominates port traffic into the Orkneys accounting for 98% of the total.

The potential for establishing a container transshipment port in Scapa Flow, to cater for container traffic between Northwest Europe and North America is currently being examined. The Scapa Container Port Steering Group, consisting of Highlands and Islands Enterprise, Orkney Islands Council, and Orkney Enterprise was set up in 2000 to promote the idea. A feasibility study has been completed and agreements have been signed with International Container Hub Ltd (ICHL) to take forward the development of a transshipment hub.

Further details about the proposed Scapa Flow container port can be found on the Orkney Container Transshipment Terminal website (<http://www.orkneycontainer.com/frameset.html>).

## Fishing ports

In 2001 the UK fleet landed a total of 458 thousand tonnes of sea fish (including shellfish), valued at £423.6 million into UK ports. Landings by the UK fleet into Scottish ports accounted for over 63% of

this total with demersal species representing 49% of the Scottish catch. Pelagic and shellfish species accounted for 33% and 18% of the Scottish catch respectively.

The Shetland and Orkney Islands and the north coast of Scotland contain a number of large fishing ports, which are listed in Table 1.5.2 and highlighted on Figure 1.5.1. Table 1.5.2 provides details of the total amount of demersal, pelagic, and shellfish species landed by the UK fleet into these ports in 2001. There are also a number of small fishing ports throughout the island groups and along the northern Scottish coast, which are shown on Figure 1.5.1.

Map ref	Fishing port	Demersal*		Pelagic*		Shellfish*	
4	Lerwick	17.6	(7.6)	35.4	(13.0)	0.2	(0.6)
5	Scalloway	2.5	(2.5)	-	-	0.1	-
6	Kirkwall	-	-	-	-	0.6	(0.9)
7	Scrabster	14.7	(17.3)	0.2	-	3.1	(4.2)
8	Wick	0.1	(0.1)	-	-	0.9	(1.0)
	<b>UK total</b>	<b>196</b>	<b>(218)</b>	<b>127</b>	<b>(38)</b>	<b>136</b>	<b>(167)</b>

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

Landings into the Shetland district in 2001 amounted to 59,141 tonnes (£27.3 million), representing over 20% of the Scottish landings by UK vessels. Of the fish landed, pelagic species accounted for 61% and included mackerel (23,894 tonnes) and herring (12,087 tonnes). Demersal species represented 38% and included blue whiting (10,213 tonnes), haddock (3,163 tonnes), and cod (2,262 tonnes). Shellfish species including scallops (194 tonnes), crabs (165 tonnes) and *Nephrops* (122 tonnes) accounted for just over 1% of the landings into the Shetland district.

## Principal ferry routes

The port of Aberdeen on the north east coast of Scotland is the main port that offers daily, year-round, Ro-Ro passenger services to Orkney, Shetland and the Faroes. There is also a ferry service from Scrabster (mainland Scotland) to Stromness (Orkney), as well as ferry links from Shetland to the Faroes and Norway. In 2001, 208,000 passengers travelled from the British mainland to the Orkney and Shetland Islands. There are a number of inter-island ferry services throughout the Orkney and Shetland Islands and these services provide important commuter and cargo links to and from the smaller islands as well as supporting the region's tourist industry.

## Ship arrivals

In the SEA 4 region, the largest ports are Sullom Voe, Lerwick, the Orkney ports, (Flotta, Scapa and Kirkwall) and Scrabster in Caithness. The numbers and types of vessels that visited these ports in 2001 are shown in Table 1.5.3.

Deadweight tonnes (x1,000)	Tankers			Ro-Ro vessels		Container vessels		Other dry cargo vessels		
	1-20	20-100	100+	1-20	20+	1-20	1-5	5-20	20-100	100+
Sullom Voe	22	105	220	-	-	-	47	-	7	18
Lerwick	107	-	-	469	-	38	330	12	1	-
Orkneys	100	113	87	938	-	35	130	-	1	8

**Table 1.5.3 – Ship arrivals at major ports in the region, by type and deadweight 2001**

Deadweight tonnes (x1,000)	Tankers			Ro-Ro vessels		Container vessels	Other dry cargo vessels			
	1-20	20- 100	100+	1-20	20+	1-20	1-5	5-20	20- 100	100+
Scrabster	13	-	-	700	-	-	13	-	-	-
<b>All UK ports</b>	<b>19,004</b>	<b>2,411</b>	<b>1,097</b>	<b>87,406</b>	<b>149</b>	<b>4,336</b>	<b>29,571</b>	<b>5,317</b>	<b>1,987</b>	<b>302</b>

In 2001, Sullom Voe was visited by 419 vessels, of which the majority were tankers. The port received over 20% of the UK's total number of large tankers (>100,000 tonnes). Ro-Ro vessels (1-20 tonnes) and tankers (20-100 tonnes) were the dominant vessel types visiting the Orkney Islands. Scrabster also received a relatively large number of Ro-Ro vessels (1-20 tonnes).

## Shipping density

For the purpose of this report, shipping density and routeing information has come from the DETR *Identification of Marine Environment High Risk Areas in the UK, 1999* consultation document. This document has utilised information regarding ship routeing and density in UK waters from the COAST database. Developed and maintained by Safetec, the main data sources used to compile the database are summarised in Table 1.5.4. The database provides a general indication of shipping density rather than an authoritative assessment of actual vessel numbers.

**Table 1.5.4 - Sources of shipping data for the COAST database**

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

The strategic nature of this report means that ship routeing and density within the SEA 4 area are described in a rather broad and general manner (Figure 1.5.2). However, the COAST database can provide information on a project-specific basis.

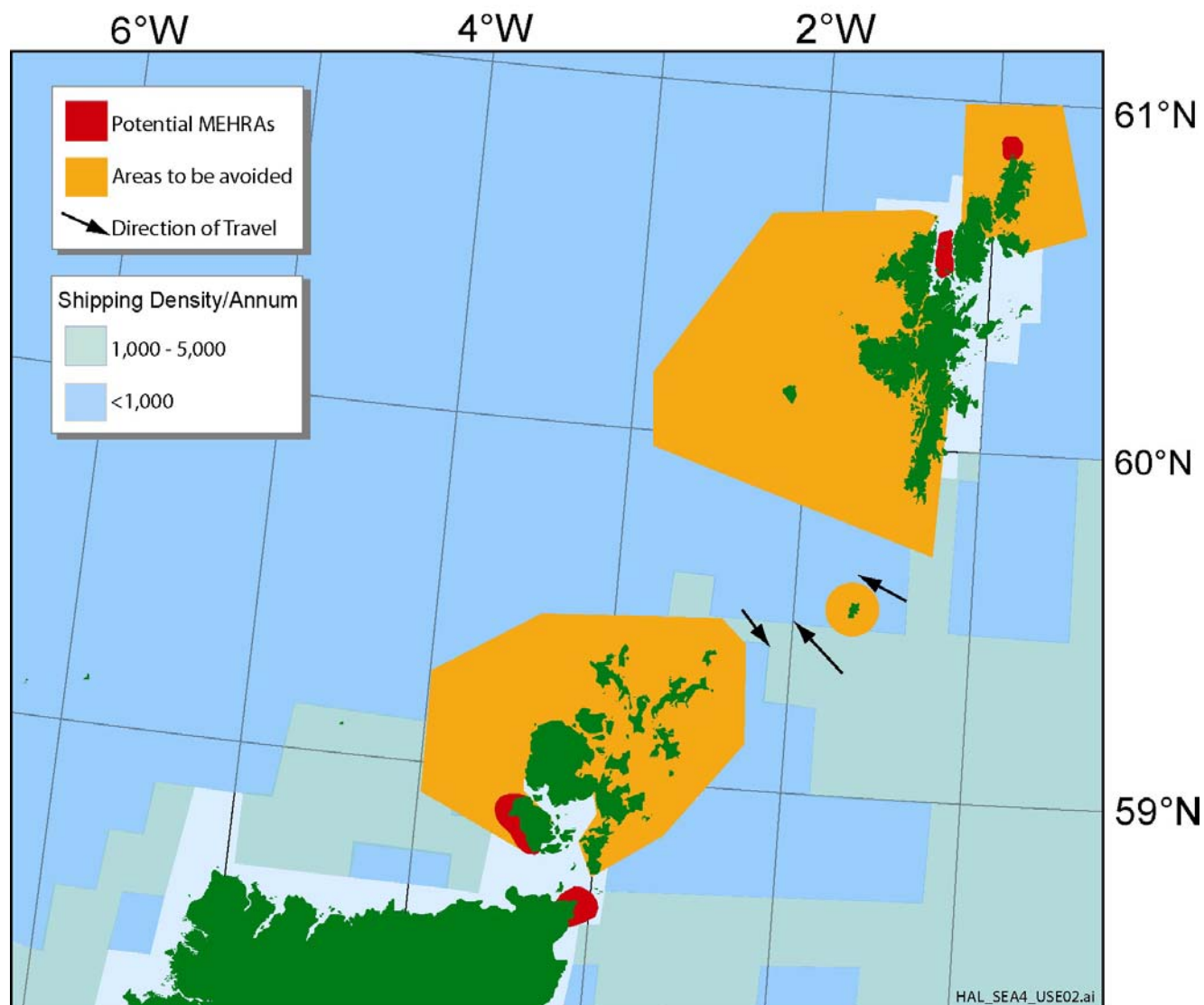
Nearshore areas of SEA 4, particularly around the Pentland Firth, Fair Isle Channel and the larger coastal ports, experience moderate shipping densities of between 1,000-5000 vessels<sup>1</sup> per annum. Further offshore, the region experiences lower shipping pressure equivalent to 1,000 vessels or less per annum (Figure 1.5.2).

Shipping activity on the west coast of Scotland includes transit traffic to and from Sullom Voe and Flotta to terminals in the Irish Sea, with east of Scotland shipping dominated by the North Sea oil industry. Shipping traffic flows from Northern Europe and funnels through the Pentland Firth and the Fair Isle Channel. The movement of bulk cargoes between the UK mainland and the Orkney and

<sup>1</sup> Vessel types in the COAST database include; bulk carriers (containerships, cement, ore, woodchip, oil and ore carriers), cargo (general, multipurpose, refrigerated, livestock and containership), ferry, liquefied gas tanker, RO/RO (containerships, vehicle, carrier and passenger), standby vessels, supply vessels, chemical tankers, oil tankers and shuttle tanker. The vessels are categorised according to size; under 2,000; 2,000 to 5,000; 5,000 to 20,000; 20,000 to 50,000, and over 50,000 dwt (Dead Weight Tonnage).

Shetland Islands and Europe as well as the ferry routes from Aberdeen to the island groups and Northern Europe represent the major shipping routes in the SEA 4 area.

Figure 1.5.2 –Shipping in the SEA 4 area



Note: MEHRA boundaries are shown as being offshore for illustrative purposes only.

### 1.5.3 Management issues and initiatives

One of the main issues relating to ports and shipping in the SEA 4 area is the environmental sensitivity of much of the coastal region and the risk of marine pollution from shipping activity.

Whilst the density of shipping throughout much of the SEA 4 area is relatively low (<1,000 vessels per annum), Sullom Voe forms a focus for oil and shuttle tanker traffic and shipping densities also increase through the Fair Isle and Pentland Firth Channels (1,000-5,000 vessels per annum).

A number of initiatives at national and international level are in preparation or in place to reduce the risk of marine pollution.

## Areas to be avoided

There are no traffic separation schemes operating in the SEA 4 area. However, there are a number of 'Areas To Be Avoided', which are designed to keep oil tanker traffic clear of sensitive coastlines (Figure 1.5.2). These include a single charted area that almost entirely encompasses the Orkney Islands, with a second area surrounding Fair Isle. There are also two charted areas around the Shetland Islands.

## Precautionary Areas

Precautionary Areas are established in the northern and south eastern approaches to Yell Sound and in the south east approaches to Lerwick. These are areas in which ships must navigate with particular caution in order to avoid the risk of oil pollution and severe damage to the environment (Marshall 1997).

## Marine Environment High Risk Areas (MEHRAs)

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

An interdepartmental 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 shortly 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 4 that have been highlighted as potential MEHRAs are identified in Table 1.5.5 and Figure 1.5.2.

**Table 1.5.5 - Potential location of MEHRA's in the SEA 4 area**

Muckle Flugga (north coast of Unst, Shetland)
West of Yell (Shetland)
West coast of Hoy (Pentland Firth, Orkney)
Duncansby Head (Pentland Firth, north coast of Scotland)

Both Flotta and Sullom Voe have well-developed procedures for passage to and from the terminals. Most of these arrangements e.g. inspection on approach by helicopter or fixed-wing aircraft using surveillance and video recording, were in place long before national or international requirements were articulated.

Oil spill contingency plans also exist and are reviewed regularly. Simulation exercises are also conducted at relatively frequent intervals. Sullom Voe has wild life response management structures and plans in place. SOTEAG advisors, the Terminal Operator (BP) and Ports and Harbours agencies and facilities, including tugs and oil pollution protection and clean-up equipment all exist in a state of readiness at Sella Ness adjacent to the oil loading jetties at Sullom Voe. If necessary these resources can be deployed island-wide at short notice. Extensive oil spill contingency planning along with equipment and infrastructure also exist at Scapa and Flotta terminals to deal with tier 1 and tier 2 spills. An environmental unit has been established by Orkney Islands Council to monitor the effects of the oil industry within the marine and land environment of Orkney (Pers. comm. Capt Nigel Mills, Director of Harbours, Orkney).

## International 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.

## Proposal for a Western European Waters PSSA

A number of European states including the United Kingdom submitted a proposal to the 49th session of the International Maritime Organisation Marine Environment Protection Committee (IMO MEPC) (July 2003) for an area of North Western European waters stretching from the Shetland Isles to Portugal to be designated as a Particularly Sensitive Sea Area (PSSA) (IMO website - <http://www.imo.org/home.asp>).

Guidelines on designating a PSSA are contained in resolution A.927(22) Guidelines for the Designation of Special Areas under MARPOL73/78 and Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas. A PSSA is defined by the 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.

There are currently six designated PSSAs: the Great Barrier Reef, Australia (designated a PSSA in 1990); the Sabana-Camagüey Archipelago in Cuba (1997); Malpelo Island, Colombia (2002); around the Florida Keys, United States (2002); the Wadden Sea, Denmark, Germany, Netherlands (2002); and Paracas National Reserve, Peru (2003).

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.

## National Contingency Plan

The Maritime and Coastguard Agency has put in place a new National Contingency Plan for dealing with pollution incidents, in consultation with the relevant government departments and other stakeholders. This 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.

### 1.5.4 Relevance for SEA 4

Shipping vessels play a key role in marine oil and gas exploration and production. A number of vessel types are utilised at different stages of the process including survey vessels, dive support vessels, pipeline laying barges, drilling ships and supply vessels. However, the low level of activity predicted following licensing of the SEA 4 area is unlikely to result in a significant increase in shipping density.

#### Sources of information

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Orkney Container Transhipment Terminal website

<http://www.orkneycontainer.com/frameset.html>

Orkney Islands Council website

<http://www.orkney.gov.uk/news/021>

Pers. comm. Capt Nigel Mills, Director of Harbours, Orkney

IMO website

<http://www.imo.org/home.asp>



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## 1.6 Mariculture

### 1.6.1 Introduction

Mariculture is the cultivation of marine species within coastal waters and can include shellfish farming, finfish farming and seaweed cultivation.

Farming for fin and shellfish species principally takes place along Scotland's western seaboard, with the Inner and Outer Hebrides and the Northern Isles providing the most favourable operational conditions. Shetland in particular, supports a large number of finfish and shellfish farming operations that provide important economic revenue to the islands.

The growth of mariculture, especially finfish farming in Scotland has led to increased concern over associated pollution levels in many of the sheltered areas that support fish farms. The Scottish Executive has introduced locational guidelines for fish farms in an effort to inform the planning process and avoid further pollution. Similarly, shellfish for human consumption must be harvested from classified production areas.

### 1.6.2 Activity in the SEA 4 area

#### Finfish

The Scottish marine aquaculture industry has grown from a small crofter based industry to a substantial international presence in the world food market within twenty years. Over the last thirty years, the salmon farming industry has been one of the most important economic developments throughout the Highlands and Islands.

The Scottish salmon farming industry injects approximately £2 million into rural communities every week as wages, with the retail value estimated at £600 million per annum. Nearly 139,000 tonnes of salmon were produced in 2001 (Table 1.6.1) representing 96% of the total Scottish production of farmed finfish. Of this, some 23% was exported to countries including France, the United States and Japan.

Within the fish farming industry there is growing interest in farming other species including brown trout/sea trout, Arctic char, cod and halibut. Although production figures for these species remain relatively small, they have increased from previous years and show considerable market potential.

<b>Table 1.6.1 – Total production (tonnes) of farmed finfish in Scotland, 2000 - 2001</b>		
<b>Species</b>	<b>2000</b>	<b>2001</b>
Atlantic salmon smolts (put to sea)	45.2 <sup>1</sup>	48.6 <sup>1</sup>
Atlantic Salmon ( <i>Salmo salar</i> )	128,959	138,519
Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	5,154	5,466
Other Species	165.2	203.8
<b>Total production (tonnes)</b>	<b>134,278.2</b>	<b>144,188.8</b>

Note: <sup>1</sup> Figures for smolts are in millions of fish

Cultivation of salmon begins in freshwater hatcheries and juveniles can be transferred to sea cages at the smolt stage (8-14 months), with salmon ready to harvest after one to two years.

Farmed finfish are grown in one of two ways: seawater cages and land-based installations, with the majority of Scottish farmed finfish grown in seawater cages. Land-based installations are generally fewer in number and principally used for broodstock, emerging species and experimental use.

Seawater cages are moored to the seabed and most installations consist of rafts of cages arranged around a system of walkways to enable servicing. Farm sites may contain several installations.

Throughout Scotland there are a large number of marine sites actively producing farmed sea fish for harvest (Table 1.6.2). In addition to this there are a number of companies registered and active but which did not produce salmon for harvest in 2001. Of the active sites in Scotland in 2001, nearly 46% produced farmed Atlantic salmon, with the region also supporting important numbers of marine and land-based smolt production sites.

<b>Table 1.6.2 - Number of companies and active sites in production in Scotland 2000-2001</b>				
<b>Finfish produced</b>	<b>2000</b>		<b>2001</b>	
	<b>Companies</b>	<b>Sites</b>	<b>Companies</b>	<b>Sites</b>
Atlantic salmon (ova & smolts) <sup>1</sup>	60	184	56	169
Atlantic salmon <sup>2</sup>	90 (68)	346 (163)	87 (81)	320 (238)
Rainbow trout	54	63	50	57
Other species	39	55	39	55
<b>Total</b>	<b>221</b>	<b>465</b>	<b>226</b>	<b>519</b>

Note: <sup>1</sup> Sites for ova and smolts include freshwater land-based sites. <sup>2</sup> Figures not in brackets represent the total number of companies and sites. Figures in brackets represent companies and sites which produced fish for harvest that year.

Extensive numbers of salmon farms are found throughout Shetland and Orkney, with a small number along the North coast of Scotland. The many voes, inlets and firths around the Shetland and Orkney coastlines provide good shelter and adequate water exchange for mariculture operations and the industry has become an important constituent of the local economy. Currently, 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). In 2001, salmon farms on Shetland and Orkney produced 39,745 (29% of the Scottish total) and 5,588 (4% of the Scottish total) tonnes of fish respectively, and between them employed almost 370 people (Table 1.6.3). There are no coastal rainbow trout farms within the SEA 4 area, but there is at least one near the mouth of a small river location at Loch Eriboll in Sutherland.

Table 1.6.3 provides details of the annual production of salmon from fish farms in Shetland and Orkney as well as details of the employment that the industry generated.

