Appendix K

# ERM Fisheries Report


# TEDA MAREA Commercial Fisheries Technical Report

*Thames Estuary Dredging Association (TEDA)*

Final Report

15 October 2010

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Thames Estuary Dredging Association

# TEDA MAREA Commercial Fisheries Technical Report:

Final Report

October 2010

For and on behalf of
Environmental Resources Management

Approved by: Kevin Murphy

Signed:

Position: Partner

Date: 15th October 2010

*CONTENTS*

# 1 INTRODUCTION

## 1.1 OVERVIEW

This report contains a review of the baseline conditions pertaining to commercial fisheries in the Thames MAREA area. In this instance the study area looks beyond the MAREA study area boundary shown by the red line in *Figure 1.1* and *Figure 1.2* to ports along the East Coast whose vessels fish in the TEDA area and foreign vessels that also fish in the general vicinity. The study also examined ICES Division IVc, within which the TEDA area resides, to provide a more regional perspective on the fisheries and to provide an indication of their importance. Using data covering these areas the report:

- Discusses the dynamics (spatial and temporal) of both the inshore (small UK vessels less then 10 m in length) and offshore (vessels larger than 10 m in length, both UK and foreign vessels) fishing vessels operating in the TEDA area.

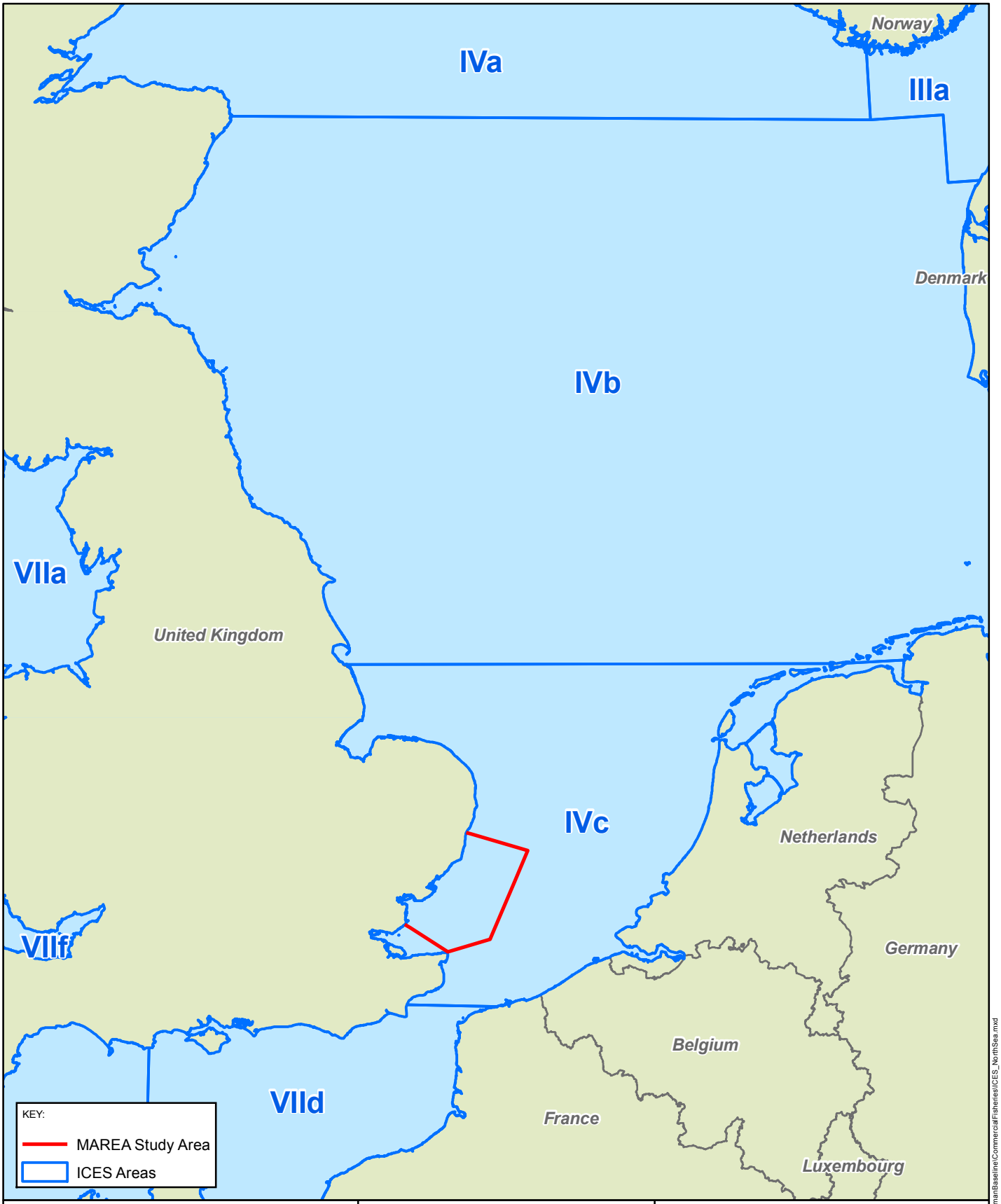
- Highlights important commercial species and their landings into ports within the TEDA area and landings of vessels whose home ports are outside the TEDA area.

- Provides an indication of the key species targeted and the fishing gears employed to catch them; and

- Estimates the economic value of the fisheries within the TEDA area and their value both locally and internationally.

The environmental legislation, and planning policies relevant to commercial fishing and the existing local fishing fleet, commercially important species and the fishing methods used to catch them are reviewed to examine the fisheries within the TEDA Marine Aggregates Regional Environmental Assessment (MAREA) area. Catch statistics and effort information have also allowed the weight and value of the catch extracted from the area to be calculated. Thus, the value of the fishery as both an exploitable resource and as a commercial commodity has been estimated. This information is used as the fisheries baseline against which impacts of marine aggregate extraction can be assessed.

For the purpose of the report, the area in which fishing patterns have been examined has been defined as ICES rectangles 31F0, 31F1, 32F1, 33F1, 31F2, 32F2 and 33F2 (*Figure 1.2*). Each rectangle is further sub-divided into four sub-rectangles (4 areas of 0.25° latitude × 0.5° longitude within each ICES rectangle) by ICES and within the dataset provided by MFA. The TEDA area covers the sub-rectangles 31F1-1, 31F1-2, 32F0-4, 32F0-2, 32F1-1, 32F1-2, 32F1-3, 32F1-4, 32F2-3, 32F2-1, 32F1-2, 33F2-3 and 33F1-4.

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CLIENT:
TEDA

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ERM

SOURCE: ESRI © Crown copyright, All rights reserved.
PROJECTION: WGS 1984 UTM Zone 31N

TITLE:
Figure 1.1
ICES Divisions in the North Sea

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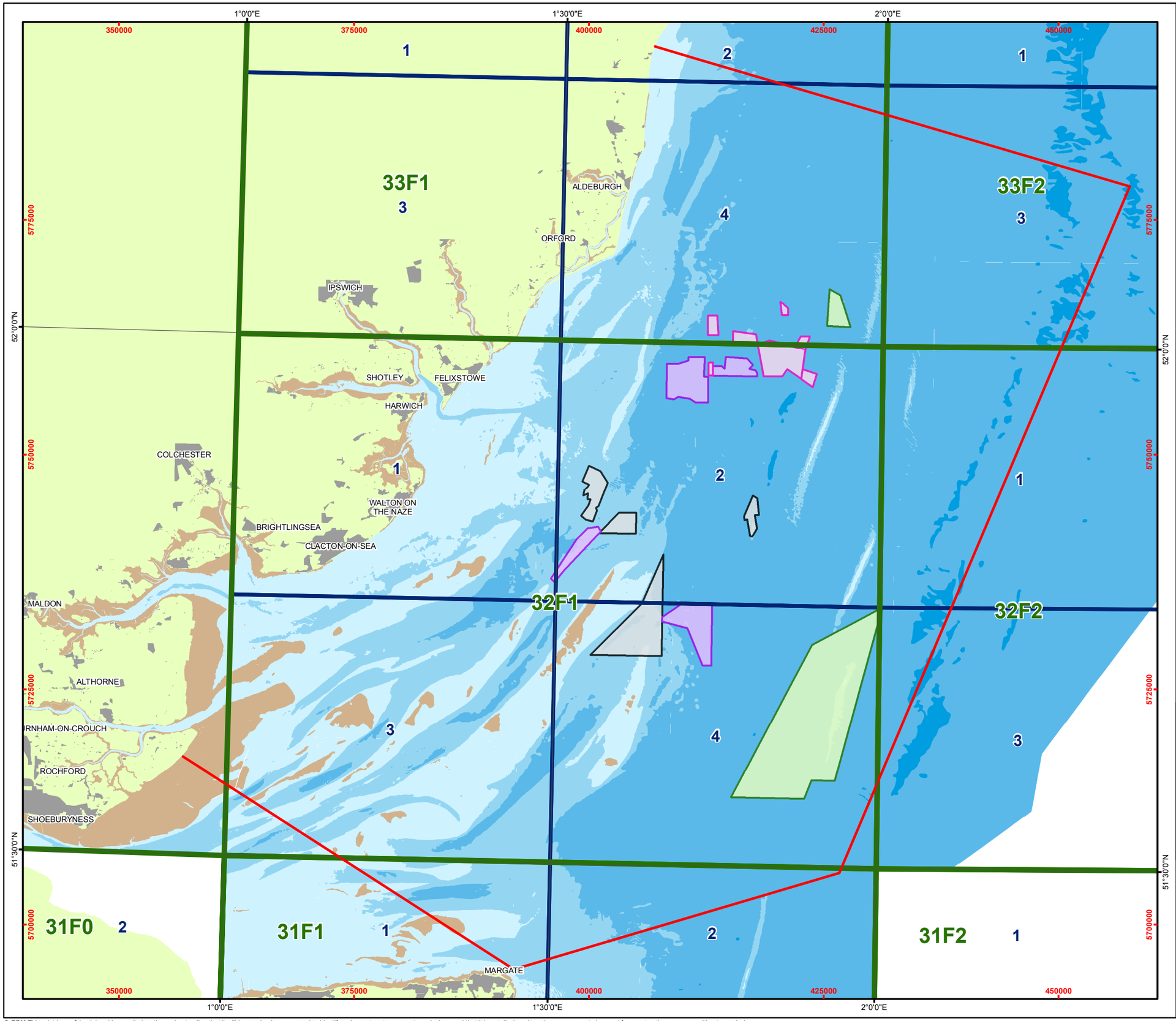


KEY:

- MAREA Study Area
- ICES Square
- ICES Sub-Square

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

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Figure 1.2
ICES Rectangles for which VMS and Overflight Data were obtained

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The commercial fishing methods currently used in the wider study area (the TEDA area and ports from which vessels that fish in the TEDA area originate) can be broadly divided into four distinct categories: trawling, netting, potting and others (including long-ling, seining and dredging). Sports fisheries are predominantly shore-based although a number of recreational angling vessels do operate in the region. The range of marine species exploited is broad and reflects the diverse marine ecosystem in the shallow coastal waters of the North Sea.

## 1.2 *REPORT STRUCTURE*

The remainder of this report is structured as follows:

- *Section 2* outlines the data sources used to inform this report, the limitations of those sources, data analysis methods and consultation carried out in order to collect further fisheries information.
- *Section 3* examines the European and UK policies that govern fisheries operating within the study area.
- *Section 4* provides a summary of the commercial landings within the ICES sub area IVc and the ports whose vessels fish within the study area.
- *Section 5* examines the different fishing fleets and their spatial and temporal distribution.
- *Section 6* discusses the different fishing methods utilised in the study area and their spatial and temporal distribution
- *Section 7* provides an economic overview of the fisheries and their value within the study area and ICES Division IVc.
- *Section 8* summarises the above findings and identifies the key fisheries and sectors to be examined in the impact assessment.
- *Appendix 1* provides detailed methodology used in the analysis of overflight survey data of UK and foreign fishing vessels and satellite tracking (VMS) data for UK vessels.
- *Appendix 2* includes the meeting minutes from consultation meetings with the Eastern Sea Fisheries Joint Committee, Kent and Essex Sea Fisheries Committee and with fishermen within the TEDA MAREA study area.

# 2 METHODOLOGY

## 2.1 DATA SOURCES

Several organisations hold data relevant to the fisheries within the TEDA area, including Centre for the Environment, Fisheries and Aquaculture Science (Cefas), Marine and Fisheries Agency (MFA), International Committee for the Exploration of the Seas (ICES), Eastern Sea Fisheries Joint Committee (ESFJC) and the Kent and Essex Sea Fisheries Committee (KESFC). The websites of these organisations were examined for relevant datasets and the organisations were contacted for more specific information sources. In addition a number of published reports on the fisheries of the North Sea and the Outer Thames Estuary were also examined and useful data extracted to complete the data set used in developing the fisheries baseline. The principal data sources are as follows.

- MFA Vessel Monitoring System (VMS) satellite surveillance data, recorded since 2000 and providing 2 hourly position reports from UK vessels over 24m in length. Since 2005, 2 hourly position reports from UK vessels over 15m in length have also been available. For the purposes of this study data were analysed for the five years between (and including) 2004 and 2008.

- MFA surveillance data of fishing vessels in English and Welsh waters from Fishery Protection Aircraft (overflight data). Recorded since 1985 and analysed for the five years between (and including) 2004 and 2008.

- MFA landing statistics (tonnage and value) for each port identified within the TEDA area and ports identified as having vessels fishing in the TEDA area (see *Figure 1.2*), analysed for the five years between (and including) 2004 and 2008.

- Cefas fisheries information datasheets for stocks targeted in the North Sea available at http://www.cefas.co.uk/data/fisheries-information/stocks-in-north-sea-and-eastern-english-channel.aspx.

- ICES Fish-Map data sheets for stocks of individual species available at http://www.ices.dk/marineworld/fishmap/ices/.

- ICES advice for each stock within the TEDA area. Available from the ICES website http://www.ices.dk/advice/icesadvice.asp

- Eastern Sea Fisheries Joint Committee (ESFJC) Website (http://www.esfjc.co.uk/index2.htm), Annual Report 2007 and Business Plan 2008 – 2009 for information on the structure of inshore fleet landings, species, fishing methods and fisheries. Available for download at http://www.esfjc.co.uk/paperwrk.htm

- Kent and Essex Sea Fisheries Committee (KESFC) Website for information on commercial fish and shellfish species, fisheries and fishing methods.

- KESFC data on the number of vessels and fishermen in the TEDA area.

- Fisheries market information from Fisheries Information Services (www.fis.com), EUROFISH (www.eurofish.dk), PEFA (www.pefa.com) auction prices from markets in the Netherlands and Belgium and from the MFA seafish statistics average annual tonnage value for each species.

- Dr Sophie des Clers and the maps produced of fishing activity her project that examined the Greater Thames Estuary fisheries in 2001 (see *Box 2.1*): des Clers, S., Dat, C., and Carrier, S., 2001. Survey of Greater Thames Estuary Fisheries Knowledge. Final Report to the Essex Estuaries Initiative, June 2001. 28 pp.

***Box 2.1 The Greater Thames Estuary Fisheries Knowledge Project***

The Greater Thames Estuary Fisheries Knowledge Project pilot project developed a framework to collect, analyse and communicate the individual and collective expert knowledge of local fishermen for use in spatial planning in the marine environment. A questionnaire to collect information was developed to structure interviews, the data were analysed and discussed with fishermen at local meetings. The collected information and data allowed the following analyses and outputs to be generated:

• An analysis and description of the vessels, and gear used within the Greater Thames Estuary;
• An analysis of the Greater Thames Estuary fisheries, including a set of maps of the Greater Thames Estuary giving areas essential to the livelihood of the fishermen interviewed along the Essex and Kent coast.

- Walmsley S.A. and Pawson, M.G., 2007. The coastal fisheries of England and Wales, Part V: a review of their status 2005–6. Scientific Series Technical Report, Cefas Lowestoft, 140: 83pp.

- Gubbay, S., & Knapman, P.A., 1999. A review of the effects of fishing within UK European marine sites. Natura 2000 report prepared for the UK Marine SACs Project. English Nature. (UK Marine SACs Project, volume .12)

- Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.

- Nichols, J., Huntington, T., and Hough, A., 2005. Final Certification Report for Thames Herring Drift-Net Fishery Client: Fisheries Partnerships Office Colchester Borough Council. 111 pp.

- Consultation meetings (*Section 2.3*).

## 2.2 *DATA LIMITATIONS*

With any fisheries dataset there are limitations as to its accuracy. The landings data in particular does not account for total removals of fish in the area as discards are currently not recorded by the fishing vessels or the MFA. During consultation (see *Section 2.4*) it was noted that the landings data before 2006 did not include all of the vessels in the under 10 m fleet and so were likely to be underestimates of total landings. In addition it was clear that the number of licensed vessels provided by the SFCs did not necessarily reflect the number of active vessels. Many vessels hold a valid licence but do not use it or are part time. Thus, it is likely that the number of active vessels in the under 10 m fleet is overestimated.

The overflight data also has its limitations as it can be difficult to separate out individual vessels from the data provided. Thus, it is difficult to estimate the number of vessels fishing within the TEDA area. It was also clear that some vessels were recorded as a particular fishing type in the overflight data when they may have changed gear types due to the economic constraints associated with using gear that is labour and fuel intensive.

It should be noted that the over 10 m sector is generally better represented in the data sets than the under 10 m inshore vessels. For instance, the data allows the examination of spatial and temporal variability of different gears for the over 10 m vessels but not for the under 10 m vessels. Thus, in *Section 6* the fishing methods are described but only data for the over 10 m sector is analysed. Discussion of any temporal and spatial variation in fishing for the under 10 m vessels is included in *Section 5.3*.

## 2.3 *ANALYSIS OF OVERFLIGHT AND VMS DATA*

Overflight and VMS data were analysed using specific GIS tools which provide graphical representations of the data. This allowed the data to be explored for spatial and temporal trends in fishing activity. For a more detailed methodology *Appendix 1* provides a summary of the overflight survey and VMS data analysis.

Overflight survey data were provided by MFA. The overflight data provided positions of UK and foreign vessels in UK waters, information on whether they were fishing and details of the gear being used. The overflight data was provided by ICES rectangle and further divided into four sub-rectangles (4 areas of 0.25° latitude × 0.5° longitude within each ICES rectangle) within the dataset provided by MFA. These divisions were kept for the analysis of overflight data to allow the full use of the dataset. In some instances only the sub-rectangle the vessel is observed in is recorded and the latitude and longitude values are unavailable. Further division of the rectangles would cause loss of resolution in the dataset and subsequent analysis.

The overflight data was standardised using the methodology described by Rogers *et al*. (2001) [(1)]. Observations of all fishing vessels were standardised to take account of the variable number of over-flights, as not all sub-rectangles in the TEDA area and ICES Divisions IVc were visited on the same number of occasions per month by the survey aircraft. Each vessel observed was given a nominal score of 1, and this was then divided by the number of over-flights that had taken place in the relevant month and sub-rectangle. The resulting index, usually a fraction, expressed each observation in terms of the effort required to make it. This provided an indication of the fishing effort as the number of standard observations within an ICES sub-rectangle during a month or year.

VMS data was also provided by MFA. The data included the ICES rectangle, sub-rectangle, position (latitude and longitude), vessel ID, gear type and speed information, all of which were used in the data analysis. Each ICES rectangle was subdivided into 15 (3 km by 3 km) individual squares to provide the greatest possible resolution from the data and following methodology used by Vanstaen *et al*. (2008) [(2)] .

The speed information was then used to identify whether vessels were fishing or not, in order to ensure the majority of data represented vessels that were actively involved in fishing, rather than steaming or stationary. As the UK VMS database retains incomplete data on vessel gear type and vessels can change their gear seasonally it was necessary for the speed rule to encompass many types of fisheries activities (eg trawling, gill netting and longlining). Fishing activity was therefore assigned to all vessels travelling at speeds between 3 and 10 km $h^{-1}$, (~1.5 to 5.5 knots). While this approach is a coarse data filter, the assigned limits circumscribes the speeds at which larger vessels move while undertaking fisheries activities. Where speed information was not available it was necessary to construct derived speeds. Derived speeds represent the speed of movement between time adjacent records within a fishing trip. Speeds held in the database (recorded speeds) always superseded calculated speed. The speed calculation followed the method utilised by Mills *et al*. (2007) [(3)] and adapted by Witt and Godley (2007) [(4)].

The overflight survey and VMS datasets were both analysed by gear type. Each gear type was then examined by year (yearly average of the number of vessels within a given sampling area) and by season (seasonal average of the number of vessels within a given sampling area) to provide an indication of changes in fishing activity on a seasonal basis and over the last ten years. The years between 1999 and 2008 were analysed for the overflight survey data.

(1) Rogers, S. I., Ellis, J.R., and Dann, J. 2001.The association between arm damage of the common starfish, Asterias rubens, and fishing intensity determined from aerial observation. Sarsia 86, 107-112.
(2) Vanstaen, K., Limpenny, D., Lee, J., Eggleton, J., Brown, A., Stelzenmüller, V., James, C., and Rocks, K., 2008. The scale and impact of fishing activities in the Eastern English Channel: an initial assessment based on existing geophysical survey data. Cefas contract report C3092, 105 p.
(3) Mills, C.M., Townsend, S.E., Jennings, S., Eastwood, P.D., and Houghton C.A., 2007. Estimating high resolution trawl fishing effort from satellite-derived vessel monitoring system data. ICES Journal of Marine Science; 64: 248–255.
(4) Witt, M.J., and Godley, B.J., 2007. A Step towards Seascape Scale Conservation: Using Vessel Monitoring Systems (VMS) to Map Fishing Activity. PLoS ONE 2(10): e1111. doi:10.1371/journal.pone.0001111

However, due to changes in the VMS data in 2005 (1), only data between 2005 and 2008 were analysed.

## 2.4 *CONSULTATION*

In order to fully understand the inshore fleet (vessels under 10 m in length) within the TEDA area it was important to consult the fishermen and Sea Fisheries Committees to validate the collected data. The first stage was to consult the ESFJC and KESFC and a consultation meeting was held on 1st October 2008. The resulting minutes from the meeting can be found in *Appendix 2*. It was clear that some data were missing and resulting from this meeting both ESFJC and KESFC provided data to fill the identified gaps.

It was during this meeting that it became clear that under 10 m vessels were poorly represented in publically available datasets. In order to redress this balance and obtain more information regarding this sector it was agreed that consultation meetings with fishermen were required. As a result four meetings with fishermen were set up and were held at the following venues:

- 26 November 2008, Wick Lodge, Clacton-on-Sea;
- 1 December 2008, St Nicholas Centre, Ipswich;
- 4 December 2008, Leigh-on-sea Town Council Offices; and
- 21 January 2009, Marlborough Hotel, Felixstowe.

At each meeting the current findings of the baseline study were presented and comments were invited from those present. Notes were taken of the relevant points and commitments made to contact people holding relevant data sets. Once the presentation was completed a 'mapping exercise' was undertaken with the fishermen. Fishermen were presented with a blank chart of the area and asked to indicate their important fishing grounds and any seasonal patterns in their fishing activity. In addition any known spawning or nursery grounds were also marked on the maps. The minutes of each meeting can be found in *Appendix 2* and the maps produced from the consultations are presented and discussed in *Section 5.3*.

(1) Data between 2000 and 2004 provides data from vessels over 24m in length. Since 2005 data is from vessels over 15m in length, increasing the size of the dataset.

# 3 POLICY CONTEXT

## 3.1 INTRODUCTION

The Common Fisheries Policy (CFP) is the European Union's instrument for the management of fisheries and aquaculture. The CFP was created to manage a common resource and to meet the obligations set out in the Treaty of Rome. It provides the legal framework for the exploitation of living marine resources in EU waters and for those vessels registered in the EU fishing in non-EU waters. The European Commission has exclusive rights to administer up to the High Water Mark. However, in practice they devolve authority to the UK government, through Defra, to manage the fisheries within 12 nautical miles of the UK and to control the activities of UK registered fishing vessels.

## 3.2 UK POLICIES AND PLANS

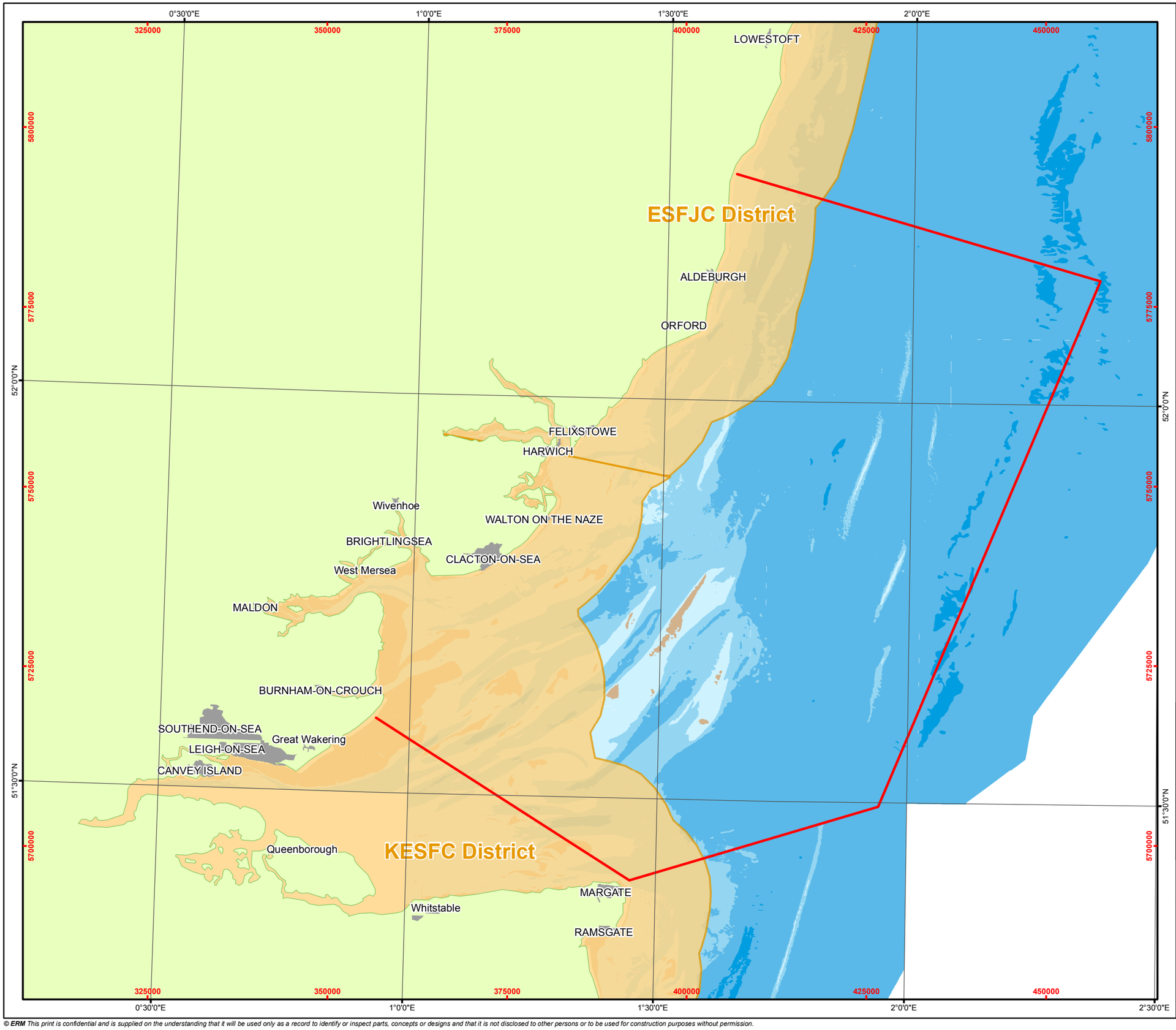
Under the Sea Fisheries Regulation Act 1966, the Sea Fisheries Committees (SFCs) of England and Wales are responsible for the management of fisheries within 6 nautical miles of mean High Water Mark. They also share responsibility for marine nature conservation. The SFCs have the power to introduce byelaws within this 6 nautical mile zone, and they enforce UK and EU fishery conservation legislation. The Eastern Sea Fisheries Joint Committee (ESFJC) and the Kent and Essex Sea Fisheries Committee (KESFC) regulate commercial fishing within the TEDA area. The ESFJC regulates fisheries from Donna Nook in the north to Dovercourt in the south. The Kent and Essex Sea Fisheries Committee regulates commercial fisheries from Dungeness in Kent to the northern boundary of Essex on the River Stour.

The management of fisheries around the coast of England and Wales is likely to change under the Marine and Coastal Access Bill which is due to pass through Parliament in autumn 2009. The Bill proposes to modernise inshore fisheries management in England by replacing Sea Fisheries Committees (SFCs) with Inshore Fisheries and Conservation Authorities (IFCAs). The new IFCAs will subsume the mandates of the SFCs and will continue to make byelaws pertinent to fisheries. They will also implement the full range of marine environmental legislation and will have stronger enforcement powers, with heavier penalties for offences. The aim of the IFCAs is to balance management of the sustainable exploitation of sea fisheries in their districts with protection of the marine environment. IFCA districts will cover the English coast out to six nautical miles and include estuaries where IFCAs will be responsible for sea fisheries management. The IFCAs will retain local authority members and one member each from Natural England, the Marine Management Organisation (MMO) and the Environment Agency. Other members with local fishing or environmental interests will be appointed by the MMO.

### 3.2.1 *Local Policies and Plans*

Sea Fisheries Committees are empowered by both the Sea Fisheries Regulation Act 1966 and the Sea Fish (Conservation) Act 1967 (as amended). They exercise these powers through a number of Statutory Instruments which enable the introduction of legislation for the purpose of protecting the marine environment from fisheries related activities, or taking into account conservation issues when creating byelaws. All these Acts have come into existence during the past decade: Sea Fisheries (Wildlife Conservation Act) 1992, Conservation (Natural Habitats & co) Regulations 1994 and the Environment Act 1995.

Locally, the ESFJC and the KESFC determine the regulatory framework within which fishing operations take place. The committees make byelaws to be observed within their Districts and enforce national and EU legislation relating to fisheries. A number of byelaws relating to specific fisheries, fishing vessels, fishing gears and the species caught are implemented by the Sea Fisheries Committees to manage the fisheries in their districts and up to 6 nautical miles offshore. Under the regime implemented under the Marine Bill the IFCAs will be responsible for implementing byelaws relating to the fisheries and their operation.




KEY:

- MAREA Study Area
- Area of Six Nutical Miles From the Coast

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

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Figure 3.1
The ESJFC and KESFC Districts, Fishing Ports and Coverage of the TEDA Area

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TEDA

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PROJECTION: WGS 1984 UTM Zone 31N

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# 4 COMMERCIAL LANDINGS

## 4.1 INTRODUCTION

To develop an understanding of fisheries within the study area it is important to examine the species of fish and shellfish that are caught. The area of the southern North Sea (ICES Division IVc) contains a number of important commercial fish and shellfish species and fishing grounds. Thus, through the landings data it is possible to understand the important commercial species in the area and those that are the most economically important. The value of the fishery in ICES Division IVc and the TEDA area based on these catches is examined in more detail in *Section 7*.

## 4.2 DATA SOURCES

Commercial landings data were downloaded from ICES using the FAOs FISHSTAT [(1)] database programme. The database provided the catches for the whole of the North Sea and ICES Division IVc between 1973 and 2007. For vessels operating in the TEDA area landings data for the ports from which vessels originated were sourced directly from the MFA.

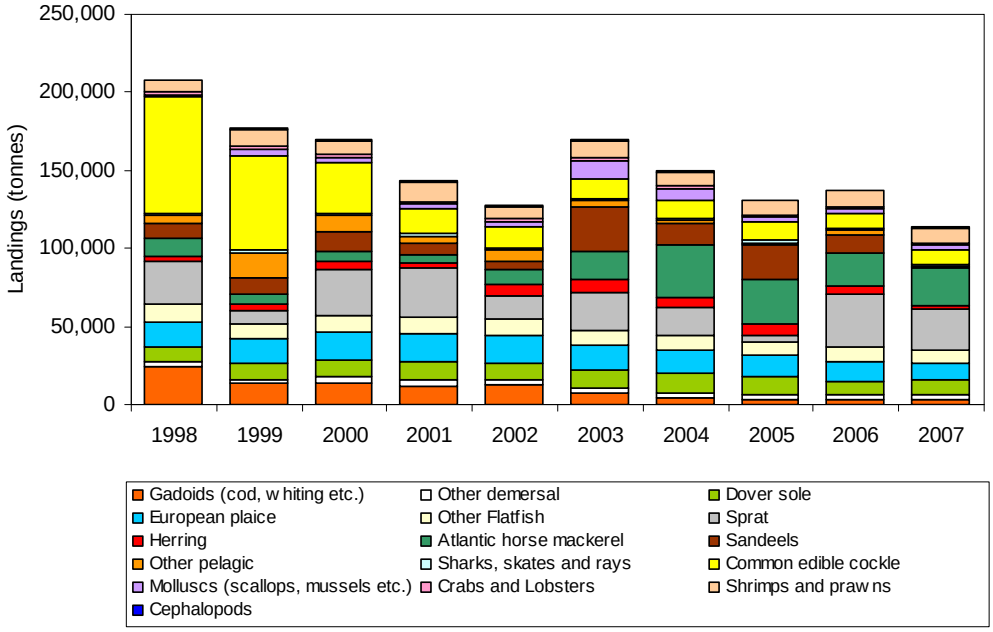
## 4.3 LANDINGS IN ICES DIVISION IVC

The TEDA study area sits within ICES Division IVc in the North Sea (*Figure 1.1*) and covers approximately 8.6% of the sea area of ICES IVc. Catches from this area are reported to the nation to which the vessels are flagged. The catches reported to the flag state are then reported in turn to ICES and the EU.

Catches from the 10 year period between 1998 and 2007 from Area IVc are shown in *Figure 4.1*. Overall catches within IVc decreased between 1998 and 2002. In 2003 a peak in catches was seen before catches again declined to 2006, where a small increase was seen over the catches in 2005 and 2007. These peaks are generally driven by changes in catches of cockles and clams and in 2003 by changes in the catches of herring, other demersals (other than flatfish and gadoids) and sandeels.

(1) FAO, 2007. FISHSTAT Plus - Universal software for fishery statistical time series. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/fi/statist/FISOFT/FISHPLUS.asp

*Figure 4.1 Total Catches from ICES Statistical Area IVc 1998 - 2007*



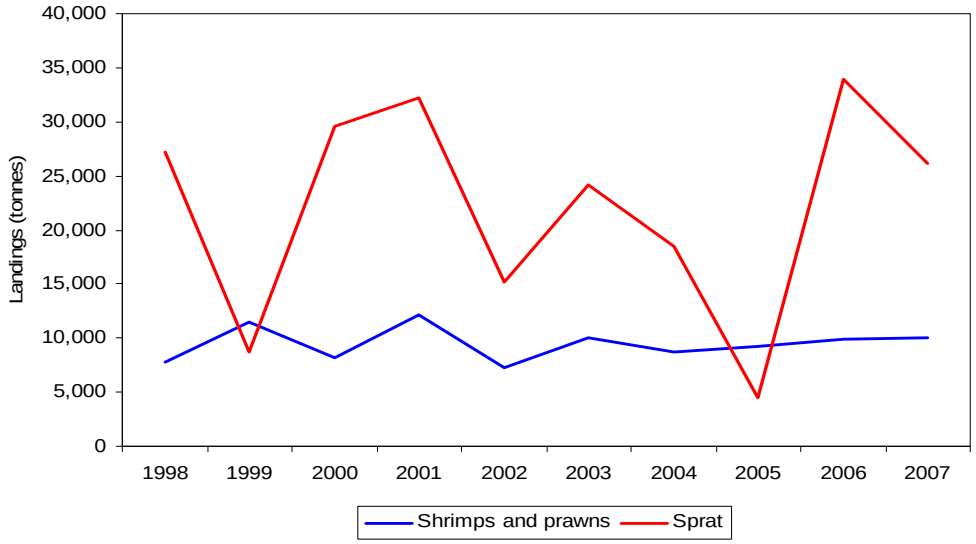

Source: Eurostat/ICES database on catch statistics - ICES 2007 Copenhagen, (formatted in FishStat Plus http://www.fao.org/fi)

Catches are dominated by cockles (*Cerastoderma edule*), pelagic fish such as herring (*Clupea harrengus*) and sprats (*Sprattus sprattus*) and demersal species including flatfishes (eg Dover sole (*Solea solea*) and plaice (*Plueronectes platessa*)), cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), demersal fish in general and shrimps and prawns.

In terms of individual catches of various groups, declines in catches between 1998 and 2007 have been seen for winkles, cockles, gadoids (cod, whiting (*Merlangius merlangus*) and haddock), oysters and eels (*Anguilla anguilla*). Some species have shown a general increase in catches between 1997 and 2006, including lobsters (*Hommarus gammarus*) (although a decrease was seen in 2005, the general trend is for an increase), other demersal fish species, European seabass (*Dicentrarchus labrax*) and shads (*Alosa* sp.).

The catches of other species show a higher degree of variability between consecutive years, and have peaks and troughs in catches throughout the 10 year period. For instance shrimps and prawns and sprats (*Figure 4.2*) fluctuate between adjacent years, rather than showing any general trend. Generally these species groups' population dynamics are driven by the environment rather than the fisheries that exploit them. Mussel, scallop and cephalopod catches also show a high degree of interannual variability. The catches of some species have remained fairly stable within the ten years between 1998 and 2007, including flatfish (sole, plaice etc) and sharks, skates and rays.

*Figure 4.2* *Catches of Shrimps, Prawns and Sprats in ICES Division IVc between 1998 - 2007*




Source: Eurostat/ICES database on catch statistics - ICES 2007 Copenhagen, (formatted in FishStat Plus http://www.fao.org/fi)

## 4.4 COMMERCIAL LANDINGS INTO PORTS IN THE TEDA AREA

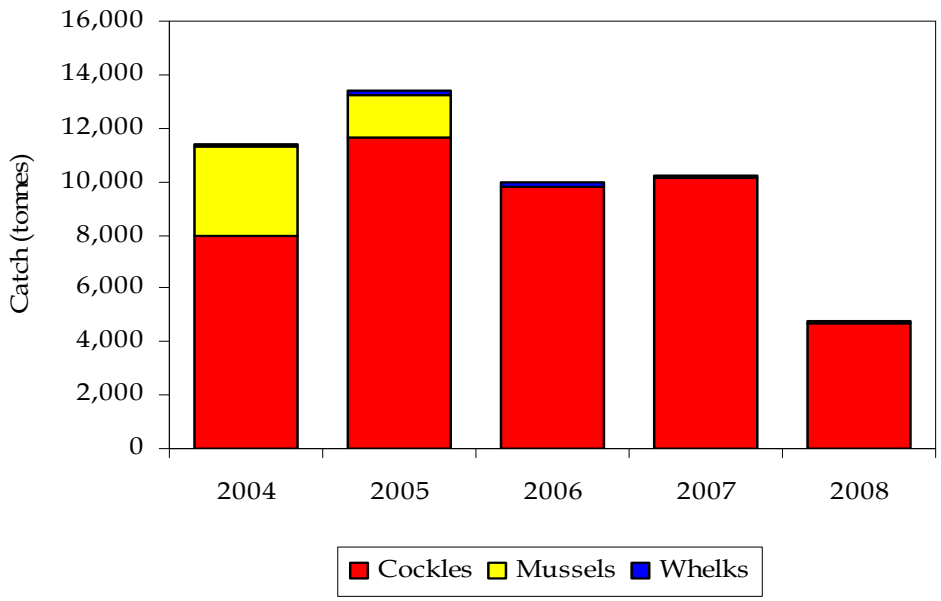
The following section examines the landings into ports that are within the TEDA area or have vessels that fish within the study area (see *Figure 3.1* for the ports examined). While these are generally representative of the landings that are taken from the study it must be noted that a number of vessels will also take catch outside the study area. In addition vessels from other ports (UK and European) may also land catch at these ports which was taken in other parts of the North Sea or may have originated from further afield. Thus, the presented landings, while providing a good indication of the species that are targeted within the TEDA area, also include catches from other waters. Thus, they may not fully represent landings (or catches) from the TEDA study area.

### 4.4.1 *Shellfish*

Shellfish form the most significant portion of landings within the TEDA area, including a number of crustaceans and molluscs. The crustacean species targeted include crab (*Cancer pagarus*), lobsters (*Homarus gammarus*) and shrimp (*Crangon crangon*). Molluscs targeted by the fisheries include mussels (*Mytilus edulis*), cockles (*Cerostoderma edule*) and whelks (*Buccinum undatum*).

The majority of shellfish landings in the TEDA area are cockles (*Figure 4.3*). From the ports in the TEDA area the landings of cockles have been between 5,000 and 12,000 metric tonnes in the period between 2004 and 2008, followed by mussels at a maximum of just over 3,000 tonnes in 2004. The other major mollusc, whelks, saw landings between 54 and 178 tonnes in the same period.

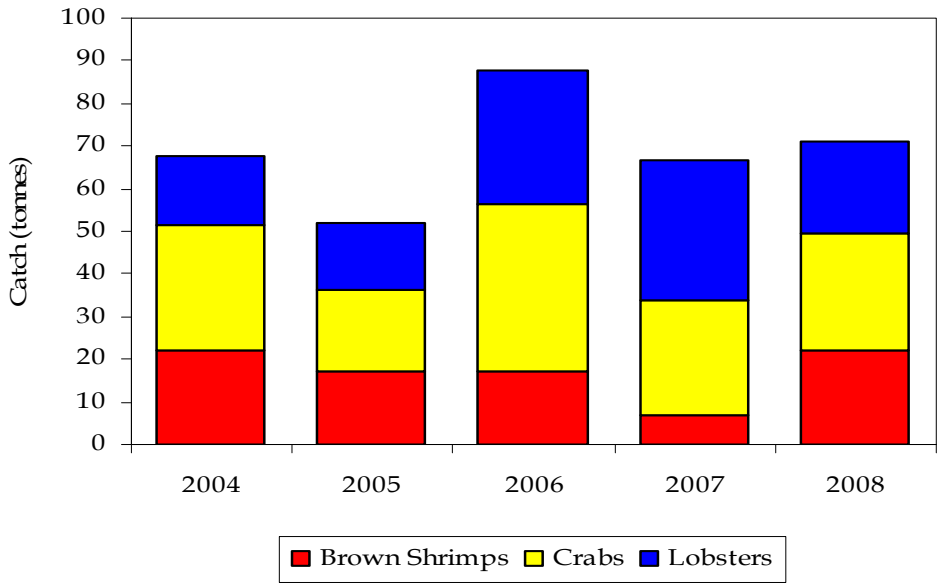
*Figure 4.3* ***Total Landings of Molluscs in TEDA Area Ports 2004 - 2008.***




Source: MFA landing statistics.

Crustacean landings are dominated by crabs, brown shrimps and lobsters (*Figure 4.4*). Landings of crabs are generally the highest, at between 20 and 40 tonnes. Lobster landings were similar at between 15 and 33 tonnes whereas brown shrimp landings were between 7 and 22 tonnes. Landings of cephalopods (squid, cuttlefish and octopus) are generally low and rarely above 1 tonne of catch. Cuttlefish landings between 2004 and 2008 were between 0.3 and 1.7 tonnes, squid between 0.3 and 1.6 tonnes. Octopus landings were rarely above a few hundred grams.

*Figure 4.4* ***Total Landings of Crustaceans at TEDA Area Ports 2003-2007.***




Source: MFA landing statistics.

Over the longer term (the 10 years between 1999 and 2008) landings have been fairly stable and patterns are dictated by the landings of cockles. Landings of cockles have generally been stable at between 8,000 and 10,000 tonnes per year. In both 1999 and 2008 these landings were lower, although the reason for these lower yields in those years is not clear. Landings of crustaceans have continued to grow with a general increase in landings of crabs and lobsters between 1999 and 2008.

### *4.4.2 Finfish*

Finfish can be separated into two distinct categories, pelagic and demersal fish species (see *Appendix L* of Thames MAREA).

- **Pelagic fish** are those species that spend the majority of the life-cycle in the water column or associated with the surface. These species generally feed and breed within the water column, although some species (e.g. herring) may spawn on the sea bed.

- **Demersal fish** spend most of their life-cycle associated with the sea bed and feed and breed in benthic habitats. However, spawning may occur in the water column and eggs and larvae may be found at or close to the surface.

Due to the nature of their different life-cycles, these groups are generally targeted using different fishing methods (see *Section 6*). These species groups are therefore discussed separately.

*Pelagic Finfish*

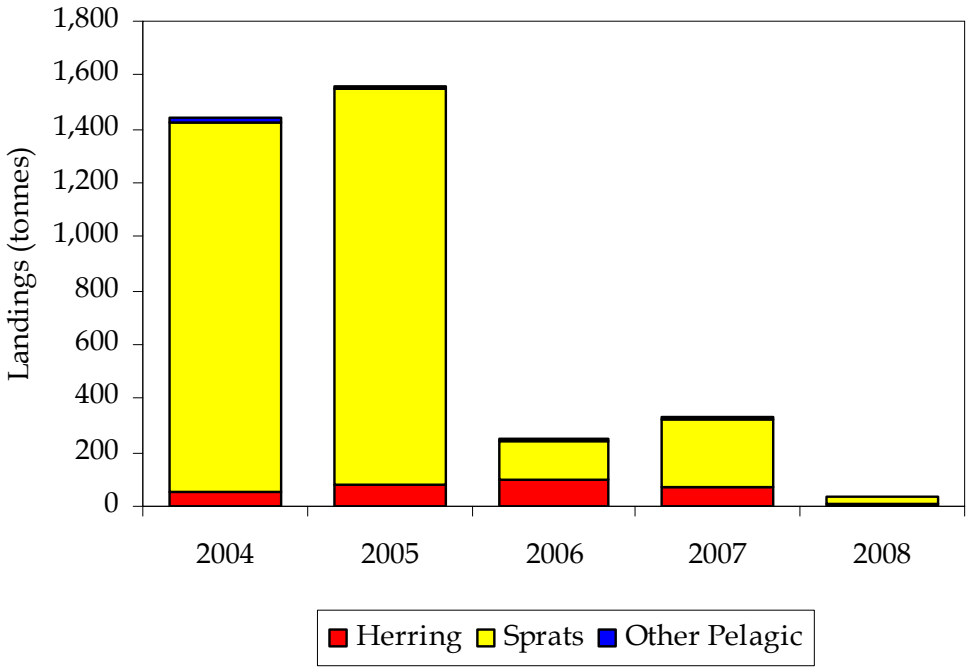
Landings of pelagic species are generally the highest for finfish within the TEDA area. Pelagic finfish species targeted in the area are mostly herring and sprats. A number of other pelagic species are also landed in much smaller numbers. These include mackerel (*Scomber scombrus*), other clupeids (i.e. pilchards, shads, smelts, sardines and sardinellas) garfish (*Belone* sp.) and horse mackerel (*Trachurus* sp.).

The majority of pelagic finfish landings at ports within the study area are sprats. The landings of herring and other pelagic species are considerably lower (*Figure 4.5*). Landings of sprats between 2004 and 2008 were between 27 and 1,467 metric tonnes, landings of herring were between 11 and 98 tonnes and other pelagic species between 2 and 11 tonnes. In recent years (2006 to 2008) the catches of sprats and herring have shown significant declines. This has been attributed to a decrease in market value and diversification of fishermen into other target species (e.g. sole).

Significant landings of sprats are recorded at Harwich (annual average of 697 tonnes), Lowestoft (91 tonnes) and Southend (30 tonnes) and small landings are recorded at Great Wakering (annual average of 2 tonnes) and Leigh-on-sea (10 tonnes). Other ports record landings of sprats but generally the total

tonnage is not significant. For herring the majority of catches (between 60 and 85%) are landed at Southend, with an annual average of 61 tonnes. Aldeburgh and Orford (0.7 tonnes annual average), Clacton (0.6 tonnes), Lowestoft (4 tonnes), Ramsgate (0.5 tonnes), Walton-on-Naze (0.9 tonnes), West Mersea (8 tonnes) and Whitstable (0.9 tonnes) also contribute. Landings are also recorded at other ports in the study area but these tend to be much lower than an annual average of 0.5 tonnes.

