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Strategic Environmental Assessment – SEA2

HUMAN ACTIVITIES IN THE NORTH SEA

RELEVANT TO SEA2

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HUMAN ACTIVITIES IN THE NORTH SEA RELEVANT TO SEA2

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CORDAH

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1. INTRODUCTION

The purpose of this report is to provide a concise synthesis of human activities in the North Sea relevant to the Strategic Environmental Assessment (SEA2) being conducted by the Department of Trade and Industry. The SEA2 areas are depicted in Figure 1 and cover the Northern North Sea (NNS), the Central North Sea (CNS) and the Southern North Sea (SNS).

The report provides a synthesis of the following economic and other human activities in the SEA2 areas:

- Shipping
- Energy (Oil and Gas and Renewables)
- Telecommunications
- Military and Ordnance Disposal Sites
- Waste Disposal Sites
- Dredging and Aggregate Extraction
- Marine Archaeological Sites and Wrecks.

It should be noted that commercial fishing and coastal activities are being addressed separately.

The information contained within each 'interest' has been compiled from a number of published or otherwise easily available sources. All sources are cited and can be accessed for more detailed information if required. The information presented is as up to date as the available literature allows.

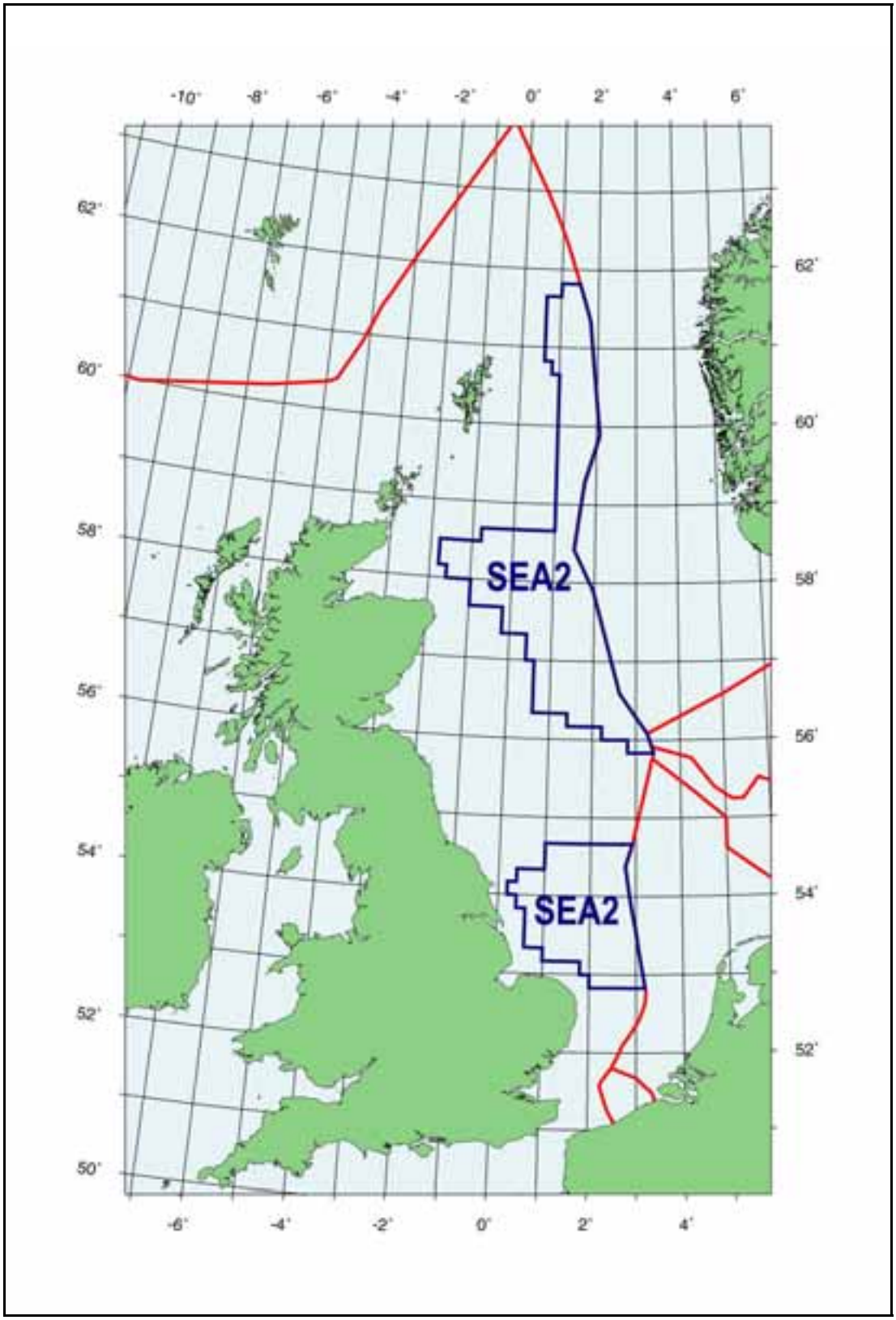

Figure 1: SEA2 Areas

2. SHIPPING

The North Sea is home to some of the busiest shipping lanes in the world. In 1996 alone there were 37,055 shipping movements transporting 48 million tonnes of cargo between the North Sea and the Baltic (QSR, 2000).

Figures 2 and 3 show that shipping traffic within the Northern and Central North Sea is relatively moderate with an average of between 1 and 10 vessels per day on routes passing through these waters. The majority of shipping traffic comprises merchant ships, supply vessels and tankers.

Within the Central North Sea merchant vessels represent over 61% of the total number of vessels and 45% fall within the weight class 0-1499 dwt. The majority of supply vessels originate in the Ports of Aberdeen or Peterhead and transect the region along the shipping lanes. The figures in Table 1 provide an estimate of the frequency of supply vessels utilising this region. There are also several tanker routes across the area, primarily in a north to southerly direction. All tankers reported to use this area weigh in excess of 40,000 dwt metric tonnes (Lord Donaldson Inquiry, 1994).

Table 1: Shipping Classifications for the Central North Sea (Lord Donaldson Inquiry. 1994)

Shipping Type	No. Routes	Total no. Vessels	Weight Class (dwt metric t)
Merchant vessels	14	14169	0-1499
Supply vessels	20	8564	0-1499
Tankers	7	400	>40,000

The Southern North Sea (SNS) experiences relatively busy shipping traffic and this is highlighted by the number of main ports along the coast. The location of these ports are shown in Figure 4 and consist of international ports, import/export facilities, roll on roll off facilities (ro-ro), ship building yards, container and ferry services, bases for the offshore oil and gas industry and commercial fishing facilities.

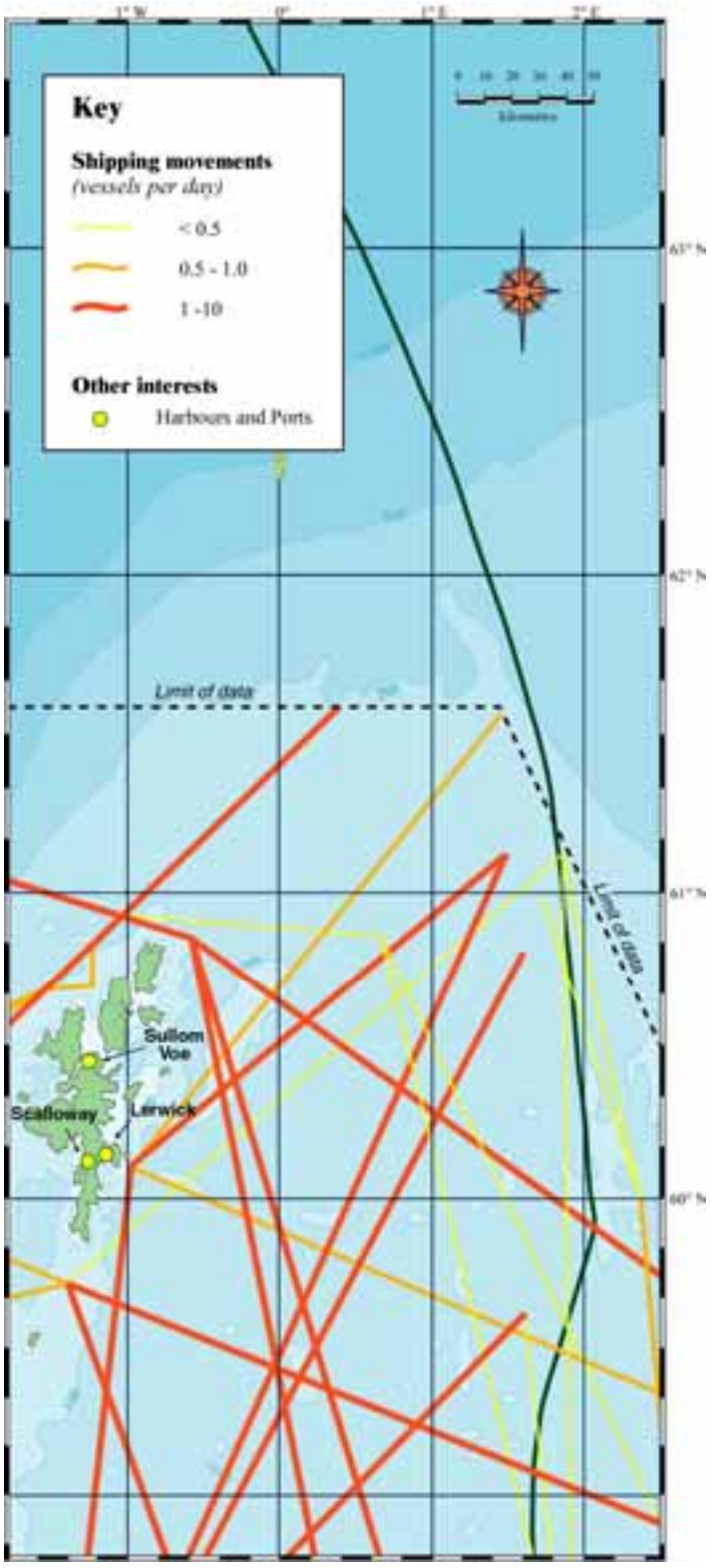

Figure 2: Northern North Sea Shipping Traffic (Cordah 1998)

