PRE- SURVEY FISHERY ASSESSMENT

AT BARRYROE (SEL1/11), NORTH CELTIC SEA, SOUTH WEST COAST OF IRELAND FOR EXOLA DAC.

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Dated: 8th February 2019
Client Document Reference: BAR-ORP-X1005

List of Abbreviations

ANIFPO	-	Anglo-North Irish Fish Producers Organisation
DCCAE	-	Dept of Communications, Climate action & Environment
BIM	-	Bord Iascaigh Mhara
EIS	-	Environmental Impact Statement
EEZ	-	Exclusive Economic Zone
FEL	-	Frontier Exploration Licence
FLO	-	Fisheries Liaison Officer
FMC	-	Fisheries monitoring centre
FPO	-	Fish Producers Organisation
ICES	-	International Council for Exploration of the Seas
IFPO	-	Irish Fish Producers Organisation
IRCG	-	Irish Coast Guard
IS&EFPO	-	Irish South & East Fish Producers Organisation
IS&WFPO	-	Irish South & West Fish Producers Organisation
IOSEA	-	Irish Offshore Strategic Environmental Assessment
KFO	-	Killybegs Fishermen's Organisation
MI	-	Marine Institute
MSO	-	Marine Survey Office
NEAFC	-	North East Atlantic Fisheries Commission
PAD	-	Petroleum Affairs Division
RSW	-	Refrigerated Sea water or Refrigerated Salt water
SAC	-	Special Area of Conservation
SFPA	-	Sea Fisheries Protection Authority
VHF	-	Very High Frequency (Radio)
VMS	-	Vessel Monitoring System

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Exola DAC, a wholly owned subsidiary of Providence Resources P.l.c. (hereafter referred to as "Exola"), is proposing to conduct site survey activities within the Barryroe licence area (SEL 1/11); situated in the North Celtic Basin approximately 43 kilometres (km) south east of the closest coast-line at Ballymacshoneen, Butlerstown North, County Cork on the south coast of Ireland.

The site survey activities will comprise a seabed and shallow geophysical survey and an environmental baseline and habitat assessment survey to be conducted over three survey areas, encompassing four potential well locations, within two separate survey vessel activity areas at the Barryroe location, as illustrated in Figure 2.1, together with a single environmental control point located approximately 10 km to the east-southeast.

Details of the survey contractor and survey vessel will be furnished to marine stakeholders in advance of the commencement of the survey activities. The proposed equipment to be deployed will include Multi beam Echo Sounder (MBES), Single beam Echo Sounder (SBES), Side Scan Sonar (SSS), Ultra-short Baseline Positioning (USBL), Magnetometer, environmental sampling & habitat assessment photography. There will also be a hull-mounted Sub-Bottom Profiler (SBP).

This report outlines the anticipated fishing activity in the relevant portion of IOSEA 5 and possible scope of overlap with the planned site surveys in ICES area VIIg, fishery statistical rectangle 31E1 which encompasses the site survey locations.

A factsheet with survey details and location map was sent to the key Irish fishery organisations in early January 2019 in keeping with best practice of early notification to marine stakeholders. Communication with fisheries is open and will remain open for the duration of the survey. The Irish Sea Fishery Protection Authority (SFPA) has also been consulted.

The Fisheries Management Centre (FMC) at the Naval Base have provided some historic VMS data from the SEL 1/11 area for a six-month period over three years from 2016 to 2018 and this study examines these results. VMS data shows fishery effort in the 31E1 fishery statistical rectangle which encompasses the Barryroe survey area. Analysis of the VMS data is detailed in Section 5 of this report.

The way in which the fishing effort may interact with the survey activities is also examined. The summary of fisheries interactions is set out in Section 5.2 and concludes that the demersal and nephrops sector is the busiest fishery within statistical rectangle 31E1 and stresses the importance of a strong communications strategy with fisheries.

The waters offshore Ireland are a shared resource and both Oil and Gas and Fisheries industries are operating under licence. Therefore, establishing good communications with fisheries prior to and maintaining communication during the Barryroe site survey will be key to keeping a good relationship with fisheries.

2. Introduction

2.1. General introduction of planned Barryroe site survey

Exola DAC, a wholly owned subsidiary of Providence Resources P.l.c. (hereafter referred to as "Exola"), is proposing to conduct site survey activities within the Barryroe licence area (SEL 1/11); situated in the North Celtic Basin approximately 43 kilometres (km) south east of the closest coastline at Ballymacshoneen, Butlerstown North, County Cork on the south coast of Ireland.

The site survey activities will comprise a seabed and shallow geophysical survey and an environmental baseline and habitat assessment survey to be conducted over three survey areas, encompassing four potential well locations, within two separate survey vessel activity areas at the Barryroe location, as illustrated in Figure 2.1, together with a single environmental control point located approximately 10 km to the east-southeast. The two survey vessel activity areas cover a total area of approximately 99 km2 (25 km2 and 74 km2 respectively) and allow for a 1 km buffer around the survey areas within which the survey vessel may manoeuvre during line turns and during equipment deployment and recovery.

The survey vessel is anticipated to be working on location for up to 16 days, excluding transit, port calls and weather downtime. Operations are currently scheduled to take place sometime between the 1st April 2019 and 30th November 2019, subject to regulatory approval and vessel availability. If the survey has not commenced within this timeframe, the operations will be undertaken sometime between 1st February 2020 and 30th November 2020, again subject to regulatory approval and vessel availability. This assessment has concentrated on the period April to September as this represents the period where interactions between the site survey activities and fisheries would be greatest. An on-board Fisheries Liaison Officer (FLO) will ensure good that communication with fishing vessels in the area will be maintained, particularly regarding planned survey vessel movements during survey operations.

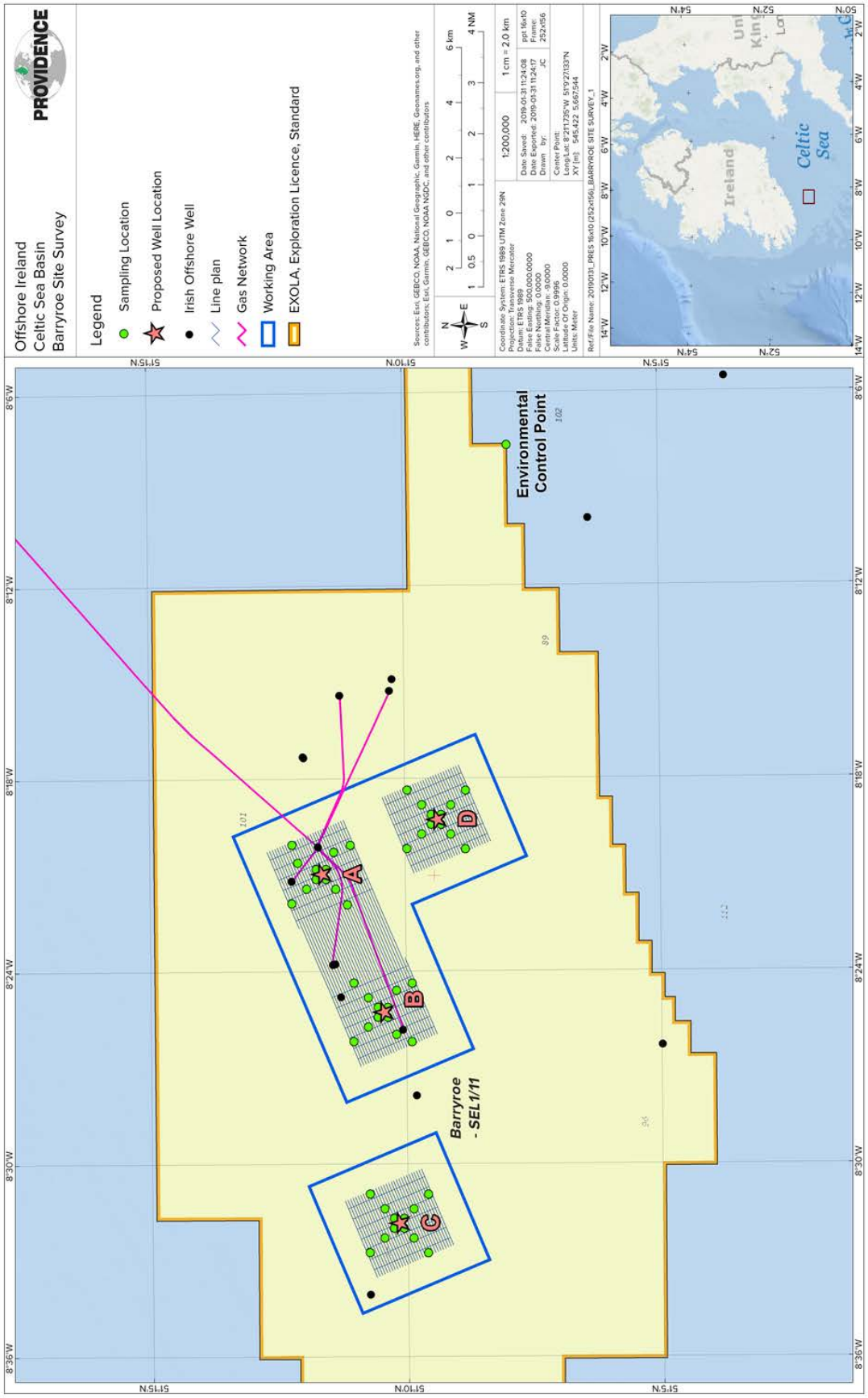


Figure 2.1 Proposed Barryroe Site Survey Activities.

2.2. Survey Location

The proposed Barryroe site survey activities will be conducted over three survey areas, encompassing four potential well locations, within two separate survey vessel activity areas, comprised of one square and one L-shaped polygon, as shown in Figure 2.2. Outside of the survey vessel activity areas, additional environmental sampling is expected to be conducted at one control location, located approximately 10 km to the east-southeast, also shown on Figure 2.2. The proposed survey working areas are defined by the coordinates outlined in Table 2.1.

ETRS 1989 (WGS 1984)		
Survey Corner	**Latitude**	**Longitude**
Working Area		
A	51° 10' 54.551" N	8° 34' 39.338" W
B	51° 11' 56.870" N	8° 30' 41.621" W
C	51° 09' 27.451" N	8° 29' 02.627" W
D	51°0 8' 25.187" N	8° 33' 00.167" W
E	51° 08' 37.747" N	8° 16' 39.081" W
F	51° 07’ 38.558" N	8° 20' 26.636" W
G	51° 09' 53.395" N	8° 21' 55.413" W
H	51° 08' 42.780" N	8° 26' 26.032" W
I	51° 11' 12.138" N	8° 28' 04.795" W
J	51° 13' 23.136" N	8° 19' 46.774" W
K	51° 07' 57.400 " N	8° 07' 38.217" W

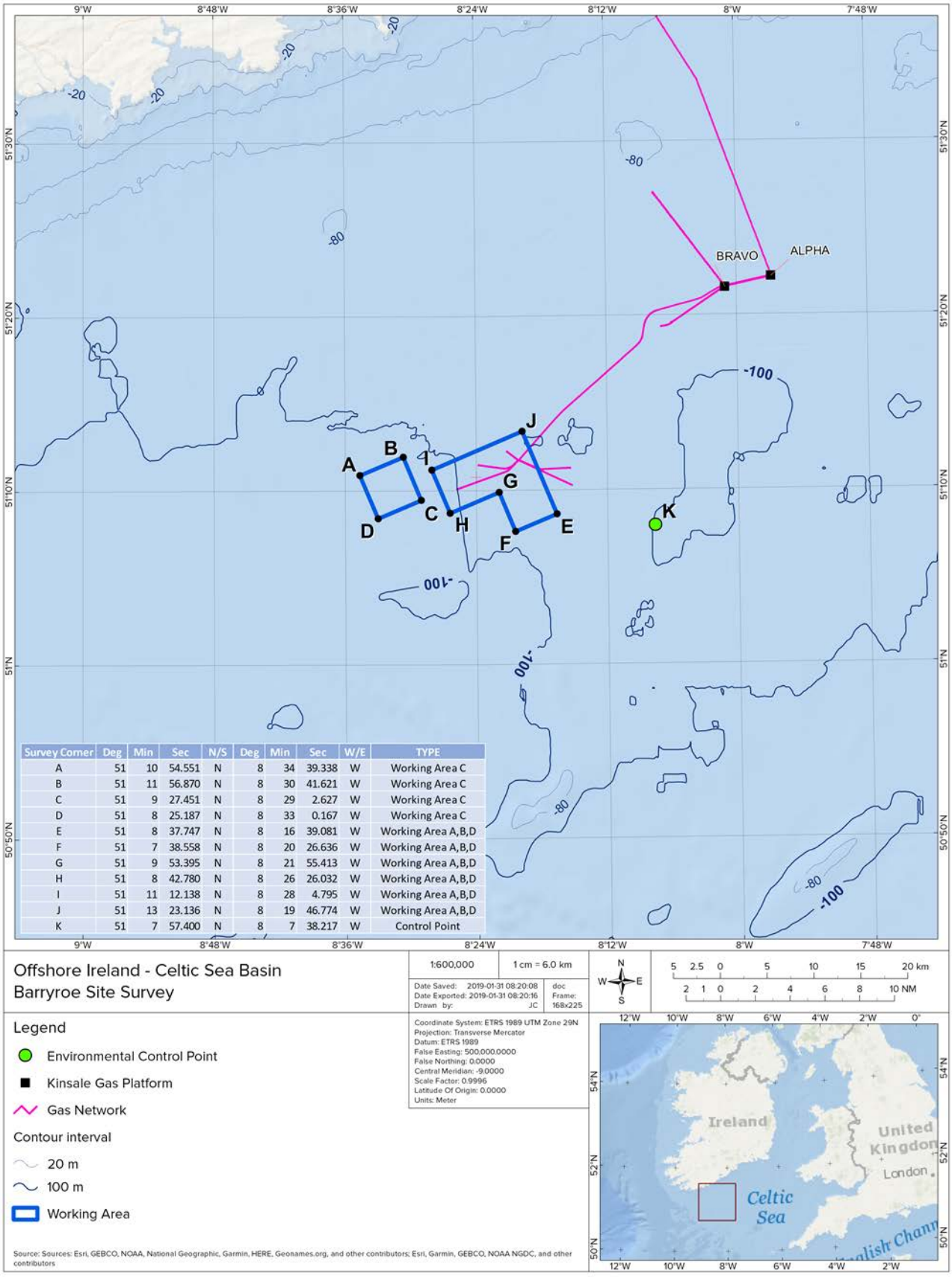
Table 2.1 Coordinates of operation working areas.