*Figure 4.5* ***Total Landings of Pelagic Fish in TEDA Area Ports 2003-2007.***




Source: MFA landing statistics.

Over the longer term (between 1999 and 2008) total landings of pelagic finfish have shown variable performance, mainly due to the inherent variability of the population dynamics of these species and changes in their market value:

- Catches of sprat have shown two peaks in 2000 (just over 2,000 tonnes) and between 2004 (1,400 tonnes) and 2005 (1,500 tonnes). Catches in other years have been below 500 tonnes.

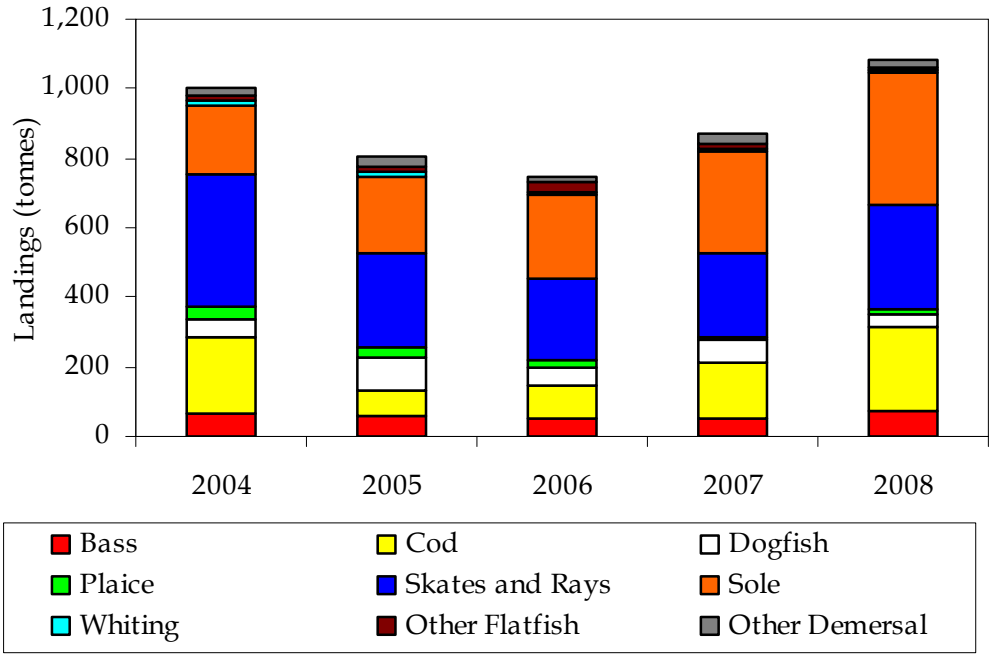
- Herring catches have shown a general decrease from a high of 138 tonnes in 2000 to only 10 tonnes in 2008. This trend is generally driven by a decrease in the marketability of the catch.

*Demersal Finfish*

Demersal finfish species form the smallest portion of landings within the study area. Demersal species are generally dominated by cod, skates and

rays [1] and Dover sole. Other significant catches include bass (*Dicentrarchus labrax*), plaice, dogfish (*Scyliorhinus* spp.) and other flatfish. A variety of other species are also caught including anglerfish (*Lophius* sp.), haddock, whiting, ling (*Molva molva*), pollack (*Pollachius pollachius*), mullets and wrasses. The majority of landings in the study area are skates and rays with average annual landings of 287 tonnes (*Figure 4.6*), followed by sole (267 tonnes) and cod (159 tonnes). Average landings of the other fish are dominated by dogfish with average annual landings of 60 tonnes, closely followed by bass (59 tonnes), plaice (21 tonnes) and whiting (7 tonnes).

***Figure 4.6*** ***Total Landings of Demersal Fish in TEDA Area Ports 2003-2007.***




Source: MFA landing statistics.

Landings for the species caught in the region have shown both increases and decreases in the period between 2004 and 2008:

- Bass landings decreased between 2004 and 2006 but in 2007 and 2008 landings have increased. In general bass have become increasingly important as a fishery in the Thames area in the last few years.
- Cod landings decreased between 2004 and 2005 but since 2006 the catches have shown year on year increases.
- Plaice landings have declined to less than a quarter of the catches seen in 2004. However, an increase in landings was seen in 2008.
- Whiting have shown a year on year decrease between 2004 and 2008.

(1) In 2008 approximately 50% of the recorded landings were Thornback ray (*Raja clavata*). Before 2008 the skate and ray species were not separated in catch statistics.

- Skates and ray landings decreased between 2004 and 2007 but have shown an increase in 2008 and are approaching the levels seen in 2004.

- Dogfish landings increased between 2004 and 2005 but have since continues to decline.

- Sole landings during the last five years have almost doubled, from 192 tonnes in 2004 to 382 tonnes in 2008. The fishery for sole is the most important for fishermen in the TEDA area.

Over the longer term (between 1999 and 2008) landings of demersal finfish species have shown varying trends. Overall, catches decreased between 1999 and 2002 but since 2002 the general trend has been a year on year increase with peaks in catches of 1,005 and 1,081 tonnes in 2004 and 2008 respectively. The catches of some species have been fairly stable and some have shown marked increases and decreases:

- Bass landings have generally been between 50 and 70 tonnes, although in 2000 and 2001 were catches dropped to 39 and 29 tonnes respectively. The reason for this drop is unknown.

- Cod catches in 1999 were close to 800 tonnes. From 2000 to 2005 catches generally decreased but have since increased year on year.

- Plaice catches have generally decreased year on year from around 100 tonnes in 12 tonnes in 2008.

- Catches of skates and ray have been relatively stable over the past 10 years, between 200 and 300 tonnes, with a peak in catches for 2004 of nearly 400 tonnes.

- Catches of sole have increased in the 10 years between 1999 and 2008 from around 200 tonnes to nearly 400 tonnes.

- Although generally low, whiting landings have decreased year on year between 1999 and 2008 from around 20 tonnes to about 4.

Fish caught within the TEDA area are landed at a number of different ports. However, some ports tend to see higher catches of one or several species than others:

- For skates and rays the highest average annual landings are recorded at Lowestoft (83 tonnes), Ramsgate (47 tonnes), West Mersea (38 tonnes) and Whitstable (28 tonnes).

- The highest average annual landings for sole are recorded at Ramsgate (50 tonnes), followed by West Mersea (34 tonnes), Lowestoft (27 tonnes) and Felixstowe (22 tonnes).

- For cod the highest average annual landings are recorded at Lowestoft (65 tonnes), Ramsgate (25 tonnes), and Felixstowe.

- The most significant annual average bass landings are recorded at Ramsgate (20 tonnes) and Whitstable (14 tonnes).

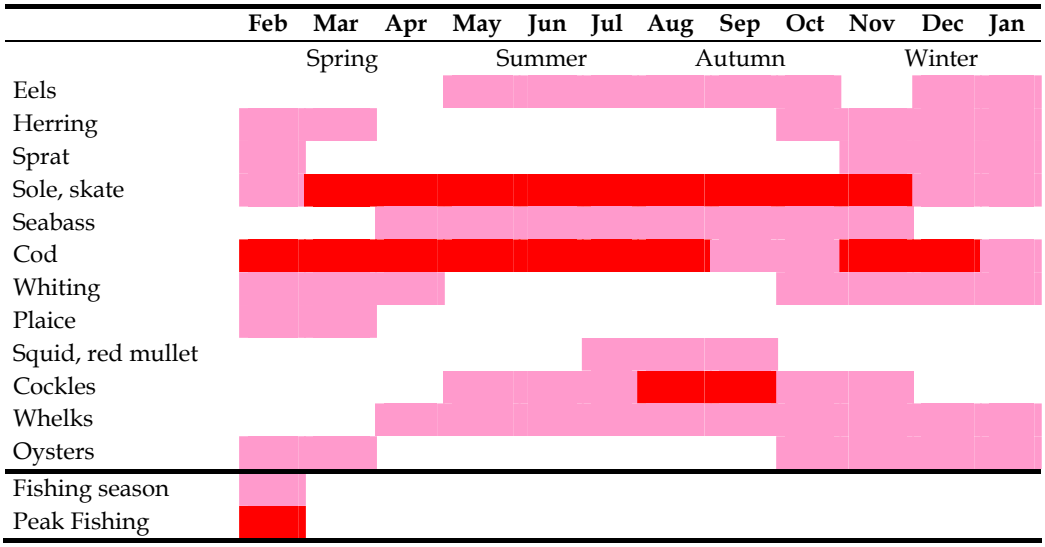
- Five ports record average annual landings of plaice above 2 tonnes (Great Wakering, Harwich, Leigh-on-sea, Ramsgate and Whitstable) with the most significant landings recorded at Lowestoft (6 tonnes).

- Lowestoft and Ramsgate record the only significant average annual landings of dogfish (21 tonnes each).

## 4.5 *SEASONAL VARIATION IN LANDINGS*

Seasonality, which brings species inshore to breed and changes their market value, is a very important feature of the fisheries in the area. *Table 4.1* summarises the seasonality of the fisheries and the times at which different species are targeted or available. However, it must be noted that the beginning and end of seasons change from year to year and localised seasonal differences in fisheries exist.

***Table 4.1 Seasonal Changes in Species Targeted***




### 4.5.1 *Shellfish*

Within the landings data there is a degree of seasonality for most shellfish species (*Figure 4.7*).

- During the first few months of the year cockle landings are not recorded but begin to increase from May onwards, reaching a peak in September before decreasing again to the end of the year. This pattern is caused by the licensing regime which permits licence holders to initially make 2

landings per week, peaking at 4 landings per week during August and September when meat yields are at their highest.

- Mussels are generally landed throughout the year but with peaks in April and December.

- Landings of Scallops are also highest in the winter months, with landings not being recorded in the summer months.

- Landings of native oysters are at their peak in November and their lowest during the close season between May and August.

- Pacific oyster landings peak in September and October and are generally stable for the remainder of the year.

- Landings of whelks are recorded throughout the year, with peaks in February and August; the lowest landings are seen in April and October.

- Crustacean landings also show a high degree of seasonality (*Figure 4.7*).

- The catches of brown shrimps increase slowly during the first few months of the year before increasing rapidly from summer to autumn, declining again in the winter. A large peak is seen during August for this species but this is influenced by a single landing of 19 tonnes into Whitstable in August 2008. Without this value the peak is still present but closer to an average of 2.2 tonnes.

- Landings of crabs and lobsters are lowest in the winter with peak landings occurring during the summer months.

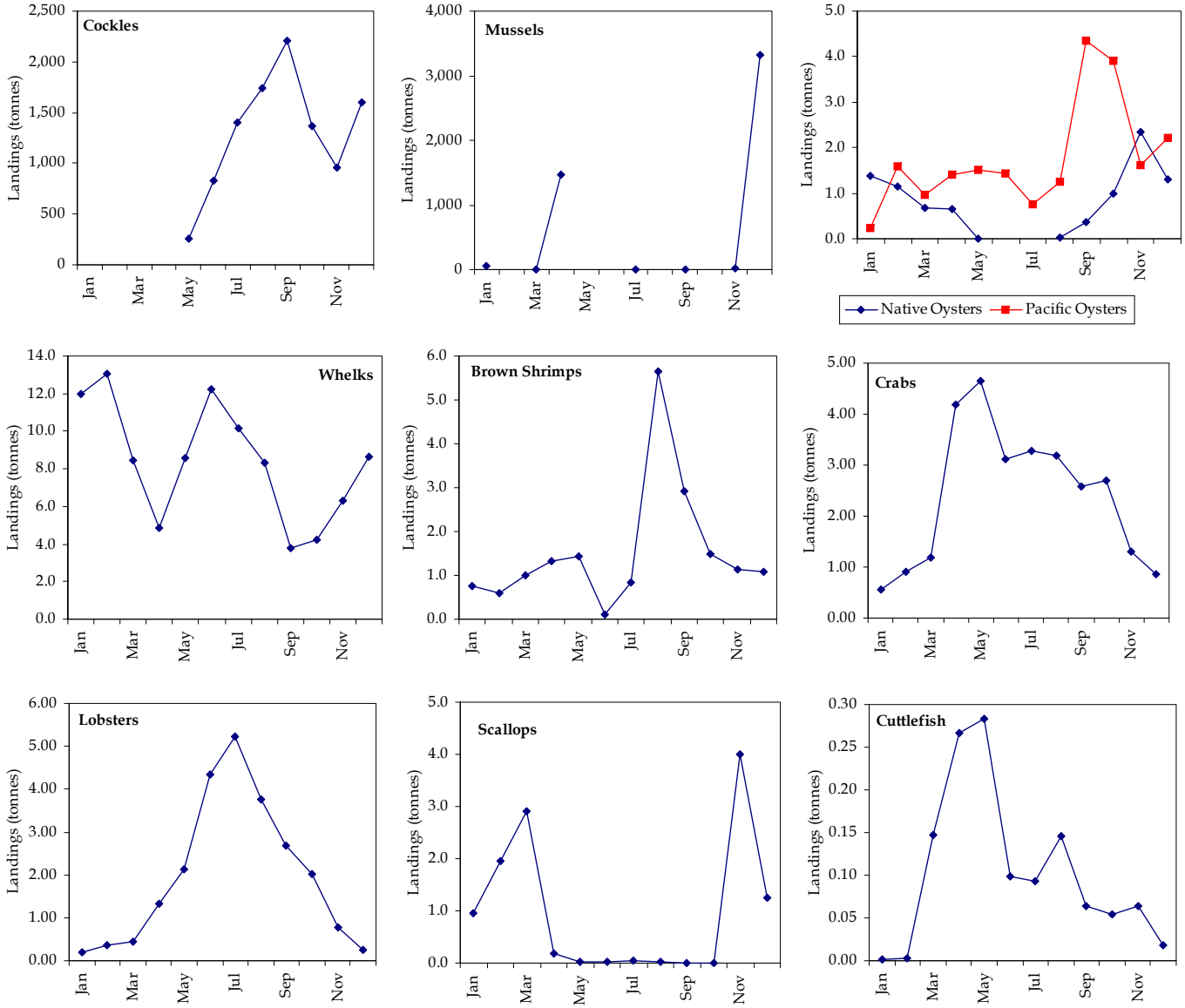
Landings of Cephalopods are generally lower than those of other shellfish but their catches show some degree of seasonality:

  - Cuttlefish (*Sepia officinalis*) landings are typical of a short lived species, landings rapidly increasing as recruits enter the adult population (and fishery) and decreasing as the population is fished and high post spawning mortality occurs [(1)].

  - Despite having a similar life-history to cuttlefish, the landings of squid (Loligo sp.) do not show a similar pattern. Compared to cuttlefish, this may be due to the very low landings of squid, which do not fully represent their population density in the area.

(1) Cuttlefish spawn once, after which they die.

*Figure 4.7 Average Monthly Landings of Shellfish into Ports in the TEDA area, 2004 to 2008.*

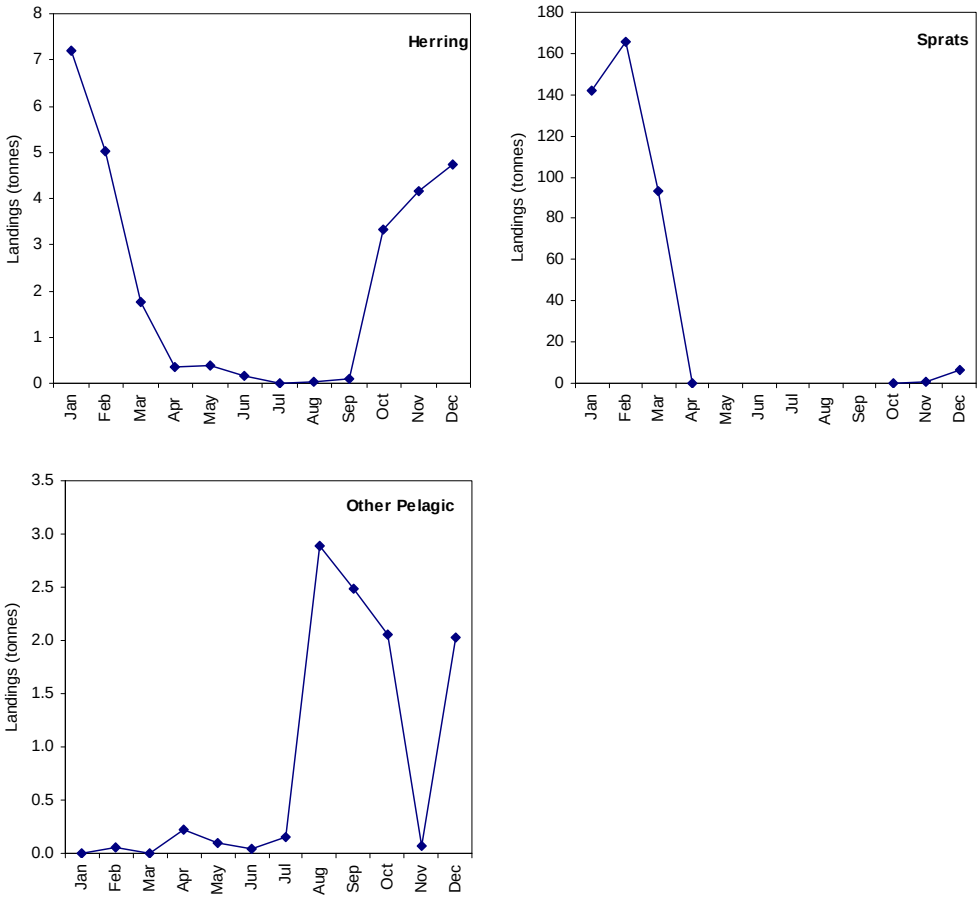



Source: MFA landing statistics.

### 4.5.2 *Finfish*

Landings of pelagic fish species show marked seasonality which is generally associated with their ecology (see *Appendix L* of Thames MAREA). Herring and sprat landings tend to be greatest in the winter months, between October and March for herring and between January and March for sprats (*Figure 4.8*):

***Figure 4.8 Average Monthly Landings of Pelagic Fish into Ports in the TEDA area, 2004 to 2008***




Source: MFA landing statistics.

- The Thames Estuary and Blackwater herring spawn in the spring (see *Appendix L* of Thames MAREA). Herring become available to the fishery during October and continue to be available through the winter until after their spawning season; from February though to April. For the remainder of the year they move away from the Thames Estuary into deeper water off the coasts of East Anglia and north Kent.

- Sprats move inshore between November and February (see *Appendix L* of Thames MAREA) and become available to the fishery during this period.

- During the summer, catches of herring are very low and no catches of sprats are recorded between April and October. Other pelagic species

show their highest catches between August and October with another peak in December.

Landings of demersal fish species are also dictated by their biology to some degree and also by weather conditions. However, the CFP quota system may also dictate the observed seasonal patterns as once the annual quota is used up for a particular species the fishery closes and catches are no longer recorded:

- Landings of bass tend to be low during the winter months (*Figure 4.9*), increasing during the spring (April and continuing at similar levels until October when they peak).

- Landings of dogfish are also highest in the spring and summer, with a peak in May.

- The sole peak in landings occurs In April, with landings during the winter being much lower. Fishermen targeting this species tend to spend more time ashore during the winter months when weather is bad.

- Other flatfish landings are lowest in January and February and peak in June and July.

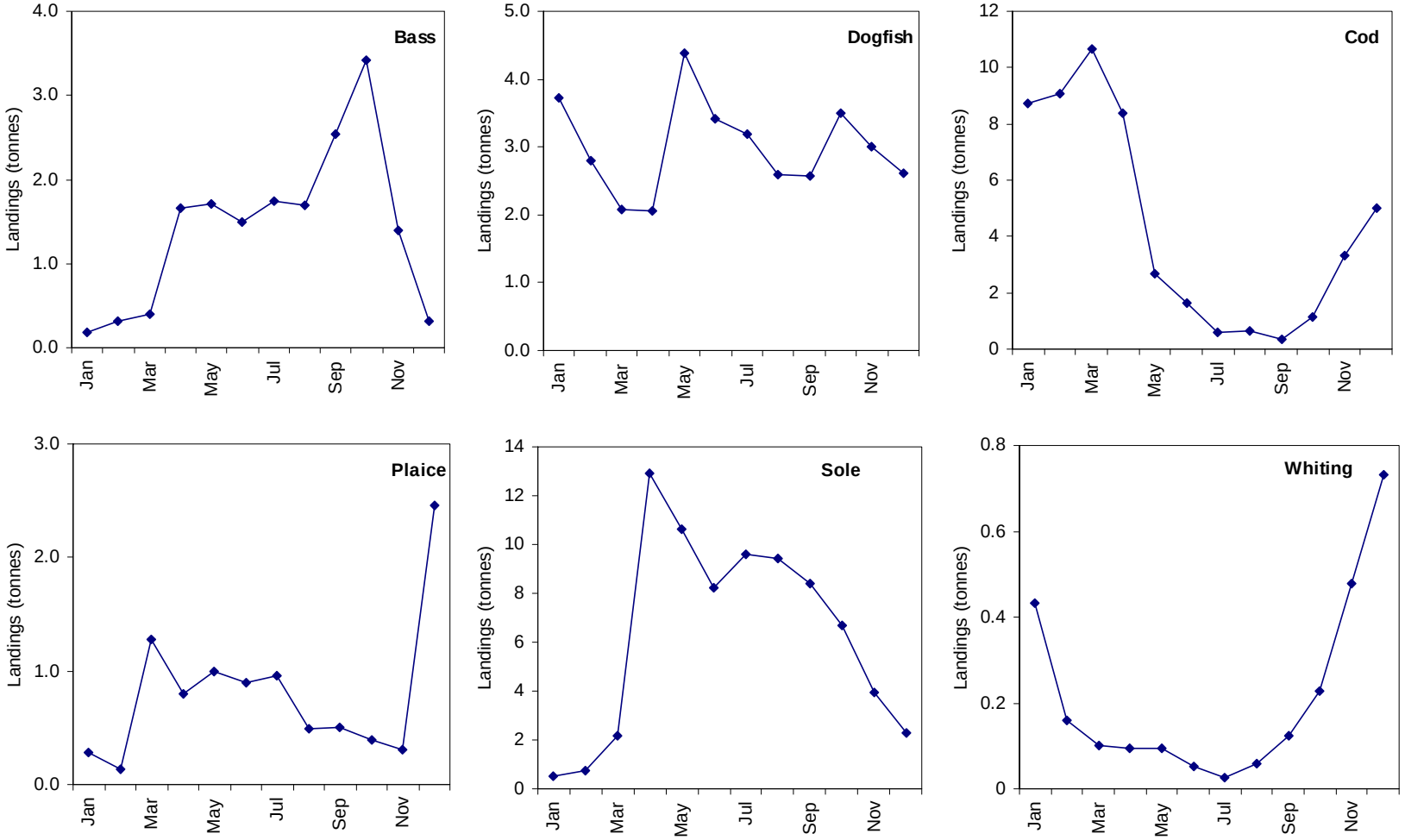
- Landings of the gadoids, (cod and whiting) are at their lowest in the summer months. The peak in cod landings occurs in the spring, in March, with the highest landings taken during the winter and spring.

- Whiting catches peak in the winter and are generally low from February to September.

- Landings of plaice show two peaks, one in the spring (March) and another in December. Generally plaice landings decrease between March and November before increasing again to the peak in December.

The majority of the observed patterns in landings are likely to be driven by the biology of each species. As each species moves inshore to breed, catches generally increase. For instance cod breed during the winter and catches increase during this time when they move inshore to the spawning areas (see *Appendix L* of Thames MAREA). However, in some instances the catches are driven by the quota system within the CFP which manages the catches of each species. If the quota is used up quickly fishers will move to target another species until the quota is released in the New Year or more quota becomes available. Generally, the landing patterns (particularly for the smaller vessels) are driven by the seasonal migrations (see *Appendix L* of Thames MAREA for details) of each species and their availability on the fishing grounds.

*Figure 4.9 Average Monthly Landings of Demersal Fish into Ports in the TEDA area, 2004 to 2008*




Source: MFA landing statistics.

# 5 FISHING FLEETS

## 5.1 INTRODUCTION

The TEDA study area is bordered by a number of ports (see *Table 5.1* and *Figure 3.1*). Vessels from ports outside the TEDA area also fish the grounds within the study area. These ports include Lowestoft and Southwold to the North and Whitstable, Margate and Ramsgate to the south (see *Figure 3.1*). Vessels from ports in Belgium, Holland, France and Germany also use the TEDA area as a fishing ground.

Generally the majority of vessels operating in the study area are below 10 m in length and operate within the 6 and 12 mile nautical limits. The larger vessels (greater than 10 m in length) are generally fewer in number but are fitted with VMS capabilities and are recorded during overflight surveys. As a result, the spatial and temporal variations of the larger vessels can be readily plotted. The spatial and temporal variation of the less than 10 m vessels is less well understood but through consultation (see *Section 2.4*) it was possible to map their fishing grounds.

There is one major fishing port (as defined by Defra) within the wider study area; Lowestoft. However through consultation it was noted that the most of the larger vessels recorded at Lowestoft were no longer involved in fishing. A number of other ports also had much greater numbers of vessels and from the data provided by the SFCs, Leigh-on-Sea was seen as the largest active port with 21 full-time vessels (10 under 10 m and 11 over 10 m in length) and 5 part-time vessels (3 under 10 m and 2 over 10 m).

*Table 5.1* displays the number of vessels, fishermen and major gears at each port within the TEDA study area. It is highly likely that potting and netting vessels are in fact the same. Some potting vessels have a category A licence with a shellfish entitlement which allows them to fish for practically all finfish and shellfish. Others may have a category C shellfish licence, entitling them to catch non pressure stock species of finfish (for example sea bass and mullet). Those under 10 m vessels with a category A licence are currently restricted as to what they can catch as the cod and sole quotas have been fully taken up.

## 5.2 DATA SOURCES

To examine the fishing fleets that operate in the area two major data sources were utilised. For the inshore fleet (generally vessels less then 10 m in length) most information was obtained through consultation with ESFJC, KESFC and fishermen that operate from ports in the area. The Sea Fisheries Committees websites were also consulted for additional information. The MSC report on the Thames Herring fishery was also consulted for more information on this particular fishery.

*Table 5.1 Characteristics of the UK Fishing Fleets from Ports in the TEDA Study Area*

| | Vessels | | | | | Fishermen | |
|---|---|---|---|---|---|---|---|
| **Home port** | **<10 m FT** | **>10 m FT** | **<10 m PT** | **>10 m PT** | **Main gear types** | **FT** | **PT** |
| Aldeburgh | 4 | | 2 | | Pots, driftnets, long-line, stern trawl | 8 | 2 |
| Barling | 1 | 1 | 3 | | Trawl, driftnets, gill nets, trammel nets, dredge | 2 | 3 |
| Brightlingsea & Colchester | 2 | | 4 | | Trawl, driftnets, gill nets, trammel nets, long-line, pots, dredge | 3 | 4 |
| Burnham-on-crouch | | 1 | 4 | | Trawl, driftnets, gill nets, trammel nets, dredge | 2 | 3 |
| Clacton & Jaywick | 2 | | 2 | | Trawl, driftnets, gill nets, trammel nets, long-line, pots | 2 | 2 |
| *Faversham | 2 | | | | Trawling, driftnets, gill nets, trammel nets | 4 | |
| Felixstowe | 3 | | 7 | | Stern trawl, gillnets | 5 | 12 |
| Harwich | 6 | 1 | 11 | 1 | Trawl, driftnets, gill nets, trammel nets, long-line, pots | 7 | 14 |
| *Herne Bay | 6 | | | | Driftnets, gill nets, trammel nets, pots | 10 | |
| Holehaven | 4 | 1 | 6 | | Trawl, driftnets, gill nets, trammel nets, | 8 | 7 |
| Leigh-on-sea | 10 | 11 | 3 | 2 | Trawl, driftnets, gill nets, trammel nets, cockle dredge | 40 | 7 |
| Lowestoft | 3 | 4 | 4 | | Stern trawl, beam trawl, gillnets, long--line , driftnets, pots | 15 | 6 |
| Maldon & Bradwell | | | 4 | | Trawl, driftnets, gill nets, trammel nets | | 4 |
| Mersea Island | 7 | 3 | 19 | | Trawl, driftnets, gill nets, trammel nets, long-line, pots, dredge | 21 | 22 |
| Orford | 2 | | | | Driftnets, gillnets, pots | 4 | |
| *Queenborough | 4 | 2 | | | Trawling, driftnets, gill nets, trammel nets, long-line, dredging | 11 | |
| Rochford & Paglesham | 2 | | 1 | | Trawl, driftnets, gill nets, trammel nets, dredge | 3 | 1 |
| Southend-on-sea & Thorpe Bay | 3 | | 4 | | Trawl, driftnets, gill nets, trammel nets | 5 | 5 |
| Southwold | | | 5 | | Driftnets, stern trawl | | 5 |
| *Thanet (Margate, Ramsgate, Broadstairs) | 32 | | | | Trawling, driftnets, gill nets, trammel nets, pots | 56 | |
| Walton-on-Naze | 2 | 1 | | 1 | Trawl, driftnets, gill nets, trammel nets, long-line, pots, dredge | 5 | 3 |
| *Whitstable | 9 | 3 | | | Trawling, drift/gill/trammel nets, potting, dredging | 20 | |
| Wivenhoe | 3 | | 2 | | Trawl, driftnets, gill nets, trammel nets | 4 | 4 |

Source: ESFJC Business Plan 2008 2009, KESFC Vessel Statistics (received 14 January 2009), MFA Vessel Statistics

*No breakdown of full-time and part-time fishermen available.

For the offshore fleet (both UK and foreign) the main data source was the VMS and overflight data provided by MFA. In addition a report on the fisheries around the UK produced by Cefas [1] was reviewed and relevant information to the fisheries in this area used to inform the report.

The inshore and offshore fleets are discussed separately in *Section 5.3* and *Section 5.4* respectively. For each sector the spatial and temporal differences in fishing are presented and for the greater than 10 m sector the temporal and spatial changes in fishing effort are further discussed based on overflight and VMS data.

## 5.3 THE INSHORE (<10 M) FISHING FLEET

The variety of gear used by individual vessels is high. However, some fishermen are specialised because of the gear they use. For instance shellfish dredgers (cockles and oysters), and pelagic netsmen (herring, sprat, mackerel) limit their activities to specific areas and depths and use one type of gear. The vast majority of fishermen are generalists, keeping a variety of gear on board (see *Table 5.1*) or rigging the same gear in different ways in order to target specific species that are either in demand, or seasonally abundant. Vessels frequently use otter and beam trawls for sole during summer and autumn in the estuaries and switch to nets and lines to fish for cod and whiting during colder winter months [2].

The majority of fishing vessels are powerful enough to steam from north to south, or west to east, and back in a day's fishing, weather, tide and currents permitting. There is nevertheless a strong spatial partition of the grounds depending on the vessels base ports and due to the following factors:

- cost of fuel and steaming time if equivalent grounds are closer to home;
- market price of the day, for example the price of Blackwater herring could make it worthwhile for pelagic netsmen in Ramsgate; and
- the knowledge necessary to work any particular ground and gear combinations.

### 5.3.1 *Fishing Grounds*

The most important fishing grounds for Thames Estuary fishermen operating from the Essex coast were mapped as part of the Essex Estuaries Initiative in 2001 (*Figure 5.1*) by des Clers *et al*. (2001) [3]. The project collected information from fishermen to determine their major fishing grounds and mapped the most important areas. The important fishing areas cover a wide variety of

(1) Walmsley S.A. and Pawson, M.G., 2007. The coastal fisheries of England and Wales, Part V: a review of their status 2005–6. Sci. Ser. Tech Rep., Cefas Lowestoft, 140: 83pp
(2) EMU Ltd. Outer Thames Estuary Regional Environmental Characterisation Report No 09/J/06/1305/0870. Prepared for Marine Aggregate Levy Sustainability Fund (MALSF).
(3) des Clers, S., Dat, C., and Carrier, S., 2001. Survey of Greater Thames Estuary Fisheries Knowledge. Final Report to the Essex Estuaries Initiative, June 2001. 28 pp.

habitats and sediment types. Generally most fishing occurs on the sand banks at the mouth of the Thames Estuary. Deeper waters are generally less important to the small vessels.

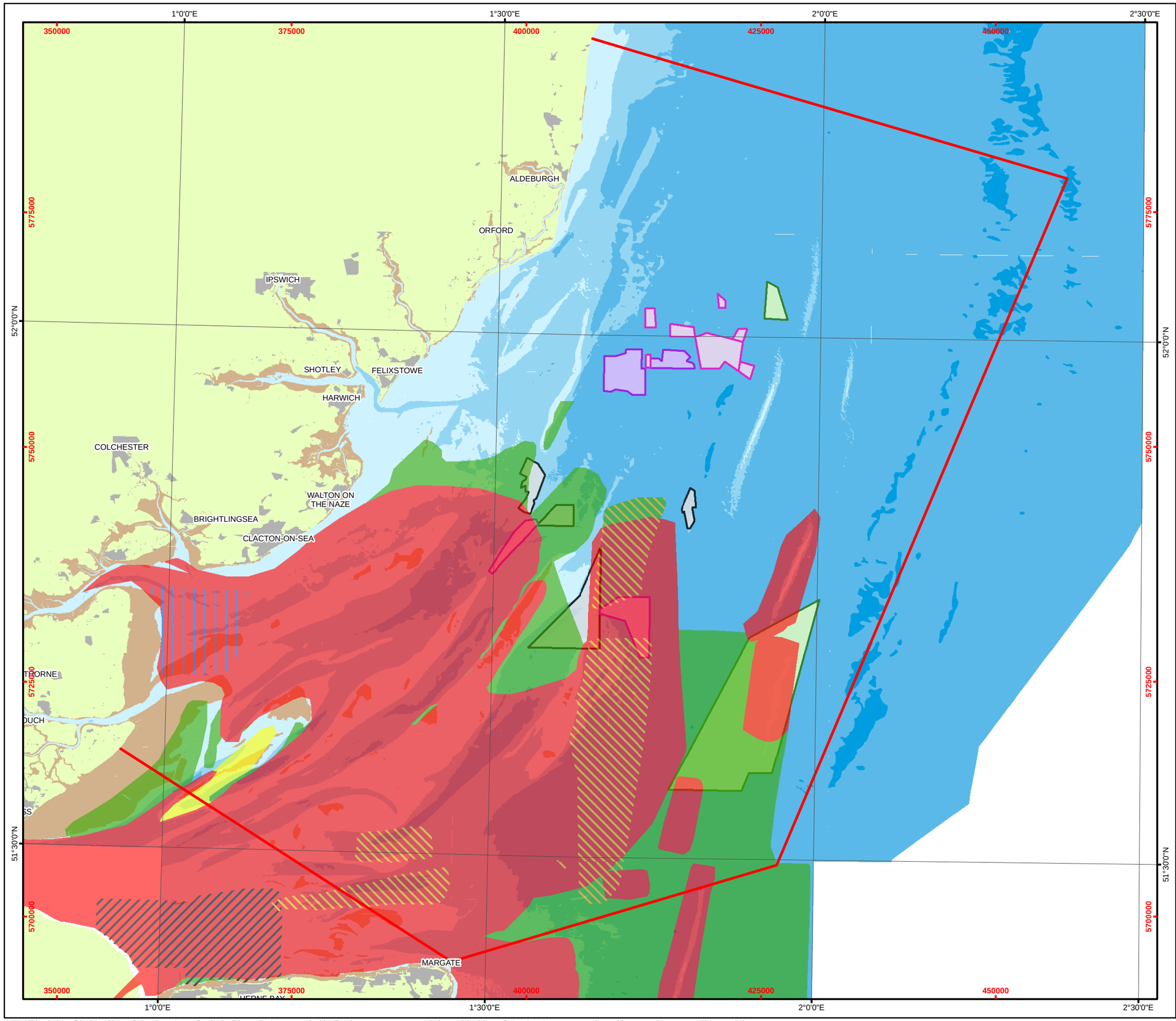
No definitions for prime and very or fairly important categories were given by des Clers et al. (2001). However, in *Figure 5.1* it can be seen that the prime grounds (assumed to fishermen's most used and important grounds) are extensive and cover a large area across the sandbanks at the mouth of the Thames Estuary. The very and fairly important grounds (assumed to be fished less often or when prime grounds are unavailable) are at the edges of the prime grounds and mostly in deeper water, although some are close to shore near the north of the Thames Estuary. The fishermen from different ports have very different prime and important fishing grounds, often adjacent to each other. The prime ground for fishermen from one port may be only important to other fishers, their prime grounds being elsewhere.

Most vessels are trawlers, netters, or dredgers and about one vessel in 4 is a multigear vessel, combining trawls and/or nets with longlines, pots and/or dredges [(1)]. Multi-gear vessels are relatively more important in the central area where tides and currents have less effect on fishing grounds. Trawlers are dominant in the Thames estuary itself, where the grounds are softer and the tides and currents can be too strong for nets and pots.

Through consultation the fishing grounds identified by des Clers *et al*. (2001) were updated (*Figure 5.2* and *Figure 5.3*). *Figure 5.2* and *Figure 5.3* demonstrate that the sand banks are still the most important fishing grounds closer to the Thames Estuary. Further north the main fishing grounds are a similar distance offshore and cover similar depths, although there is less reliance on the sandbanks Some fishermen appear to target areas for specific species, particularly the sand banks for sole, skate and more specifically bass (*Figure 5.3*). Others fish over a much wider area and target cod in addition to the other species. However, the time of year in which fishing takes places often determines which species is targeted (*Figure 5.3*).

*Figure 5.3* demonstrates the fishery is highly seasonal. Although fishermen tend to fish certain areas all year round there are certain areas which are fished more during particular months. In addition the area over which fishing activity takes place may expand seasonally, with the area fished for cod and sole in the Essex part of the fishery expanding between September and May and March and November respectively. In the northern area (Suffolk coast) it appears that the targeted areas become smaller during the peak fishing times, with fishing occur closer to shore for cod, skate and sole during different period between late Autumn and Spring (or late summer in the case of skate). For cod two additional areas are identified where targeted fishing occurs in the central and northern areas in late spring. A similar area in late spring for skate is also identified in the central part of the study area.

(1) des Clers, S., Dat, C., and Carrier, S., 2001. Survey of Greater Thames Estuary Fisheries Knowledge. Final Report to the Essex Estuaries Initiative, June 2001. 28 pp.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Fishing Grounds**

- Prime Grounds
- Very Important Grounds
- Fairly Important Grounds
- Prime Grounds to Large Vessels
- Blackwater Herring
- Oysters

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

N W E S

0 10 Kilometres

TITLE:

Figure 5.1
Important Fishing Grounds Identified During the 2001 Thames Estuary Fisheries Knowledge Project

CLIENT:

TEDA

| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:400,000 |

DRAWING: GTEFK_FishingGrounds_All.mxd

REV: 0

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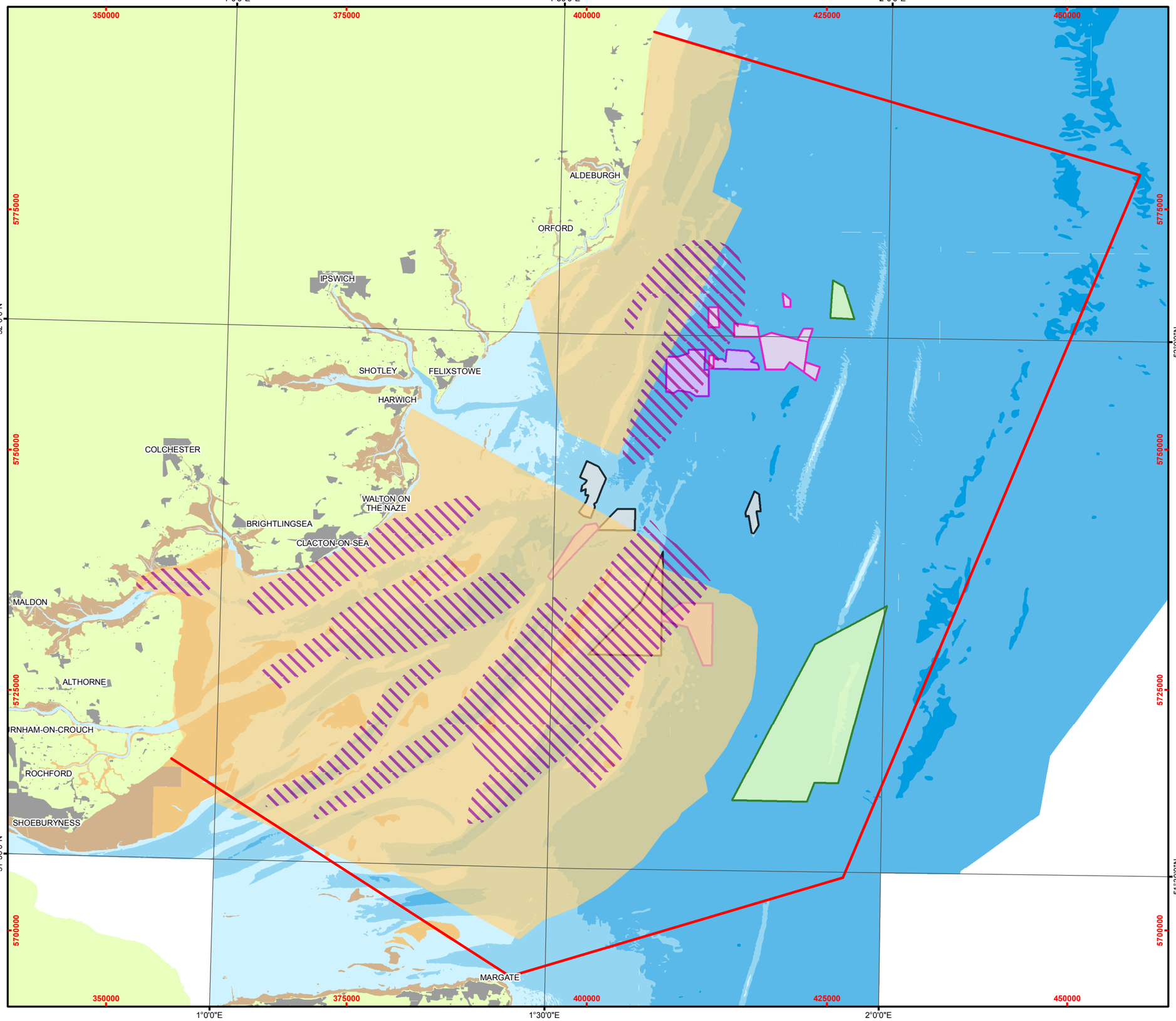
SOURCE: Seazone Solutions Limited. © Crown copyright, All rights reserved.; Based on "Greater Thames Estuary Fisheries Knowledge, 2000-2001" and "Survey of Greater Thames Fishery Knowledge, 2001"
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\Commercial\Fisheries\GTEFK_FishingGrounds_All.mxd




KEY:

- MAREA Study Area
- Prime Fishing Grounds
- Fishing Grounds

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

N
W E
S

0 10
Kilometres

TITLE:

Figure 5.2
Important Fishing Grounds Identified During Consultation

| CLIENT: TEDA | | SIZE: A3 |
|---|---|---|
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:400,000 |
| DRAWING: Consultation_FishingGrounds.mxd | | REV: 0 |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ERM

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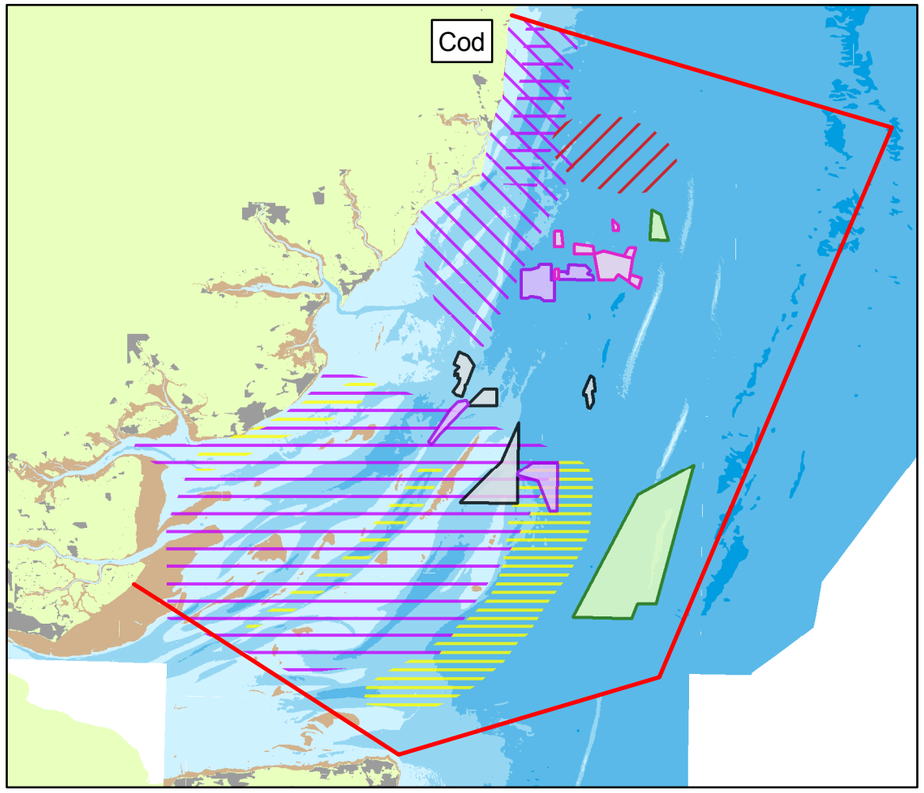
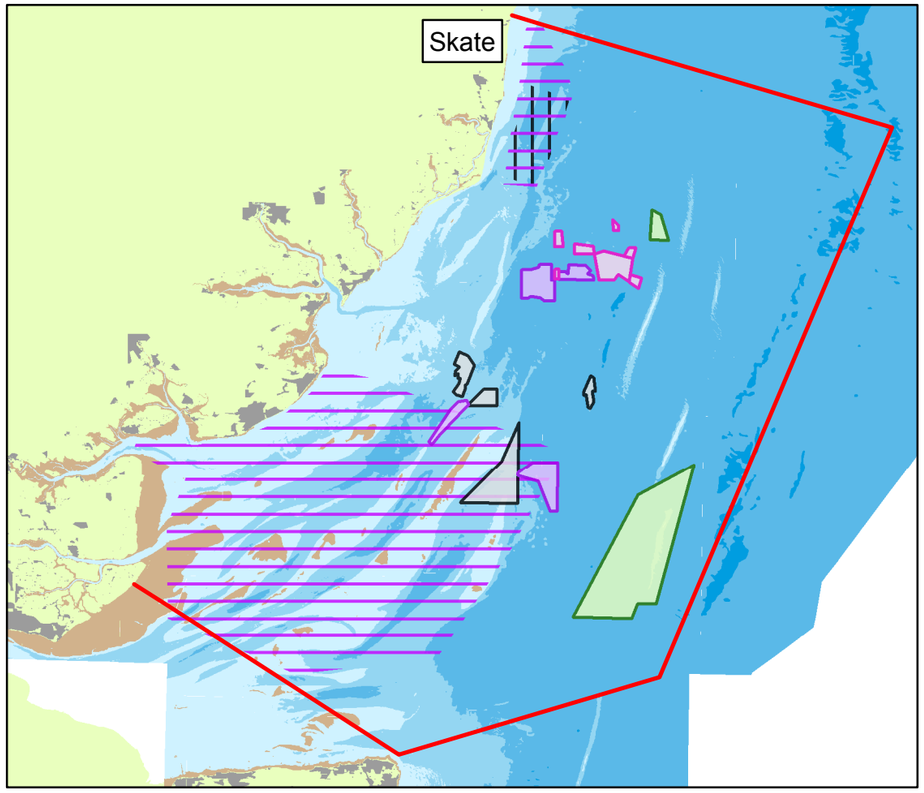
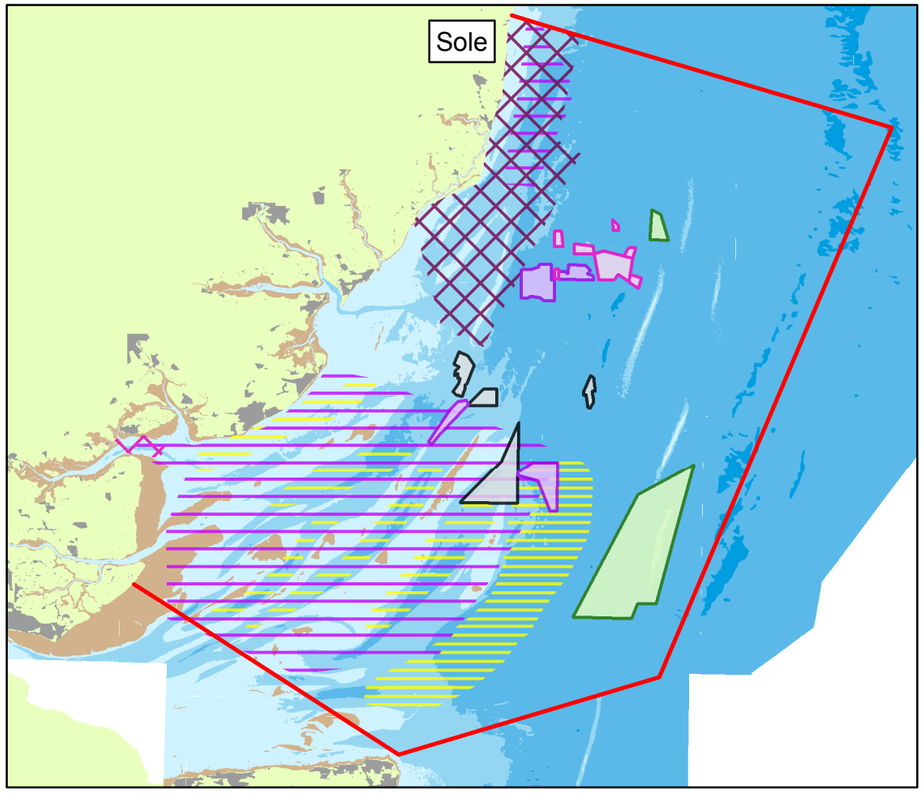
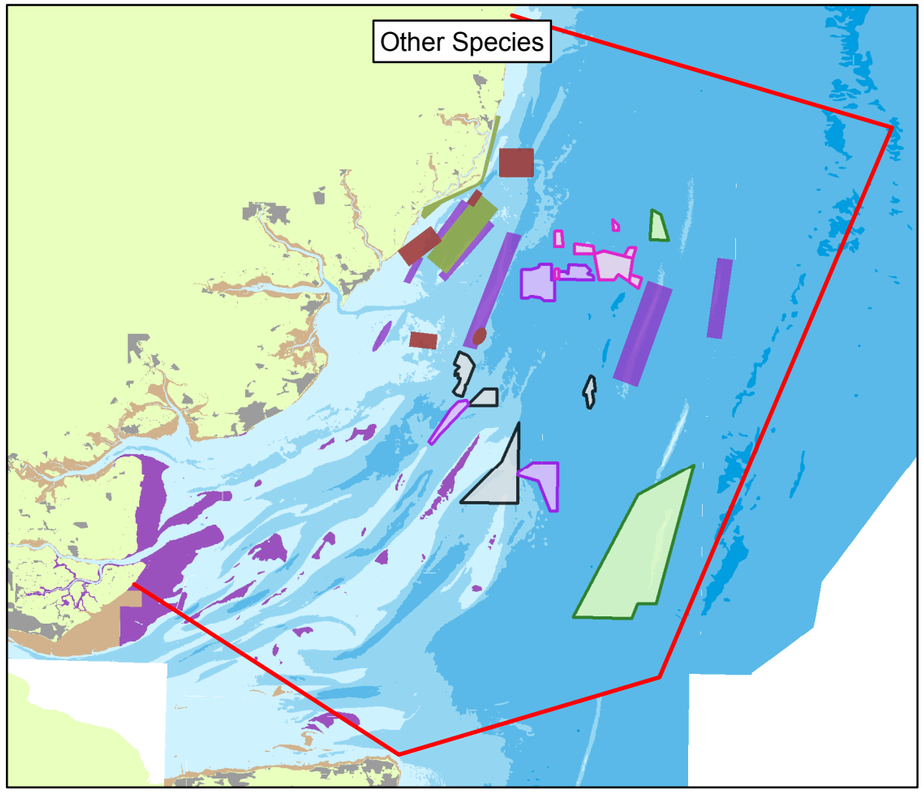
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\Commercial\Fisheries\Consultation_FishingGrounds.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Period**

- March to April
- April
- April to November
- September to May
- November to December
- November to August
- Whole year

**Other Species**

- Bass (August to November)
- Crab and Lobster (Whole year)
- Herring and Sprat (December to March)

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

N W E S

0 25

Kilometres

TITLE:

Figure 5.3
Seasonal Fishing Identified During Consultation

CLIENT:

TEDA

| DATE: 06/09/2010 | CHECKED: AP | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: As Scale Bar |

DRAWING: Consultation_FishAreaSpecies.mxd

REV: 0

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PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\Consultation_FishAreaSpecies.mxd

Other important species fished in the area include bass, crustaceans (crabs and lobsters) and pelagic fish species (herring and sprats). Bass are mostly targeted on the sand banks in the TEDA area between late summer and late autumn in both Essex and Suffolk fisheries. Crustacean potting effort is concentrated in the Suffolk portion of the study area and close to shore throughout the entire year. Sheltered waters within local estuaries are fished for eels and shrimps using eel fyke nets and trawling. These areas are also used for oyster cultivation [(1)]. Outside of the Thames and Blackwater herring fishery (see *Figure 5.4* and *Box 5.1*) fishing for pelagic species occurs close to the Suffolk coast near the ports of Orford and Aldeburgh between winter and spring. Herring and sprat are both targeted in these areas.