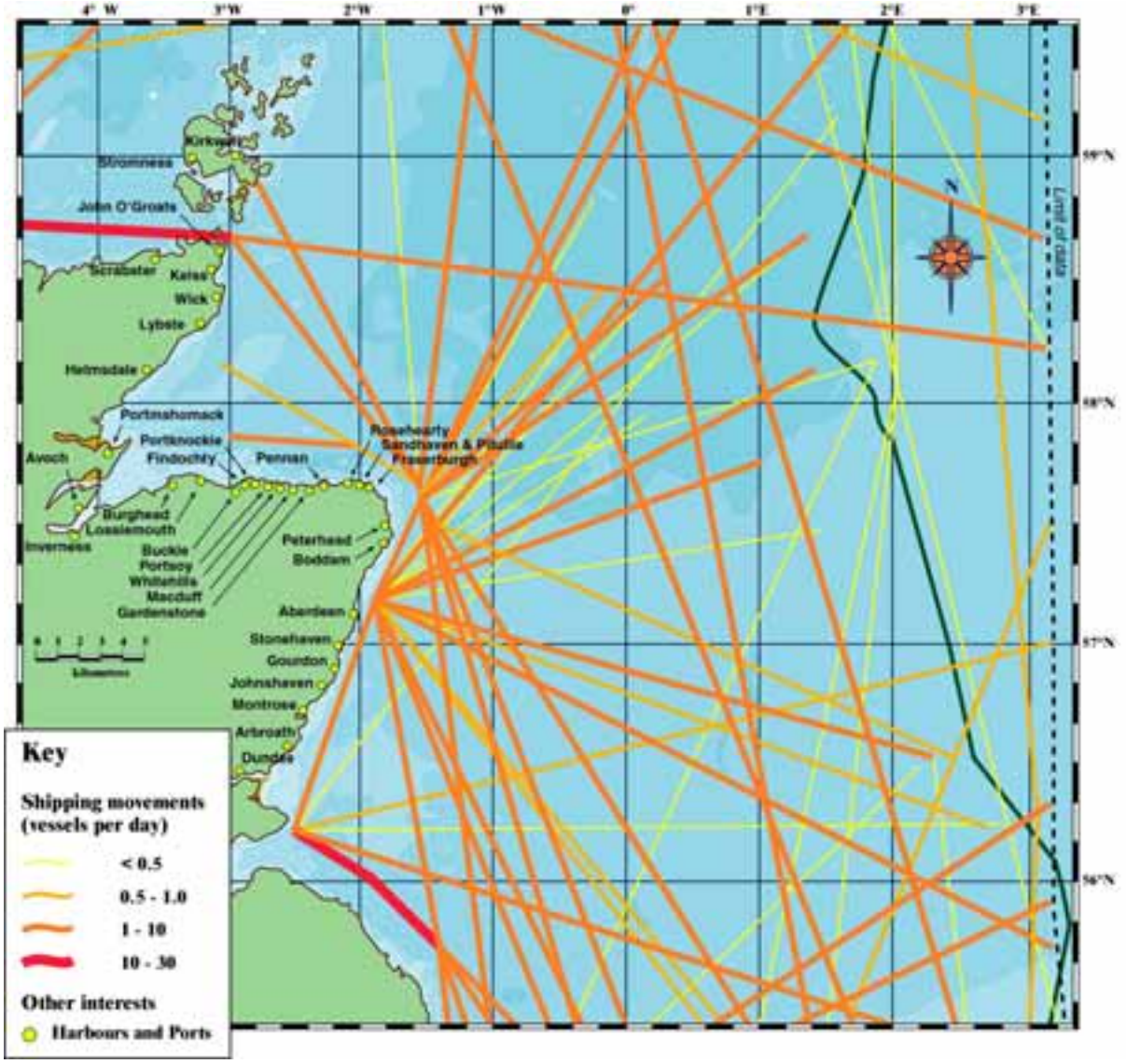

Figure 3: Central North Sea Shipping Traffic (Cordah 1998)

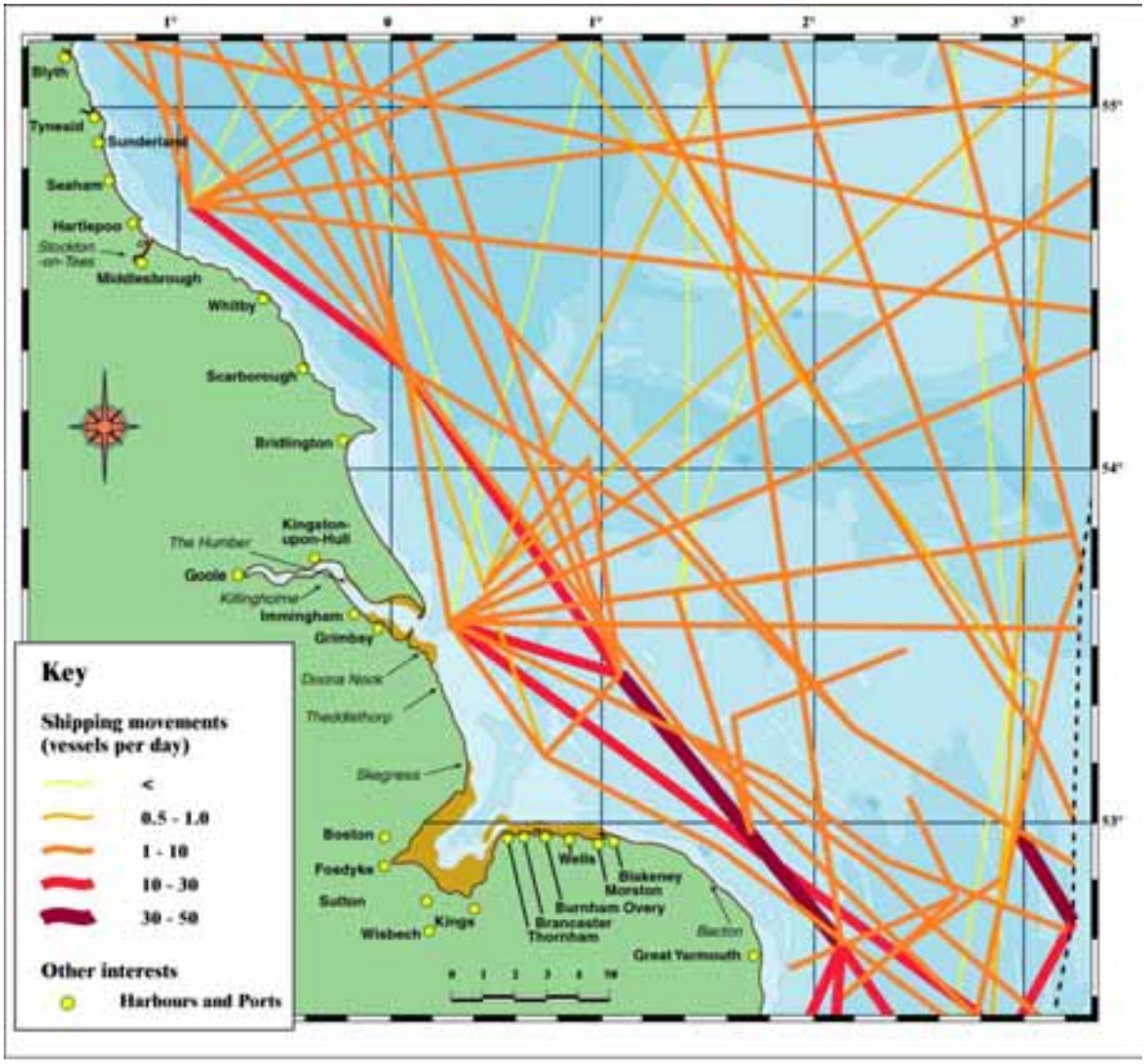

Figure 4: Southern North Sea Shipping Traffic (Cordah 1998)

2.1 COAST Database

Detailed information on shipping traffic and routing data can be obtained from a database called COAST. The database was developed in 1995/96 by Safetec in a Joint Industry Project funded by the Department of Transport, Health and Safety Executive and the UK Offshore Operators Association. An overview of all the shipping routes in COAST passing through UK waters can be seen in Figure 5. The routes have been colour-coded based on vessel type. The width of the route lines indicates the volume of vessels on the route (i.e., wider line = higher shipping density). Safetec maintain COAST and produce annual updates of the database to reflect changes to shipping routes (e.g. due to the installation of new offshore platforms, port competition) (Dovre Safetec Ltd. 1996).