The Barryroe licence area is located in the North Celtic Sea Basin, at approximately 43 km offshore off the coast of southern Ireland and is adjacent to the PETRONAS operated Seven Heads and Kinsale Head gas fields. The North Celtic Sea Basin is bordered by Saint George’s Channel to the northeast, by the Bristol Channel to the east, the Bay of Biscay to the south, opening to the Atlantic Ocean to the west and southwest.

The Celtic Sea south of Ireland is an extended shelf within which the water depth is generally less than 100 m. The northeast portion has depths of between 90 m and 100 m, increasing towards Saint George's Channel. In the opposite direction, sand ridges pointing southwest have a similar height, separated by troughs approximately 50 m deeper.

The seabed of the Celtic Sea region is primarily comprised of extensive areas of mixed sediments, coarse, rocky, and sandy to muddy sands. Areas of rock and hard substratum are present in the inshore parts of the region.

Generally, water movement is from south to north, with oceanic water from the North Atlantic entering from the south and west of the region. The strongest winds in this area come from the west and south, with a tendency for the strongest winds to be experienced in the west of the region.



Survey Corner	Deg	Min	Sec	N/S	Deg	Min	Sec	W/E	TYPE
A	51	10	54.551	N	8	34	39.338	W	Working Area C
B	51	11	56.870	N	8	30	41.621	W	Working Area C
C	51	9	27.451	N	8	29	2.627	W	Working Area C
D	51	8	25.187	N	8	33	0.167	W	Working Area C
E	51	8	37.747	N	8	16	39.081	W	Working Area A,B,D
F	51	7	38.558	N	8	20	26.636	W	Working Area A,B,D
G	51	9	53.395	N	8	21	55.413	W	Working Area A,B,D
H	51	8	42.780	N	8	26	26.032	W	Working Area A,B,D
I	51	11	12.138	N	8	28	4.795	W	Working Area A,B,D
J	51	13	23.136	N	8	19	46.774	W	Working Area A,B,D
K	51	7	57.400	N	8	7	38.217	W	Control Point

Figure 2.2 Proposed Barryroe site survey operation areas.

Licence SEL 1/11 is located within ICES sub-division VIIg and statistical rectangle 31E1. The area is influenced by the Gulf Stream resulting in rich and diverse fishing grounds. 31E1 is the location of the Kinsale Galley Head fishing grounds. Ballycotton fishing grounds lie to the north of the survey area. Labadie, Jones, Pistola, Nymphe, Northwest and West banks lie to the south and southwest of 31E1 and are very popular areas for demersal fisheries.

The survey area lies approximately 30 km northwest of the UK-waters boundary.

The importance of southern and southwestern Irish waters as spawning and nursery grounds for stocks such as Herring, Mackerel and Hake and other demersal species is recognised by the establishment of a "Biologically Sensitive Area (BSA)" by the EU Commission. This area is shown on the map below (Figure 2.3). 31E1 is located within the boundary of the EU-Commission designated Biologically Sensitive Area.

In 2003, the EU also established a specific fishing effort regime inside the BSA and outside the BSA for demersal, scallop and crab fisheries (i.e. different fishing effort regulations apply inside and outside of the box) (Council Regulation (EC) No 1954/2003).

The BSA overlaps with spawning and nursery areas for several important demersal stocks and pelagic stocks, examples of which are given below in Table 2.2.

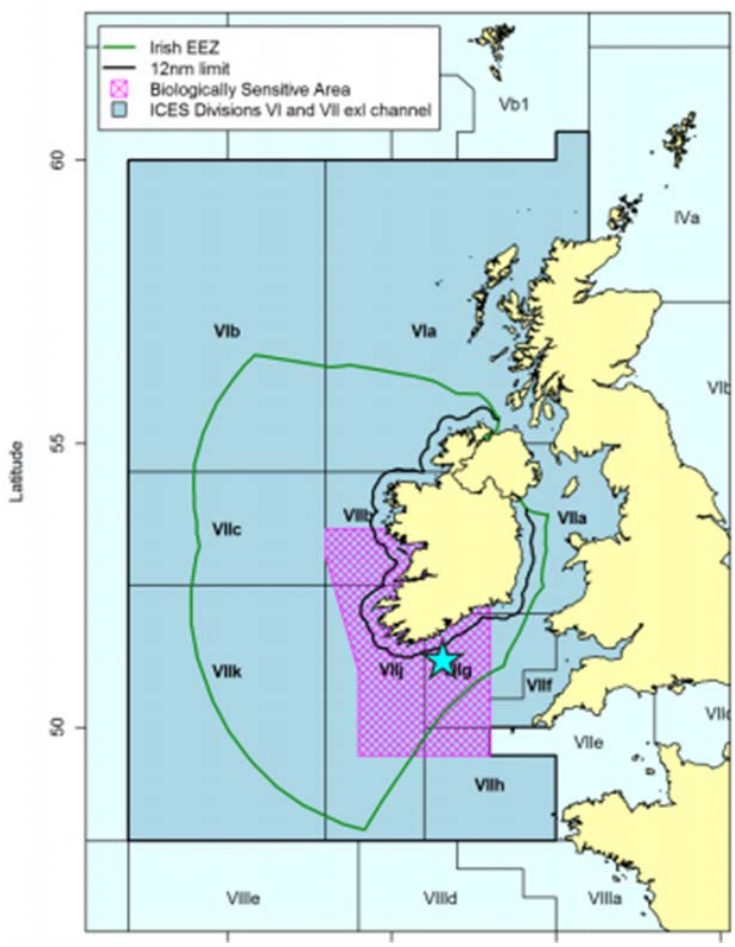


Figure 2.3 Biologically Sensitive Area shown in pink shading, with site survey location represented by a blue star.

2.3. Spawning areas of some key species

There are spawning and nursery areas of commercially important species present within the BSA. Many fish species aggregate to spawn. Some species may aggregate behaviourally and so may have extensive spawning grounds that may change location slightly from year to year, while other species may aggregate over a more restricted spatial extent. (Coull et al, 1998). There are numerous modes of reproduction in fishes, and broadcast spawning, which involves shedding the eggs and sperm into the water column, is one of the more frequent strategies (Balon, 1984) and such species may have more extensive spawning grounds than those species which deposit eggs on the sea floor.

Juvenile fish are vulnerable to predators and harsh conditions in the open water. Therefore, it is typical for juvenile fish to stay in sheltered nursery grounds which provide an abundance of food. At nursery and spawning grounds, fish aggregate in large numbers and so are particularly vulnerable to disturbance.

The proposed survey area overlaps known spawning grounds and nursery areas for certain fish species. Pelagic spawning species in the area include Mackerel, Horse Mackerel, Blue Whiting and Herring, while demersal spawning species in the area include Nephrops, Cod, Hake, Megrim, Whiting and Haddock. Table 2.2 shown below is taken from the Marine Institute and shows a sample of both pelagic and demersal species spawning periods off the south coast of Ireland. It is worthwhile noting that fish spawning can vary temporally and spatially, such that spawning areas are diverse, and fish may spawn earlier or later in the season.

Species	J	F	M	A	M	J	J	A	S	O	N	D
Anglerfish[1] *Lophius piscatorius*			N	N	N	N	N	N	N			
Blue whiting *Micromesistius poutassou*				N	N	N						
Cod *Gadus morhua*												
Common skate [2] *Dipturus batis*-complex	N	N	N	N	N	N	N	N	N	N	N	N
European hake *Merluccius merluccius*					N	N	N	N	N			
Haddock *Melanogrammus aeglefinus*				N	N	N	N					
Horse mackerel *Trachurus trachurus*			N	N	N	N						
Lemon Sole *Microstomus kitt*						N	N	N	N	N	N	
Ling *Molva molva*				N	N	N	N					
Mackerel *Scomber scombrus*					N	N	N	N	N			
Megrim *Lepidorhombus whiffiagonis*			N	N	N	N						
Nephrops	N	N	N	N	N	N	N	N	N	N	N	N
Sprat *Sprattus sprattus*												
Spurdog [3] *Squalus acanthias*	N	N	N	N	N	N	N	N	N	N	N	N
Whiting *Merlangius merlangus*				N	N	N	N	N				

Key:

	Peak Spawning		Low Intensity Spawning		Without Spawning Period	N	Nursery		Indicates the period when survey may occur [4]

Table 2.2 Fish Spawning and Nursery areas in the vicinity of the proposed Survey Area (ICES Rectangle 31E1) (Coull et al., 1998; Marine Institute,2009; Ellis et al.,2012)

3. Fisheries

3.1. Fisheries management

Within EU waters, fisheries management is conducted in accordance with the EU Common Fisheries Policy (CFP), and catching opportunities for stocks under EU competency are agreed during meetings of the Council of Ministers. Under the CFP's regionalization policy, proposals on certain issues (for example discard plans) are made by the North Western Waters Regional Fisheries Group. National authorities manage activities in coastal waters (i.e. within 12 nautical miles). The fisheries for some stocks are managed based on agreements by the North East Atlantic Fisheries Commission (NEAFC) and by coastal states. Salmon fisheries are managed nationally based on agreements at the North Atlantic Salmon Conservation Organization (NASCO), and fisheries for large pelagic fish are managed based on agreements at the International Commission for the Conservation of Atlantic Tunas (ICCAT). International fisheries advice is provided by the International Council for the Exploration of the Sea (ICES), the European Commission's Scientific Technical and Economic Committee for Fisheries (STECF), the Standing Scientific Committee of ICCAT, and the North Western Waters and Pelagic Advisory Councils.

The ICES designated Celtic Seas ecoregion includes all or parts of the Exclusive Economic Zones (EEZs) of three current EU Member States (Irelands, UK, and France) and of the Isle of Man. The ecoregion ranges from north of Shetland to Brittany in the south and includes subdivision VIIg. Total allowable catch (TAC) is the main fishery management tool in the ICES designated Celtic Seas ecoregion. These TACs were introduced for most stocks in 1982, but the TACs (and quotas) were generally not restrictive until the early 1990s. The 2013 reform of the Common Fisheries Policy aimed to eliminate discarding through the introduction of the EU landing obligation (LO). The LO was introduced for pelagic species in 2015 and has been phased in for demersal TAC species since 2016. From 2019, the LO will apply to all TAC species, although there are some exemptions.

TACs are supplemented by a large number of technical measures which act as a fisheries management tool. For example, these include measures to improve the selectivity of towed gears (partly in order to reduce bycatch), and effort and gear restrictions. The EU Commission govern both common and regional technical measures.

Spatial management is also employed, both for fisheries and for ecosystem reasons. For example, closed areas/seasons are used to protect spawning grounds for fish. Protected areas have also been designated for habitats and species listed by EU Nature Directives. Fishery regulations are in place to restrict certain fisheries that may affect relevant habitats and species, e.g. for cold-water corals.

The waters of the Northeast Atlantic are divided by ICES into a series of divisions and sub-divisions (Figure 3.1), which are used to geo-reference the boundaries of fish stock and fisheries management areas and to coordinate scientific oceanographic and marine resource research. The planned Barryroe site survey activities are proposed to take place within ICES statistical rectangle 31E1 in sub-division VIIg (see Figure 3.6).

The waters around Ireland consist of ICES Sub-areas VI and VII which contain Divisions VIa, b and VIIa - k. The divisions are further partitioned into statistical rectangles of 0.5X latitude by 1.0X longitude, or 70 km by 55 km (3,880 km2). The Irish Exclusive Economic Zone (EEZ) is the sea area in which Ireland has special rights over the use of marine resources. It extends up to 200 nm offshore (Figure 3.1).