### 5.3.2 *Essex Coast Fisheries*

The Essex coast and the Thames Estuary, due to the sheltered waters, allow small boats to fish most of the year. These vessels work a number of gears including:

- oyster lays;
- otter trawls for sole, skate and rays and cod;
- fixed and drift nets for sole, skate and rays, cod, bass and mullet;
- longlines for cod and occasionally bass;
- handlines for bass;
- eel fyke nets; and
- whelk and lobster pots.

The most commonly used gear in Essex are nets (fixed and drifting gill or trammel nets). Drifting and anchored tangle and trammel nets are set close inshore, and across offshore sand banks targeting sole and taking bycatches of bass, rays and a variety of flatfish such as plaice, flounders and dabs. Thornback rays are targeted using anchored tangle nets. In the autumn gill and trammel nets are also used to target cod. A number of vessels also use trawls and target flatfish such as sole, plaice, rays and the occasional lemon sole.

Gill nets, either fixed or drifted, and trammel nets are used to catch bass between spring and autumn. Fishing for bass is either restricted or prohibited in three bass nursery areas adjacent to power station outfalls; Bradwell (within the area but being decommissioned), Isle of Grain and Kingsnorth (both outside but close to the TEDA area). Herring and sprat are targeted during late autumn, winter and early spring. Two herring stocks are found off the Essex coast. The first is a discrete inshore stock that spawns in spring in the northern part of the Thames Estuary, including the Blackwater Estuary (*Box 5.1* and *Figure 5.4*). A small number of boats exploit this herring stock from October to February. The North Sea herring mixes seasonally with the inshore stock, and is mainly taken by trawling. Sprats are caught in pair trawls from

(1) ( )EMU Ltd. Outer Thames Estuary Regional Environmental Characterisation Report No 09/J/06/1305/0870. Prepared for Marine Aggregate Levy Sustainability Fund (MALSF).

November to February when they appear inshore. Demand for herring and sprat is generally low and many fishermen have diversified causing a decline in catches. Herring are usually sold through small local outlets, whereas sprats are generally sold for fishmeal.

It is also known that native oyster grounds are present within the area fished by the Thames and Blackwater herring fishery, particularly in the mouth of the Blackwater estuary.

***Box 5.1 The Thames Estuary and Blackwater Herring Fishery***

The Thames Estuary and Blackwater herring (Clupea harrengus) fishery was certified as sustainable by the MSC in March 2000 and re-certified in December 2005. The MSC is an independent, global, non-profit organisation that certifies sustainable fisheries. The Thames Estuary and Blackwater herring fishery is one of 7 currently certified fisheries in the UK.

The fishery is regulated by DEFRA, which sets and monitors the total allowable catch limit (TAC), set at just over 100 tonnes in the 2001/02 season. The Kent and Essex Sea Fisheries Committee makes bylaws to protect the fish stock which include regulation of mesh size, and the prohibition of trawling over spawning grounds.

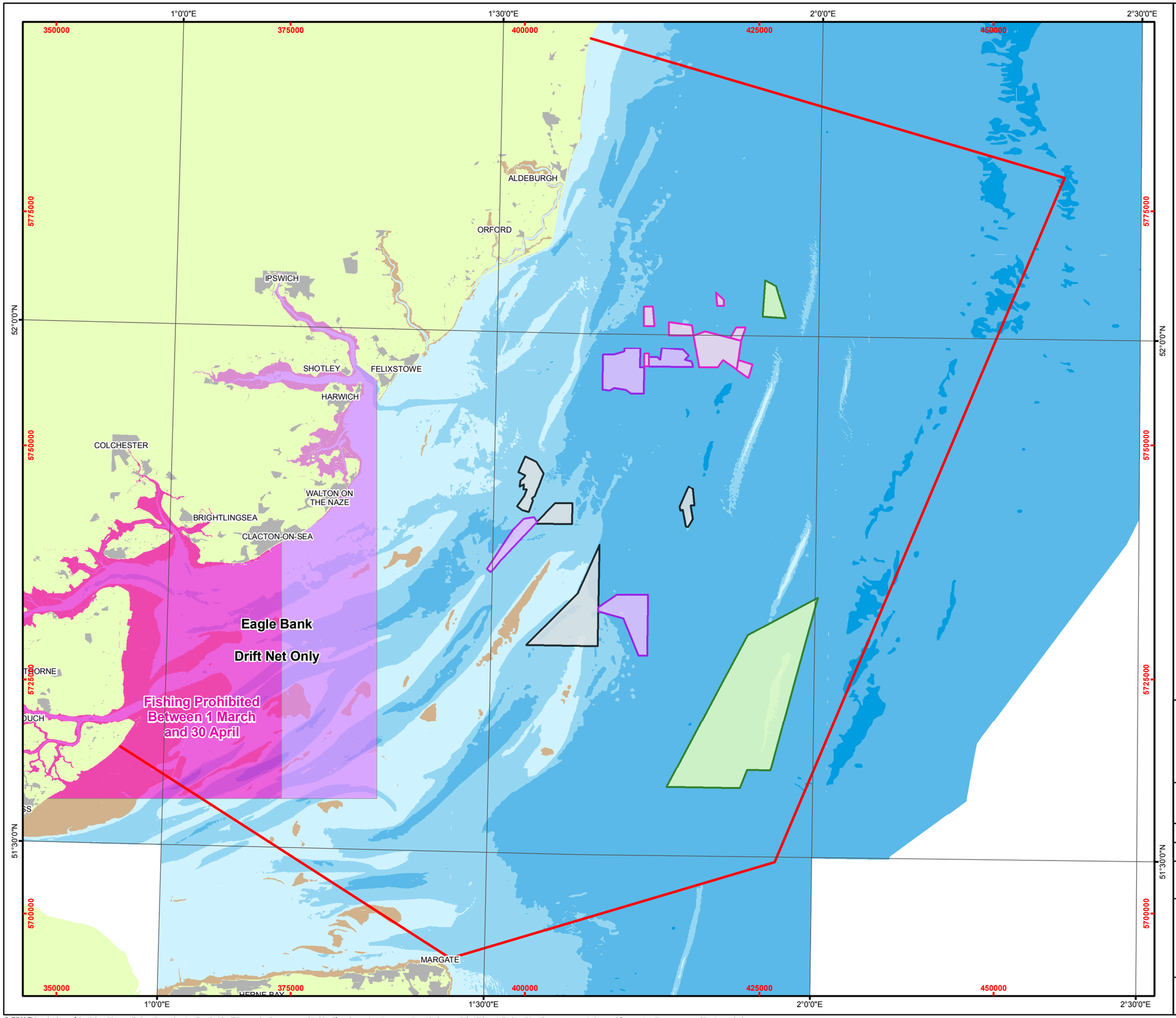
With the increase in demand for Thames herring following the failure of the East Anglian fishery during the 1960s, the effort expended in targeting herring in the Thames increased in what was initially a recreational fishery. At the start of the 1988/1989 season MAFF introduced a regulation defining a drift net only area on the north side of the Thames estuary (Eagle bank (see *Figure 5.4*)) and forbidding the use of trawls.

In recent years the numbers of fishermen participating in the fishery has declined due to low demand for herring. Total catches have also seen a decline, from 56 tonnes in the 2000/01 season to just 14 tonnes in the 2003/04 season. In 2004 a new licensing procedure was introduced. As a result in the 2004/2005 season only thirteen vessels were licensed to fish in the drift net area and only five of those were active. More recently evidence from the KESFC suggests that no vessels are taking part in the fishery due to the low market value of Thames Herring, which are generally smaller than the main North Sea population.

### *5.3.3 Suffolk Coast Fisheries*

Finfish are important along the Suffolk coast, although there is little in the way of safe berths or anchorages other than at Lowestoft, Southwold, Felixstowe and Ipswich. Thus, many small beach boats (of around 6 m) are used to trawl, and longline up to 12 miles offshore or use drift nets within a mile or two of the shore. In Suffolk, gill and trammel nets are set for cod and whiting during the colder months and, in spring, tangle and trammel nets are set for flatfish, particularly sole although plaice, turbot and rays may also be caught. Longlines are used to target cod, rays, dogfish, ling, pollack and turbot and this method raises a higher price at market for these fish due to their better condition in comparison to trawl caught fish. Drift nets are used for herring mainly in late autumn when they become more abundant. During late summer, sprats and mackerel are caught in small quantities, and a winter sprat fishery takes place in years when these fish are particularly abundant. Bass are caught in fixed and drift nets during the summer together with grey mullet.

There has also been a recent expansion of a brown crab fishery on inshore grounds at Aldeburgh in Suffolk using traditional wooden creels. Fishermen that usually pot for lobster and crab may switch to fishing for bass if catches are poor.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Depth Areas**

- Drying
- <=10m
- <=20m
- <=50m
- <=100m

N W E S

0 10

Kilometres

TITLE:

Figure 5.4

Thames Estuary and Blackwater Herring Drift Net Only Fishery Regulatory Area (Eagle Bank)

CLIENT:

TEDA

| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:400,000 |

DRAWING: HerringDriftNet.mxd

REV: 0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PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\Commercial\Fisheries\HerringDriftNet.mxd

### 5.3.4 *The Sustainable Access to Inshore Fisheries Project*

In 2009, Defra launched the Sustainable Access to Inshore Fisheries (SAIF) project aimed at finding ways to make the English inshore fishing fleet more sustainable, as part of a package of measures announced in December 2008 to begin to address overcapacity in the fleet. The project seeks to:

- Achieve a greater understanding of the problems currently facing the English inshore fishing industry.
- Determine the social impact of inshore fishing and how associated benefits might be maximised in the future.
- Ensure that the inshore fishing industry can secure optimum economic benefits whilst operating in a way which is not damaging to the environment and safeguards stocks for future generations.

The first phase of the project is to bring together research into the economic, environmental, and social benefits of the fleet. New research will also be commissioned to fill evidence gaps. The second phase will advise on the Development and Appraisal of policy options based upon the findings of the commissioned research, and the third phase will involve selecting and implementing the preferred policy options.

One of the research projects that has fed into the SAIF is the 'Environmentally Responsible Fishing Project', aimed at measuring the economic and environmental impact of inshore commercial fishing vessels targeting quota species. The project ran from August 2008 to November 2009 and involved 12 vessels from the Thames Estuary, 10 vessels from Lowestoft (which may also fish in the MAREA study area) and 9 vessels from Hartlepool to the north.

The 31 vessels involved fished without quota restrictions, to determine the level of their impact upon stocks. The vessels were required to submit logbooks for each trip, monthly accounts, and regular data on discards and catch length. The project aimed to provide a more accurate picture of unrestricted inshore fleet activity and the distribution of catches and fishing effort in the area. The data that has been collected supports the regular seasonal patterns of fishing, with cod, rays and sole dominating the catch in Lowestoft and throughout the outer Thames Estuary [(1)].

The data is currently being analysed and key findings will be published this year [(2)]. Unfortunately this data was unavailable for use in this MAREA, however the information from the project may be utilised, along with other fisheries information, in individual licence application EIAs. This will ensure

(1) Fishing Focus. The Defra and MFA marine fisheries newsletter. Number 14, Spring 2009. Available at: http://www.defra.gov.uk/foodfarm/fisheries/documents/fisheries/fishfocus14.pdf (accessed 08/03/10).
(2) Sustainable Access to Inshore Fisheries (SAIF) Project Newsletter. Issue 1, January 2010. Available from http://www.defra.gov.uk/foodfarm/fisheries/documents/fisheries/saif-news012010.pdf (accessed 8/03/10).

the potential impact to fisheries, and their target species, can be fully addressed for each application area.

## 5.4 THE OFFSHORE (> 10 M) FISHING FLEET

Vessels greater than 10 m in length are recorded during overflight surveys and vessels greater than 15 m send data via satellite (VMS) on their position, speed and a variety of other information that enables monitoring of fishing activity. This data is recorded for both UK and foreign vessels fishing within UK waters.

In addition to ports along the coast of the UK a number of vessels from ports within other European countries (both European Union member states and non member states) fish the area. Some of these vessels land their catch in UK ports whereas other land at their home port. The total number of vessels longer than 10 m and the nations with which they are flagged observed fishing in the TEDA study area are shown in *Table 5.2*.

***Table 5.2 Total Observations of Foreign and UK Vessels Fishing within the TEDA Study Area, 2003-2008.***

| Flag | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Belgium | 194 | 158 | 219 | 186 | 203 |
| Germany | 2 | 10 | 2 | | 2 |
| France | 49 | 43 | 28 | 20 | 36 |
| Faroe Islands | | | 1 | | |
| Netherlands | 87 | 70 | 23 | 126 | 40 |
| Norway | | 1 | | | |
| UK | 55 | 44 | 90 | 203 | 308 |

### 5.4.1 UK Fishing Vessels

In general there are few UK vessels greater than 10 m in length from ports in the Outer Thames Estuary that actively fish. In addition the number of over 10 m vessels fishing in the TEDA area that are UK flagged is relatively low in comparison to the number of foreign vessels (*Table 5.2*). Those vessels that do fish tend to carry a number of gears, including gill nets, drift nets, trammel nets and twin, triple or multi-rigged otter trawls.

Target species during the spring and summer are sole, rays, bass and mullet. Herring, cod and whiting are targeted during the autumn and winter. However, some vessels will fish for sole, rays and mixed flatfish for most of the year. Dredging also takes place for whiteweed [(1)] and cockles. Many inshore trawl vessels harvest whiteweed using simple rakes when target species are scarce or fishing restrictions prevent their exploitation. Demand for whiteweed has declined in recent years and currently only a few boats engage in the fishery during autumn and winter.

(1) A fern-like hydroid (a colonial animal related to coral) that is dried and sold for decorative purposes.

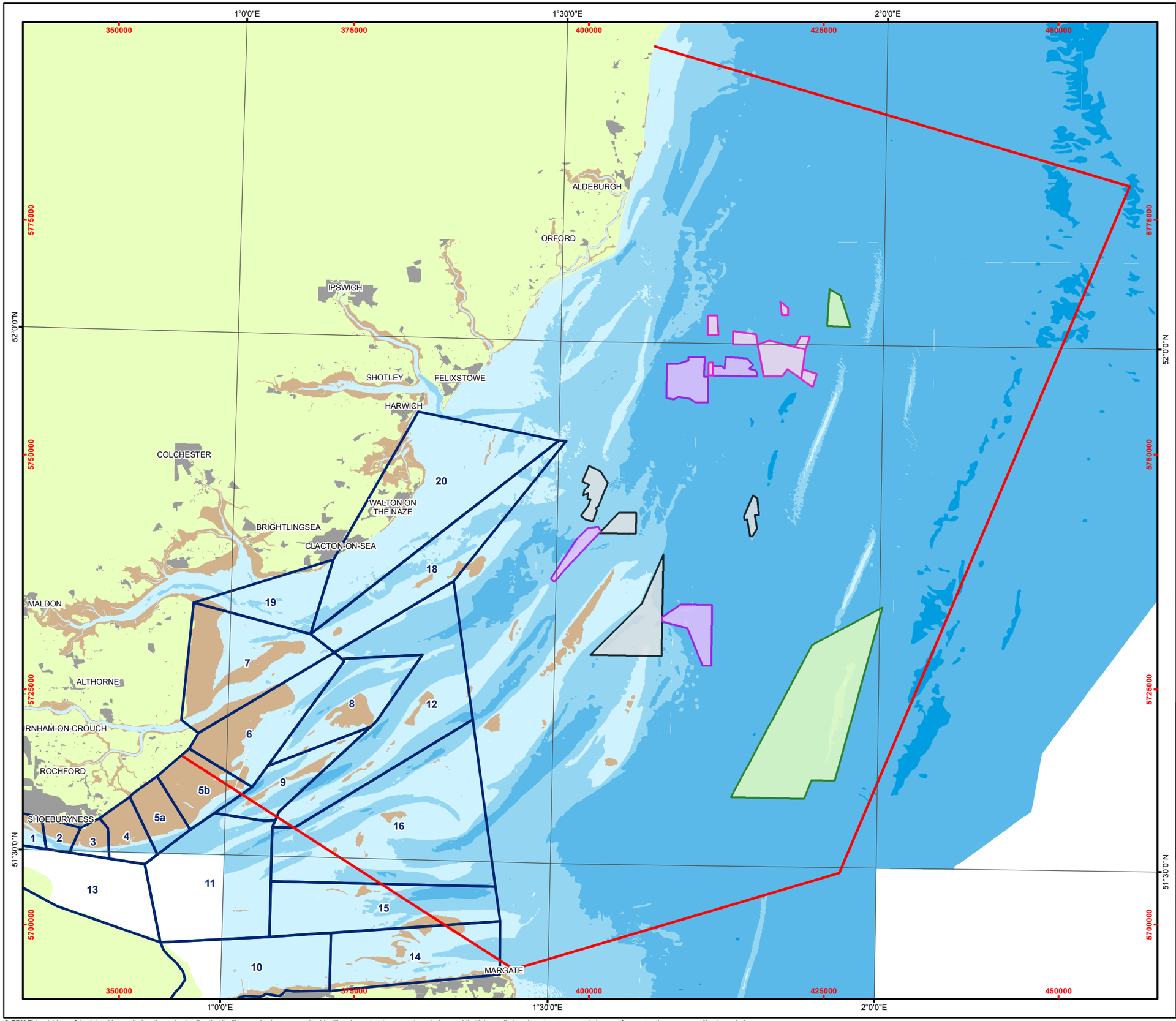
*Thames Estuary Cockle Fishery*

A large number of vessels over 10 m, mainly from Southend-on-Sea and Leigh-on-Sea plus a few from Great Wakering, Whitstable, Queenborough and Brightlingsea, fish under the Thames Estuary Cockle Fishery Order. The local fleet uses a sieve-like mechanism that sifts the sand to separate the cockles, which are pumped onto the boat. The fleet concentrates its efforts on the Shoebury, Maplin and Foulness Sands (*Figure 5.5*).

***Table 5.3 Landings and Value of Cockles Recorded at TEDA Ports***

| Year | Total Landings (tonnes) | Percentage of Total Landings | Total Value (£) | Percentage of Total Value |
|---|---|---|---|---|
| 2004 | 7,985 | 57% | £3,181,856 | 48% |
| 2005 | 11,658 | 74% | £6,157,050 | 63% |
| 2006 | 9,819 | 89% | £4,284,172 | 56% |
| 2007 | 10,146 | 88% | £6,587,558 | 65% |
| 2008 | 4,716 | 79% | £2,217,968 | 36% |

The Thames cockle fishery rapidly expanded following the collapse of the Dutch cockle fisheries in the late-1980s and declines in UK cockle stocks (eg the Welsh Dee and the Wash). The fishery is now the most productive in the UK. In 1994, the KESFC was granted the Thames Cockle Fishery Order, and manages the fishery through monitoring of the stocks, seasonal closures and limiting the size and number of vessels and dredges. Licence holders are permitted to make between 2 and 4 landings per week, peaking during August and September, when meat yields are at their best. All cockle beds are closed from mid November to the end of May, and during weekends. Some cockle vessels fish for mussels and sole during the closed season and when yields are lower.




TITLE:

Figure 5.5

Cockle Harvest Areas in the Kent and Essex Sea Fisheries Committee District

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:400,000 |

DRAWING: CockleHarvestAreas.mxd

REV: 0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ERM



PROJECTION: WGS 1984 UTM Zone 31N

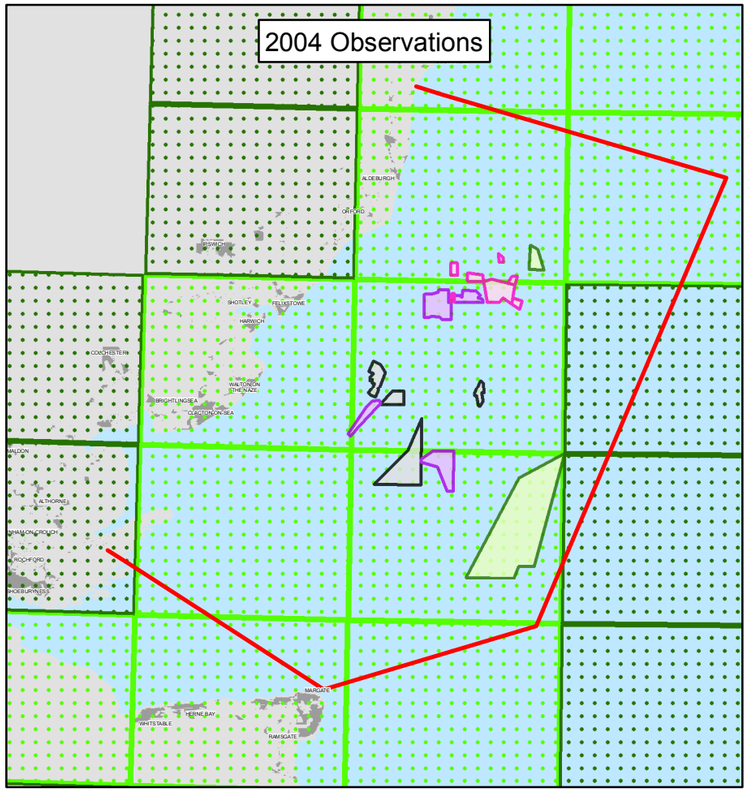
File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\CockleHarvestAreas.mxd

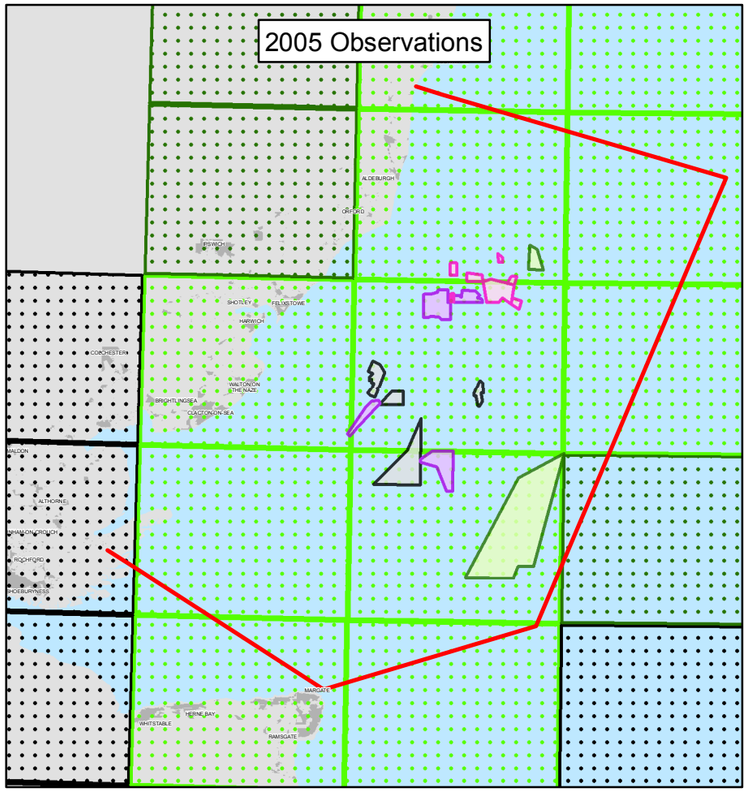
The landings of cockles into ports covering the study area are higher than for any other species (see *Figure 4.3* and *Table 5.3*). Over the last five years the landings of cockles into ports in and around the study area have had an average value of just under £4.5 million, more than 50% of the total value of landings. In terms of weight the landings of cockles are, on average, just under 80% of the total landed at ports in the study area. Landings taken from Thames Estuary cockle fishery within the TEDA area are likely to be lower than this total as only 60% of the Thames Estuary cockle fishery is within the study area (*Figure 5.5*). Vessels operating from ports both inside and outside the study area also target cockles in areas outside the Thames Estuary Cockle fishery, on seabed areas that provide habitat for the cockles. These vessels contribute to the overall landings taken from within the area.

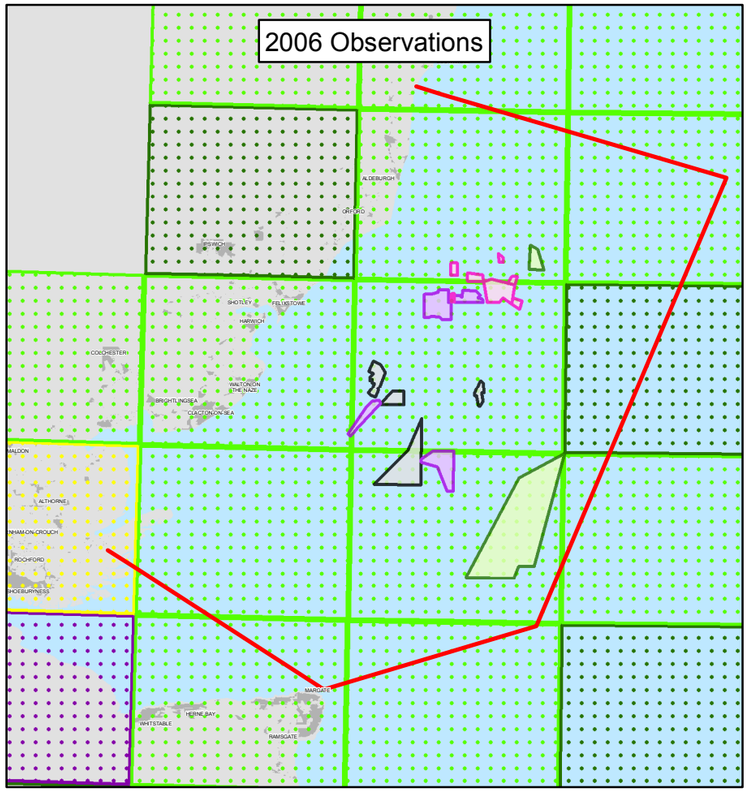
*Spatial and Temporal Variation in Fishing Effort*

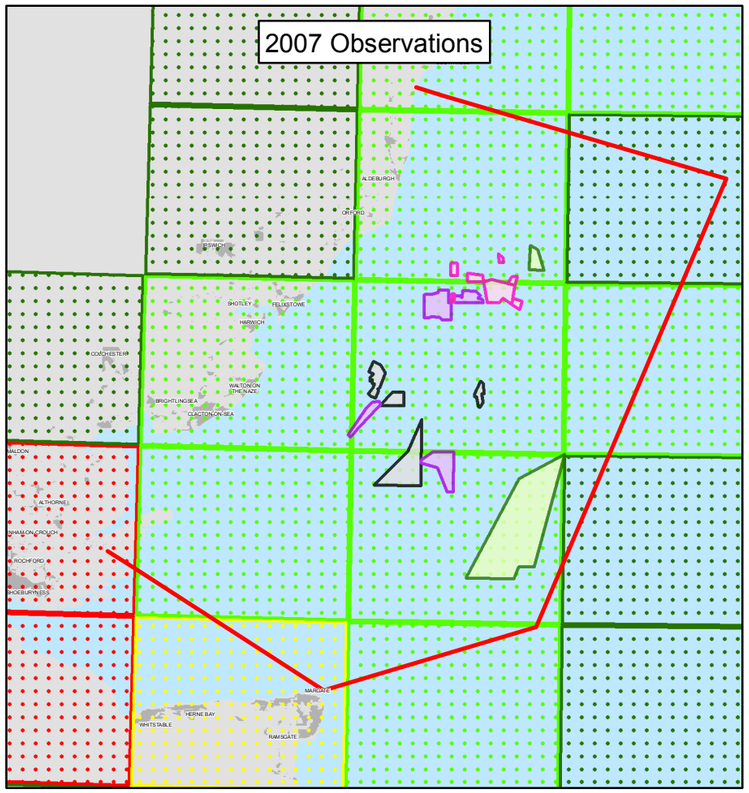
Between 2004 and 2008, although the number of observed vessels is relatively low in comparison to the foreign vessels in the area (<1 standard observation per sub-rectangle), UK vessels fished throughout the entire study area. However, in 2006 and 2007 increased numbers of vessels (between 1.5 and 3 standard observations) were seen fishing close to the Thames Estuary (*Figure 5.6*), probably targeting sole. The overall VMS data and in 2005, 2007 and 2008 also reflected this pattern, with UK vessels being seen fishing in these areas (*Figure 5.7*). Many vessels fish for sole within the Thames Estuary (particularly the inshore (<10 m) fleet) where there is thought to be a major spawning and nursery ground. In addition cockle vessels fishing in this area may also contribute to the increase in effort seen during these years. Overall the VMS and overflight data suggests fishing takes place across the TEDA area with the most intense fishing by UK vessels seen through the central part of the area and towards the Thames Estuary (*Figure 5.7*).

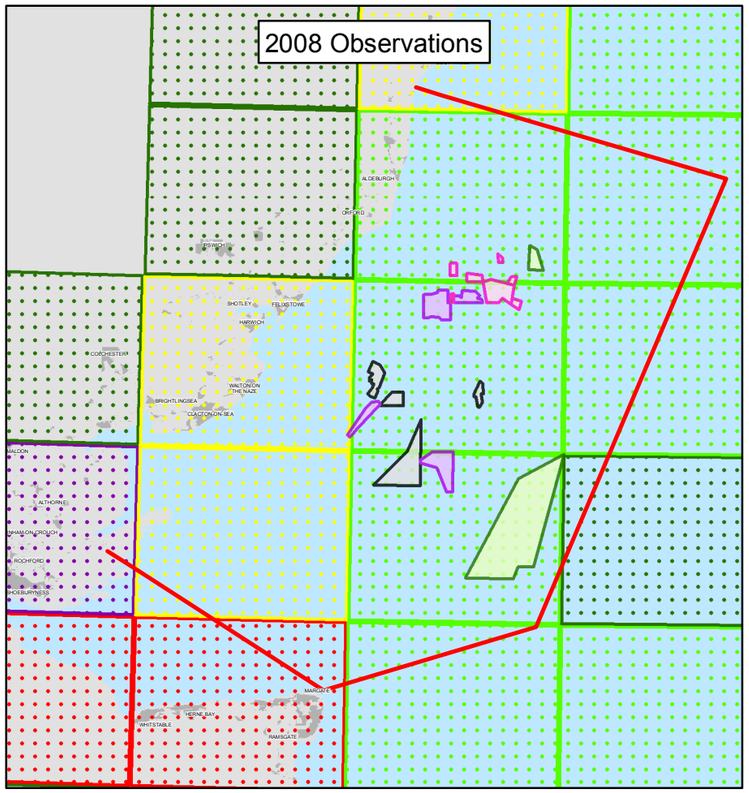
In terms of seasonal trends (*Figure 5.8*), the number of observed vessels is generally low across the entire study area within each season. In winter the number of vessels observed is low in most of the TEDA area but towards the Thames estuary and Kent coast the number of vessels is higher. These vessels are probably targeting sole or cod which have moved inshore during the winter months. In spring, effort is elevated in the extreme north of the study area (33F1-4) as well as close to the Thames estuary. In the summer and autumn, vessel numbers are low across the study site and higher in the Thames estuary, probably due to vessels targeting sole and cockles. From VMS data (*Figure 5.9*) UK vessels show a similar pattern to that of the foreign fishing fleet (see *Section 5.4.2*). Fishing in the winter is highest outside the TEDA area and at very low intensity inside. During spring more vessels are found within the TEDA area as vessels move inshore. In summer fishing activity remains inshore and the number of vessels is generally lower. Again, vessels are seen fishing close to the Thames and Blackwater estuaries probably fishing for sole on the Gunfleet and East Barrow sands. In the autumn fishing activity decreases, possibly as vessels move further offshore or complete their quota.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

N W E S

0 25 Kilometres

CLIENT: TEDA

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TITLE: Figure 5.6
Standard Observations of UK Fishing Vessels in the TEDA Study Area, 2004 - 2008

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|---|---|---|
| DATE: 06/09/2010 | CHECKED: | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |


PROJECTION: WGS 1984 UTM Zone 31N

DRAWING: SObs_UKFishingInc08.mxd

REV: 0

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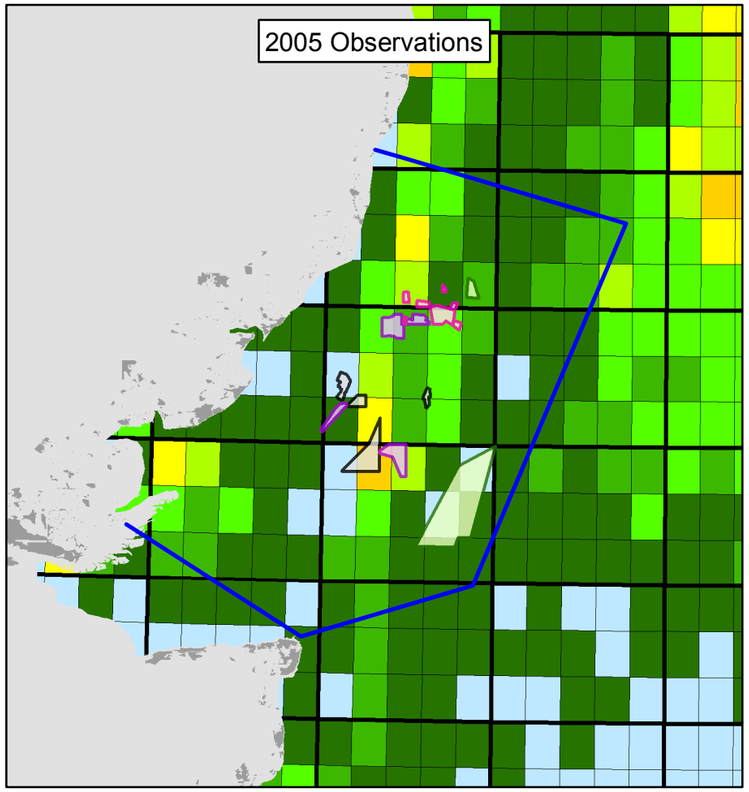
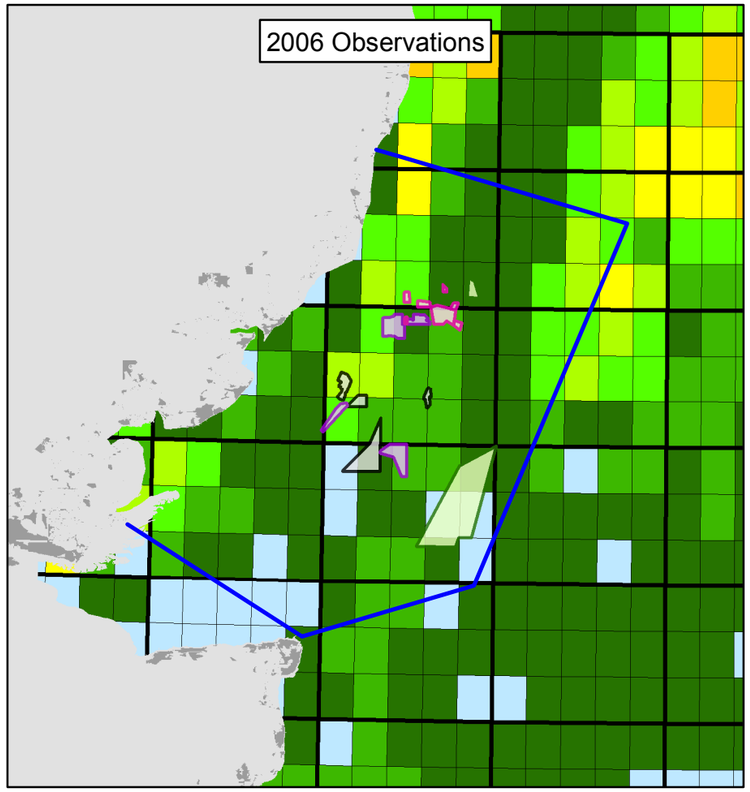
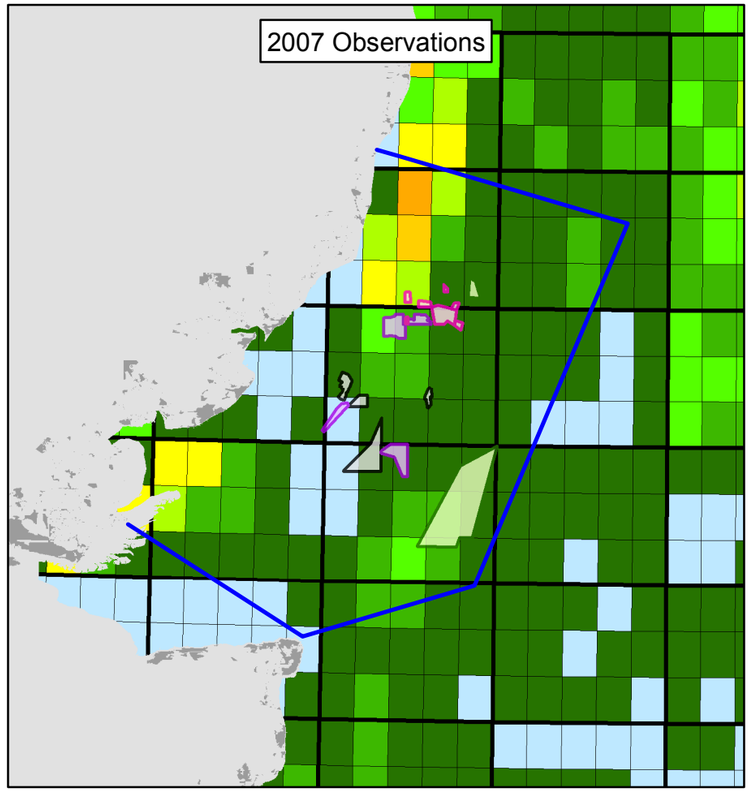
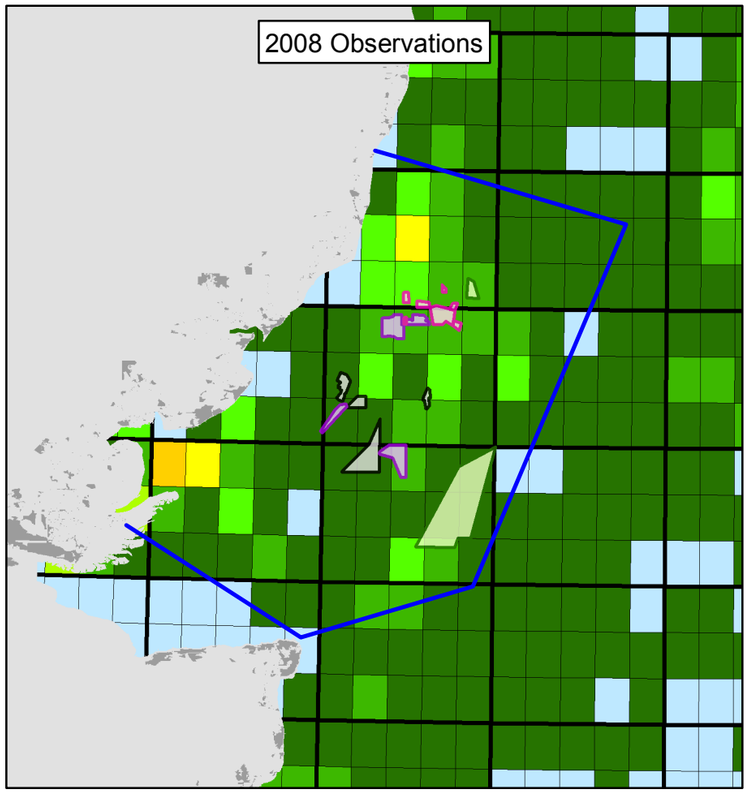
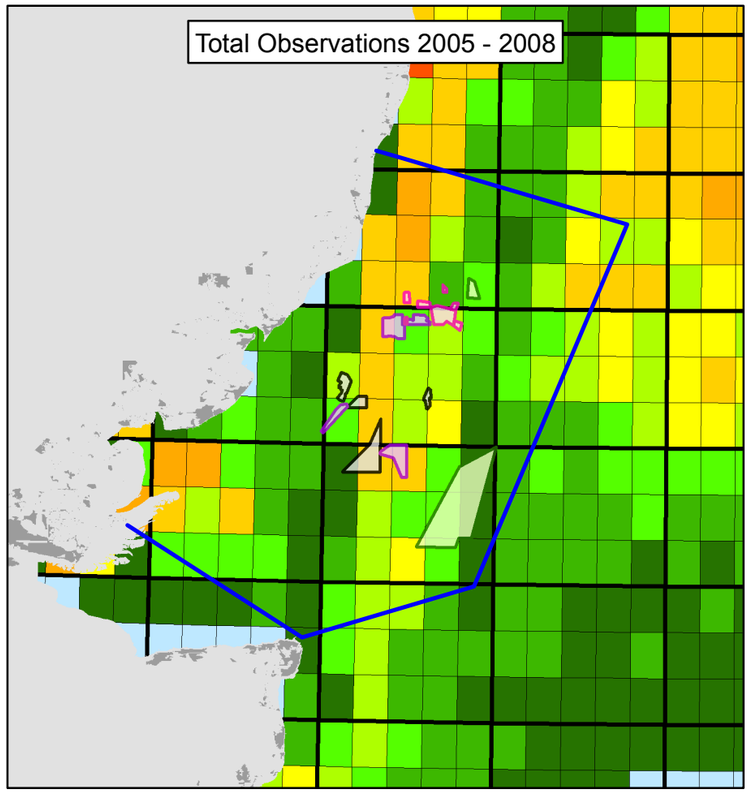



KEY:

MAREA Study Area

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing
- ICES Subsquare Boundary

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

N
W E
S

0 40
Kilometres

CLIENT:
TEDA

ERM
Eaton House
Wallbrook Court
North Hinksey Lane
Oxford, OX2 0QS
Tel: 01865 384800
Fax: 01865 384848

ERM

TITLE:
Figure 5.7
Annual Distribution of Active UK Fishing Vessels from VMS Data in the TEDA Study Area, 2005 to 2008