<b>Table 1.6.3 – Employment and production from salmon farms in SEA 4</b>				
<b>Region</b>	<b>Year</b>	<b>Employees</b>		<b>Annual Production (Tonnes)</b>
		<b>Full-time</b>	<b>Part-time</b>	
Shetland	2000	258	77	43,133
	2001	227	52	39,745
	2002	-	-	53,974*
Orkney	2000	91	15	6,370
	2001	75	15	5,588
	2002	-	-	6,895*

Note: \*Projected production in 2002

The sheltered waters of Loch Eriboll, on the north coast of Scotland provide some of the best conditions for aquaculture development on Scotland's north coast. This area, with its limited employment opportunities, is one of the most remote and sparsely populated in the UK. Aquaculture has become one of the main economic development options and is now an important adjunct to crofting and tourism.

## Shellfish

Scotland's shellfish industry represented an estimated 36% of the UK's total farmed shellfish production value in 2001. Of the species cultivated, mussels (89.2%) and pacific oyster (8.3%) accounted for the largest proportion of the shellfish produced (Table 1.6.4).

	<b>Scotland</b>	<b>England</b>	<b>Wales</b>	<b>UK Total*</b>
Pacific oyster	279	209	16	826
Native oyster	8	117	0	145
Scallops	28	0	-	28
Queens	47	-	-	47
Mussels	2,988	4,799	8,568	17,332
Clams	-	34	-	36
Cockles	-	105	-	105
<b>Estimated value (£ Million)</b>	<b>4.0</b>	<b>2.5</b>	<b>3.0</b>	<b>11.1</b>

Note: \*Northern Ireland figures not included

Mussels dominate shellfish production in the SEA 4 area, with smaller volumes of Pacific oysters, scallops, queens and native oysters also produced (Table 1.6.5). Shetland accounted for over 27% of Scotland's total mussel production in 2001, an increase of more than 100% from previous years. Orkney shellfish farming in 2001 was predominantly of Pacific oyster.

	<b>Shetland</b>	<b>Orkney</b>	<b>Highland</b>	<b>Scottish total<sup>1</sup></b>
Pacific oyster	53	22	1345	<b>4,364</b>
Native oyster	-	-	-	<b>103</b>
Scallops	-	-	606	<b>721</b>
Queen scallops	-	-	357	<b>1,882</b>
Mussels <sup>2</sup>	822	-	522	<b>2,992</b>

Note: <sup>1</sup> Total includes values for Strathclyde and Western Isles. <sup>2</sup> Mussel figures are in tonnes.

Shellfish species commonly farmed are mussels, oysters and scallops. Mussels are grown on weighted ropes suspended from either buoyed lines or rafts, while oysters are either grown on trestles in the inter-tidal zone or in stacked trays below the low water mark. In general, scallops are initially grown in nets suspended from buoyed lines or rafts. After 12-18 months in suspended cultivation the scallops are then grown directly on the seabed.

In 2001, there were 261 active shellfish farms in Scotland (Table 1.6.6), producing 3,350 tonnes of shellfish with an estimated value of £4.0 million. The number of active sites increased by 6% reflecting the development of new sites, particularly for mussel production. Over 20% of the active sites in Scotland in 2001 were in Shetland. Applications for mussel farm sites in Shetland has grown rapidly and there are now approximately 90 shellfish sites in Shetland (Pers. comm. M Holmes, Shetland Islands Council).

<b>Sites</b>	<b>Shetland</b>	<b>Orkney</b>	<b>Highland</b>	<b>Scottish total</b>
Active <sup>1</sup>	54	10	83	<b>261</b>

Note: Active<sup>1</sup> = growing and placing on the market.

In 2001 the Scottish shellfish industry employed 137 full time staff and 146 part time staff with a further 89 employed as casual workers. The industry is an important source of employment in the SEA 4 area, with 15% of the Scottish shellfish industry total (full time staff) employed in Shetland (Table 1.6.7).

<b>Table 1.6.7 - Regional employment for the shellfish farm industry 2001</b>			
	<b>Full time</b>	<b>Part time</b>	<b>Casual</b>
Shetland	21	37	27
Orkney	5	3	11
Highland	33	44	22
<b>All Scotland</b>	<b>137</b>	<b>146</b>	<b>89</b>

## Seaweed harvesting

The seaweed harvest industry has declined over time and continues to suffer severe setbacks. Despite this, seaweed remains Scotland's most significant wild plant resource, with harvesting traditionally done by hand. Scotland is still a minor producer of seaweed and accounts for only 2% of the European market.

The predominant group of seaweed harvested in Scotland are the brown seaweeds (Phaeophytes), which contain alginates (salts of alginic acid). These are used for many applications including food products, welding, wound dressings and in the paper and textile industry. Historically, much of the seaweed for these industries came from Orkney, but in recent years Scottish suppliers have been replaced by suppliers from countries such as Ireland, Iceland and Tasmania.

There are a number of companies in Scotland that manufacture seaweed fertilisers, but use raw material supplied from countries such as Ireland, Canada and Norway. One exception is the Orkney Seaweed Company, a recently established company, based on Westray that aims to market a range of unique products from freshly harvested local seaweed. In addition to this, there are developments in Shetland for a seaweed fertiliser company, producing organic *Ascophyllum* meal used *in situ* and sold locally. Several local cottage industries have become established in Orkney using local seaweed in the production of medicines and cosmetics, with small companies marketing health products.

Norway and France – the two largest European producers – have sizeable industries based on seaweed collection by automated harvesting equipment. The main harvest in Norway is of *Laminaria* and *Ascophyllum* for alginate and fertiliser production.

### 1.6.3 Management issues and initiatives

#### Finfish

Fish farming in Scotland is at an important stage in its development, and its future is the subject of extensive public debate. The Scottish Executive is currently undertaking a consultation on the development of a long-term strategic framework for aquaculture in Scotland, which will set out the key social, economic and environmental principles within which the industry must operate and where the public sector will intervene, either as sponsor or regulator.

The Crown Estate currently has the responsibility for authorising marine aquaculture developments in its capacity as landlord for much of the seabed around the Scottish coast. However, local authorities are due to supersede the Crown Estate in this role once legislation is prepared.

In Shetland and parts of Orkney, the Zetland and Orkney County Council Acts 1974 already enable the respective local authorities to exercise planning control over fish, and shellfish farming development by means of the Works Licence procedure.

## Aquaculture Framework Plans

Planning authorities are also increasingly using non-statutory Aquaculture Framework Plans to guide the development of both finfish and shellfish farms. Highland Council was amongst the first to develop these plans and their role has become increasingly important as the aquaculture industry has grown and developed.

Loch Eriboll, on the north coast of Scotland was one of the first locations to be covered by a Framework Plan. The plan sets out an overall development strategy for the loch as well as highlighting the characteristics and development potential of specific areas within the loch.

As mentioned above, Shetland and Orkney Councils exercise planning powers below mean low water. The Shetland Structure Plan provides the broad locational and policy framework for development, the Council's Works Licence Policy provides detailed guidance on the placing of works in the sea, on the seabed or on the foreshore. Policy LP/C3 of the Orkney Council's Local Plan commits the Council to *"...produce a [non-statutory] Fish Farming Framework plan to provide policy background for determining applications for marine fish farms..."*

## Location of finfish farms

In order to aid the planning authorisation process, SEERAD published the Policy Advice Note *Locational guidelines for the authorisation of marine fish farms in Scottish waters* in January 2003. This identified areas which are likely to be environmentally sensitive to new or expanded fish farm developments, and for which stringent assessment should be carried out prior to development consent being given.

Three categories of areas of coastal waters, based on the level of nutrient loading and associated benthic impact arising from existing fish farm developments, have been proposed:

- **Category 1:** where the development of new or the expansion of existing marine fish farms will only be acceptable in exceptional circumstances.
- **Category 2:** where new developments or expansion of existing sites would not result in the area being re-categorised as category 1.
- **Category 3:** where there appear to be better prospects of satisfying nutrient loading and benthic impact requirements, although the detailed circumstances will always need to be examined carefully.

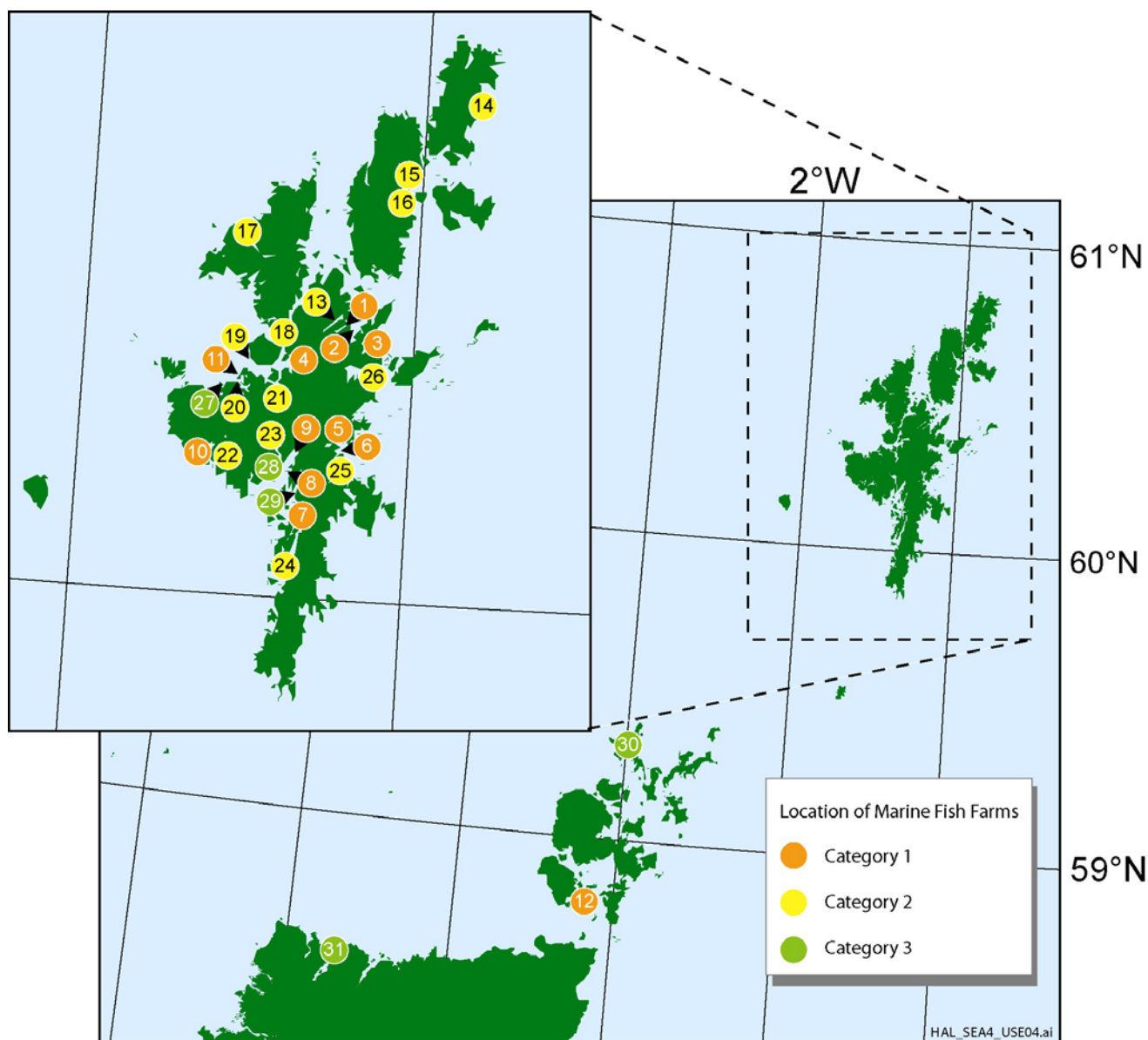
Because of the marginal effect of shellfish farming on nutrient loading, the nutrient loading categories do not apply to shellfish farming.

The location and categorisation of coastal waters with regard to fish farm development in the SEA 4 area are shown in Table 1.6.8 and Figure 1.6.1. The sites marked on Figure 1.6.1 do not reflect the total number of finfish sites within the region but rather the main areas from which finfish have been produced.

**Table 1.6.8 – Location and categories of fish farm development areas, 2002**

<b>Map Ref</b>	<b>Production Area</b>	<b>Map Ref</b>	<b>Production Area</b>
	<b>Shetland Islands</b>		
1	Collfirth Voe	18	Busta Voe
2	Swining Voe	19	Swarbacks Minn
3	Vidlin Voe	20	Vementry Sound and Brindister Voe
4	Olna Firth	21	Aith Voe
5	Cat Firth	22	Gruting Voe
6	Laxfirth Voe	23	Sanndsound Voe
7	Burwick Bay	24	Clift Sound
8	Stromness Voe	25	Dales Voe
9	Weisdale Voe	26	Dury Voe
10	Vaila Sound	27	West Burra Firth
11	Northra Voe	28	Selivoe
13	Dales Voe	29	Whiteness Voe
14	Baltasound		<b>Orkney Islands</b>
15	Basta Voe	12	Kirk Hope
16	Mid Yell Voe	30	Pierowall Bay
17	Ronas Voe		<b>Highlands - Sutherland</b>
		31	Loch Eriboll

Figure 1.6.1 – Location and categorisation of coastal waters in the SEA 4 area



## Shellfish

### Shellfish Harvesting Classifications

In the UK, shellfish for human consumption must be harvested from designated harvesting areas.

The classification of shellfish harvesting areas in Scotland is compiled by FRS and is required under EC Directive 91/492/EEC on the health conditions for the production and placing on the market of live bivalve molluscs. This Directive is now implemented in the UK by means of the 1998 Regulations which themselves were amended by the Food Safety (Fishery Products and Live Shellfish) (Hygiene) (Amendment) Regulations 1999.

The harvesting areas have been classified according to the extent to which shellfish sampled from the area are contaminated with *E. coli*. The classification of a harvesting area determines the treatment required before molluscs can be marketed (Table 1.6.9).



**Table 1.6.9 – Shellfish harvesting area classification categories and criteria**

Category	Criteria	Treatment
A	Less than 230 <i>E. coli</i> /100g flesh, or less than 300 faecal coliforms/100g flesh.	Molluscs can be harvested for direct human consumption
B	Less than 4,600 <i>E. coli</i> /100g flesh (in 90% of samples), or less than 6,000 faecal coliforms/100g flesh (in 90% of samples).	Molluscs can go for human consumption after purification in an approved plant or after relaying in an approved class A relaying area or after an EC approved heat treatment process
C	Less than 60,000 faecal coliforms/100g flesh.	Molluscs can go for human consumption only after relaying for at least 2 months in an approved relaying area followed, where necessary, by treatment in a purification centre, or after an EC approved heat treatment process

Shellfish production areas in the SEA 4 area are highlighted in Table 1.6.10 and Figure 1.6.2. Table 1.6.10 provides details of the species of shellfish produced within the area as well as the classification category for 2003. The sites marked on Figure 1.6.2 do not reflect the total number of shellfish farms rather the main areas from which shellfish are farmed.

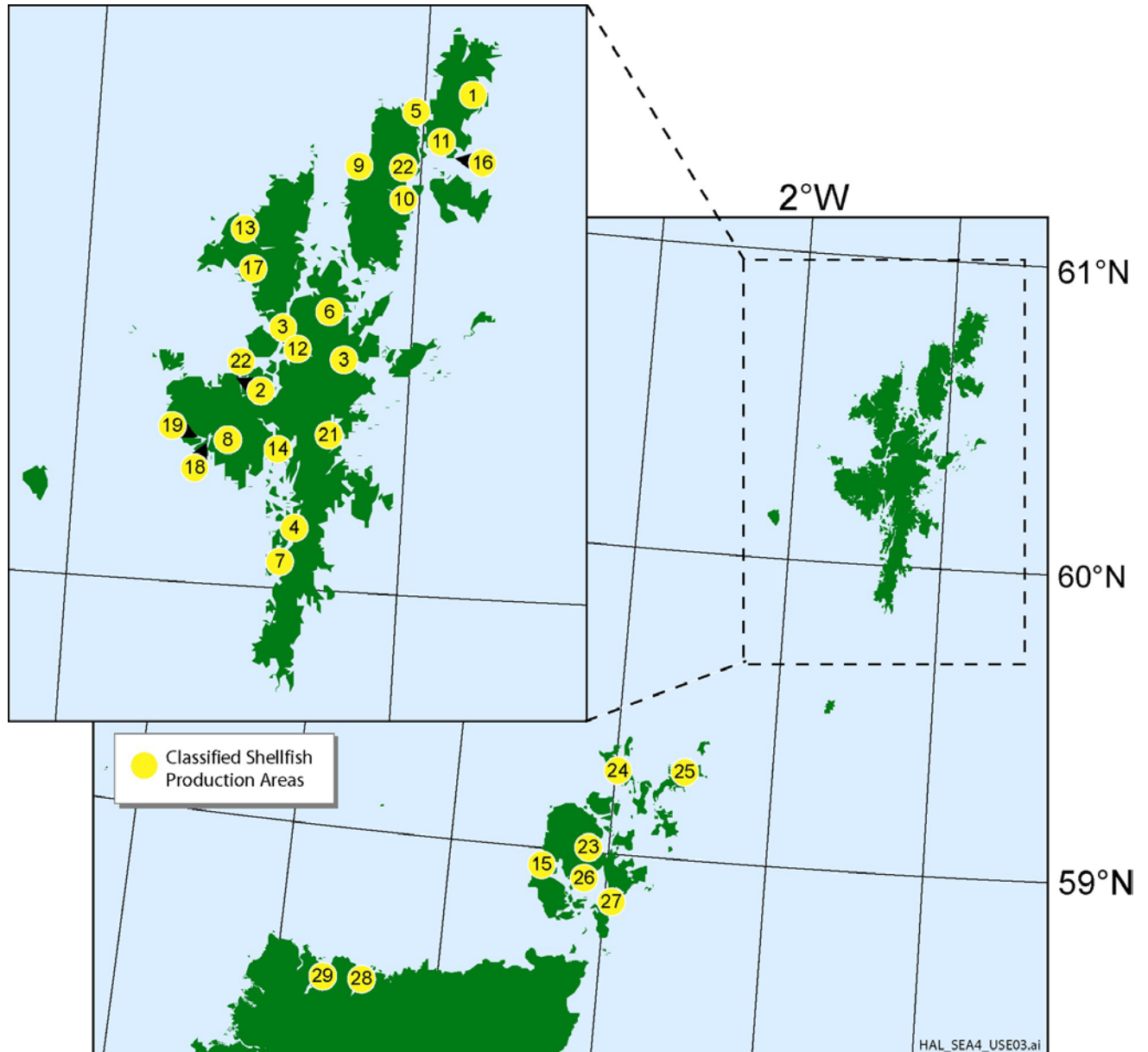
**Table 1.6.10 – Classified shellfish production areas in the SEA 4 area, 2003**

Map Ref	Production Area	Species	Class
<b>Shetland Islands</b>			
1	Baltasound	Pacific Oyster ( <i>Crassostrea gigas</i> ) Mussels ( <i>Mytilus edulis</i> )	A – December to July B – August to November A – January to December
2	Brindister Voe	Mussels	A – January to July B – August to December
3	Busta Voe and Linga Voe Catfirth	Mussels Mussels	A – January to December A – November to August B – September to October
4	Clift Sound	Mussels	A – April to December B – January to March
5	Culivoe, Southwick	Mussels	A – January to December
6	Dales Voe: Scarva Ayre	Mussels	A – August to June B – July only
	Dales Voe: Muckle Ayre	Mussels	A – January to September B – October to December
7	East Burra Firth	Mussels	A – September to July B – August only
8	Gruting Voe, Browland Voe, Seli Voe, Braewick	Mussels	A – October to July B – August to September
9	Inner Whalefirth	Mussels	A – January to December
10	Mid Yell Voe	Mussels	A – December to January B – February to November
11	North Uyea	Mussels	A – October to April B – May to September
12	Olna Firth	Mussels	A – February to September B – October to January

**Table 1.6.10 – Classified shellfish production areas in the SEA 4 area, 2003**

13	Ronas Voe	Mussels	A – November to June B – July to October
14	Sandsound Voe	Mussels	A – June to October B – November to May
16	South Uyea	Mussels	A – October to April B – May to September
17	Ura Firth (Valladale)	Scallops ( <i>Pecten maximus</i> )	A – April to January B – February to March
18	Vaila & Easter Sound (Galtaskerry)	Mussels	A – January to December
19	Vaila Sound: Riskaness	Mussels	A – January to December
20	Vementry: Cribba Sound, Seggi Bight, Suthra Voe	Mussels	A – January to December
21	Wadbister Voe	Mussels	A – January to December
22	Yell: Basta Voe	Mussels	A – February to October B – November to January
<b>Orkney Islands</b>			
23	Bay of Firth	Oysters	A – March to October B – November to February
24	Bay of Tuquoy	Cockles ( <i>Cerastoderma edule</i> )	B – January to December
25	Otterswick Bay, Sanday	Cockles	A – May to October B – November to April
26	Swanbister	Razor fish ( <i>Ensis spp.</i> )	A – July only B – August to June
27	Watersound and Burray	Mussels	A – April to August B – September to March
15	Sound of Hoy, Stromness	Mussels	A – September to July B – August only
<b>Highlands - Sutherland</b>			
28	Kyle of Tongue	Oysters	A – January to December
		Mussels	A – August to May B – June and July only
29	Loch Eriboll	Oysters	A – January to December
		Mussels	A – November to August B – September to October

Figure 1.6.2 - Classified shellfish production areas in the SEA 4 area



#### 1.6.4 Relevance for SEA 4

Mariculture provides an important source of income for coastal communities within the SEA 4 area. At present aquaculture developments are largely restricted to sheltered coastal waters and as a result are unlikely to be directly affected by any proposed increase in oil and gas activity as a result of SEA 4 licensing.

