



Environmental Support to Drilling in Irish Waters – Subcontractor Report Pre-Drilling Fisheries Study

Document No: **IE-EXP-52/04-IOLAR-HS-00013-RP-01**

Rev: **U1**

<i>Rev</i>	<i>Date</i>	<i>Reason for Revision</i>
U1	27/09/18	Issued for Use

Authorisation Record		<i>Sub-Contractor</i>	<i>Environmental Specialist</i>	<i>Environmental Specialist</i>
		<i>Sinbad Offshore Signed</i>	<i>Xodus Signed</i>	<i>Xodus Signed</i>
<i>U1</i>	<i>27/09/18</i>	<i>Eimear Stafford</i>	<i>Annette Woodham</i>	<i>Annette Woodham</i>
<i>Rev</i>	<i>Date</i>	<i>Prepared by</i>	<i>Checked by</i>	<i>Approved by</i>



XODUS
DEVELOP



Environmental Support to Drilling in Irish Waters

Subcontractor Report: Pre-drilling fisheries study

Nexen Petroleum UK Ltd

Assignment Number: A100460-S00

Document Number: A-100460-S00-REPT-006

Xodus Group
The Auction House, 63A George St
Edinburgh, UK, EH2 2JG

T +44 (0)131 510 1010
E info@xodusgroup.com
www.xodusgroup.com





Subcontractor Report: Pre-drilling fisheries study

A100460-S00

Client: Nexen Petroleum UK Ltd

Document Type: Report

Document Number: A-100460-S00-REPT-006

A01	27 Sep 2018	Issued for Use	ES Sinbad	AW Xodus	AW Xodus	
R01	14 Feb 2018	Issued for Review	ES Sinbad	AW Xodus	AW Xodus	-
Rev	Date	Description	Issued By	Checked By	Approved By	Client Approval



PRE-DRILL FISHERY ASSESSMENT
PORCUPINE BASIN
SOUTH WEST COAST OF IRELAND
FOR
NEXEN PETROLEUM U.K. LTD

Carried out by: Eimear Stafford

Eimear Stafford

Sinbad Offshore Support Limited
Church Road, Killybegs
Co. Donegal

Dated: 26th September 2018

Contents

Executive Summary.....	3
1. Introduction	
1.1 General introduction of planned exploration well	4
1.2 Well Location.....	5-6
1.3 Key geographical characteristics	6
2. Fisheries	8
2.1 Fisheries management & types of fishing	8
2.2 Fishing fleets.....	19
2.3 Fishing Methods	21
2.4 Irish discharge Ports	23-25
3. Stakeholder Analysis	26
3.1 Fisheries Engagement.....	26
3.2 Key Fishing organisations -FPO's (Fish Producer Organisations)	27
3.3 Planned communications with operational fisheries	27
3.4 Commercial Traffic / Navigation.....	27
4. Analysis of fisheries interactions	28
4.1 Summary of VMS data for 2014, 2015, 2016 and 2017	28-33
4.2 Summary of likely fisheries interaction	34-35
5. Recommendations	35
6. Conclusion	35-36

Executive Summary

Nexen Petroleum U.K. Limited is planning to drill a deep-water exploration well in Frontier Exploration Licence (FEL) 3/18 in the Porcupine Basin, approximately 232 kms off the south west coast of Ireland. FEL 3/18 (**Fig 1.**) covers an area of 1300.61 km² over offshore licence quadrants 43/27, 52/2, 52/3, 52/4, 52/9(p) and 52/10(p).

Prior to undertaking drilling operations, Nexen conducted a geotechnical survey in July 2017 in depths between 2000m and 2500m at the proposed drilling location and surrounding area to identify the seabed and subsurface geology at the site.

This Pre-Drill Fisheries Assessment report outlines the expected fishing activity in IOSEA 2 area (*specifically covering the Porcupine Basin*), IOSEA 5 area (*which includes all of the study areas used for the previous IOSEAs*), ICES area V11k2, statistical rectangle 30D6, and the scope of overlap with the planned drilling operation.

Consultations with the key fishery organisations and the Sea Fishery Protection Authority (SFPA) in advance of the 2017 site survey plans were undertaken in an effort to gather information from the fisheries perspective. Findings from these engagements are shown in Table 5 on page 26. Up to date consultations with fisheries will be undertaken again prior to commencement of drilling activities.

Fisheries Management Centre (FMC) have provided some historic VMS data from the FEL 3/18 area for 2014 to 2017 inclusive and this report examines this deepwater fishery effort. Analysis of the VMS data can be seen on pages 28 to 33.

Some deepwater fisheries and the pelagic Tuna fishery are the most likely to interact with the drilling operations. Pan-EU porcupine bank *Nephrops* fishery, and *demersal whitefish fisheries'* vessels may be encountered transiting the area of operations. The overall summary of likely interactions can be seen on pages 34 and 35.

Importantly, establishing good communications with fisheries before and during the planned drilling operations will prove key to maintaining good fisheries management during all future offshore operations. Both E&P and Fisheries industries are operating to a Licence in the waters offshore Ireland. Nexen Petroleum UK Ltd are committed to developing good communications as has been demonstrated by their keenness to engage the fisheries stakeholders at an early stage.

Recommendations can be seen on Page 35.

1. Introduction

1.1 General introduction of planned exploration well

Nexen Petroleum U.K. Ltd, is planning to drill an exploration well in the southern Porcupine Basin off the west coast of Ireland in 2019. The proposed well, located in Frontier Exploration Licence (FEL) 3/18, is located approximately 232kms off the south west coast of Ireland.

Sinbad Offshore Support have been appointed by Xodus Group on behalf of Nexen Petroleum U.K. Limited to liaise with fishery stakeholders and prepare this pre-drill fisheries study outlining the historical levels of fishing effort in the area, and the expected levels during drilling operations.

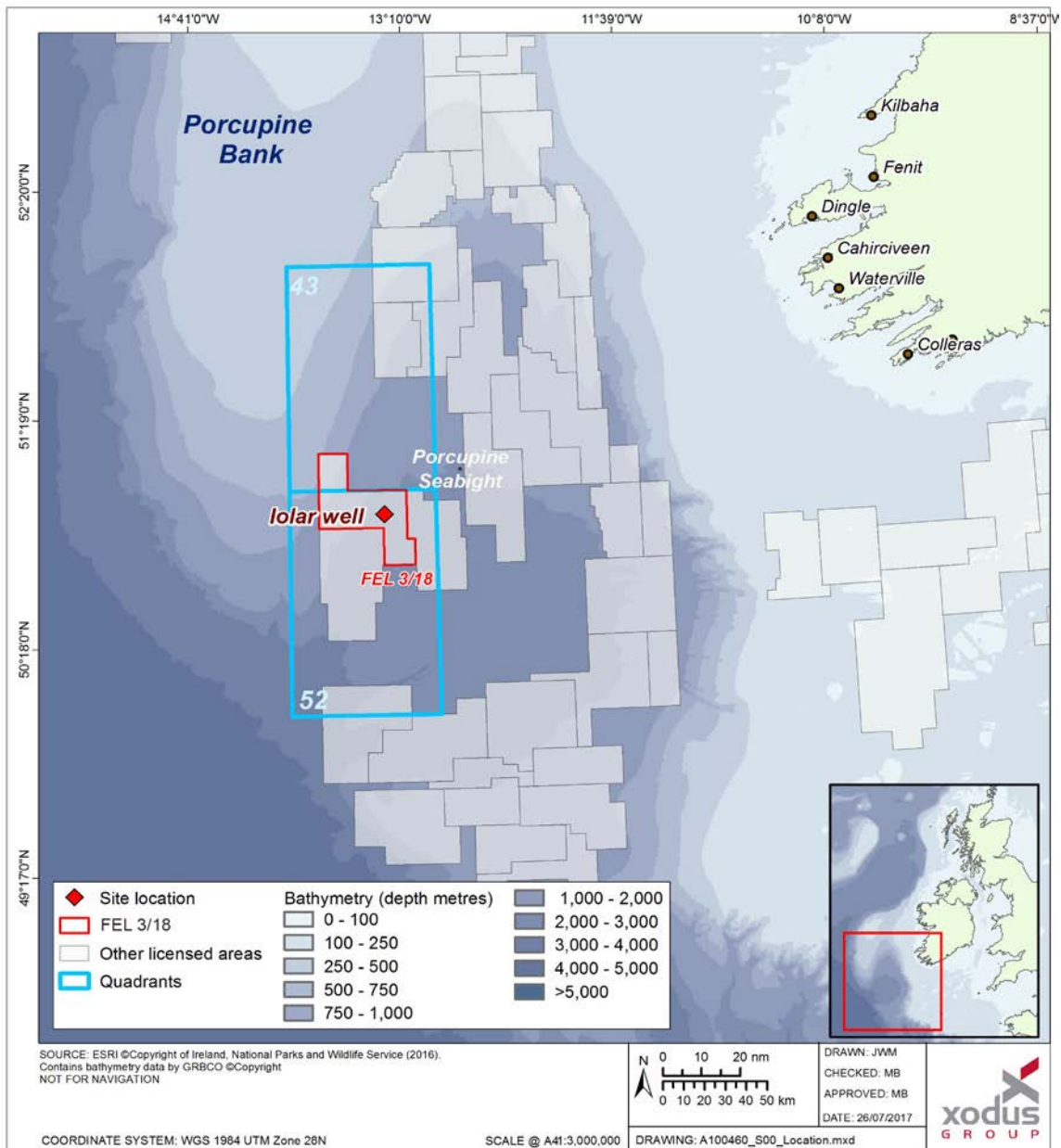


Fig 1: Map showing location offshore of Licensing Option 16/7 and outline of Iolar survey (Xodus Group).

1.2 Well Location

The coordinates of the planned Iolar exploration well are expressed in WGS84 as follows:-

UTM28N ED50	
Latitude	Longitude
50° 53' 31.16"	13° 21' 24.38"

Table 1: Iolar Well coordinates

The planned exploration well is located within water depths of approximately 2200m. The location lies in the Porcupine Seabight which is a deepwater basin which slopes southwards, on a northeast – southwest trend, and opens westwards onto the Porcupine Abyssal Plain.