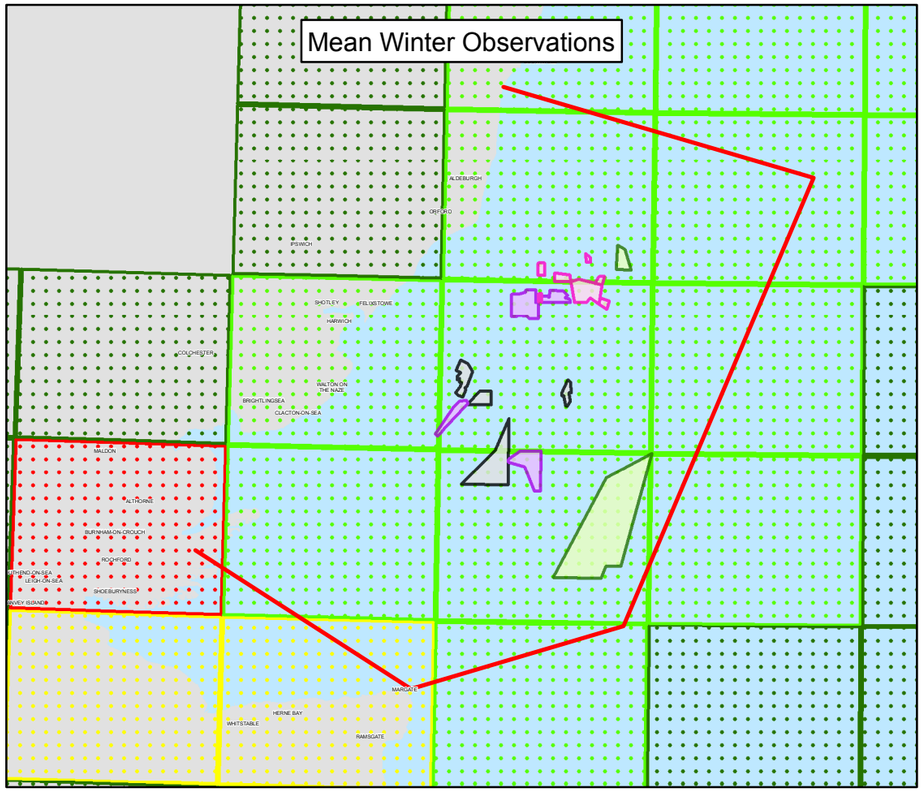
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: As Scale Bar |

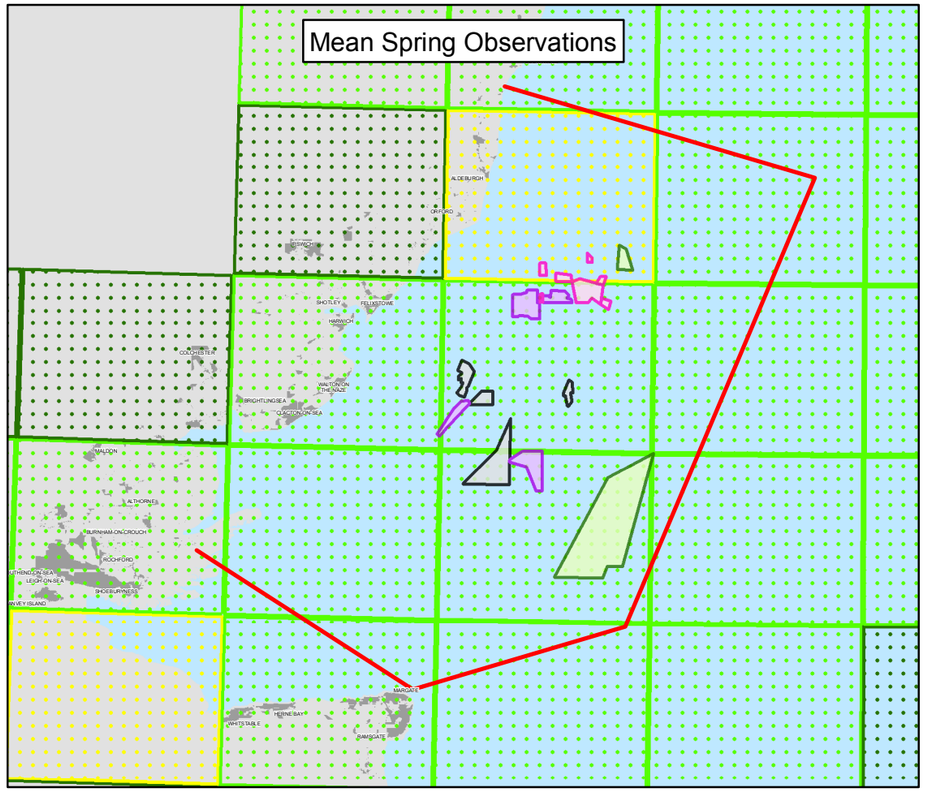
SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data

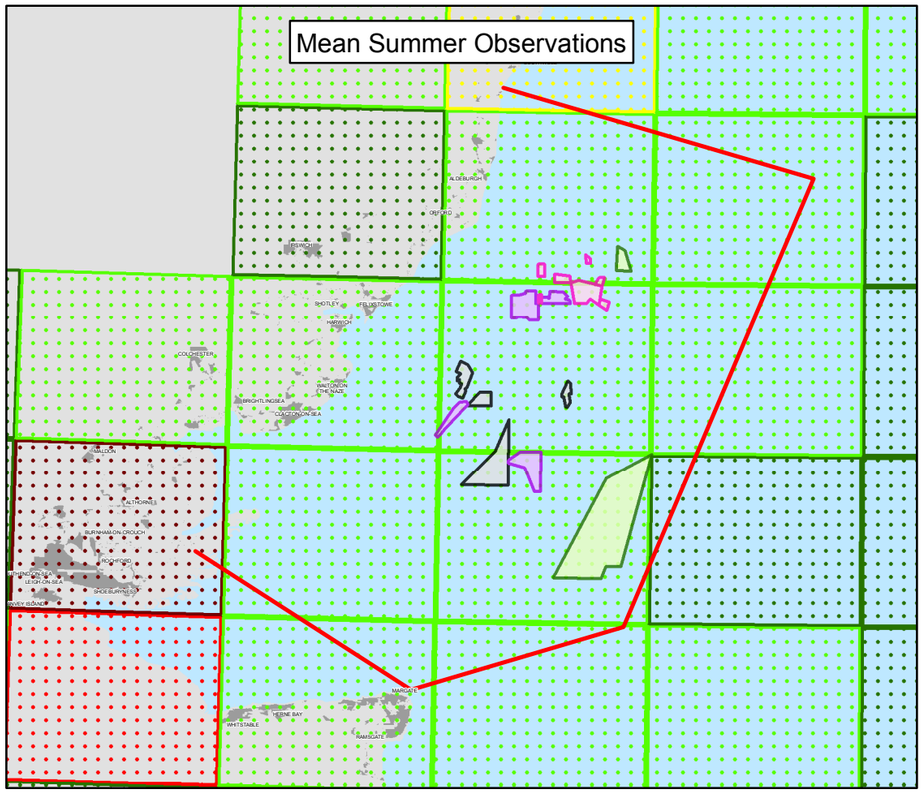
PROJECTION: WGS 1984 UTM Zone 31N

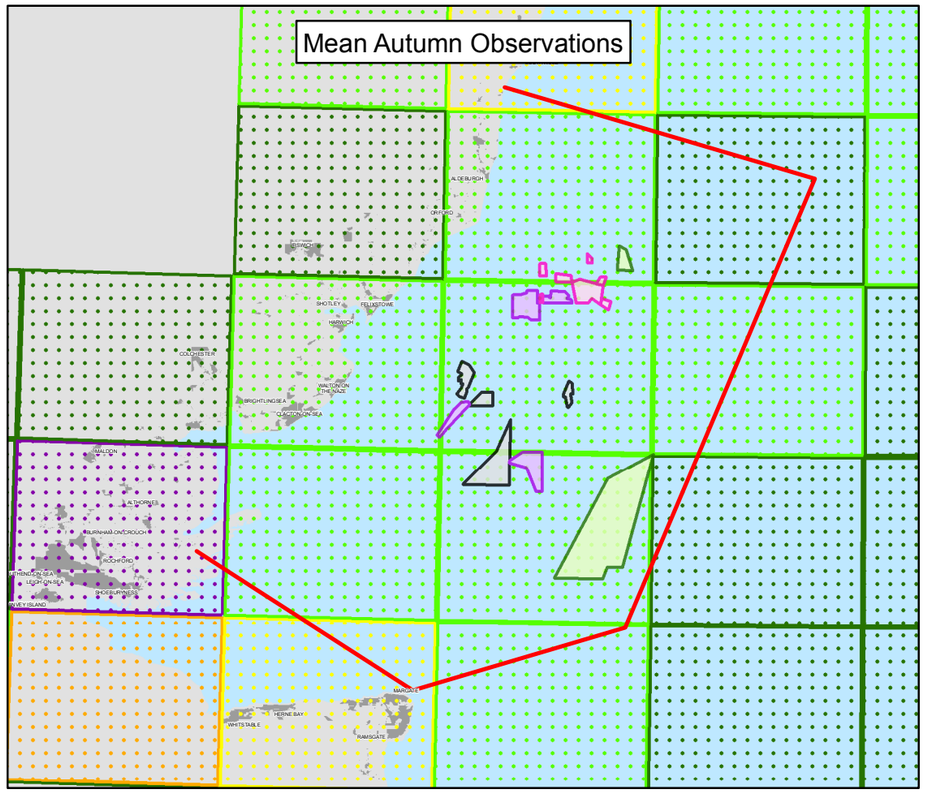
DRAWING: VMS_UKFishingInc08.mxd
REV: 0

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_UKFishingInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

N
W E
S

0 50
Kilometres

TITLE:
Figure 5.8
Seasonal Standard Observations of UK Fishing Vessels in the TEDA Study Area

CLIENT:
TEDA

| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

DRAWING: SObs_UKSeasonInc08.mxd
REV: 0

*ERM*
Eaton House
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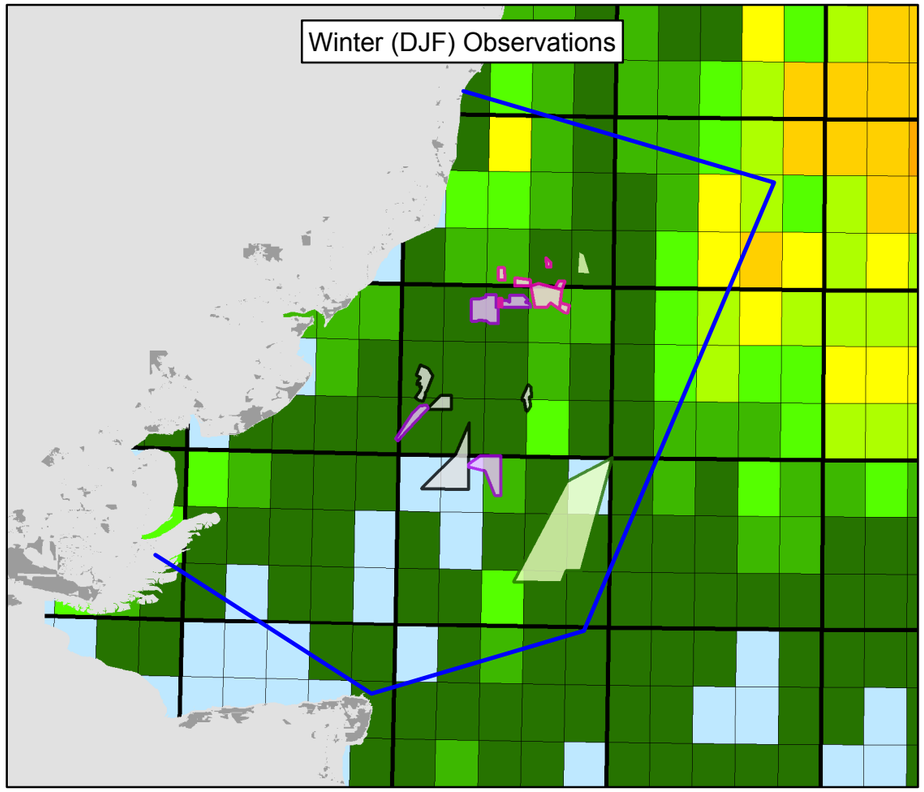
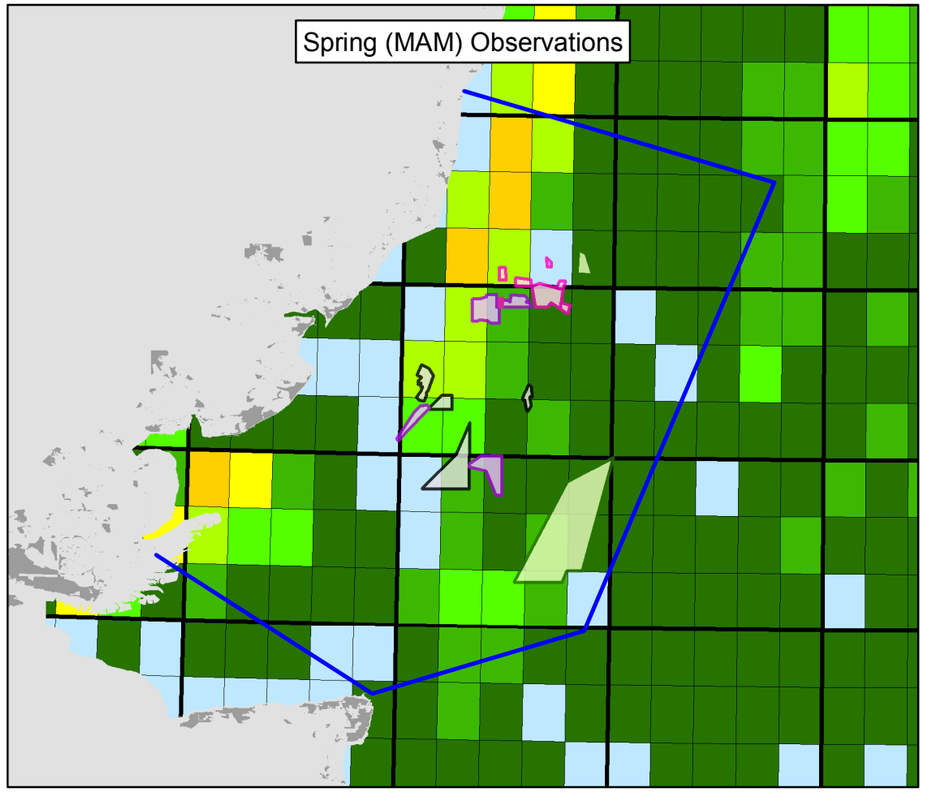
North Hinksey Lane
Oxford, OX2 0QS
Tel: 01865 384800
Fax: 01865 384848

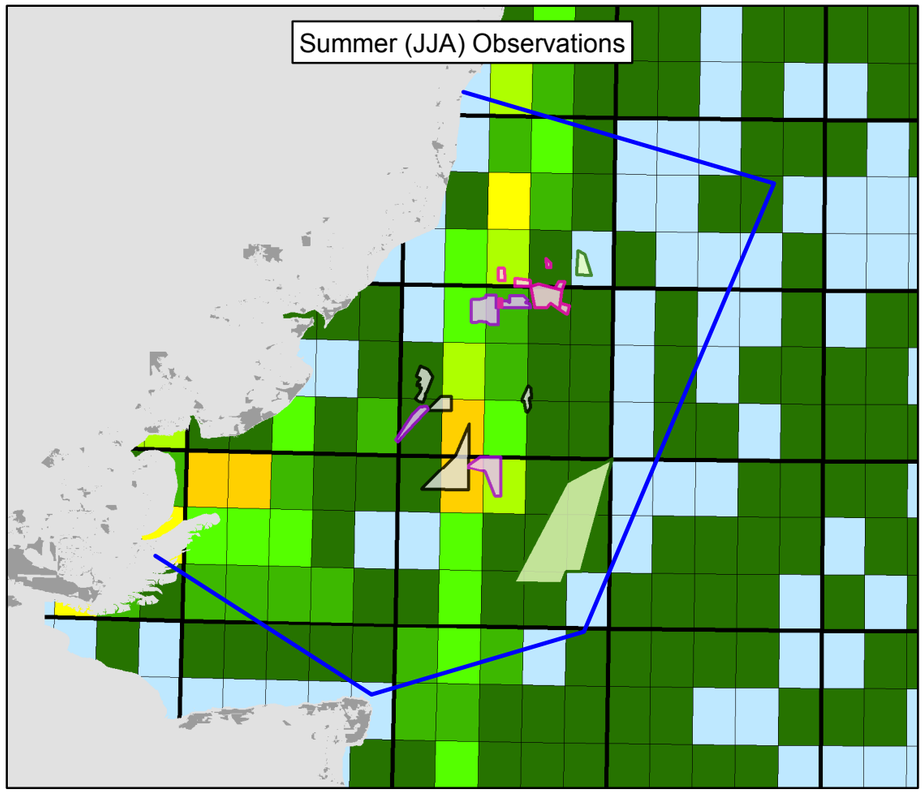
ERM

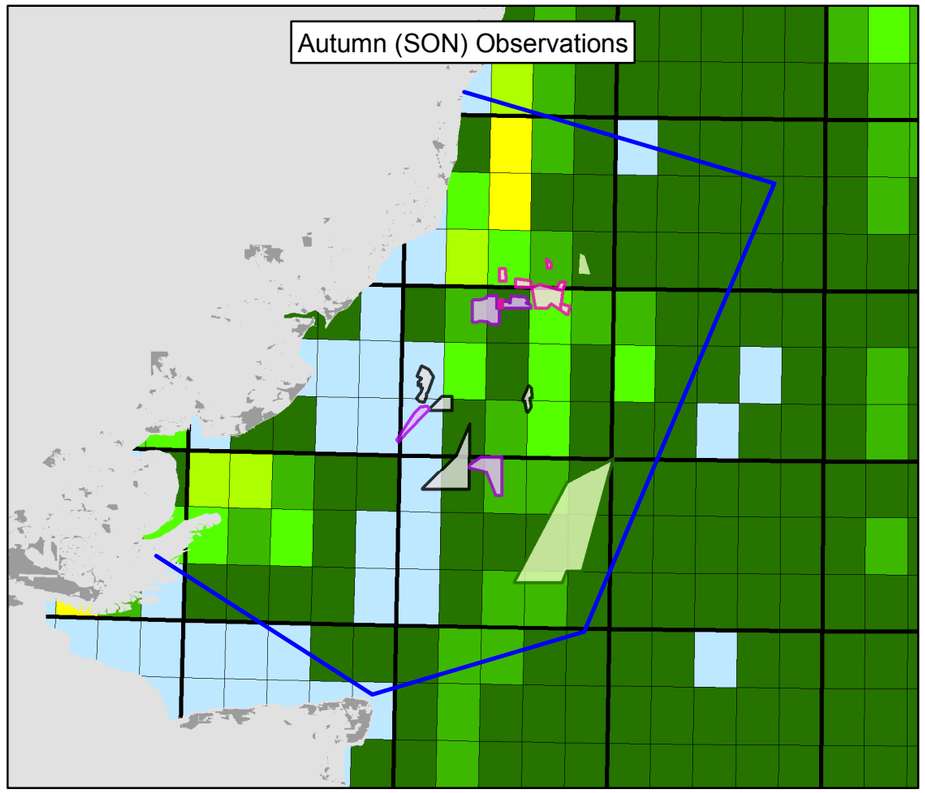
SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\Final\Figures_0110\HumanBaseline\Commercial\Fisheries\SObs_UKSeasonInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 5.9

Seasonal Distribution of Active UK Fishing Vessels in the TEDA Study Area: 2005-2008

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

DRAWING: VMS_UKFishingSeasonInc08.mxd

REV: 0

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Fax: 01865 384848

ERM

SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_UKFishingSeasonInc08.mxd

### 5.4.2 *Foreign Fishing Fleet*

The majority of foreign fishing vessels are from European Union countries, although a few vessels from outside the EU also fish within the TEDA study area (*Table 5.2*). In most years, these vessels expended higher effort, were more numerous and are larger than the vessels from the UK. Vessels from Belgium were the most often observed, followed by Dutch and vessels from the UK (*Table 5.2*). In 2007 and 2008, UK flagged vessels were the most commonly observed fishing in the TEDA study area. This may be for a number of reasons, such as rises in fuel bills forcing foreign vessels to fish closer to home and vessels re-flagging as UK based vessels.

Other nations that fish in the area include vessels flagged in Germany and Norway, although vessels from Denmark, Sweden, Ukraine, Russia and the Faroe Islands have also been observed in the ICES squares analysed for the TEDA MAREA. However, a large number of these vessels did not actually fish in the area.

*Spatial and Temporal Variation in Fishing Effort*

Fishing effort from foreign vessels represents the greatest proportion of effort for vessels greater than 10 m in length within the TEDA area (*Figure 5.10*). Vessels have been observed fishing by overflight surveys in all areas of the TEDA study area. In 2004 fishing was evenly spread across the entire area, the number of vessels observed within each sub-rectangle being relatively moderate (1 -2 standard observations). The highest numbers were observed in sub-rectangles 32F1-2 and 32F1-4. To the west and north of these areas, the number of vessels was very low (<1 standard observations). In 2005, the number of observed fishing vessels was higher than in 2004 but was highest to the east and in sub-rectangle 32F1-4. In 2006 the number of vessels was agin higher, although 32F1-4 showed much higher observed numbers than the remaining sub-rectangles (3-4 standard observations). The number of fishing vessels and the areas with the highest number of vessels was similar to that of 2004. A similar pattern was seen in 2008, although the number of vessels seen fishing in 32F1-4 was marginally higher.

A general seasonal pattern can be seen in fishing activity by the foreign fishing fleet (*Figure 5.11*):

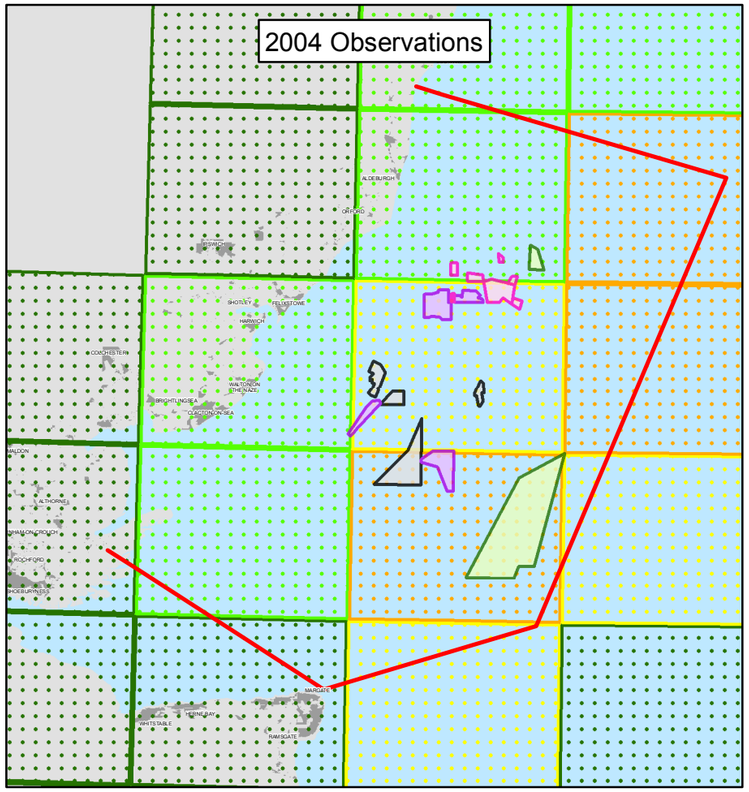
- During the winter most fishing vessels are concentrated further offshore, outside the study area.

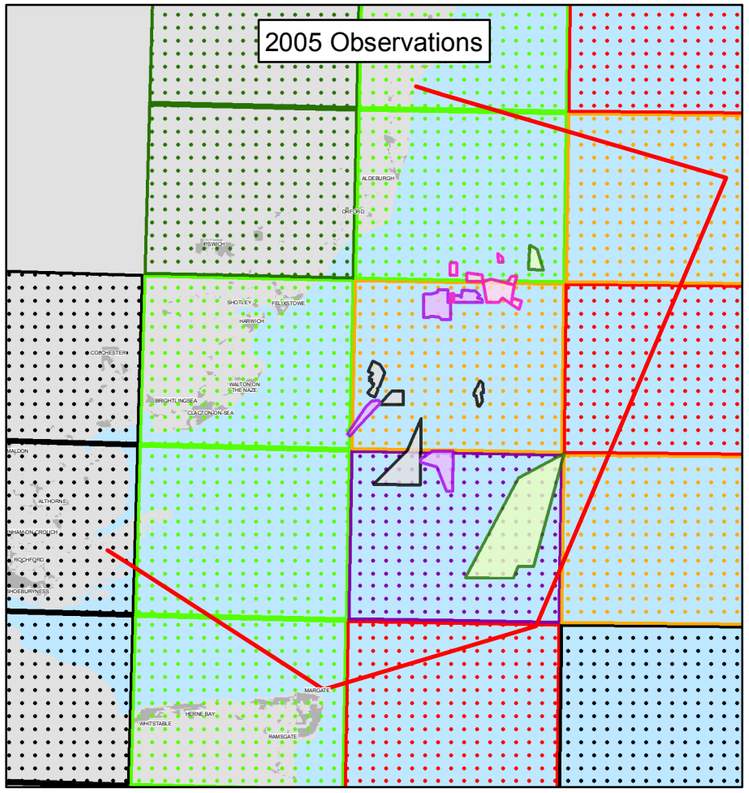
- During spring fishing moves into the TEDA area, the number of vessels fishing increases and is highest within ICES sub-rectangle 32F1-4.

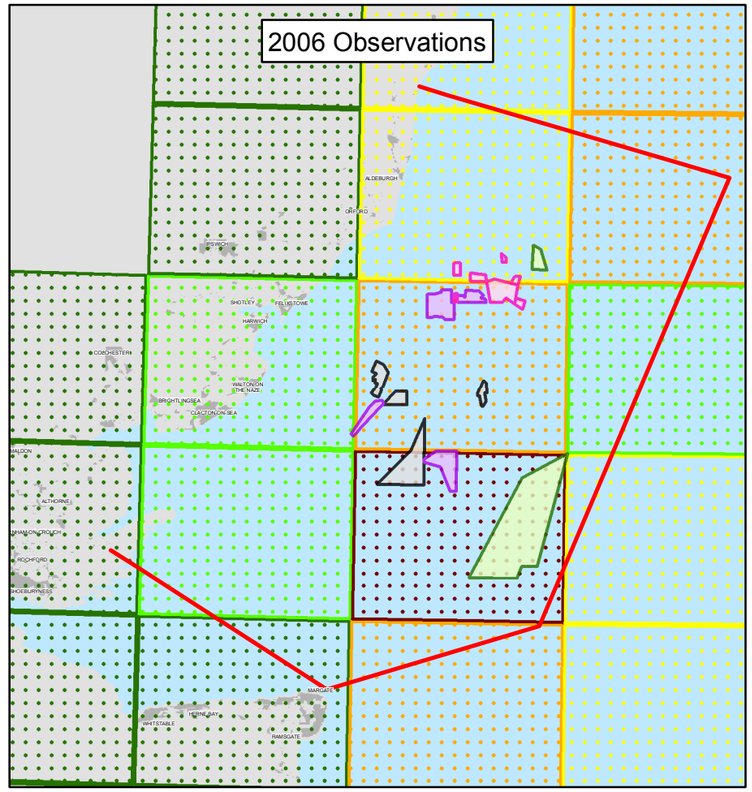
- In summer, while still mostly inshore, fishing vessels begin to move further offshore and are more evenly spread across the region.

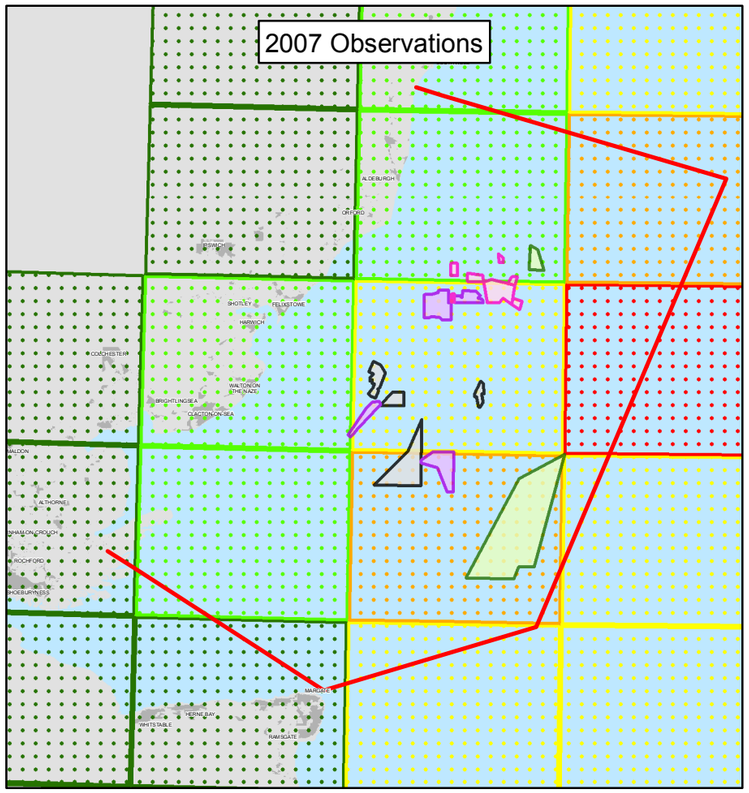
- Fishing again moves further offshore in the autumn, the highest number of vessels is found in 32F1-4 and the sub-rectangles to the northeast and north.

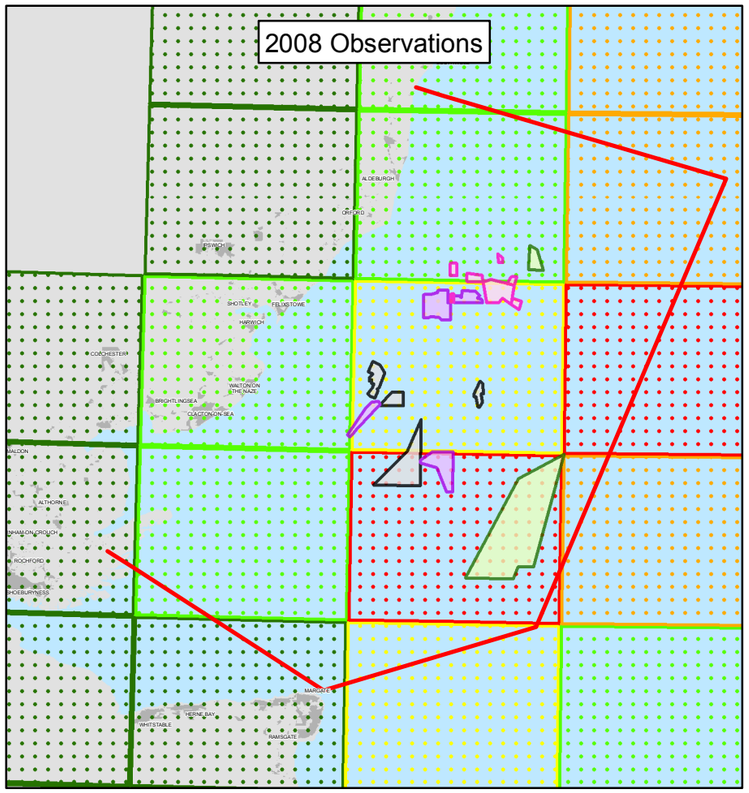
This pattern is likely to be driven by the biology of the fish species that are targeted, which move to shallower water during the spring and summer to breed (see *Appendix L* of Thames MAREA). Once breeding is completed the adult population migrate further offshore and the fishing fleets follow them.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

N W E S

0 25 Kilometres

CLIENT: TEDA

ERM
Eaton House
Wallbrook Court
North Hinksey Lane
Oxford, OX2 0QS
Telephone: 01865 384800
Facsimile: 01865 204982

TITLE: Figure 5.10

Standard Observations of Foreign Fishing Vessels in the TEDA Study Area, 2004 - 2008

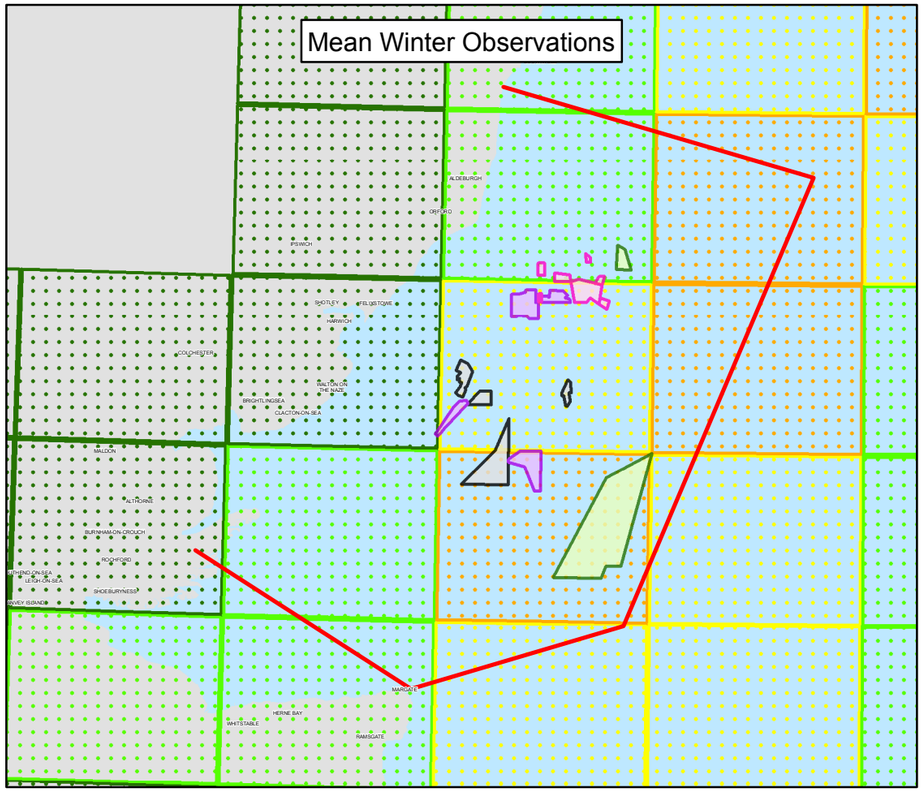
| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

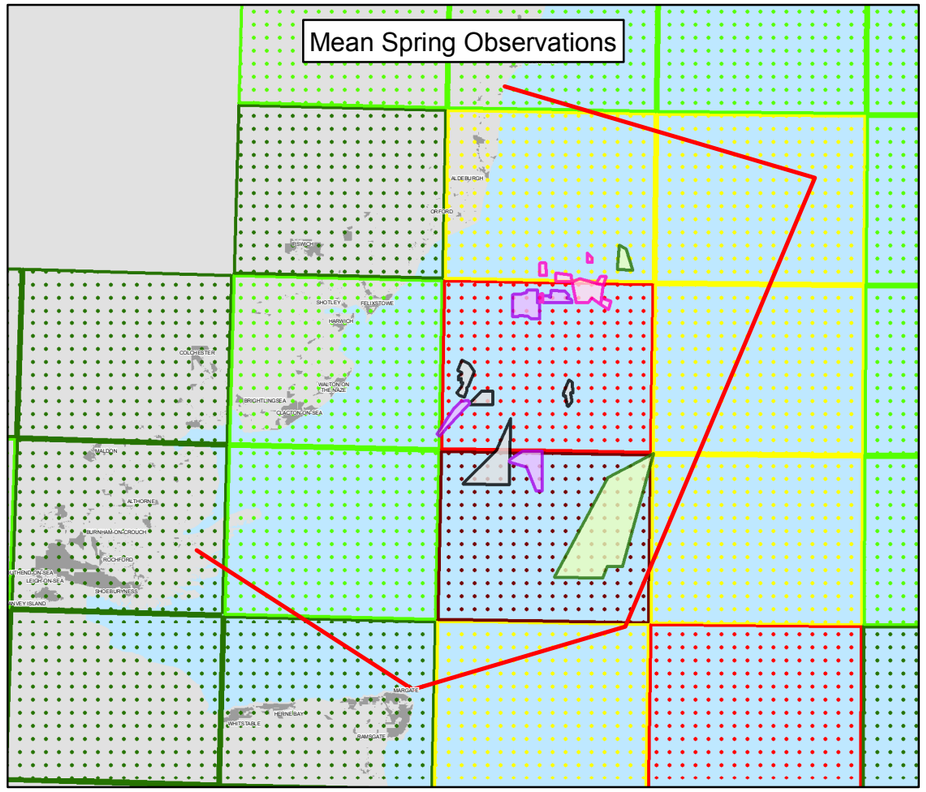
SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

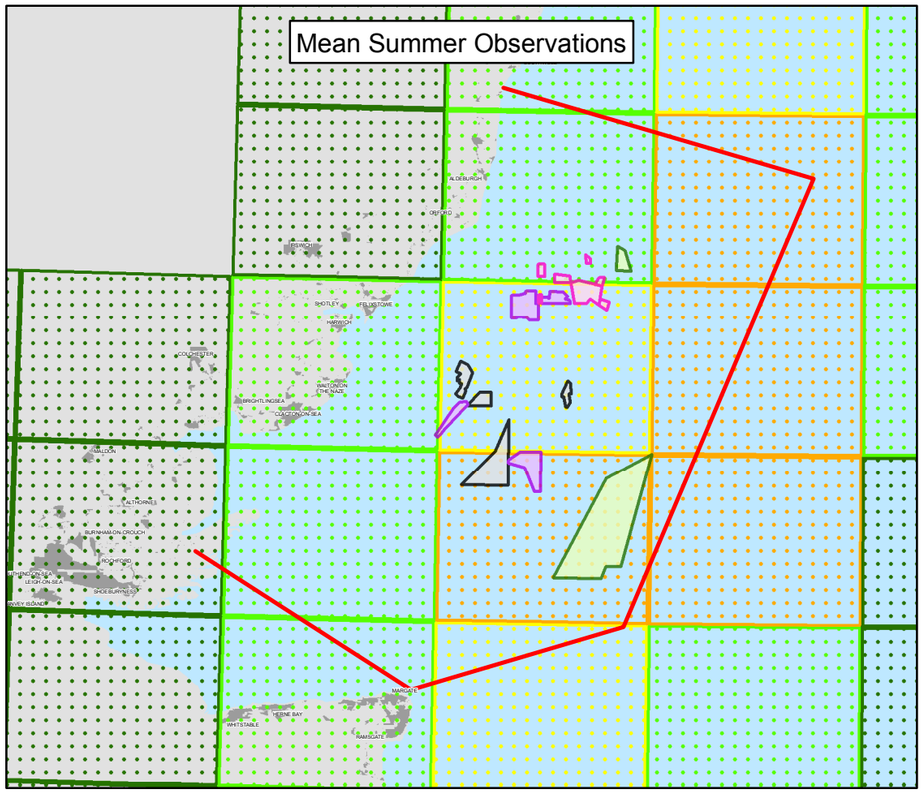
DRAWING: SObs_ForeignFishingInc08.mxd

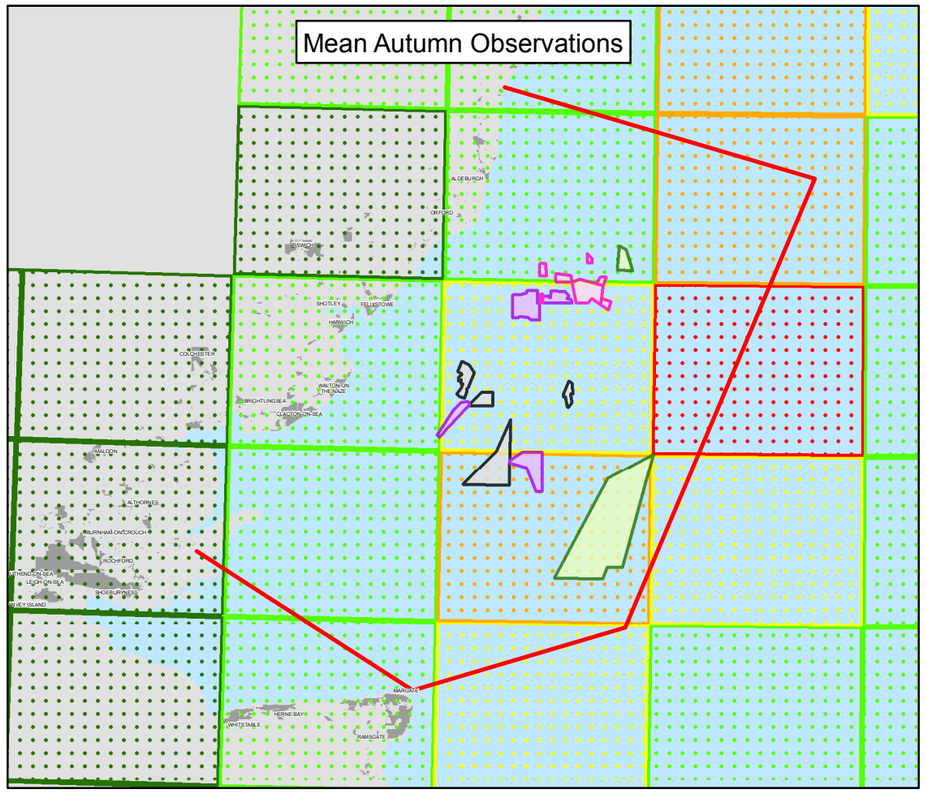
REV: 0

File: 0075577\ecl\REA_GIS_NYL\Maps\Final\Figures_0110\HumanBaseline\CommercialFisheries\SObs_ForeignFishingInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

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Kilometres

TITLE: Figure 5.11

Seasonal Standard Observations of Foreign Fishing Vessels in the TEDA Study Area

CLIENT: TEDA

| | | |
|---|---|---|
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |
| DRAWING: SObs_ForeignSeasonInc08.mxd | | REV: 0 |

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ERM

SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\Final\Figures_0110\HumanBaseline\CommercialFisheries\SObs_ForeignSeasonInc08.mxd

# 6 SPATIAL AND TEMPORAL TRENDS OF FISHING METHODS (>10M VESSELS)

## 6.1 INTRODUCTION

A number of different fishing methods are by fishing vessels operating within the TEDA study area. While the gear types used by the smaller inshore fleet were examined using available data in *Section 5.3* the spatial and termporal trends of the offshore fleet is examine in this section (both UK and foreign fishing fleets). The number of observations from overflight surveys, carried out by Defra, of vessels within the TEDA study area using various gear types is shown in *Table 6.1*.

***Table 6.1 Number of Vessel (>10 m) Observations from Defra Overflight Surveys for Each Gear Type within the TEDA Study Area, 2004 - 2008.***

| Gear type | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Side trawler (pelagic/demersal) | 1 | | 3 | | |
| Stern trawler (pelagic/demersal) | 13 | 16 | 39 | 52 | 42 |
| Beam trawler | 272 | 229 | 234 | 285 | 222 |
| Long liner | 2 | | 2 | | 1 |
| Gill netter | 8 | 9 | 14 | 35 | 45 |
| Potter/whelker | 15 | 17 | 17 | 38 | 44 |
| Drift netter | 3 | | | 1 | 6 |
| Rod and line | | 1 | | | 6 |
| Trawler | 73 | 52 | 50 | 83 | 149 |
| Pair trawler | | 1 | 4 | 4 | 2 |
| Suction dredger | | | | 12 | 42 |
| Unknown | | | | 22 | 30 |
| Scallop Dredger | | 1 | | 3 | |

Source: Defra overflight data provided by MFA.

## 6.2 DATA SOURCES

The overflight and VMS data have been used to provide some indication of the variation in the number of fishing vessels throughout the area and between years and months.

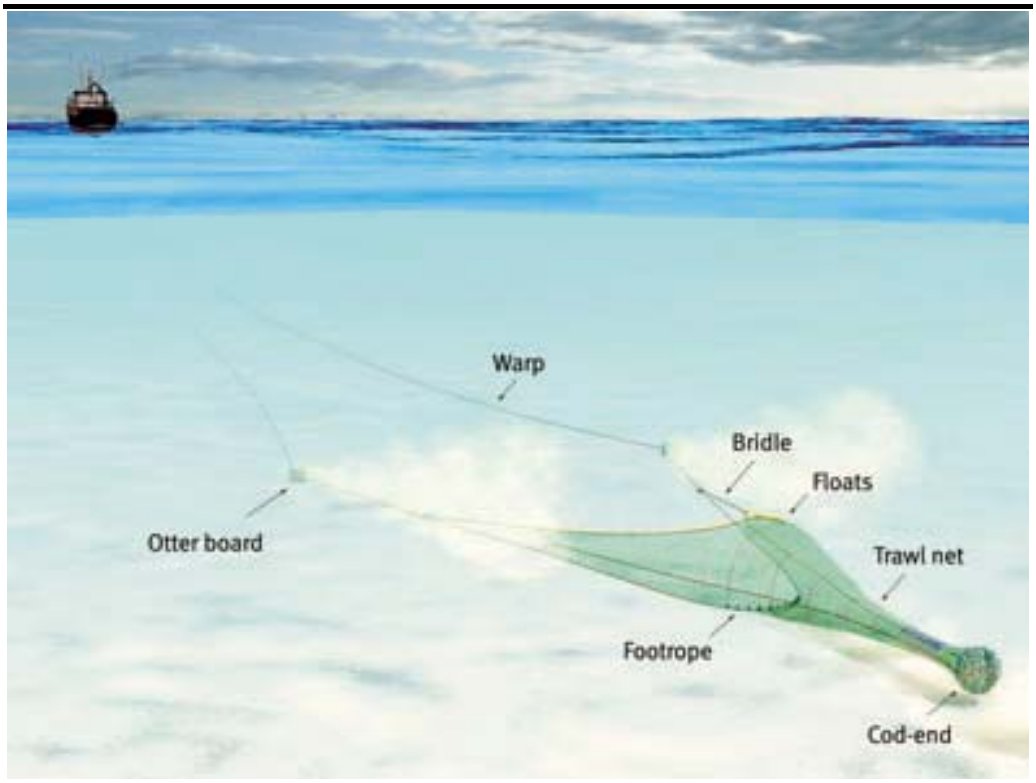
However, these data should be viewed with some caution. During consultation it was suggested that a number of the beam trawlers from Belgium (the most numerous foreign nation (see *Table 5.2*)), due to increasing fuel costs and beam trawling being fuel intensive, have switched to either scallop dredging or otter trawls which need less fuel to tow. In addition the number of Dutch and Belgian vessels fishing in the Thames has decreased in 2008 due to rising fuel costs making trips from their ports to the Thames Estuary more expensive.

## 6.3 TRAWLS VESSELS OVER 10 M

A variety of trawl gears are used in the study area to target a number of species. Generally trawls are used to target demersal fish species and may take some benthic invertebrates as bycatch (crabs, squid etc). Pelagic trawl gears are used to target pelagic fish species such as herring, sprats and sandeels (mainly Danish and Norwegian vessels). The main trawl gears recorded in the overflight data (vessels over 10m) are:

- pelagic and demersal side trawlers;
- pelagic and demersal stern trawlers;
- beam trawlers; and
- pair trawlers.

***Figure 6.1 The Principal Features of Demersal Otter Trawl Gear***




Source: Galbraith, R. D., and Rice, 2004 (1)

(1) : Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.

Beam trawlers are largely used to target flatfish such as sole and plaice that burrow in the sand (see *Appendix L* of Thames MAREA), and brown shrimps *Crangon crangon* [(1)]. In this type of trawl, the mouth of the net is kept open by the beam that is mounted at each end on guides or skids that travel along the seabed. The trawls are adapted and made more effective by attaching tickler chains that drag along the seabed in front of the net, causing the fish to rise from the sand and into the oncoming trawl.