The *Braer* spill (which was related to the transport of crude oil rather than to the exploration and production of hydrocarbons) had particularly severe effects on the fish farming industry in the Shetland Islands.

Experience (e.g. the *Braer* spill) also indicates that irrespective of actual contamination levels and closures, spills may result in significant loss of public confidence in seafood quality from the perceived affected area, and therefore in sales revenue. Either perceived or actual contamination of

target species with hydrocarbons or other chemicals may therefore result in economic damage to the inshore aquaculture and associated processing and support industries.

As discussed above, the incremental risk associated with SEA 4-related activities is considered to be very small.

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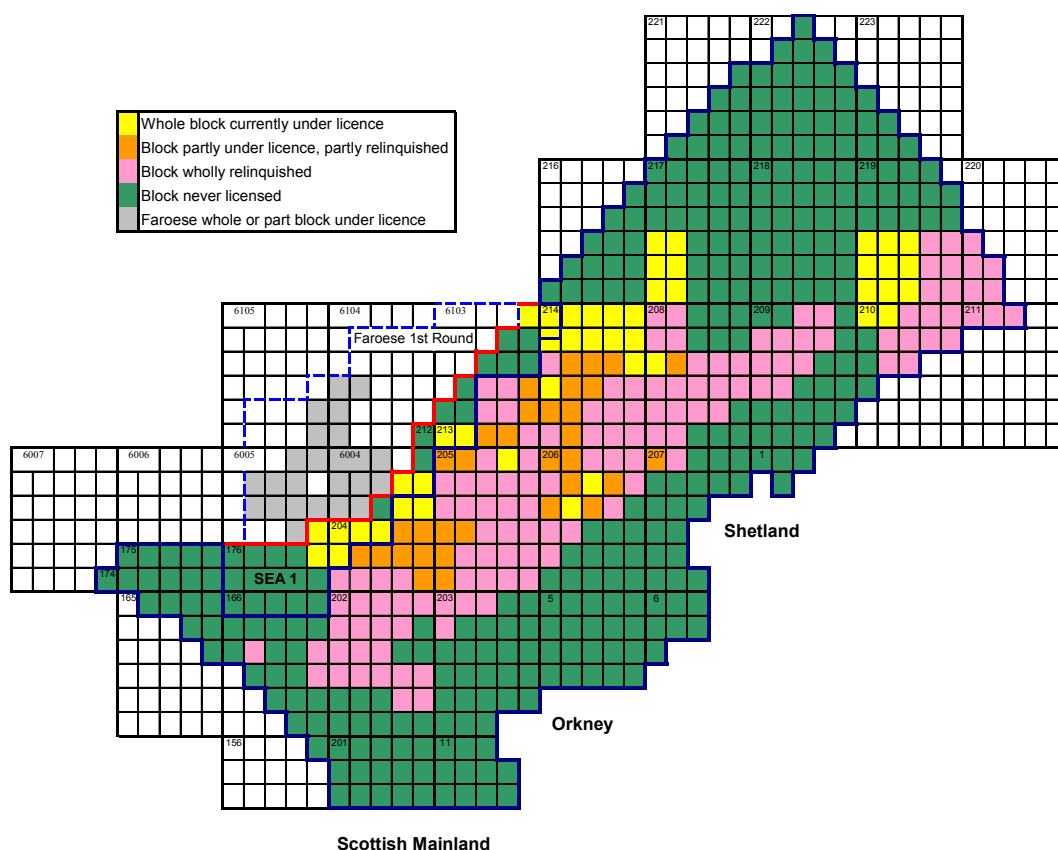
## 1.7 Oil and gas activity

### 1.7.1 Introduction

The oil and gas industry in the North Sea has grown into a major economic industry since the late 1960's. 2002 saw levels of production in the UK in excess of 105 million tonnes of oil, 37 million tonnes of gas and 438 thousand tonnes of condensate.

Within the North Sea, oil and gas activity has primarily centred on the oil and gas fields of the northern and central North Sea and the gas fields of the southern North Sea. Some areas of SEA 4 have never been licensed or have previously been licensed but have since been relinquished (Figure 1.7.1), with the result that there has been relatively little exploration in the area.

*Figure 1.7.1 – Schematic of blocks within the SEA 4 area, either currently licensed or potentially available for licensing*



*Note: The SEA 1 area and the blocks licensed during the Faroese 1<sup>st</sup> licensing round are also highlighted. The Faroese first licensing round was launched on the 17<sup>th</sup> February 2000 and covered approximately 14,000 km<sup>2</sup>, divided into 56 whole blocks and 26 part-blocks. Seven licences were awarded on 17<sup>th</sup> August 2000.*

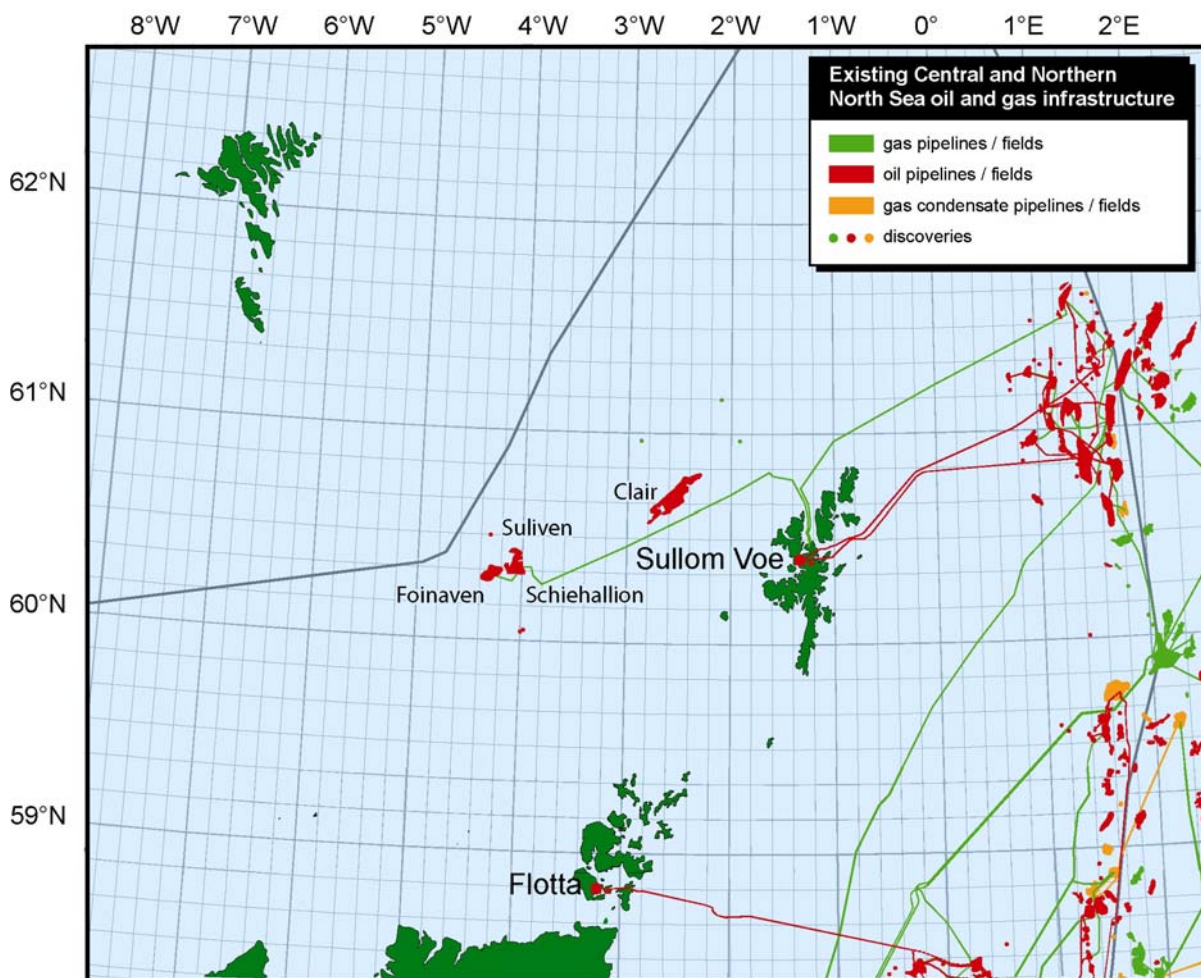
### 1.7.2 Activity in the SEA 4 area

To date, 186 exploration and appraisal (E & A) wells have been drilled along the UK Atlantic Margin, while a survey conducted by the DTI in early 2002 found there was intention to drill 5 E & A wells in 2003 and a further 4 in 2004, in the area west of Shetland (which includes west of Scotland and the Rockall Basin). Within the SEA 4 area, which includes much of the Atlantic Margin, 202 exploration wells and 94 development wells have been drilled to date.

Historically, the area west of Shetland and Orkney has, in general, been too difficult from a technical perspective to develop. As a consequence of this there are currently only two producing fields, Foinaven and Schiehallion within the SEA 4 area the details of which can be found in Table 1.7.1 and Figure 1.7.2.

<b>Table 1.7.1 – Oil fields in production within the SEA 4 area</b>	
<b>Oil field in production:</b>	<b>Foinaven</b>
Block number	204/24a
Date of discovery	October 1992
Production start	November 1997
Recoverable reserves originally present	Oil: (million tonnes) 49.60 Gas: (billion cubic metres) 6.12
First year of peak production	1999
Peak production	4.14 (million tonnes per year)
Transport system	Floating production system with offshore loading
Extension into other UK blocks (quadrant/block number)	204/19a, 204/25b
<b>Oil field in production:</b>	<b>Schiehallion</b>
Block number	204/20a
Date of discovery	October 1993
Production start	July 1998
Recoverable reserves originally present	Oil: (million tonnes) 79.87 Gas: (billion cubic metres) 1.14
First year of peak production	1998
Peak production	6.91 (million tonnes per year)
Transport system	Floating production system with offshore loading
Extension into other UK blocks (quadrant/block number)	205/16, 204/25a, 205/21b

Figure 1.7.2 – Oil and gas infrastructure in the SEA 4 area



The Shetland and Orkney islands play an important role in terms of infrastructural support for the oil and gas industry. The Sullom Voe and Flotta oil terminals provide facilities for the import of resources from developments to the east and west of the islands. Support facilities are also provided at Lerwick.

Information relating to terminal receipts for the Sullom Voe oil terminal is described in Table 1.7.2.

Table 1.7.2 - Sullom Voe oil terminal 2002	
<b>Oil terminal:</b>	Sullom Voe
<b>Terminal operator:</b>	BP
<b>Production from</b>	Alwyn North, Brent, Columba B/D, E, Cormorant N, S, Deveron, Don, Dunbar, Dunlin, SW, Eider, Ellon, Grant, Heather, Hudson, Hutton NW, Kestrel, Loyal, Lyell, Magnus, S, Merlin, Murchison, Ninian, Osprey, Pelican, Schiehallion, Strathspey, Tern, Thistle
<b>Terminal receipts (thousand tonnes)</b>	22,603
<b><i>Oil pipelines connected to terminal</i></b>	
<b>From – to</b>	Cormorant South to Sullom Voe
<b>Material conveyed</b>	Crude oil
<b>Length</b>	149.7km



**Table 1.7.2 - Sullom Voe oil terminal 2002**

<b>Diameter</b>	914mm
<b>Pipeline operator</b>	Shell/Esso
<b>Year commissioned</b>	1978
<b>From – to</b>	Ninian to Sullom Voe
<b>Material conveyed</b>	Crude oil
<b>Length</b>	169km
<b>Diameter</b>	914
<b>Pipeline operator</b>	BP
<b>Year commissioned</b>	1978

Although Flotta and Flotta West receive production from fewer installations and their terminal receipts are considerably lower than that of Sullom Voe, they still play an important role in terms of infrastructural support in the region (Table 1.7.3).

**Table 1.7.3 - Flotta and Flotta West oil terminals 2002**

<b>Oil terminal:</b>	Flotta
<b>Terminal operator:</b>	Talisman Energy
<b>Production from</b>	Chanter, Claymore, Galley, Hamish, Highlander, Iona, Ivanhoe, MacCulloch, Petronella, Piper, Renee, Rob Roy, Rubie, Saltire, Scapa, Tartan
<b>Terminal receipts (thousand tonnes)</b>	6,464
<b><i>Oil pipelines connected to terminal</i></b>	
<b>From – to</b>	Piper to Flotta
<b>Material conveyed</b>	Crude oil
<b>Length</b>	209.2km
<b>Diameter</b>	762
<b>Pipeline operator</b>	Elf
<b>Year commissioned</b>	1976
<b>Oil terminal:</b>	Flotta West
<b>Production from</b>	Foinaven
<b>Terminal receipts (thousand tonnes)</b>	5,281

## Significant developments in SEA 4 area

### Clair field

The Clair field is the largest discovered, but as yet undeveloped hydrocarbon resource on the UKCS. It lies 75km west of Shetland and was discovered in 1977. However until recently, it has been too difficult to successfully exploit the field. With the advance of technology, the field can now be developed and in 1997 the five Clair partners jointly agreed to develop the field. The consent for the Clair field was granted in November 2001 and will last until December 2008.

Phase 1 of the Clair field development will focus on 3 reservoir areas, which have an estimated 1.75 billion barrels of oil in place, 250 million of which are recoverable. The proposed initial development involves the drilling of 24 wells, 15 of which will produce oil and gas, 8 will be water injectors and 1 will be a drill cutting reinjection well. Oil from the platform will be exported to the Sullom Voe

terminal in Shetland via a pipeline, with gas either reinjected into the reservoir or exported by the new Magnus enhanced recovery pipeline. This pipeline (Clair) will be laid through Orka Voe to the terminal in summer 2003.

### Magnus enhanced recovery pipeline

In 2000, consent was given to BP for the construction of the Magnus enhanced recovery pipeline, which has since been completed and is now operational. A subsea pipeline transports surplus gas from the Foinaven and Schiehallion fields west of Shetland, to the Sullom Voe oil terminal where the gas is enhanced with natural gas liquids. A further pipeline transports the enhanced gas to the Magnus oilfield in the northern North Sea, where it is re-injected into the oil reservoir to enhance recovery of the remaining oil reserves.

### 1.7.3 Management issues and initiatives

Operators from the oil and gas industry have taken the opportunity to adopt a coordinated, strategic approach to environmental management in the UK Atlantic Margin, north west of Scotland. It is expected that this initiative will set the standard for other emerging oil and gas provinces. Oil companies operating in the UK Margin area are not only cooperating with each other but are also working with the Government, regulatory authorities and the academic research community, identifying key sensitivities, developing dialogues with local communities and interested parties, researching and understanding the existing environment, and developing and monitoring protection measures.

From this novel and groundbreaking approach a number of groups have emerged and the work of these groups is briefly described in the following sections.

#### Atlantic Frontier Environmental Network (AFEN)

Full members of AFEN include the Department of Trade and Industry, the Scottish Executive and the Joint Nature Conservation Committee, as well as a number of oil and gas operators. The group has been instrumental in originating and focusing regional studies in the licensed area to determine the state of the environment, in conjunction with operators' localised studies of development sites. AFEN's work includes:

- Atlantic Margin seabed surveys
- Monitoring seabirds of the Atlantic Frontier
- Monitoring marine mammals
- Coastal protection strategies

Additional information about the work of AFEN can be found on the UKOOA website ([http://www.ukooa.co.uk/issues/1999report/enviro99\\_margin.htm](http://www.ukooa.co.uk/issues/1999report/enviro99_margin.htm))

#### Atlantic Frontier Environmental Forum (AFEF)

AFEF was established to ensure that results from AFEN studies were distributed as widely as possible as well as ensuring that AFEN were addressing matters important to local communities. The group has an independent chairman and representatives from local authorities, wildlife agencies and other conservation bodies, as well as government agencies, academia and offshore oil and gas industry operators (via AFEN).

## Shetland and Orkney initiatives

Since the mid 1970's there has been an ongoing, intensive monitoring programme, centred on the Sullom Voe oil terminal in Shetland. SOTEAG (the Shetland Oil Terminal Environmental Advisory Group) was set up in 1977 by the Sullom Voe Association, a company jointly owned by Shetland Islands Council and the Brent and Ninian pipeline groups, to advise, monitor and report on the performance and the effect the oil terminal has on the Shetland environment.

One of the most important functions of SOTEAG is to demonstrate to the Shetland public and others that the environmental impacts from oil terminal operations are acceptable, through ongoing monitoring from objective and unbiased scientific studies. Biennial and annual monitoring programmes focus on chemical and macrobenthic studies of soft shores and rocky shores, as well as ornithological studies. SOTEAG also advises on the review of oil spill contingency plans, wildlife response procedures and provides independent *ad hoc* advice on any environmental issues that could affect the area which is affected by the operation of the terminal and its port facilities.

The potential impact of the Flotta terminal on the Orkney marine environment led to the establishment of the Orkney Marine Biology Unit of the University of Dundee in the late 1970s. The Unit was contracted by Orkney Islands Council to carry out a programme of biological monitoring around the terminal from the 1970s until 1990. Since 1990 shoreline monitoring has been carried out by Orkney Islands Council and extensive work has been done on an environmental database which complements the Port Oil Spill Contingency Plan (Pers. comm. Capt Nigel Mills, Director of Harbours, Orkney)..

### 1.7.4 Relevance to SEA 4

There has been relatively little oil and gas exploration and development within the SEA 4 area, with the most significant infrastructure found in the northern North Sea to the east of the SEA 4 area. There are two operational fields within the SEA 4 area, Foinaven and Schiehallion, with a third, Clair, in development. The other significant development in the area is the subsea Magnus enhanced recovery pipeline.

Given the relatively small number of developments in the area, it is unlikely that any increase in oil and gas activity, as a result of SEA 4 offshore licensing, will have any detrimental effect on these operations.

#### Sources of information

Aberdeen University Oil and Gas Centre website

<http://www.abdn.ac.uk/oilgas/soteag.htm>

DTI Oil & Gas UK production data release 2003

<http://www.og.dti.gov.uk/pprs/report3.pdf>

DTI UKCS oil & gas production platforms and floating installations 2002

[http://www.og.dti.gov.uk/information/bb\\_updates/appendices/Appendix13.htm](http://www.og.dti.gov.uk/information/bb_updates/appendices/Appendix13.htm)

DTI Offshore oil and gas pipelines 2001

[http://www.og.dti.gov.uk/information/bb\\_updates/appendices/Appendix14.htm](http://www.og.dti.gov.uk/information/bb_updates/appendices/Appendix14.htm)

Offshore Technology – Clair Field Shetland

<http://www.offshore-technology.com/projects/clair>

Pers. comm. Capt Nigel Mills, Director of Harbours, Orkney.