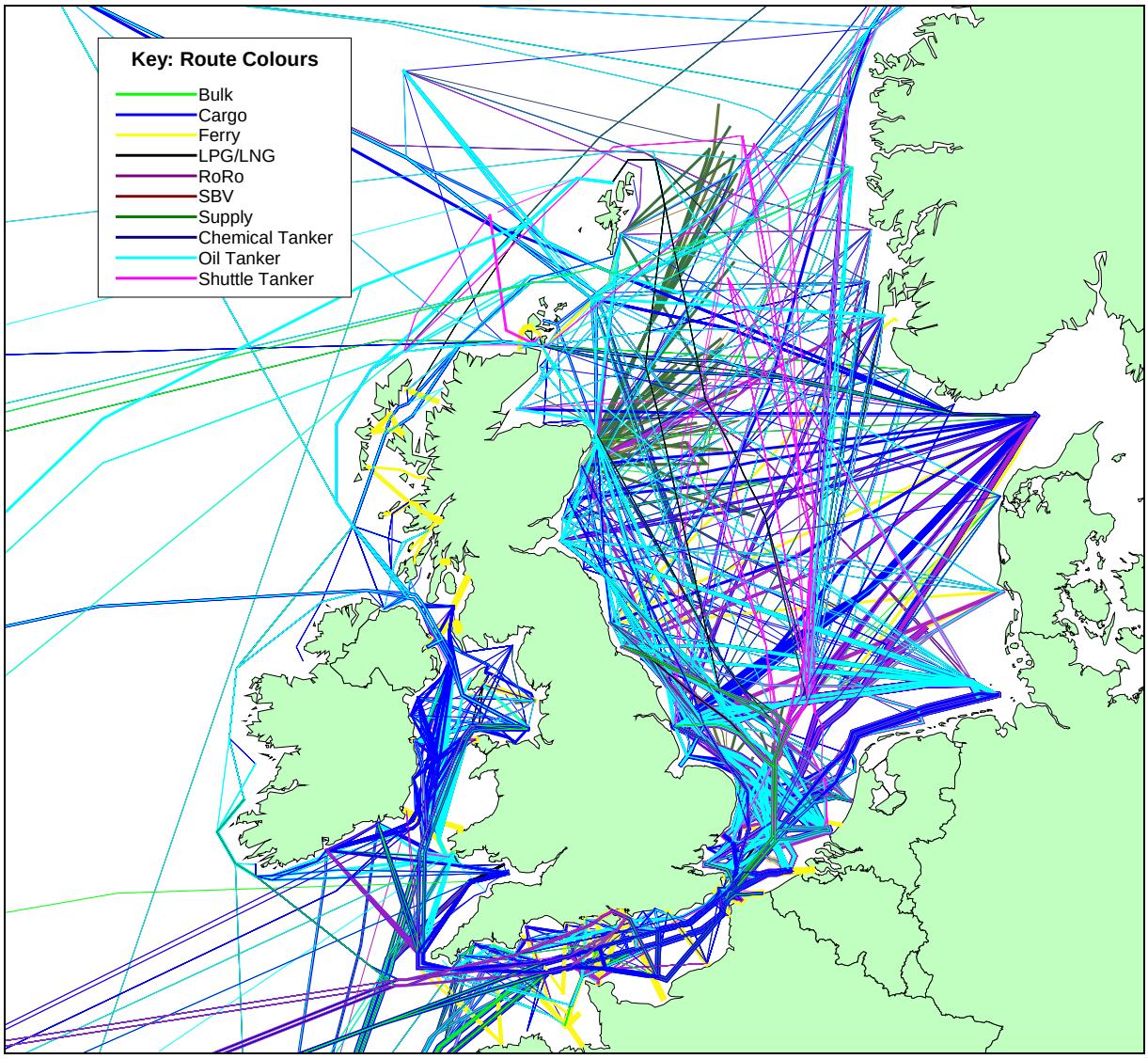

Figure 5: COAST Shipping Routes (All Vessel Types)

COAST has improved upon the reliability of existing traffic databases by utilising a large number of data sources including:

- Port Callings Data provided by Lloyd's Maritime Information Services (LMIS)
- Offshore Traffic Surveys carried out by Standby Vessels
- 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.

By combining these data sources it was possible to determine the position of the routes utilised by traffic traversing UK waters, the volumes of traffic and type/size distributions of the vessels on each of the routes, and the width of the routes.

The database does not include "non-routine" traffic, such as naval vessels, fishing vessels, pleasure craft and offshore traffic to mobile drilling units. The main information contained in the COAST database for each route is given below:

- Port of Departure/Destination
- Route Waypoints
- Number of Vessels per year
- Vessel Type Distribution
- Vessel Size Distribution
- Flag Distribution
- Age Distribution
- Speed Distribution.

2.2 Sources of Information

- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area I Northern North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/4/98. 55 pp. Plus figures
- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area II Central North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/5/98. 56 pp. Plus figures
- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area IV Southern North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/6/98. 65 pp. Plus figures
- Dovre Safetec Ltd., Development of UKCS Vessel Traffic Database for DOT/UKOOA/HSE, Report No. DST-95-CR-110-02, May 1996.
- Lord Donaldson's Inquiry (1994). Safer Ships, Cleaner Seas. Report of the Lord Donaldson's Inquiry into the Prevention of pollution from Merchant Shipping. HMSO, London.
- OSPAR Commission 2000. Quality Status Report 2000, Region II – Greater North Sea. OSPAR Commission, London. 136 +xiii pp.

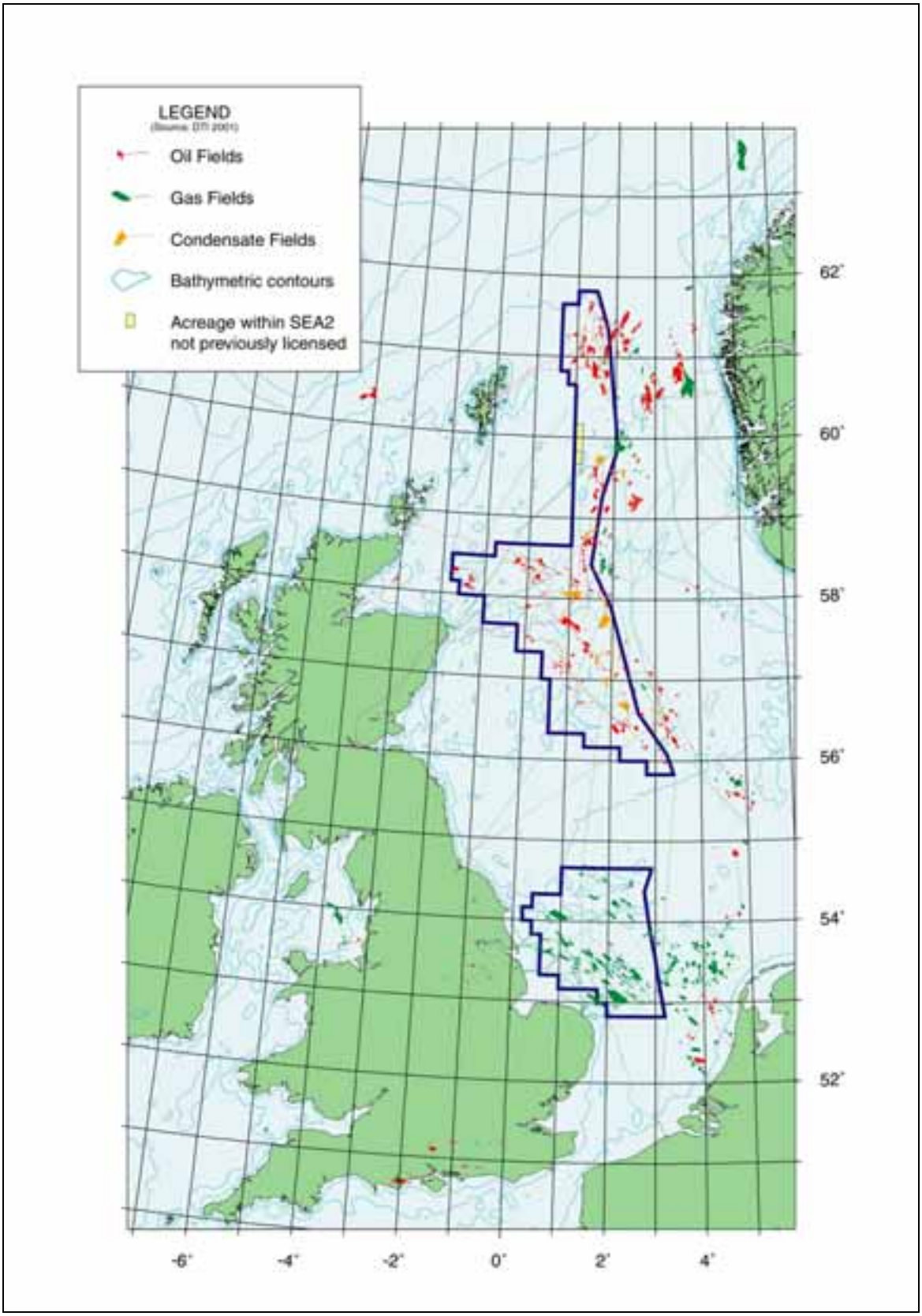

Figure 6: Oil and Gas Infrastructure

3. ENERGY (OIL AND GAS AND RENEWABLES)

3.1 Oil and Gas

The offshore oil and gas industry has become a major economic activity in the North Sea since the late 1960's. North Sea Gas was first discovered in the Southern North Sea in 1965 and brought ashore in 1967. The giant Forties Field (Central North Sea) was discovered in 1970 and the first oil (from the Argyll Field) came ashore in 1975. Between 1990 and 1998, the number of platforms in the North Sea area as a whole increased from 300 to 475, and oil production almost doubled (Quality Status Report, 2000). The major oil developments have been in the northern parts of the North Sea in the United Kingdom whereas gas deposits are exploited mainly in the shallower southern regions in the United Kingdom (Figure 6).

All the largest and most easily developed oil fields have been discovered and are now past their production peak. Oil production rose rapidly until 1985 then levelled off, but gas production was still rising in 1999. Both will last well into the 21st century. Figure 7 shows the number of offshore discoveries (number of wells) between 1965 and 2000, highlighting the peaks and troughs of the industry over the years.

The Government's policy is to have a regular programme of licensing. The licensed areas to date are shown in Figure 6. It is hoped that the 20th Round, covering the mature basins in the North Sea, will be launched by the end of 2001. Thereafter, it is intended that licensing rounds will be held annually as urged by the industry through the government initiative PILOT.