The Porcupine seabight basin is bounded by three steep-sided platforms: – to the east, the Irish Continental shelf forms a continuous border, with the Slyne Ridge and the Porcupine Bank closing the seabight to the north and west respectively. The Goban Spur borders the seabight to the southeast. Water depths in the basin range from 200 – 400m on the shelf areas, to 5000m in the abyssal plain.



Fig 2: Distribution of the main fishing grounds around Ireland. (*North Western Waters Atlas 3rd edition – Marine Institute*) It is clear from **Fig.2** that the planned Iolar well location lies to the southeast of the Porcupine prawn (*Nephrops norvegicus*) fishing grounds (FU 16), which is Ireland's second most valuable fishery.

The proposed well location lies to the west of the busy pan-EU demersal fishing grounds on the slope of the Irish continental shelf – See **Fig 2**.

Most of the deep-water fisheries in the Porcupine Basin itself are exploited by the Spanish fleet and may be considered as a by-catch of mixed fisheries. They operate in different ICES Sub-areas VI, VII, using different gears (trawl, longline, gillnet). This study will describe the deep-water fisheries of the Northeast Atlantic exploited by the Spanish fleet, gears, seasonal activity and their target species.

The proposed well location is situated outside of the EU-Commission designated Biologically Sensitive Area (**BSA**). The importance of southern and southwestern Irish waters as spawning and nursery grounds for stocks such as Herring, Mackerel and Hake for example is recognised by the establishment by the EU Commission of a "Biologically Sensitive Area (BSA)" (or Irish Conservation Box) and the area is shown on the map below (**Fig. 3**).

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

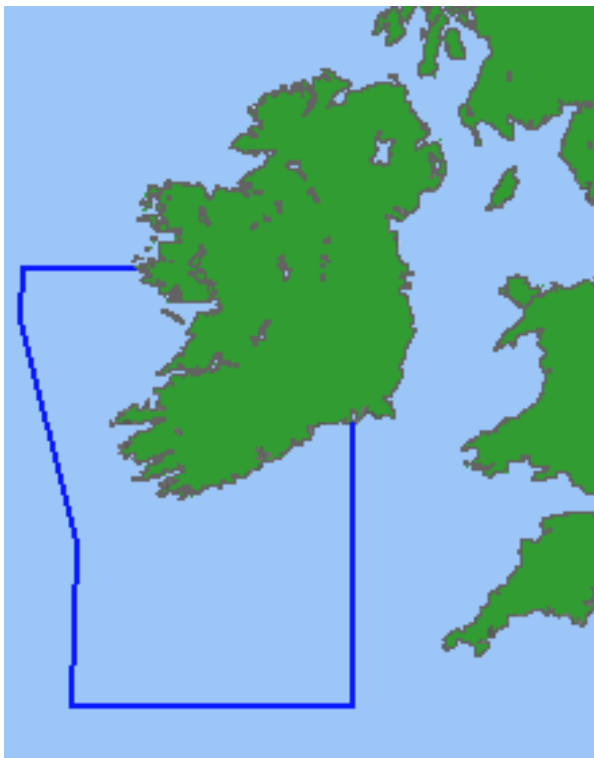


Fig 3. Biologically Sensitive Area outlined in blue, also known as Irish Conservation Box

1.3 Key geographical characteristics

The planned exploration well is located in the Porcupine Seabight basin in approximately 2200m water depth. The Porcupine Basin is a north-south trending elongate sedimentary basin located 200

km west of the Irish mainland. The basin is some 350 km long with widths varying from approximately 65 km in the north to 200 km in the south.



Fig 4: Sedimentary basins around Ireland and Britain (Marine Institute).

The well will be drilled over 100km south-west of two offshore Special Areas of Conservation (SACs) as designated in 2006 by EU Habitats Directive. Code reference IE0002328 known as the Hovland Mound Province SAC, and code reference IE00227 is known as the Belgica Mound Province SAC, named after the research vessel R/V Belgica.

The SAC sites are located at the northern and north eastern edges of the Porcupine Seabight approximately 130km west of the Blasket Islands, west coast of Ireland.

2. Fisheries

2.1 Fisheries management & types of fishing

Within the European Union, fisheries are managed through the Common Fisheries Policy (CFP). Total Allowable Catches (TACs) and effort controls are established by regulation each year for most stocks in the EU, including waters around Ireland. Some stocks are managed by the North East Atlantic Fisheries Commission (NEAFC). Responsibility for large pelagic fish lies with the International Commission for the Conservation of Atlantic Tunas (ICCAT). Collective 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), and the North Western Waters and Pelagic ACs.

The waters of the Northeast Atlantic are divided by ICES into a series of Divisions and Sub-divisions, which are used to geo-reference the boundaries of fish stocks and fisheries management areas and to coordinate scientific oceanographic and marine resource research.



Fig 5: The boundaries of the ICES subdivisions within Ireland's EEZ.

<http://www.sfpa.ie/Corporate-Affairs/Publications>

Note: The ICES subdivision in which the planned Iolar well is located is V11k2.

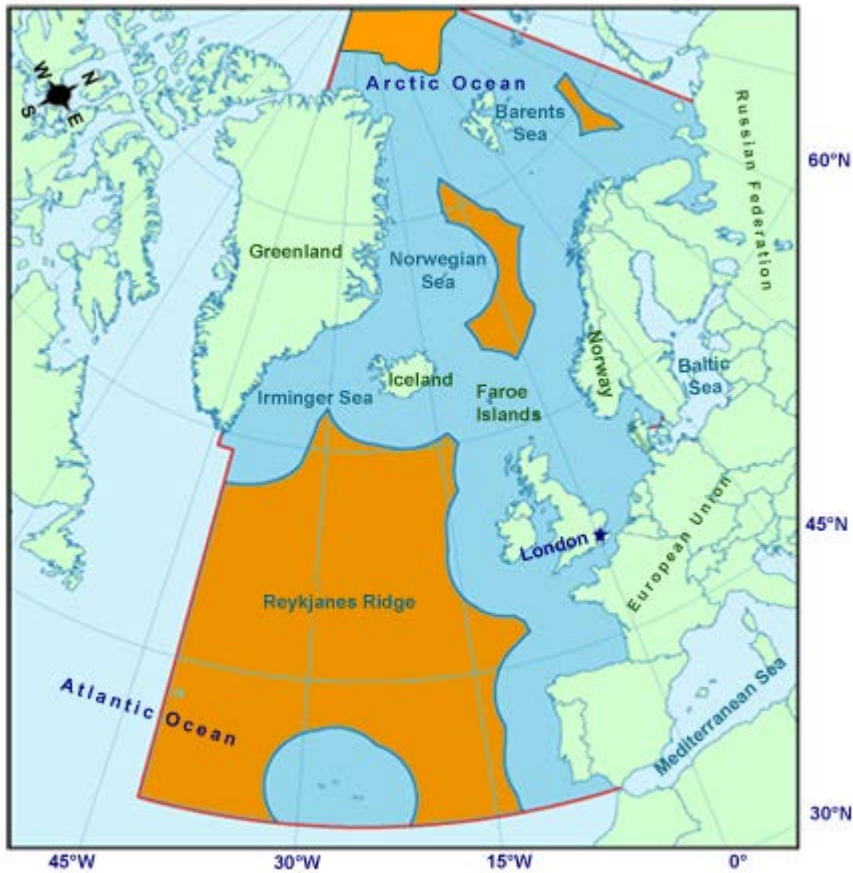


Fig 6: Map of NEAFC area <http://archive.neafc.org/about/ra.htm>
 Orange = international waters / Dark blue = NEAFC Region 1 and Region 2

The North East Atlantic Fisheries Commission (NEAFC) is the Regional Fisheries Management Organisation (RFMO) for the North-East Atlantic, one of the most abundant fishing areas in the world. The area covered by the NEAFC Convention stretches from the southern tip of Greenland, east to the Barents Sea, and south to Portugal.

NEAFC's objective is to ensure the long-term conservation and optimum utilisation of the fishery resources in the Convention Area, providing sustainable economic, environmental and social benefits. To this end, NEAFC adopts management measures for various fish stocks and control measures to ensure that they are properly implemented. NEAFC also adopts measures to protect other parts of the marine ecosystem from potential negative impacts of fisheries.

Contracting parties to NEAFC include: -

- EU
- Denmark (in respect of Faroe Islands and Greenland)
- Iceland
- Norway
- Russian Federation