UKOOA The Atlantic Margin

[http://www.ukooa.co.uk/issues/1999report/enviro99\\_margin.htm](http://www.ukooa.co.uk/issues/1999report/enviro99_margin.htm).

Shetland Islands Council: SOTEAG Environmental monitoring at the Sullom Voe oil terminal in Shetland

## 1.8 Renewable energy

### 1.8.1 Introduction

Traditionally, nuclear power has been the most utilised form of alternative energy production. However, renewable energy production from wind, wave and tidal power, is becoming increasingly important as a means of electricity production. This has been prompted, in part by the Kyoto protocol - the driving force for governments to increase use of renewable energy as a means of reducing carbon emissions. The increased interest in renewables is also in response to the implications of reduced UK oil and gas production, which will make the UK a future net energy importer instead of an energy exporter.

The issues of climate change and securing energy supplies are challenges that the Government's energy white paper, published in February 2003, entitled; "*Our energy future – creating a low carbon economy*" aims to address. This paper reiterates the UK Government's proposal that by 2010, 10% of UK electricity needs should be met from renewable sources and indicates that a range of new measures have been put in place to deliver this commitment. However while this white paper is also applicable in Scotland, the promotion of renewable energy is devolved and rests with the Scottish Executive, who have proposed a target for renewable energy of 18% by 2010.

At present around 12% of Scotland's electricity generation comes from renewable sources, the vast majority of which comes from large, well-established hydro schemes. However, in recent years there has been an upsurge in interest in energy developments in Scotland's coastal waters, and offshore renewables including coastal locations for windmills has become the fastest growing sector of the renewable industry

### 1.8.2 Activity in the SEA 4 area

Scotland has an immense offshore renewable energy resource - including wind, wave and tidal –and it is estimated that the potential resource may be capable of generating 46.5 GW (Gigawatts) by 2010.

This section will review current commercial and experimental projects in Scotland and describe those within the SEA 4 area that are utilising wind, wave and tidal power.

#### Wind

The UK has one of the largest wind resources in Europe, accounting for over 50% of Europe's total potential. Therefore the development of wind power in the UK is a key means by which the UK Government might meet its reduced emission requirement.

The first offshore wind farm in Scotland is likely to be at Robin Rigg, in the Solway Firth, the proposals for which were approved in March 2003. However, while Scotland has important offshore wind resources, the lack of spare capacity on the existing grid system, may restrict the full exploitation of the resource. At present there are no existing or current proposals for offshore wind farms within the SEA 4 area.

#### Wave

Waves with the greatest energy are found off the north west coast of Scotland. To intercept waves at their peak energy potential, depending on water depths, wave devices should ideally be situated 10km offshore. However, devices for harnessing wave energy are still at the experimental stage and this sector is further from commercialisation than offshore wind farms. The only commercially operational wave-power station in the world – the LIMPET device – is situated on Islay.

Within the SEA 4 area, there are no commercial wave devices in operation. This notwithstanding, Seapower International, a Swedish company, has proposed the construction of a prototype wave device, 500m off Mu Ness, near the Dale of Walls in Shetland, in 2003.

In addition to this there is a proposal to build a marine test centre in Orkney (Stromness), expected to open late 2003 and provide test facilities for the first, full scale, pre-production prototype Pelamis, a novel offshore wave converter. The site at Stromness was selected as it offered suitable wave and current energy resources, as well as good onshore facilities, sheltered waters for construction and a suitable connection to power infrastructure.

## Tidal

Tidal energy is considered one of the greatest untapped energy resources available. It is estimated that the UK has approximately 40 possible locations where suitably fast currents occur. However, like the wave sector, tidal devices are still in the experimental stages.

*Stingray*, the world's first large scale tidal stream generator systems, was deployed in Yell Sound off the Shetland coast in 2002 for preliminary testing. The site had ideal testing conditions, offering strong currents in a relatively sheltered channel. The success of the first tests is set to be maintained by the redeployment of *Stingray* (subject to appropriate consents) in spring 2003 for additional testing, with plans for installing the *Stingray* power station, connected to the local network, in 2004.

### 1.8.3 Management issues and initiatives

#### Renewable Obligations

In 2000, the government announced their intention to introduce Renewable Obligations<sup>1</sup>, a market incentive measure, one of many measures designed to increase the renewable share of electricity demand in order to reach their 2010 target of 10%. In Scotland, support for renewable resources now comes from the Renewables Obligation Scotland (RSO), which came into force in 2002. As well as the Renewable Obligation initiative, there are a number of new market based measures which directly benefit renewable energy.

#### Capital grants

Capital grant support, valued at £89 million is being made available by the DTI and the New Opportunities Fund for the development of longer term technologies such as offshore wind and other marine projects. The process for awarding the first grants has already been initiated.

#### The climate change levy (CCL)

From 2001 the CCL was imposed on supplies of electricity, gas and other fuels to business users and public bodies. Levies are collected from licensed electricity suppliers, who in turn bill their business customers. Exemptions from this levy include electricity supplies that are verifiably generated from renewable sources. This has encouraged some businesses and public bodies to switch to renewable energy tariffs.

A small proportion of the receipts from the CCL will be used to support renewable energy projects, with the most significant proportion being used for energy efficient projects.

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<sup>1</sup> The Obligation is a "requirement for licensed electricity suppliers to supply year on year increases of their demand from renewables" (Scottish Executive: Scotland's Renewable Resources 2001 – volume 1 The Analysis)

## Performance and innovation unit (PIU)

The UK Government's PIU recently published a report that reviewed renewable energy in the UK and its future prospects. The report recommended additional funding for technologies and activities such as offshore wind projects, demonstrations of wave and tidal technologies and research into "next generation" technologies.

In June 2002, the PIU was merged with the Prime Minister's Forward Strategy Unit (PMFSU) and part of the Centre for Management and Policy Studies (CMPS), to create the Strategy Unit. The SU carries out long-term strategic reviews and policy analysis and reports directly to the Prime Minister through the Cabinet Secretary.

## Scottish initiatives

To demonstrate their commitment of realising Scotland's renewable potential, the Scottish Executive have already taken key actions in what they regard as a long, ongoing process.

As previously mentioned the RSO provides support in Scotland for the renewable energy industry and has thus far created a huge demand for renewable electricity. Developers, keen to meet this demand, have increased the number of developments (principally wind and hydro projects), some of which have been approved and are awaiting construction.

In December 2002, the Scottish Executive were considering the establishment of a new consents procedure for developers proposing projects in Scotland's coastal waters. At present developers need to apply through various areas of the Executive under different legislation, obtain a lease from the Crown Estate as well as tabling a Private Members Bill, while any new system would aim to simplify the consents process.

The Scottish Executive have also recently launched the Scottish Community Renewable Initiative (SCRI), a Scotland wide service, providing guidance, monitoring and aftercare for renewable energy projects. In addition to their advisory role, significant new grant funding will be available under the SCRI for households and communities installing or developing renewable energy projects.

In addition to this, financial support has been given by among others, the Scottish Executive, the Highlands and Islands Enterprise, Scottish Enterprise and Orkney Islands Council, for the establishment of the Orkney Wave Energy Test Centre.

For the renewable resources around Shetland, Orkney and the rest of Scotland to be fully exploited, the existing grid system needs to be significantly strengthened. To achieve this, the Scottish Executive is to work with industry bodies to optimise the potential for small-scale distributed generation, in addition to funding a study by the academic sector to determine how renewable generation can match demand.

### 1.8.4 Relevance to SEA 4

Offshore renewables, while the fastest growing sector of the renewables industry, is still a relatively fledgling industry, with only wind energy having reached a viable stage. Areas around the Shetland and Orkney Islands offer great potential in terms of natural wind, wave and tidal resources. However, whether these resources can be harnessed remains at the discretion of developing technologies, significant strengthening of the existing grid system and consent and planning permissions being granted.

At present there are no commercially viable renewable energy projects within the SEA 4 area. It is unlikely there will be any detrimental effects of increased oil and gas activity as a result of SEA 4 licensing, on the renewable energy industry as presently defined.

**Sources of information**

Crown Estate website

<http://www.crownestate.co.uk>

DTI Future Offshore Consultation Document

DTI The World Offshore Renewable Energy Report 2002-2007

DTI Energy White Paper: Our energy future – creating a low carbon economy

Scottish Coastal Forum 2002 A Strategy for Scotland's coasts and inshore waters

Scottish Executive: Scotland's Renewable Resources 2001. Volume I The Analysis

Wilson S & Downie AJ (2003). A review of possible marine renewable energy development projects and their natural heritage impacts from a Scottish perspective.

Scottish Natural Heritage commissioned report F02AA414.

## 1.9 Military activity

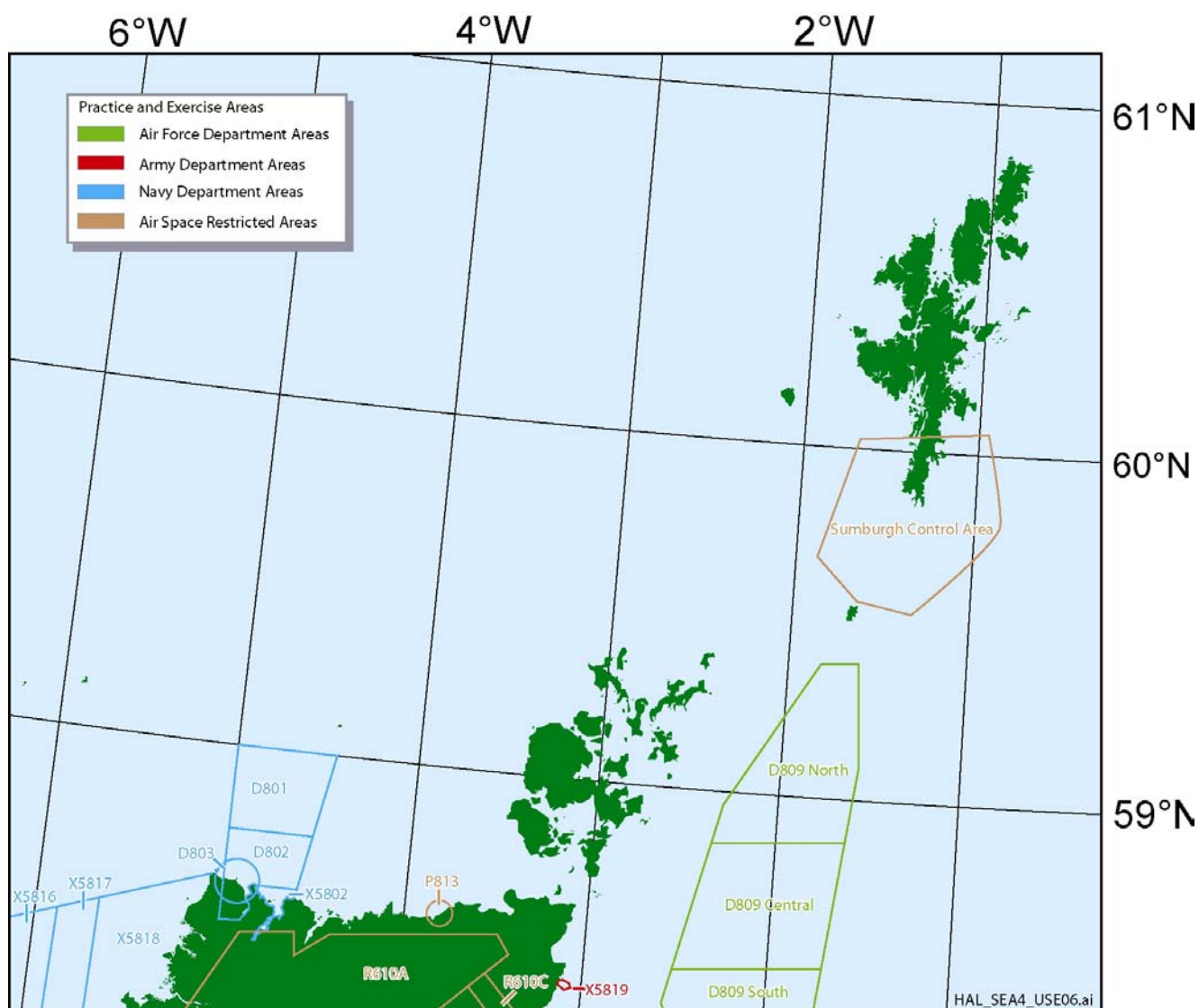
### 1.9.1 Introduction

Information relating to military activity in the SEA 4 area comes from Practice and Exercise Areas (PEXA) charts produced by the UK Hydrographic Office. These charts show the sea areas round the UK coast which are in use or available for use by the Ministry of Defence for practice and exercises with or without the use of live ammunition.

### 1.9.2 Activity in the SEA 4 area

There are a number of military activity areas within the Shetland, Orkney and the north of Scotland coastal regions, the majority of which are for navy training (Figure 1.9.1 and Table 1.9.1).

Figure 1.9.1 – Military activity in the SEA4 area



The coastal waters north of Cape Wrath and including Loch Eriboll support several practice and exercise areas that are used by the Navy for a number of activities. Naval submarines, aircraft and vessels also use The Minch, to the south west of the SEA 4 area. Within SEA 4, there are a number of



areas which have airspace reservations (shown in brown on Figure 1.9.1) including the Sumburgh Control Area, which covers a large area to the south of Shetland. To the east of Orkney and outwith the area covered by SEA 4, there are several large Air Force practice areas (Table 1.9.1 and Figure 1.9.1).

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

**Table 1.9.1 – Military activity in the SEA4 area**

Serial no.	Name	Type of practice*	Altitude range (feet above surface)
<b>Navy department areas</b>			
D801	Cape Wrath (North West)	A/A, T, A/S, A/C, H.M. Ships, PTA	55,000
D802	Cape Wrath (South West)	A/A, T, A/S, A/C, ASF, LB, TA, NGS, PTA	55,000
D803	Garvie Island	RP, PB, LB, ASF	40,000
X5802	Eriboll	H.M. Ships	
X5816	Tiumpan	S/M, A/C, H.M. Ships	
X5817	Minch North	S/M, A/C, H.M. Ships	
X5818	Stoer	S/M, A/C, H.M. Ships	
<b>Air Force department areas</b>			
D809	Moray Firth (North)	A/A, ASF, A/C, S/M, T, A/S, PTA, AAF, H.M. Ships	55,000
D809	Moray Firth (Central)	A/A, ASF, A/C, S/M, T, A/S, PTA, AAF, H.M. Ships	55,000
D809	Moray Firth (South)	A/A, ASF, A/C, S/M, T, A/S, PTA, AAF, H.M. Ships	55,000

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).

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. The Cape Wrath firing range is extensively used during these courses for naval gunfire support and exercise areas in the North Sea provide large areas for both anti-submarine and air defence exercises (ETS News website). Other military operations in the area include the NATO Exercise Northern Light taking place off the west coast of Scotland in September 2003. The NATO force will comprise 50 ships and submarines, 15 fighter aircraft, numerous military helicopters and approximately 800 amphibious and land troops from twelve NATO nations (US Department of State – International Information Programmes website).

### 1.9.3 Relevance for SEA 4

The predicted levels of activity following licensing of the SEA 4 area are unlikely to interfere with military activity in the area, given the small number of practice and exercise areas. Oil and gas activities might interfere with naval exercises but in the SEA 4 area, these are primarily coastal in nature thereby reducing the likelihood of interaction.

**Sources of information**

PEXA Chart Q.6404 Flannan Islands to Clyth Ness. Admiralty Charts and Publications.  
UK Hydrographic Office

## 1.10 Telecommunication cables

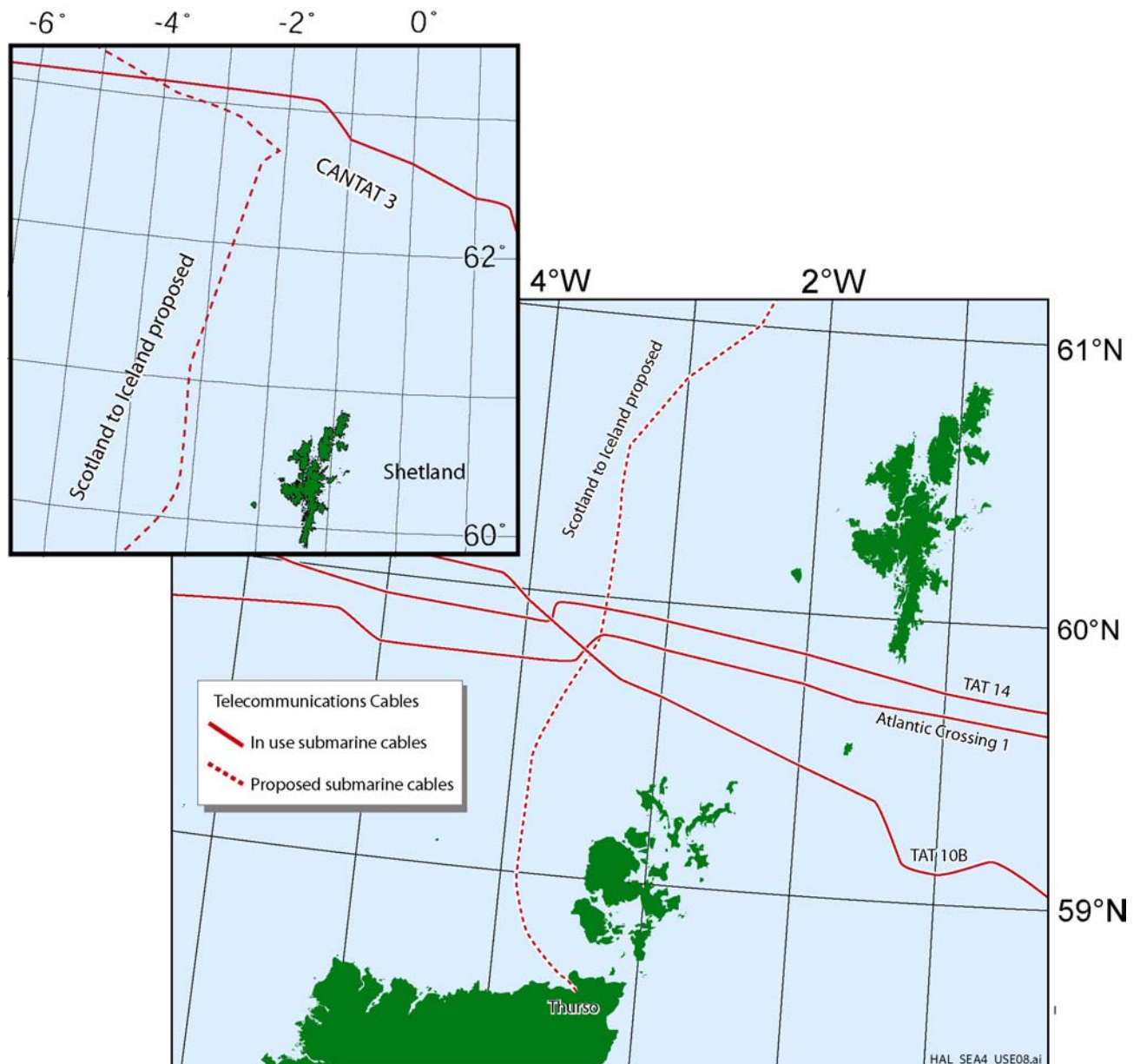
### 1.10.1 Introduction

Over the past three years there has been a 500% increase in global electronic data transmission due to the growth in Internet use and the development of e-commerce. Cable numbers are increasing as a result of this increased traffic with many now traversing the North Sea to link the UK with mainland Europe, as well as connecting Europe to North America.

### 1.10.2 Cables in the SEA 4 area

There are four operational telecommunication cables that traverse the SEA 4 area, primarily connecting mainland Europe with the eastern seaboard of America (Figure 1.10.1 and Table 1.10.1).