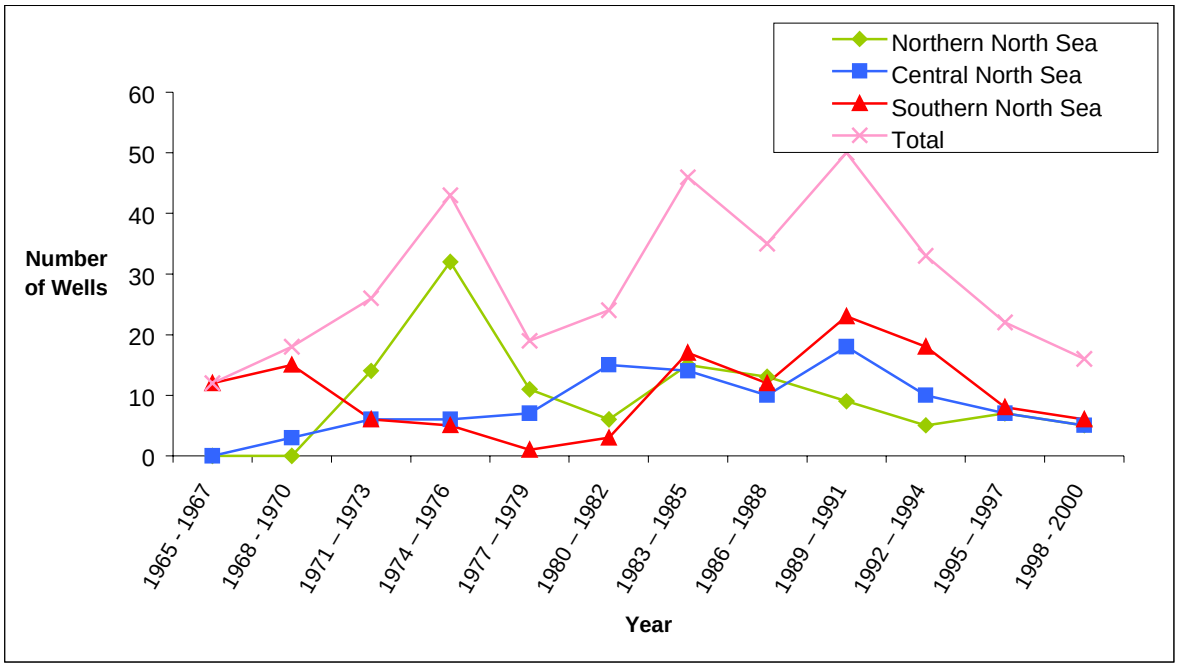

Figure 7 Offshore Discoveries between 1965 and 2000

Onshore and offshore oil and gas activity for the Northern, Central and Southern North areas are described in the UKOOA 18th Round Environmental Screening Reports and is summarised below.

The Northern North Sea has several important oil producing fields including Magnus, Brent, Ninian, Hutton and Beryl. The oil that is produced in blocks 2, 3 and 211 is transported to the Sullom Voe terminal on Shetland by two pipelines connecting through the Cormorant or Ninian pipeline system. Gas production in these blocks is transported to the St Fergus Terminal via the Far North Liquids and Gas Systems (FLAGS) and the Frigg pipeline system.

The Central North Sea is of considerable importance to oil and gas activity. Onshore terminals are located at Nigg and Flotta, which receive oil by pipeline from offshore fields such as Beatrice, Claymore and Piper and associated fields. The Forties pipeline carries oil to the terminal at Cruden Bay. The onshore gas terminal at St. Fergus receives gas through the Frigg, FLAGS, Fulmar, Miller and SAGE pipelines.

The Southern North Sea sedimentary basin is dominated by gas fields (Fig 6). There are seven operational gas terminals in this region with pipelines running to each from the offshore gas fields. The nearest major gas fields are some 20 to 25 km offshore, extending across the UK Continental Shelf into the Dutch sector.

3.1.1 Offshore Oil and Gas Trunk and Interfield Pipelines

The total length of pipelines in current operation reaches a total of 10,640 km and ranges from 60mm to 914mm in diameter. They consist of rigid and flexible oil and gas pipelines forming a network of arteries between offshore petroleum production sites and terminals on land.

The types of material conveyed along the pipelines are crude oil, natural gas, associated gas and gas and condensate. Appendix 14 in the DTI Brown Book 2001 details all the pipelines and their characteristics (http://www.dbd-data.co.uk/bb2001/).

3.1.2 Decommissioning

Britain's offshore oil and gas industry has developed to the point when an increasing number of installations will be decommissioned because they have come to the end of their economic lives (Table 2). The industry remains committed to doing all that is reasonably practicable to reduce the safety risk and risk of damage to the environment when decommissioning such installations, the majority of which will be removed entirely. To this end it is developing efficient, fit-for-purpose decommissioning solutions for those installations, which are based upon achieving the right balance between safety, protection of the environment and cost.

Table 2: Decommissioned Installations (DTI Energy Report, 2001)

Field/Installation	Area	Main Installations Decommissioned	Approved Decommissioning Option	Year of Approval
Piper Alpha	MF	Fixed Steel Platform	Toppling	1988
Crawford	NNS	Floating Production, Facility (FPF) Catenary Anchor Leg Mooring (CALM) Buoy Subsea Facilities	Removal to shore Removal to shore Removal to shore	1991
Argyll, Duncan and Innes	CNS	Floating Production, Facility (FPF) Catenary Anchor Leg Mooring (CALM) Buoy	Removal to shore Removal to shore	1992
Blair	NNS	Subsea	Re-use	1992
Angus	CNS	Floating Production, Storage and Offloading (FPSO) Vessel	Re-use	1993
Forbes AW	SNS	Fixed Steel Platform	Removal to shore	1993
Esmond CP & CW	SNS	2 x Fixed Steel Platform	Removal to shore	1995
Gordon BW	SNS	Fixed Steel Platform	Removal to shore	1995
Emerald	NNS	FPSO	Re-use	1996
Frigg FP	NNS	Flare Column	Removal to shore	1996
Leman BK	SNS	Fixed Steel Platform	Removal to shore	1996
Staffa	NNS	Subsea	Removal to shore	1996
Viking AC, AD, AP & FD	SNS	4 x Fixed Steel Platform	Removal to shore	1996
Brent Spar	NNS	Oil Storage and Loading Facility	Re-use as part of quay extension	1998
Donan	NNS	FPSO	Re-use	1998
Fulmar SALM	CNS	Single Anchor Leg Mooring Buoy	Removal to shore	1998
Blenheim and Bladon	NNS	FPSO	Re-use	2000
Durward and Dauntless	CNS	FPSO Subsea Facilities	Re-use Removal to shore	2000
Maureen and Moira	NNS	Large Steel Gravity Platform Concrete Loading Column	Re-use or Removal to shore Re-use or Removal to shore	2000
Camelot CB	SNS	Fixed Steel Platform	Re-use or Removal to shore	2001

3.1.3 The Future of Oil and Gas

Up to the beginning of 2001 some 28 billion barrels of oil equivalent (including gas and gas liquids) had been produced from the UKCS. Many commentators believe we are close to the half way point in the life of the basin with almost as much again to be extracted over the next 30 years. What is clear is that the development of the remaining oil and gas will be more difficult, given the combination of smaller field sizes, higher development costs, ageing infrastructure and the uncertainties introduced by the fluctuating price of oil and gas. Table 3 shows production projections up to 2006 (DTI Energy Report 2001).

Unlike the UKCS discoveries made in the 1970s, when the average discovery size was some 300 million barrels of oil equivalent, only the exceptional discovery of this size is made today and on average they are an order of magnitude smaller.

Table 3: Production Projections (DTI Energy Report, 2001)

Year	Oil (incl. NGLs and Condensate)/ Million Tonnes	NGLs/ Million Tonnes	Gas/ Billion Cubic Metres
2001	120-135	7.8-8.6	100-110
2002	125-135	8.5-9.3	105-115
2003	120-130	8.6-9.5	105-115
2004	110-120	8.0-8.8	105-115
2005	95-105	6.7-7.5	100-110
2006	80-95	5.8-6.4	90-100

NGL - Natural Gas Liquid

Further exploration will continue, searching in particular for 'subtle' traps. The extent to which 'enhanced oil recovery' techniques are applied to existing and future finds will be influenced by the uncertainties in the price of oil. These techniques are costly and require specialized platform facilities. They include injection of steam, surfactant chemicals, miscible gases and polymers to lower the viscosity of the oil and increase flow rates and yields. There will be increasing development of small satellite fields linked by subsea collectors and pipelines to an existing central platform and pipeline to shore (UKOOA pers com).

The UKCS competes with other oil and gas prone regions of the world for the investment funds needed to explore for and develop its resources. Through PILOT, the government, oil companies and contractors are co-operating in finding ways to improve the competitiveness of the UKCS and maximise the economic recovery of the nation’s resources.

3.2 Renewable Energy

The UK Government announced last year its new policy on renewable energy, the aim of which is to stimulate further the development of the UK renewable energy industry. The objective is that, by 2010, 10% of UK electricity requirements will be met from renewable sources, subject to the cost to consumers being acceptable.

Due to existing hydro-electric power schemes, Scotland starts from a much higher base line than England and Wales. The Scottish Executive's objective is that, by 2010, 18% of electricity supplied in Scotland should be accounted for by renewable energy.

In respect to the SEA2 areas, renewable sources of energy could be obtained from wind, wave and tidal generating devices.

3.2.1 Wind Power

The wind energy resource at sea is extremely large. The UK is very well endowed with this resource and has over 33% of the total European potential. The UK's offshore resource is equivalent to three times the UK's electricity usage for 1998. Conservative calculations show that offshore wind alone could meet the Governments current renewables target. There are large areas of the North Sea with high steady wind speeds suitable for offshore turbines.

The UK's only offshore windfarm is located off the east coast at Blyth, Northumberland. This site consists of 2 turbines located 1 km off the coastline.