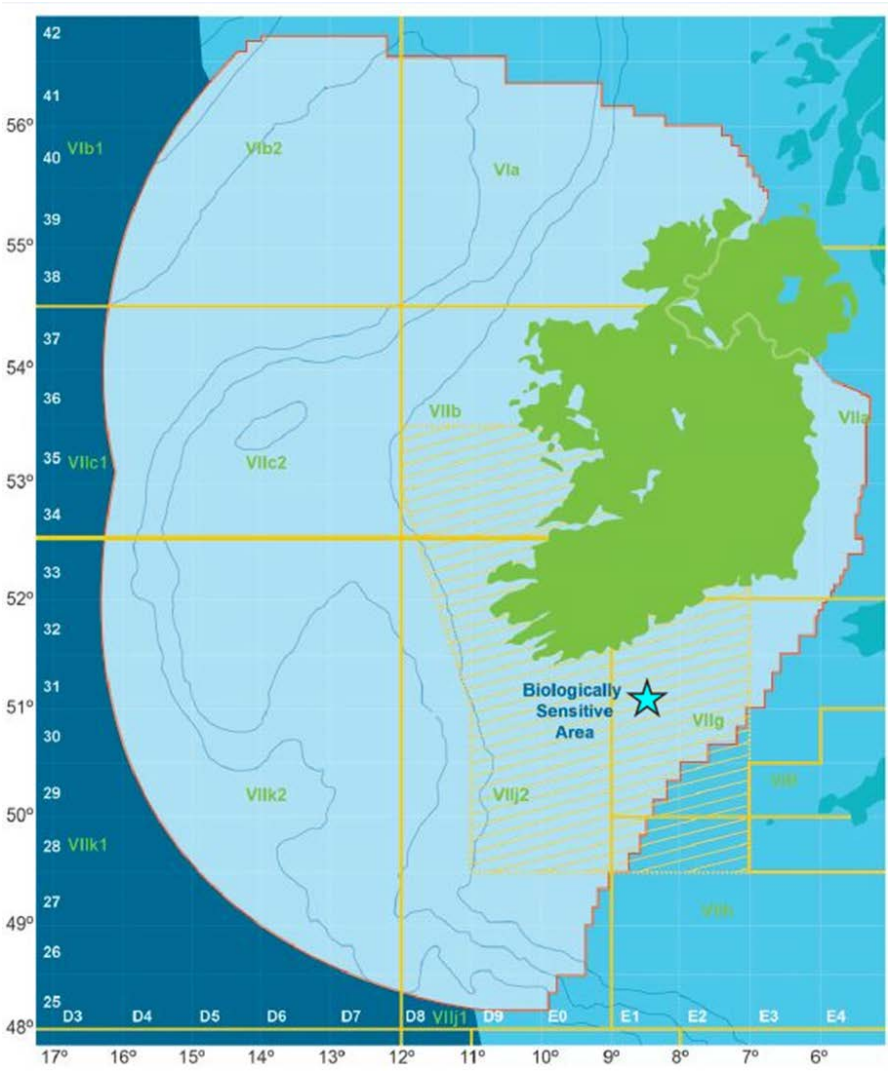


Figure 3.1 The boundaries of the ICES subdivisions within Ireland's EEZ (SFPA). Area VIIg extends southwards over the UK boundary. Barryroe site survey shown as a blue star.

The ICES is a network of more than 4000 scientists from over 350 marine institutes in 20-member countries and beyond. 1600 scientists participate in their activities annually.

ICES is committed to building a foundation of science around one key challenge: integrated ecosystem understanding of marine ecosystems. ICES advances this through the coordination of oceanic and coastal monitoring and research and advises international commissions and governments on marine policy and management issues. They provide the best available science for decision-makers to make informed choices on the sustainable use of the marine environment and ecosystems when deciding quota controls.

The Irish Naval Service acts as the official agency with responsibility for the operation of Ireland's Fisheries Monitoring Centre (FMC). The FMC is located at Naval Base, Haulbowline, Cobh, Co. Cork. This responsibility is carried out as part of a Service Level Agreement between the Department of Defence, Naval Service and the Sea Fisheries Protection Authority (SFPA).

The FMC carries out monitoring and surveillance of all fishing vessels equipped with a Vessel Monitoring System (VMS) that operate in the Irish EEZ. They patrol the waters around Ireland, monitoring and inspecting hundreds of fishing vessels from a number of different countries. They also patrol the waters of NEAFC adjacent to Irish waters to monitor Irish vessels operating in other jurisdictions. VMS is a system which processes information passed by registered fishing vessels using onboard satellite communications regarding their position, effort and catch. All vessels that are 12m and over have a VMS system on-board.

3.2. Commercial Fisheries Overview and catch statistics for 2017

Making up almost 16% of the total extent of EU waters, fisheries in the waters offshore Ireland are diverse, with many different techniques employed depending on the target species. The Irish fishing fleet is very diverse with around 2050 registered active fishing vessels. Small vessels (< 10 m) operate inshore, typically targeting shellfish with pots or demersal fish with nets. Vessels ≥ 10 m target a wide variety of species using several types of gear. Vessels in the 12–25 m length range target nephrops using trawls on several grounds around Ireland and on the Porcupine Bank. Both inshore and offshore mixed demersal fisheries use trawls and seine nets to target gadoids or benthopelagic fish (such as cod, haddock, whiting) and benthic species like plaice, dab or sole. Vessels using gillnets target hake offshore and pollack, monkfish, and cod in inshore areas. Ten Irish beam trawlers target benthic species such as megrim, monkfish, flatfish, and rays.

There are dredge fisheries for razor clams and scallops in inshore and offshore areas. About 100 vessels are engaged in aquaculture related activities, including dredging for seed mussels, and mussel and oyster dredging.

Twenty-two large (≥ 30 m) Irish pelagic fishing vessels operate across the waters offshore Ireland. Vessels using pelagic trawls target mackerel, horse mackerel, blue whiting, boarfish, and sprat. Pelagic trawling for albacore tuna occurs in these waters when the species' quota has not been exhausted in the Bay of Biscay.

Latest available figures from SFPA for 2017 show that there were 21,285 landings to Irish ports from eight countries, with a weight of 318,416 tonnes, and valued at just less than €352 million. The number of landings in 2017 were down 2.4 % from those of 2016. The overall value was 5.4% lower in 2017, with the average value per tonne in 2017 being €1,106 versus €1,347 in 2016. Irish vessels accounted for 87% of the landings, 67% of the tonnage landed and 65% of the value (SFPA).

The Irish seafood industry generates an estimated 11,600 jobs, supporting the economic viability of remote, rural and coastal communities. At production level it is estimated that 4,987 people are employed in fisheries, 1,936 in Aquaculture, 3,507 in seafood processing and 1,185 in ancillary services, (Bord Bia).

3.2.1. Demersal Fisheries

Also known as whitefish, demersal fish are slow swimmers and are not migratory. They congregate on or near the seabed. Demersal fish can be divided into two main types: strictly benthic fish

which can rest on the sea floor (e.g., flatfish), and benthopelagic fish (e.g., cod, haddock, whiting) which float in the water column just above the sea floor.

They survive on bottom-living organisms and other fish. These fish are nomadic and therefore the vessels need to be nomadic to catch them. The general pattern of demersal catches is that they decrease generally with distance offshore and increasing depth. The range of species caught in the waters of the continental shelf (up to 200 m depth) include hake, haddock, monkfish and megrim, pollack, whiting, plaice, ling and black sole. Shelf-edge species include monkfish and hake typically targeted at maximum depths of 600 m. There are spawning grounds off the coast for all the above species and the spawning period for many species is between late winter and spring.
Fishing methods employed for this diverse fishery include beam and otter trawls (bottom trawls), seine netters, gill and tangle netters, and longlines. The fishery attracts vessels from Ireland, France, Spain, Belgium and the UK.

The ICES designated Celtic Seas ecoregion groundfish community consists of over a hundred species, but the 25 most abundant of these account for 99 percent of the total estimated biomass (ICES). The most abundant species are haddock, whiting, and pout. Common flatfish species include dab, plaice, and several species of sole and megrim.

Details of the main demersal species are provided in Table 3.1, while summary descriptions of selected species (the most important commercially) are presented below:

Hake are caught in deeper waters (> 70 m) throughout the ICES designated Celtic Seas ecoregion (See Figure 3.2 below). Catches are concentrated along the continental shelf edge where the directed gillnet and longline fisheries occur. Monkfish are also common, with the highest catches on the shelf in the Celtic Sea and western English Channel. The highest megrim catches are in the western Celtic Sea.

Whiting catches are highest in the Celtic Sea south of Ireland where there are also significant catches of haddock and cod. Pollack are mainly caught in inshore areas of Cornwall and along the southern coast of Ireland.

The main nephrops catches are in the western Irish Sea, in the Minches, the Celtic Sea, and on the Porcupine Bank. There are also significant catches of scallops in the Irish Sea (around the Isle of Man) and off southern Cornwall. Brown crab catches mainly occur in coastal areas of Cornwall, northwest of Ireland, and north of Scotland.

Species	Depth in Metres	Method	Country	Season
Hake	100 m to 1,000 m	Longlines Gillnets, Trawling	Ireland, UK, Spain, France Belgium,	Year round
Cod	0 m to 500 m	Trawling, Gillnets Longlines	Ireland, France, UK, Spain, Belgium,	Year round
Angler / Monkfish	100 m to 1,000m	Trawling, Gillnets Longlines	Ireland, France, Spain, UK, Belgium, Germany	Year round
Haddock	0 m to 500 m	Trawling, Gillnets, Longlines	Ireland, France, UK, Belgium	Year round
Whiting	0 m to 500 m	Trawling – Otter trawls	Ireland, France, UK, Belgium,	Year round
Ling	100 m to 1,000 m	Trawling, Gillnets, Longlines	Ireland, Spain, France, UK, Belgium, Germany, Portugal, Norway	Year round
Saithe	100 m to 500 m	Trawling, Gillnets, Longlines	Ireland, Spain, France, UK, Belgium	Year round
Pollack	100 m to 500 m	Trawling, Gillnets, Longlines	Ireland, France, Spain, UK, Belgium	Year round
Megrim	100m to 1000m	Bottom Trawls Otter & Beam	Ireland, Spain, France, UK,	Year round

Table 3.1 Commercial demersal fisheries – target fishery species, seasonality, target depths, fishing methods employed by the national and international fleets.