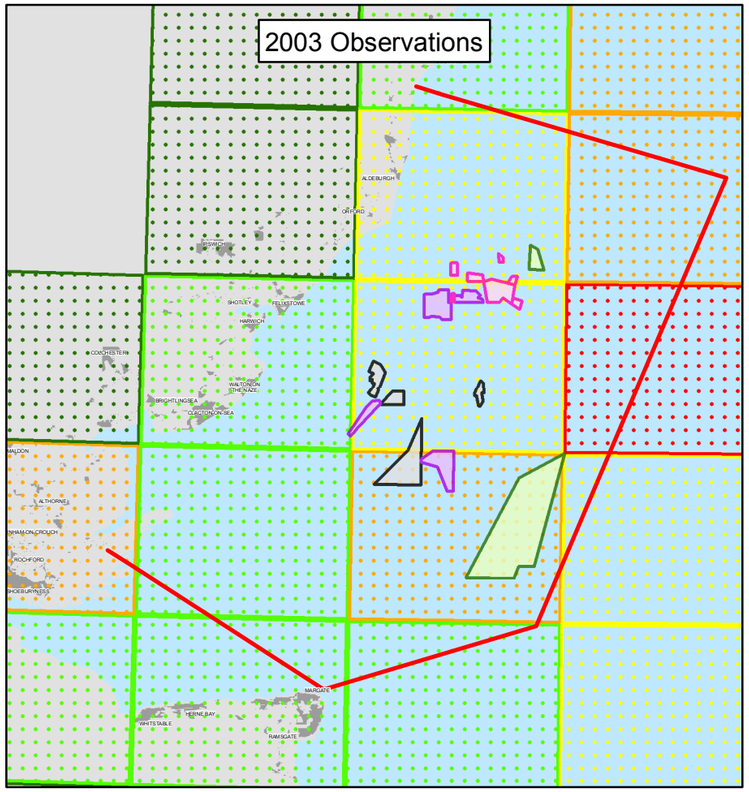
Otter trawls (*Figure 6.1*) are mainly used to catch species such as cod, whiting, coalfish (saithe) (see *Appendix L* of Thames MAREA) and *Nephrops*. The otter trawl is a large cone-shaped net, which is towed across the seabed. The mouth of the net is kept open by otterboards, which maintain contact with the seabed. This method is used by pair, side and stern trawlers. Pelagic trawls are generally otter trawls that are towed through mid-water or close to the surface to catch pelagic species.

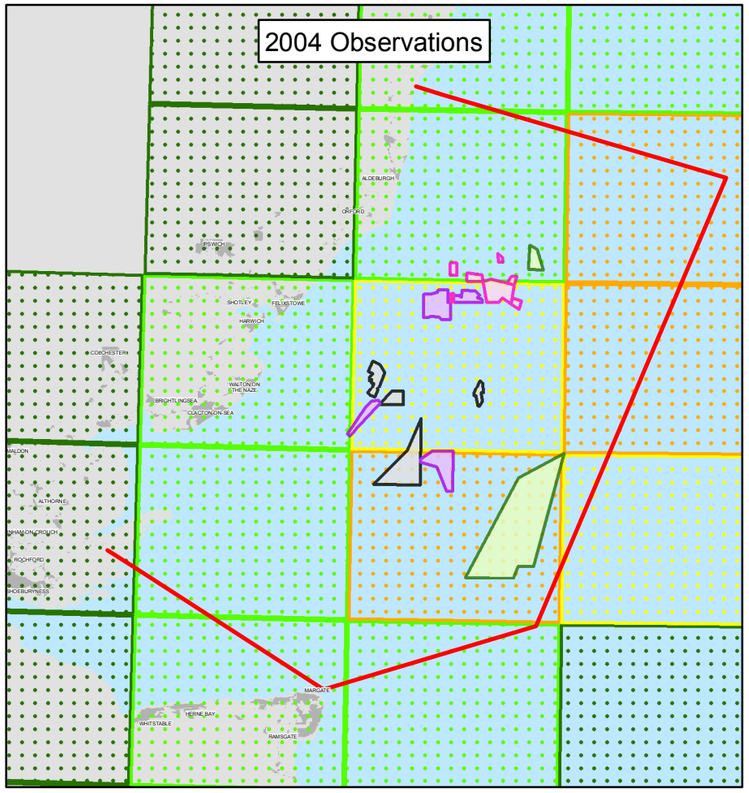
### *6.3.1 Spatial and Temporal Variation in Fishing Effort*

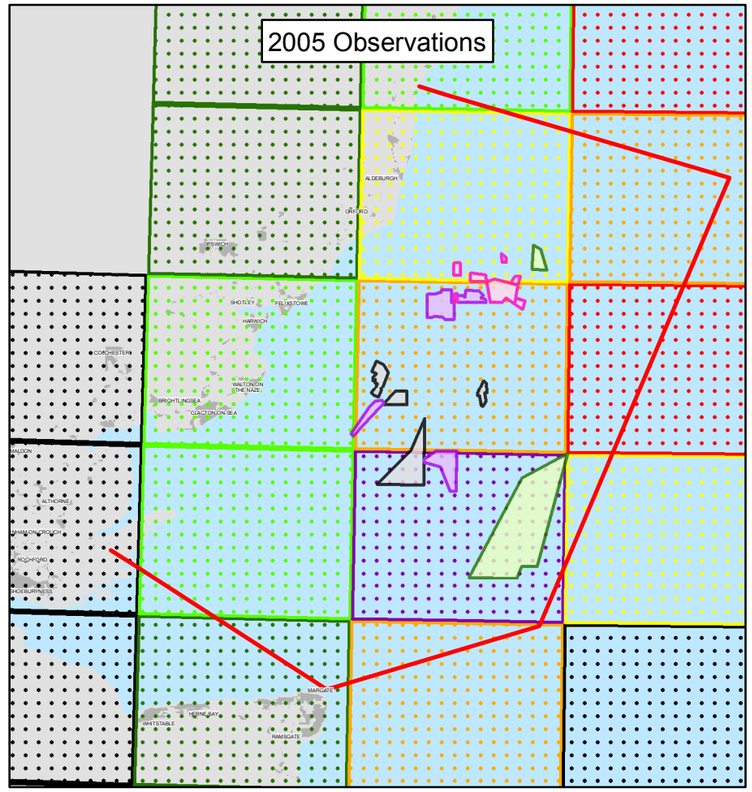
The trawl fishery operates all year round, although there are temporal and spatial changes in the number of vessels fishing. Analysis of the overflight data shows interannual variation (see *Figure 6.2*). In 2004 vessels were distributed through the centre of the study area and the highest numbers were found in ICES sub-rectangle 32F1-4. In 2005, a similar pattern was present, although the most northerly central sub-square had fewer vessels observed fishing. The remaining sub-rectangles within the TEDA study area are characterised by low effort. In 2006, the highest vessel numbers are agin through the central area although the numbers are higher in 32F1-4 and 32F1-2. 2007 was similar to2006, 32F1-2 having the highest number of observed vessels. In 2008, the distribution of vessels is similar to 2005 with most vessels through the central area and the highest concentration in 32F1-4.

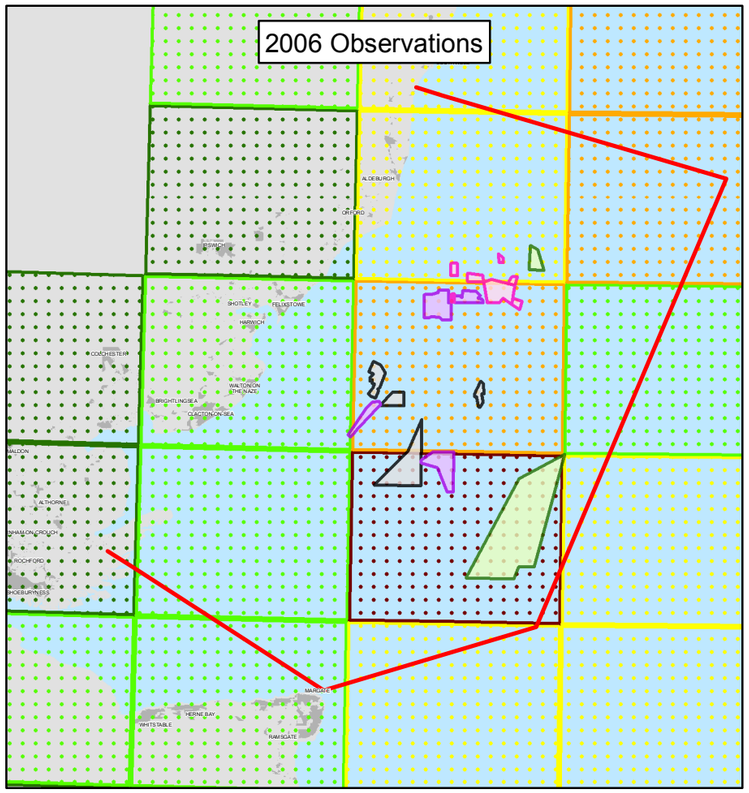
In 2006 and 2007, the number of vessels observed during the summer was lower than the general annual pattern. In 2006 the number of observed vessels was higher in autumn than the average. However, the highest numbers are still seen within the same ICES sub-rectangles other than during the summer of 2007. This is likely to be due the different weather patterns seen in the summer of 2007, potentially changing the distribution of fish in the study area or preventing fishing in normal areas. Thus, vessel distribution changed as vessels fished elsewhere.

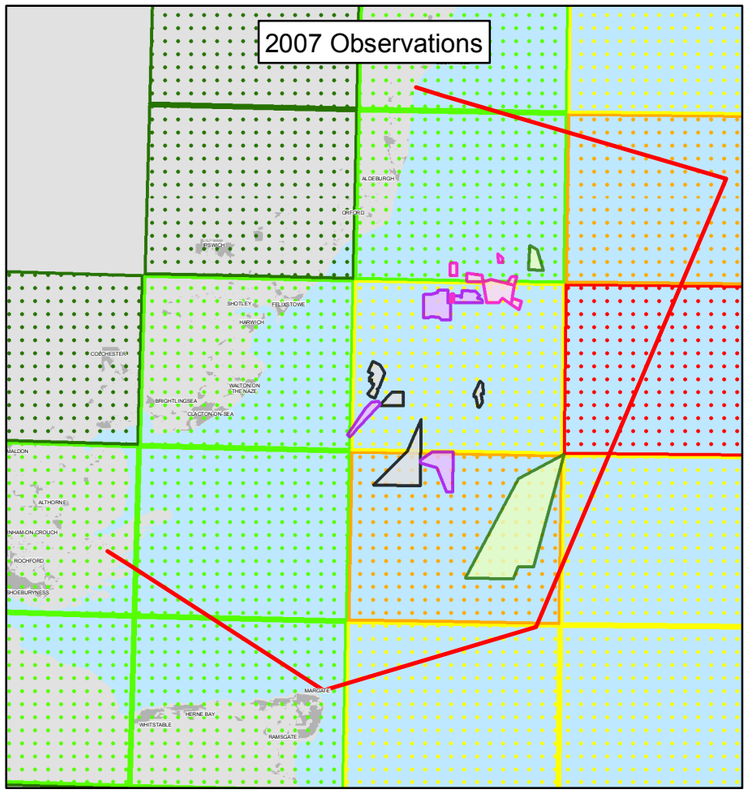
(1) Gubbay, S., & Knapman, P.A., 1999. A review of the effects of fishing within UK European marine sites. Natura 2000 report prepared for the UK Marine SACs Project. English Nature. (UK Marine SACs Project, vol .12).




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

N W E S

0 25 Kilometres

CLIENT: TEDA

ERM
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Oxford, OX2 0QS
Tel: 01865 384800
Fax: 01865 384848

TITLE: Figure 6.2

Standard Observations of Trawl Fishing in the TEDA Study Area, 2003 - 2007

| DATE: 30/09/2010 | CHECKED: | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

DRAWING: SObs_TrawlersYear.mxd

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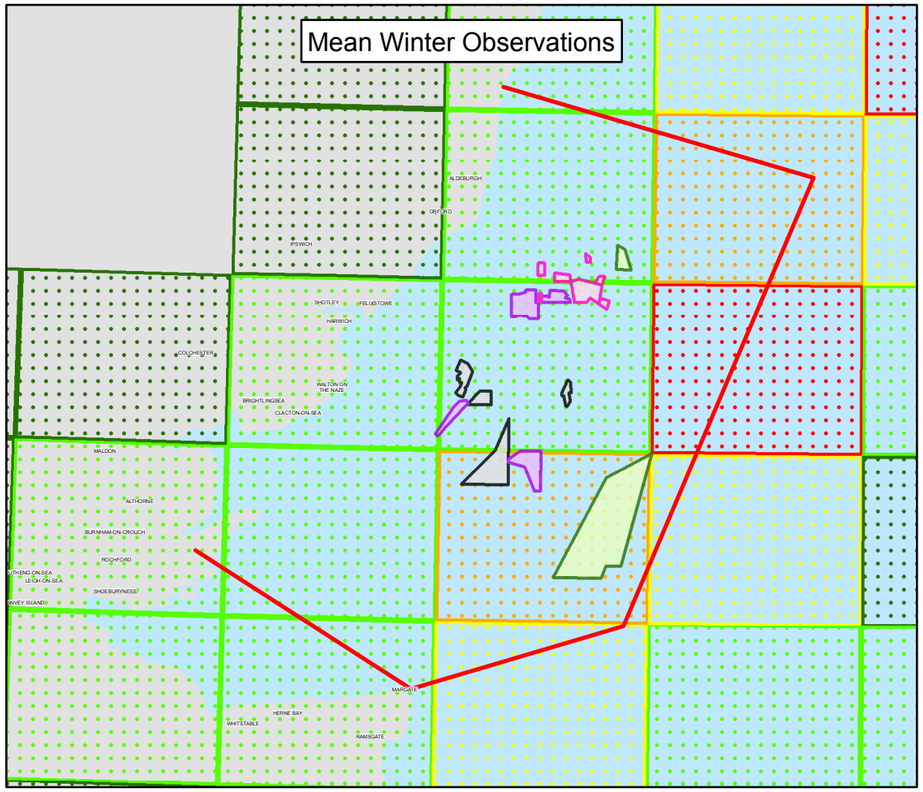


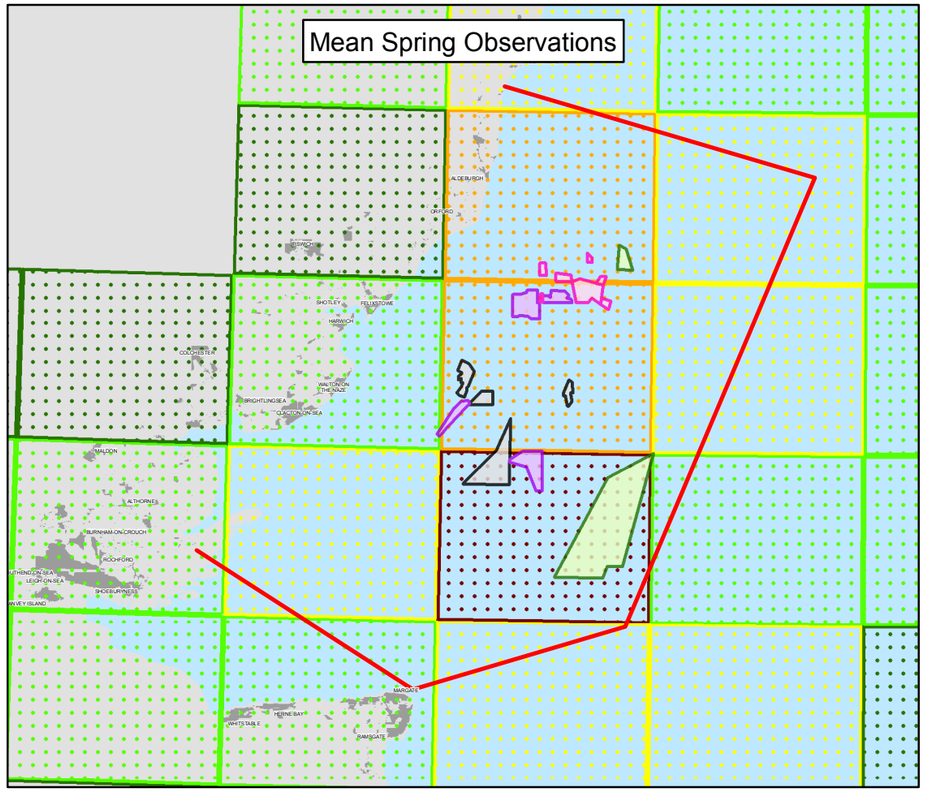


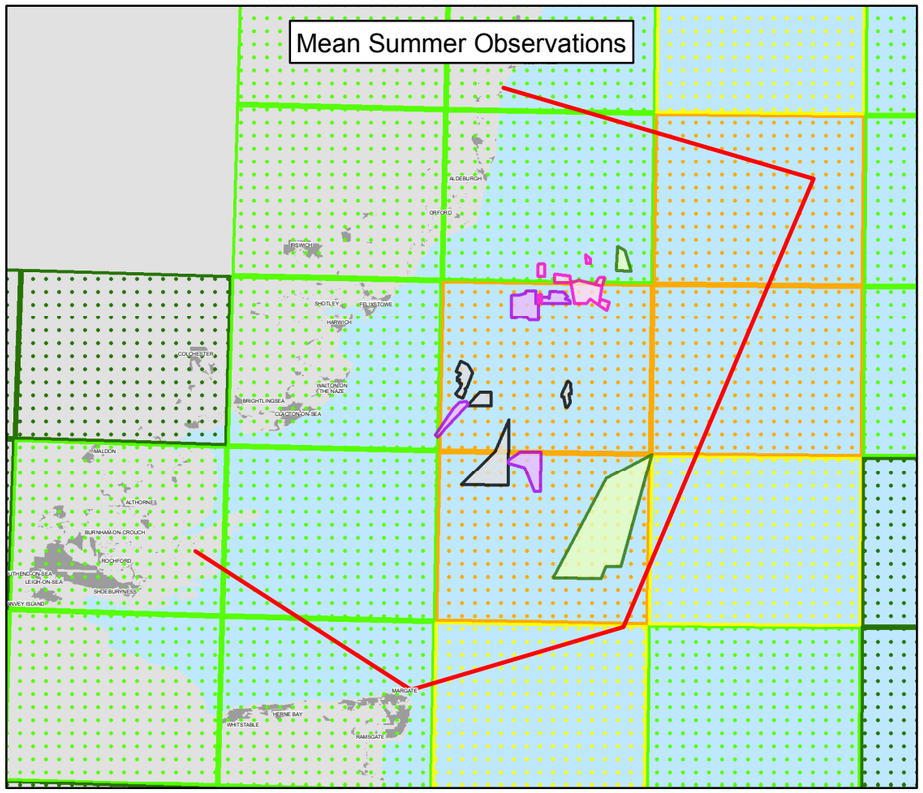


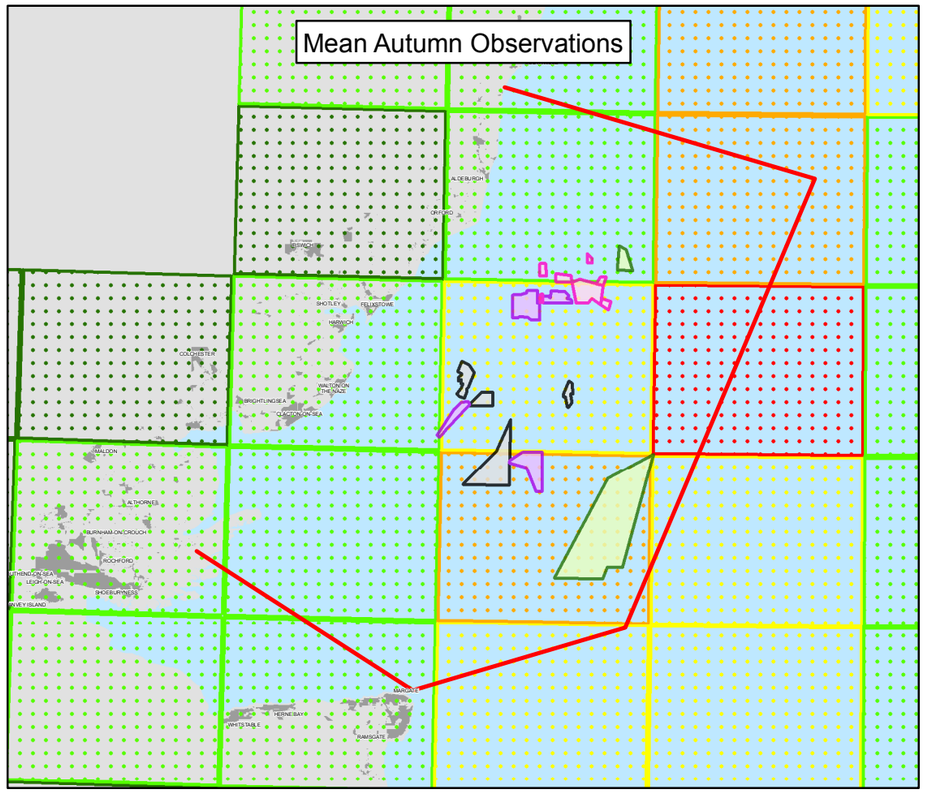


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- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

N
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0 50
Kilometres

TITLE: Figure 6.3
Seasonal Standard Observations for Trawl Vessels Fishing in the TEDA Study Area

CLIENT: TEDA

| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
|---|---|---|
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

DRAWING: SObs_TrawlersSeason.mxd REV: 0

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ERM

SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

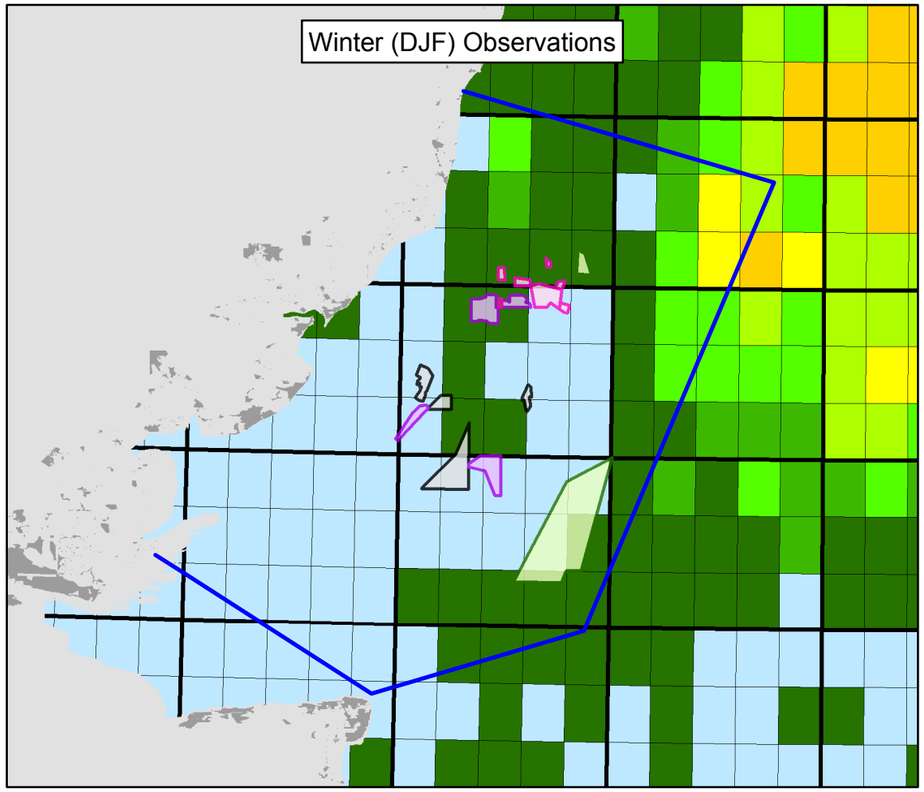
File: 0075577\EcdaREA_GIS_NYL\Maps\Final\Figures_0110\HumanBaseline\Commercial\Fisheries\SObs_TrawlersSeason.mxd

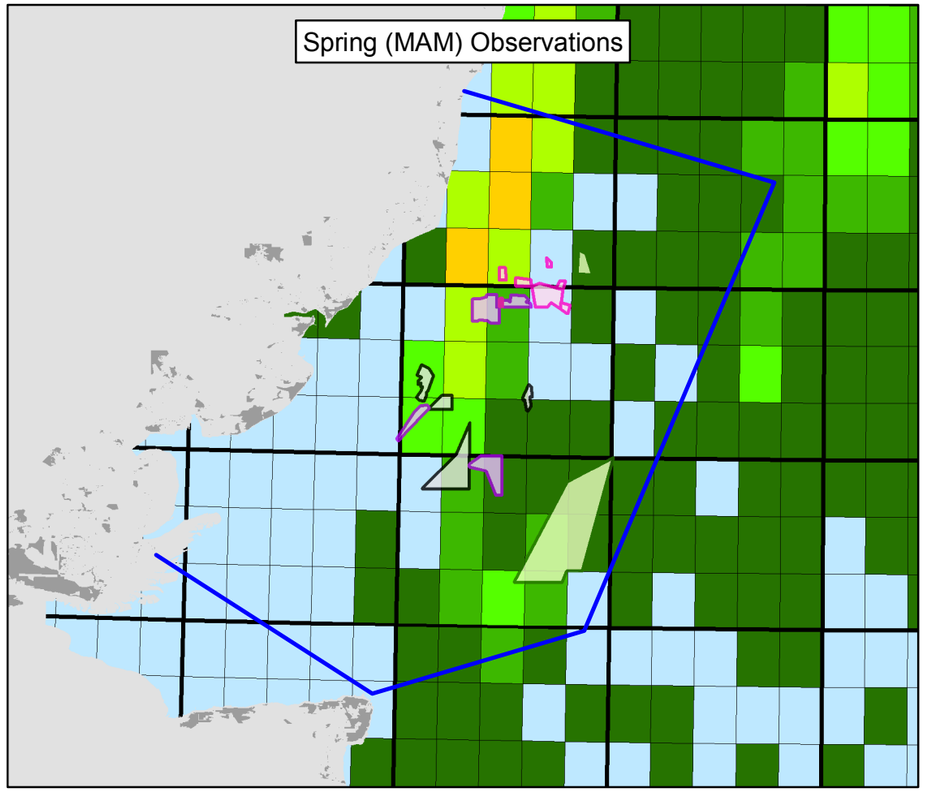
The same seasonal pattern is observed across the study area over the last ten years (*Figure 6.3*). During the winter months vessel numbers are generally low. The highest numbers were seen in ICES sub-rectangle 32F1-4, although these were lower than for the rest of the year. During the spring and summer the number of vessels through the centre of the TEDA study area increased. The remaining TEDA area was fished to a lesser degree. In the autumn the number of vessels observed decreases again across the TEDA area. The number observed is again highest in the ICES sub-rectangle 32F1-4.

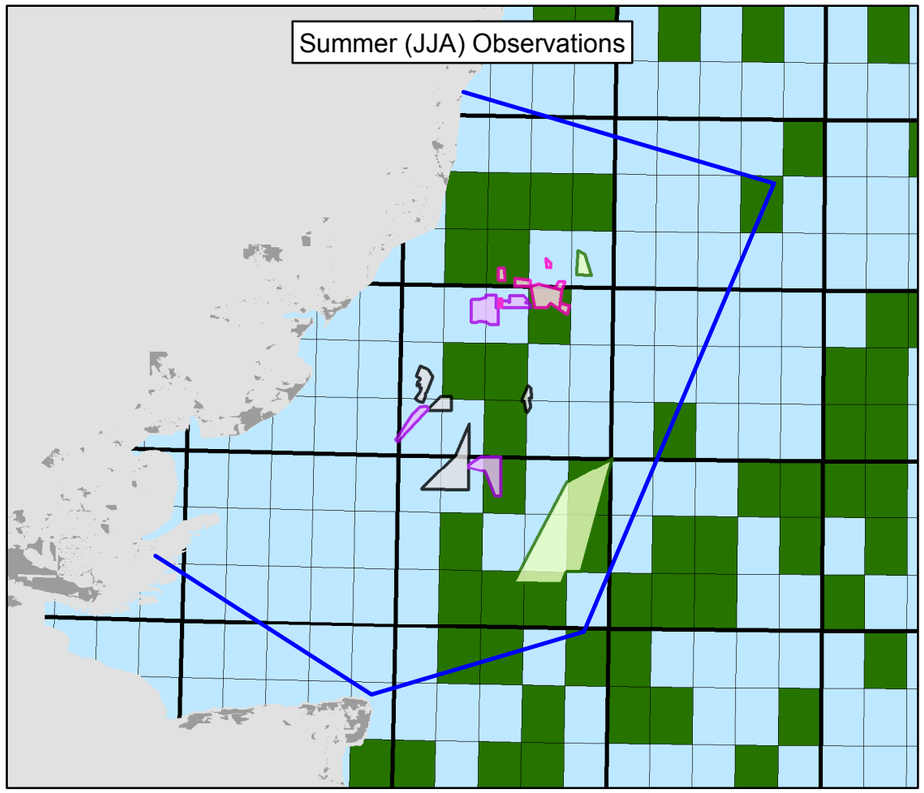
VMS data for beam trawlers shows a similar pattern to that of the overflight data. In winter, most activity is further offshore and outside the TEDA study area and in spring activity moves closer in shore. Activity during summer and autumn is reduced as is the number of vessels fishing (*Figure 6.4*) possibly as they move outside the TEDA area or their quota is completed. As the VMS data set encompasses vessels 15 m and larger and the overflight also covers vessels to 10 m in length and foreign vessels are excluded from the VMS dataset this may explain small differences observed in the overall fishing patterns seen between the overflight and VMS datasets. Many of the UK vessels may move to other areas to fish for different species once they have completed their quota and therefore move out of the TEDA study area, reducing the overall number of vessels in the area.

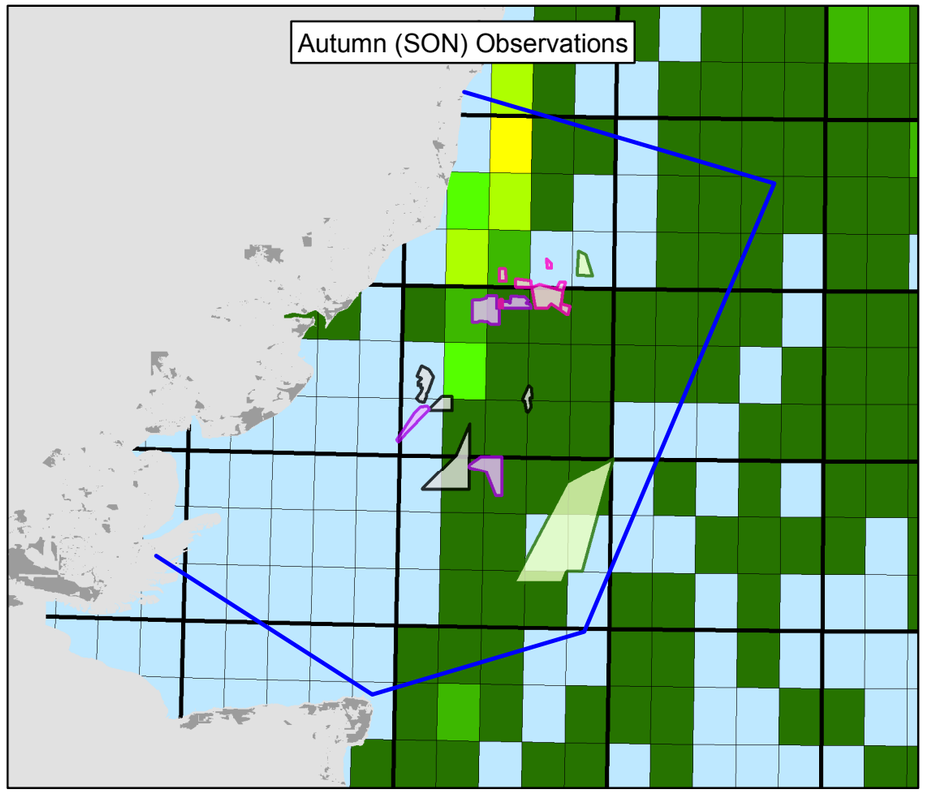
The number of other trawlers (*Figure 6.5*) and shrimp trawlers (*Figure 6.6*) are much lower within the TEDA study area. Generally, for other trawl vessels fishing is spread throughout the area with only a few vessels recorded in any of the squares. Numbers are highest during the winter and reduced during spring, summer and autumn. During summer higher concentrations of vessels are seen close to the Blackwater estuary. These vessels are probably targeting cod, skate and sole. Only a few shrimp trawlers appear in the TEDA area and only during winter and spring, being most numerous in spring. Generally the shrimp fishery is further north towards the Wash and these vessels are probably fishing at the extremities of the fishery.

The observed fishing pattern is likely to reflect changes in the distribution of target species. During the spring and summer months fish move inshore to spawning grounds (see *Appendix L* of Thames MAREA) and it is likely that fishers move inshore following the stocks. Fish species that move inshore during this period are cod, thornback ray and sole and it is likely that vessels targeting these species are following their inshore migrations.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.4

Seasonal Distribution of Active Beam Trawlers from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 06/09/2010 | CHECKED: VA | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

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| DRAWING: VMS_BeamTrawlersSeasonInc08.mxd | REV: 0 |

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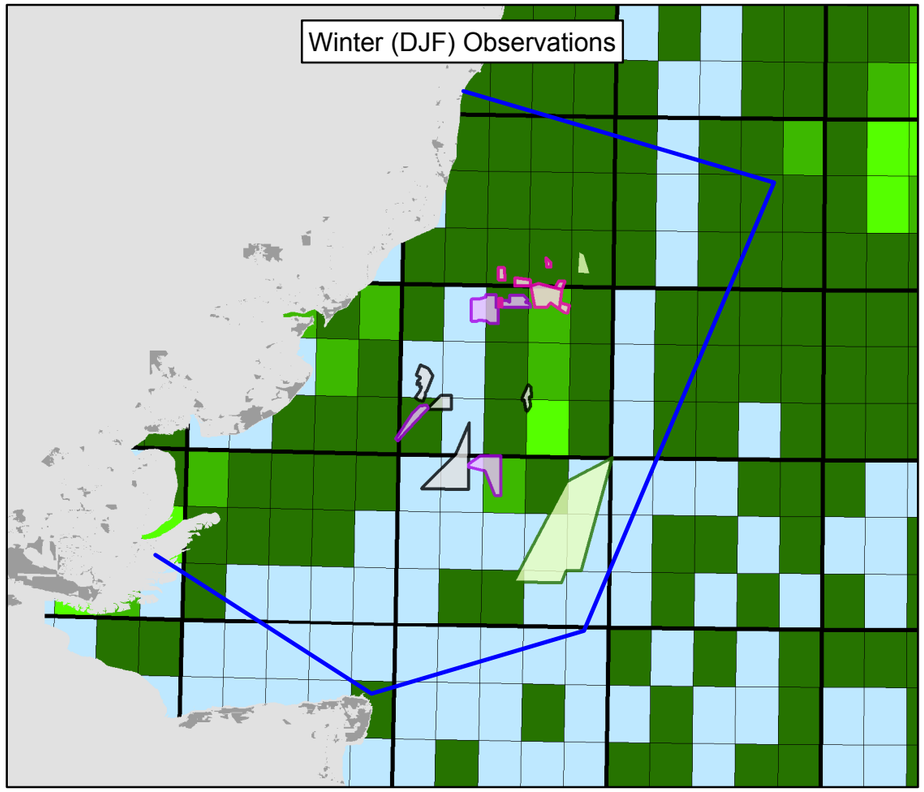
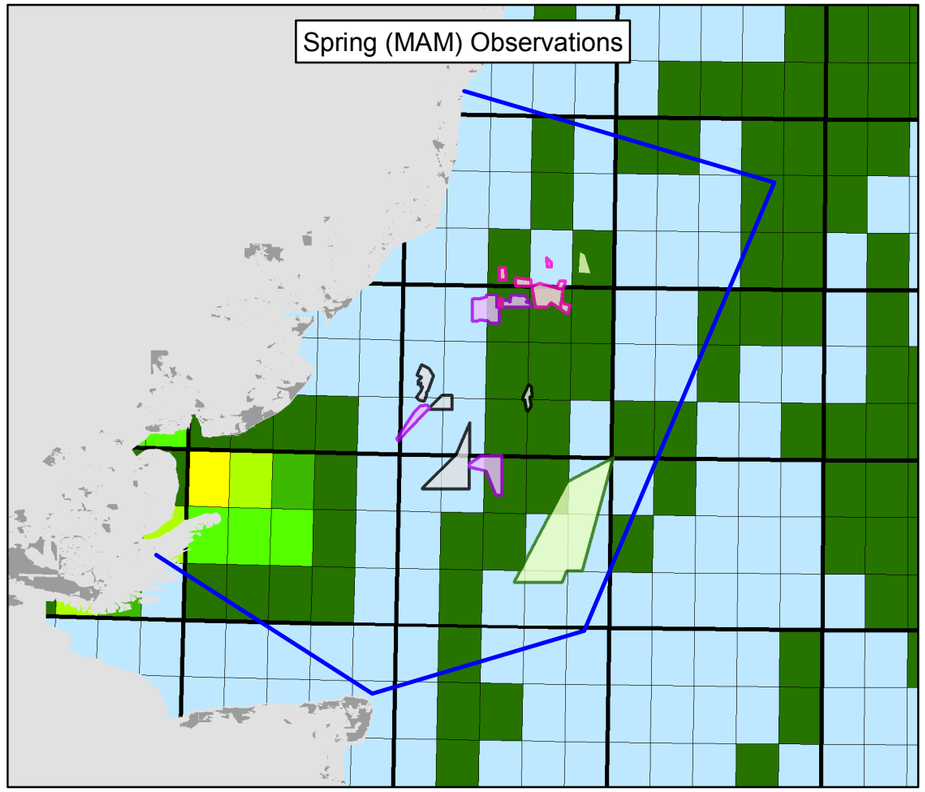
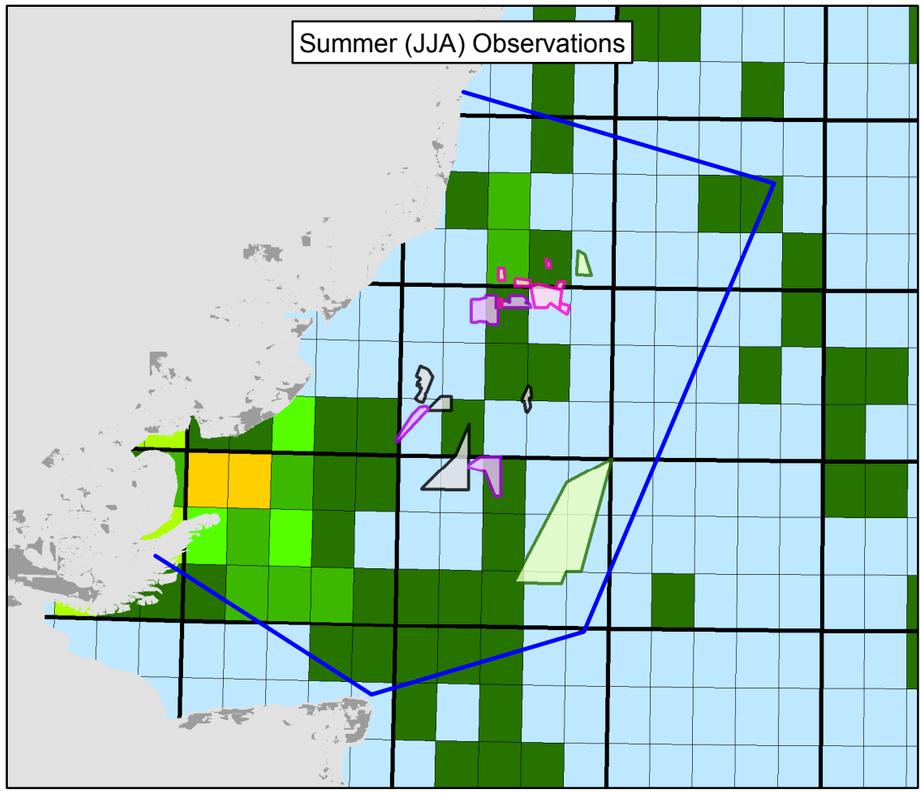
SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

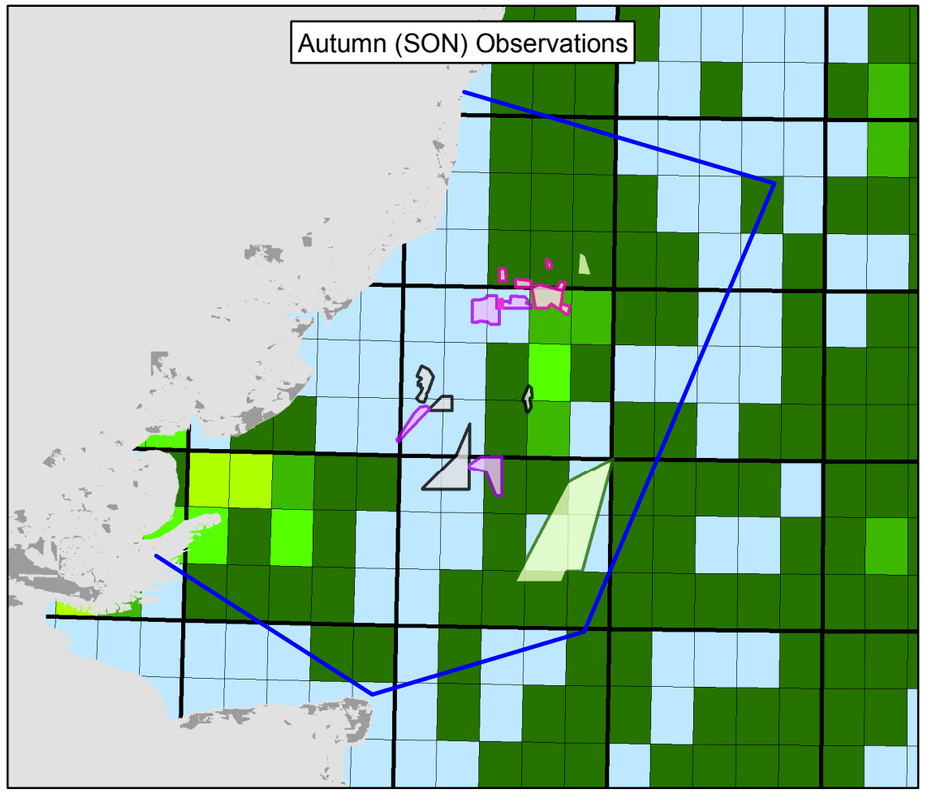
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_BeamTrawlersSeasonInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.5

Seasonal Distribution of Active Trawlers in the TEDA Study Area 2005-2008

(Excluding Beam Trawlers and Shrimpers)

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

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| DRAWING: VMS_MiscTrawlersSeasonInc08.mxd | REV: 0 |

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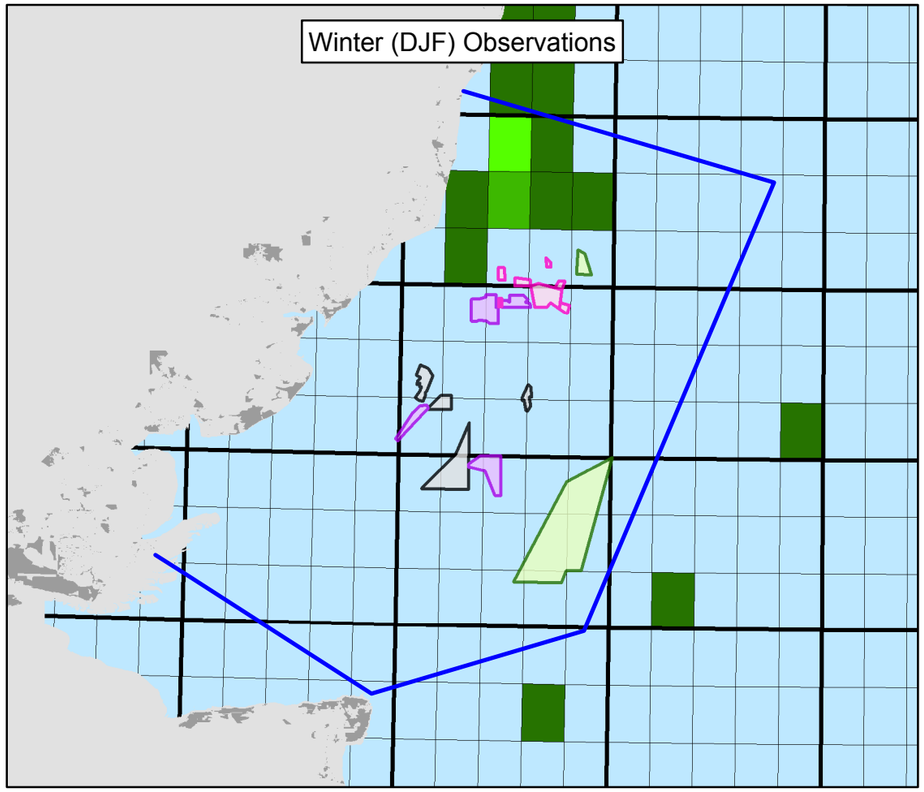
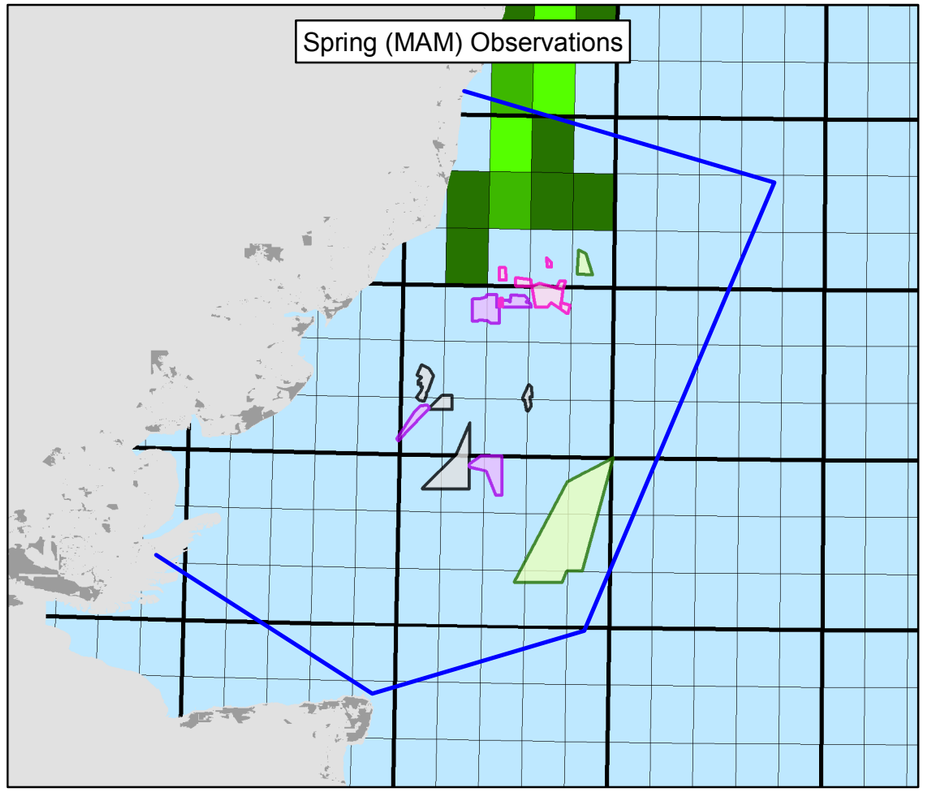
ERM

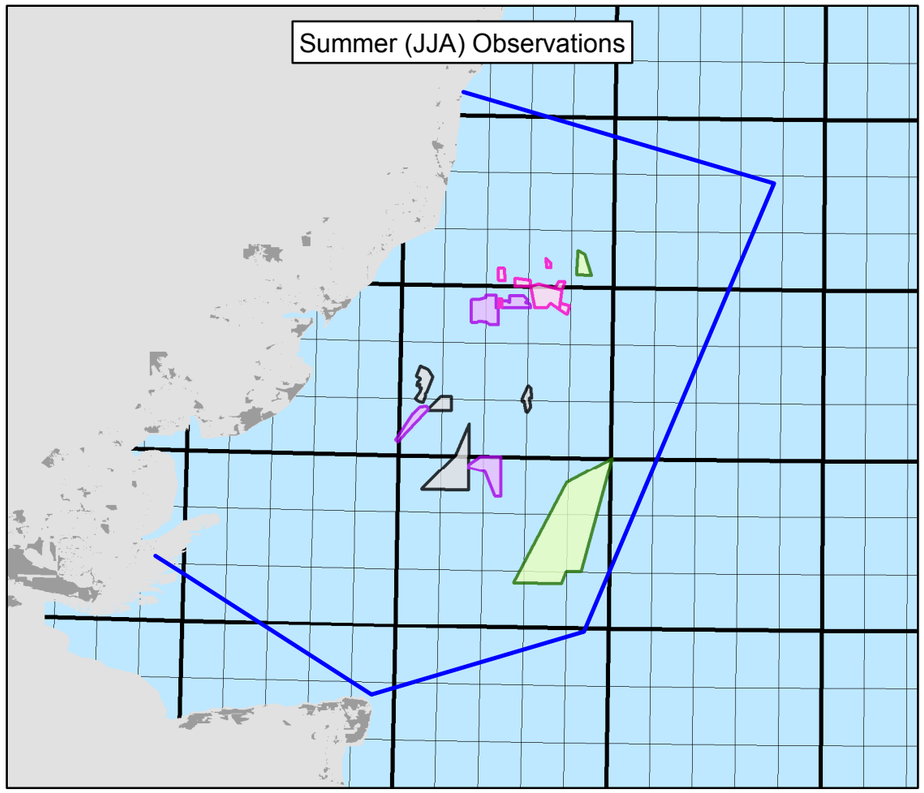
SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

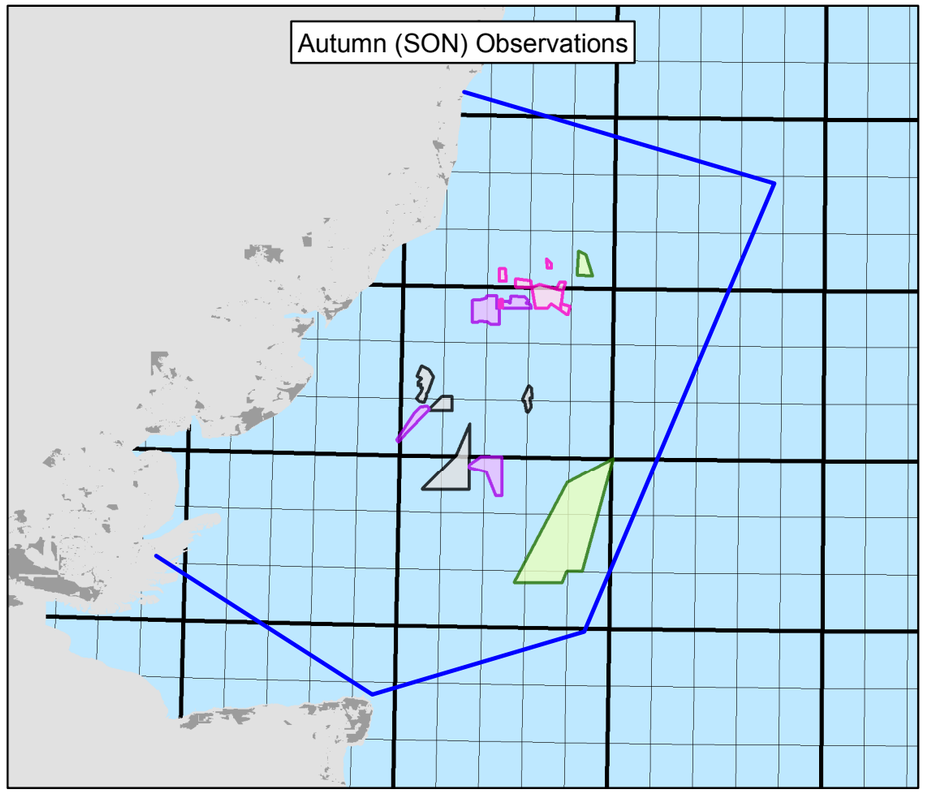
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_MiscTrawlersSeasonInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.6
Seasonal Distribution of Active Shrimper Trawl Vessels from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |
| DRAWING: VMS_ShrimpersSeasonInc08.mxd | | REV: 0 |

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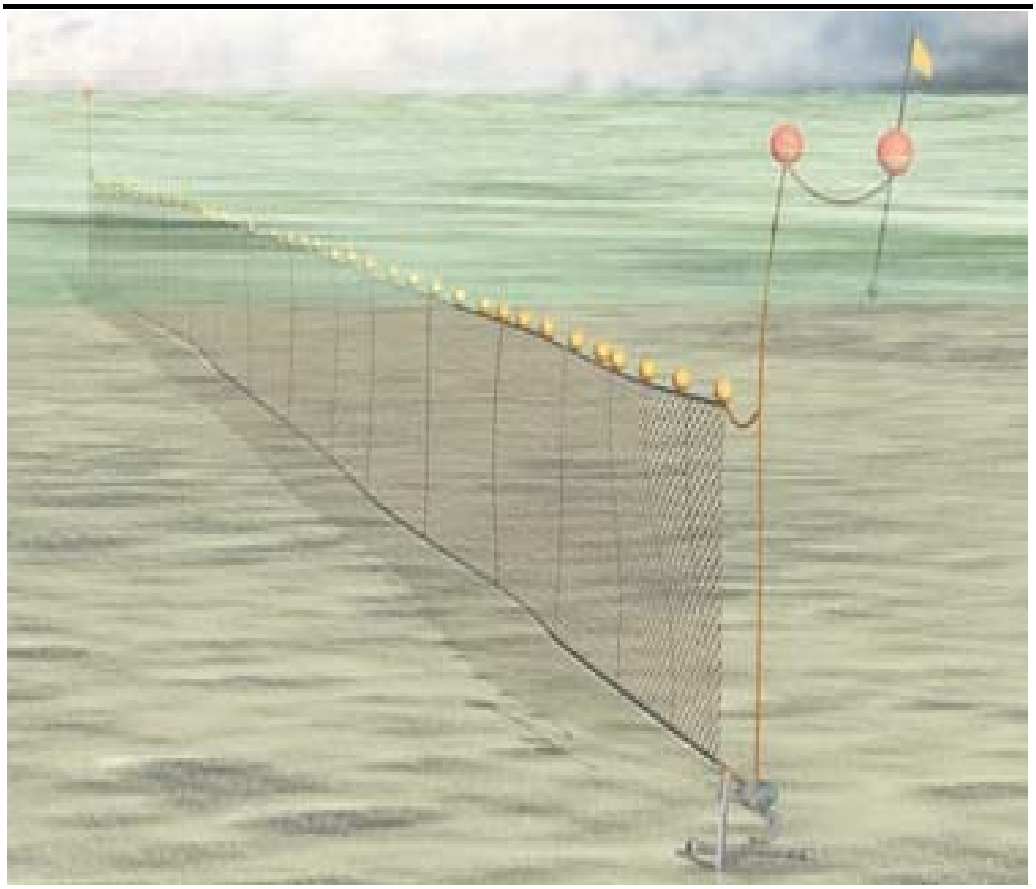
SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_ShrimpersSeasonInc08.mxd

## 6.4 GILLNETS AND DRIFTNETS

Gill nets [1] (*Figure 6.7*) can be set at or below the surface, on the seabed, or at any depth in between. Drift netting (a type of gill net), will often be used by vessels for targeting small inshore pelagic fish such as herring and sprats. Drift nets are not attached to the vessel but are allowed to drift in the water column. The vessel working with the net will keep the net in sight at all times floats attached to the net making this easier.