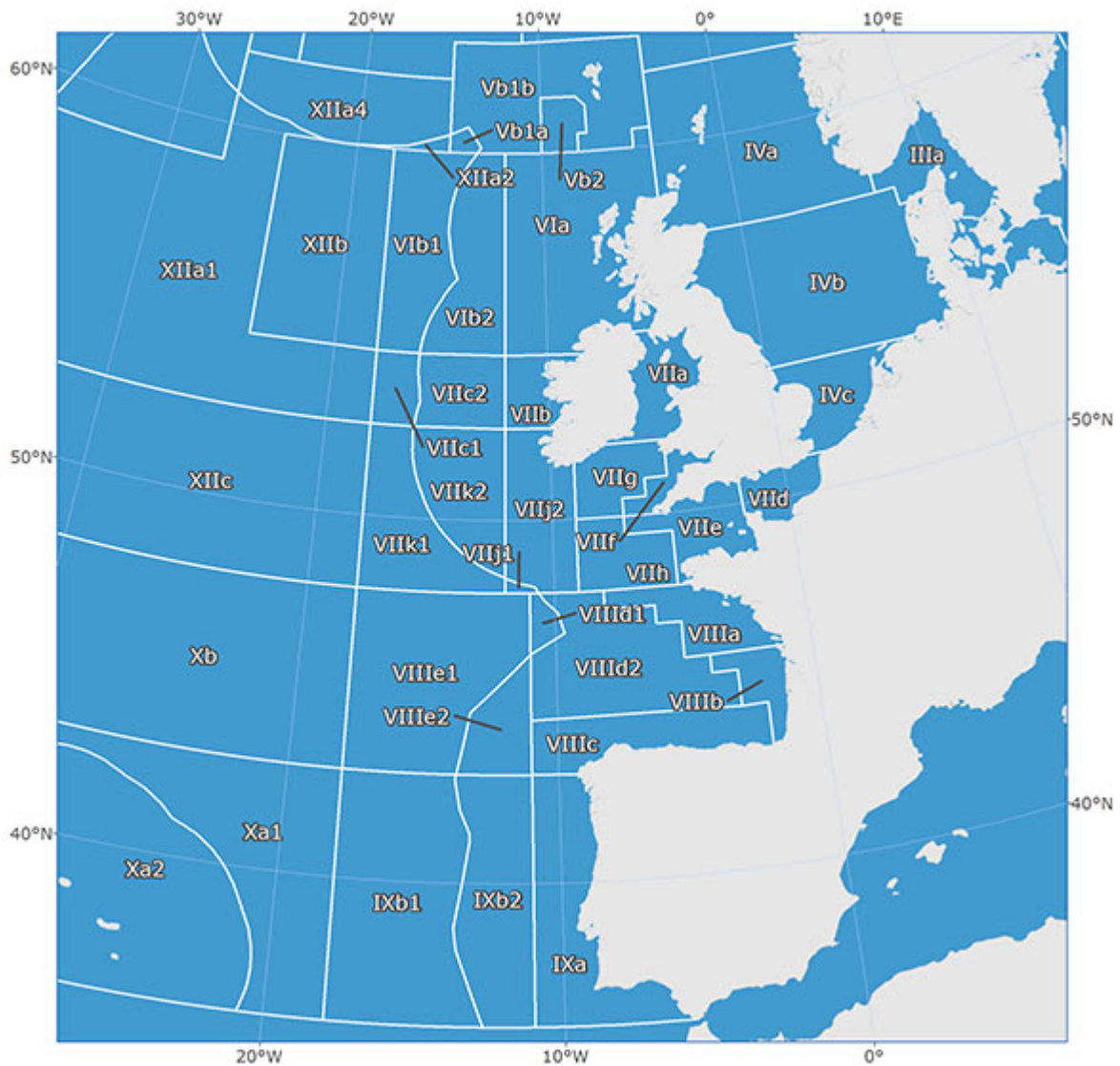


Fig 7: The detailed boundaries of the ICES subdivisions
<http://www.fao.org/fishery/area/Area27/en>

The International Council for the Exploration of the Seas (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.

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 vessels equipped with a Vessel Monitoring System (VMS) that are operating in the Irish EEZ and also of all Irish vessels operating in any jurisdiction.

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

Demersal fisheries

Also known as whitefish, demersal fish are slow swimmers and are not migratory. They congregate on or near the seabed and are bottom-feeders. 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 depth.

Demersal effort is greatest in water depths of up to 300 fathoms or 500 m. Species include Monkfish, Hake, Megrim and Ling. Demersal fish are often caught together and comprise a mixed demersal fishery. Fishing methods employed for this diverse fishery include beam and otter trawls (bottom trawls), seine netters, gill and tangle netters, and longlines. These fisheries attract vessels from Spain, UK, Ireland and France, most particularly long-liners from Spain and trawlers from Ireland and France.

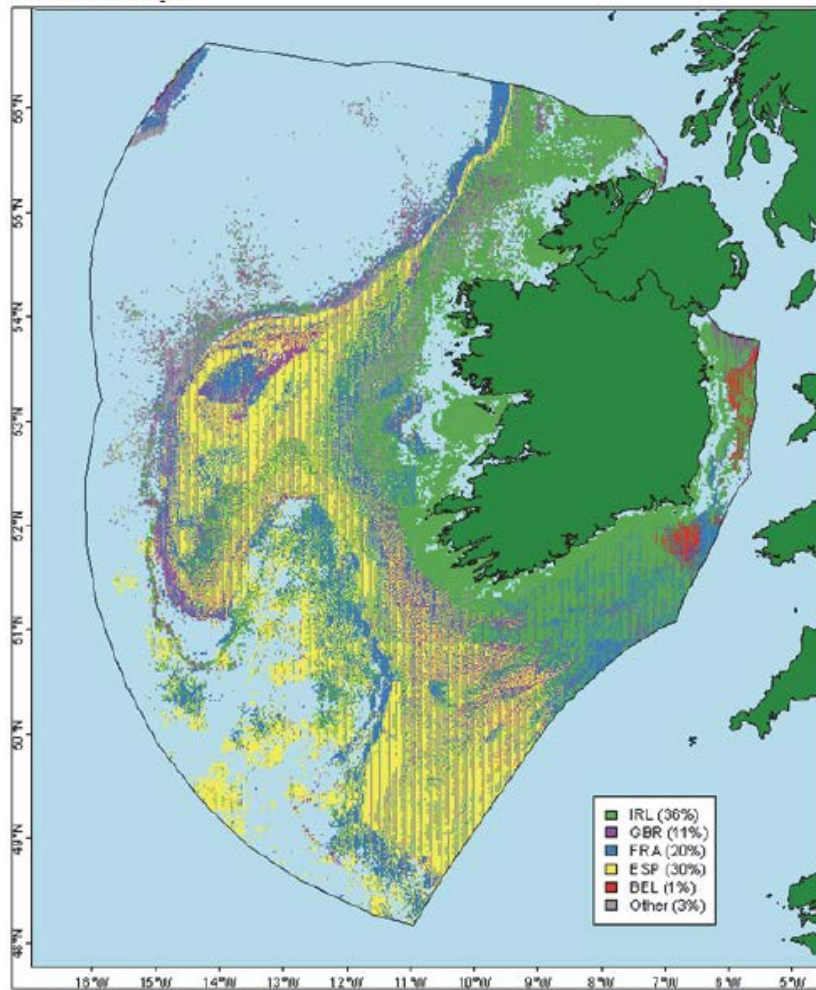
Within the IOSEA 2 area, demersal fish catches are confined to the shallower northern region and along the eastern boundary. There have been little or no demersal fish landings recorded from the deep waters of the Porcupine Seabight in the southern half of the IOSEA2 area.

The seasonality of activity for demersal fishing off the west coast of Ireland is as follows: - (Selected species)

Haddock, Hake, Monk, Megrim and Ling	- Year-round
Nephrops	- April to October
Sole	- April to December
Crab, Lobster	- Year-round

Most of the fishing effort in Ireland's EEZ is carried out by foreign vessels $\geq 15\text{m}$. Ireland is responsible for only 36% of the international effort of vessels $\geq 15\text{m}$, Spain 30%, France 20% and UK 11% and consists of mainly demersal otter trawlers – see **Fig 8**.

Vessel nationality



▲ The nationality of vessels $\geq 15\text{m}$ fishing in the Irish EEZ (all gears combined). IRL = Ireland; GBR = United Kingdom; FRA = France; ESP = Spain; BEL = Belgium. The percentages in the legend refer to the share of the total effort inside the EEZ for each country (adapted from Gerritsen and Lordan, 2014).

Fig 8: Vessel nationality breakdown in Ireland's EEZ (*North West Waters Atlas 3rd Edition – MI*)

Fig 8 above shows the nationality of vessels $\geq 15\text{m}$ fishing in the Irish EEZ. The available data is from 2014 but clearly shows fishers located over the deep waters of the Porcupine Basin are primarily made up of Spanish and French vessels.

The Nephrops fishery operates in depths from 100 m to 300 m. The Irish Nephrops fisheries are divided into areas known as Functional Units (FU). There is one functional unit over the Porcupine Bank – FU 16 which lies to the north of the proposed well location – See **Fig 9**.

Nephrops is the second most valuable commercial species landed from Irish waters. Nephrops is a very active fishery within the Porcupine Bank area. More than 95% of Nephrops are taken using single- or multi-rig trawlers targeting Nephrops or in mixed species fisheries.

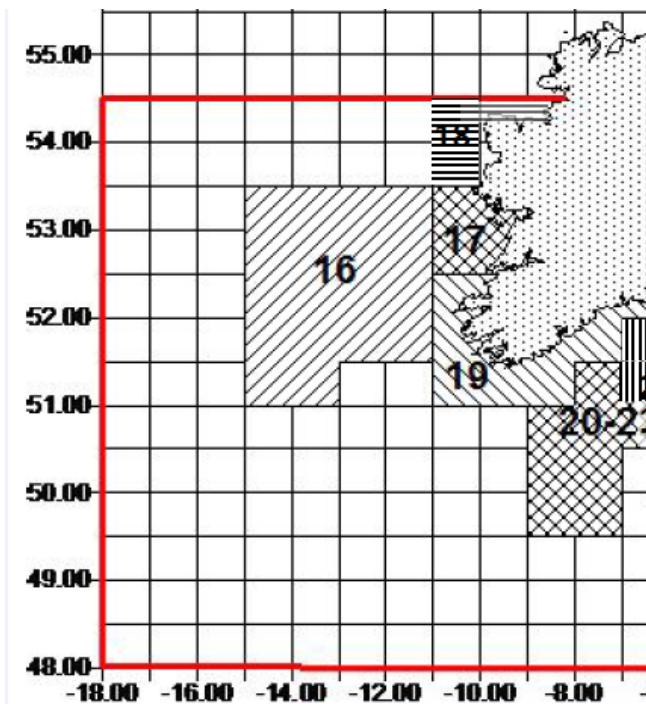


Fig 9. Porcupine Bank Nephrops FU-16.

<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Nep-VII.pdf>

Monkfish (also known as Anglerfish) & **Megrim** are found at a wide range of depths, extending from very shallow inshore waters down to approximately 1000 m. These fish were originally thought to have little commercial value and until the 1980s were taken mainly as a bycatch or discarded by the bottom trawl fisheries. Monkfish is now one of the most important species caught off the west coast of Ireland, by weight and by value. In the waters over the continental shelf and slope, they are a year-round target species, with an increase in landings during the summer months. This may be due to longer daylight hours allowing increased fishing effort. The highest catch rates for Monkfish are by French trawlers and occur along the shelf edge at depths between 200 – 500 m.

Hake and **Ling** are found from 100 m to approximately 1000 m. These round-fish are generally taken from along the shelf edge and the deeper waters off the slope. They are a year-round fishery, and again an increase in landings can be seen during summer months. Spain generally takes the largest share of landings, but more Irish and French vessels have entered this fishery in recent years. The highest catch rates are along the 200m contour line.

DEMERSAL CATCH STATISTICS: To demonstrate the economic importance of the demersal sector to the Irish economy, an extract from the latest available SFPA Annual Report 2015 is provided in **Fig.10** showing that demersal species accounted for 22% of the overall tonnage representing 45% of the total value of all species landed into Irish Ports.