The Crown Estate have recently announced eighteen wind farm developers who have successfully pre-qualified to obtain a lease of the seabed for development of offshore windfarms. Figure 8 shows the location of these sites. Seven of the sites are located on the east coast of the UK, each occupying 10km^2 of the seabed at a distance of 1.5 to 8km from the coastline. Contractors are currently gaining the necessary statutory consents and it is hoped that work will start on the development of the sites within 3 years.

The sites permit a development of up to 30 turbines on each site, with a minimum output for the site of 20 MW. The turbines will generally be built in relatively shallow water - less than about 30 metres in depth.

Although it is possible to build wind turbine structures in water deeper than 30m it is very expensive and would not be economically viable for offshore wind turbines. Wind speeds tend to increase as distances increase offshore. This means that turbines built further offshore should capture more wind energy. Unfortunately, as the distance to land increases, the cost of building and maintaining the turbines and transmitting the power back to shore also increase sharply, limiting the distance out to sea at which offshore wind projects will be built. However, dependent on the success of the current offshore wind farm developments, wind farms further offshore are a realistic possibility. Research work is currently considering the possibility of using floating platforms or redundant oil industry infrastructure to site wind turbines and thus reduce costs.

3.2.2 Wave and Tidal Power

There are currently no wave generation devices in the SEA 2 areas. Redundant and active oil industry infrastructure within the areas does provide the potential for such devices to be sited offshore. However, this area of technology is currently only at a research and testing stage and will not be introduced in the short-term.

3.3 Sources of Information

3.3.1 Oil and gas

- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area I Northern North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/4/98. 55 pp. Plus figures
- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area II Central North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/5/98. 56 pp. Plus figures
- Cordah (1998). UKCS 18th Round Environmental Screening Report: Area IV Southern North Sea. Report to UKOOA. CORDAH, Neyland, Pembrokeshire. Report No. OPRU/6/98. 65 pp. Plus figures
- OSPAR Commission 2000. Quality Status Report 2000, Region II – Greater North Sea. OSPAR Commission, London. 136 +xiii pp.
- The DTI Energy Report (www.dbd-data.co.uk/bb2001/).
- UKOOA, 2001 pers com.

3.3.2 Renewables

- British Wind Energy Website - www.britishwindenergy.co.uk/
- The DTI Website - www.dti.gov.uk/renewable/main.html
- The Crown Estate Website - www.crownestate.co.uk/
- DTI New and Renewable Energy Programme – Annual Plan 2000/2001
- Wavegen Limited – Pers. com.

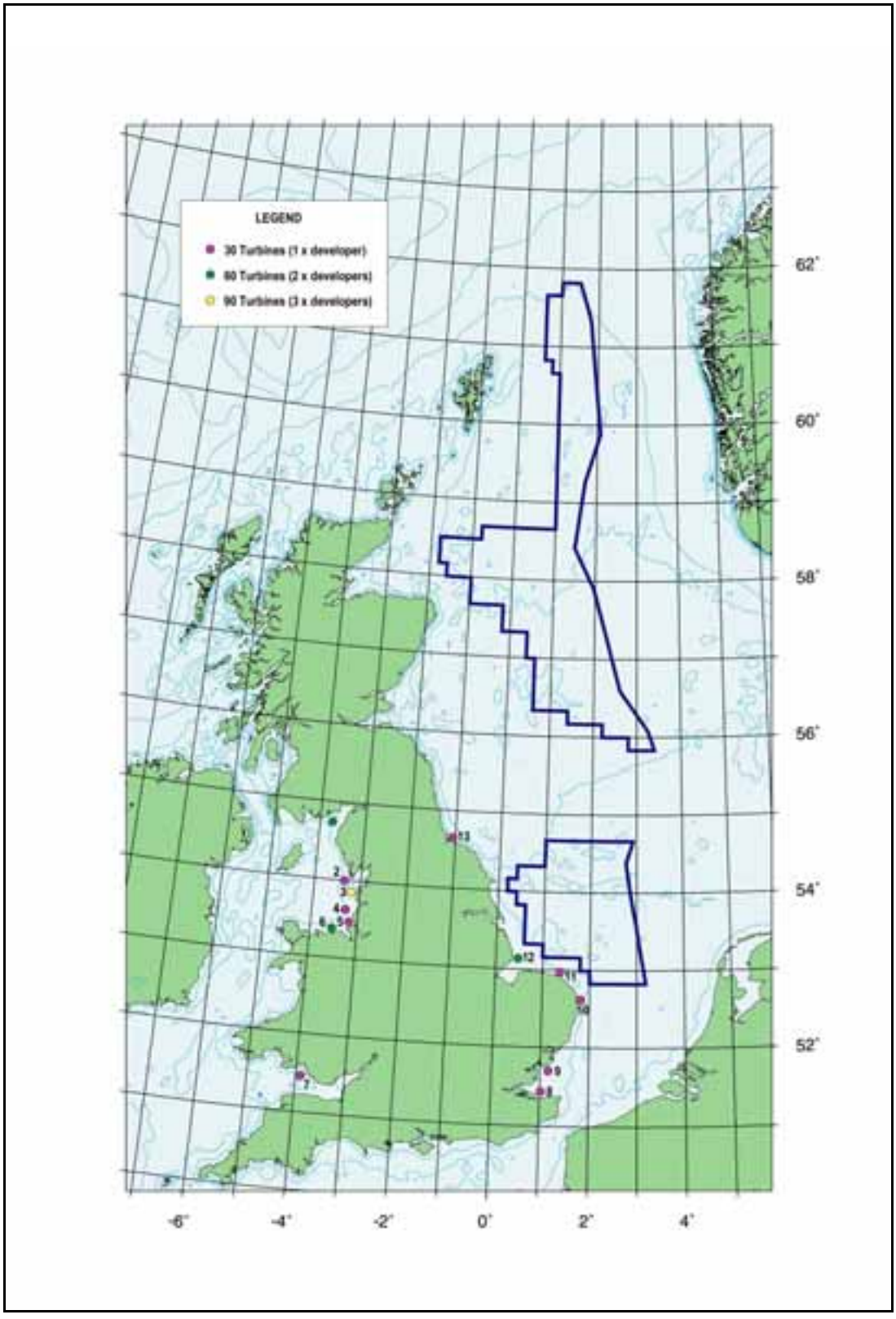

Figure 8: Proposed Offshore Windfarm Locations

4. TELECOMMUNICATIONS

Ten telecommunications cables cross the SEA2 areas. The cables crossing the Northern, Central and Southern components of the SEA2 area are listed in the table below.

Table 4: Telecommunication Cables

SEA 2 Area	Cable name
Northern	TAT14 (K) (CONCERT)
	ATLANTIC CROSSING 1 (AC1) (GLOBAL CROSSING)
	TAT 10B (CONCERT)
Central	CNS FIBRE OPTIC (BP)
	CANTAT 3 (CONCERT)
	PANGEA NORTH UK DMK(PANGEA LTD)
	UK-DENMARK 4 (CONCERT)
Southern	NORTH SEA OFFSHORE (BA/BT)
	UK – NETHERLANDS 14 (CONCERT)
	UK – GERMANY 5 (CONCERT)

Figure 9 shows the routes of the cables listed above.

Use of the Internet and continued development of e-commerce has led to an increasing demand for communication cable capacity. In the past three years traffic on a global scale has grown by over 500%. Changes in technology have made many systems laid in UK waters during the early 1990's redundant. The introduction of fibre optic cable as well as improvements in terrestrial and subsea technology mean that cable operators will continue to seek to provide new systems.

4.1 Sources of Information

- Cable awareness charts - Seafish Industry Authority (Kingfisher chart service).
- The Crown Estate Website - www.crownestate.co.uk/estates/marine/cables/index.shtml