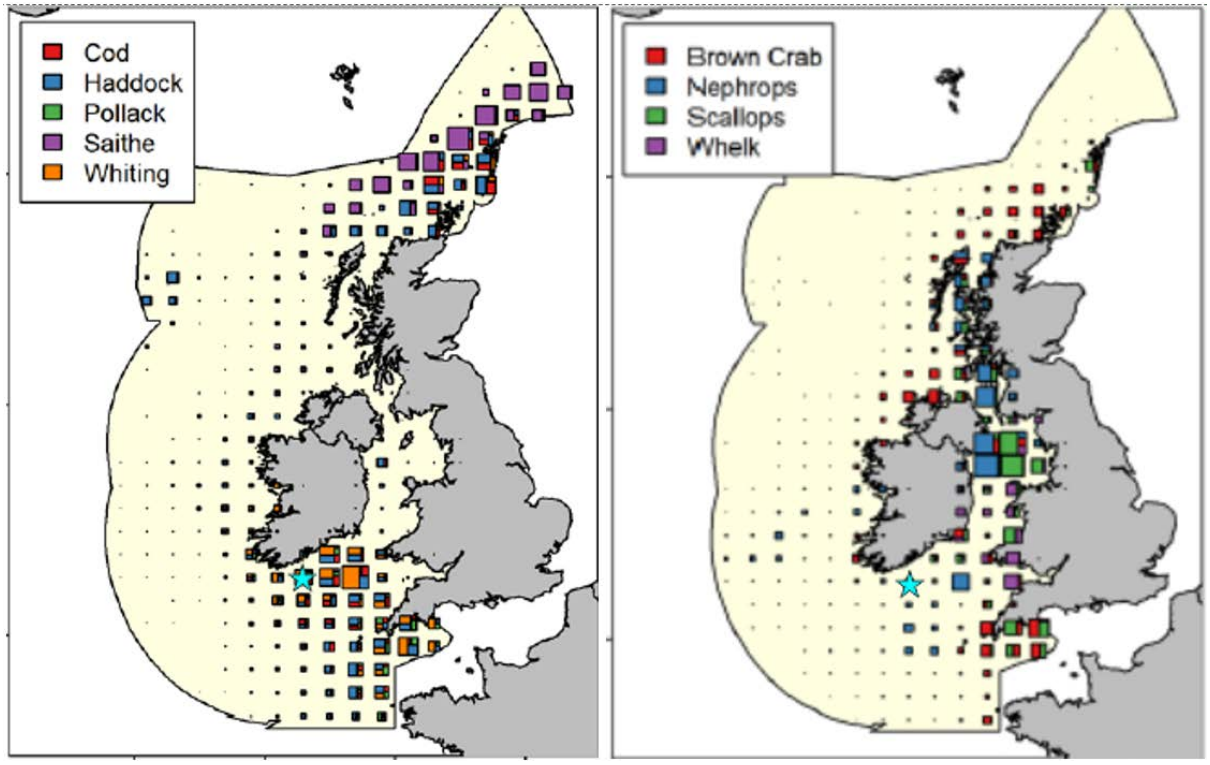
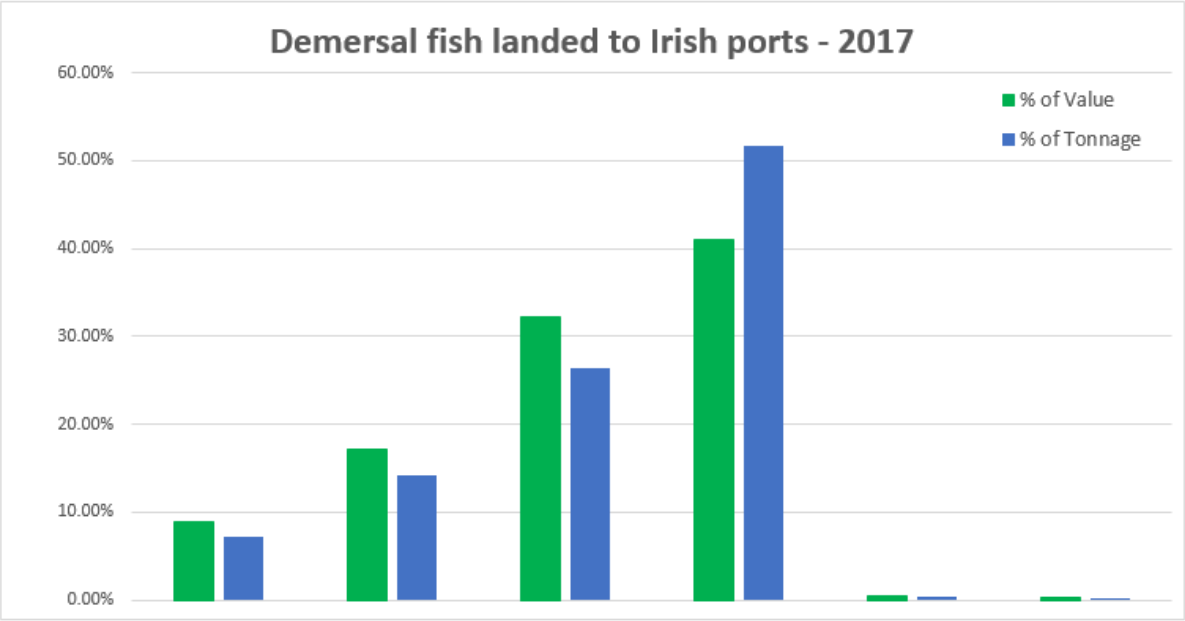


Figure 3.2 The spatial distribution of landings for the main benthic, gadoid and shellfish species around Ireland (ICES Fisheries Overview).

3.2.2. Demersal Catch statistics for 2017

The demersal sector is significant to the Irish economy. Latest available SFPA figures for 2017 show that demersal species accounted for 24% of the overall tonnage but contributed 44% of the total value of all species landed into Irish Ports.

A breakdown of demersal fish landed into Irish ports in 2017 is presented in Figure 3.3. Irish vessels landed 52% of demersal species landed into Irish ports, which was worth 41% of the overall value for demersal fish at over €65 million. For the same period the landings from French registered vessels was worth €51 million for 26% of the tonnage. Landings from Spain and UK registered vessels amounted to 21% of landing and attained 23% of the value.



	UK	SPAIN	FRANCE	IRELAND	GERMANY	BELGIUM
Tonnes	4904	9743	18072	35215	221	113
Value €'000's	14191	27437	51394	65208	710	359

Figure 3.3 Demersal landings to Irish ports in 2017 (SFPA).

Irish vessels made a total of 394 landings to ports in countries outside of Ireland in 2017. Of these landings a total of 813 tonnes of Demersal fish were landed with a first sale value of €3.5m.

3.2.3. Pelagic Fisheries

Pelagic species are those which, as adults, live in large shoals in mid-water. They are torpedo shaped fish and fast swimmers. They typically undergo extensive migrations between feeding, spawning and overwintering grounds. The principle species, mackerel, horse-mackerel, herring, blue whiting, boarfish, redfish and tuna, are caught while migrating in shoals along the shelf edge to spawn. As they progress along their migration, the effort of movement will decrease their fat content. Catch values also reduce as fat content reduces, and therefore vessels will target these species early in their migratory patterns.

Important pelagic species abundant in the Celtic Sea include herring, mackerel, sprat, boarfish and horse-mackerel and move widely between feeding and spawning grounds.

These pelagic fish are caught with dedicated pelagic refrigerated sea water (RSW) tank vessels with gears such as pelagic trawls. Alternatively, the vessels may use purse seines or trolled lures. Surface long-lines are also occasionally used for large pelagic species such as tuna. Trawling gear are usually mid-water (between surface and half way to bottom), however, at various times of year, lunar cycle, 24hr cycle, some types of fish (mackerel & horse-mackerel) will decide to lay very close off the bottom i.e. 1 – 2 m off the bottom, at daybreak and sunset for example.

Atlantic herring is a small pelagic forage fish and a key species within the Celtic Sea ecosystem. The Celtic Sea herring fishery is a single species pelagic fishery predominantly targeted by Irish fishing vessels off the south coast of Ireland. The stock is made up of autumn and winter-spawning components, with a protracted spawning period from October to January. Spawning begins inshore at the western Irish south coast and follows an eastward movement. After the spawning period, herring migrate to the offshore feeding grounds that extend from Labadie Bank to the Smalls.

Fishing of Celtic Sea herring stocks further offshore is carried out by much larger pelagic tank vessels using polyvalent mid-water trawls. 90% of this fishery is taken by Irish vessels, with the majority of the remainder taken by Dutch (5%) and UK registered vessels. The season opens in September and typically finishes up in December each year.

Boarfish form dense aggregations above banks and ridge. The fishery is open from September to April and the fish are generally taken at depths of 200 m.

Mackerel stocks overwinter along the Irish continental shelf edge, before these shoals break up and disperse further west to feed in spring and early summer. Horse-mackerel are thought to show similar migration patterns. In the first few months of each year, the Irish trawlers target these large shoals of overwintering fish along the shelf. This season generally ends in March each year. The main catches are taken at 200 m depth contour. Horse mackerel, also known as Scad, is targeted mainly by Irish and Netherlands vessels. Like Mackerel the main catches are along the continental shelf at depths of around 200 m. Mackerel and Horse Mackerel are Ireland's most valuable fishery. Details of the main pelagic species in the ICES designated Celtic Seas ecoregion are provided in Table 3.2 below.

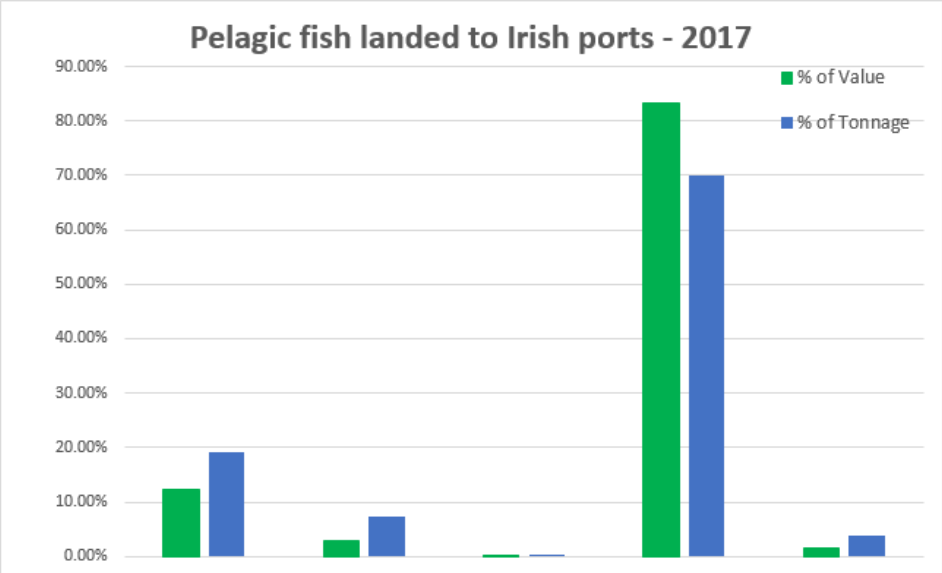
Species	Depth in Metres (m)	Method	Country	Season
Tuna	Surface To 2,000 m	Line & Poll Midwater Trawling, Purse Seine	Ireland, France, UK Spain	July to September
Mackerel & Herring	Surface To 2,000 m	Midwater Trawling, Purse Seine	Ireland, France, UK, Netherlands, Germany Poland, Lithuania	October to March
Blue whiting	Surface To 2,000 m	Midwater Trawling	Ireland, Spain, France, UK, Netherlands, Germany, Poland, Lithuania, Norway, Faroe Islands, Denmark.	January to April
Horse Mackerel	Surface To 2,000 m	Midwater Trawling	Ireland, France, UK, Netherlands, Denmark, Germany, Lithuania	September to July
Boarfish	Surface To 2,000 m	Midwater Trawling	Ireland, UK, France, Netherlands	September to April

Table 3.2 Commercial pelagic fisheries - target fishery species, seasonality, target depths, fishing methods employed by the national and international fleets.

3.2.4. Pelagic catch statistics for 2017

Latest available SFPA figures for 2017 shows that pelagic species accounted for 70% of the overall tonnage of all species landed into Irish Ports.

A breakdown of pelagic fish landings into Irish ports in 2017 is presented in Figure 3.4. 70% of all Pelagic landings in Irish ports in 2017 were from Irish vessels and accounted for 83% of the total value. UK registered vessels landed 19% of this tonnage worth 12% of the total value, and Norwegian registered vessels landed a further 7% of this fish accounting for 3% of the value; the remaining tonnage for this species class were landed by the Faroe Islands and France as shown.



	UK	NORWAY	FRANCE	IRELAND	FAROE
Tonnes	43070	16297	14	156756	8293
Value €'000's	10961	2673	9	74708	1360

Figure 3.4 Pelagic fish landings to Irish ports in 2017 (SFPA).

Pelagic statistics shown in Figure 3.4 represent those landings to Irish ports only, but Pelagic species accounted for the vast bulk of landings abroad by Irish vessels.

Pelagic species landed to Norway by Irish vessels accounted for 28% of the Norwegian tonnage and 26% its value. Pelagic landings to the UK by Irish vessels represented 26% of the UK tonnage and 35% of its value. The landings to France and Denmark by Irish vessels accounting for 8 and 10% of the tonnage and 29% and 8% of the overall value respectively.

3.2.5. Nephrops Fishery

This is the most valuable demersal fishery in Ireland and the second most important fishery after mackerel for Irish fishermen. The soft sediments in the North Celtic Sea are characterized by burrowing megafauna, including the most important commercial crustacean - Norway lobster. The coarser sediments are habitats for commercially important shellfish species, e.g. king scallop and queen scallop.

Nephrops construct and occupy burrows within the muddy sediment at depths from 800m up to the 15m contour. Adult Nephrops do not migrate once they occupy a burrow and only emerge to forage and to mate, and it is at this time that they are available to be caught by commercial fisheries.

There are about 20 main Nephrops fishing grounds in Irish waters. These are managed within eight Functional Units (FU) (see Figure 3.5) which helps to prevent uneven exploitation. Irish SW and SE coast management falls into FU 19 in which there are multiple small but important grounds i.e. Cork, Galley, Helvick and Bantry Bay grounds. The Cork grounds are in 31E1, see Figure 3.5 and Figure 3.6.