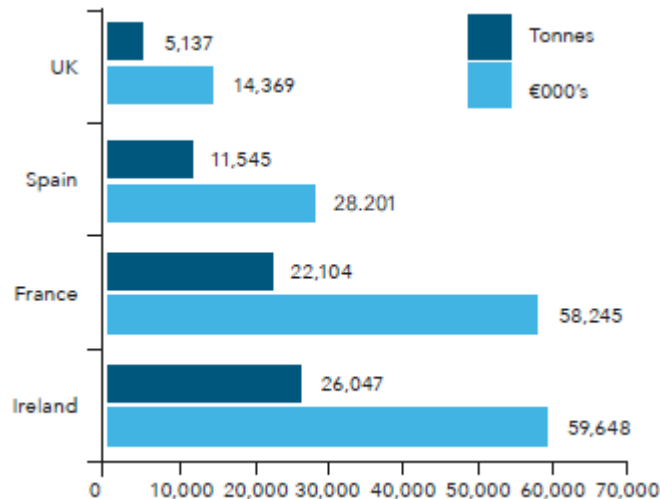


Fig 10: Demersal landings to Irish ports 2015 (*SFPA Annual report 2015, latest report available*)

Fig 10 above shows that: -

- Irish vessels landed 40% of demersal species landed into Irish ports, which was worth 37% of the overall value for this segment at over €59 million.
- Landings from French registered vessels were worth €58 million for 34% of the tonnage.
- Landings from Spain and UK registered vessels amounting to 26% of this tonnage, attaining 27% of the value.
- Spanish, French & UK vessels will also land more demersal fish to their home ports.

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, Blue Whiting, Herring, Boarfish, Redfish and Tuna**, are taken while migrating in shoals southwards along the shelf edge to spawn.

As they progress along their migration southwards, the effort of movement will decrease their fat content. Catch values also reduce as fat content reduces, and therefore vessels will target these species along the shelf edge further north to the west of Shetlands for prime catches.

These pelagic fish are caught with dedicated pelagic RSW (refrigerated sea water) vessels with gears such as pelagic trawls, although purse seines, trolled lures and surface long-lines are also occasionally used for large pelagic species such as tuna. Tows 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. Pelagic vessels will target fish off the bottom of the seabed if the seabed is clean of obstructions to allow the bottom to take the net.

Vessels engaged in this fishery off the west coast of Ireland are Irish, Norwegian, UK, Belgium and Netherlands.

The seasonality of activity for the pelagic fishery off the west coast of Ireland is as follows: -

Mackerel & Herring	–	October to March
Horse Mackerel	–	September to July
Boar Fish	–	September to April
Blue Whiting	–	January to April
Tuna	–	July to September

Western **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. As they begin their migration south, trawlers take mackerel and horse-mackerel in lesser quantities, and this season generally ends in March each year. The main catches are taken at 200m 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 200m. Mackerel and Horse Mackerel are Ireland's most valuable fishery.

Blue whiting can be found all along the continental shelf break and extending into the deep basins off the west coast of Ireland north of 52°N. The Blue Whiting season commences in January and closes in late April each year, although the main fishery happens during February to March. These fish migrate from the south to the north. During the first few months of the year, huge shoals of these oceanic fish are found along the southwest edge and slope of the Porcupine Bank as they move north. The European Union fishing fleet take large quantities of these fish from this area, as do Norway, the Faroes and the Russian Federation.

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

Tuna is a very lucrative fishery and considerable effort can be seen during the period July to September each year. Tuna catches depend on the gulf-stream conditions and water temperatures and effort is typically located south of 53°N.

PELAGIC CATCH STATISTICS: To demonstrate the economic importance of the demersal sector to the Irish economy, an extract is included in **Fig. 11** from the latest available *SFPA Annual Report 2015* showing that pelagic species accounted for 28% of the overall tonnage representing 45% of the total value of all species landed into Irish Ports.

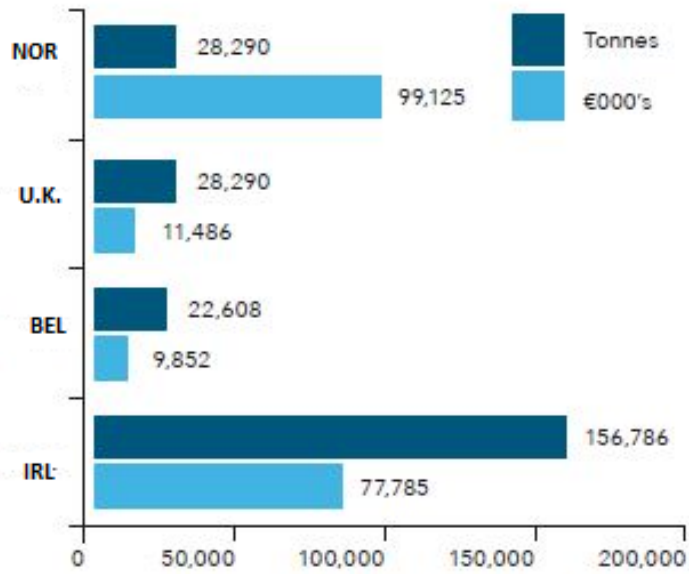


Fig 11: Pelagic landings in Irish ports 2015 (*SFPA Annual report 2015*)

Fig 11 above shows that: -

- Irish vessels accounted for two thirds (66%) of pelagic landings in Ireland with a first sale value in excess of almost €78 million.
- Landings from Norwegian registered vessels accounted for 12% of these fish, worth over €99 million.
- The 50,898 tonnes landed by Belgium and UK had a combined first sale value of € 21.3 million.

Deepwater fisheries:

Deep-sea fish are generally defined as the diverse assemblage of fish species living beyond marginal seas and continental shelves, and/or at depths greater than 400 metres. Deepwater fish live in a very different ecosystem to traditional shelf species as at these great depths there is little light, little food and the fish are vulnerable to the effects of overfishing because of their slower reproductive cycles and slow growth rate. Major habitats are upper continental slopes, ridges, deep island and seamount slopes and summits and deep bank areas, but deep fjords and shelf troughs/canyons are also included.

Deep-sea fish 'stocks' comprise the subset of deep-sea fishes that are targets or by-catches in commercial fisheries. Few of these fishes are truly midwater (pelagic) species. Most are demersal, or live on or in association with the seabed, but some may feed benthopelagically. Most deep-sea fish stocks are exploited in waters shallower than 1000 metres, although some are exploited up to 2000 metres.

In the Northeast Atlantic, some deepwater species (e.g. alfonsino, blackspot seabream, black scabbard fish, ling, tusk), have life histories like shallow-living demersal species, while others (e.g. roundnose grenadier and deepwater sharks) have extreme longevities spanning several decades or more than a century. Deepwater sharks have very limited fecundities. Most demersal deepwater species also depend on midwater organisms as prey. Fish abundances are highest at depths of 1000–1800 m in the Porcupine Basin.

Bottom trawling is extending into the deep ocean, where fishing effort has intensified. The life spans of deep-sea fishes are much longer and their potential growth rates are much lower than those of related shallow water species. Of the three major gear types targeting deep-sea bottom species, Gillnets, longlines and bottom trawls, the latter are by far the most commonly used and can target depths up to 1500m.

The main species taken in these deepwater fisheries in ICES area V1 and V11 are forkbeard, rabbit fish, roundnose grenadier, Alfonsinos and deepwater sharks. The fisheries take place in depths between 400 m and 1200 m at the slope edge, and here stocks are targeted mainly by French registered vessels.

DEEPWATER CATCH STATISTICS - 2015: Deep-water species are not a commercially viable fishery on their own and very few fishers will target them. In total, deep sea landings account for a very small proportion of landings into Irish ports, with an overall total of 1,097 tonnes in 2015.

Quotas for deepwater species have decreased annually. The quota for 2017 was 577 tonnes compared to 540 tonnes for 2018. This represents almost a 6% drop in one year. The main quotas for Ireland are for Black Scabbard, Roundnose Grenadier and Forkbeards.

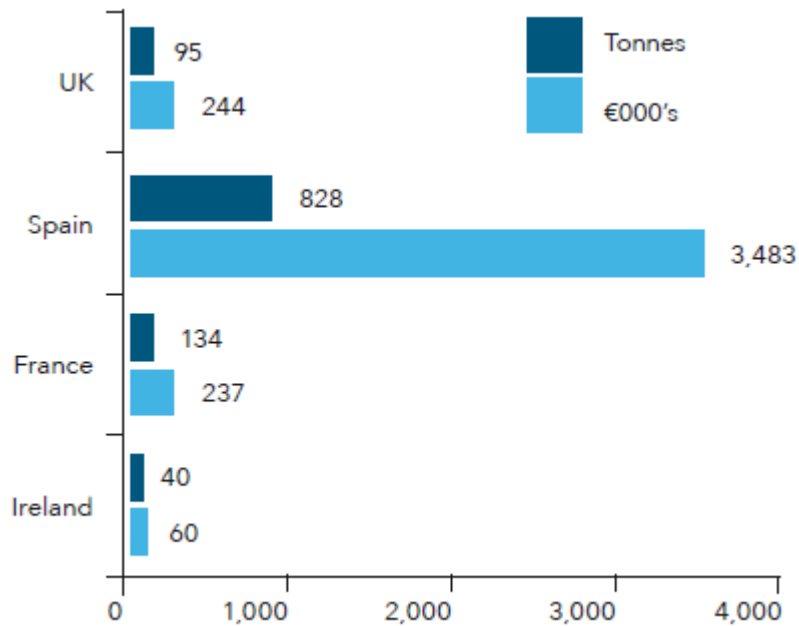


Fig 12: Deepsea landings to Irish ports in 2015 (*SFPA Annual report 2015*)

Fig 12 from the latest available SFPA Annual Report 2015 shows Irish vessels landed the smallest portion of 40 tonnes valued at €60,000. Spanish and French took the largest share of 962 tonnes valued at just over €3.5 million. UK vessels caught 95 tonnes at a value of €244,000. (*SFPA Annual Report 2015*).

It is important to remember that the above statistics refer to landings in Irish ports only. EU vessels will also take further catches to their own home ports.