***Figure 6.7 An Example of a Gillnet***

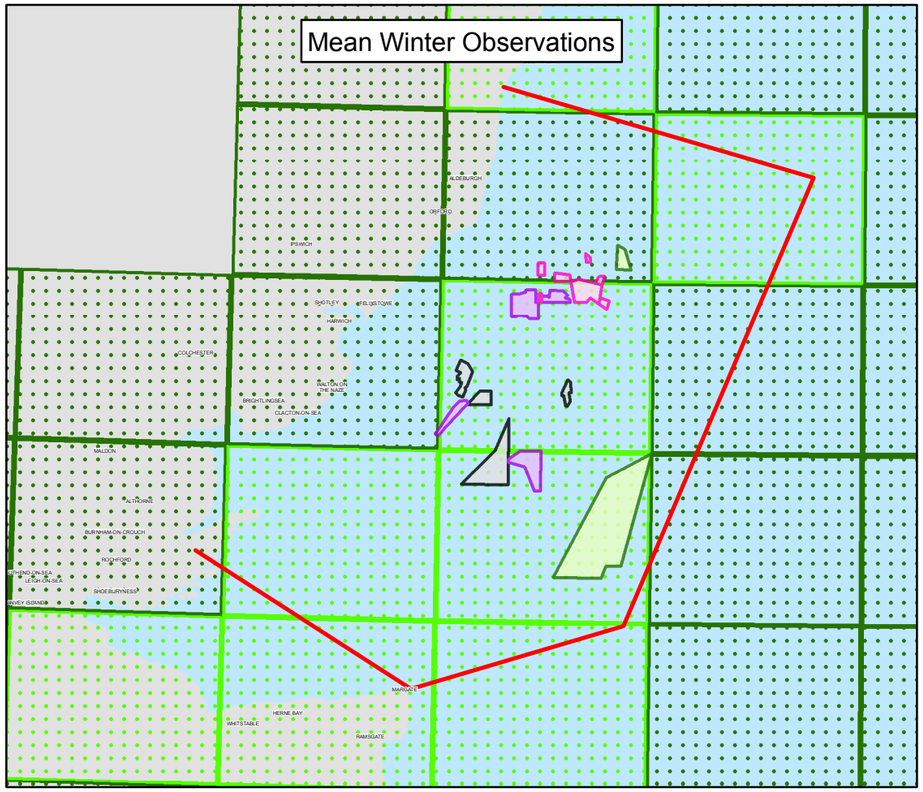


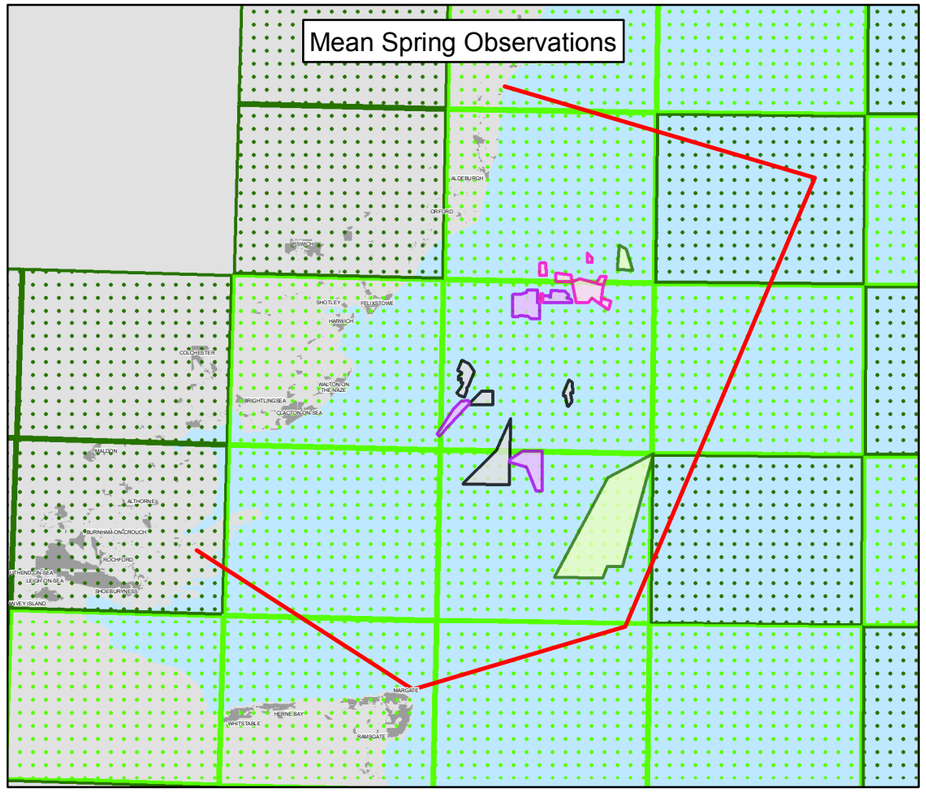
Source: Galbraith, R. D., and Rice, 2004 [2]

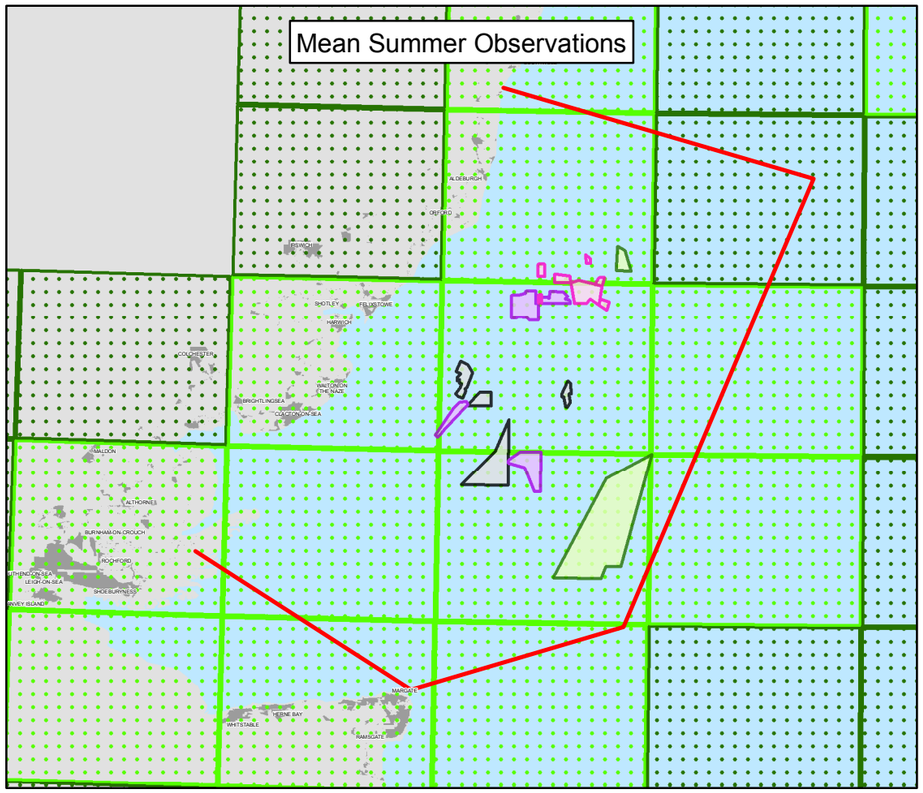
### 6.4.1 *Spatial and Temporal Variation in Fishing Effort*

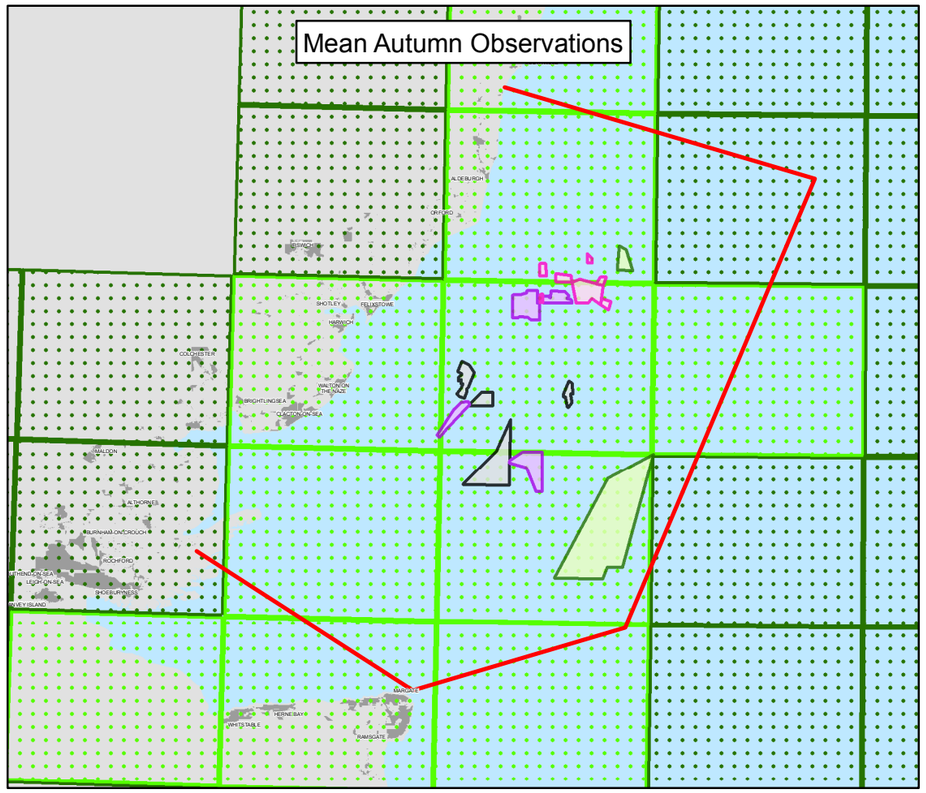
Generally, few vessels (maximum of 12 vessels between 2003 and 2007) using this gear type are recorded during the overflight survey (*Figure 6.8*) and fewer still are recorded by VMS data (*Figure 6.9*). The majority of vessels that use nets (gill, drift and trammel) are less than 10 m in length and are discussed in more detail in *Section 5.3*. Gillnet and driftnet fishing by the offshore fleet does not show any seasonality and throughout the year is spread across the entire study area at a very low level.

(1) Static nets set upright in the water to catch fish by entangling their gills in their mesh.
(2) : Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

N W E S

0 50
Kilometres

TITLE:
Figure 6.8
Seasonal Standard Observations for Netting Vessels Fishing in the TEDA Study Area

CLIENT:
TEDA

| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
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| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

DRAWING: SObs_NettersSeasonInc08.mxd REV: 0

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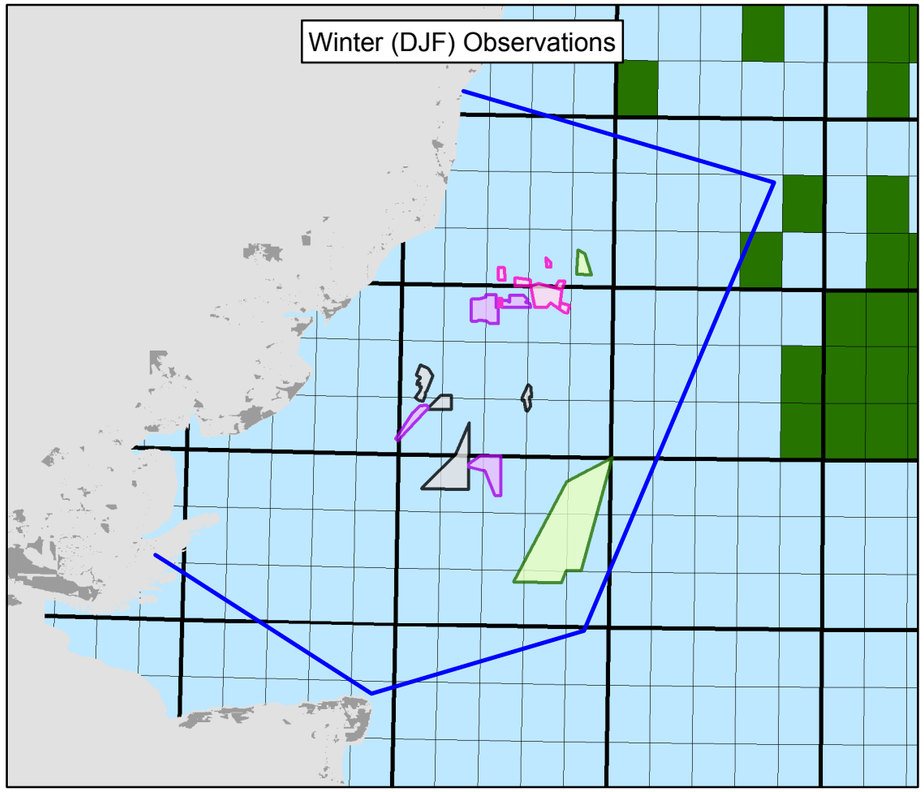
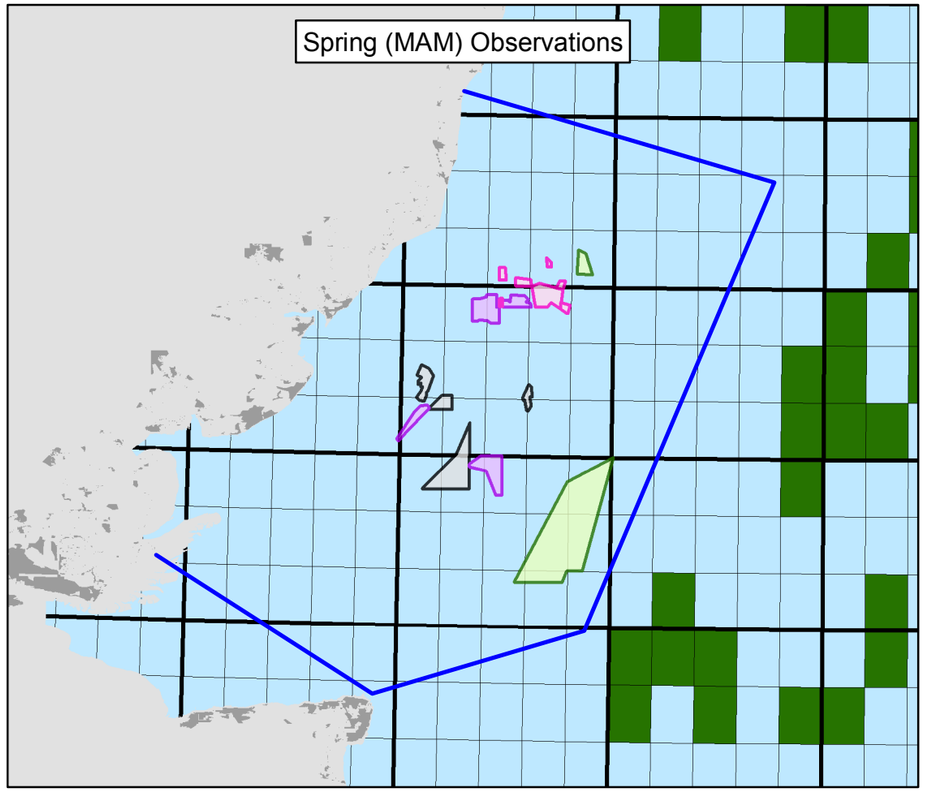
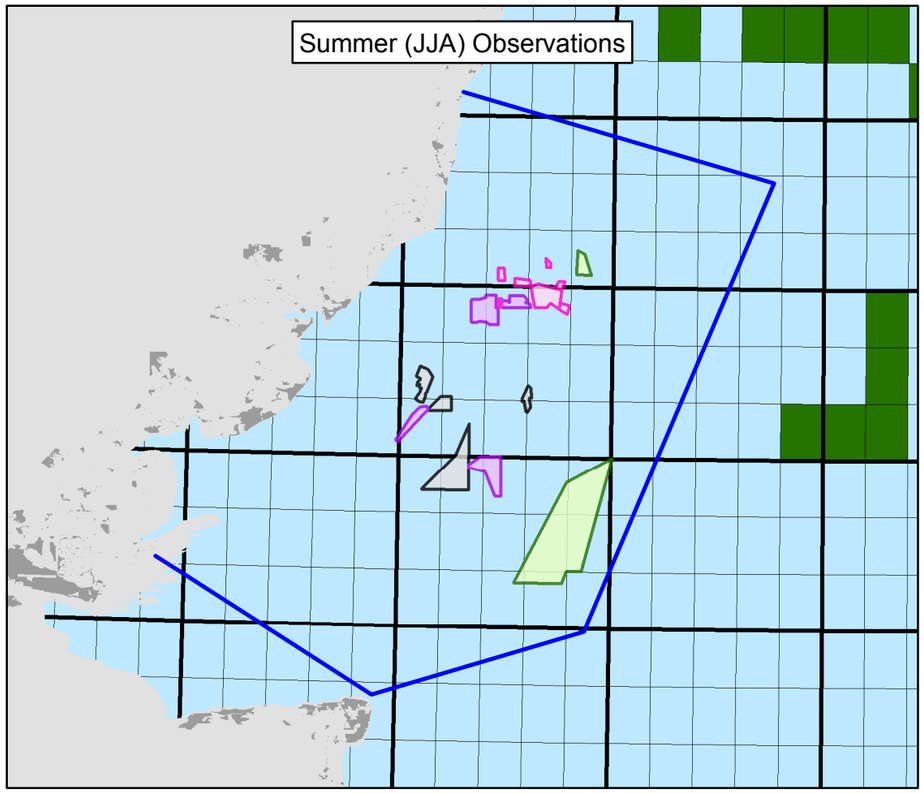
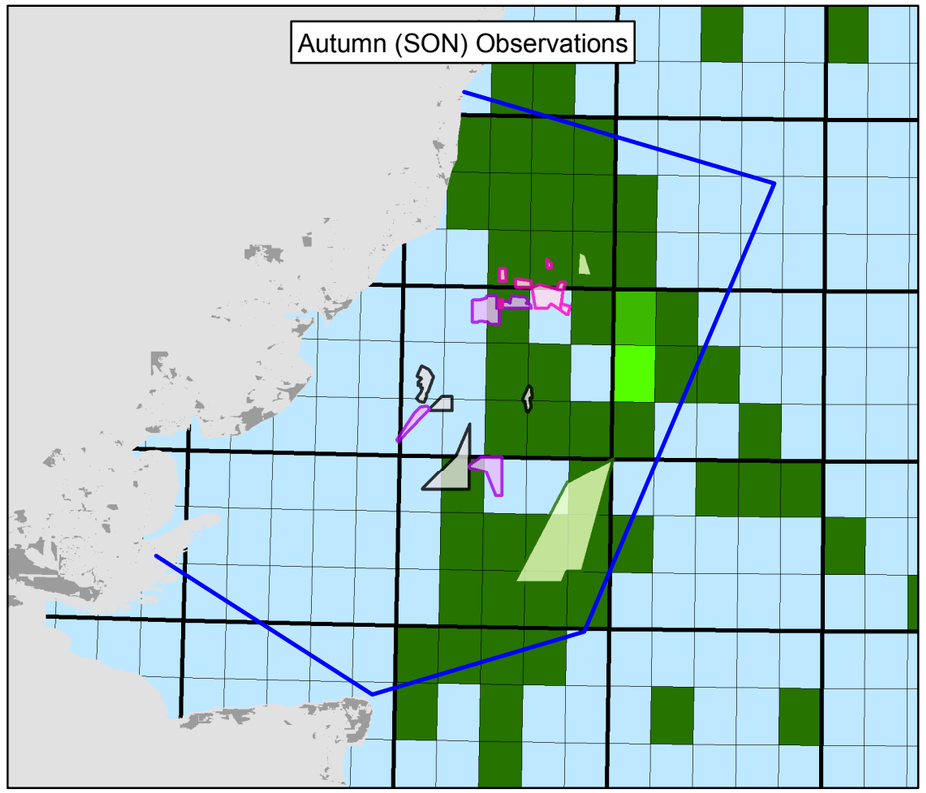
SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\SObs_NettersSeasonInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.9

Seasonal Distribution of Active Netting Vessels from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

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| DRAWING: VMS_NettersSeasonInc08.mxd | REV: 0 |

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PROJECTION: WGS 1984 UTM Zone 31N

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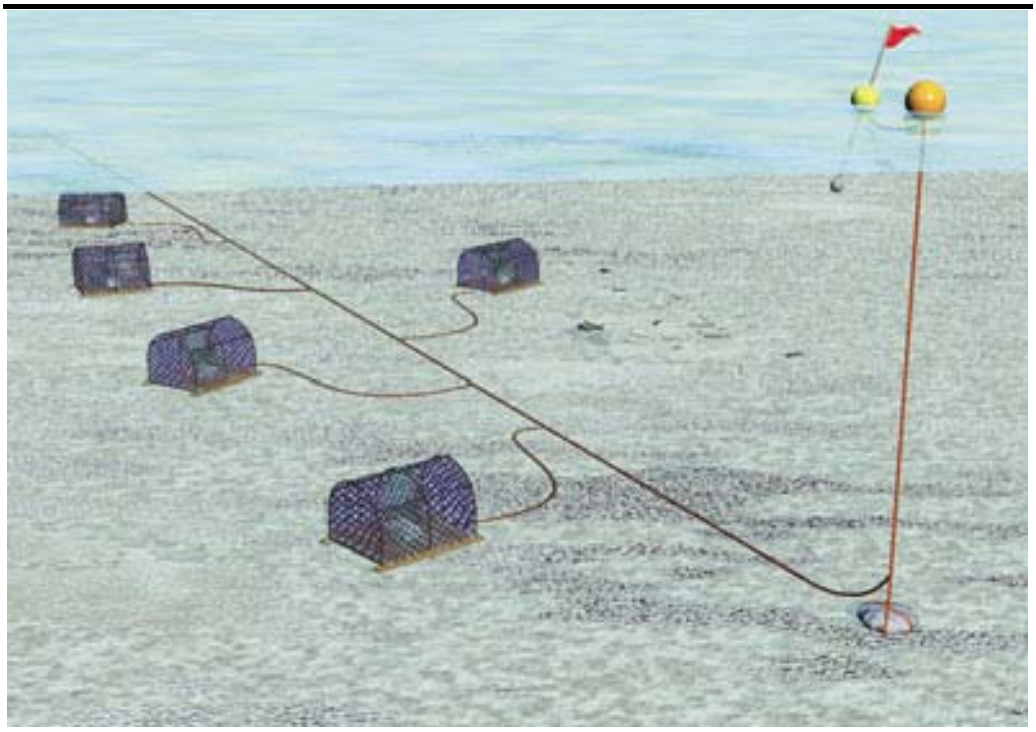
The larger vessels in the VMS data set are even fewer and rarely seen within the TEDA study area. However in autumn a handful of vessels are seen through the central part of the study area possibly targeting cod and bass.

## 6.5 *POTTING*

Potting vessels are generally smaller (less then 10 m) inshore vessels rather than the larger offshore vessels. A maximum of 16 vessels using this type were recorded by the overflight surveys fishing in the TEDA area in one year (between 2003 and 2007). Potting for shellfish by the inshore fleet occurs throughout the year, but effort generally increases inshore from late March through to late September or early October. The species most commonly caught by potting vessels include [1]:

- lobster *Homarus gammarus*;
- edible crab *Cancer pagurus*;
- velvet crab *Necora puber*; and
- whelk *Buccinum undatum*.

***Figure 6.10 An Example of a String of Pots used by Commercial Fishermen***



Source: Galbraith, R. D., and Rice, 2004 [2]

The majority of pots used are of a plastic parlour pot design, although a small number of traditional creel pots are still used. Pots are strung together in a line which is then anchored to the seabed (*Figure 6.10*). These pots are then

(1) Note: actual locations fished for these species and their population distributions are at this time unknown
(2) Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.

baited and left anchored to the seabed until the owner returns to check them. Commercial potting effort tends to be concentrated around suitable hard ground, wrecks, pipelines and other areas where target species gather.

### 6.5.1 *Spatial and Temporal Variation in Fishing Effort*

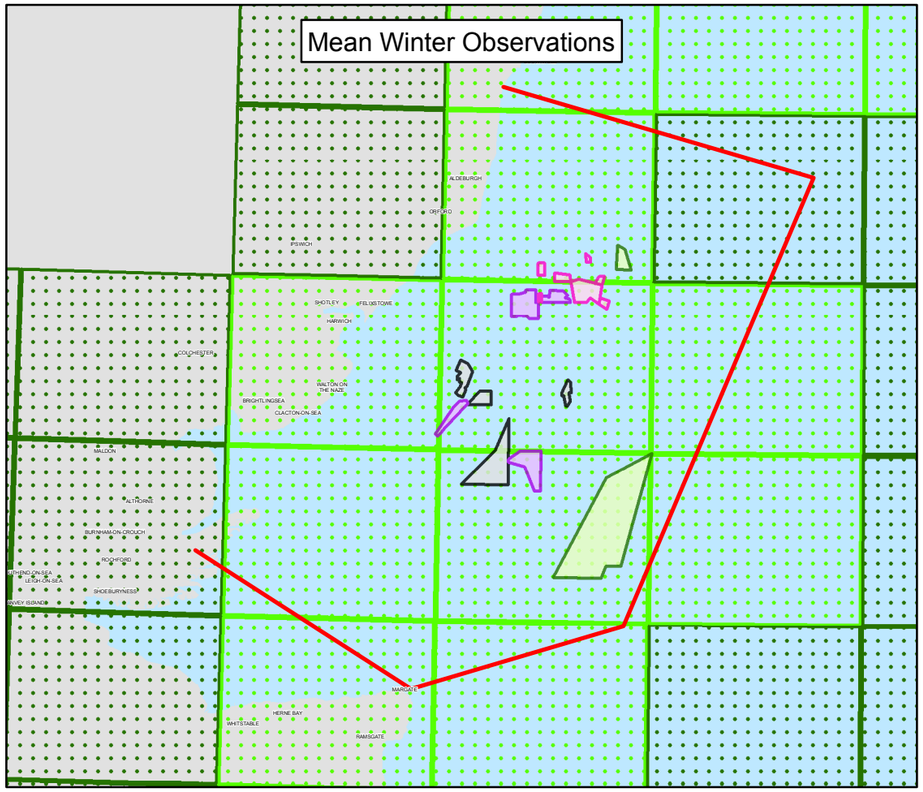
Lobster prices can vary greatly between summer and winter. In the first half of 2007, average monthly lobster prices in the UK ranged from £16 per kg in January to £8.02 per kg in December [(1)]. Historically, the peak fishing period for edible crab is from the end of March to the middle of May, with a second peak from August. Crab caught in the area fetch in the region of £0.90 to £1.10 per kg.

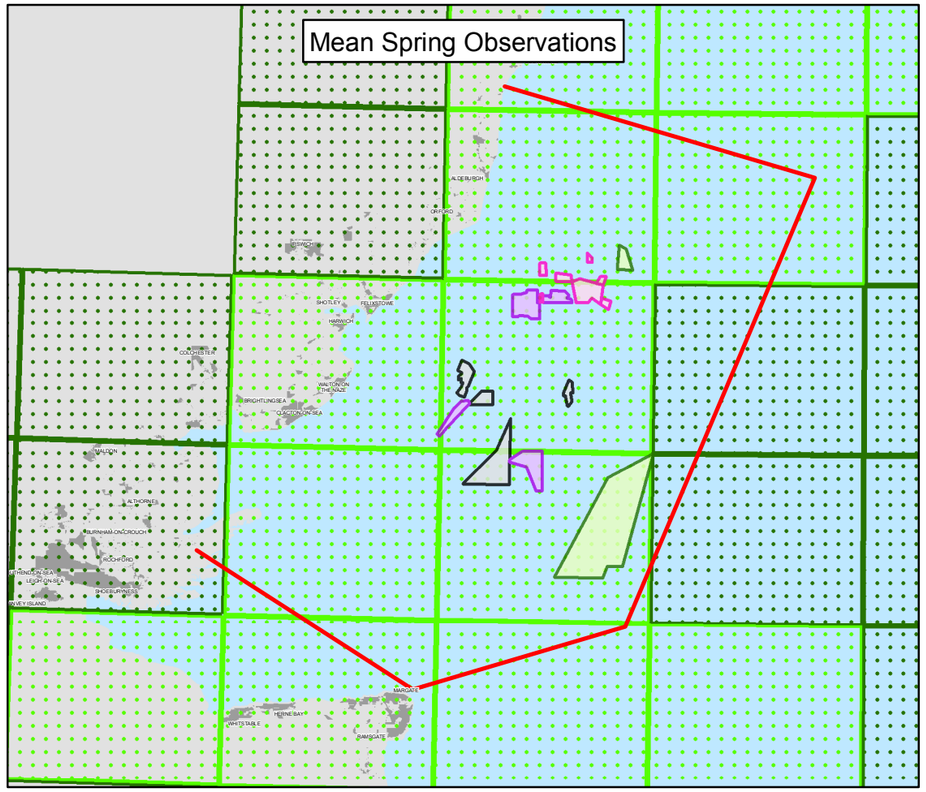
Nationally there is an increasing trend in shellfish potting effort, although this trend is less distinct within individual fisheries. Concerns have been raised at a national level and measures are currently under investigation with respect to maintaining sustainability of the shellfish resource without significantly impacting the shellfish sector [(2)]. Whilst the general pattern is of increased effort, which can be observed for the majority of months, it is more pronounced during the summer period. Effort generally declines in the autumn and winter months [(3)]. The reasons for this may be numerous, but the activity of unlicensed 'hobby fishermen' increases significantly during the summer months.

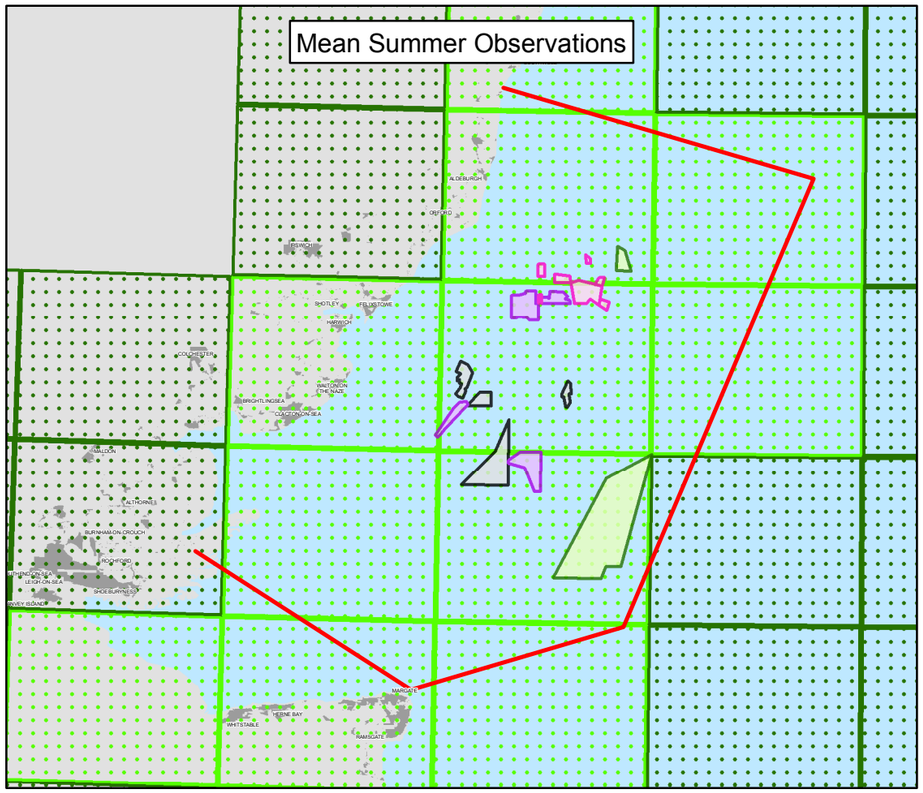
Analysis of overflight data demonstrates that the number of vessels larger than 10 m fishing in the TEDA study area is very low (in comparison to trawling for instance). There appears to be little variation in seasonality for these vessels and the few vessels that do fish are generally spread throughout the TEDA study area (*Figure 6.11*). The majority of fishing using pots is carried out by small (<10 m) vessels that would not be recorded in overflight surveys. Thus, total effort is likely to be much higher and as discussed previously, seasonality is inherent in the fishery. Factors such as weather, the distance of target species from shore and the number of 'hobby fishermen' determine local seasonal trends in effort. The potting fishery is generally seasonal, although larger vessels may fish all year round.

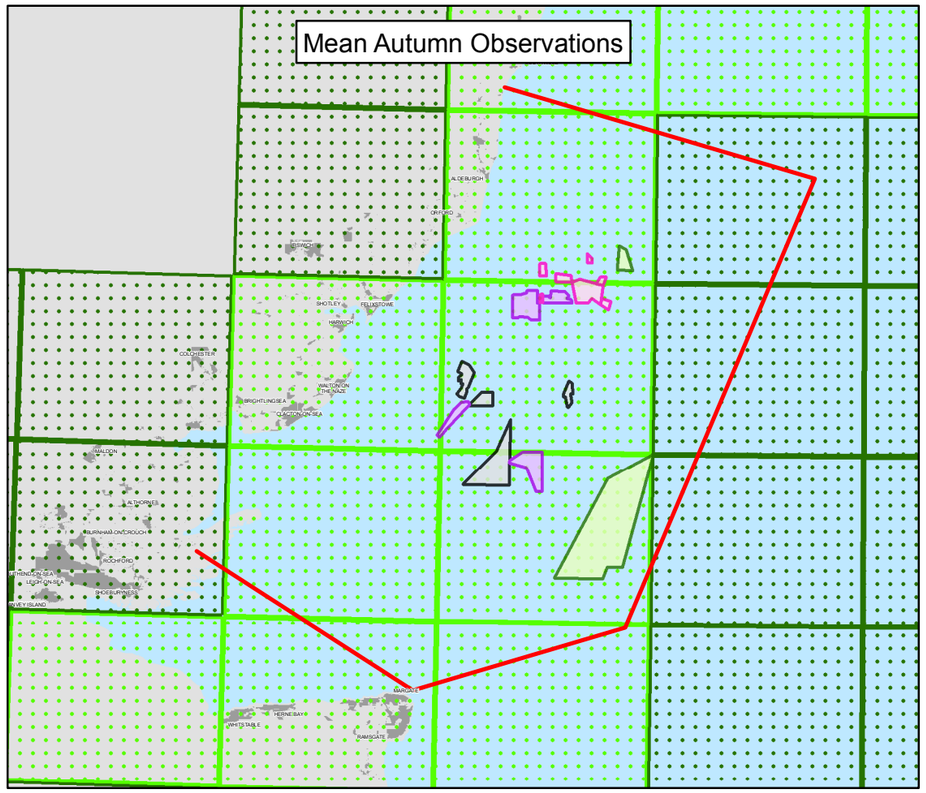
The number of potting vessels recorded in the VMS data is also very low (*Figure 6.12*) and shows very little seasonality. During winter, spring and summer the number of potting vessels is low throughout and generally across the central part of the TEDA area. In autumn the few potting vessels are seen fishing outside the TEDA study area.