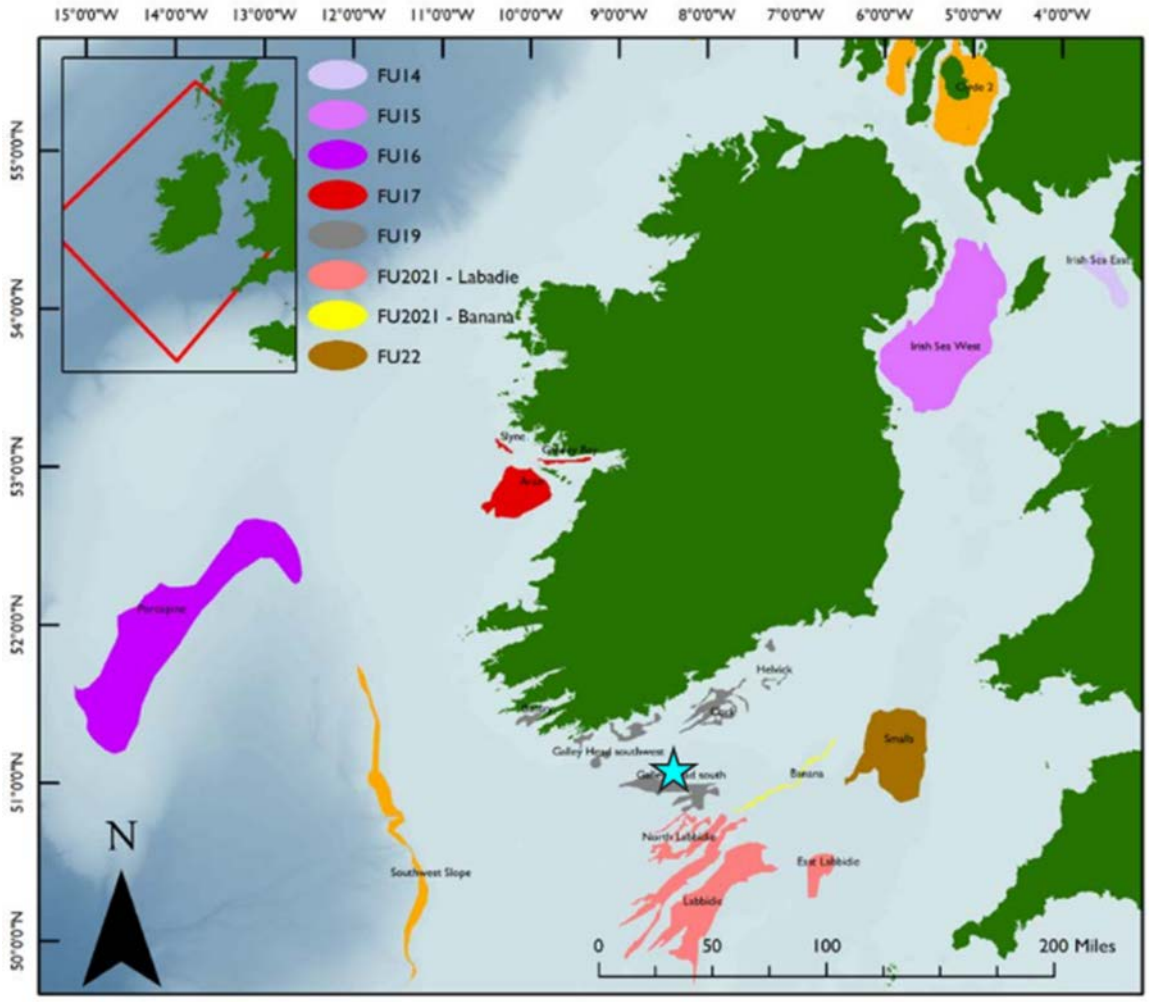


Figure 3.5 Spatial extent of primary Nephrops fishing grounds in Irish waters. Individual grounds are coloured by relevant Functional Units (FUs) (Marine Institute).

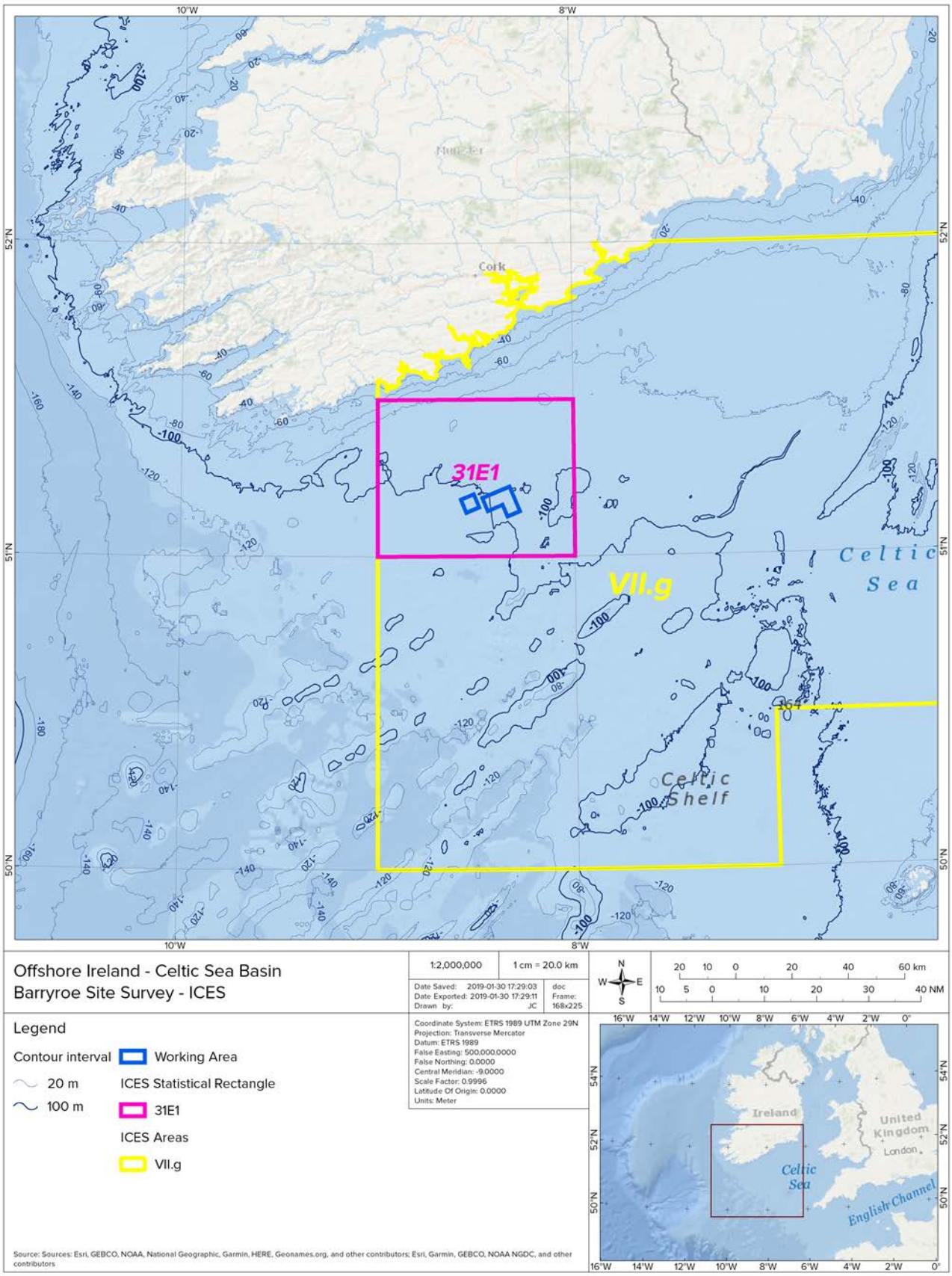


Figure 3.6 Location of statistical rectangle 31E1.

The Celtic Sea Area FUs 19-22 (see Figure 3.5) support a large multinational targeted Nephrops fishery yielding estimated landings of 7,408 tonnes annually over the last decade (ICES, 2017).

The Nephrops fishery is active from April through to October and are mainly exploited using otter trawls. There are big tidal effects on this fishery around the spring-neap tidal cycle. Vessels have a preference for the slacker neap tides. Vessels will work during daytime and night-time hours, but generally the greatest potential catch is at sunrise and to a lesser extent at sunset.

Nephrops fishing vessels need to tow their trawls in a straight line, and any deviation from this arrangement has negative effects on the gear and ultimately the catch (in a sense similar to seismic towed gear).

3.3. Fishing Methods in survey area

The dominant fishing method in the 31E1 area, see Figure 3.6, is demersal using otter trawling which is mainly used to catch monkfish, megrim, nephrops, haddock and whiting. Other gears in use in the area include, seine nets targeting haddock, hake and whiting; gillnets targeting hake and black or white pollack; and pelagic trawls targeting herring.

3.3.1. Bottom (Otter) Trawling / Seining

The scientific community divides bottom trawling into benthic trawling and demersal trawling. Benthic trawling is towing a net at the very bottom of the ocean (i.e. nephrops effort) and demersal trawling is towing a net just above the benthic zone. Bottom trawling can be contrasted with mid-water trawling (also known as pelagic trawling), where a net is towed higher in the water column. Bottom trawling targets both bottom-living fish (benthic) and semi-pelagic or gadoid species such as cod, haddock, and whiting. Bottom trawling can be carried out by one trawler or by two trawlers fishing cooperatively (pair trawling).

Otter trawlers and demersal seiners account for the majority of the fishing effort in the Celtic Sea. The Belgian fleet have around 21 vessels between 18 – 24 m working in the Irish & Celtic Sea using beam trawls and otter trawls. The French offshore fishery in the Celtic Sea Divisions VIIg and VIIh has around 350 vessels mostly composed of 18 – 35 m bottom trawlers targeting nephrops, monkfish, megrim and rays, with less than 10 vessels using seine nets. The Irish offshore mixed demersal fisheries use trawls and seine nets. There are ten Irish >15 m beam trawlers operating in the sandy waters of the Celtic Sea targeting megrim, monkfish and rays in Division VIIg. Some UK or Scottish mixed fishery vessels engage in trawling in the Celtic Sea.

In general, demersal trawlers use a gear ratio of 2:1 to 5:1 depending on the water depth they are working in. In ICES area 31E1 the water depth is 100 m and fishers will deploy +/-200 m of wire in this area. They can have single trawls (2 wires) or double trawls (3 wires) and generally try to tow in a NE/SW direction. A normal trawl can last for 4 – 7 hours, and usually there is one hour between hauling and redeployment.

3.3.2. Long-lining

This type of fishing is carried out by means of baited hooks attached to a nylon line which is at the same time attached to the main line. These main lines, with the hanging baited hooks, are launched from the vessels, thus forming several miles long lines which are anchored. They are left for a certain period in order to make catches that are then hauled on board. Long lining can be divided into surface or pelagic longline, used to catch fish such as tuna and swordfish, or bottom-set or demersal longlines placed on the sea floor, to catch fish such as hake or cod. Long-lining is concentrated on the continental shelf and slope, and not to be expected in or around the proposed site survey area.

3.3.3. Gillnetters

A bottom-set gillnet consists of a single netting wall kept almost vertical by a float-line and a weighted ground-line. The means of capture is that the fish are gilled, entangled or enmeshed in the netting. The net is set on the bottom, or at a certain distance above it and kept stationary by anchors or weights on both ends. Small solid floats, usually made of plastic and either cylindrical or egg-shaped, are attached to the headline and lead weights are evenly distributed along the ground line. The netting is made of multifilament nylon, monofilament or multi-monofilament fibres to keep the visibility of the gear low. The size distribution of the catch is very much dependant on the mesh size used in the gillnet. According to their design, ballasting and buoyance, these nets may be used to fish near to the surface, in mid-water or at the bottom in sea waters. The target species for gillnetters are pelagic, demersal and benthic species.

A large number of gillnetters (<12 m) are active in the Celtic Sea. While the primary target of gillnetters operating in division VIIg is cod, gillnetters also target hake, black pollack and white pollack.

3.3.4. Mid-water Trawling

Mid-water trawling is net fishing, at a depth that is higher in the water column than the bottom of the ocean. Mid-water trawling is also known as pelagic trawling. In mid-water trawling, a cone-shaped net can be towed behind a single boat and spread by trawl doors, or it can be towed behind two boats (pair trawling) which act as the spreading device. Mid-water trawling targets pelagic fish such as mackerel, horse mackerel and blue whiting.

The dedicated pelagic vessels are called Refrigerated Sea Water vessels or RSW vessels for short and are only active for about 5 months of the year targeting a single species at a time. A typical Irish RSW vessel uses pair pelagic trawls for targeting pelagic species. Pelagic trawls are much larger than trawls which catch whitefish. The trawls are normally towed between two vessels at around 4.5 knots. Pelagic trawls are towed at the appropriate level in the water column to intercept target shoals, with gear depth being controlled by altering towing speed and/or warp length. As a result, there is no impact on bottom habitats and bottom structures.

Sophisticated sensors on the net can tell the skipper how much fish is in the net, allowing the skipper to have control over how much fish can be caught at a time. This is important as each vessel has its own quota for each species and if they are coming close to the amount they can take, they can set the sensors to only catch the remaining amount they are allowed.

The main Celtic Sea Herring fishery in division VIIg takes place during the autumn and winter months on offshore feeding grounds south of Ireland. Irish, Netherlands and Germany exploit this fishery using two types of vessels, larger boats with RSW storage and smaller dry-hold vessels.

3.4. Irish discharge Ports

Some of the main discharge ports for fishing vessels operating off the south coast are shown in Figure 3.7 and the rest are listed below. Irish vessels, along with many EU vessels discharge at these ports. At times the EU boats transit to their home ports to discharge their catches and re-stock their vessels.