2.2 Fishing fleets

A fishing fleet is an aggregate of commercial fishing vessels. The term may be used of all vessels operating out of a particular port, all vessels engaged in a particular type of fishing (as in the "Tuna fishing fleet"), or all fishing vessels of a country or region. The following **Tables 2 – 4** show the range and complexity of the different fleets which work off the west coast of Ireland at various times throughout the year.

Pelagic sector			
Species	Depths in Meters	Method	Country
Tuna	Surface to 2000	Line & Pole, Mid Water trawling, purse-seine netting	Ireland UK France Spain
Mackerel	Surface to 2000	Midwater trawling Pair trawling	Ireland, UK, Netherlands, France Germany Poland Lithuania
Blue Whiting	Surface to 2000	Midwater trawling	Ireland ,Norway, Nether- lands, Spain, France, UK, Germany, Denmark, Lithuania Faroe Islands, Russian Federation
Horse Mackerel	Surface to 2000	Midwater trawling	Ireland, Netherlands Denmark, Germany Lithuania France & UK
Boarfish	Surface to 2000	Midwater trawling	Ireland, Netherlands UK France
Herring	Surface to 2000	Midwater trawling	Ireland, UK, Netherlands, Lithuania, Germany

Demersal Sector

Species	Depth in Meters	Method	Country
Hake	200m to 500m	Longlines Gillnets Trawling, Beam & otter	Ireland UK Spain France Belgium Netherlands
Cod	200m to 500m	Trawling Gillnets	Ireland, UK France, Belgium Netherlands
Haddock	200m to 500m	Trawling	Ireland France UK Belgium
Whiting	200m to 500m	Trawling	Ireland UK France Netherlands, Belgium
Ling	200m to 1000m	Longlines Trawling	Ireland UK Spain France, Belgium Denmark Germany, Portugal, Norway
Saithe	200m to 500m	Trawling Gillnets	Ireland France UK Belgium
Pollack	200m to 500m	Trawling	Ireland France UK, Spain & Belgium
Anglerfish/Monkfish	200m to 1000m	Trawling Gillnets	Ireland, Netherlands UK, Spain, France, Belgium, Germany
Tusk	200m to 1000m	Longlines Gillnets Trawling	Ireland UK Spain Germany France Norway Faroe Islands

Demersal Nephrops – Shell fish Sector			
Species	Depth in Meters	Method	Country
Nephrops	200 to 500	Potting /Tangle Nets / Bottom trawls	Ireland UK France, Spain
Brown Crab	200 to 300	Potting /Tangle Nets	Ireland UK France
Red Crab	500 to 1200	Potting /Tangle Nets	Ireland UK Spain Germany

Tables 2-4: Fishing Fleets comprising of vessels \geq 20m

2.3 Fishing Methods

Listed below is a brief description of the different methods of fishing which are those most likely to be encountered in and adjacent to the proposed survey area during the period:-

Mid-water Trawling: (Pelagic – i.e. Tuna)

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 tuna and mackerel, horse mackerel and blue whiting.

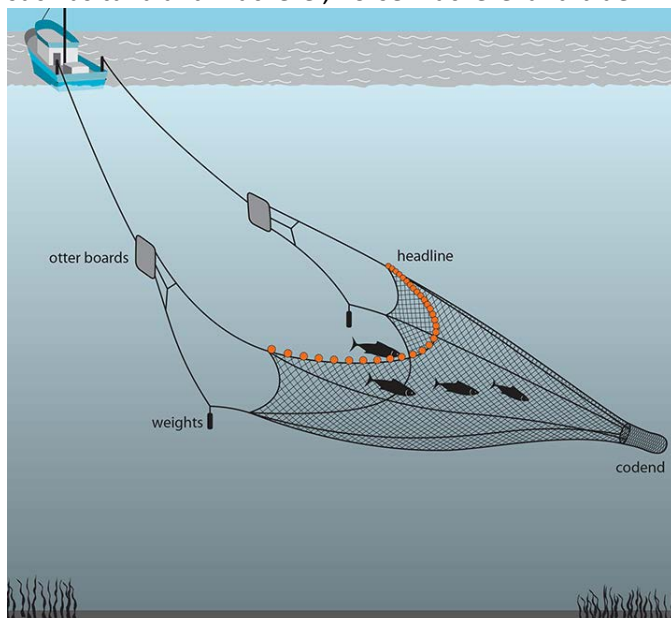


Fig 13: Mid-water trawling

Bottom Trawling:

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 (groundfish) and semi-pelagic species such as cod, haddock, plaice, sole, and monk. Bottom trawling can be carried out by one trawler or by two trawlers fishing cooperatively (pair trawling).

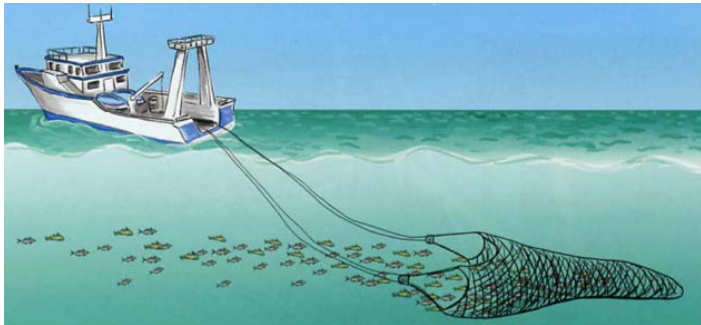


Fig 14: Bottom trawling

Gill-netting:

Gill nets are vertical panels of netting normally set in a straight line. Fish may be caught by gill nets in 3 ways: (1) wedged – held by the mesh around the body (2) gilled – held by mesh slipping behind the opercula, or (3) tangled – held by teeth, spines, maxillaries, or other protrusions without the body penetrating the mesh. Most often fish are gilled. A fish swims into a net and passes only part way through the mesh. When it struggles to free itself, the twine slips behind the gill cover and prevents escape.

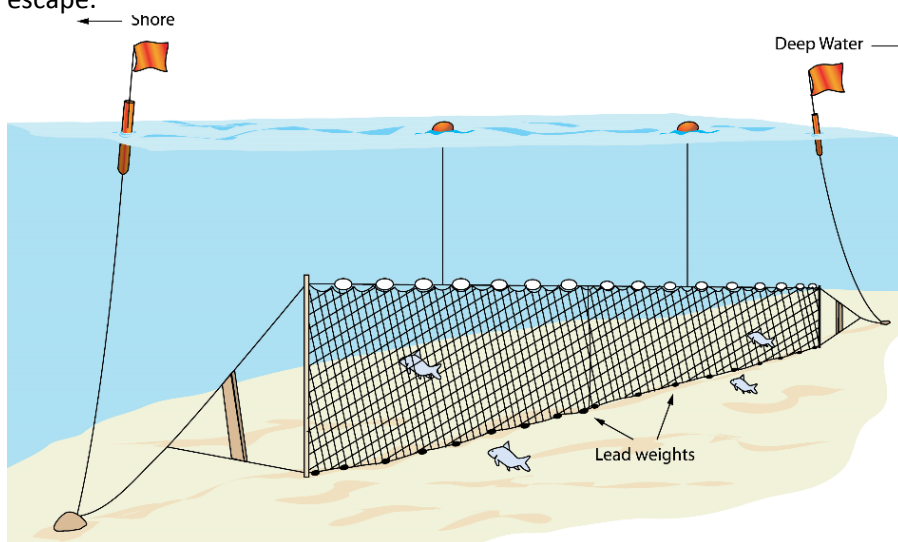


Fig 15: Gillnetting & Tangle-net

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 of time in order to make catches that are then hauled on board. Long lining can be divided into SURFACE or PELAGIC LONGLINE, to catch fish such as tuna and swordfish, or BOTTOM-SET or DEMERSAL LONGLINES placed on the sea floor, in order to catch fish such as hake or cod.

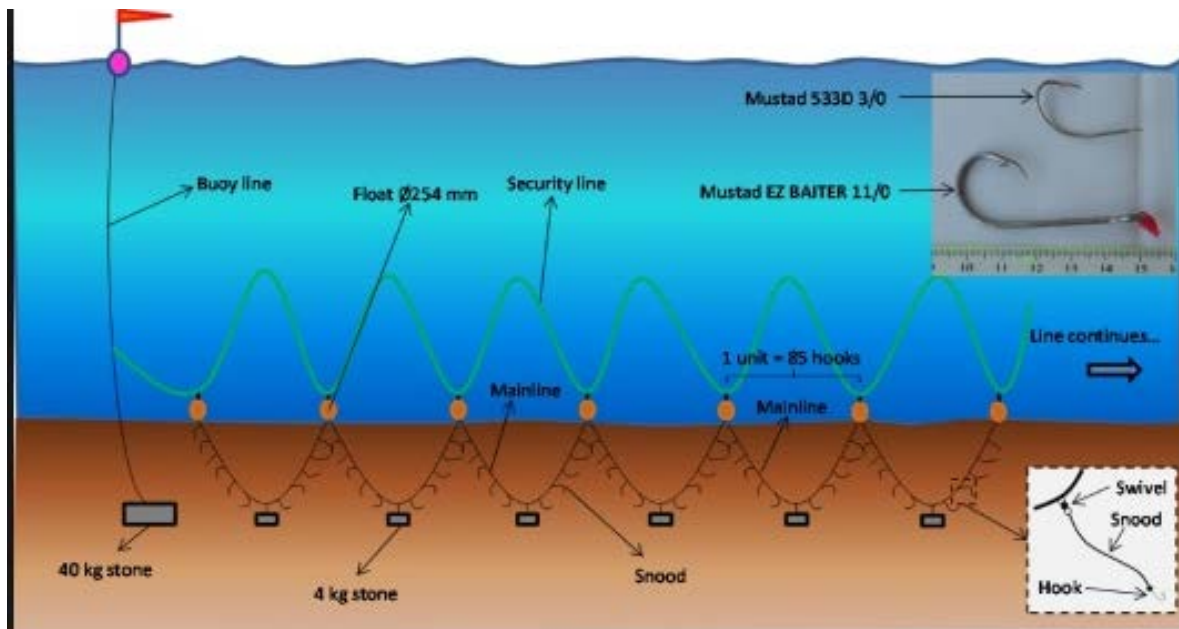


Fig 16: Bottom-set Spanish longlines

Fig. 16 above is descriptive of the usual Spanish longline method while fishing for hake and ling along the continental slope. The mainline is weighted down to the seafloor by stone at intervals of approx. 270 m, and portions of the line are floated.