Figure 1.10.1 – Telecommunication cables in the SEA 4 area



<b>Table 1.10.1 - Telecommunication cables in the SEA 4 area</b>		
<b>Cable land fall</b>	<b>Cable</b>	<b>Operator</b>
Redcar (UK) and Mainland Europe	CANTAT 3	BT
Mainland Europe	TAT 14	BT
Mainland Europe	Atlantic Crossing 1	Global Crossing
Mainland Europe	TAT 10B	T-systems International
Thurso	Scotland to Iceland <sup>1</sup>	Iceland Telecom

Note: <sup>1</sup> Proposed submarine telecommunications cable

### 1.10.3 Relevance for SEA 4

The locations of telecommunication cables in the SEA 4 area are charted on Admiralty charts and Kingfisher Cable Awareness Charts. Oil and gas activities as a result of SEA 4 licensing are unlikely to interfere with the telecommunications network given that identification of such cables is a priority during the initial survey stages of appraisal.

#### **Sources of information**

Kingfisher Cable Awareness Charts: North Sea - North, North west Approaches

## 1.11 Aggregate extraction

### 1.11.1 Introduction

Sand and gravel are important sources of industrial aggregate, utilised in concrete production, road and building construction, beach replenishment and coastal defenses. The small, local aggregate extraction activity in Shetland, Orkney and the north coast of Scotland is overwhelmingly land-based.

Within the SEA 4 area there are maerl beds found around the Shetland and Orkney Islands and Loch Eriboll on the north coast. Although maerl is a valuable commercial resource, extraction in the SEA 4 area is on a very small scale.

### 1.11.2 Activity in SEA 4 area

Commercial dredging areas for marine sand and gravel are restricted by the occurrence of suitable deposits as well as a number of other factors including economic viability, technical constraints, distance from licence area to point of landing and the market demand for the product. Prospecting in Scotland's coastal waters for sand and gravel, has, in general, been unpromising, with only limited exploitable reserves located. Within the SEA 4 area, local aggregate requirements are adequately met by land-based supplies, resulting in a lack of demand for marine based resources.

There are currently no licensed areas for marine aggregate extraction in the coastal waters of the SEA 4 region.

It is widely accepted that in such areas as Shetland, Orkney and the north coast of Scotland, 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.

### 1.11.3 Management issues and initiatives

#### Maerl

Maerl – a collective term for several species of red seaweed that form hard calcified outer casings – is commercially valuable as a soil conditioner, an animal food additive, an acid drinking water filter and an additive in pharmaceutical and cosmetic products. Maerl is legally protected under the EC Habitats Directive 1992 and is listed on the UK Biodiversity Action Plan, as maerl beds form an important habitat for a wide variety of marine plants and animals.

In Scotland, maerl is widespread throughout the Western Isles, Shetland and along the north coast at Loch Eriboll. The maerl beds are well established particularly in the mouths of sea lochs, bays and sounds around the Orkney Islands. The full extent of these beds and their commercial viability remain undetermined.

In recent times only one extraction contract for 5,000 tonnes from around the Orkney coast, has been implemented. In 1996, extraction of a further 20,000m<sup>3</sup> over a five year period from Wyre Sound in Orkney, was given a favourable Government View (with conditions), however this went little further than the exploratory stage

The biggest European producer is currently France, taking the resource mainly from beds in the seas around Brittany.

## Legislative control

The extraction of marine aggregates is licensed by the Crown Estate, subject to a favourable Government View<sup>2</sup> being granted. In Scotland legislation governing the extraction of marine aggregates is the Town and Country Planning (Scotland) Act 1997, if the extraction is within the planning jurisdiction (i.e. above Low Water Mark) and the Environmental Impact Assessment and Habitats (Extraction of Minerals by Marine Dredging (Scotland)) Regulations<sup>3</sup>.

Local legislation applicable to aggregate extraction, includes the Zetland County Council Act 1974, which covers all territorial waters around Shetland, and the Orkney County Council Act 1974, which covers defined areas around Orkney.

### 1.11.4 Relevance to SEA 4

The coastal and marine areas within the SEA 4 region are not utilised for commercial marine aggregate extraction. As a consequence, any proposed increase in oil and gas activity, as a result of SEA 4 licensing, is unlikely to affect these extractive operations.

#### Sources of information

Barne JH, Robson CF, Kaznowska SS, Doody JP, Davidson NC & Buck AL (1997). Coasts and seas of the United Kingdom. Region 1 Shetland: Region 2 Orkney: Region 3 North-east Scotland: Cape Wrath to St Cyrus.

Birkett DA, Maggs C & Dring MJ (1998). Maerl: An overview of dynamics and sensitivity characteristics for conservation management of marine SACs

<http://www.english-nature.org.uk/uk-marine/reports/pdfs/maerl.pdf>

Crown Estate website

<http://www.crownestate.co.uk/estates>

The Crown Estate: Seabed Dredging, the area involved

<http://www.bmapa.org/pdf/crown.pdf>

Scottish Coastal Forum (2001) Foreshore and seabed development consents. Legislation overviews

Scottish Executive: Action for Scotland's Biodiversity

<http://www.scotland.gov.uk/library3/environment/afsb-04.asp>

Scottish Executive Central Research Unit (2001). Flora Celtica: Sustainable development of Scottish plants

<sup>2</sup> The Government View Procedure is “a non-statutory procedure, in which consultation is undertaken with interested parties and a Government View (favourable – with or without conditions – or unfavourable) on the application is given” (Scottish Coastal Forum 2001)

<sup>3</sup> As at 2001, this legislation and an additional Government circular setting out the requirements for EIA to be undertaken for all new applications were in preparation.

## 1.12 Marine disposal

### 1.12.1 Introduction

The last fifteen years have seen statutory changes governing the types of waste that can be disposed of at sea. During this time licensed areas have been in operation within the SEA 4 area for the disposal of dredged material excavated from ports and harbour operations.

In Scotland, the licensing function for disposal at sea is administered by SEERAD through the Fisheries Research Services under the Food and Environment Protection Act 1985.

Since 1994, the dumping of most forms of industrial waste has been prohibited, with the disposal of sewage sludge phased out at the end of 1998. The majority of the remaining material eligible for disposal at sea is now dredging waste from excavated ports, navigation channels and coastal engineering projects

### 1.12.2 Activity in the SEA 4 area

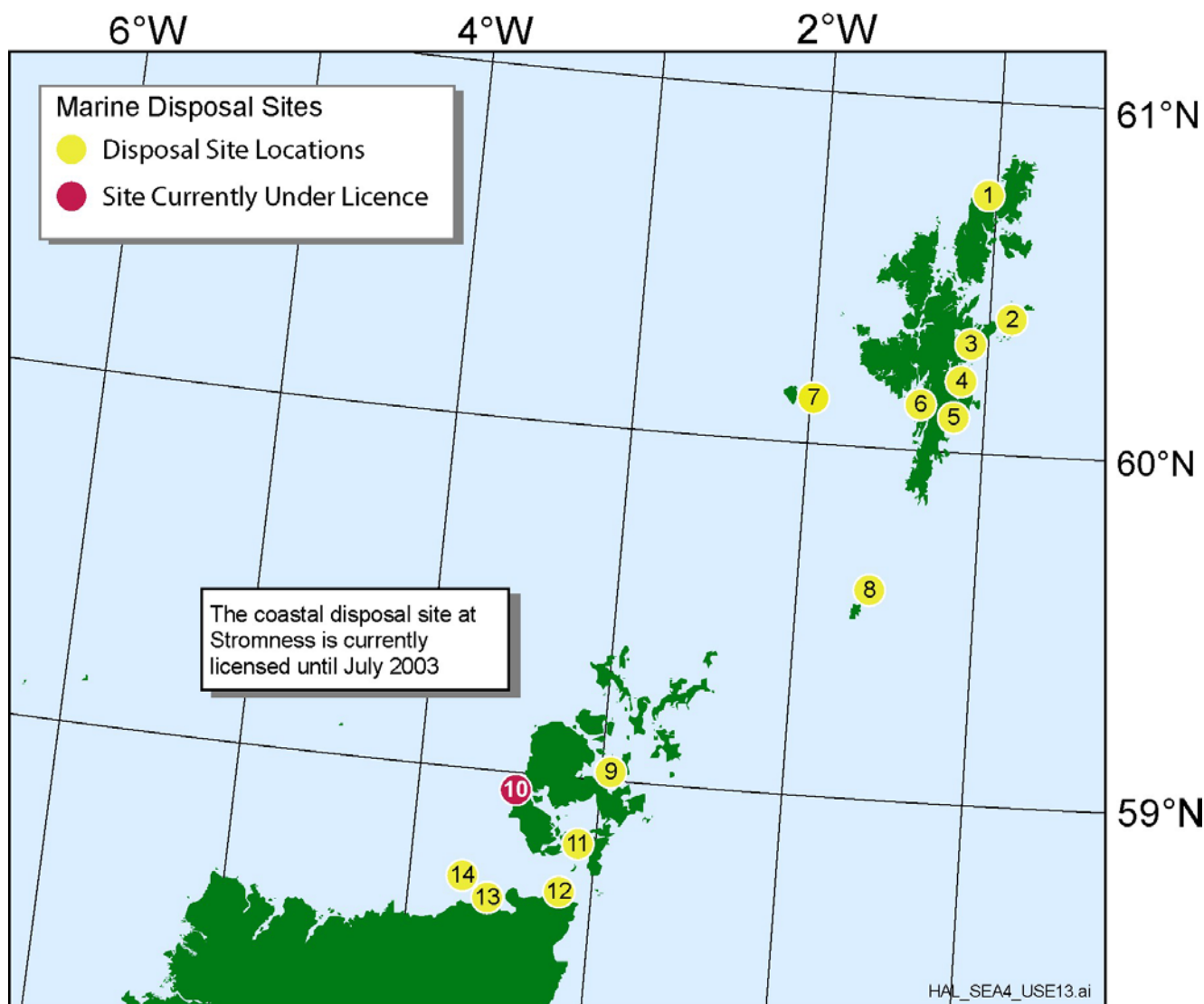
#### Disposal of dredged material

Within the last few years there have been a number of coastal sites around Shetland, Orkney and the north coast of Scotland which have been licensed for the disposal of dredged material. The details of these can be found in Table 1.12.1 and Figure 1.12.1.

**Table 1.12.1 - Location of coastal disposal sites within the SEA 4 area**

Map ref.	Disposal site name	Map ref.	Disposal site name
1	Cullivoe	8	North Haven
2	Skerries	9	Kirkwall
3	Symbister	10	Stromness
4	Lerwick	11	Scapa
5	Punds Voe	12	Gills Bay
6	Scalloway	13	Thurso
7	Foula	14	Scrabster

Figure 1.12.1 – Location of coastal disposal sites in the SEA 4 area



Since 2000, there have been six licenses granted for the marine disposal of dredged material. Of those licenses granted within the last three years, only one at Stromness remains valid in 2003 (Table 1.12.2) (Pers. comm. Peter Hayes, FRS).

Site name	Licence period	Licensed Tonnage	Returned Tonnage
Stromness	Sep 99 – Sep 00	200	27
Stromness	Nov 00 – Oct 01	200	18
Skerries harbour	Jul 00 – Jul 01	27,400	15,473
Cullivoe	Jun 00 – Jun 01	3,150	2,170
Stromness	Nov 00 – Oct 01	200	66
Stromness	Jul 02 – Jul 03	53,275	55,679

Further information relating to the marine disposal sites within the SEA 4 area can be obtained from the Fisheries Research Services Marine Laboratory in Aberdeen.



## Munitions dumping

Dumping of chemical weapons and munitions at sea has been carried out since the end of the First World War. The full extent of material dumped, their locations and present condition or stability is not fully known, however a considerable amount is believed to be dumped within the OSPAR Convention<sup>1</sup> area. Contracting parties to the Convention have supplied what information there is available to determine the location and extent of marine dumped chemical weapons and munitions.

Dumped munitions and chemical weapons can be disturbed by seabed activities such as fishing, sand and gravel extraction, dumping operations and the placement of cables and pipelines. Therefore it is essential that details of locations of dumpsites and areas where munitions are detected are accurately maintained.

There were no recorded dumpsites for chemical weapons or munitions within the SEA 4 area in 2002, with three identified sites just outside the SEA 4 area (Table 1.12.3).

Latitude	Longitude	Type of munitions	Notes
64.7	-1.6	CW <sup>1</sup> - Tabun	462 shells dumped set in concrete
62.97	1.46	CW	4,500 tons scuttled vessels
59	-7.67	CW	-

<sup>1</sup>CW means chemical weapons

Given the large number of sunken warships within Scapa Flow there is conjecture as to the condition of any munitions which went down with the ship. Certainly there are very small streams of oil fuel from specific wrecks. There is no reason to believe that these wrecks provide a significant environmental safety problem within the Flow.

### 1.12.3 Relevance to SEA 4

There are no records of chemical weapon or munitions dumpsites or any indication that munitions have been detected within the SEA 4 area. Although there is uncertainty surrounding the quantities, types, locations and present condition of the materials the lack of recorded evidence suggests that there are no significant dumpsites within the SEA 4 area. Therefore, there is unlikely to be a direct affect by any proposed increase in oil and gas activity as a result of SEA 4 licensing.

#### Sources of information

Barne JH, Robson CF, Kaznowska SS, Doody JP, Davidson NC & Buck AL (1997). Coasts and seas of the United Kingdom. Region 1 Shetland: Region 2 Orkney: Region 3 North-east Scotland: Cape Wrath to St Cyrus.

Crown Estate website

<http://www.crownestate.co.uk/estates>

OSPAR Commission 2002 Overview of past dumping at sea of chemical weapons and munitions in the OSPAR Maritime Area.

Personal comments Peter Hayes FRS Marine Laboratory

<sup>2</sup> “OSPAR Convention” is the Convention for the Protection of the Marine Environment of the North-East Atlantic and it entered into force on the 25<sup>th</sup> March 1998. It has been ratified by a number of European countries including the United Kingdom.

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## 1.13 Tourism and leisure

### 1.13.1 Introduction

Tourism is one of Scotland's largest industries and it has grown by 43% over the last thirty years. The industry is an important source of income and employment within the SEA 4 area which has many long established tourist attractions. The area is important for a diverse range of recreational activities from bird watching to sailing.

There are a large number of beaches, mostly quiet and in scenic locations, and sheltered areas around Shetland, Orkney and the Scottish north coast, however designated bathing waters are few in number. Marinas are being further developed in the area to satisfy increasing demand from visiting yachts.

A number of strategies and initiatives have been introduced at local level throughout the SEA 4 region that aim to improve and enhance the tourism industry, especially in relation to ecological, historical and archaeological attractions.

### 1.13.2 Activity in SEA 4 area

#### Tourism and leisure

In 2001 the tourism sector was badly affected by the foot and mouth crisis. The number of visits to the UK fell by over 9% (over 2 million visits) with spending reduced by £1.5 billion. However, the industry improved throughout 2002 and there was an increase in visits in the period June to August of 7% compared to the same period in 2001.

The Shetland Visitor Survey of 2000 found that, excluding the cruise and yacht market, over 47,000 people visited Shetland with a total expenditure of over £11 million. Of the total number of visitors, 45% were for business, 35% for holiday and 18% to visit family and friends (2% classified as 'others'). Approximately 113,000 visited the Orkney Islands in the same year.

The numbers and expenditure of both UK and foreign tourists to the Scottish Highlands for 2001 are shown in Table 1.13.1.

<b>Table 1.13.1 – Number and expenditure of UK and overseas tourists to the Highland region and Scotland 2001</b>		
	<b>Highland region</b>	<b>Scotland total</b>
<b>UK residents</b>		
Number of trips to the region (million):	2.53	23.71
Expenditure (£ million):	480	4,403
<b>Overseas residents</b>		
Number of tourists (million):	0.36	3.65
Expenditure (£ million):	73	1,116

The coastal region of SEA 4 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,

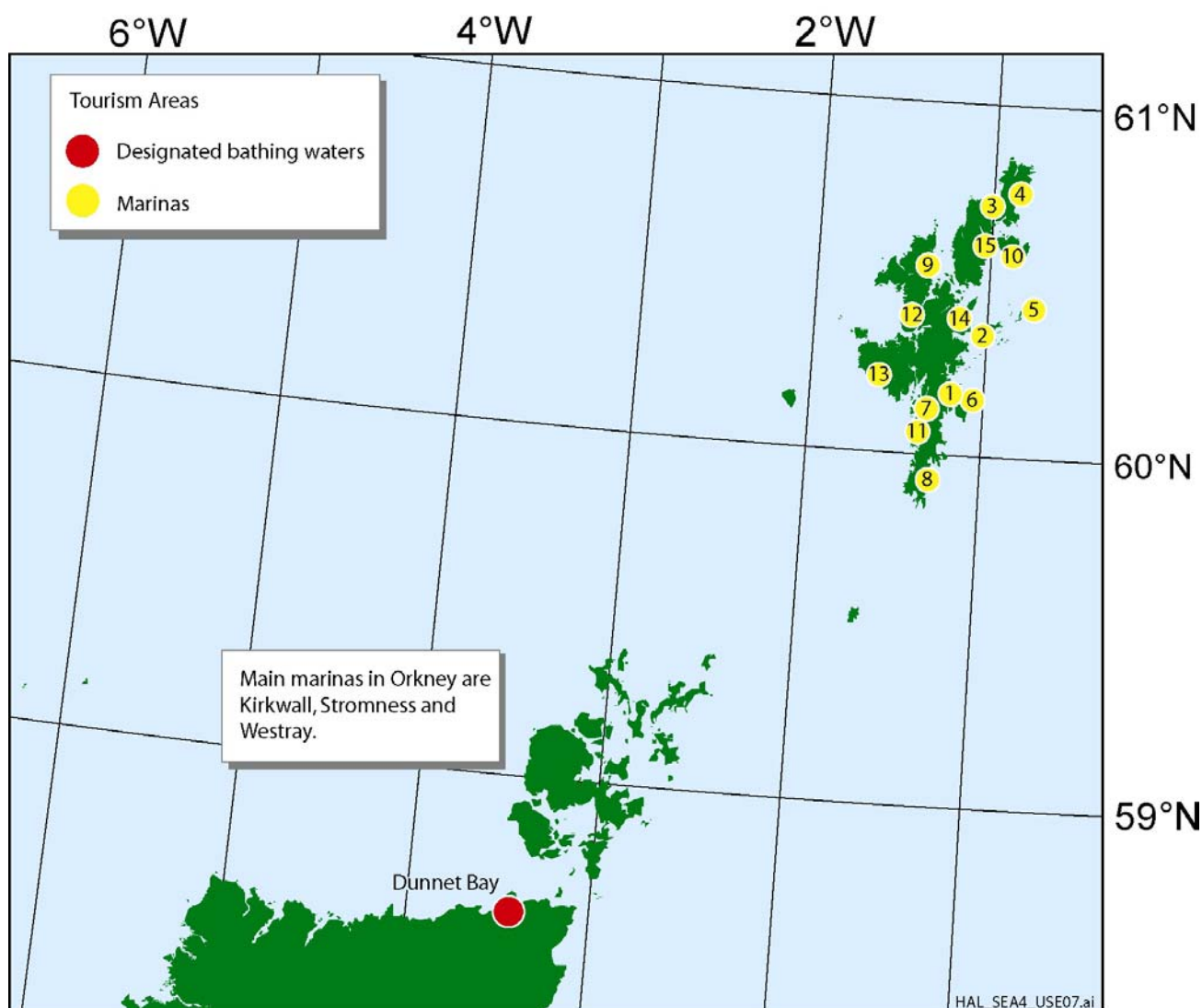
windsurfing, motorised watersports and wreck diving, while there are a number of coastal paths on the north coast of Scotland, including those at Duncansby Head, John O’Groats and Sandside Bay.

The Scottish tourist industry employed over 197,000 people in 2001 and in the Caithness and Sutherland regions, it is estimated that the industry employs or sustains approximately 2,500-3,000 people – accounting for 14% of all employment in the area. As traditional industries decline, the importance of tourism and recreation to rural economies is likely to increase.