(1) Marine Fisheries Agency, 2007: Monthly Return of Sea Fisheries statistics for England Wales, Scotland and Northern Ireland, December 2007. Fisheries statistical Unit [online] Available at http://www.mfa.gov.uk/statistics/catchlanding.htm [Accessed 16.07.08]
(2) Bannister, C. 2006. Towards a National Development Strategy for Shellfish in England. Executive Report. Prepared for the Sea Fish Industry Authority. Funded by FIFG Projects; 05/ENG/44/30 & 05/ENG/44/03.
(3) ESFJC, 2007. Eastern Sea Fisheries Committee Annual Report 2007. 88pp.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

N
W E
S

0 50
Kilometres

TITLE:
Figure 6.11
Seasonal Standard Observations for Potting Vessels Fishing within the TEDA Study Area

CLIENT:
TEDA

| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
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| DRAWN: IG | APPROVED: | SCALE: 1:1,000,000 |

DRAWING: SObs_PottingSeasonInc08.mxd
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ERM

SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

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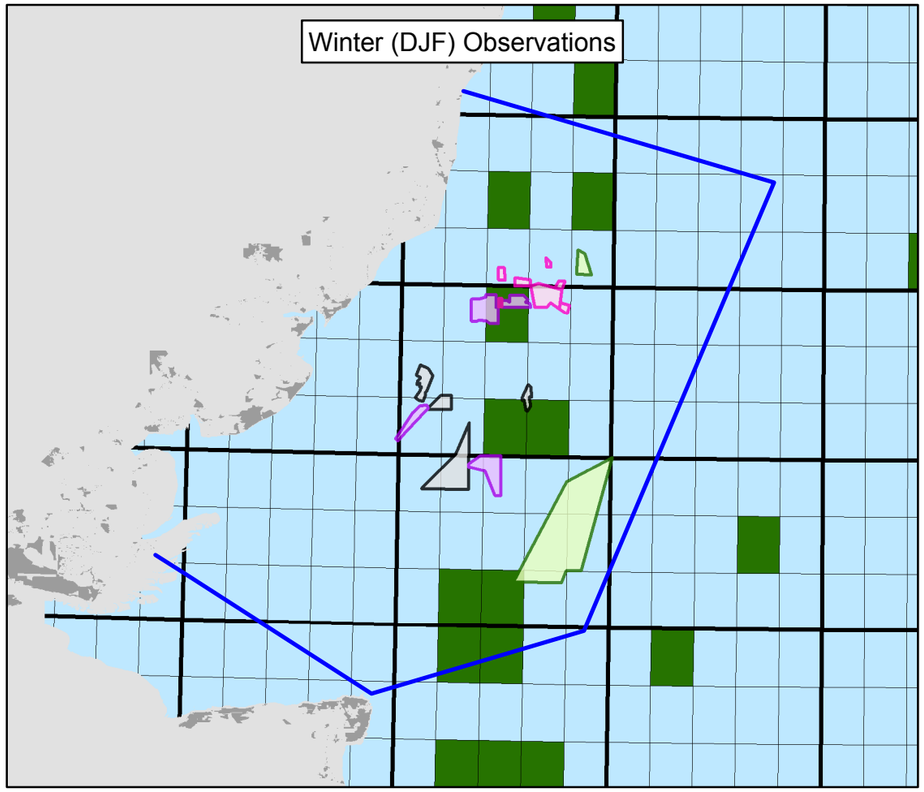


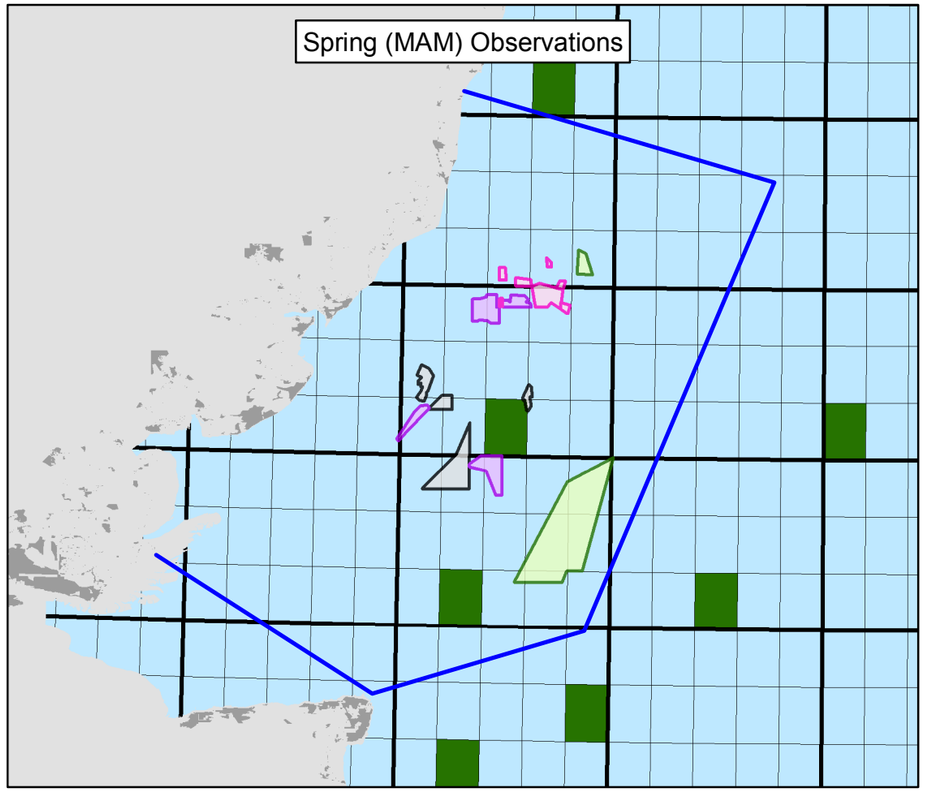


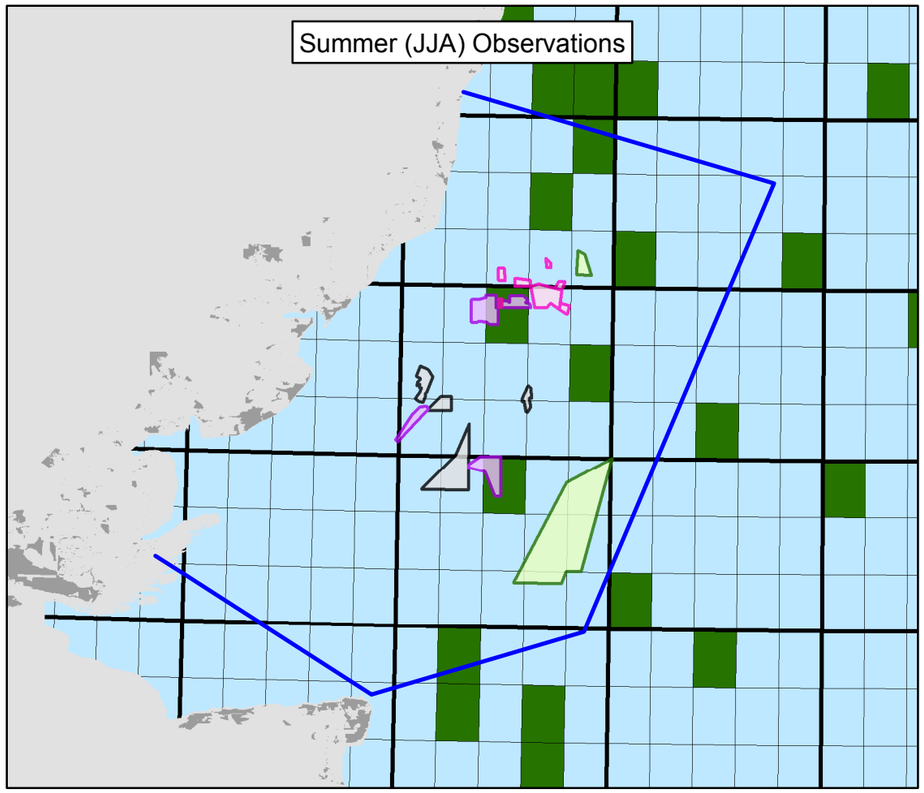


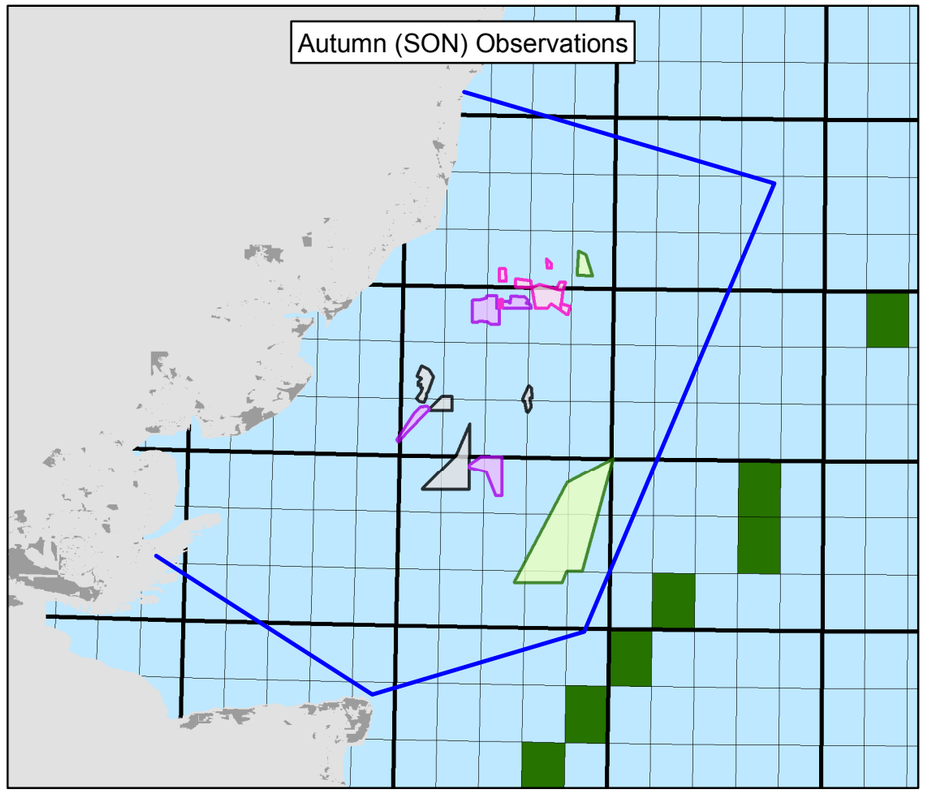


KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.12

Seasonal Distribution of Active Potting Vessels from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

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| DRAWING: VMS_PottersSeasonInc08.mxd | REV: 0 |

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SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

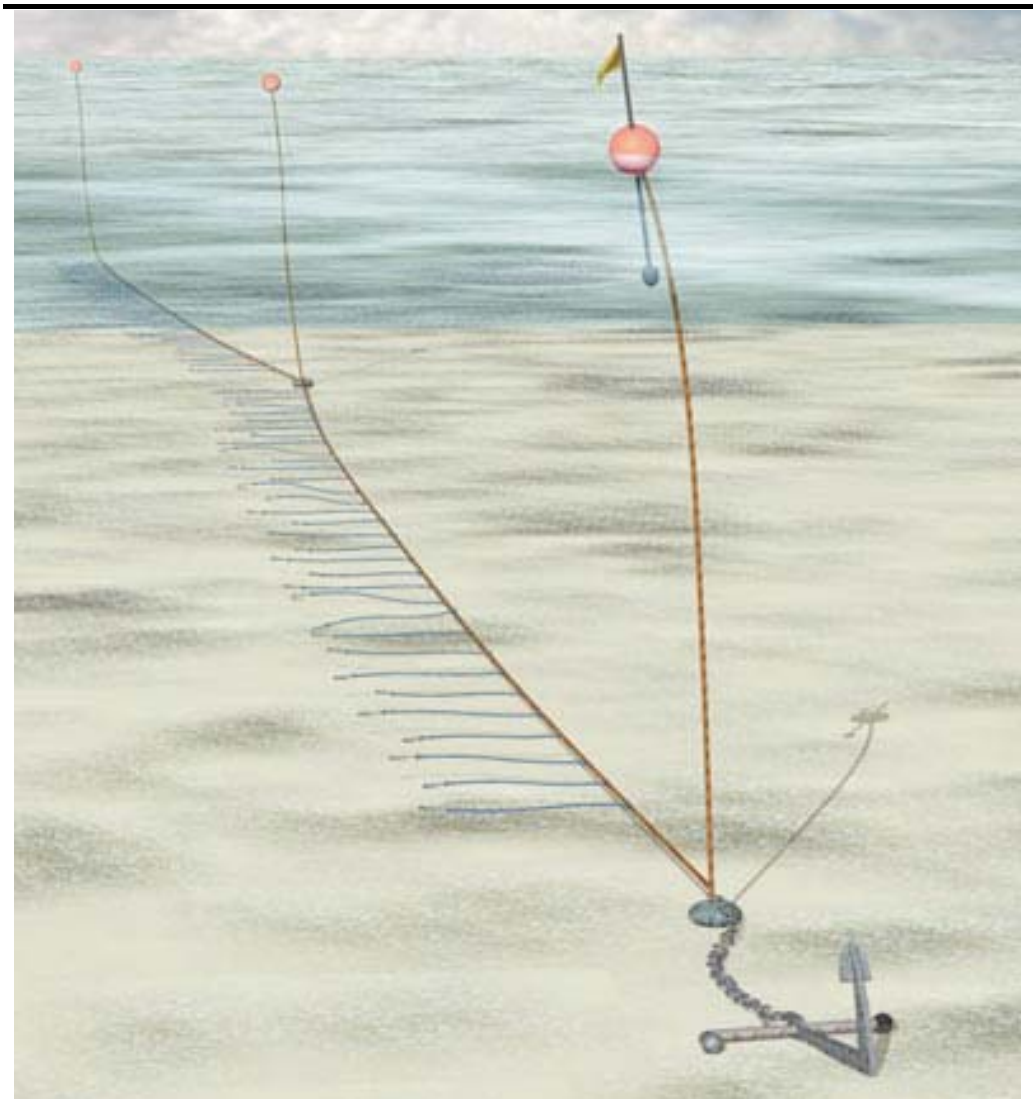
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577\TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_PottersSeasonInc08.mxd

## 6.6 LONG-LINES

Any species of fish can be targeted using long lines. A line of baited hooks will be anchored at each end (*Figure 6.13*) and left for approximately one tide before being brought ashore, any catch removed and the hooks being rebaited. Long-line fishing takes place in the southern North Sea for cod, skates and rays, bass and whiting. Long-lining is generally restricted to a small number of vessels in both the above and below 10 m categories (2 over 10 m vessels seen in any one year between 2003 and 2007). Fishing takes place year round but different species are caught depending on the season.

***Figure 6.13 An Example of a Bottom Long-line***



Source: Galbraith, R. D., and Rice, 2004 (1)

(1) Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.

### 6.6.1 *Spatial and Temporal Variation in Fishing Effort*

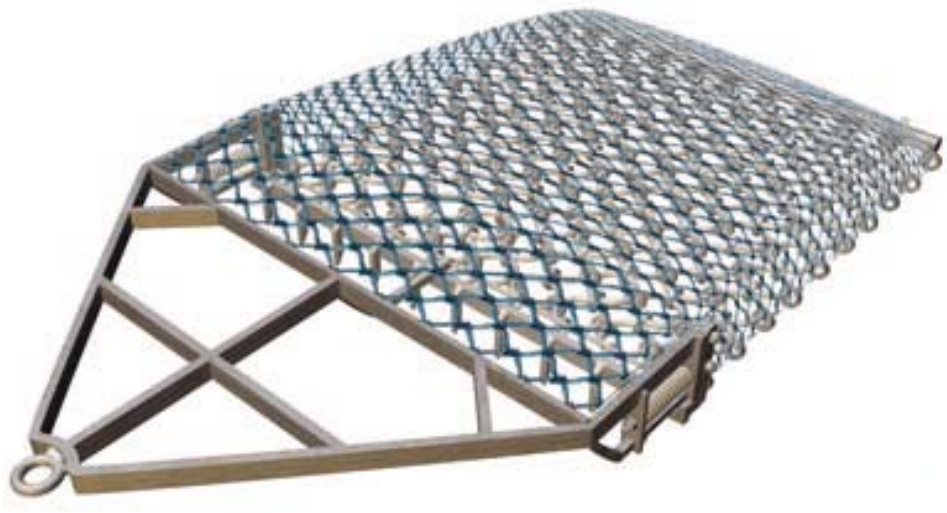
Data for 10 m vessels from overflight surveys suggests that in general few long-line vessels of this size operate within the study area (*Table 6.1*). On an annual basis the number of vessels observed is very low across the study area (below 1 standard observation). In most years there has been no long-line fishing effort within the study area. In years in which vessels are present they are generally concentrated to the north. Effort generally only covers the more northerly areas in ICES sub-rectangle 32F1-2 and 33F1-4 (North Inner during the winter and spring months (*Figure 6.15*). Moving into summer the effort moves further to ICES sub-rectangle 32F1-2.

No long-line vessels were recorded by the VMS data between 2005 and 2007 (*Figure 6.16*) suggesting vessels less than 15 m length carry out the majority of long-line fishing in the study area.

## 6.7 *DREDGING*

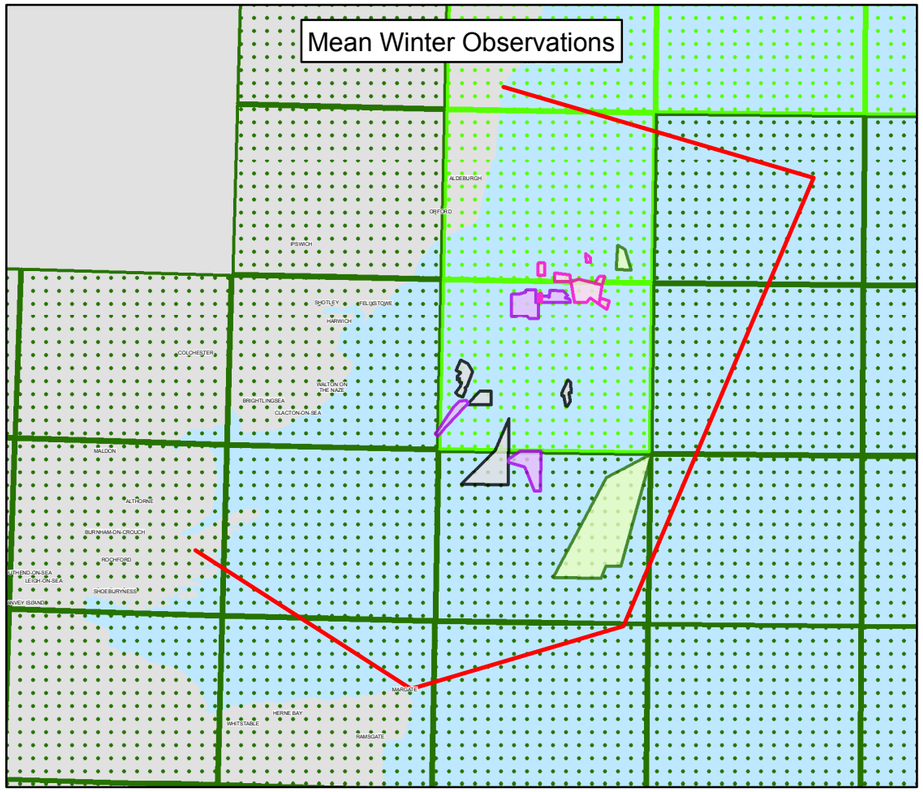
Dredging gear consisting of a mouth frame to which a holding bag constructed of metal rings or meshes is attached (*Figure 6.14*). Dredges are principally of two variants: dredges that scrape the surface of the seabed and those that penetrate the seabed to 30 cm or more. Some surface dredges include rakes or teeth to penetrate the top layer of substrate and capture animals recessed into the seabed.

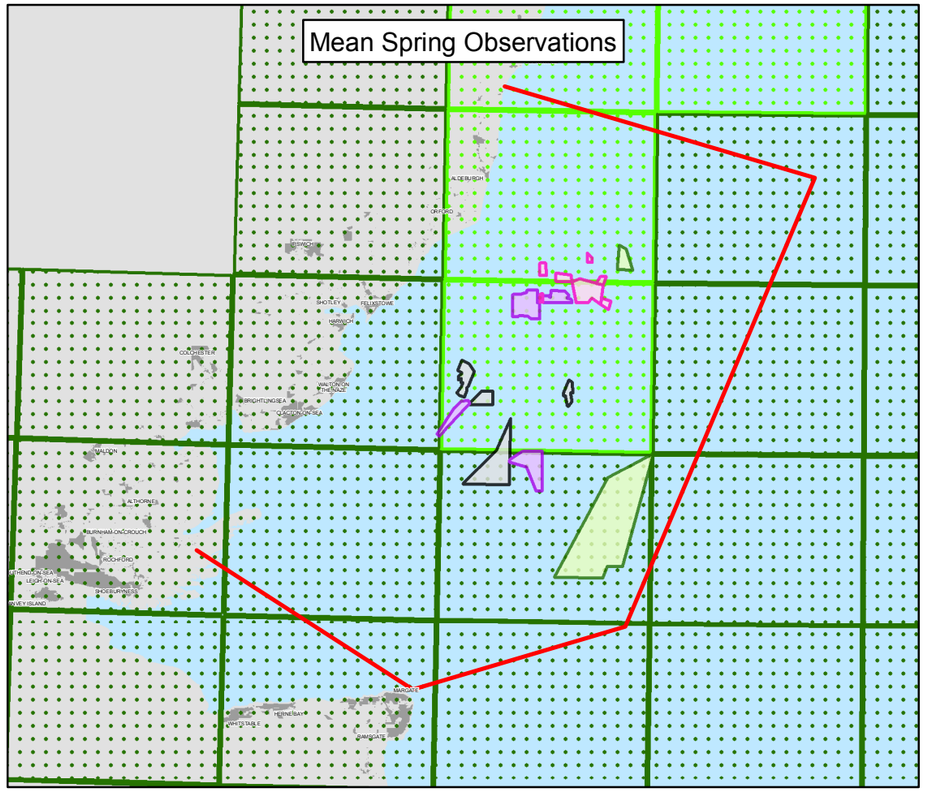
***Figure 6.14 Example of a Commercial Scallop Dredge***

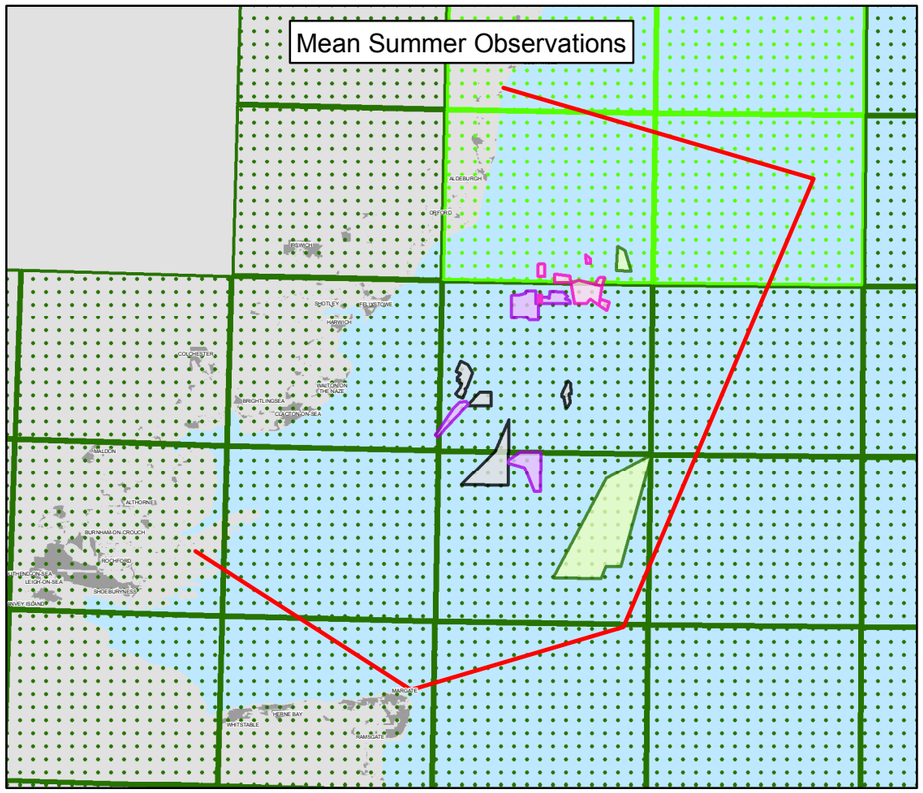


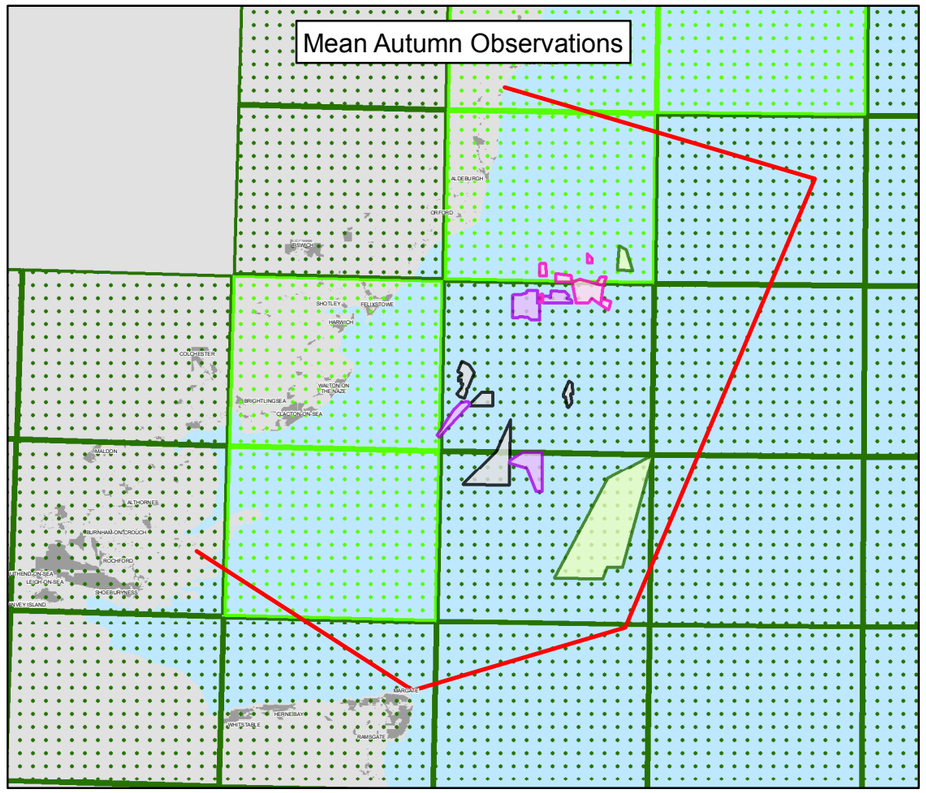
Source: Galbraith, R. D., and Rice, 2004 [1]

(1) Galbraith, R. D., and Rice, 2004. A. An Introduction to Commercial Fishing Gear and Methods Used in Scotland, FRS Marine Laboratory, Aberdeen. Scottish Fisheries Information Pamphlet, No. 25, 44 pp.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area

**Standardised Observations**

- Not Surveyed
- No Vessels Observed
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- > 3

**NOTES**
Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Autumn = September, Octobe, November

N
W E
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0 50
Kilometres

TITLE:
Figure 5.15
Seasonal Standard Observations of Longline Vessels Fishing in the TEDA Study Area

CLIENT:
TEDA

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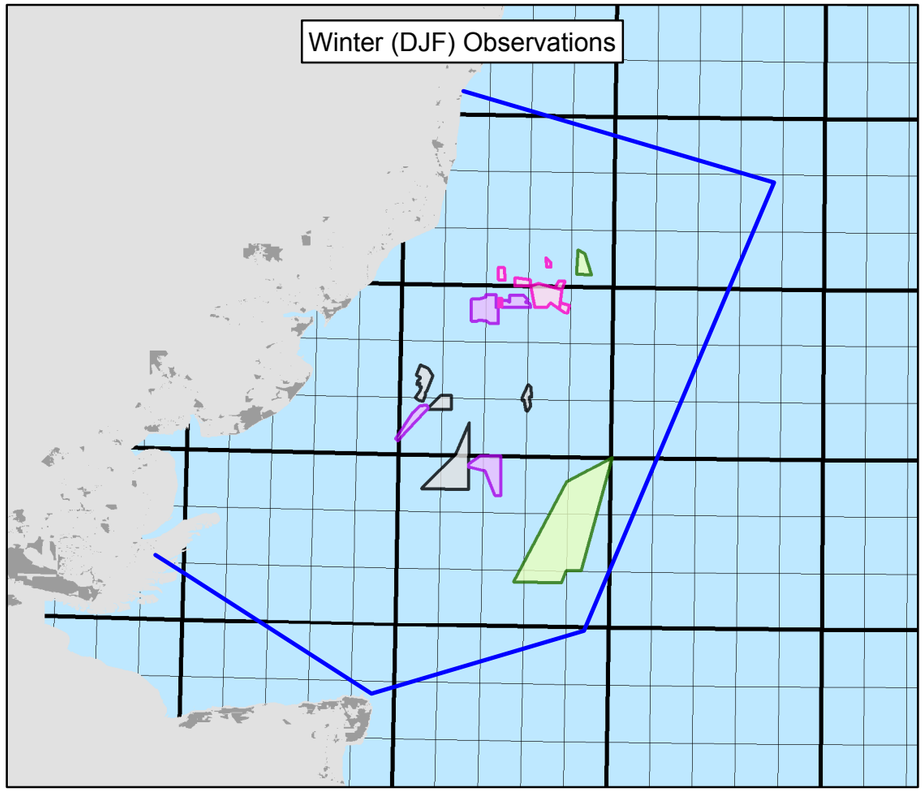
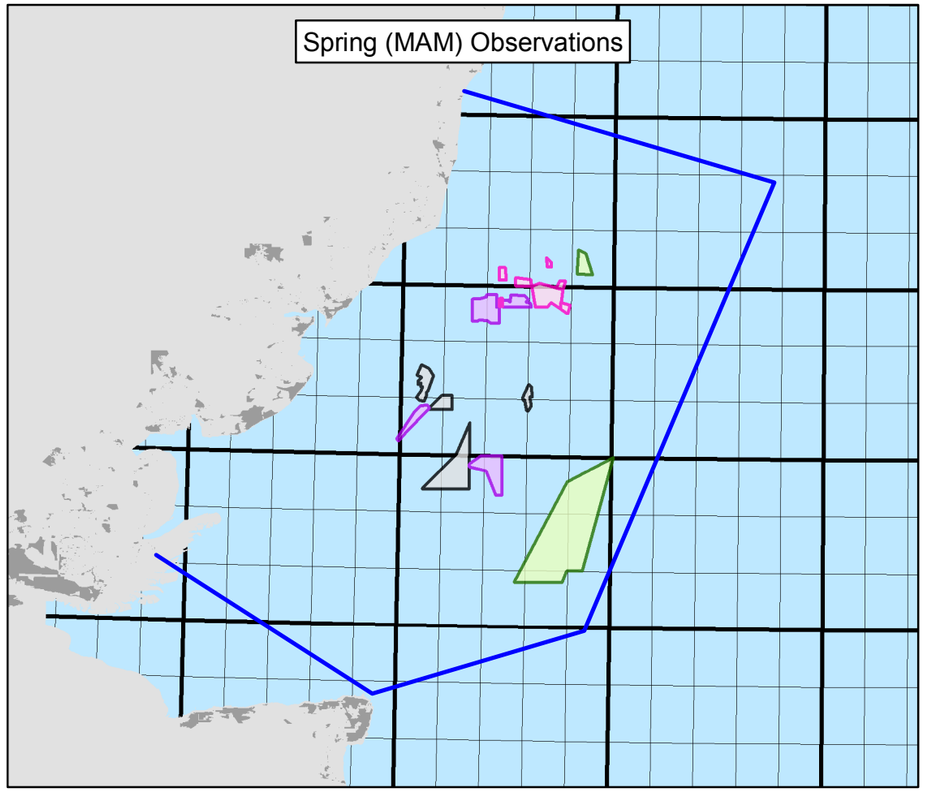
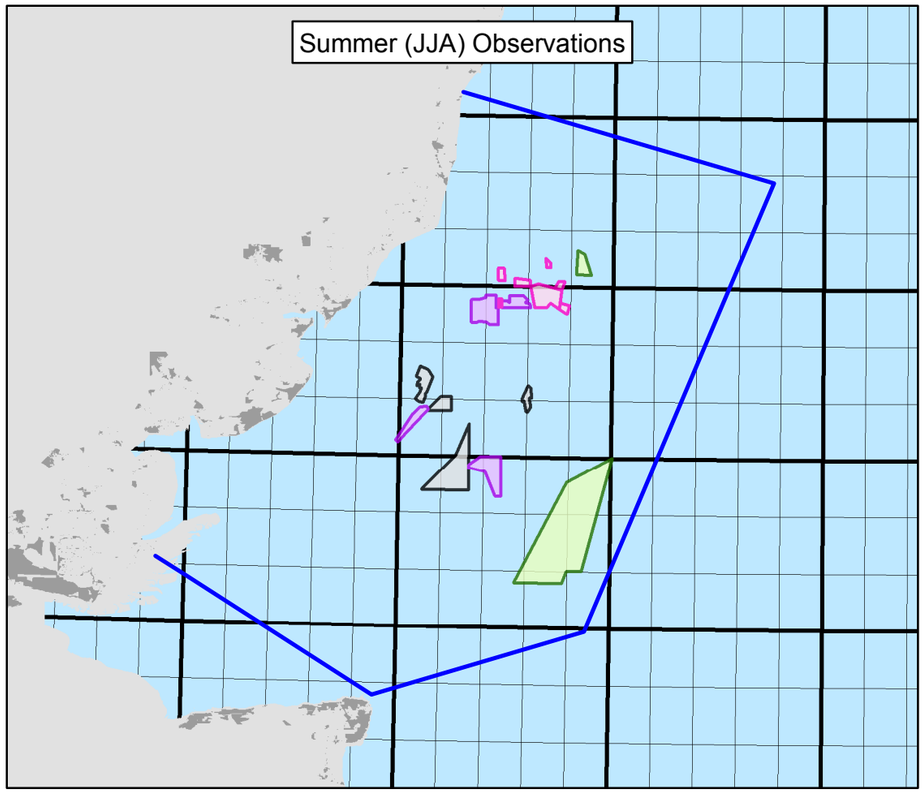
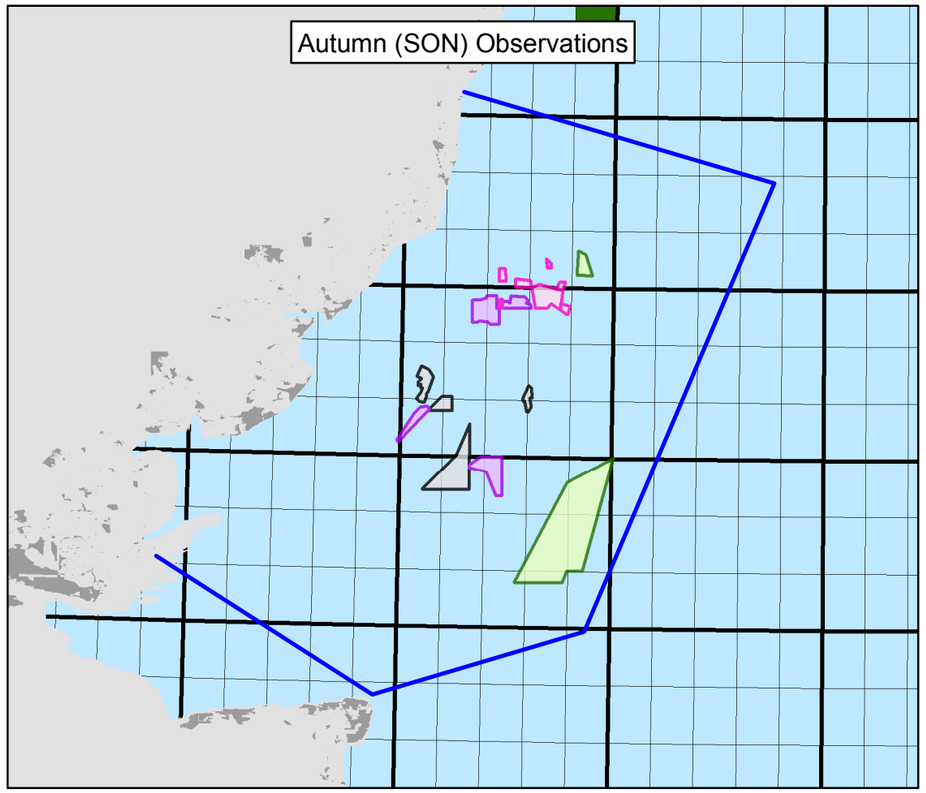
SOURCE: Seazone Solutions Limited. MFA Overflight Survey Observations of Fishing Vessels. 
PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\SObs_LonglineSeasonInc08.mxd




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.16

Seasonal Distribution of Active Long-line Vessels from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

| | | |
|---|---|---|
| DATE: 30/09/2010 | CHECKED: AP | PROJECT: 0075577 |
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| DRAWING: VMS_LinersSeasonInc08.mxd | REV: 0 |

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SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_LinersSeasonInc08.mxd

Surface dredges are generally utilised in waters around the UK and are used to target a variety of bottom dwelling animals, like mussels, oysters, scallops and clams. The most common method of cockle fishing is now the use of a hydraulic dredge with solid handling pumps (suction dredging).

The number of scallop dredge vessels (> 10 m in length) operating in the study area is very low (< 1 standard observation per ICES sub-rectangle) and they generally opearte close to shore. Over the last five years only 8 observations have been made of suction dredging vessels fishing in the study area (compared to 7,196 observations for trawlers).

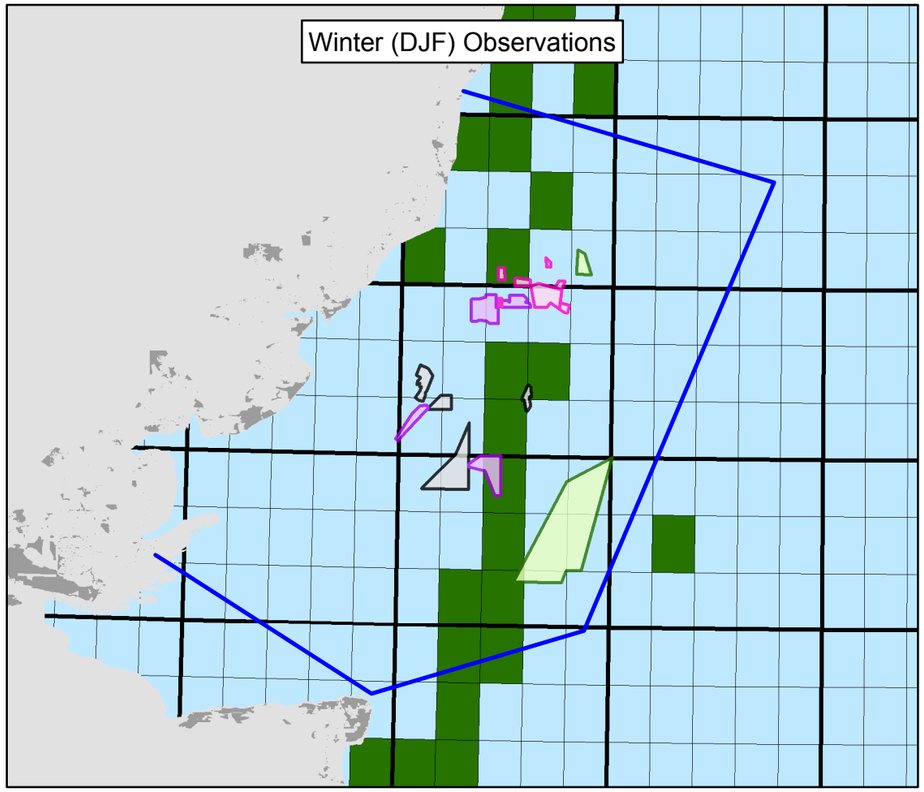
Within the Thames Estuary, cockle suction dredging is the most common method. Mussel dredging activity is the next most common, with scallop dredging being rare, due to the habitats that scallop occupy being relatively uncommon. Dredging effort is highest in the winter months for oysters, mussels and scallops. Suction dredging takes place between May and December with the peak effort occurring in September.

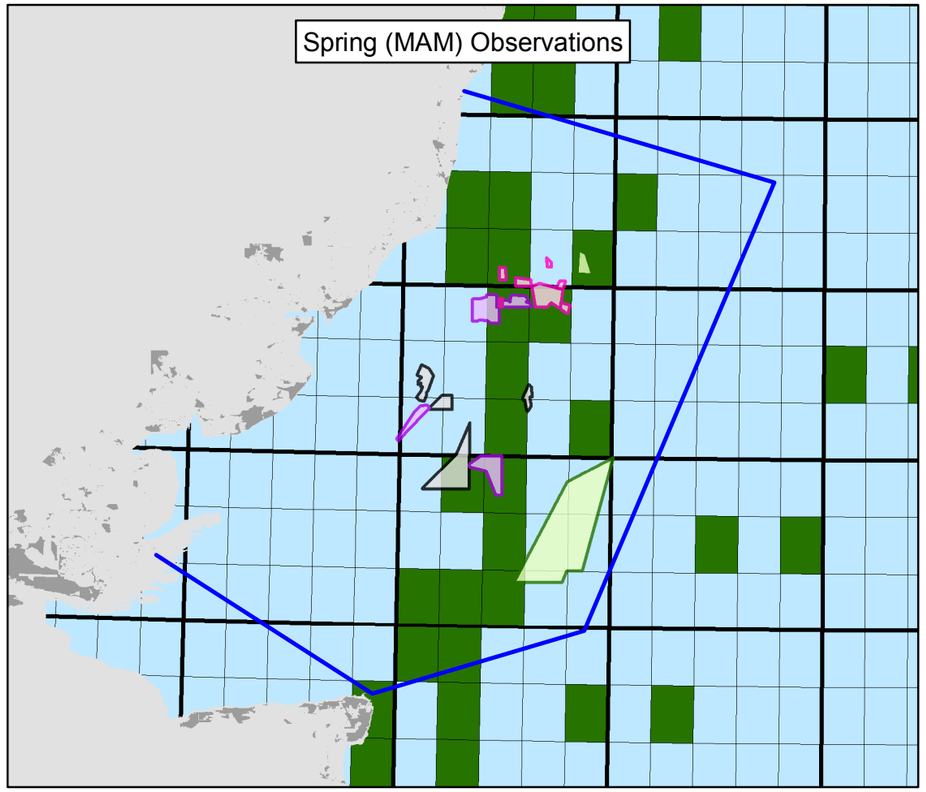
### *6.7.1 Spatial and Temporal Trends in Fishing*

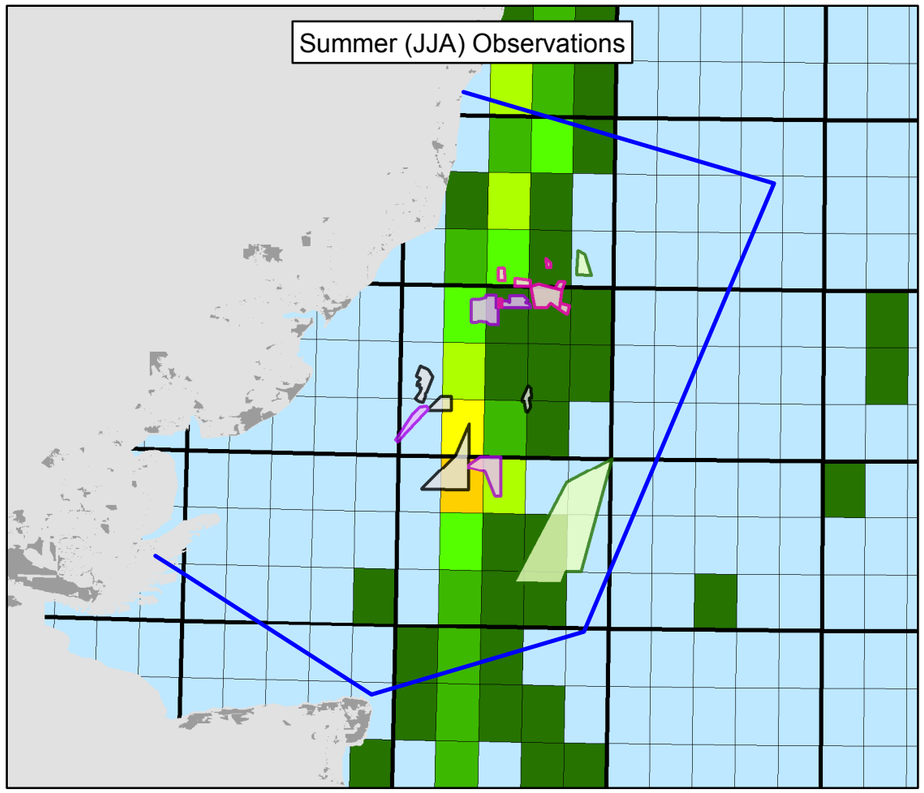
While the overflight data shows no patterns in dredge vessels fishing, the VMS data shows dredge vessels operating throughout the TEDA study area (*Figure 6.17*). Generally the number is very low (less then 10 per square in winter, spring and autumn) but during the summer there is a small increase across the central part of the TEDA area. This is most prominent close to the Longsand and Kentish knock sand banks and outside the Thames Estuary cockle fishery. During August and September activity in the cockle fishery is at its highest as meat yields are at their best.

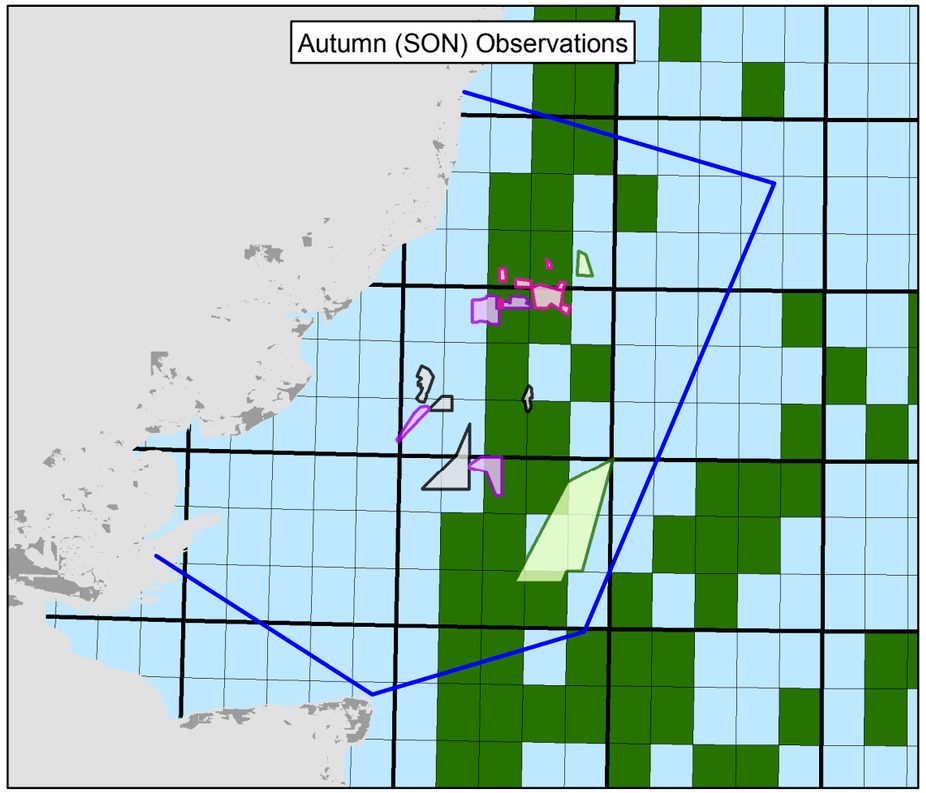
## *6.8 SPORTS FISHERIES*

Sports fisheries are relatively widespread throughout the region and carried out from boats (fishing close to wrecks) or from the shore, both methods using rod and line. Cod, pollack, bass, thornback ray, smooth hound, grey mullet, whiting and flatfish are common targeted species. Shore angling constitutes the largest area of effort. Boat angling within the ESFJC regulatory area is carried out by a number of vessels operating from several ports in the region (e.g. Lowestoft, Southwold and Orford). In the KESFC area vessels operate from the majority of ports. The boat-based activity is restricted to the late spring and summer months, with no discernible activity within the area during autumn and winter.




KEY:

MAREA Study Area

**Dredging Areas**

- Licenced Dredging Area
- Licence Renewal Application Area
- Dredging Licence Application Area
- Prospecting Licence Area
- ICES Subsquare Boundary

**Number of Vessels Fishing**

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- >1000
- No Vessels Recorded Fishing

N W E S

0 25

Kilometres

TITLE:

Figure 6.17

Seasonal Distribution of Active Dredge Vessels from VMS Data in the TEDA Study Area, 2005-2008

CLIENT:

TEDA

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SOURCE: Sea Zone Solutions Ltd; MFA Vessel Monitoring System Data 

PROJECTION: WGS 1984 UTM Zone 31N

File: 0075577\TedaREA_GIS_NYL\Maps\FinalFigures_0110\HumanBaseline\CommercialFisheries\VMS_DredgersSeasonInc08.mxd

During the late autumn, winter and early spring, sea anglers concentrate their effort on catching cod and whiting (*Table 6.2*). Cod is historically an extremely important target species for the recreational sector and it is during this period that effort from the shore is at its highest. Much of the boat orientated angling effort is focused closer to shore than the dredging areas within the TEDA region. During late spring, summer and early autumn bass are targeted, while species such as mackerel, red mullet, grey mullet, sea trout, thornback ray and tope tend to be targeted from late summer through autumn. Pollack, pouting, sole and smoothounds become important in the autumn, whereas dogfish are caught throughout the year (*Table 6.2*).

There is also a large number of sea angling clubs, many organising shore-based competitions. The area also attracts many privately owned angling boats due to the large areas of sheltered water and plentiful marinas and slipways. Being close to the dense populations of London and the South East, recreational sea fisheries also attract visitors that support businesses and livelihoods comprised of the many angling charter boats, bait-diggers, tackle shops, and angling guides. The recreational sea fisheries are a valuable asset to the economy of the region, encouraging spending on tourism and leisure as well as providing a recreational activity that brings direct income to fishing vessels, tackle shops, angling guides and associated industries.

In Suffolk most Charter boats operate from the mouth of the River Orwell between Felixstowe and Harwich. A number of other charter boats are based in both of the rivers at Shotley, Ipswich, Levington and Harwich. From the River Deben there are Five Charter Boats operating from the Felixstowe Ferry and Ramsholt. Further north, one boat operates from Orford in the river Alde. From Southwold on the River Blyth there are four boats operating as Charter boats. Out of the ports of Lowestoft and Oulton Broad there are around six to eight charter boats.

All boats work within a mile to up to sixty miles from their home ports depending on what month of the year it is and where the fish are expected to be. In the summer fishing charter boats target cod on the wrecks or bass on the sands. However, the main areas are the rough towers off Felixstowe out as far north as the outer Gabbards and all ground within this area. On a good weekend there will be up to sixty privately owned fishing boats fishing in these same grounds with anything from one to six anglers on each boat. These boats launch from slipways at Levington Marina, Felixstowe Ferry, Ramsholt, Orford and Southwold. There are also over a hundred recreational fishing boats moored up in various Suffolk Marinas, or on "swing" moorings in a river.

*Table 6.2* ***Recreational Sea Fishing Seasons***

| Species | Scientific Name | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bass | *Dicentrachus labrax* | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Cod | *Gadus morhua* | ■ | ■ | | | | | | | ■ | ■ | ■ | ■ |
| Dabs | *Limanda limanda* | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| Dogfish | *Scyliorhinus* sp. | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Eels | | | | | | | ■ | ■ | ■ | | | | |
| Flounder | *Platichthys flesus* | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | |
| Grey Mullet | *Mugil cephalus* | | | | | ■ | ■ | ■ | ■ | ■ | | | |
| Herring | *Clupea harrengus* | | | | | | | | | | ■ | ■ | |
| Mackerel | *Scomber scombrus* | | | | | | | ■ | ■ | ■ | | | |
| Pollack | *Pollachius pollachius* | | | | | | | | | ■ | ■ | ■ | |
| Pouting | *Trisopterus luscus* | | | | | | | | | ■ | ■ | ■ | |
| Red Mullet | *Mullus barbatus* | | | | | ■ | ■ | ■ | ■ | ■ | | | |
| Sea Trout | *Salmo trutta* | | | | | | | ■ | ■ | ■ | | | |
| Smoothounds | *Mustelus* sp. | | | | | | | | | ■ | ■ | ■ | |
| Sole | *Solea solea* | | | | | | | | ■ | ■ | ■ | ■ | |
| Thornback Ray | *Raja clavata* | | | ■ | ■ | ■ | ■ | ■ | | | | | |
| Tope | *Galeorhinus galeus* | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| Whiting | *Merlangius merlangus* | ■ | ■ | | | | | | | ■ | ■ | ■ | ■ |

Source: ESFJC, 2008. Eastern Sea Fisheries Committee Business Plan 2008-2009. 46pp.

# 7 FISHERIES VALUE

## 7.1 INTRODUCTION

Fish that are landed by vessels within the study area are sold at fish markets both locally and further afield. Some are transported to ports in continental Europe and others are landed locally. The prices received at market are determined by the supply, the time of year, the quality and source of the species being sold.