Equipping of a longline with two lines considerably reduces losses of longline gears during operations on hard ground. Besides, in operational conditions in areas with strong near-bottom and bottom currents, the fishing gear is less likely to drift. This method also allows for catching of fish who are swimming above the sea floor.

2.4 Irish discharge Ports

The main discharge ports for fishing vessels operating in the Porcupine area are listed below. EU vessels discharge at Irish ports and also transit to their home ports to discharge their catches.

Killybegs Fishery Harbour Centre (FHC)

Killybegs Fishery Harbour Centre is located in County Donegal, on the North West coast of Ireland. Its position, at the tip of a deep fjord-like inlet, makes it one of the safest, most sheltered, deep-water harbours on the Irish coast. Killybegs has long been acknowledged as Ireland's leading fishing port and home to the pelagic sector, along with several demersal vessels, for Irish, Norwegian, UK, Spanish, French and Dutch.

Rossaveal Fishery Harbour Centre (FHC)

Rossaveal Fishery Harbour Centre is strategically located on the North side of the North Sound approaches to Galway Bay. The inner harbour is positioned on the north-eastern shore of upper Cashla Bay and is well sheltered. Demersal and nephrops landings are the main landings in this port.

Castletownbere Fishery Harbour Centre (FHC)

Castletownbere Fishery Harbour is known as Ireland's premier whitefish port and is an excellent natural harbour which is located in Berehaven. Berehaven is located within Bantry Bay on the southwest coast of Ireland, sheltered by the 11km length of Bere Island lying 2km to the south and the mountainous Beara Peninsula to the North. Castletownbere port is the second largest port in terms of landings. Demersal and nephrops landings are the main landings in this port with mainly Irish, French and Spanish vessels.

Dingle Port:

Located on the Dingle Peninsula in County Kerry, this is another important discharge port for whitefish landings. Although it is not a designated Fishery Harbour Centre, it caters for demersal and nephrops landings. The main landings in this port are from Irish, French and Spanish vessels.

Union Hall:

The fishing village of Union Hall is situated approximately 74km south of Cork city in a sheltered corner of Glandore Harbour. Demersal and nephrops landings are the main landings in this port with mainly Irish vessels.

Dunmore East:

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, and a significant number of leisure craft visit the port during the Summer months.

Others:

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

- Bantry Bay
- Kinsale
- Cobh
- Youghal
- Dungarvan
- Waterford
- New Ross



Fig 17: Fish landing ports around Ireland

3. Stakeholder Analysis

3.1 Fisheries Engagement

In preparation for the geotechnical site survey in July 2017, Nexen Petroleum UK Ltd, through Sinbad Offshore Support Ltd consulted with the key Fish Producer Organisations (FPO - listed at section 3.2), and the Sea Fisheries Protection Agency by email and telephone.

Table 4 below summarises the topics arising from the pre-survey fishery engagements.

No.	Summary of issues arising from consultations with FPOs.
1	The extensive Albacore Tuna Fishery is the main fishery which takes place in the LO 16/7 area (now FEL 3/18) during the summer months. Up to 200 x Irish and EU vessels can enter the survey area from July onwards. Albacore tuna is a free swimming pelagic species and can turn up anywhere and it would take a lot of research to predict the seasonal variations in the tuna fisheries, but the survey vessel may encounter this busy fishery during the survey period.
2	Mackerel and horse mackerel fishing takes place in the winter and spring months and there would be no targeted summer fishing in this area.
3	Demersal fishing is a year-round activity, but highest catches are during the summer months. The survey location lies approx. 100nm from the whitefish grounds on the shelf edge to the east. The survey vessel can expect to encounter EU whitefish boats transiting through this area from time to time but it would not be a usual route for Irish vessels.
4	The Nephrops fishery is of short duration (June – September) but is a very high-value and high intensity fishery with vessels from Ireland and EU present. The closest point of this fishery ground is approx. 40nm to the northwest of the planned survey location and therefore no displacement of fishing vessels is likely.
5	There is a very small Irish quota for deepwater stocks for 2017 – i.e. Forkbeards, Roundnose Grenadier and Black Scabbard. These species are not targeted by Irish vessels, but can be caught as a by-catch.
6	Expect a good deal of demersal fishing vessels in transit through the area from the nephrops grounds further northwest, to various ports to discharge their catches.
7	The FPOs requested details of the survey vessel name and call-sign, and contact details. This information will be provided when it becomes available.
8	The FPOs asked if that a Fisheries Liaison Officer to be onboard during survey operations. We assured them that an FLO will be onboard if required by the regulators.
9	The FPOs asked if a Marine Notice would be issued for the survey activities. We assured them that a Marine Notice would be published in advance of operations.
10	The FPOs reviewed the map provided and the general consensus is that these survey operations will not impact on the fishing activities of their vessels during this time.

Table 5: Summary of Fishery engagements

3.2 Key Fishing organisations -FPO's (Fish Producer Organisations)

The main Irish fish producer organisations are:-

- 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

3.3 Planned communications with operational fisheries

In advance of, and during the planned drilling operation, the following communications measures should be considered as best practice:-

- A. Notification of the drilling activity to be given in detail in a '**Marine Notice**' which will be published on the Irish Department of Transport website. This Marine Notice is also sent to all Irish Harbour authorities.
- B. A **Radio Navigation Warning** to be arranged by the Operator, and this will be broadcast numerous times daily by the Irish Coastguard for the duration of the drilling activities.
- C. Notification of the drilling activities 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 Spain and France, outlining details of the planned drilling operation. This notice to be distributed to these organisations in sufficient time and in advance of the planned operations. Notices to include a known point of contact ashore.
- E. Regular Securitaee messages to be broadcast over VHF radio on agreed working channel.

3.4 Commercial Traffic / Navigation

The proposed prospect area is not in any main commercial shipping lane but it is known that cargo vessels, i.e. Bulk Tankers transit this area from the various points of origin to USA and Canada. Oil terminal vessels from Bantry Bay and deep sea cargo vessels servicing the Aughanish Alumina plant in the Shannon Estuary may also transit the area.

These larger ships operate on an autopilot system using a standard route. These ships travel along repeated corridors/routes and despite sea regulations, there may be no crew observing the radar or the sea. This area off the west coast would be considered relatively quiet waters and ship's crews may be less vigilant.

There are no Irish weathbuoys located in the vicinity of the proposed well. There is a weather buoy located to the northwest of the proposed well location at **51.00 N 13.55 W (51°0'0" N 13°33'0" W) – Station 62081 – K2 Buoy.**

4. Analysis of fisheries interactions

4.1 Summary of VMS data for 2014 to 2017

The FMC at the Naval Services have provided VMS data relating to the entire Licensing Option 16/7 (now FEL 3/18) area for the years 2014 to 2017. It includes the fishery statistical rectangle **30D6** which encompasses the survey and future well location, and areas immediately to the north and south, east and west of the area.

We are informed by the FMC that there has been little inter-annual deviation in the past three years, although this can change with the arrival of the tuna fleet into the area in any given year.

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 to us, and in this respect, the vessel identities remain protected and private.

From the data supplied, we have been able to determine the nationality and numbers of individual vessels over the periods. **Table 6** below shows the numbers of individual vessel sightings by nationality for Jun - Sep over a four-year period 2014, 2015, 2016 and 2017. The VMS data shows all fishing vessels $\geq 15\text{m}$ working over and surrounding the proposed drilling area within ICES fishery subdivision V11k2.

Period	IRL	DEU	ESP	FRA	GBR	TOTALS
2014	118	9	712	194	19	1052
2015	71	10	259	51	13	404
2016	53	9	72	35	17	186
2017	61	0	92	15	32	200
Totals	242	28	1043	280	49	1642
	14.74%	1.71%	63.52%	17.05%	2.98%	100.00%

Table 6: Vessel sighting numbers by Nationality in LO 16/7 area over a four-year period.

2014 was by far the busiest year, with a total of 1052 vessels during the period examined. The Albacore Tuna arrived in the area during this period, accounting for the large numbers. The numbers show a drop off in subsequent years as the tuna remain further to the south and southeast.

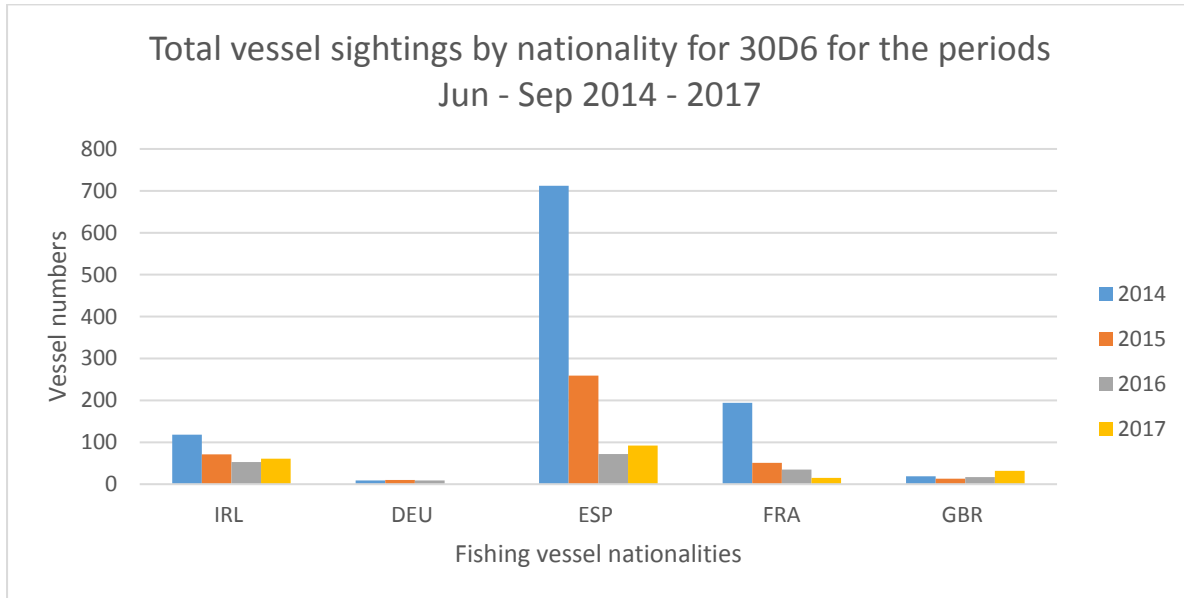


Fig 18: Vessel numbers by nationality : Jun – Sep, 2014 - 2017

The majority of fishers in the area are Spanish registered vessels, followed by France and Ireland. Some of the French-flagged vessels are beneficially owned and crewed by Spanish owners and operators.