## Bathing waters

Bathing waters that have attained certain water quality standards are identified as designated bathing waters under the EC Bathing Water Directive. In Scotland, the Directive is enforced through the Bathing Waters (Classification) (Scotland) Regulations 1991. Within the SEA 4 area, there is one designated bathing water area at Dunnet Bay on the north coast of Scotland that complied with the mandatory standard in 2002 (Figure 1.13.1).

Figure 1.13.1 – Designated bathing waters and marinas in the SEA 4 area



The Blue Flag is an exclusive eco-label awarded to beaches that satisfy criteria as stated in the EU Bathing Water Directive (76/160/EEC). There are no Blue Flag beaches in the SEA 4 area. Seaside

Awards acknowledge beaches that are clean, safe and display up-to-date information to the public. In 2002 there were no seaside award beaches in the SEA 4 area. This is not necessarily a criticism in so far as the great majority of beaches are isolated, pristine, visited by small numbers and there is little reason to seek formal clarification, especially as there are no villages or towns adjacent to most of these beach sites.

## Marinas

New developments in the Orkney and Shetland islands, have greatly improved the facilities available to visiting yachts from Holland, Germany, Denmark, Sweden and Norway. Marina developments in the region are shown in Table 1.13.2 and Figure 1.13.1.

**Table 1.13.2 - Marina developments in the SEA 4 area**

Map ref	Marina	Location
1	Gremista	Lerwick Harbour, Lerwick
2	Symbister	Symbister Harbour, Whalsay
3	Cullivoe	Cullivoe Harbour, North Yell
4	Baltasound	Balta Sound, Unst
5	Skerries	Stringa Voe, Out Skerries
6	Bressay	Leiraness Voe, Bressay
7	Scalloway	Port Arthur, Scalloway
8	Virkie	Pool of Virkie, Dunrossness
9	Collafirth	Colla Firth, Northmavine
10	Aith	Aiths Voe, Aithsting
11	Bridge End	South Voe, Burra Isle
12	Delting	Roe Sound, Delting
13	Walls	Vaila Sound, Walls
14	Vidlin	Vidlin Voe, Vidlin
15	Mid Yell	Mid Yell Voe, Mid Yell

The main marinas in Orkney are Kirkwall, Stromness and Westray and attract visitors keen to use Orkney as a central base for exploring the east and west coasts of Scotland.

### 1.13.3 Management issues and initiatives

#### Tourism and leisure

The Scottish Executive published the first strategy for the development of the tourist industry in 2000, which identified five areas for action - the need for effective use of IT; better marketing; higher standard of quality and service; develop the skills of the workforce and improve the support structure. Following review of the strategy, the Scottish Executive published the *Tourism Framework for Action 2002:2005*, which set out the opportunities and challenges that face the industry and identified further actions to be taken.

A focus for VisitScotland is to encourage expansion of the business tourism industry. The tourism industry is seasonal, which means employment is seasonal, however, business tourists not only spend on average, half as much again as leisure tourists, but the seasonal period is longer.

The three local authorities in the SEA 4 area - Shetland Islands Council, Orkney Islands Council and Highlands and Islands Council - recognise the importance of tourism to the area and have implemented structure plans that contain tourism policies aimed at taking a proactive approach to the

industry. Key objectives of these policies are to significantly increase and enhance the tourist industry within their regions, while ensuring wise and sustainable use of the natural environment and considering the needs of local communities.

In addition to new tourist developments, the structure plans highlight the need for the early development of Local Tourism Action Plans and Tourism Management Schemes, to take the strategy forward at a local level. Action Plans have been developed for Caithness and Sutherland.

## Employment

The Shetland and Orkney Islands and the Scottish north coast are relatively isolated and access for tourists is comparatively more difficult and expensive than to other parts of Scotland. The numbers of tourists visiting these regions are therefore less than those visiting other parts of the country. Despite this, the revenue generated from the tourist industry is vital to the Highlands and Islands economy, sustaining many small businesses, as well as providing direct and indirect employment in regions where there are fewer employment opportunities.

The Scottish Executive aims to set up a new industry led body to re-focus attention on the people employed within the tourism industry. Its remit will include promoting better terms and conditions, for employees and improving learning, employment and career opportunities.

## Niche markets

Niche markets, and visitors with a strong interest in the environment, nature and wildlife watching – “green tourism” - need to be proactively targeted. The establishment of Marine National Parks and the further development of Marine Nature Reserves could provide an important national and international focus for many visitors.

## Bathing waters

In 2002 the Scottish Executive Environment Group published a report “Scotland’s Bathing Waters; A Strategy for Improvement”. This strategy sets out objectives to reduce sewage pollution at bathing waters and examines the role that various sectors play in pollution reduction.

### 1.13.4 Relevance to SEA 4

Tourism provides a vital source of income for rural communities within the SEA 4 area. However, the relative remoteness of the area still proves difficult and costly to access for many tourists and this is reflected in lower numbers visiting the areas than those visiting other parts of Scotland or the UK as a whole.

The natural landscapes, wildlife observations, diving opportunities and marinas remain the principle draw for tourists to the area and these are unlikely to be directly affected by any proposed increase in oil and gas activity as a result of SEA 4 licensing.

#### Sources of information

Barne JH, Robson CF, Kaznowska SS, Doody JP, Davidson NC & Buck AL (1997). Coasts and seas of the United Kingdom. Region 1 Shetland: Region 2 Orkney: Region 3 North-east Scotland: Cape Wrath to St Cyrus

Blue flag beaches/marinas website

<http://www.blueflag.org>

Highlands & Islands Enterprise network Economic Factsheet 2000

[http://www.the-lochaber-economy.com/documents/pdf/tourism\\_stats.pdf](http://www.the-lochaber-economy.com/documents/pdf/tourism_stats.pdf)

Orkney Tourist Board website

<http://www.visitorkney.com/sailing.html>

Sail Scotland website

<http://www.sailscotland.co.uk/marinas.cfm>

Seaside Awards website

<http://www.seasideawards.org.uk>

Scottish Coastal Forum 2003. Tourism and recreation task group

Scottish National Tourist Board website

<http://www.visitscotland.com>

Scottish Executive: A new strategy for Scottish tourism

<http://www.scotland.gov.uk/library2/doc11/sfst-00.asp>

Shetland Islands Council Development Plan

Shetland Enterprise website

<https://hie.co.uk/shetland/visitmarkt>

VisitScotland website

<http://www.visitscotland.com/>

Pers. Comments: Shetland Tourist Board.

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## 1.14 Coastal and marine archaeology

### 1.14.1 Introduction

A description of the prehistoric archaeology of the SEA 4 area is presented in the technical report, *The scope of Strategic Environmental Assessment of Continental Shelf Area SEA 4 in regard to prehistoric archaeological remains* ([http://www.offshore-sea.org.uk/sea/dev/html\\_file/udsea4\\_archaeology.php](http://www.offshore-sea.org.uk/sea/dev/html_file/udsea4_archaeology.php)).

The report states that “*Prehistoric submarine archaeological remains back to a date of about 9000 years ago, Mesolithic and Neolithic, could occur in the SEA 4 area between the northern mainland coast and out to a depth of the order of 150m on either side of the Orkney-Shetland Ridge.*” Although primarily focussed on the potential and realised marine archaeological resource, the report also briefly describes coastal archaeology in the SEA 4 area.

Dr Flemming’s report provides an authoritative and interesting review of the potential for prehistoric marine archaeology in the SEA 4 area, and considers the potential impacts and opportunities that oil and gas operations present in terms of this resource.

This section provides a broad overview of known archaeological sites in the SEA 4 area. It also describes the situation relating to shipwrecks and military remains and gives brief details of the legislation that protects them.

### 1.14.2 Archaeological sites in the SEA 4 area

#### 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 for the Orkney and Shetland Islands Council areas revealed 851 and 622 matches, respectively. The records are diverse and include a large number of sunken cargo, fishing and whaling vessels as well as military vessels and coastal defences.

#### 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/wwd\\_ancientmonuments](http://www.historic-scotland.gov.uk/wwd_ancientmonuments)) revealed a large number of monuments within the SEA 4 area, although the majority of these are terrestrial in nature (Table 1.14.1).

<b>Classification</b>	<b>Shetland</b>	<b>Orkney</b>	<b>Highland</b>
Cross and carved stones	2	1	43
Ecclesiastical	18	17	74
Industrial	11	5	45

<b>Classification</b>	<b>Shetland</b>	<b>Orkney</b>	<b>Highland</b>
Prehistoric domestic and defensive	197	135	428
Prehistoric ritual and funerary	94	172	364
Secular	36	31	153
<b>Total</b>	<b>358</b>	<b>341</b>	<b>1,107</b>

At present only a small number of underwater archaeological and historic sites are protected under existing legislation. Two areas of Scapa Flow, containing seven wrecks (three battleships and four cruisers) of the German High Seas Fleet which were scuttled in 1919, are scheduled as sites of national importance.

The wrecks are the only remnants of the High Seas Fleet to have survived commercial salvage activity. Normally the powers contained in the *Protection of Wrecks Act 1973* are used to ensure that wrecks of historical, archaeological or artistic importance are protected from unauthorised interference. The decision to schedule the wrecks in Scapa Flow was made because their designation means that no permit is required to visit these sites, provided they are not disturbed or damaged in any way.

## ScapaMAP

ScapaMAP is a research project based in the Department of Civil and Offshore Engineering, Heriot-Watt University, to promote the better management of the archaeological and historical heritage resources submerged in Scapa Flow. The project is supported by Historic Scotland and the Carnegie Trust for the Universities of Scotland.

The project aims to produce detailed maps of the remains of the High Seas Fleet, build effective monitoring strategies and produce site-specific management plans.

## Wrecks

### Designated wrecks

Two shipwrecks in the SEA4 area have been protected under the *Protection of Wrecks Act 1973*. These are the *Kennemerland* (60°25'12"N 00°45'00"W), a Dutch East Indiaman which sank in December 1664 on Stoura Stack, Out Skerries, Shetland and the *Wrangels Palais* (60°25'30"N 00°43'12"W), a Dutch warship which sank in 1687 on the Out Skerries, Shetland.

Historic Scotland manages the systems that control access and minimises impacts to these protected sites.

### War graves

The *Protection of Military Remains Act 1986* provides a means of protecting marine war graves (shipwrecks and aircraft). Under the Act, a number of wrecks (all war graves) have been designated as 'controlled sites'. Within the SEA 4 area, these controlled sites include *HMS Hampshire*, sunk off Orkney in 1916 with the loss of 650 lives; *HMS Vanguard*, sunk in Scapa Flow in 1917 with the loss of 667 lives; and *HMS Royal Oak*, sunk in Scapa Flow in 1939 with the loss of 833 men.

*Friends of War Memorials - Maritime*, is a group established in 1997 which seek to preserve and protect these subsea "memorials". They have compiled a list of UK vessels which they believe to be war graves and which should be designated controlled sites. There are number of vessels on this list which are within the SEA 4 area. Details of the list can be found on the group's website ([http://freespace.virgin.net/blue\\_graves/register.htm](http://freespace.virgin.net/blue_graves/register.htm)).

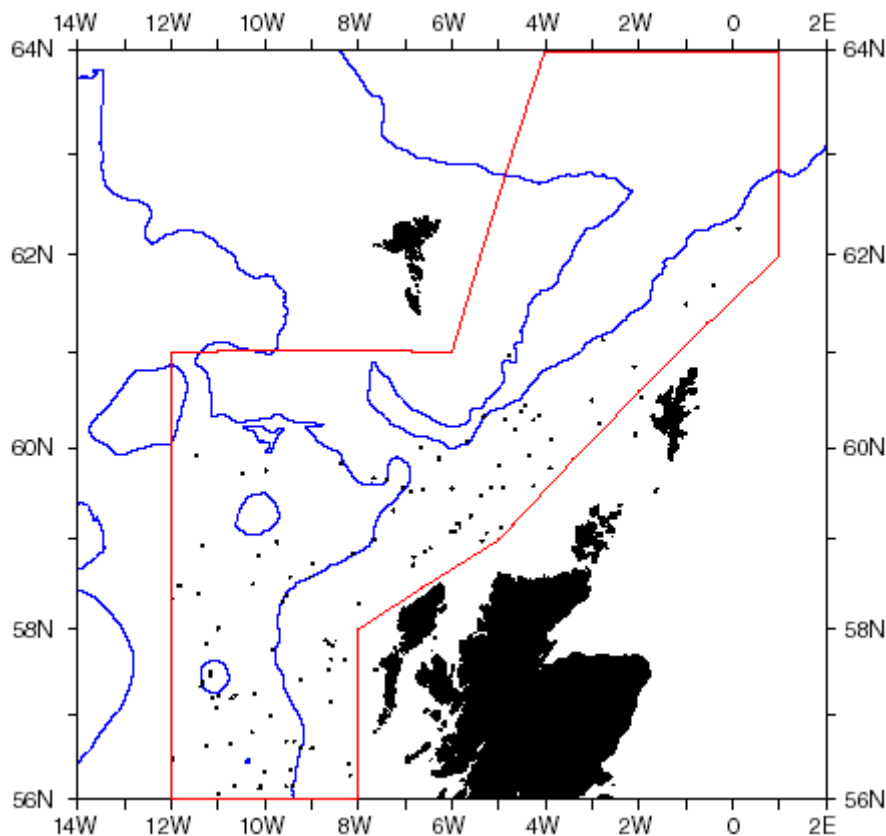
## Wrecks in the SEA 4 area

Information relating to the locations of a large number of shipwrecks and aircraft losses within UK waters is kept by the UK Hydrographic Office. However, this database likely represents a small fraction of the actual number of shipwrecks and aircraft losses whose locations remain unknown.

As part of the 1996 and 1998 AFEN surveys of the Atlantic Margin, the UK Hydrographic Office provided information relating to the locations of known wrecks in the area. Given that the region known as the Atlantic Margin covers a large part of the SEA 4 area, the results are of relevance to the present study.

The AFEN study restricted the list of wrecks found in the area to those which might have a significant environmental effect, and it was therefore decided to include only the wrecks of large vessels, defined as being over 60 metres in length or over 1,000 gross tonnes. This eliminated fisherman's fasteners, assorted anthropogenic junk, and many small fishing vessels, leaving a total of 112 wrecks of large vessels in the area. Of these, 24 were sunk by U-boat in the First World War and 52 were sunk by U-boat in the Second World War. The positions of the 112 large vessels wrecked in the area are plotted in Figure 1.14.1.

*Figure 1.14.1 – Location of significant wrecks located within the AFEN area, defined by the red lines. The 1000m isobath is shown in blue (Source – AFEN CD-ROM).*



### 1.14.3 Relevance for SEA 4

The SEA 4 area contains a large number of known important coastal and marine archaeological sites. However, the archaeological resource is likely to be much greater given that many sites have yet to be discovered. Despite this, it is unlikely that the limited activity predicted following licensing of SEA 4

would adversely affect this resource. As well as describing the potential impacts of oil and gas activities on the archaeological resource, Dr Fleming's report also examines the opportunities presented by these activities to uncover submarine archaeology. The report recommends mitigation measures to prevent damage to prehistoric archaeological remains from oil and gas activities.

#### **Sources of information**

Fleming NC (2003). The scope of Strategic Environmental Assessment of Continental Shelf Area SEA 4 in regard to prehistoric archaeological remains

Atlantic Frontier Environmental Network (2000). Environmental Surveys of the Seafloor of the UK Atlantic Margin [CD-ROM].

Owen O (Principal Inspector of Ancient Monuments). Historic Scotland response to SEA 3 consultation process

Royal Commission on the Ancient and Historical Monuments of Scotland website  
<http://www.rcahms.gov.uk/canmoreintro.html>

ScapaMAP information - International Centre for Island Technology website  
<http://www.icit.demon.co.uk/scapamap.htm>

Historic Scotland website  
[http://www.historic-scotland.gov.uk/wwd\\_ancientmonuments](http://www.historic-scotland.gov.uk/wwd_ancientmonuments)

Friends of War Memorials - Maritime website  
<http://freespace.virgin.net/war.graves/register.htm>

## 1.15 Locally important activities

### 1.15.1 Dounreay nuclear site

#### Introduction

The Dounreay nuclear site near Thurso operated by British Nuclear Fuel Ltd (BNFL) and the UK Atomic Energy Authority (UKAEA), has operated experimental fast breeder reactors and associated fuel processing plants for over 30 years. The 200MW Dounreay Fast reactor ceased generation of electricity in 1994. Since this time the relevance of Dounreay for 'energy' has disappeared, however the establishment will continue to be an important strategic subject for the Caithness and Sutherland area because of the economic and/or environmental significance of a number of issues including, decommissioning works to the various reactors now shut down, reprocessing of spent fuel, rectification of previous contamination incidents and the long term storage of low level radioactive waste.

#### Decommissioning

Management at the site is now focused on decommissioning of the reactors, ancillary nuclear facilities and the restoration of the environment. The Dounreay Site Restoration Plan is expected to take 50-60 years to complete and cost in the region of £4 billion.

The approach laid out in the Plan is to deal with the major hazards first and all of the major radiological hazards will be removed within some 25 years. By this time, the shaft which was used for storage and disposal, and wet silo will have been emptied. After the decommissioning programme is complete, a further period of care and surveillance will be required before the site can be released for unrestricted use. Table 1.15.1 highlights the decommissioning progress to date.

<b>Table 1.15.1 – Decommissioning progress to date</b>		
<b>Reactor</b>	<b>Shut down</b>	<b>Details</b>
Prototype Fast Reactor	1994	Fuel has been removed. Disposal of reactor coolant expected to be completed in 2003
Dounreay Fast Reactor	1977	A plant to deal with the wastes from the coolant has been constructed.
Dounreay Intermediate Level Waste Shaft	1977	Project underway to remove the waste from the shaft and treat it for storage
Dounreay Materials Test Reactor	1969	Fuel has been removed. Reactor being prepared for a further period of long-term care and maintenance prior to decommissioning
<b>Waste facilities</b>		
Dounreay has also improved its facilities for dealing with radioactive wastes		

The change from operations to decommissioning has led to a substantial increase in employment in recent years. Staffing levels have risen from 1,100 in the mid-1990s to about 2,000 in 2001 and UKAEA recruited an additional 250 staff during 2001/2002. According to the UKAEA, some £61 million is injected into the Caithness economy each year as a result of decommissioning.

## Management issues and initiatives

### Dounreay Site Restoration Plan

The Dounreay Site Restoration Plan, mentioned above, addresses the overall task of restoring the Dounreay site. The Plan integrates the many separate activities of decommissioning, fuel treatment, waste management and land remediation.

## Dounreay Particles Advisory Group (DPAG)

In recent years, a number of radioactive particles have been washed up on the nearby public beach at Sandside. The risk to the public from these particles is assessed by SEPA who, with UKAEA have initiated a monitoring programme. The Dounreay Particle Advisory Group (DPAG) was convened by SEPA in 2000 to provide UKAEA and SEPA with independent expert advice on the particles and suitable monitoring and research programmes.

DPAG members include those from universities, the National Radiological Protection Board, health boards and fisheries science. The Group published its second interim report in March 2003 which summarised the issues considered by the group over the last two years.

The main conclusions of the report are:

- More particles have been released into the environment, and for a longer period of time, than previously thought.
- It is likely that there are a number of separate groups of particles offshore. The movement of these particles means that they are unlikely to have come from a single source at Dounreay.
- The monitoring systems used to detect particles on beaches and in the marine environment need further development.

Further information regarding the DPAG and details of their interim report can be found on the SEPA website (<http://www.sepa.org.uk/regulation/radioactivity/dpag/index.htm>).

## Relevance for SEA 4

The decommissioning of Dounreay is important locally in terms of employment and the economic revenue it brings into the surrounding area. Licensing of the SEA 4 area and subsequent production is unlikely to have any detrimental effect on the decommissioning process

### Sources of information

UKAEA website

<http://www.ukaea.org.uk/dounreay/>

Planning the Future – A Summary of the Dounreay Site Restoration Plan (2000)

SEPA DPAG website

<http://www.sepa.org.uk/regulation/radioactivity/dpag/index.htm>

## 1.16 Overarching coastal and marine management initiatives

### 1.16.1 Introduction

Scotland has one of the most varied marine and coastal environments in the world, and for a relatively small country, a remarkably long coastline. Measured at the mean high water mark, the coastline of Scotland, including its islands, is over 11,800km long, equivalent to more than 10% of the north west European total.