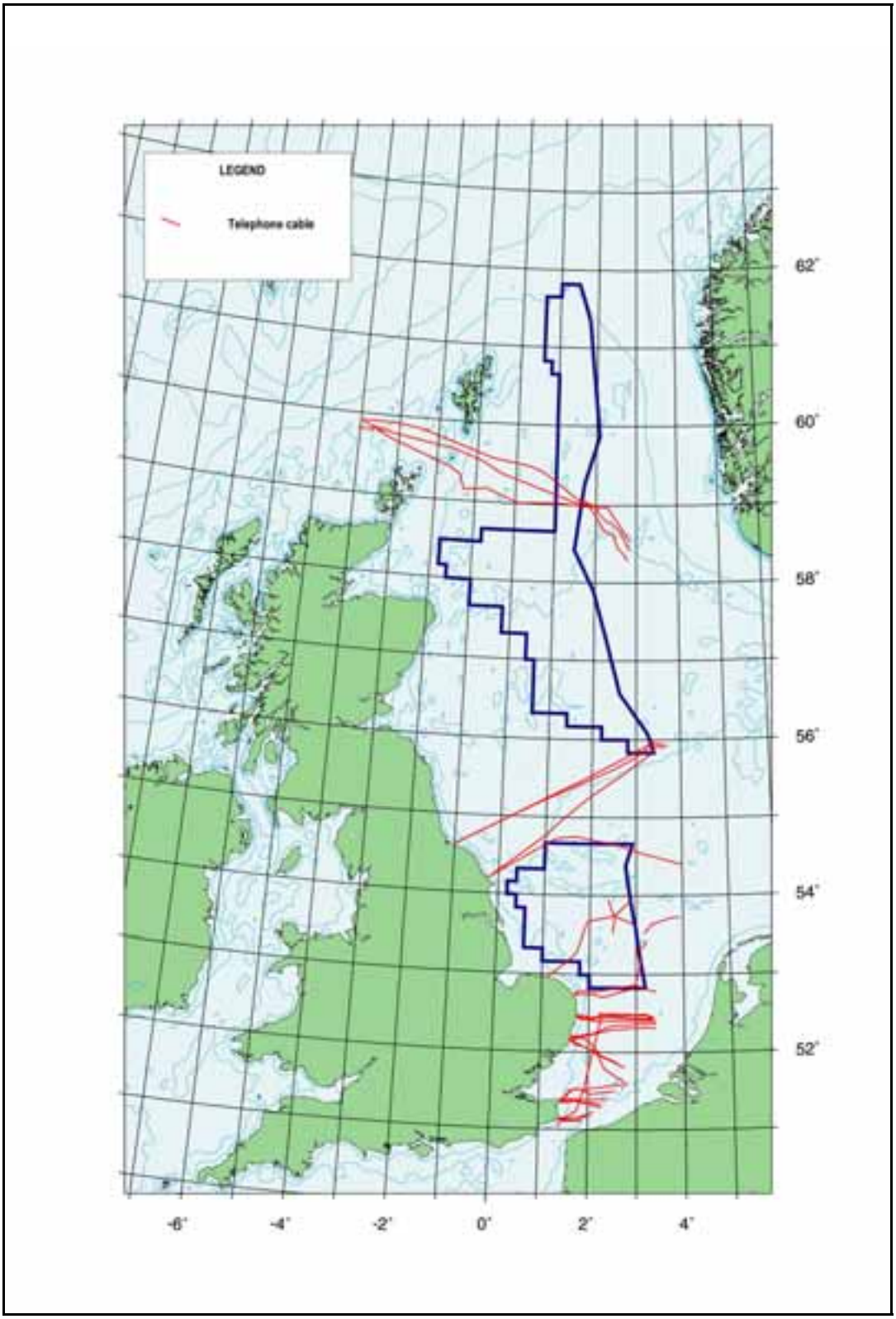

Figure 9: Telecommunication Cables

5. MILITARY AND ORDNANCE DISPOSAL SITES

5.1 Ordnance Disposal

The disposal of ordnance in UK waters is no longer undertaken. However, this disposal option has been used extensively in the past, with all such historic disposal areas being marked on British Admiralty charts as “danger areas”. The UK Hydrographic Office has records of 21 ordnance disposal sites of varying size in UK waters.

There are no recorded historic disposal sites within or close to the SEA 2 area.

5.2 Military exercise areas

Military exercise areas in UK waters are shown on the British Admiralty Q series of charts. The relevant charts for the SEA 2 area are Q6404, Q6405, and Q6401.

There are four military exercise areas within or overlapping the SEA 2 area:

1. Flamborough Head submarine exercise area;
2. Outer Silver Pit submarine exercise area;
3. D316 air combat training area;
4. D317 air combat training area.

Figure 10 shows the military exercise areas listed above.

The Q charts were most recently updated in 1995 (Q6404 & Q6405) and 1998 (Q6401). There have been no changes to any of the areas listed above since those dates.

5.3 Sources of Information

- Admiralty Charts Q6404, Q6405 and Q6401.
- MoD Staff Officer Faslane Naval Base
- Ministry of Defence, 2000. White Paper: Modern Forces for the Modern World, London. ISBN 0-10-139992-8
- UK Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN

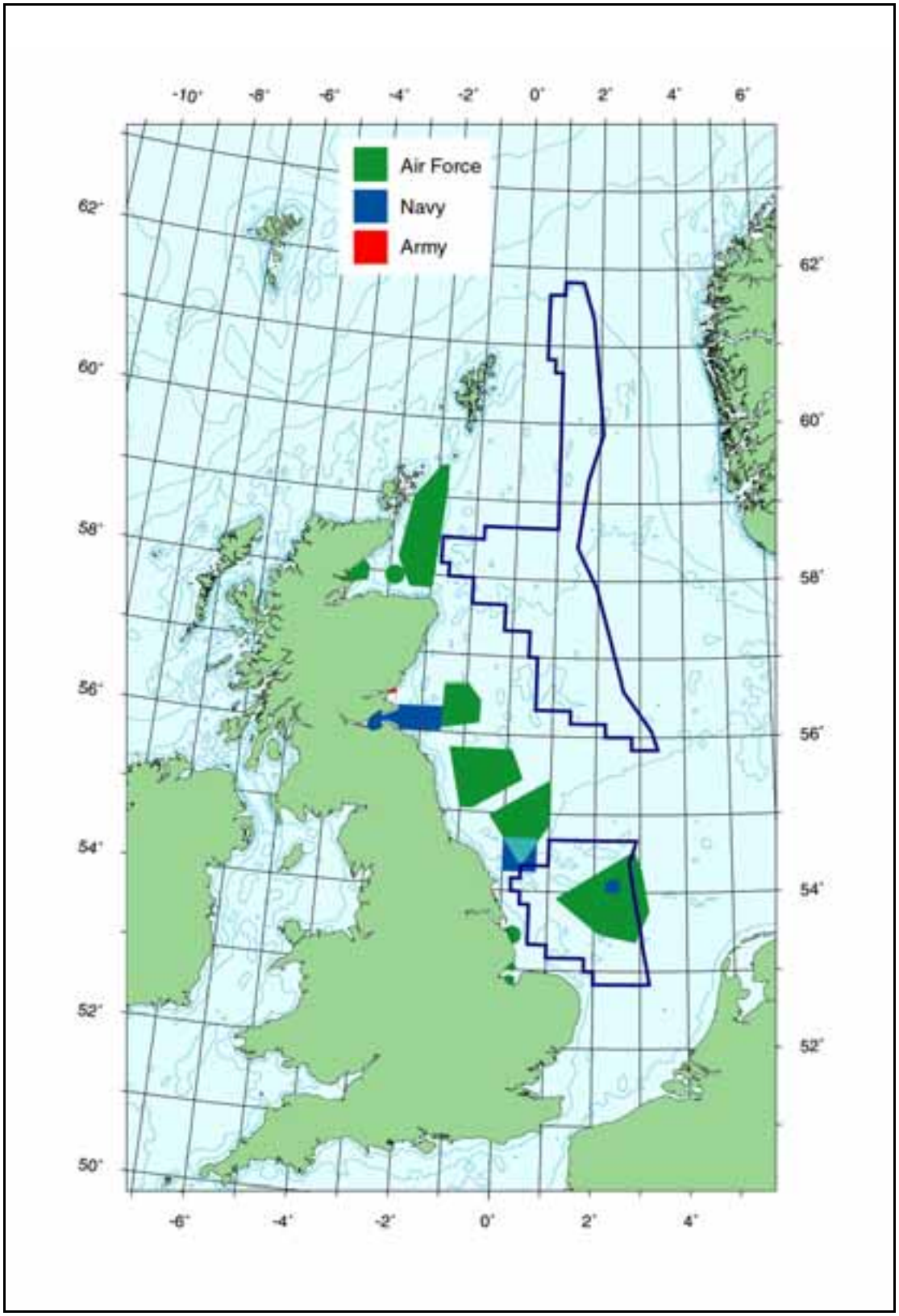

Figure 10: Military Exercise Areas

6. WASTE DISPOSAL SITES

Under the OSPAR Convention, the dumping of waste and other material is prohibited with the exception of dredged material, fish waste, inert material of organic origin and (until 2004) vessels and aircraft. The dumping of sewage sludge has been banned under OSPAR since 1st January 1999. A summary of waste disposal licensing bodies is shown in table 5.

Table 5: Summary of License Granting Bodies in the UK

Country	Licensing Body
England	CEFAS / DEFRA
Scotland	SERAD
Wales	Welsh Executive

Figure 11 shows all licensed waste disposal sites in the North Sea for 1995 – 1997. Wastes disposed at these sites include dredged material, sewage sludge and industrial waste. This data is pre 1999 hence sewage sludge disposal was permitted. Out of a total of 31 licensed waste disposal sites, 4 were used for the disposal of sewage sludge. Two of these sites display increasing dumping levels and 2 display reduced dumping levels between 1995 and 1997.

Table 6 summarises the nature of each disposal site in the North Sea and presents the amount of waste dumped at the site in 1995 and 1997 in tonnage.

Table 6: Summary of Licensed Disposal Sites in the North Sea

Site ID	Name	Waste	1995 Tonnage	1997 Tonnage	Difference
CR019	Sutors	Dredging	0	166143	Increase
CR020	Helmsdale	Dredging	0	0	Not Used
CR031	Lossimouth	Dredging	0	0	Not Used
CR050	Macduff	Dredging	5162	2013	Decrease
CR070	Peterhead	Dredging	0	0	Not Used
CR110	Aberdeen	Dredging	140652	226081	Increase
CR130	Dornoch	Dredging	0	0	Not Used
FO003	Stonehaven	Dredging	17425	0	Decrease
FO010	Montrose	Dredging	0	55022	Increase
FO021	Firth of Taye	Dredging	22910	105160	Increase
FO030	Bell Rock	Sewage Sludge	124120	169060	Increase
FO035	Port Edgar	Dredging	0	0	Not Used
FO040	Firth of Forth	Dredging	0	0	Not Used
FO050	St Abbs Head	Sewage Sludge	219620	206019	Decrease
FO080	Eyemouth	Dredging	0	29248	Increase
HU015	Bridlington A	Dredging	15200	16000	Increase
HU020	Humber 4B/Hook	Dredging	2344045	1353613	Decrease
HU041	Goole Reach	Dredging	19255	17480	Decrease

Site ID	Name	Waste	1995 Tonnage	1997 Tonnage	Difference
HU093	Humber 2 Extension C	Dredging	0	0	Not Used
HU100	Spurn Head	Sewage Sludge	120896	25913	Decrease
HU120	Lynn Knock Buoy	Dredging	0	0	Not Used
HU130	Boston1	Dredging	0	0	Not Used
HU145	Dudgeon	Dredging	0	0	Not Used
TY031	Ellington South Foreshore	Industrial	187802	0	Decrease
TY060	Howdon Area	Sewage Sludge	430126	605987	Increase
TY090	Sunderland	Dredging	0	6553	Increase
TY122	Easington Foreshore	Industrial	0	0	Not Used
TY180	Whitby	Dredging	95410	96710	Increase
TY190	Scarborough Rock	Dredging	9980	124250	Increase
TY022	Amble Outfall Marina	No available data	0	1300	Increase
HU118	Galahad Pipeline Route	No available data	31479	0	Decrease

In 1995 and 1997 the majority of the disposal sites in the North Sea were used for the disposal of dredging waste. This waste consists mainly of material that has been removed from navigation channels (maintenance dredging) and areas where coastal construction is taking place (QSR, 2000).