*Table 7.1 Average Fish Prices (£ per tonne) at UK Ports, 2004 - 2007*

| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| Brill | 4,303 | 4,111 | 5,144 | 5,718 | 5,527 |
| Catfish | 1,496 | 1,345 | 1,767 | 1,662 | 1,597 |
| Cod | 1,440 | 1,496 | 1,585 | 1,617 | 1,704 |
| Dogfish | 965 | 962 | 890 | 919 | 714 |
| Haddock | 677 | 721 | 813 | 1,163 | 1,235 |
| Hake | 2,339 | 2,376 | 2,614 | 2,714 | 1,659 |
| Lemon Soles | 3,056 | 2,921 | 2,982 | 3,053 | 3,202 |
| Ling | 1,025 | 1,019 | 1,083 | 1,176 | 1,187 |
| Megrims | 2,132 | 2,289 | 2,546 | 2,715 | 2,488 |
| Monks or Anglers | 2,045 | 2,104 | 2,428 | 2,625 | 2,471 |
| Plaice | 1,190 | 1,223 | 1,292 | 1,192 | 1,235 |
| Pollack (Lythe) | 1,470 | 1,295 | 1,397 | 1,465 | 1,493 |
| Saithe | 411 | 416 | 472 | 505 | 494 |
| Sand Eels | 55 | 62 | na | na | 1,824 |
| Skates and Rays | 1,005 | 1,029 | 1,194 | 1,172 | 1,124 |
| Soles | 6,340 | 6,415 | 7,016 | 7,743 | 7,450 |
| Turbot | 5,446 | 5,714 | 7,296 | 8,130 | 8,369 |
| Whiting | 622 | 676 | 639 | 804 | 894 |
| Whiting, Blue | 69 | 54 | 48 | 84 | 123 |
| Witches | 1,361 | 1,678 | 1,740 | 1,568 | 1,231 |
| Herring | 129 | 136 | 209 | 234 | 187 |
| Horse Mackerel | 150 | 179 | 327 | 264 | 280 |
| Mackerel | 416 | 495 | 649 | 780 | 669 |
| Pilchards | 260 | 445 | 303 | 368 | 381 |
| Sprats | 146 | 189 | 340 | 213 | 181 |
| Other Pelagic | 607 | 493 | 283 | 97 | 922 |
| Cockles | 610 | 781 | 615 | 471 | 651 |
| Crabs | 1,107 | 1,084 | 1,185 | 1,301 | 1,318 |
| Lobsters | 9,915 | 9,307 | 9,229 | 11,452 | 11,299 |
| Mussels | 536 | 167 | 117 | 91 | 207 |
| Nephrops (scampi) | 2,337 | 2,313 | 2,489 | 2,785 | 2,865 |
| Periwinkles | 948 | 1,235 | 930 | 1,209 | 2,495 |
| Queen Scallops | 390 | 368 | 472 | 608 | 383 |
| Scallops | 1,522 | 1,509 | 1,583 | 1,770 | 1,867 |
| Shrimps | 1,644 | 1,300 | 1,610 | 1,751 | 2,581 |
| Squids | 2,243 | 2,720 | 2,420 | 3,015 | 3,285 |
| Other Shellfish | 654 | 686 | 767 | 879 | 863 |

Source: MFA UK sea fisheries statistics Table 3.10 available to download from http://www.mfa.gov.uk/statistics/ukseafish07tables.htm

## 7.2 DATA SOURCES

The main source of information was the ICES IVc landings used in *Section 4.3*, the landings from UK vessels fishing in ICES IVc and landings from UK ports whose vessels fish in the TEDA area. However the ICES IVc data only provides landings data and no information regarding the value. The MFA landings data only represents vessels from the UK and vessels from overseas that have landed their catch as those ports. In order to include the vessels from outside these ports in the valuation it was important to provide a value to the catches provided by ICES. The MFA annual market price data for UK ports was downloaded to provide pricing information. For species not covered by this data and known to be landed in other ports, Fisheries Information Services (1) market data reports and live market information for ports throughout Europe and the UK were downloaded.

## 7.3 ECONOMIC VALUATION

In order to estimate the value of the fisheries in the TEDA MAREA study area a number of steps were needed to evaluate the data. It was essential to estimate the value of all landings within ICES IVc and landings from UK vessels from within this area of the North Sea. The next process was to use these values and re-distribute the catches within the ICES rectangles in IVc. This allowed the landings within those rectangles covering the study area to estimated and the proportion of effort from the overflight data was then used to determine the landings within the TEDA study area itself. The final piece was then to estimate the landings for the different fleets:

- The landings from the inshore (<10 m) vessels was estimated from the MFA database of landings with some adjustments for ports outside the actual TEDA area as not all landings reported were necessarily from the TEDA study area.

- The UK offshore fleet (>10 m) was estimated from the UK landings for IVc from the MFA.

- The foreign fleet from the ICES landings minus the UK offshore fleet.

## 7.4 METHODOLOGY

The first stage was to estimate the value of landings in ICES Division IVc for both total landings and for the catches landed by UK vessels fishing within IVc based on MFA statistics:

$$V_{tot}^{IVc} = \sum C_s^{IVc} P_s \qquad \text{Equation 1}$$

(1) www.fis.com

$$V_{tot,UK}^{IVc} = \sum V_{s,UK}^{IVc} \qquad \text{Equation 2}$$

where $C_s^{IVc}$ is the landings of each species, *s*, in ICES sub area IVc , $P_s$ is the price per tonne of each species, *s* and $V_{s,UK}^{IVc}$ is the value of landings for each species, *s*, by UK vessels fishing within sub area IVc reported to the MFA.

### 7.4.1 *Landings in the TEDA Study Area*

The next stage was to estimate the total landings taken from within the study area. These landings were then to be estimated for the UK inshore fleet (<10 m), UK offshore fleet (>10m) and foreign fishing vessels. The first step was to estimate from the ICES data the total catch taken within the TEDA study area:

$$C_{tot}^{TEDA} = \rho \sum \left( \left( C_{tot}^{IVc} \Big/ A_{tot}^{IVc} \right) A_r^{TEDA} \right) \qquad \text{Equation 3}$$

Followed by the total catches for the offshore UK fleet (>10 m) operating in the study area:

$$C_{o,UK}^{TEDA} = \rho \sum \left( \left( C_{tot,UK}^{IVc} \Big/ A_{tot}^{IVc} \right) A_r^{TEDA} \right) \qquad \text{Equation 4}$$

where $\rho$ is the proportion of vessels fishing within the TEDA study (estimated from overflight survey data) compared to those fishing in the sub rectangles that cover the TEDA study area, $A_{tot}^{IVc}$ is the total area of ICES Division IVc in km$^2$ and $A_r^{TEDA}$ is the area of each sub rectangle, *r*, covering the TEDA study area in km$^2$. The catches from the foreign vessels fishing in the TEDA area were then estimated as:

$$C_{for}^{TEDA} = C_{tot}^{TEDA} - C_{o,UK}^{TEDA} \qquad \text{Equation 5}$$

However, this method did not take into account the importance of the smaller vessels operating in the area as it only used the overflight survey data. Most of the vessels from ports in the TEDA area are below 10 m in length and are not recorded in the overflight surveys. The MFA landings data were utilised to estimate the total landings from these ports and to ensure that double counting of the large vessels did not occur the value for these vessels was also taken into account:

$$C_{i,UK}^{TEDA} = \left( \sum C_p^{TEDA} w_p \right) - C_{o,UK}^{TEDA} \qquad \text{Equation 6}$$

where $C_p^{TEDA}$ is the landings reported to MFA from port, *p*, where vessels that fish in the TEDA area originate. Weighting, *w*, is applied to the catches form port *p* depending on whether the port was inside or outside the TEDA study area. Not all landings reported from these ports are likely to be taken within the TEDA MAREA area and so the weighting was introduced to take account of this fact. The weighting applied to ports outside the TEDA area was

examined at several levels (1, 0.75, 0.5 or 0.25), which allowed exploration of influence of catches form these ports on the total landings within the TEDA study area. The catches from ports inside the TEDA area had a weighting of 1 applied at all times. The offshore catches already estimated were then taken into account as the reported landings would be for both the offshore and inshore fleet. The total landings in the TEDA area were then re-estimated as:

$$C^{TEDA} = C_{for}^{TEDA} + C_{o,UK}^{TEDA} + C_{i,UK}^{TEDA} \qquad \text{Equation 7}$$

### 7.4.2 *Landings Value in the TEDA Study Area*

The final stage was to use the different iterations of the total landings in the study area to estimate the value of the landings fro each of the different fleets. The first stage was to estimate the total value of landings from the ICES IVc data and the total value of the landings taken by the UK offshore fleet from the MFA IVc data:

$$V_{tot}^{TEDA} = \rho \sum \left( \left( V_{tot}^{IVc} \Big/ A_{tot}^{IVc} \right) A_r^{TEDA} \right) \qquad \text{Equation 8}$$

$$V_{o,UK}^{TEDA} = \rho \sum \left( \left( V_{tot,UK}^{IVc} \Big/ A_{tot}^{IVc} \right) A_r^{TEDA} \right) \qquad \text{Equation 9}$$

The value for the inshore (<10 m) UK fleet is then estimated as:

$$V_{i,UK}^{TEDA} = C_{i,UK}^{TEDA} \left( V_{tot,UK}^{IVc} \Big/ C_{tot,UK}^{IVc} \right) \qquad \text{Equation 10}$$

And the value for the foreign fleet is then estimated as:

$$V_{for}^{TEDA} = C_{for}^{TEDA} \left( V_{tot}^{IVc} \Big/ C_{tot}^{IVc} \right) \qquad \text{Equation 11}$$

Finally the total value of catches in the TEDA study area is re-estimated as:

$$V^{TEDA} = V_{for}^{TEDA} + V_{o,UK}^{TEDA} + V_{i,UK}^{TEDA} \qquad \text{Equation 12}$$

This last formulation was to ensure that the foreign and two UK fleets landings added up to the correct total for the area. Without this re-estimation there would be a discrepancy

## 7.5 *RESULTS*

The inshore fleet estimation used a weighting factor of 0.5 as this produced the most likely estimate of landings and value of landings in the TEDA study area. The remaining weighting factors produced estimates of:

- weighting factor of 1 – 8,547 tonnes;
- weighting factor of 0.75 – 6,048 tonnes; and
- weighting factor of 0.25 – 1,369 tonnes.

The first two weigthing factors produced estimates that were 48 and 34% of the total UK catch within ICES IVc which appears to be unlikely. The final weighting factor produces a figure that is too low to be likely. As a result the landings estimated using the 0.5 weighting factor for the inshore (<10 m) fleet was deemed to be the most appropriate estimate of catches for this sector.

Using this level of weighting the resulting estimates produced in *Table 7.2* were produced. The whole fishery in the study area is estimated to be worth just over £38 million in a single year of which £10.3 million is taken by the UK fleet (£4.1 million for the over 10 m UK fleet and £6.2 million to the inshore fleet). The catch and value of the fishery is much higher for the foreign fleet in comparison to that of the UK due to the much larger number of vessels and larger size of the vessels fishing from other countries (see *Table 5.2*).

***Table 7.2 Estimated Total Catch and Annual Value of Fisheries for ICES IVc and TEDA Study Area, 2006***

| Area | Fleet | Total Catch (tonnes) | Total Value (£) |
|---|---|---|---|
| ICES IVc | All | 137,088 | £224,810,483 |
| | UK | 17,763 | £29,129,527 |
| | Non UK | 119,325 | £195,680,956 |
| Study Area | All | 23,373 | £38,328,576 |
| | Offshore (>10 m) UK | 2,527 | £4,144,450 |
| | Inshore (<10 m) UK | 3,762 | £6,169,156 |
| | Non UK | 17,083 | £28,014,969 |

While these figures are estimates and may actually be higher or lower, they provide an indication of the value of the fishery to the local economy, the fishing industry and to the economies of several ports in other European nations. However, the estimated value must be taken with some caution as the landings may have been taken from outside the TEDA area and the initial estimate from the ICES data does not include the under 10 m vessels. The method used also only provides an estimate of the total value of the fishery in ICES Division IVc as the actual value of the ICES catch data was not available. In addition there is inherent variability in market prices, generally driven by seasonal and interannual variation in availability of target species and so the estimated values can not be taken as an exact calculation of the value of fisheries within the TEDA study area.

The North Sea and the Outer Thames Estuary have been important areas for fishing activity for centuries. The region is important for populations of a number of commercial fish species (eg cod, sole, thornback ray, plaice and herring), providing spawning, nursery and feeding grounds for many of them. A wide variety of fisheries (eg drift net and tangle net finfish fisheries, Thames Estuary cockle fishery) have developed in order to exploit these resources and the dynamics of the fisheries have become linked to the life cycles of the fish and shellfish that they target.

The most widely used commercial fishing methods currently utilised in the region can be broadly divided into four distinct categories: trawling, netting, potting and others (including long-ling, seining and dredging). The range of marine species exploited is broad and reflects the diverse marine ecosystem in the shallow coastal waters of the North Sea. The most important species landed at local ports are shellfish, particularly molluscs such as cockles and mussels. The most numerous crustacean species landed locally by fishermen are brown shrimp, crabs and lobster. Landings of finfish at ports in the TEDA study area are from both pelagic and demersal species groups. The pelagic species are mainly landings of sprats followed by herring. Other pelagic species may include shads, pilchards and anchovies. Catches of demersal species are more complex but are mainly cod, skates and rays and sole. Other significant catches include bass, plaice and other species of flatfish and dogfish.

The UK fleet is small in comparison to the foreign fleet which fishes in the study area. Most UK vessels are below 10 m in length and fish close to shore using pots, nets and trawls. UK vessels can be found fishing throughout the study area and they are dispersed and spread across the entire area. The foreign fleet is more numerous than the UK vessels and effort is higher within the study area throughout the year.

Fishing within the study area generally follows a seasonal pattern, generally due to the seasonal migrations of the targeted species and their availability to the fishery. In the winter (December, January, and February) fishing by larger vessels is further offshore and generally outside or on the edges of the study area. Smaller vessels are targeting herring, cod, whiting, sprats and plaice inshore as these species migrate towards the coast and estuary to breed. In the spring (March, April, May) the effort expended by the larger vessels moves closer inshore and covers the study area, with greatest fishing effort across the dredge licence, application and prospecting areas. The smaller vessels begin to target bass, eels and sole, cod and skate become increasingly more important.

In summer (June, July, August) most of the vessels greater than 10 m in length fish inshore but the fleets begin to move further offshore. The small inshore

vessels continue to fish cod, sole, bass and skate with some squid and mullet also featuring in catches. By autumn (September, October, November) the majority of larger vessel effort is further offshore and on the edges of the study area once more. The smaller inshore UK fleet continues to fish sole, skate and cod with 2whiting, herring and sprat again becoming important.

The patterns observed in both over and under 10 fleets is most driven by the biology of the targeted fish species, which move to shallower water during the spring and summer to breed. Once the adult population migrates further offshore the fishing fleets follows them in order to continue exploiting the fish and shellfish as a resource.

The important fisheries in the area can generally be separated into three distinct types. The Thames Estuary cockle fishery, the inshore fleet (generally small less then 10 m vessels) and the offshore fleet (vessels greater than 10 m in length from the UK and overseas) all operate within the TEDA area. Of these the Thames Estuary cockle fishery stands out as the most productive single fishery in the area and in terms of income (54%) and volume (77%) dominates the landings into ports in the area.

The Thames Estuary Cockle fishery operates across the Shoebury, Maplin and Foulness Sands. Vessels here use mechanical dredged that suck up the cockles and the separate them from the sediment that is also bought up by the dredge. The landings of cockles in the area are significantly higher and the value of the fishery is many times that of any other fishery or target species. In the context of fisheries in the UK, the Thames Estuary Cockle fishery is now the most productive and most important cockle fishery in the UK and one of the largest in Europe.

The inshore fisheries of the Essex and Suffolk coasts covered by the TEDA area are typical of those around the UK. Close inshore a wide variety of small vessels target a wide variety of species using multiple gears, although trawls and nets tend to dominate. The main target species are sole, thornback ray and cod for most of the year although a number of other species (e.g. bass, dogfish and plaice) also feature in the fishery on a seasonal basis. The area was once an important fishing ground for sprat and herring but in recent years low market prices have caused many fishermen to cease fishing for these species. The Thames and Blackwater herring fishery is also one of only 7 MSC certified sustainable fisheries in the UK. However, landings from this fishery have been incredibly low in recent years and will continue to be so until market prices improve.

Further offshore larger vessels, mainly from other European nations (Belgium, France, Holland and Germany), use mainly trawl gear to target a number of finfish species including cod, whiting, plaice, sole and a number of other flatfish. Some vessels will also target the large populations of herring and sprat on a seasonal basis.

Appendix 1

# Methodology for Fishing Vessel Location Analysis.

# 1 APPENDIX 1 - METHODOLOGY FOR FISHING VESSEL LOCATION ANALYSIS

## 1.1 OVERFLIGHTS SURVEYS

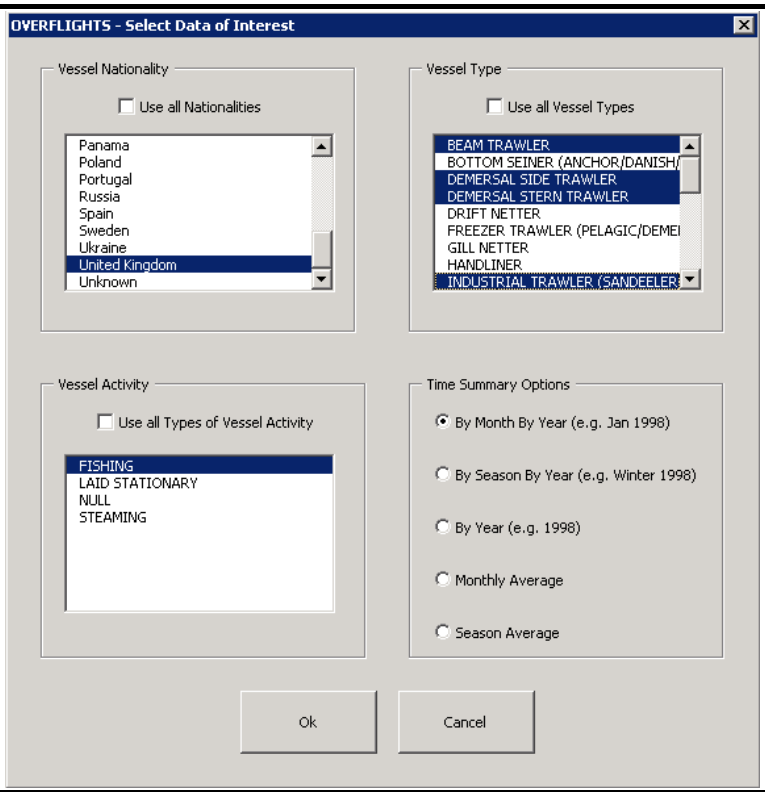
ERM developed a custom GIS analysis tool to assess fishing vessel activity from overflight survey data. The inputs to this tool are two data tables:

- Individual vessel observations by ICES grid sub-rectangle; and
- Number of flights over each ICES grid sub-rectangle.

Following a recommendation from CEFAS, ERM adopted the standardisation methodology from Rogers *et al.* (2001). By this method a simple division of the number of observations by the number of flights, standardises the output so that every sub-rectangle can be compared equally. Maps of standardised observations can then be produced creating grids of relative vessel frequency for the area of interest.

At the most basic level this equation can simply be applied to the total number of vessels within the study area; however the additional vessel attribute information that is available enables more complex analysis to be undertaken allowing the assessment of vessel activity for different vessel types, nationalities and time periods.

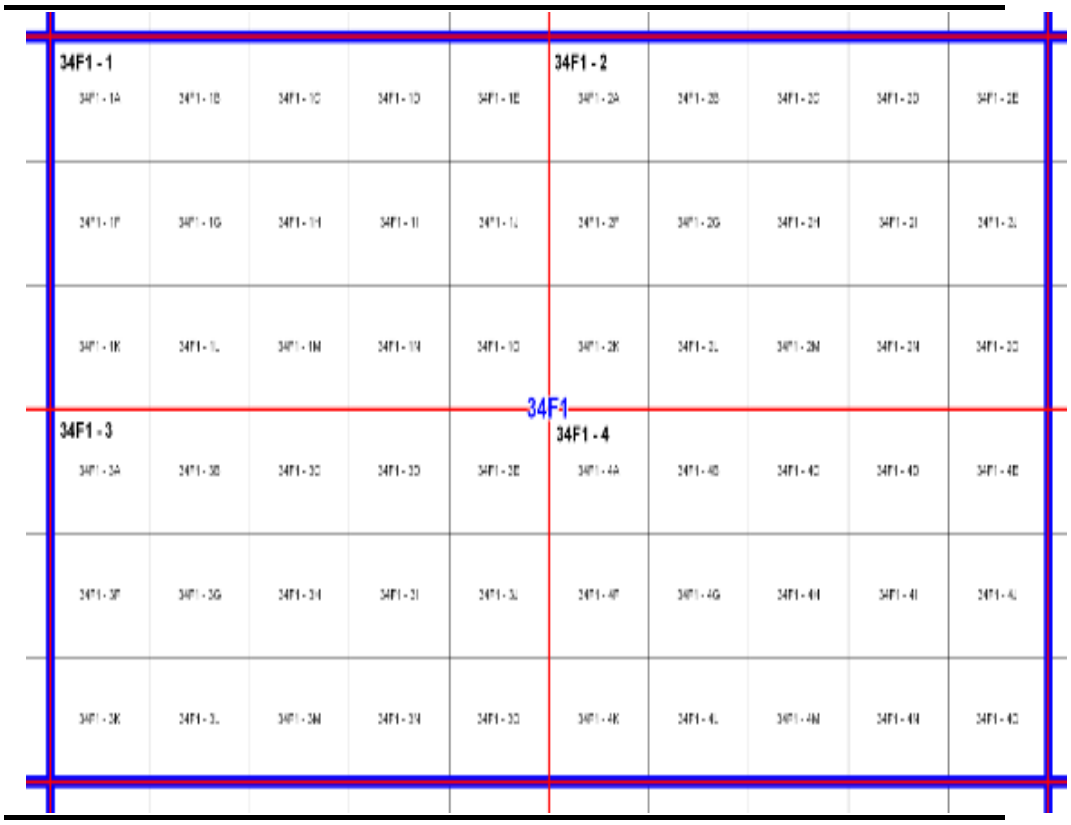
The GIS tool provided the query interface shown below to select the parameters for vessels of interest. Having set the query parameters this produced a series of maps for these specific criteria for further review and assessment. The tools were setup to enable fisheries specialists with limited GIS training to directly interact with the data to identify key patterns and distributions.



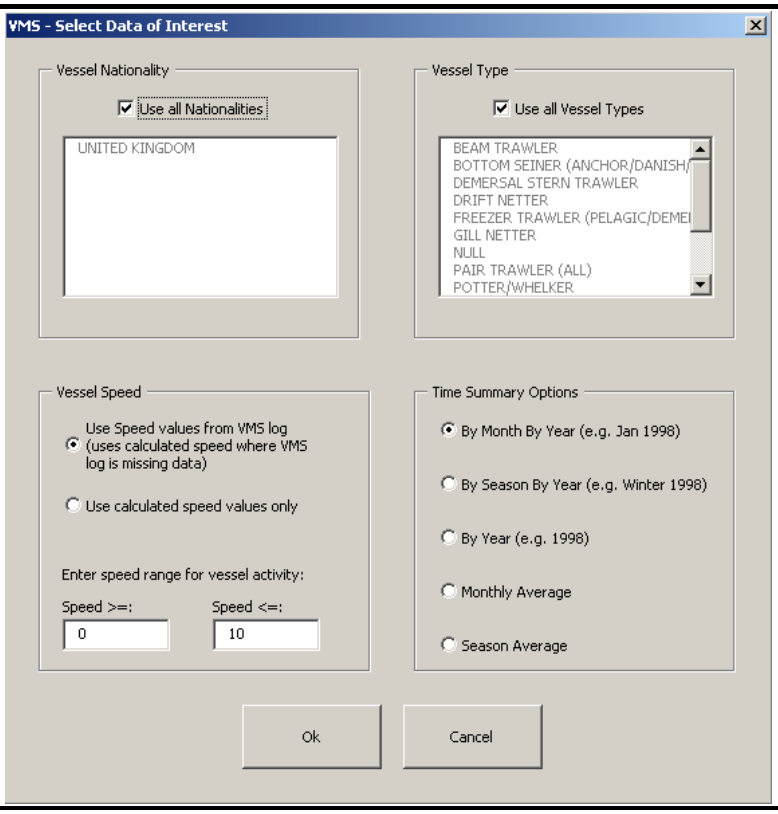

## 1.2 *VMS SURVEYS*

ERM developed an additional custom GIS analysis tool to assess fishing vessel activity from Vessel Monitoring System data. The data was supplied as a single table of vessel positions every 2 hours with associated vessel metadata. The VMS data provides a more continuous record of individual vessel positions, but has some limitations relative to the overflight data as it does not record vessel activity making it more difficult to differentiate when vessels are actually fishing.

ERM adopted the methodology of Witt *et al.* (2007) to use vessel speed information to infer whether or not a vessel is actively fishing. Where speed was not recorded in the metadata, it was calculated based on the previous and current position. Vessel positions were then summarised, based on a subdivided ICES grid as shown below; the greater data volume from VMS enables greater granularity in the mapped outputs.




Following the approach used for the overflight data a comparable query input tool was created allowing users to set criteria for vessel type, nationality, speed and time periods. Having set the query parameters this produced a series of maps for these specific criteria for further review and assessment. The tools were setup to enable fisheries specialists with limited GIS training to directly interact with the data to identify key patterns and distributions.




## 1.2 *REFERENCES*

Rogers, S. I., Ellis, J.R., & Dann, J. 2001. The association between arm damage of the common starfish, Asterias rubens, and fishing intensity determined from aerial observation. Sarsia 86, 107-112

Witt, M.J., and Godley, B.J., 2007. A Step towards Seascape Scale Conservation: Using Vessel Monitoring Systems (VMS) to Map Fishing Activity. PLoS ONE 2(10)

Appendix 2

# Consultation Minutes

**Meeting minutes**

**Environmental Resources Management**

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|---|---|
| ***Subject/Ref*** | TEDA Fisheries Consultation Meeting |
| ***Venue*** | ERM, London |
| ***Date of Meeting*** | 01/10/2008 |
| ***Present*** | TEDA: Richard Fifield<br>ERM: Nicola Lee, Adam Payne<br>KESFC: Ian Campbell<br>ESFJC: Judith Stoutt |
| ***Distribution*** | TEDA, ERM, KESFC, ESFJC |
| ***Date*** | 2 October 2008 |

**ACTION**

**Item 1: Data Sources**

*ERM* has used a number of data sources including the MFA (landings, overflight, VMS), Cefas, ICES, MSC (Thames herring), KESFC (vessels, fishermen and gear) and ESFJC (vessels, fishermen, gear, recreational fishing). Majority of information is for vessels larger than 10m. Information regarding fishing activity and landings for vessels less then 10m in length is not readily available. It is collected by the SFCs in the area but calculation of total landings and value is not easily done from this data. Both KESFC and ESFJC are developing programmes to improve this information gathering as this data type is becoming more and more important. Other projects (including Fishermap (part of the Finding Sanctuary project in south-west England) (Dr des Clers UCL)[1] and MFAs Env responsible fishing) are collecting data that may be of use in this regard, particularly fishing locations and catches.

The list of ports is not complete but some of the smaller ports landings are included in those of larger ports. However, it is not clear where this is the case. Also need to check if data for Sheringham is required.

ERM to send port list to ESFJC and KESFC to ensure all ports covered.

**Item 2: Baseline**

The MSC Thames Estuary and Blackwater herring has become a non-fishery. 2007 landings were around 20 kg (compared to around 20 tonnes in previous years) and effort is generally low. The fishery is no longer commercially viable. However, should the market price and the demand for these fish increase the fishery has the potential to be

KESFC to provide latest data from herring fishery

[1] Dr Sophie des Clers has previously worked with Thames Estuary fishermen to create maps of "Fishermen's Knowledge", which could be of value to the Thames MAREA.

viable once more.

The main landings in the TEDA area are cockles and mussels. In the Suffolk portion crustaceans and finfish using pots and trawls are more important as there are no extensive cockle beds. Mussel landings have declined in some areas as a result of a ban on their transport as seeds for mussel farms possibly due to an oyster virus outbreak.

The most important finfish are herring and sprats. Sprat catches declined in 2006 and 2007. A reduced number of vessels are targeting this fish, the remainder have diversified into other species. As a result catches have declined. Dover sole, skates and rays and cod are the most commercially exploited fish in the area and most vessels now target these species.

| | |
|---|---|
| Seasonal variation in some species may be as a result of the management measures in place. For instance the cockle catches increase from may when the season starts and increases towards August/September when the quota is at its highest, decreasing again as the quota is reduced. Similarly sole landings could be greatest in spring whilst there is quota to be taken, then reduce drastically later in the year when the majority of vessels have fulfilled their quota for that year. | ERM to examine seasonal management measures to further investigate seasonality. |
| Other seasonal trends dictated by species life cycle – herring and sprat are fished just after and before spawning period.<br><br>Fisheries value estimation based on vessels >10 m but methodology is agreed. However, this will need to be presented to Cefas for final verification. Estimating the value of landings to vessels less then 10 m is more complex. Data is collected but coverage is temporally and spatially variable. However, it may be possible to use this data to estimate the value of landings in these areas. | ERM to discuss with KESFC and ESFJC potential for calculating value. |
| The MFA Environmentally responsible fishing project may provide more information. Project lasts for one year, fishers keep log books and are allowed to land everything they catch. Boats in Lowestoft and Thames Estuary are involved. | ERM to contact MFA regarding their project. Ian to provide contact details for Essex (Nick?) and Lowestoft (Roger Mason) |
| The mapping of fishing effort and where the small vessels fish is difficult. ESFJC is implementing a project to install VMS on small vessels (initially only within the Wash Fishery Order area but eventually to be rolled out across the District) but the timing is unknown at this point. The Fishermen's Knowledge project (Dr des Clers UCL) has mapped fishing areas in the Thames Estuary (based on fishers knowledge) and may be useful in this regard. (Fishermap is the ongoing Finding Sanctuary project that Dr. des Clers is advising.) ESFJC is undertaking a Fisheries Mapping Programme throughout its District (Lincolnshire, Norfolk and Suffolk) through consultation with fishermen, (based on Dr. des Clers' approach) to achieve protection for | ERM to contact Dr des Clers and MFA regarding their projects – KESFC and ESJFC to forward contact details |

fishing grounds and biologically important areas through marine spatial planning.

VMS data indicated a large amount of activity around Crouch and Blackwater areas. ERM were curious as to what this activity was as started in 2005 and is very localised. Ian indicated this was Cockle dredgers and beam trawlers from West Mersea and Rochford fishing cockle beds and Maplin sands for bass and sole.

**Item 3: Data Gaps**

Most data gaps were dealt with in the baseline section (see above)

| | |
|---|---|
| Currently the main data gap is for the VMS speed data. Once this is available the fished areas can be plotted and variability in fishing can be determined. The data can also be used in ERMs fishing GIS tool in conjunction with the overflight data to better understand fishing patterns in the study area. | ERM to re-contact MFA for speed data. |
| ERM does currently not have any information on the vessels at the North Kent ports that fish in this area. This information is important for a full picture of the types of vessels fishing, their size, gear and number of fishermen that operate within the TEDA area. | KESFC to provide details of vessels from the North Kent Coast. Adam to provide list of ports. |

**Item 5: Assessment**

The approach for the assessment was discussed. Generally the approach was accepted. It was suggested that it may be pertinent to consider possible future trends in fisheries (e.g. by having regard for historic changes in target species). It was felt that this was beyond the scope of an REA but should be taken into consideration for individual EIAs. The REA will however look at historical long term trends (15 years) to identify those fisheries which have fluctuated historically. The data will be used to qualitatively predict which fisheries may be subject to change in the future.

**Item 6: Consultation**

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|---|---|
| Further consultation is required once the additional information is collected and the baseline is updated based on this new data. Consultation will take place with fishermen's associations on two occasions. ESFJC stressed the importance of maintaining an open approach in meetings with fishermen and their representatives, in order to build trust and engender understanding. These will be evening meetings and will try to cover all the areas covered by TEDA. Meetings to be held in the evenings and at locations which are easily reachable by most. | ERM to attend East Coast Fishing/Dredging Liaison Meeting.<br><br>ERM to liaise with ESFJC and KESFC regarding suitable locations and dates for further consultation |

**Meeting minutes**

**Environmental Resources Management**

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|---|---|
| ***Subject/Ref*** | TEDA Fisheries Consultation |
| ***Venue*** | CLACTON |
| ***Date of Meeting*** | 26 November 2008 |
| ***Present*** | Adam Payne (ERM), Nicola Lee (ERM), Richard Fifield (TEDA), Ian Campbell (KESFC), Michael Free, Richard Jacobs, Steve Barrett, Clive Mills, Steve Place |
| ***Distribution*** | ERM, TEDA, KESFC |
| ***Date*** | 22 December 2008 |

***Introduction / Objective of Meeting***

ERM provided an overview of the information obtained to date and Fisheries representatives were given the opportunity to comment on the data and provide additional data where applicable. The following provides a summary of key points raised by the fishermen and discussed during the meeting.

**ACTION**

Thames Herring are generally smaller than those from the main North Sea population. Therefore the market value is lower.

***Catch Statistics from Landings Data***

Catch statistics up to 2005 are unreliable. From 2006 the reliability becomes increasingly better with under 10's becoming better represented in the dataset.

The Environmentally Responsible fishing scheme provides good information on where fish are, where people are fishing and the fishery in generally. The key contact at Cefas is Jon Elson.

ERM to contact Jon Elson at Cefas to discuss data use. ERM propose to use interim results in REA which may be available mid February.

The Belgian beam trawlers identified in overflight data may have changed gear and could be turning to scallop dredging or otter trawls. This overflight data may therefore be falsely representing the number of beam trawlers within the area.

ERM to go through 2008 data thoroughly to check data validity

The range and spatial coverage of vessels < 10 m is greater than generally anticipated with some vessels travelling distances of up 50 km or more to their fishing grounds.

The number of vessels identified from the overflight data seems excessive

ERM to check data and ensure whether number of vessels or

| | |
|---|---|
| | number of observations |
| The number of vessels quoted at each port is not correct. Often vessels can be licensed but not actively fishing which distorts the data. | KESFC to update vessel list. |

*Spawning Grounds*

Despite Lemon sole spawning grounds being identified within the TEDA area (Cefas Interactive Spatial Explorer and Analysis tool), it is unlikely that lemon sole spawn in the area as they are caught only in very small numbers.

| | |
|---|---|
| Bass spawning grounds are present within the Thames estuary, as are Sand eels spawning grounds, smoothound spawning and important sole spawning grounds. Juvenile Bass are found throughout the Thames Estuary area. | Cefas information on Bass spawning grounds to be sought by ERM. REA to include information in REA on those identified. |
| Thornback ray reported to spawn in the area and a significant quantity are caught locally (locally called roker). Spawning takes place in spring throughout most of the area however there are some localised concentrations mostly in the Thames, Kentish Flats and down the Essex coast. | |
| Spawning periods for several of the species are different locally than the rest of the North Sea. | ERM to update spawning periods with local information provided by fishermen during the consultation meetings |

*Summary*

In general there was agreement with the data, methodologies and approach taken by ERM but some of the data was questioned. In most cases those present provided additional sources of information they thought would fill the gaps in ERMs dataset. In addition they provided anecdotal evidence of the species present, where and when they spawned. At the end some fishermen indicated on maps where they fished and a potential spawning area for thornback rays.

While only a few fishermen attended, the meeting went well and the meeting was well received.

ERM would like to thank to Ian Campbell for his assistance in organising the meeting and also extend their thanks to all the fishermen who gave up their time to attend the meeting and provide valuable information and feedback.

*The Environmentally Responsible Fisheries Scheme*

The Environmentally Responsible Fishing Scheme started in August 2008 and continues till August 2009. Within the project are vessels from the Hartlepool, Lowestoft, West Mersea and the Kent coast areas. The project covers a large

portion of the TEDA area and is therefore useful to the TEDA MAREA. An Interim report is due to be published at the start of 2009, the results of which will be used to inform the TEDA baseline study.

The vessels involved fish outside of the CFP quota system, keeping whatever they catch. Each vessel is fitted with VMS and records everything that is caught (and discarded) in a log book. The data is then sent to Cefas who will analyse the data, looking at spatial trends, size distributions and from this analysis provide a more comprehensive picture of the under 10 m sector.

The purpose is to build a full social and economic profile of the under 10 m sector, which is currently data poor and not fully understood. The current statistics available for this sector have been recognised as unreliable and so this project endeavours to provide a format for rectifying this situation.

**Meeting minutes**

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|---|---|
| ***Subject/Ref*** | TEDA Fisheries Consultation |
| ***Venue*** | Ipswich |
| ***Date of Meeting*** | 1 December 2008 |
| ***Present*** | Adam Payne (ERM), Nicola Lee (ERM), Richard Fifield (BAL), Judith Stoutt (ESFJC), Alan Garnham (ESFJC) |
| ***Distribution*** | ERM, BAL, ESFJC |
| ***Date*** | 22 December 2008 |

***Introduction / Objective of Meeting***

ERM provided an overview of the information obtained to date and Fisheries representatives were given the opportunity to comment on the data and provide additional data where applicable. The following provides a summary of key points raised by the fisheries managers (ESFJC) in the absence of fishing industry representatives, and discussed during the meeting.

**ACTION**

***General Fisheries Trends***

Fishing for cod and skate has been good this year. Herring and Sprat also available but value low so not marketable. Suffolk has mainly been Crab and Lobster.

Cod are being fished and caught all year round especially under the Environmentally Responsible Fisheries project. Sole fishery has also been operating longer this year.

***Sources of Information***

| | |
|---|---|
| ESFJC are updating their vessel records at each port | Alan to update ERM with vessel list by year end. |
| Recommended by ESFJC that we get Environmentally Responsible Fishing data | ERM to contact Cefas for data |
| ESFJC trying to create their own version of " fishermap" over the next few months. ESFJC need to confirm that they are happy to work with ERM on this. | ERM and ESFJC to coordinate fishing map exercises |
| Fishermen will need to know why they should participate and why this is of use to them as opposed to previous approaches | ERM to put together paper on why this exercise is useful and e-mail presentation to ESFJC |

***Summary***

Unfortunately due to the venue and another meeting for a wind farm development occurring at the same time no fishermen attended the meeting. ERM and ESFJC discussed the findings and ways that data may be improved based on the discussions in the previous meeting. In general there was agreement with the data, methodologies and approach taken by ERM. ESFJC agreed with ERM's approach and discussed ways in which the information could be gathered. It was decided to examine the potential for a further meeting a new venue and the degree to which the mapping exercise could be integrated with ESFJCs own efforts.

Meeting to be reconvened at a more suitable location and fishermen given ample notice

ERM would like to thank to Judith Stoutt and Alan Ganham for their assistance in organising the meeting and for providing valuable information and feedback.

***The Environmentally Responsible Fisheries Scheme***

The Environmentally Responsible Fishing Scheme started in August 2008 and continues till August 2009. Within the project are vessels from the Hartlepool, Lowestoft, West Mersea and the Kent coast areas. The project covers a large portion of the TEDA area and is therefore useful to the TEDA MAREA. An Interim report is due to be published at the start of 2009, the results of which will be used to inform the TEDA baseline study.

The vessels involved fish outside of the CFP quota system, keeping whatever they catch. Each vessel is fitted with VMS and records everything that is caught (and discarded) in a log book. The data is then sent to Cefas who will analyse the data, looking at spatial trends, size distributions and from this analysis provide a more comprehensive picture of the under 10 m sector.

The purpose is to build a full social and economic profile of the under 10 m sector, which is currently data poor and not fully understood. The current statistics available for this sector have been recognised as unreliable and so this project endeavours to provide a format for rectifying this situation.

**Meeting minutes**

**Environmental Resources Management**

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Facsimile 01865 384848
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| | |
|---|---|
| ***Subject/Ref*** | TEDA Fisheries Consultation |
| ***Venue*** | Leigh-on-sea |
| ***Date of Meeting*** | 4 December 2008 |
| ***Present*** | Adam Payne (ERM), Nicola Lee (ERM), Richard Fifield (BAL), Ian Campbell (KESFC), Alan Boulton, Glyn Gilson, Paul Gilson, Darryl Godbold Daren Stagg, |
| ***Distribution*** | ERM, BAL, KESFC |
| ***Date*** | 22 December 2008 |

| ***Introduction / Objective of Meeting*** | **ACTION** |
|---|---|
| ERM provided an overview of the information obtained to date and Fisheries representatives were given the opportunity to comment on the data and provide additional data where applicable. The following provides a summary of key points raised by the fishermen and discussed during the meeting. | |
| ***General Fisheries Information*** | |
| Landings data is not reliable as an index of the available fish or the total catch. It does not include discards. The Environmentally Responsible Fisheries Project should provide more information on this as discards are being recorded. | ERM to contact Cefas RE: Env. Resp. Fish. project. |
| Bass is increasingly important in the Thames area and catches have increased rapidly over the past few years. This is not currently reflected in ERMs data. | ERM to draw out Bass fishery information from current MFA landings. |
| The fishermen all noted that the current estimate of value as presented by ERM is unrepresentative of the UK fleet. It was reported that a single cockle boat could bring in an annual gross profit of £2 million. It was noted that all boats have to report the value of their catch and that Tonnages should also be available from KESFC and ESFJC. | ERM to obtain local landings value data from MFA and to recalculate. ESFJC and KESFC to provide ERM with data by 1st January 2009 |
| ***General Data*** | |
| Overflight data shows vessels moving inshore during the spring to target species that move inshore during this season, including skate, cod and sole. | |
| It was reported that vessels from Belgium and Holland have not fished in the Thames Estaury as frequently this year due to rising fuel costs. | ERM to examine 2008 data when available for change in overflight sightings of foreign vessels |
| It was noted that there are no known commercial sand eel vessles. | |

| | |
|---|---|
| Sophie des Clers is updating fishermap project to reflect changes since original project in 2001. The timescales for publication of this update are not known. | ERM to contact Dr des Clers and discuss data. |
| ***Fish Ecology (Spawning grounds)*** | |
| Skate (roker) thought to be spawning all over the TEDA area as small fish are regularly caught. However, there could be some concentrations in particular areas. | |
| Shad are present in the Thames estuary however it is currently unclear as to whether there is a viable spawning population. | |
| Lemon sole are not identified in large numbers. | |
| Spawning periods for most species (cod, plaice, skate, sprat) show local variations when compared to main North Sea populations | ERM to update spawning period data to reflect this. |
| ***Other information (marine mammals)*** | |
| More harbour porpoise have been seen this year and lots of grey seals<br><br>More gannets and fulmers have been potted than in previous years | ERM to contact John Ford for more information – KESFC to provide contact details. |
| ***Summary*** | |
| In general there was agreement with the methodologies and approach taken by ERM but a large portion of the data was queried by the fishermen. In most cases those present provided additional sources of information they thought would fill the gaps in ERMs dataset. In addition they provided anecdotal evidence of the species present, where and when they spawned. The mapping exercise was not repeated as the fishermen had recently taken part in a similar exercise. ERM did not want to replicate the effort and instead indicated to the fishermen that they would contact the other study directly (Dr des Clers, UCL) | ERM to contact Dr Sophie des Clers at UCL regarding the fishermap project. |
| Initially some there was some confusion over the nature of the dredging. These fishermen are having issues with the Port of London Authority and the dredging for the new London Gateway container port. Once it was made clear the project was concerned with the aggregate industry rather than maintenance dredging the meeting proceeded to plan. While only a few fishermen attended, the meeting went well and the approach taken was generally well received. The outcome was some useful information and an idea of the number of gaps in the dataset. The fishermen also provided solutions to fill those gaps. | |

ERM would like to thank to Ian Campbell for his assistance in organising the meeting and also extend their thanks to all the fishermen who gave up their time to attend the meeting and provide valuable information and feedback.

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The vessels involved fish outside of the CFP quota system, keeping whatever they catch. Each vessel is fitted with VMS and records everything that is caught (and discarded) in a log book. The data is then sent to Cefas who will analyse the data, looking at spatial trends, size distributions and from this analysis provide a more comprehensive picture of the under 10 m sector.

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**Meeting minutes**

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| | |
|---|---|
| ***Subject/Ref*** | TEDA Fisheries Consultation |
| ***Venue*** | Felixstowe |
| ***Date of Meeting*** | 21 January 2009 |
| ***Present*** | Adam Payne (ERM), Nicola Lee (ERM), Judith Stoutt, Alan Garnham (ESFJC), Jessica Woo (ESFJC), Albert Crago, Jamie Lee-Amies, David Lee-Amies, Stephen Crawford, Rob Butters, Helen Reed, H.H. Willsbry |
| ***Distribution*** | ERM, BAL, ESFJC |
| ***Date*** | 03 February 2009 |

***Introduction / Objective of Meeting***

ERM provided an overview of the information obtained to date and the results of previous consultation. Fisheries representatives were given the opportunity to comment on the data and provide additional information where applicable. The following provides a summary of key points raised by the fishermen and discussed during the meeting.

It should be noted that the ESFJC, who also attended the meeting, were carrying out a mapping exercise of main fishing grounds, the gear used and the species targeted. Hence this was a joint meeting to gain a better understanding of key fishing areas which could be used by both the Outer Thames Estuary MAREA and the ESFJC.

**ACTION**

***General Fisheries Trends***

Shipwash (Area 118/2) area was identified as one of the main fishing grounds for fishermen operating from Felixstowe. Boats from Orford and Lowestoft may also fish in this area and across aggregate licence application areas to the north.

Main target species in these areas are cod skate and sole. Secondary species include whelks, shrimps and crabs although the quantities of these are relatively low in comparison. Shrimps in particular are important for vessels operating from other ports in this area.

Cod are being fished and caught all year round by four vessels operating under the Environmentally Responsible Fisheries project. Sole fishery has also been operating longer this year.

A number of charter and private boats (as many as 60 in some days in the summer) also fish for cod in these areas using rod and line. These vessels generally outnumber the commercial vessels and can catch as much, if not more, as the commercial fishermen. These vessels originate from Felixstowe, Lowestoft, Southwold, Orford and

Alan Garnham to provide more information regarding angling in the area.

Aldeburgh among others.

It is difficult for the commercial fleet to move to other grounds due to issues with territoriality. Fishers from ports further north that fish in areas to which the fleet could move would not be happy with any incursion into their fishing grounds. Felixstowe fishermen generally avoid fishing outside their usual areas.

***Sources of Information***

| | |
|---|---|
| ESFJC have updated their vessel records for each port | ESFJC to update ERM with vessel list. |
| ESFJC provided fishermen with map to indicate where, when and how they fish. | ESFJC to provide ERM with fishing maps. |
| Fishermen indicated that the cockle fishery is fragmented into various licence blocks. This data should be available from the KESFC | ERM to investigate data and obtain from KESFC |

***Summary***

In general there was agreement with the methodologies and approach taken by ERM to collating data on the inshore and offshore fleet. However, it was noted that our data for Suffolk included a number of gaps, particularly regarding the location of fishing activity. Through discussion with the fishermen and the mapping exercise ERM were able to fill these gaps and provide greater coverage of the TEDA area.

Unfortunately only 7 fishermen attended due to a window in weather conditions that allowed fishing to take place that evening. However, the meeting went well, the approach taken was well received and it was generally agreed that the data coverage was good, although the limitations of the available data were noted. The outcome was some useful information and an indication of where these fishermen ply their trade. The fishermen also provided an indication of where they fish to ESFJC on Admiralty Charts. ERM have digitised this data and included as part of fisheries report.

ERM would like to thank to Judith Stoutt, Alan Ganham and Jessica Woo for their assistance in organising the meeting and for providing valuable information and feedback.

***The Environmentally Responsible Fisheries Scheme***

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The vessels involved fish outside of the CFP quota system, keeping whatever they catch. Each vessel is fitted with VMS and records everything that is caught (and discarded) in a log book. The data is then sent to Cefas who will analyse the data, looking at spatial and temporal trends in fishing activity throughout the year.

The purpose is to build a full social and economic profile of the under 10 m sector, which is currently data poor and not fully understood. The current statistics available for this sector have been recognised as unreliable and so this project endeavours to provide a format for rectifying this situation. It is hoped this information will feed into to both fisheries management and marine spatial planning.

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