We also examined the data to determine the levels of fishing activity in the ICES rectangles.

ICES rectangle	29D6	30D5	30D6	30D7	31D6	Totals
2014	221	215	218	186	212	1052
2015	81	61	88	110	64	404
2016	34	19	41	42	50	186
2017	23	21	39	57	60	200
Totals	359	316	386	395	386	1842
%	19.49%	17.16%	20.96%	21.44%	20.96%	100.00%

Table 7: IOLAR lies in 30D6

ICES rectangles included in the results above are 29D6, 30D5, 30D6, 30D7 and 31D6.

Each rectangle covers an area of 30 km x 30 km. The rectangles we examined lie to the immediate north, west, east and south of 30D6 in which the Iolar prospect lies, to give a better presentation of fishing in the general area.

	31D6	
30D5	30D6	30D7
	29D6	

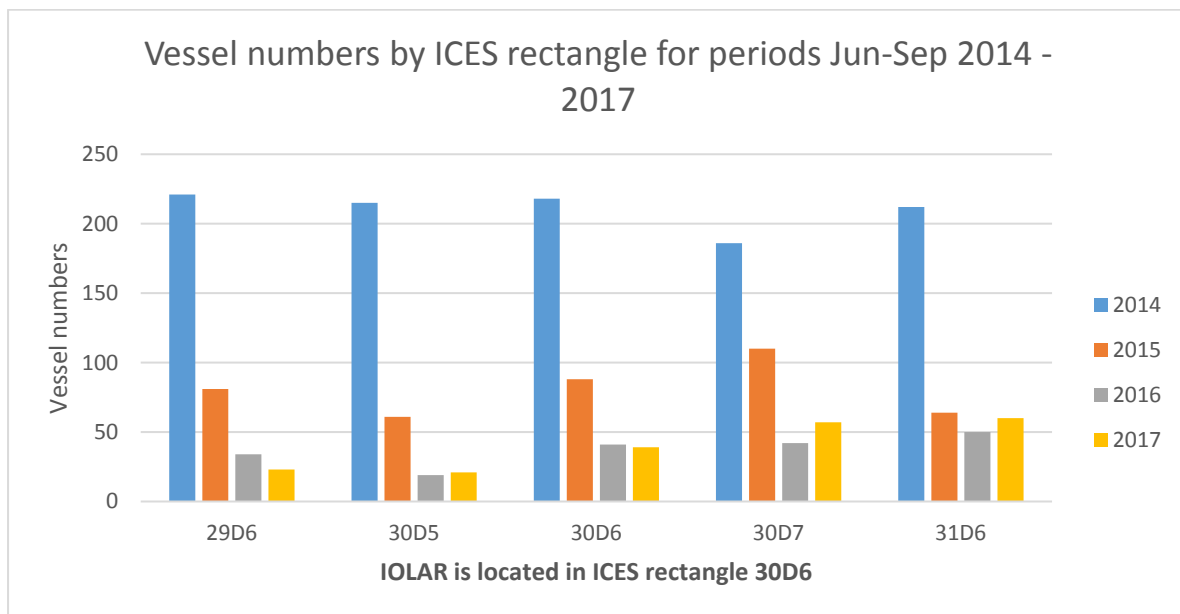


Fig 19: Vessel numbers by ICES rectangles : Jun – Sep, 2014 – 2017

Albacore Tuna migrated into the area in July of 2014 in great numbers. **Fig. 19** above shows that there were over 200 fishing vessels targeting tuna in the area. The majority of these were Spanish, followed by French and Irish vessels. The Spanish vessels in the area mainly used the Trolling method of fishing while the French and Irish used pair-trawling. Trolling can be phonetically confused with trawling, but both are entirely different methods of fishing. Trawling involves towing of a net, while trolling involves drawing baited fishing lines through the water.

There has been a steady drop off in vessel numbers in subsequent years as the path of the tuna has remained much further to the south and southeast. But as fisheries have advised us “Albacore tuna is a free swimming pelagic species and can turn up anywhere and it would take a lot of research to predict the seasonal variations in the tuna fisheries”

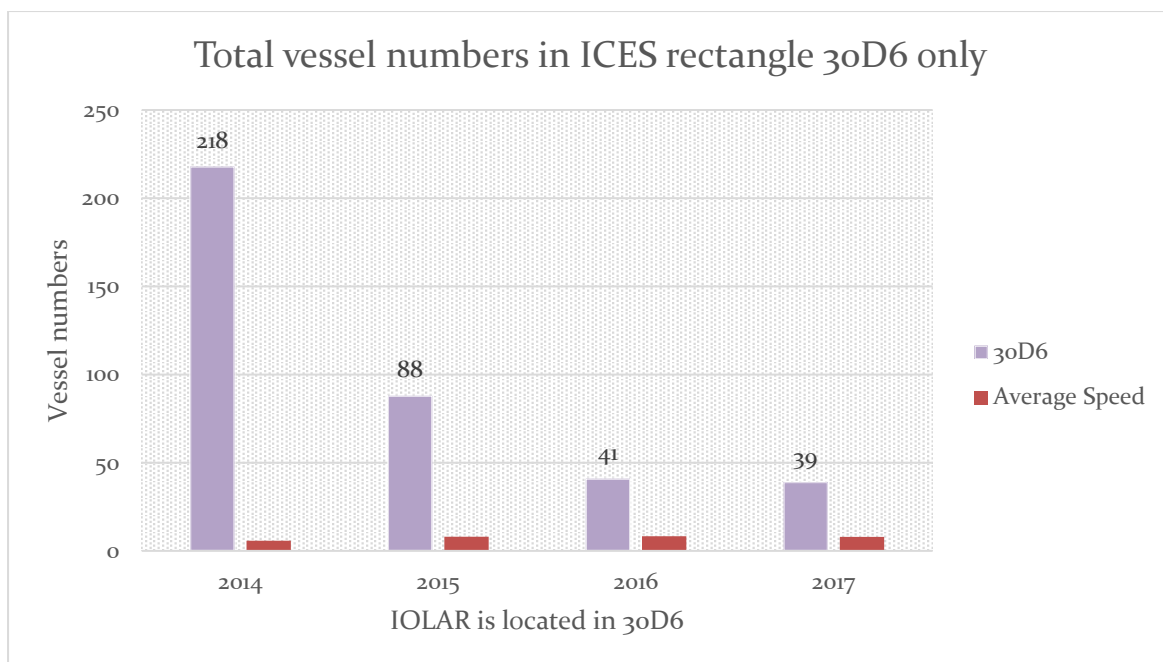


Fig. 20: Vessel numbers by ICES rectangle **30D6** : Jun – Sep, 2014 – 2017

Fig. 20 shows fishing vessel numbers for each year for ICES rectangle **30D6** only, and highlights the drop-off in the area since 2014 levels.

The average speed of vessels throughout the 30D6 area is 6.52 knots indicating that vessels were engaged in fishing activity. Trolling for tuna typically happens between 6 – 8 knots.

The Irish FMC also supplied us with a visual representation of the data for each year in the form of screen shots from their database – See **Fig 21 - 24**. This is included to illustrate the distribution of vessels working in the LO 16/7 area from June to September each year.

30D6 is located right in the centre of each of the following screenshots.

Legend:

- Ireland - Green
- Spain - Red
- France - Blue
- UK - Yellow

ICES Subdivisions included:

V11k2

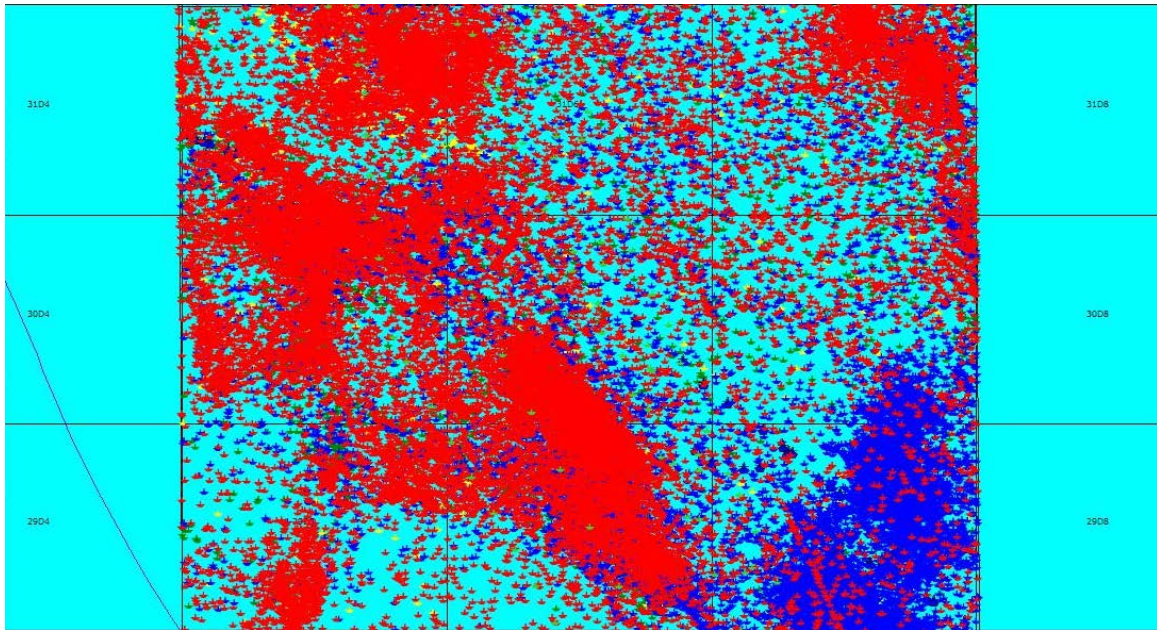


Fig.21: VMS screenshot of 2014 fishing activity. This clearly shows the dense tuna fishery active in the area during July – Sep, VMS data results show 218 vessels in 30D6.