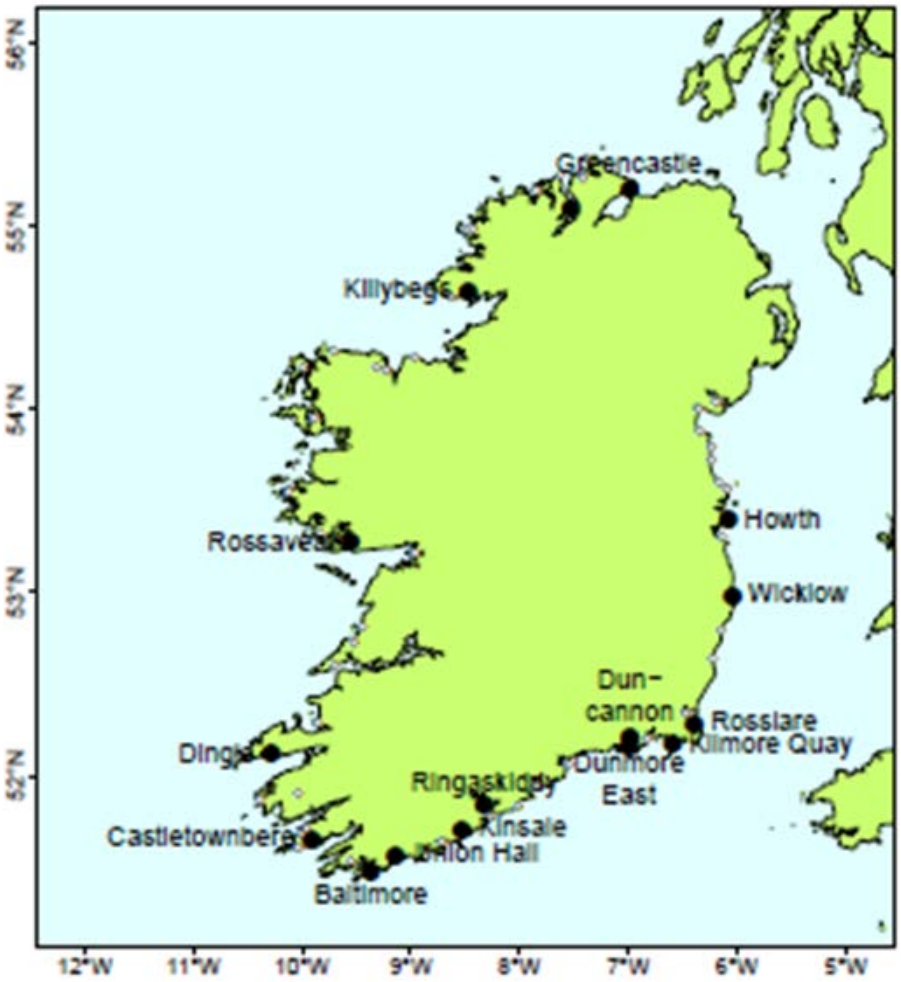


Figure 3.7 The main Irish Fisheries Ports.

3.4.1. Castletownbere Fishery Harbour Centre (FHC)

Castletownbere FHC is known as Ireland's premier 'whitefish' port. In terms of all landings for 2017, Castletownbere FHC was the largest with total landings of 36,446 tonnes with a value of EUR 112,297,775. Demersal & nephrops landings from Irish, French and Spanish boats are the main landings in this port with a total of 31,406 tonnes of demersal fish landed in 2017.

3.4.2. Union Hall Fishery Harbour Centre

The fishing village of Union Hall is situated approximately 74km southwest of Cork city. The main species landed are demersal and nephrops by mostly Irish vessels but some French vessels land catch at this port also.

3.4.3. Dunmore East Fishery Harbour Centre

Dunmore East is a major fishing port situated at the southern end of Dunmore Bay, on the western side of the entrance to Waterford Harbour. Crowded during the Autumn Herring and Spring Fishing seasons, the main species landed are pelagic, demersal and shellfish.

3.4.4. Other ports

Fishermen will discharge their catches at other smaller but important ports along the south coast including: -

- Ballycotton
- Crosshaven
- Cobh
- Ringsaskiddy
- Youghal
- Kinsale
- Baltimore
- Dingle

The south coast of Ireland is of particular importance for smaller vessels (<10m), which tend to be local 'day boats' fishing from and landing to local ports around the south coast.

The most important southerly ports for landings of demersal species are Castletownbere, Dingle and Dunmore East which are among the top ten ports by weight landed and by value in Ireland. These ports also receive pelagic landings.

The landings data shown in Figure 3.8 below are from ports on the south coast, and feature in the top 20 ports by weight in the SFPA 2017 landing statistics www.sfpa.ie

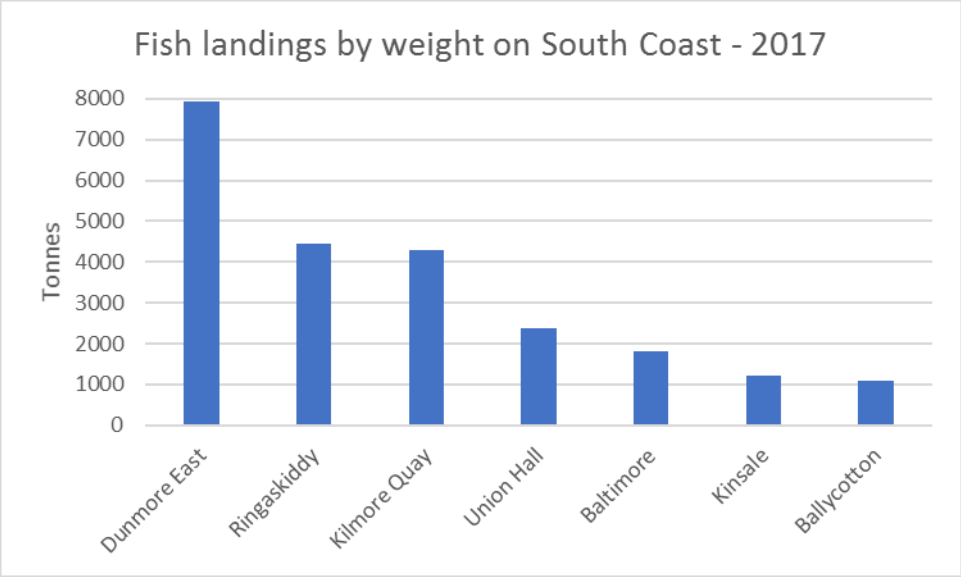


Figure 3.8 Landings by weight in south coast ports - 2017

These same ports feature in the top 20 ports by value for 2017 – see Figure 3.9.

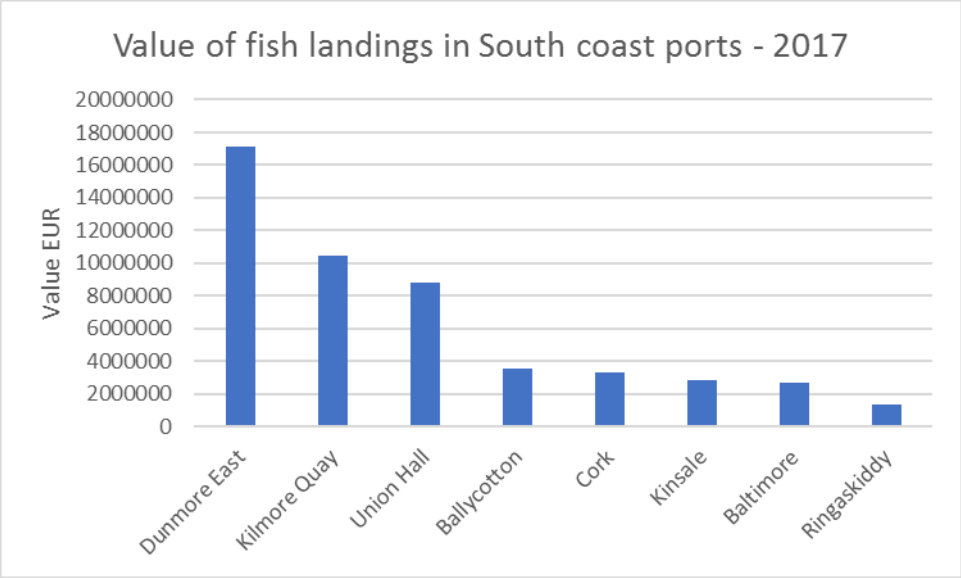


Figure 3.9 Landings by value in south coast ports - 2017

Whiting, haddock and nephrops make up the largest components of these landings. Other important species taken from the south and southwest coast of Ireland are monkfish, hake, ling, lemon sole, megrim, black pollack, john dory, gurnard, turbot, pollack, and witch.

4. Stakeholder Analysis

4.1. Fisheries Notification

In preparation for the proposed Barryroe site survey, Exola, through Sinbad Offshore Support Ltd have furnished the key Irish Fish Producer Organisations (FPOs - listed at section 3.2), with details of the location and timing of the proposed survey activities in January 2019. Engagement is open and will remain so until the surveys have been completed.

The Sea Fisheries Protection Agency (SFPA) have also been furnished with the map of the proposed survey location. When requested to advise on fishing levels and activities in the area, the SFPA provided the following response: -

> *"This site is located in a very active area for demersal fisheries. There is considerable fishing for prawn (nephrops) and mixed whitefish.*
>
> 1. *Demersal fishery – extensive demersal fishery with a wide range of vessels fishing this ground, from small to large demersal trawlers.*
> 2. *Whitefish/Prawn fishing is very mixed with a lot of different species including cod, haddock, whiting, monkfish, megrim, hake and prawns.*
> 3. *Whitefish vessels are mainly Irish, British and French – trawlers and gillnetters.*
> 4. *Shellfish, Crab & Lobster - no VMS data available as vessels too small.*
> 5. *Pelagic fishery comprises of the Celtic Sea herring fishery which usually starts in September through to the end of year.*
> 6. *Boarfish fishing is a possibility; with Ireland's large pelagic fleet having most of the EU quota.*
> 7. *The Albacore tuna fishery is active during the summer months, however there isn't usually much fishing in this area.*
>
> *If you have any other queries, please let me know."*

4.2. Key Fishing organisations - Fish Producer Organisations (FPO)

The updated factsheet regarding the proposed site survey was sent to the following Irish FPO's in January 2019:-

KFO	-	Killybegs Fishermen's Organisation
IS&W	-	Irish South & West Fish Producers Organisation
IS&E	-	Irish South & East Fish Producers Organisation
IFPO	-	Irish Fish Producers Organisation
ANIFPO	-	Anglo North Irish Fish Producers Organisation
CSHMAC	-	Celtic Sea Herring Management Advisory Committee

No questions or comments were received from the FPO's.

4.3. Communication strategy

Exola has addopted the following communications measures, which are considered as best practice, for the notification of fisheries: -

A. Notification of the survey activity and vessel details to be given in detail in a 'Marine Notice' to be published on the Irish Department of Transport website. This Marine Notice will also be sent to all Irish Harbour authorities.

B. A Radio Navigation Warning to be broadcast numerous times daily by the Irish Coastguard for the duration of the surveying activities.

C. Notification of the surveys to be given in detail in a Notice to Fishermen which will be published by way of advertisements to be placed in "Kingfisher Fortnightly Bulletin" an online publication for fishermen and the oil and gas industry. Advertisements also to be included in monthly editions of well-known Irish fishing journals "The Marine Times" and "The Irish Skipper". These publications have a wide UK, Scottish and Irish fishing industry audience and readership.

D. In the case of other EU nationalities, a "Multi-lingual notification campaign" comprising a translated factsheet to be distributed to a comprehensive list of fishing organisations and vessel owners in those countries identified in the VMS data (Figure 5.1) outlining details of the planned survey operation. The notices will include a known point of contact ashore.

E. Regular Securitae messages will be broadcast by the survey vessel over VHF radio on agreed working channel. The survey vessel movements can be broadcast to fishers in a daily 24-hr lookahead message to allow fishers adequate time to give clearance.

4.4. Commercial Traffic / Navigation

CSO figures for 2017 show that the Port of Cork had 1,263 vessel arrivals and handled 217,774 TEU of cargo units and 8,967,000 tonnes of cargo, representing 22.75% of cargo handled in all of Irelands ports.

Facilities at the Port of Cork include deep-water, RoRo, ferry, cruise and general-purpose terminals. The route schedule is shown in Table 4.1.

The Port of Cork is the only port in Ireland with a dedicated cruise berth which is located in Cobh. At the time of writing this report (January 2019) there are 68 cruise vessels scheduled to visit Cork in 2019, most of which will have gross tonnage in excess of 20,000 tonnes. These figures are subject to change as some vessels may cancel due to weather, or more cruise vessels may decide to make a port call.

The south coast of Ireland is home to many recreational craft marinas. Sailing and day cruising are popular pastimes. International yacht or sail racing can also take place in the area.

The nearest weather buoy is a 2.5 metre ODAS Buoy M5 located at 51.6900°N 06.7040°W.

Figure 4.1 Shipping routes from Cork Port.

The Marine Institute (MI) or the Irish Fishing Industry will generally conduct a Boarfish survey during summer months each year, The MI may conduct other fishery studies around the area and details can be found at http://www.marine.ie/Home/site-area/infrastructure-facilities/research-vessels/vessel-schedules .