Within the SEA 4 area, the highly indented coastline of Shetland is almost 1,400km long and represents approximately 12% of the total coastline of Scotland. Similarly, the numerous islands that make up Orkney support a coastline of over 880km in length, 7.5% of the Scottish total.

The SEA 4 coastal environment supports a range of important habitats and species (as described in the Conservation Report - [http://www.offshore-sea.org.uk/sea/dev/html\\_file/udsea4\\_conservation.php](http://www.offshore-sea.org.uk/sea/dev/html_file/udsea4_conservation.php)) and provides an important resource for a variety of different users (as described in the previous sections).

This section describes a number of management initiatives and schemes which seek to balance the environmental sensitivity of the coastal area with its resource potential. It describes overarching management schemes, which apply to a range of coastal users rather than the more specific management initiatives described within the previous sections.

### 1.16.2 Coastal planning initiatives

#### Introduction

The rural nature of much of the SEA 4 coast means that coastal planning management is of great importance in maintaining the character of the area. To this end, a number of statutory and non-statutory plans and initiatives help to guide development within the coastal zone.

#### National Planning Policy Guidelines (NPPG)

National Planning Policy Guidelines (NPPG) 13 sets out the Scottish Executive's policy on coastal planning matters. NPPG 13:

- Sets out how planning can contribute to achieving sustainable development and also maintaining and enhancing biodiversity on the coast
- Highlights the need to distinguish between policies for the developed, undeveloped and isolated coast
- Indicates how planning authorities should respond to the risk of erosion and flooding in the coastal zone
- Outlines policy guidance for developments which may require a coastal location
- Identifies action to be taken by planning authorities in their development plans and in development control decisions

The Guidelines are transposed into a strategic planning policy through the creation of development plans.

#### Development Plans

The development plan is made up of two parts – the structure plan and the local plan. The **structure plan** for an area takes a long-term view of development, considering its general scale and broadly where it should be located. **Local plans** are often for smaller areas and set out more detailed policies

and proposals to guide development. Between them they determine how much development may take place, where it will take place and where it is unlikely to be allowed.

The current status of development plans in operation within the SEA 4 area is shown in Table 1.16.1.

<b>Table 1.16.1 – Current status of development plans in the SEA 4 area</b>			
	<b>Local Authority</b>	<b>Submitted</b>	<b>Adopted</b>
<b>Shetland</b>			
Shetland Structure Plan 2001-2016	Shetland Islands Council	2000	2001
Shetland Local Plan Finalised Draft	Shetland Islands Council	2002	
<b>Orkney</b>			
Orkney Local Plan Finalised Draft <sup>1</sup>	Orkney Islands Council	2000	2002
<b>North coast of Scotland</b>			
Highland Structure Plan	The Highland Council	2000	2001
North West Sutherland Local Plan <sup>2</sup>	The Highland Council		1987
Tongue and Farr Local Plan <sup>2</sup>	The Highland Council		1995
Caithness Local Plan	The Highland Council		2002

Note: <sup>1</sup>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 part of the Development Plan has been revised and in December 2001 the Council approved a finalised draft of the Plan. <sup>2</sup>A Local Plan for North Sutherland will replace the North West Sutherland and Tongue and Farr Plans – work on the Plan is due to start in 2003.

## Shoreline Management Plans

Shoreline Management Plans (SMPs) provide large scale assessment of the risks associated with coastal processes of erosion and flooding and present a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner (DEFRA 2001).

SMPs were first introduced in England and Wales in 1995 and have been prepared, under direction from DEFRA (formerly MAFF), by partnerships of coastal local authorities for the entire English and Welsh coastline. The Plans are based upon natural divisions of the shoreline, sedimentary cells and sub-cells, rather than administrative boundaries.

There is no statutory requirement for Scottish authorities to prepare SMPs, though some have chosen to do so because of the benefits they confer. Currently, there are no SMPs for coastal areas of SEA 4.

### Sources of information

NPPG 13 - Coastal Planning. Scottish Executive website

[http://www.scotland.gov.uk/about/Planning/nppg\\_13\\_coastalplann.aspx](http://www.scotland.gov.uk/about/Planning/nppg_13_coastalplann.aspx)

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[http://www.scotland.gov.uk/about/Planning/planning\\_guide.aspx](http://www.scotland.gov.uk/about/Planning/planning_guide.aspx)

The Shetland Structure Plan 2001-2016. Shetland Islands Council

Shetland Local Plan Finalised Draft. Shetland Islands Council

The Orkney Local Plan 2000 Finalised Draft. Orkney Islands Council

The Highland Structure Plan. Highland Council

Highland Council Development Plan Register

[http://www.highland.gov.uk/plintra/devplans/pdf/dpr\\_nov02.pdf](http://www.highland.gov.uk/plintra/devplans/pdf/dpr_nov02.pdf)

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DEFRA (2001). Shoreline Management Plans. A Guide For Coastal Defence Authorities.

DEFRA Publications, London



### 1.16.3 Coastal water quality initiatives

#### Introduction

Within SEA 4, the management and maintenance of water quality is an important factor for a number of industries as well as conservation agencies. For example, shellfish must be harvested from areas that meet specific water quality criteria, bathing waters are classified according to the quality of their water and in terms of conservation; reductions in water quality could have a detrimental effect on the species or habitats of conservation interest.

As mentioned in the previous sections, there are specific classification schemes for shellfish harvesting areas and bathing waters that are monitored and regulated by SEPA. In addition, SEPA operate more general classification schemes for coastal and estuarine waters.

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.

#### Water quality classification schemes

SEPA operates two water quality classification schemes covering estuarine and coastal waters in Scotland. Through these, SEPA classifies the quality of tidal waters out to three nautical miles, the limit of waters regulated under SEPA's statutory pollution prevention and control powers.

##### Estuarine waters

The classification of estuarine waters includes measurements of dissolved oxygen; the presence, bioaccumulation and biological effects of toxic contaminants; biological quality (including the status of sediment-dwelling invertebrate and estuarine fish communities, and the suitability for passage of migratory fish through the estuary); and aesthetic impacts, mainly from litter and oil. The scheme does not take into account either bacterial contamination or nutrient levels, although it does include the indirect impact of nutrient enrichment upon resident flora and fauna

In 2001, SEPA classified 266.9km<sup>2</sup> of estuarine waters in the Highlands, Islands and Grampian area, of which almost 96% was classified as excellent, 3% good and 1% unsatisfactory. No areas were classified as seriously polluted.

##### Coastal waters

SEPA's coastal water classification scheme aims to assess impacts on beaches, the seabed and water quality up to three nautical miles from the coast. The scheme incorporates measurements of chemical quality, biological quality, bacteriology and aesthetics. The scheme is applied to around 6,900km of Scottish coastline although it has not yet been applied to the coastal waters of the Outer Hebrides, Orkney and Shetland.

In 2001, SEPA classified 8503.8km<sup>2</sup> of coastal waters in the Highlands, Islands and Grampian area, of which about 96% was classified as excellent, 2.4% good, and 0.2% as seriously polluted.

#### Water Framework Directive

The Water Framework Directive (Directive 2000/60/EC) was adopted by the European Parliament and the Council of the European Union in December 2000. It establishes a new planning system for the protection, improvement and sustainable use of Europe's water environment.

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

- Firstly, it introduces new, broader ecological objectives, designed to protect and where necessary, restore the structure and function of aquatic ecosystems.
- The second key change is the introduction of a river basin management planning system. This will be the key mechanism for ensuring the integrated management of groundwater, rivers, canals, lochs, reservoirs, estuaries and other brackish waters, and coastal waters.

The Directive sets out a timetable for both initial transposition into the laws of each Member State and thereafter, for the implementation of requirements (Table 1.16.2).

<b>Table 1.16.2 – Timetable for implementation of Water Framework Directive (1<sup>st</sup> tranche of RBMPs)</b>	
<b>Year</b>	<b>Requirement</b>
2003	Transpose directive into domestic law. Identify river basin districts and the competent authorities that will be empowered to implement the Directive.
2004	Complete first characterisation and assessment of impacts on river basin districts. Complete first economic analysis of water use. Establish a register of protected areas.
2006	Establish environmental monitoring programmes Publish a work programme for producing the first River Basin Management Plans (RBMP)
2007	Publish an interim overview of the significant water management issues in each river basin district for general consultation.
2008	Publish draft RBMPs for consultation.
2009	Finalise and publish first RBMPs Finalise programme of measures to meet the objectives
2012	Ensure all measures are fully operational. Publish timetable and work programme for second RBMPs

The Directive was transposed into Scottish law through the passing of the Water Environment and Water Services (Scotland) Bill in January 2003.

A single Scottish River Basin Management Plan is likely to be supplemented by sub-basin plans. These will introduce, for the first time in Scotland, 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), including increased linkages with the aquatic and wetland aspects of the Birds and Habitats Directives.

Further details of the Directive and the Water Environment and Water Services (Scotland) Bill can be found on the SEPA website (<http://www.sepa.org.uk/guidance/wfd/introduction.htm>).

**Sources of information**

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## 1.16.4 Coastal and marine nature conservation initiatives

### Introduction

The coastal region of SEA 4 supports a range of important habitats and species, many of which are protected under local, national and international conservation designations. At a national level, the many coastal SSSIs in the region have simple management statements which provide information about the site, factors which influence management and a summary of the management system in place. At an international level, management schemes for marine SACs have been produced for a number of sites in Shetland and this process is ongoing.

Presently, there are a number of initiatives underway which may influence conservation management of the coastal and marine resource in the future. These include the Review of Marine Nature Conservation and a number of biodiversity initiatives.

### Marine cSAC management

As described in the Conservation Report, the coastal region of SEA 4 supports a number of sites that contain habitats and species of international importance for nature conservation. The primary form of protection for these sites comes from inclusion within the *Natura 2000* network, as either candidate Special Areas of Conservation (cSAC) under the Habitats Directive or Special Protection Areas under the Birds Directive.

The development of management schemes for marine cSACs plays a key role in the implementation of the Habitats Directive.

### Management schemes in SEA 4

Papa Stour cSAC is situated off the west coast of Mainland Shetland and includes the water and coast around the island of Papa Stour, as well as part of the coast on the adjacent mainland at Sandness.

Papa Stour cSAC was selected as one of twelve sites included in the UK Marine SACs Project. The main aim of the Project was to develop individual management schemes for candidate SACs in Britain and to collate and improve knowledge on the management of marine SACs throughout Europe.

Shetland Islands Council set up a Marine SACs Advisory Panel encompassing the relevant/competent authorities and organisations listed below:

- **Shetland Islands Council:** Member and service representation
- **Interest groups:** Shetland Salmon Farmers Association, Shetland Shellfish Growers Association, Shetland Shellfish Management Organisation, Shetland Fishermen's Association, Shetland Agricultural Association, Shetland Amenity Trust, Shetland Islands Tourism and RSPB
- **Government agencies and Statutory undertakers:** Scottish Natural Heritage, Scottish Fisheries Protection Agency, Scottish Environment Protection Agency and North of Scotland Water Authority
- **Community councils:** Both the Association and individual Community Councils, as appropriate.

The main aim of the management scheme was to assist relevant authorities in the management of the marine cSAC with respect to the requirements of the Habitats Directive and the Conservation (Natural Habitats &c.) Regulations 1994. The finalised management scheme for Papa Stour cSAC was published in 2000.

The Advisory Panel is now involved in developing, implementing and monitoring schemes for all marine cSACs in Shetland.

The Advisory Panel was responsible for the production of draft management schemes for The Vadills marine cSAC and Mousa marine SAC in February 2003. Both schemes set out appropriate measures for the management of the habitats and species within the sites. In doing so, they take into account not only the requirements of the interest features within the sites, but also the importance of local economic, social, cultural and recreational factors.

## Initiatives to establish offshore conservation sites

### Introduction

Initiatives at both national and European level are in the process of identifying selection criteria and potential offshore sites which may warrant protection. These initiatives include the Offshore Natura 2000 Project and OSPAR's Marine Protected Areas programme.

*The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* came into force on 31 May 2001, and regulates UKCS offshore oil and gas activities with respect to the European Council Directive on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), and the European Council Directive on the conservation of wild birds (the Birds Directive).

The JNCC has completed an assessment to inform the selection of Natura 2000 sites in offshore waters - *Natura 2000 in UK Offshore Waters: Advice to support the implementation of the EC Habitats and Birds Directive in UK offshore waters*. JNCC Report 325 (Johnstone *et al.* 2002) (<http://www.jncc.gov.uk/Publications/JNCC325/intro325.htm>). The report describes selection criteria and identifies potential areas which may qualify for protection.

A summary of this report, as well as a description of the OSPAR MPA initiative was provided for SEA 3 (Section 6 of the technical report, *Conservation Sites in the SEA 3 Area* - [http://www.offshore-sea.org.uk/sea/dev/html\\_file/pdf2.cgi/TR\\_010\\_W.pdf](http://www.offshore-sea.org.uk/sea/dev/html_file/pdf2.cgi/TR_010_W.pdf)). This current section will not re-examine issues covered by the SEA 3 review but will rather describe progress to date in identifying potential offshore conservation sites.

## Progress in identifying offshore Natura 2000 sites

At present, all identified marine cSACs and SPAs (which will form part of the *Natura 2000* network) are on or adjacent to the UK coast. There are no sites that are wholly at sea. However, JNCC are currently undertaking work to assist in identifying further sites in the offshore environment; this project follows a change in policy by the UK Government to apply both the Birds and Habitats Directives to the entire UK continental shelf. The first phase of this project will identify suitable sites in waters beyond 12nm from land. In undertaking this review of waters beyond 12nm, it is possible that further suitable sites will be identified within 12nm from the shore.

In June 2002, a seminar was held by DEFRA with representatives of other European countries and interested parties to consult on the methods proposed by the UK to implement the Habitats and Birds Directive out to 200 nautical miles. The proceedings of the meeting can be found on the JNCC website ([http://www.jncc.gov.uk/marine/offnat/pdf/meeting\\_0602.pdf](http://www.jncc.gov.uk/marine/offnat/pdf/meeting_0602.pdf)). In general, the methodology was received favourably with only some reservations on the methods proposed to identify offshore seabird aggregations. This element of work is to be developed further in 2003 to identify the most appropriate techniques.

To complete the site selection process for sites in the UK as a whole, a JNCC led inter-agency project group has been set up to co-ordinate all aspects of Natura 2000 site selection in the marine environment (0-200nm). This group replaces the former Offshore Natura 2000 Project groups, and integrates work on SACs with work under the Birds Directive.

A more recent update on the selection of criteria and potential areas for SACs and SPAs is provided in the JNCC Marine Natura 2000 paper, JNCC 03 P01 of March 2003 (see - <http://www.jncc.gov.uk/management/committee/papers03-03/>). This paper updated the Joint Committee on the work carried out under the marine Natura 2000 programme since September 2002 and in summary, proposed:

- Guidance for defining the seaward boundaries of seabird colony SPAs and habitat SACs away from the coast
- A methodology for the selection of offshore habitat SACs and that this methodology, together with the group 1 sites, be the subject as a basis for wider consultation with stakeholders
- Wider discussion on the level of biological information needed to select offshore habitat SACs with stakeholders, including Government during 2003

Following a consideration of selection criteria and principles, areas of Annex 1 habitat within the 12-200 nautical mile zone could be classified into Group 1 or Group 2 depending (respectively) on the confirmation/suspicion of the presence of Annex I habitat, adequacy/inadequacy of biological information, and absence/presence of sites of such character in territorial waters (0-12nm).

It is noted that sites will need to be selected from Group 2 as well as areas of habitat in Group 1 to fully represent the range of marine habitat types under Annex I of the Directive in UK waters.

### **Darwin Mounds**

In summer 2002, the JNCC formally submitted to DEFRA its recommendations that the Darwin Mounds should be a Special Area of Conservation (SAC). The area of sandy mounds on the Wyville Thomson Ridge currently supports the best known natural occurrence of the cold water coral, *Lophelia pertusa* in UK waters. Formal proposing of the site by the UK Government will proceed when regulations are in place to implement the EC Habitats Directive in UK offshore waters.

A public consultation on the Offshore Marine Conservation (Natural Habitats &c.) Regulations 2003 was launched by DEFRA in August 2003. This sets out the proposed Regulations to apply the Habitats and Birds Directives to the UK Continental Shelf and waters beyond 12 nautical miles over which the UK exercises sovereignty. The consultation document can be found on the DEFRA website (<http://www.defra.gov.uk/corporate/consult/offshore-marine/index.htm>).

The European Commission has, as of the 20<sup>th</sup> August 2003, adopted emergency measures immediately banning the use of bottom trawled gear over the Darwin Mounds. Under new measures adopted last December to reform the Common Fisheries Policy, the UK government requested Commission action because of the damage the gear is causing to the corals. The emergency measures are applicable for 6 months and will allow time for the Commission to adopt a Council Regulation permanently banning the use of the fishing gear concerned (EUROPA website).

### Qualifying habitats and species in the SEA 4 area

As mentioned above, the JNCC report *Natura 2000 in UK Offshore Waters* identifies potential areas of Annex I habitat and the distribution of Annex II species in UK offshore areas. This report remains the main source of information regarding offshore sites and includes distribution maps which will not be reproduced here but should be referred to for further information.

From the report, potential areas of 'reef' habitat relevant to SEA 4 include iceberg ploughmarks along the West Shetland Slope and Wyville Thomson Ridge; the Judd Deep; Solan Bank; Turbot and Otter Banks, and areas around the Shetland Islands. Of the potential areas the JNCC Marine Natura 2000 paper of 2003 identifies the Wyville Thomson Ridge as the only area of habitat within the SEA 4 area for which there is sufficient information to class it in Group 1.

Pockmarks with carbonate structures formed by leaking gases are the only features known to occur in UK offshore waters that may conform to the Annex I habitat 'Submarine structures made by leaking gases'. To date, a number of pockmark regions have been identified in the northern North Sea to the east of the SEA 4 area.

The SEA 4 area also supports a number of Annex II species for which offshore SACs may possibly be designated. These include grey seal, common seal, bottlenose dolphin and harbour porpoise. Further research is needed to clarify the offshore distributions of these species but it is likely, given the importance of the coastal regions of SEA 4 for seal breeding and haul out sites as well as our current knowledge of cetacean distribution, that offshore areas of SEA 4 may be protected in the future.

The importance of the coastal waters of SEA 4 for a large number of seabirds also make it likely that coastal SPAs in the region may be further extended into the marine environment and offshore areas important for feeding or overwintering may be designated.

### Progress in identifying OSPAR Marine Protected Areas (MPAs)

At Sintra, Portugal, in 1998 the OSPAR Commission adopted a new Annex V '*On the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area*' and an accompanying OSPAR Strategy. The objective of this Annex is to take the necessary measures to protect and conserve the ecosystems and the biological diversity of the maritime area which are, or could be, affected as a result of human activities, and to restore, where practicable, marine areas which have been adversely affected.

At a meeting in January 2003, in Dublin, the Biodiversity Committee published *Draft OSPAR Recommendations on a Network of Marine Protected Areas* to be put forward for adoption by the Commission. The purpose of the Recommendations are to establish an ecologically coherent network of well managed marine protected areas in the OSPAR maritime area by 2010 which will:

- Protect, conserve and restore species, habitats and ecological processes which have been adversely affected by human activities;
- Prevent degradation of, and damage to, species, habitats and ecological processes, following the precautionary approach;
- Protect and conserve areas that best represent the range of species, habitats and ecological processes in the maritime area.

It was also agreed at the meeting that an intercessional group on marine protected areas be set up to facilitate the implementation of the proposed OSPAR recommendation.

A Summary Record of the Dublin meeting, including a list of threatened species and habitats can be found on the OSPAR website (<http://www.ospar.org/eng/html/welcome.html>).