6.1 Sources of Information

- Crown Estate 2000: http://www.crownestate.co.uk/estates/marine/agg/mad/02.shtml
- QSR, 2000. Quality Status Report, 2000. Region II Greater North Sea. OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic.

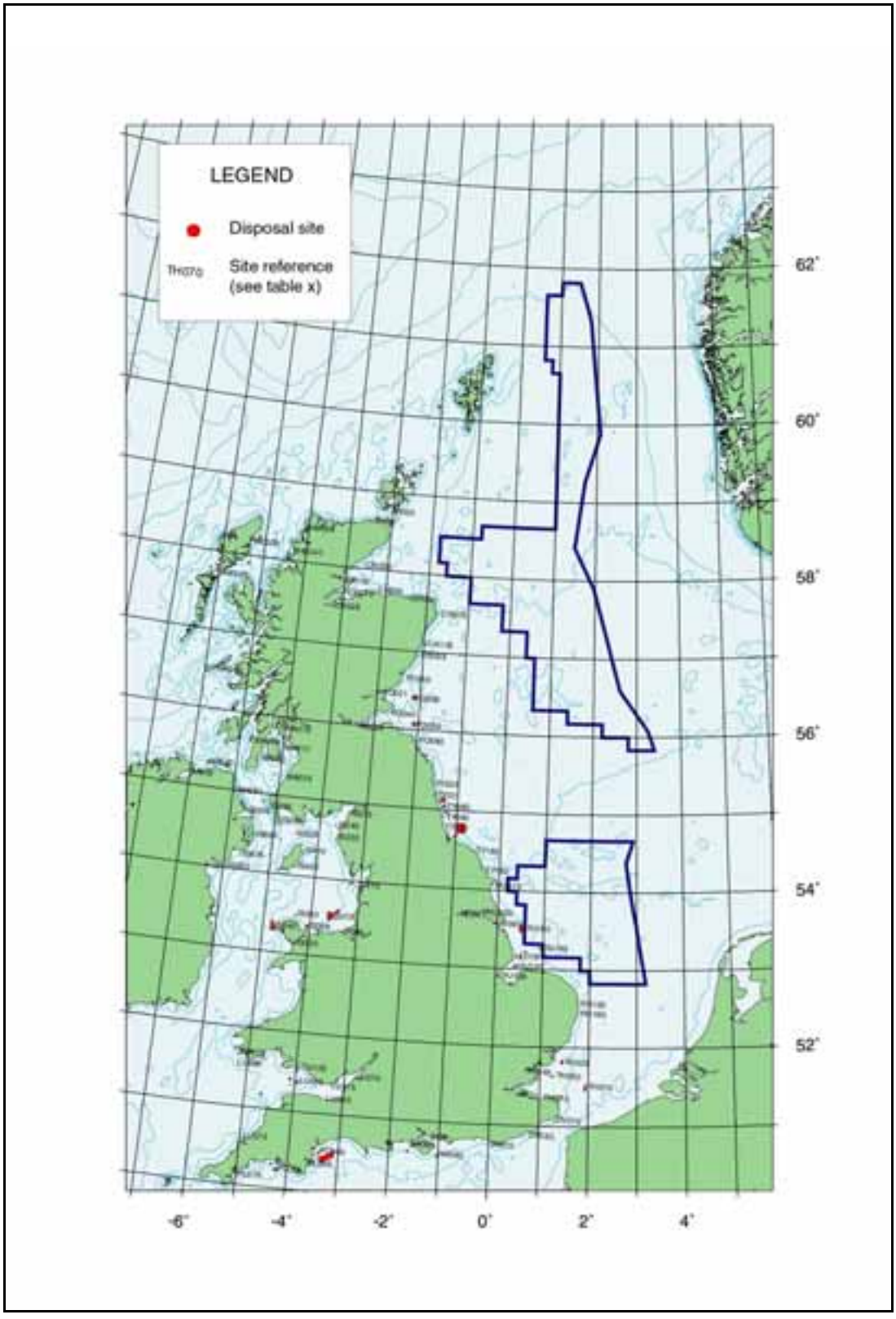

Figure 11: Waste Disposal Sites

7. DREDGING AND AGGREGATE EXTRACTION

Licenses for marine aggregate extraction are granted by the Crown Estate in consultation with the bodies outlined in Table 5 (section 6). Licensed aggregate sites in the North Sea are summarised in Figure 12.

The largest aggregate extraction site in the UK is located off the East Coast and covers an area of 192.3 km^2. The average size of extraction sites around the UK is 36.92 km^2. The main region of aggregate extraction in the North Sea is the Humber Region. In 2000, the Crown Estate reported that the total licensed area in this region was 478.4 km^2 (Crown Estate, 2000). Of this licensed area, only 57.5 km^2 was dredged for aggregate. Between 1st January 2000 and 31st December 2000, a total of 3,811,044 tonnes of aggregate was removed from the Humber Region. Some of the licensed aggregate extraction sites fall within the southern SEA2 area. There is no maintenance dredging within the SEA2 areas.

7.1 Sources of Information

- Crown Estate 2000: http://www.crownestate.co.uk/estates/marine/agg/mad/02.shtml
- OSPAR Commission 2000. Quality Status Report 2000, Region II – Greater North Sea. OSPAR Commission, London. 136 +xiii pp.

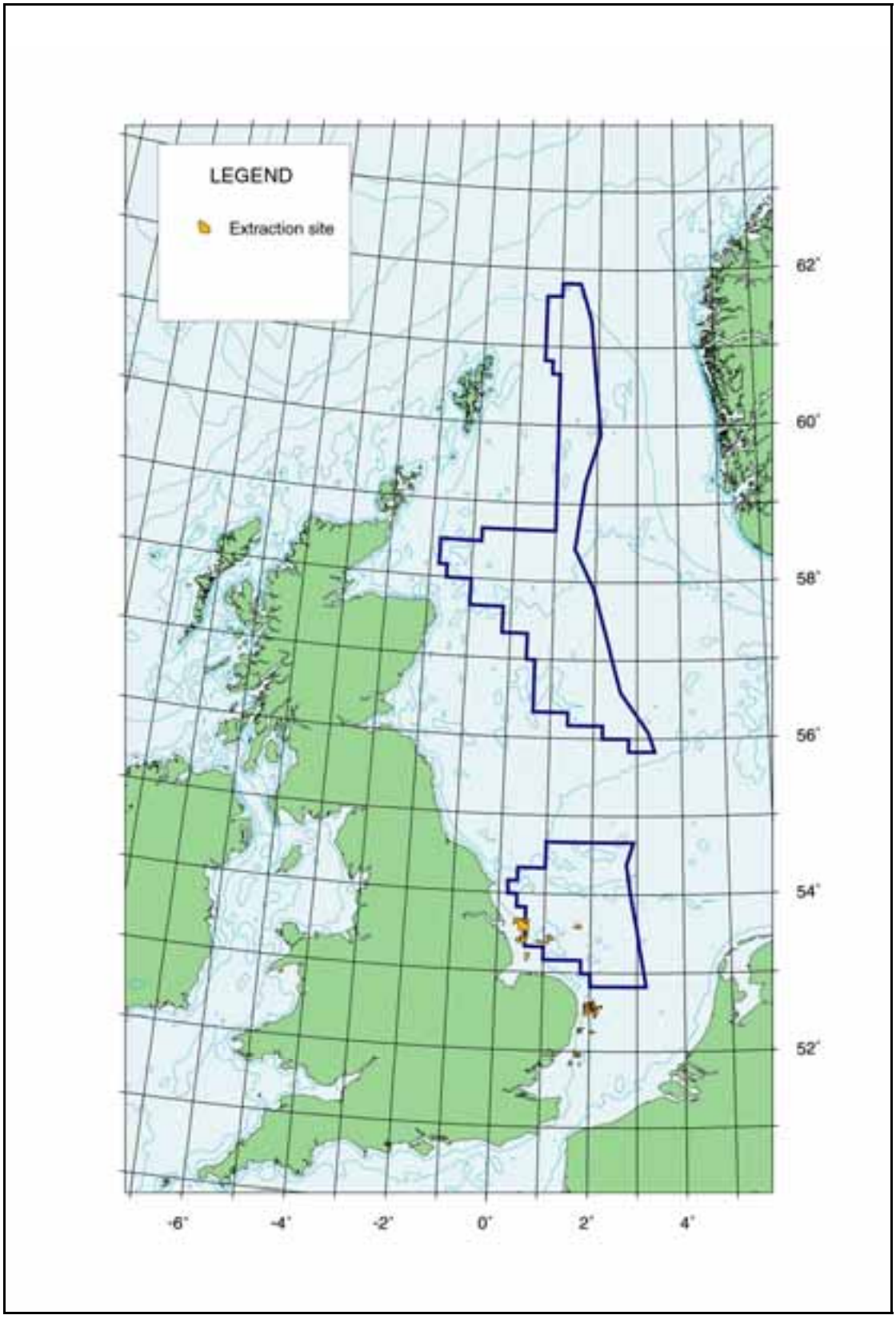

Figure 12: Aggregate Extraction Sites

8. MARINE ARCHAEOLOGICAL SITES AND WRECKS

8.1 Wreck sites within the SEA2 area

There are numerous wreck sites throughout the SEA2 area and many are marked on British Admiralty charts. However, it is important to understand that not all wreck sites are marked on these charts. While the UK Hydrographic Office (UKHO) holds details of all wrecks and possible wreck sites reported in UK waters, these wreck sites are generally only charted when the provenance of the report is considered reliable, or the wreck site has been confirmed by survey. The UKHO also holds records of uncharted wrecks whose position is as yet unconfirmed, as well as details of obstructions, fouls, fisherman's fasteners, and wartime non-submarine contacts, all of which may indicate the presence of a wreck.