International fishing survey vessels from countries like Canada, Russia, Faroe Islands amongst others may also conduct fishery research studies and surveys in and around the area during the proposed site survey.

Interaction with commercial traffic is expected to be unlikely, however it is recommended that good communication is followed for the duration of the site survey activities.

Shipping routes and schedules from Cork Port				
Day	**Route**		**Type**	**Operator**
Sunday	Tivoli	Antwerp	LoLo	Eucon Shipping & Transport
Sunday	Tivoli	Dublin	LoLo	Eucon Shipping & Transport
Monday	Tivoli	Liverpool	LoLo	BG Freightline (Leeside Shipping)
Tuesday	Tivoli	Rotterdam	LoLo	BG Freightline (Leeside Shipping)
Wednesday	Ringaskiddy	Santander	RoRo / Pass	Brittany Ferries
Thursday	Tivoli	Rotterdam	LoLo	X-Press Container Lines
Friday	Tivoli	Dublin	LoLo	X-Press Container Lines
Friday	Ringaskiddy	Tilbury	LoLo	Maersk Shipping
Friday	Ringaskiddy	Rotterdam	LoLo	Maersk Shipping
Friday	Ringaskiddy	Bremerhaven	LoLo	Maersk Shipping
Friday	Ringaskiddy	America	LoLo	Maersk Shipping
Friday	Ringaskiddy	Santander	RoRo / Pass	Brittany Ferries
Friday	Tivoli	Southampton	LoLo	X-Press Container Lines
Saturday	Ringaskiddy	Roscoff	RoRo / Pass	Brittany Ferries
Saturday	Tivoli	Rotterdam	LoLo	Samskip Multimodal
Saturday	Ringaskiddy	Med	RoRo / LoLo	Grimaldi (Ocean & General)
Saturday	Ringaskiddy	Esbjerg	RoRo / LoLo	Grimaldi (Ocean & General)
Saturday	Ringaskiddy	Wallhamn	RoRo / LoLo	Grimaldi (Ocean & General)
Saturday	Ringaskiddy	Antwerp	RoRo / LoLo	Grimaldi (Ocean & General)
Saturday	Tivoli	Dublin	LoLo	Samskip Multimodal
Saturday	Tivoli	Waterford	LoLo	Samskip Multimodal
Saturday	Ringaskiddy	Bristol	RoRo / LoLo	Grimaldi (Ocean & General)

Table 4.1 Cork shipping schedules and routes.

5. Analysis of fisheries data

5.1. Summary of VMS data for 2016, 2017 and 2018

The FMC at the Naval Services have provided VMS data relating to the fishery statistical rectangle 31E1 for April to September 2016, 2017 and 2018. It encompasses the entire SEL 1/11 area, within which the proposed site survey activities will be located. The FMC supplied the data in tabular format (.xls) showing dates and time of vessel monitoring, nationality codes, vessel ID numbers, ICES areas, statistical rectangle numbers, along with vessel speeds and courses. Other vessel identification like names, callsigns, IMO or MMSI numbers were not presented, and in this respect, the vessel identities remain protected and private.

The VMS data shows all fishing vessels ≥12m working over and around the proposed site survey area within ICES fishery subdivision VIIg, statistical rectangle 31E1. Each statistical rectangle covers an area of approximately 70 km x 55 km (3880 km2). The proposed site survey activities lie towards the middle of 31E1 as shown in Figure 5.2 to Figure 5.4. From the data supplied, we have been able to determine the nationality and numbers of individual vessels present over the respective periods.

Table 5.1 below shows the numbers of individual fishing vessel sightings by nationality in ICES statistical rectangle 31E1 for April to September over a three-year period 2016, 2017 and 2018.

	ESP	FRA	IRL	GBR	NLD	BEL	DEU	Totals
2016	1	21	114	14	1	0	1	152
2017	2	24	99	12	3	9	0	149
2018	3	19	123	8	1	4	0	158
Totals	6	64	336	34	5	13	1	459
%Effort	1%	14%	73%	7%	1%	3%	0.22%	100.00%

Table 5.1 VMS data of individual fishing vessel numbers recorded by flag in 31E1.

Ireland accounts for 73% of fishing effort in the statistical rectangle 31E1 over the past three years (April – September) followed by France 14% and UK at 7%.

Irish vessels fishing in this area are predominantly demersal, otter and beam trawlers, seiners and gillnetters.

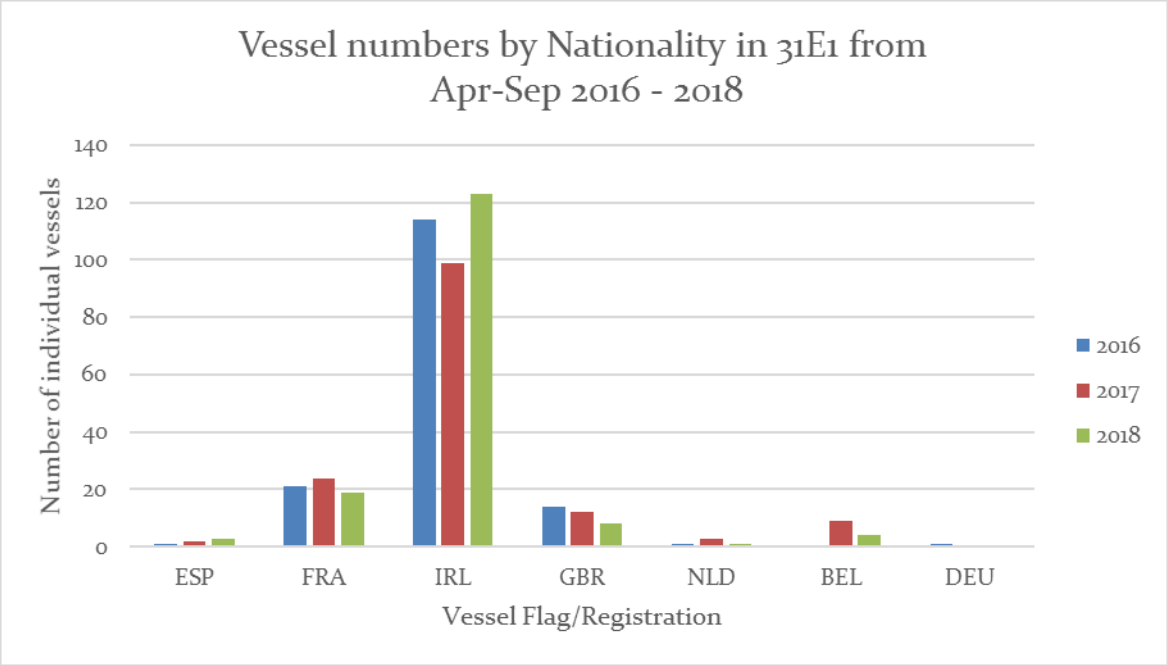


Figure 5.1 VMS data of individual fishing vessel numbers recorded by flag in 31E1.

Some of the French flagged vessels in the area are beneficially owned and crewed by Irish, UK and Spanish owners and operators.

The average vessel speeds for the large Dutch trawlers in the area was 11kts indicating that they were in transit, and not engaged in fishing activity in this area.

The following diagrams, Figure 5.2 to Figure 5.4, provided by FMC at the Naval base are a visual representation of each vessel sighting during April to September in each year. The screenshots shown represent ICES statistical rectangle 31E1 in its entirety within ICES sub-division VIIg. The proposed site survey working area has been overlaid onto the diagrams for reference.

The coordinates of ICES statistical rectangle 31E1 are as follows: -

ETRS 1989 (WGS 1984)	
DD Latitude	**DD Longitude**
51.5000	-8.0000
51.0000	-8.0000
51.5000	-9.0000
51.0000	-9.0000

Table 5.2 Coordinates for ICES statistical rectangle 31E1.

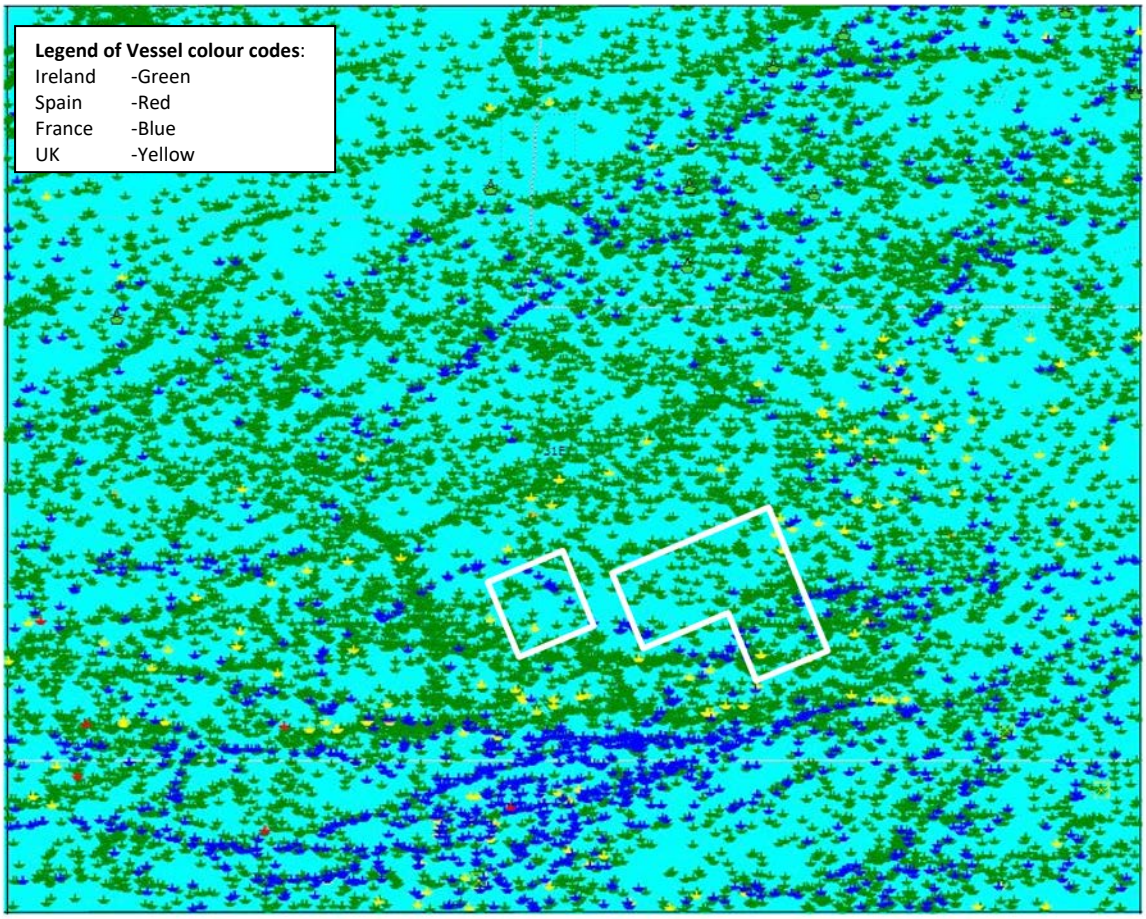


Figure 5.2 VMS screenshot of 31E1 from Apr-Sep 2016.

There was a total of 152 individual vessels working in 31E1 during this period in 2016.

The density of vessel activity above is uniform throughout the quadrant. This represents the fishing effort of mainly Irish and French demersal vessels working over the Kinsale Head grounds north of the Labadie bank. Some UK flag vessels can also be seen.