A review of distinctive habitats and species as well as those of conservation interest in the OSPAR maritime area was produced by WWF in October 2002 (Gubbay *et al.* 2002). *The Offshore Directory – Review of a selection of habitats, communities and species of the north-east Atlantic* aims to provide a useful reference to those working towards marine habitat and species conservation and the identification, establishment and management of MPAs in the OSPAR maritime area.

## Review of Marine Nature Conservation

The Review of Marine Nature Conservation (RMNC) was set up in 1999, by DEFRA. The review was established to examine the effectiveness of the system for protecting nature conservation in the marine environment.

The Review published an Interim Report and recommendations in 2001, part of which included an outline of a marine nature conservation framework. The Report recommended that this framework be tested at a ‘regional sea’ scale to investigate how it could be applied in practice. The Irish Sea was selected by the RMNC Working Group as the most suitable ‘Regional Sea’ for the study.

### Irish Sea Pilot

The Irish Sea Pilot seeks to improve the integration of nature conservation with the activities of other sectors. It aims to determine the potential of existing legislative, governance and enforcement systems for delivering marine nature conservation effectively. The Pilot is funded by DEFRA until March 2004.

The conservation framework the pilot is designed to test was developed by the UK Conservation Agencies for the RMNC and considers the sea at four scales:

1. The **whole sea** from the high watermark to the limits of UK jurisdiction should be maintained in a healthy state;
2. Ecologically distinct ‘**regional seas**’. The Irish Sea would be one such Regional Sea;
3. **Ecological units/Seascapes** within regional seas should be identified in terms of areas of discrete seabed, landform, substrate type or water column feature;
4. **Specific areas of national importance** for the maintenance of marine biodiversity within regional seas and ecological units will be identified, in particular areas necessary to sustain populations of nationally important habitats or species.

For each of the competent scales, the framework proposes that objectives will be set with the agreement of stakeholders. The sectoral authorities responsible for regulating marine activities will endeavour to achieve these objectives as they carry out their functions.

A draft set of ecological units of the Irish Sea and a map of their distribution has now been produced. The next stage is to identify the habitats and species associated with each ecological unit in order to investigate how well they can be used to predict the natural biodiversity resources of a regional sea with a view to extending the approach to other UK seas.

In parallel with work on identification and mapping of ecological units, a set of criteria for the identification of nationally important marine nature conservation features has been drafted and endorsed by the RMNC. The Irish Sea Pilot is now testing the application of these criteria.

A number of consultation documents have recently been produced by the RMNC including reviews of marine legislation, an interim data report and draft conservation objectives for the Irish Sea ([http://www.jncc.gov.uk/marine/irishsea\\_pilot/reports\\_comments.htm](http://www.jncc.gov.uk/marine/irishsea_pilot/reports_comments.htm)).

## Biodiversity initiatives

In June 1992, 159 governments at the Earth Summit, Rio de Janeiro, signed the Convention of Biological Diversity. The Convention entered into force in December 1993 and was the first treaty to provide a legal framework for biodiversity conservation. It called for the creation and enforcement of national strategies and action plans to conserve, protect and enhance biological diversity.

### UKBAP

In response to the Convention, the UK Government and partners created the UKBAP, a compendium of 436 biodiversity action plans – 391 species action plans and 45 habitat action plans. The selection of priority species and habitats is based on a detailed appraisal of the current status of critical species and habitats in the UK, together with the threats to their survival. Grouped species action plans have been produced where a range of common policies and actions are required for a number of similar species.

### LBAP

Local Biodiversity Action Plans (LBAPs) are seen as the most effective means of ensuring that the national biodiversity strategy is translated into effective action at local level. The primary purpose of LBAPs is to focus resources by means of local partnerships to implement conservation action for the priority species and habitats and locally important wildlife and sites.

Most of the local government regions within the SEA 4 area have, or are in the process of publishing LBAPs (Table 1.16.3). For the purpose of this report, species and habitats of direct relevance to SEA 4 have simply been listed, further details being available from the UKBAP website (<http://www.ukbap.org.uk>).

<b>Table 1.16.3 – LBAPs of relevance to SEA 4</b>	
<b>Plan name</b>	<i>Living Shetland Project</i>
<b>Plan coverage</b>	Shetland
Local/UK species:	Information collated but unpublished
Local/UK habitats:	Information collated but unpublished
Action plan status:	-
<b>Plan name</b>	<i>Orkney's Community Biodiversity Project</i>
<b>Plan coverage</b>	Orkney
Local/UK species:	Arctic tern, cetaceans, red throated diver, redshank, common skate, otter,
Local/UK habitats:	Coastal strandline, maritime grassland, maritime heath, coastal saltmarsh, coastal sand dunes, coastal vegetated shingle, maritime cliffs and slopes



**Table 1.16.3 – LBAPs of relevance to SEA 4**

Action plan status:	In draft
<b>Plan name</b>	Undecided
<b>Plan coverage</b>	Highland
Local/UK species:	Undecided
Local/UK habitats:	Undecided
Action plan status:	-

## Biodiversity strategy

In February 2003, the Scottish Biodiversity Forum published a proposed strategy document for consultation - *Towards a strategy for Scotland's biodiversity: Biodiversity Matters!* This set out a proposed strategy for the protection and enhancement of Scotland's biodiversity resource over the next 25 years.

The key overarching aim of the strategy is to “*facilitate real change on the ground to conserve and enhance Scotland's biodiversity.*”

For the Scottish maritime environment, the strategy recognises that policies promoting better-coordinated marine planning and management need to be pursued at Scottish, UK and European levels. The strategy also supports an ‘ecosystem-based approach’ for marine management.

## Draft Nature Conservation (Scotland) Bill

Biodiversity is also seen as an important component of the Draft Nature Conservation Bill that was presented for consultation by the Scottish Executive Environment Group in March 2003.

The proposed bill contains provisions which are designed to deliver:

- The conservation of biodiversity
- A more rounded and effective system of protection for SSSIs
- Improved measures to secure species protection and tackle wildlife crime

It is envisaged that the proposed bill will significantly enlarge the list of stakeholders who must be consulted when a new SSSI is identified or an existing one extended. The bill will create a statutory requirement for every new notification of an SSSI to be supported by a site management statement, thereby allowing socio-economic concerns to be addressed at an early stage. The bill will also establish a new mechanism for appeal by engaging the expertise and specialist skills of the Scottish Land Court.

The proposed bill will link with and support the draft Scottish Biodiversity Strategy. Public bodies will have to have regard to the Strategy in fulfilling their biodiversity duty.

## Sustainable Scottish Marine Environment Initiative

The Scottish Executive launched the first phase of a 'Sustainable Scottish Marine Environment Initiative' in November 2002. The aim of the initiative is to develop and then test the benefits of possible new management framework options for the sustainable development of Scotland's marine resources through the establishment of a number of pilot projects.

The initiative comprises three phases:

- Phase 1 - Management framework options design and pilot project scoping (February to May 2003)
- Phase 2 - Management framework creation and the inauguration of pilot projects (May 2003 to March 2004)
- Phase 3 - Pilot project implementation (April 2004 onwards)

The project will consider the nature, scale and potential of social, economic and environmental resources in Scottish waters and the pressures they face.

The initiative is intended to build upon and complement existing initiatives such as the UK-led Marine Stewardship Report and Review of Marine Nature Conservation, and in particular the Irish Sea Pilot and the work of the Scottish Coastal Forum.

#### **Sources of information**

Papa Stour cSAC website

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UK Marine SAC website

<http://www.ukmarinesac.org.uk/pdfs/casestudy-papastour.pdf>

JNCC Irish Sea Pilot website

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<http://www.scotland.gov.uk/consultations/environment/lnsp1.pdf>

Sustainable Scottish Marine Environment Initiative website

<http://www.scottish-marine-sustainability.co.uk/>

OSPAR website

<http://www.ospar.org/eng/html/welcome.html>

JNCC Offshore Natura 2000 seminar proceedings

([http://www.jncc.gov.uk/marine/offnat/pdf/meeting\\_0602.pdf](http://www.jncc.gov.uk/marine/offnat/pdf/meeting_0602.pdf))

*Natura 2000 in UK Offshore Waters: Advice to support the implementation of the EC Habitats and Birds Directive in UK offshore waters.* JNCC Report 325 (Johnstone *et al.* 2002) - <http://www.jncc.gov.uk/Publications/JNCC325/intro325.htm>

JNCC Nature News Issue 5: Spring 2003. Into the big blue. JNCC website

<http://www.jncc.gov.uk/communications/naturenews/issue5/bigblue.htm>

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[http://europa.eu.int/comm/fisheries/news\\_corner/press/inf03\\_36\\_en.htm](http://europa.eu.int/comm/fisheries/news_corner/press/inf03_36_en.htm)

## **1.16.5 Integrated Coastal Zone Management (ICZM)**

### **Introduction**

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.

On 30 May 2002, the European Union adopted a Recommendation on implementing ICZM in Europe. This asks Member states to undertake a national stocktaking of legislation, institutions and stakeholders involved in the management of the coastal zone and, based on this, to develop national strategies to deliver ICZM.

The UK stocktaking exercise is to be completed early in 2004. Following that the UK Government will prepare an overarching vision for the coast underpinned by a fully integrated set of strategies for Scotland, England, Wales and Northern Ireland by 2006.

The Scottish Coastal Forum is currently in the process of developing the national coastal strategy for Scotland which will address the main areas identified in the EU Recommendation.

## Scottish Coastal Forum

The early 1990's saw a plethora of activity on the issue of integrated coastal zone management in the UK. In Scotland, one of the key initiatives was the publication in March 1996 of "Scotland's Coasts - a Discussion Paper" (<http://www.scotland.gov.uk/environment/coastalforum/scotscoast.asp>) prepared by the Government. The main proposals set out in the paper were:

- The encouragement of local coastal fora to take forward integrated management of local coastal areas.
- The creation of a Scottish Coastal Forum, bringing together representatives of bodies with a major interest in, or responsibility for, coastal issues to provide a national context for the work of local fora.
- The preparation of a series of national guidance and advice publications, drawing upon the work and experience of the Scottish Coastal Forum and of the local coastal fora.

The proposals in the consultation paper received widespread support and the Scottish Coastal Forum was formed by Government, under independent Chairmanship, in November 1996 to:

- Encourage the formation of local coastal fora providing a point of co-ordination for these as well as acting as a central point for their views and concerns.
- Encourage debate on coastal issues at national level.
- Seek opportunities for better co-ordination of national frameworks and policies; consider the need for further advice and guidance; and assist in its preparation.
- Gather information about approaches to coastal management and disseminate good practice to local fora.

The current membership of the Forum includes the Association of Scottish Shellfish Growers, British Ports Association, CBI (Scotland), CoastNET, CoSLA, Crown Estate, HIE, Maritime & Coastguard Agency, Scottish Enterprise, Scottish Executive, SEPA, Scottish Fishermen's Federation, SNH, Scottish Quality Salmon, Sport Scotland, Scottish Environment LINK, Scottish Tourist Board.

To date, the Forum has been actively involved in a range of projects and has produced a number of reports including an inventory of coastal plans, an assessment of the socio-economic and environmental benefits of ICZM in Scotland, an appraisal of lessons learned from local coastal management partnerships, strategy papers, legislation overviews and a range of information sheets and conference proceedings.

Further information regarding the Scottish Coastal Forum can be found on their website (<http://www.scotland.gov.uk/environment/coastalforum/default.asp>).

## Relevant initiatives in SEA 4

### Fair Isle Marine Environment and Tourism Initiative (FIMETI)

FIMETI is a partnership of the Fair Isle community, Fair Isle Bird Observatory Trust and the National Trust for Scotland set up in 1995. The aims of the Initiative are:

- To provide adequate protection for the marine environment surrounding Fair Isle in recognition of its cultural as well as its environmental values and traditions for the benefit of the Isle, its inhabitants, its visitors and the nation.
- To demonstrate the continued role and value of safeguarding the marine resource through sustainable management as traditionally practiced by inhabitants of Fair Isle.
- To maintain and enhance the marine environment and related traditional activities.
- To provide facilities and interpretation which will benefit and serve tourists, widen the range of tourism attractions, and make Fair Isle a model for environmentally positive tourism.
- To initiate and act as a model for integrated protection, interpretation and appreciation of the marine environment.

The scope of the Initiative's aims meant that outside bodies, particularly those with an interest in or responsibility for Fair Isle's marine area, had to become involved. Recognition of this led, in 1998 to the formation of the Fair Isle Marine Partnership (FIMP).

The Fair Isle Marine Partnership is a forum for all interested parties and users of the Fair Isle marine resource. FIMP currently comprises representatives of Fair Isle Observatory Trust, the Fair Isle Community, the National Trust for Scotland (the three partners in FIMETI), the RSPB, SNH, The Shetland Fishermen's Association and Shetland Islands Council.

More information can be found on the FIMETI website (<http://www.fairisle.org.uk/FIMETI/>).

### Orkney Marine and Coastal Forum

The Orkney Community Plan published in 2003 by Orkney Islands Council lays out a vision of how the community of Orkney will develop in the future. With regard to Orkney's natural environment, the Plan sets out a number of objectives:

- To protect the marine environment of Orkney and promote the sustainable use of its resources.
- To raise awareness of sustainability and environmental issues among businesses, organisations and consumers.

To this end, the Orkney Marine and Coastal Forum has been established which is assisting in the development of a Coastal Zone Management Plan for the whole of Orkney.

### Scapa Flow Management Strategy

Orkney Islands Council commissioned the International Centre for Island Technology (ICIT) to produce a Scapa Flow Management Strategy in 1998, (updating a 1989 document). The Strategy described the baseline environment and potential benefits of an ICZM strategy for Scapa Flow.

The Council's corporate plan, *A Vision for Orkney*, indicates that a wider study of Coastal Waters Management is now under way headed by the ICIT.

## Highlands and Islands Enterprise: Marine Science Strategy Group

In 2002, Highlands and Islands Enterprise set up a group of interested groups and individuals to develop a strategy for better exploration of Scottish marine resources. This is a development from the report, *Assessment of Marine Science Activities and Capability in Scotland*, which was commissioned in 2001, jointly by Scottish Enterprise and Highlands and Islands Enterprise. This report showed that a vigorous sector exists which is estimated to be worth more than £100m to the Scottish economy. The work of the Highlands and Islands Group is ongoing and further information can be obtained from the HIE website (<http://www.hie.co.uk>).

In general, the existence and aims of this group is symptomatic of a rising interest in the potential of both the coastline and adjacent marine areas for various forms of development and integrated exploitation within a sustainable, ecosystem-based framework. The SEA 4 area will be subsumed within many of these initiatives, most of which appear to be seeking a more coherent management framework than exists at present where sectoral rather than integrated approaches are dominant.

## Relevant European initiatives

### OSPAR Commission

In 1992, the Oslo and Paris conventions were merged and modernised to form the OSPAR Convention for the Protection of the Marine Environment of the North East Atlantic. The convention requires that Contracting Parties shall *'take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected'*.

The Ministerial Meeting of the OSPAR Commission in Sintra (Portugal) in July 1998 agreed on strategies aimed at guiding the future of the work of the Commission. In 1998 and 1999 the Commission adopted strategies for the purpose of directing its work on the medium- to long-term in five main areas, i.e. the protection and conservation of the ecosystems and biological diversity of the maritime area, hazardous substances, radioactive substances, combating eutrophication, and the environmental goals and management mechanisms for offshore activities. Five annexes were devised to reach these objectives (Table 1.16.4).

**Table 1.16.4 - OSPAR Annexes**

<b>Annex I</b>	On the prevention and elimination of pollution from land-based sources
<b>Annex II</b>	On the prevention and elimination of pollution by dumping or incineration
<b>Annex III</b>	On the prevention and elimination of pollution from offshore sources
<b>Annex IV</b>	On the assessment of the quality of the marine environment
<b>Annex V</b>	On the protection and conservation of the ecosystems and biological diversity of the maritime area

The United Kingdom is one of 16 contracting parties to the convention. In the UK, OSPAR is coordinated by DEFRA (supported by JNCC in the development and implementation of the Biodiversity strategy) and the DTI (responsible for the Offshore Activities strategy).

### European marine strategy

The European Commission's 6<sup>th</sup> Environment Action Programme stipulated the development of a strategy for the protection and conservation of the marine environment with the overall aim *"to promote sustainable use of the seas and conserve marine ecosystems"*.

The development of an EU marine strategy is still very much in its infancy. The European Commission document, *Towards a strategy to protect and conserve the marine environment* ([http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002\\_0539en01.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0539en01.pdf)), has reviewed the present European and international policies which seek to control threats to the marine environment and has identified a number of objectives for the EU strategy. The document sets out an action plan and work programme for the Commission, the Member States, Candidate Countries and all relevant stakeholders to define and develop a strategy by 2004 for the protection and sustainable use of the marine environment.

The marine strategy will cover a range of themes including: loss of biodiversity and destruction of habitats; hazardous substances; eutrophication; radionuclides; chronic oil pollution; litter; maritime transport; health and environment; climate change; enhancing co-ordination and co-operation, and improving the knowledge base.

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## APPENDIX 1: GLOSSARY AND ABBREVIATIONS

<b>Term</b>	<b>Definition</b>
A/A	High and Low-angle Gunnery
AAF	Air-to-Air Flying
A/C	Aircraft
AFEN	Atlantic Frontier Environmental Network
ASF	Air-to-Surface Firing
A/S	Anti Submarine Practice
CCL	Climate Change Levy
CFP	Common Fisheries Policy
COAST	Computer Assisted Shipping Traffic – vessel movement database, developed by Safetec on behalf of UKOOA, DETR and HSE
DPAG	Dounreay Particle Advisory Group
DEFRA	Department for Environment, Food and Rural Affairs
Demersal	Living at or near the bottom of the sea
DETR	Department of Environment, Transport and the Regions (functions now split between the Department for Environment, Food and Rural Affairs (DEFRA) and the Department for Transport and the Office of the Deputy Prime Minister which replaced the Department for Transport, Local Government and the Regions (DTLR))
DTI	Department of Trade and Industry
EU	European Union
FIMETI	Fair Isle Marine Environment and Tourism Initiative
Finfish	A term used to separate true fish from shellfish, crayfish, jellyfish etc.
FRS	Fisheries Research Services
GW	Giga Watts
ICES	International council for the Exploration of the Sea
ICIT	International Centre for Island Technology
ICZM	Integrated Coastal Zone Management
IMO JMC	International Maritime Organisation Marine Environment Protection Committee
JMC	Joint Maritime Course
Km	Kilometre
LB	Live Bombing
MARPOL	International convention for the Prevention of Pollution from Ships
MEHRA	Marine Environment High Risk Area – area of high environmental sensitivity at risk from shipping
MW	Mega Watt
NPPG	National Planning Policy Guidelines
OPRC	Oil Pollution Preparedness, Response and Co-operation
OSPAR	Oslo and Paris Commission
Ova	Eggs
Pelagic	Organisms living in the water column of the sea
PEXA	Practice and Exercise Areas for the military
PSSA	Particularly Sensitive Sea Area
PTA	Pilotless Target Aircraft

<b>Term</b>	<b>Definition</b>
RMNC	Review of Marine Nature Conservation
Ro-ro	Roll on-roll off
RSO	Renewables Obligation Scotland
S/M	Submarine Exercises
SAC	Special Area of Conservation
SCRI	Scottish Community Renewable Initiative
SEA	Strategic Environmental Assessment
SEERAD	Scottish Executive Environment & Rural Affairs Department
SEPA	Scottish Environment Protection Agency
SOTEAG	Shetland Oil Terminal Environmental Advisory Group
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
Strategic Environmental Assessment	An appraisal process through which environmental protection and sustainable development is considered in decisions on policy, plans and programmes
SU	Firing at surface target
T	Torpedo
TA	Torpedo from Aircraft
TT	Target Towing
UA	Unitary Authorities
UK	United Kingdom
UKAEA	United Kingdom Atomic Energy Authority
UKCS	United Kingdom Continental Shelf