There are 1157 confirmed and possible wrecks within the SEA2 area, with 69 in the Northern North Sea, 524 in the Central North Sea, and 564 in the Southern North Sea.

Figure 13 shows the location of confirmed and possible wreck sites within the SEA2 area, including obstructions, fouls, fisherman's fasteners, and wartime non-submarine contacts.

8.2 Non-wreck debris within the SEA2 area

In addition to wrecks and possible wrecks, the UKHO records also include the recorded positions of non-wreck debris on the seabed. These records can include items such as lost cargoes, anchors, cables and large boulders.

There are 151 records of non-wreck debris within the SEA 2 area, with 39 in the Northern North Sea, 84 in the Central North Sea, and 28 in the Southern North Sea.

Figure 14 shows the location of non-wreck seabed debris within the SEA2 area.

8.3 Designated historic wrecks

Currently there are forty-six wreck sites designated under the Protection of Wrecks Act 1973, off the coast of the UK. However, these are likely to represent only a small proportion of the total number of wrecks which may be of cultural significance in UK waters.

No designated wreck sites are located within any of the SEA2 areas. However, two designated wreck sites are located relatively close to the western boundary of the Northern North Sea SEA area. Details of those wrecks are given below.

Table 7: Designated Wreck Sites Relatively Close to the SEA2 area

Designated wreck name	Position
Kennermerland	60° 25' 10.1''N 00° 45' 7.2''W
Wrangels Palais	60° 25' 28.1''N 00° 43' 23.4''W

8.4 Sources of Information

- Archaeological Diving Unit, St Andrews University
- Ian Oxley, Heriot Watt University
- UK Hydrographic Office

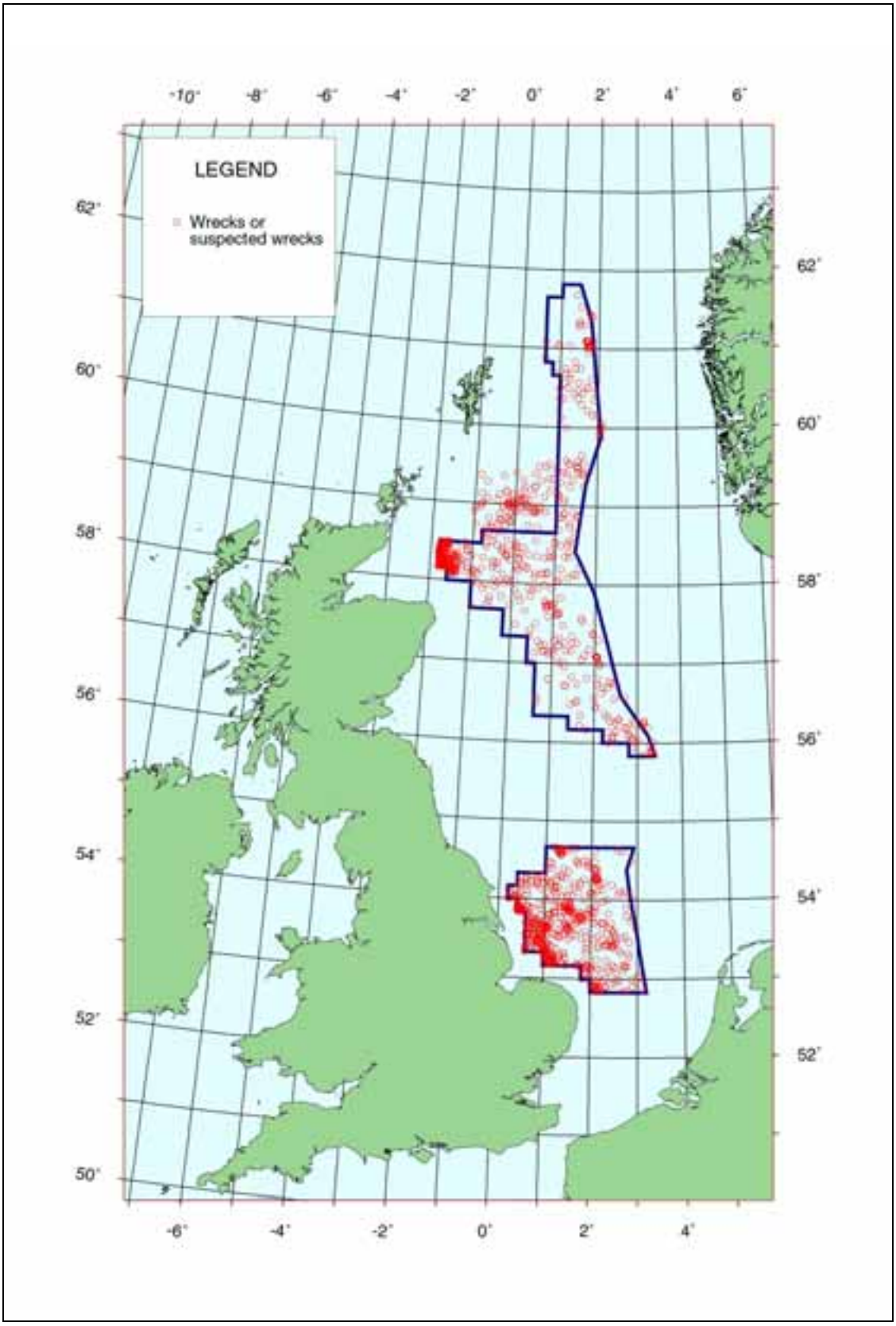

Figure 13: Confirmed and possible wreck sites

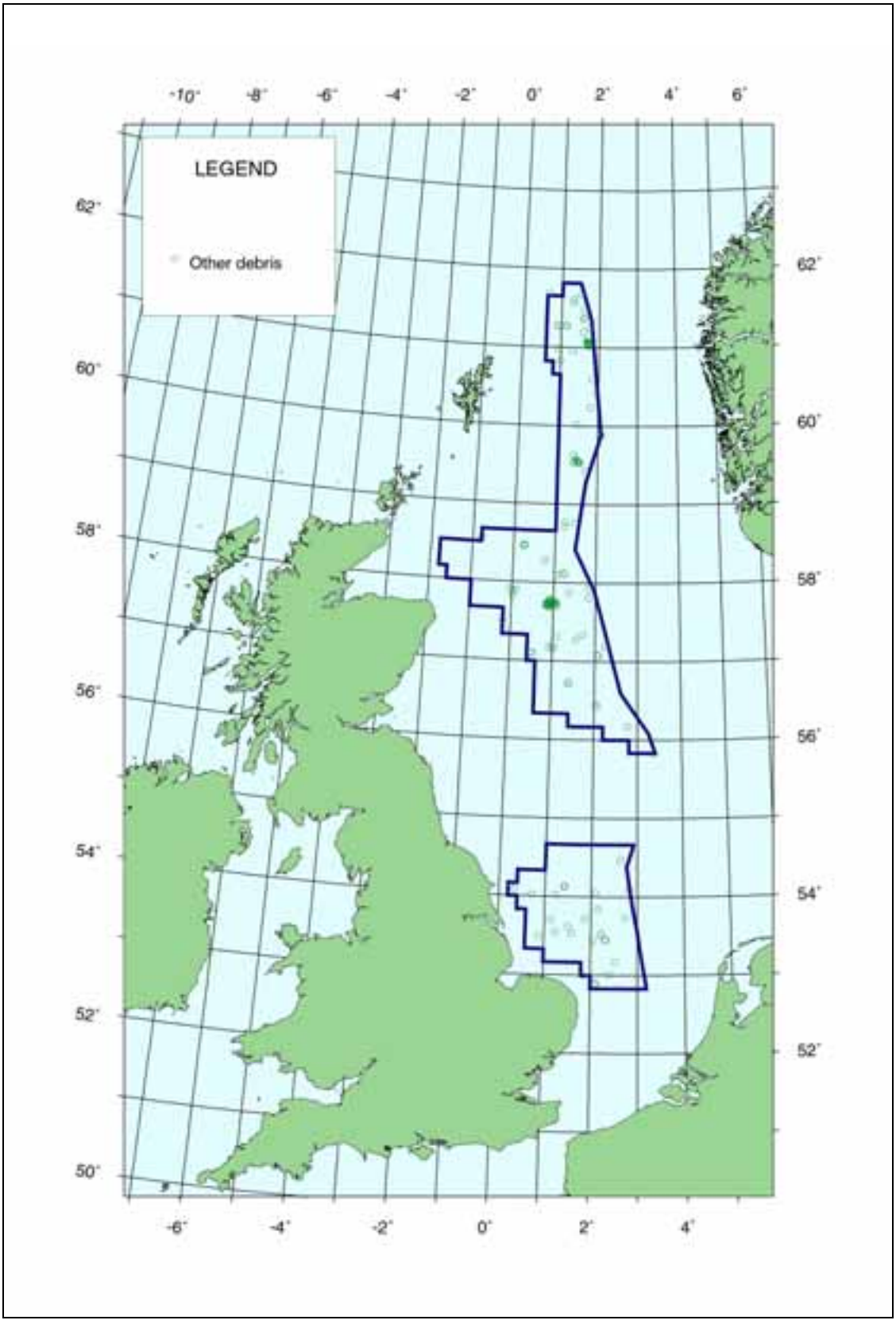

Figure 14: Location of non-wreck debris