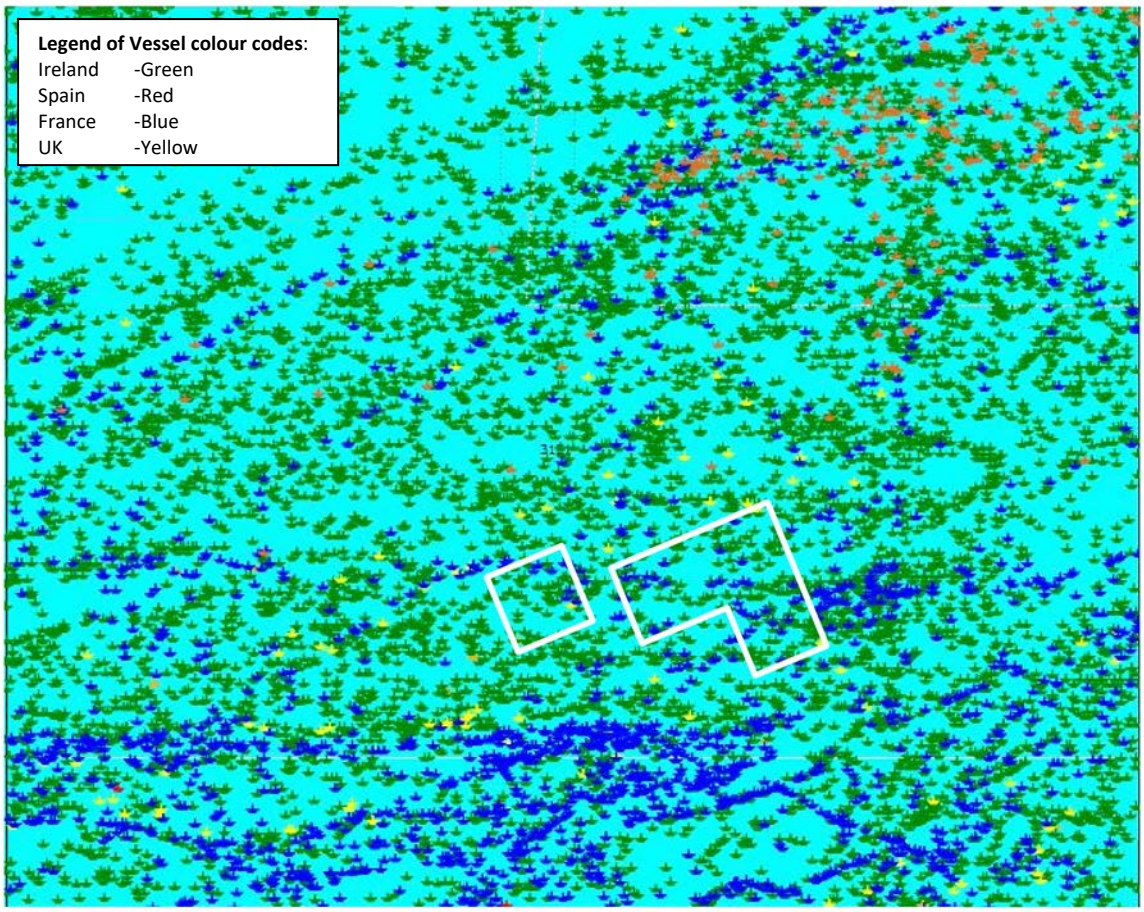


Figure 5.3 VMS screenshot of 31E1 from Apr-Sep 2017.

There was a total of 149 individual vessels working in 31E1 during this period in 2017.

The distribution of vessels over the shelf is consistent with 2016 findings, except with lesser numbers.

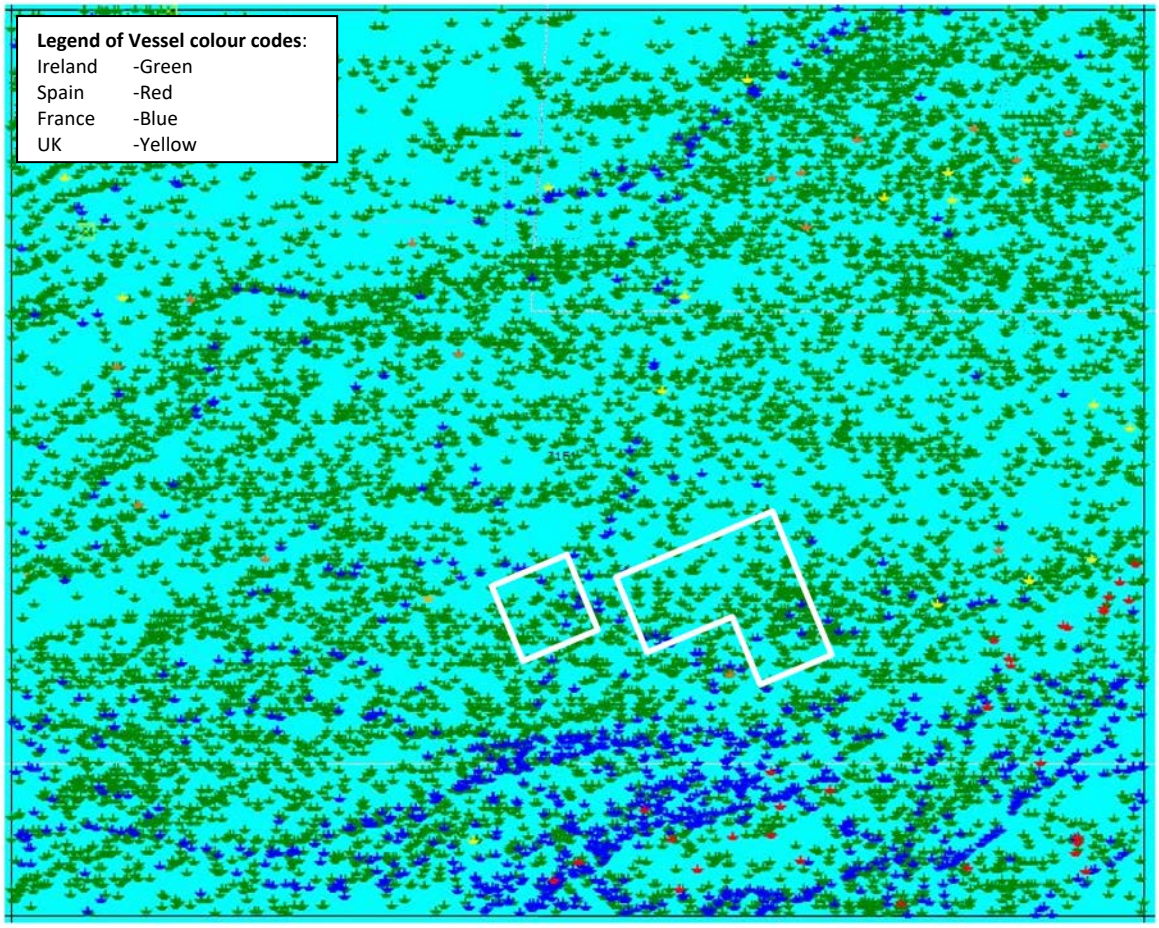


Figure 5.4 VMS screenshot of 31E1 from Apr-Sep 2018.

There was a total of 158 individual vessels working in 31E1 during this period in 2018.

Again, the pattern of the main distribution of vessels remains consistent with the previous two years, with the busiest months being May and September. The average speed of vessels in 31D1 during the period was 3kts indicating that vessels were engaged in fishing.

5.2. Summary of fisheries interaction / potential impacts

There are many diverse forms of fishing around the south and southwest coast of Ireland from aquaculture and inshore fisheries, to the offshore fisheries. This report has concentrated on the fishing efforts in ICES statistical rectangle 31E1 on the basis that the proposed site survey activities will take place within this area.

The following is the summary of the fishing efforts in and around the proposed site survey area, and the possible interaction with the survey activities.

5.2.1. Nephrops Fishery:

This is the most valuable demersal fishery in Ireland and the second most important fishery after mackerel for Irish fishermen. Species include prawns, Dublin Bay prawns, Norway Lobster, scampi and langoustine. Prawns inhabit muddy sediment and live in burrows. They leave their burrows only to forage or mate, and it is at this time that they are available to be caught by commercial fisheries.

The proposed Barryroe site survey area is in Functional Unit 19 which contains the 'Cork' and 'Galley Head South' nephrops grounds, as shown in Figure 3.5 and will feature small day-boats. Further to the southwest are the Labadie and Cockburn grounds.

This fishery is very active from April to October, with Irish and some French vessels typically 20 – 30m using otter and beam trawls. There are big tidal effects on this fishery around spring and neap tides. Vessels have a preference for slacker neap tides. These vessels may work during daytime and night-time hours, and generally the greatest potential catch is at sunrise and to a lesser extent at sunset.

Nephrops fishing vessels need to tow their trawls in a straight line, and any deviation from this arrangement has negative effects on the gear/catch. These vessels will be aware of the current exclusion zones in place around the well heads and pipelines of Seven Heads and mindful of avoiding that area. However, regular and clear communications (as outlined in the Communications Strategy in Section 4.3) with this fishery is vital for good management in order to mitigate any possible impacts between the two sectors. Securitae messages can be broadcast by the survey vessel giving details of its intended movements.

5.2.2. Crab fishery:

There is no expected impact with the crab fishery in this area, as vessels targeting it are smaller and this fishery is located closer to shore than the area in which the proposed site survey activities will be undertaken.

5.2.3. Scallop fishery:

Dredge effort is concentrated further to the east and northeast of the proposed survey area and thus no impact is expected.

5.2.4. Demersal Whitefish:

The dominant fishing method in 31E1 is demersal trawling, mainly used to catch haddock and whiting. Other gears used to target haddock and whiting are seine nets. VMS screenshots in Figure 5.2 to Figure 5.4 show that there is an extensive and very active demersal fishery in this area. It is a year-round fishery, and the VMS has shown that the busiest months for 2018 were May and September. Irish trawlers dominate this fishery in the area, with some French and UK vessels also. These vessels will be aware of the 500 m exclusion zones currently in place around the Seven Heads area, and mindful of avoiding that area, however, the survey vessel can expect to encounter these vessels and therefore regular and clear communications (as outlined in the Communication Strategy in Section 4.3) with this fishery is vital for good management in order to mitigate any possible impacts between the two sectors.

Other whitefish targeted further west and southwest are hake, monkfish and megrim and fished by a very large fleet of mobile and static gear vessels including longliners, gillnetters, seiners and trawlers. Interaction with these mainly Irish, French and UK flagged vessels may be limited to vessels in transit to and from discharge ports. The site survey activities are not expected to have any significant impact.

5.2.5. Pelagic fishery:

The main pelagic species targeted in the area are Celtic Sea herring and boarfish, and the gears used are pelagic trawls. There is a very active herring fishery to the northeast with smaller vessels ≤10m called the Dunmore Box Sentinel fishery, but no overlap with survey activities can be expected as the area is significantly east of the site survey activities and the season will have finished in January-February. The larger Irish pelagic fleet that work further offshore will have finished their effort for mackerel, horse-mackerel, herring, and blue whiting by the end of April, and therefore no interaction with this fishery is expected. There may be some pelagic trawl effort for boarfish in the area as advised by SFPA.

Around 10 – 15 large Dutch pelagic freezer-trawlers operate in the waters off the west coast of Ireland, mainly targeting horse mackerel and mackerel. It is possible that they may target boarfish in the Celtic Sea during June-July. Ireland has most of the EU quota for boarfish however, and the VMS data (Section 5) for the three years 2016 - 2018 show a total of 5 Dutch vessels in ICES rectangle 31E1, representing 1% of the overall fishing effort in the area. An average speed of 12kts indicates that they were in transit across this area. On this basis we can conclude that overlap with this fishery is possible but unlikely.

Albacore Tuna migrate from the Bay of Biscay northwards through the warm temperate waters of the Atlantic from July onwards. This fishery is very active during the summer months with considerable activity west of 11 Deg W, closer to the shelf edge. Interaction with this fishery is not likely.

6. Recommendations

- Dissemination of information to fishery stakeholders should commence as early as possible. Effective lines of communication between the on-board Fisheries Liasion Officer (FLO) and active fishing vessels should also be maintained during the survey operations.

- It is recommended that the communications package as listed at Section 4.3 on page 32 should be implemented before the survey commences, with emphasis on notifying EU fishers.

- It is recommended that all persons involved with this survey should be mindful that fishing vessels are also operating under licence and have equal status and access rights. As such it is imperative that respectful relations are developed and maintained for the duration of the proposed survey. These good relations are also important to the success of other oil & gas industry exploration in the future.

- It is recommended that a French speaking person ashore with a working knowledge of both the fishing industry and offshore operations should be available if liaison with foreign vessel owners is required. It would be envisioned that this person would work in conjunction with the FLO.

- It is recommended that in order to avoid potential confusion, coordinates to be shared with the fishing industry are always shown in WGS84 lat-long format.

7. Conclusion

Historic VMS fishing data has been analysed and detailed, and an appraisal of possible interaction with the proposed survey activities in 31E1 has been examined and outlined in this report.

Vessels engaged in Nephrops fishing will be aware of the current exclusion zones in place around the well heads and pipelines of Seven Heads and mindful of avoiding that area. However, regular and clear communications (as outlined in the Communications Strategy in Section 4.3) with this fishery is vital for good management in order to mitigate any possible impacts between the two sectors.

Vessels engaged in Demersal Whitefish fishing will be aware of the current exclusion zones in place around the well heads and pipelines of Seven Heads and mindful of avoiding that area. However, regular and clear communications (as outlined in the Communications Strategy in Section 4.3) with this fishery is vital for good management in order to mitigate any possible impacts between the two sectors.

Vessels engaged in Pelagic fishing are generally active early in the calendar year, thus interaction with this fishery is possible but unlikely.

There is no expected impact with the crab and scallop fishery in this area.

Recommendations have been made to mitigate any disruption or possible incursions with fisheries, with communication being key to fostering good working relations with fisheries. Advance notification is very important to all fishing vessels working in the area.

There are 500 m safety exclusion zones currently in place around the well heads and pipelines of Seven Heads, over which the site survey vessel with operate, fishermen are cognisant of avoiding that particular area meaning there should be no significant impact to fisheries.

Interaction with commercial traffic is expected to be unlikely, however it is recommended that good communication is followed for the duration of the site survey activities.

The communications measures adopted by Exola, which are considered as best practice, will ensure minimal interaction with other marine users.