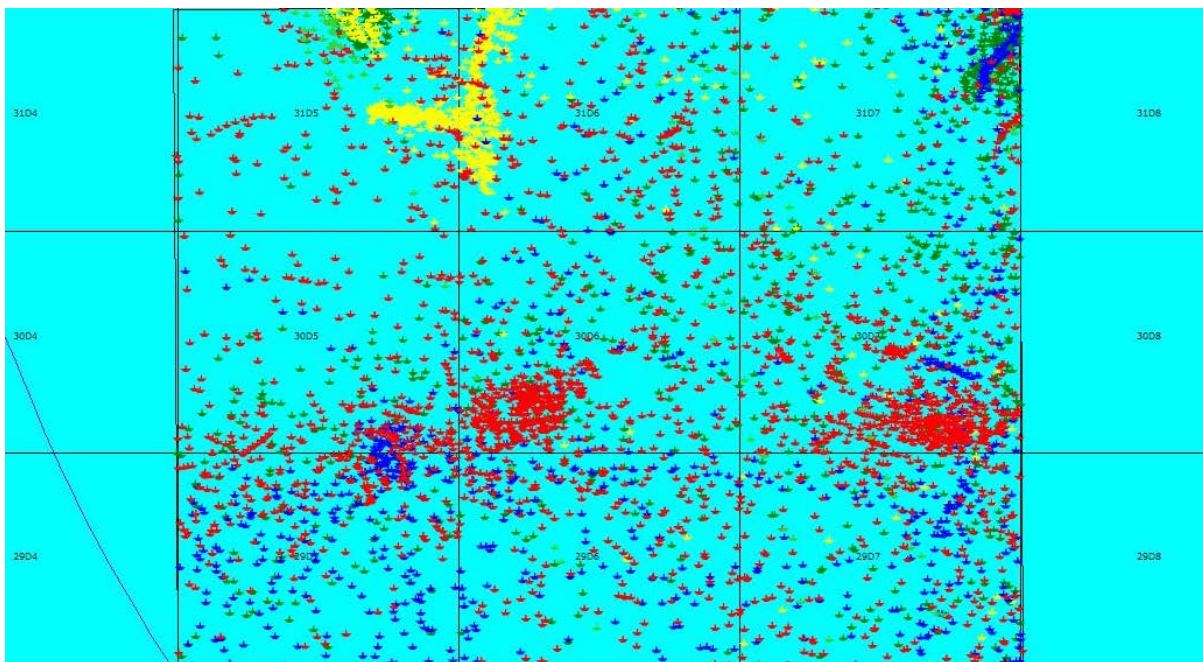


Fig.22: VMS screenshot of 2015 fishing activity. Numbers were down on the 2014 results, with a total of 88 vessels in 30D6 during Jun-Sep.

ICES Statistical rectangle 30D6 is shown below in the centre of both screenshots.

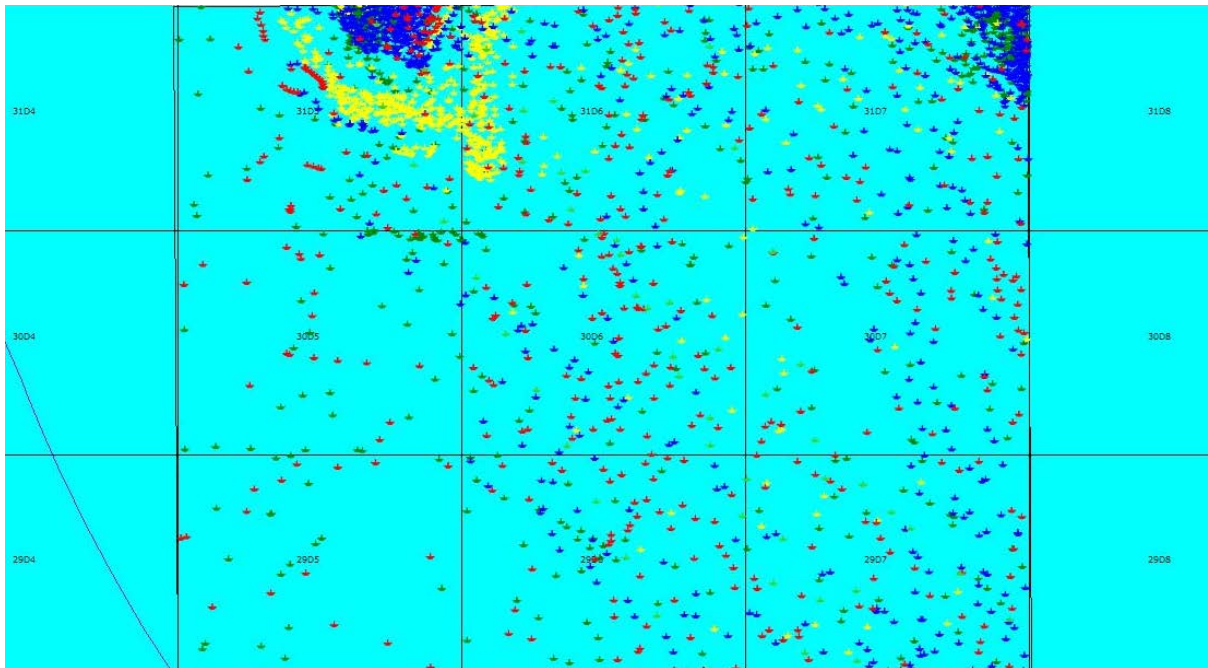


Fig.23: VMS screenshot of 2016 fishing activity.

Vessel numbers are down to 41 in 30D6 during the period.

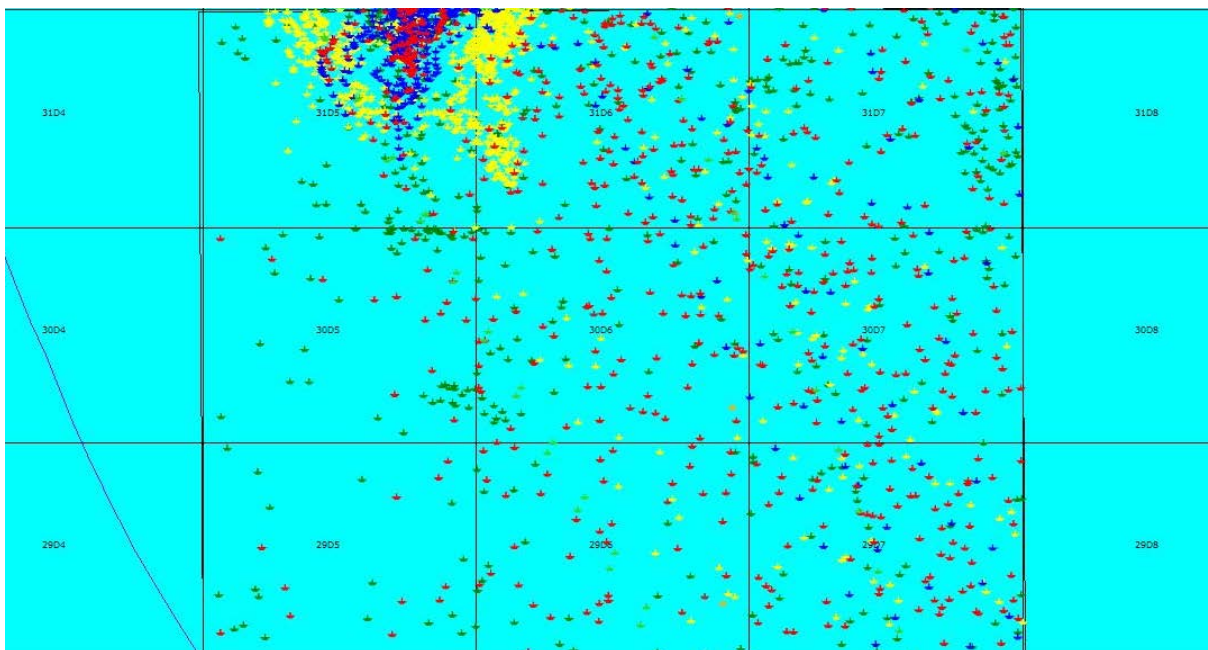


Fig.24: VMS screenshot of 2017 fishing activity

Activity is down again but similar to 2016 levels with 39 fishing vessels active in 30D6.

4.2 Summary of likely fisheries interaction

From VMS data received, and information gathered from the fish producer organisations and the Sea Fishery Protection Authority, the following is the appraisal summary of the various fishing efforts and their likelihood of interaction with the planned drilling operations.

Nephrops Fisheries: This is the most valuable demersal fishery in Ireland and the second most important fishery after mackerel for Irish fishermen, and the Porcupine is the highest €/kg in the entire Irish Nephrops fishery. The Nephrops fishing grounds lie over the porcupine bank, and the most southerly nephrops areas lie approximately **30 km northwest the proposed lolar location**. Most vessels are from Ireland, Spain, UK, and France. This fishery is very active from **April to October**. The extent of interaction that can be expected is **EU vessels transiting** to and from fishery ports of Lorient, La Rochelle, and Concarneau in France, and Vigo, Burela and La Coruna in Spain.

There is no expected impact with the **Crab** fishery in this area. Max depth for crab fishery is 200 m.

Demersal / Whitefish: The expected interaction with demersal fishing vessels working in and around 30D6 can be summarised as follows: -

Bottom trawlers: Sizeable numbers of these vessels fish on the whitefish grounds which lie **approximately 60 km to the east and northeast of the proposed drilling area**. There is **no expected interaction** with this demersal fishery.

Gillnetters: There is a very active year-round fishery targeting hake on the edge of the Slope **approximately 60 km to the east and northeast of the proposed drilling location**, working in depths from 200 m to 600 m. The gear used includes static gear on the seabed with dhan poles on the surface. Vessels are mainly Spanish 30m to 40m overall length. Again, there is **no interaction expected** with this demersal fishery.

Longliners: There is a very active year-round demersal fishery targeting hake along the Slope edge **approximately 60 km to the east and northeast of the proposed drilling location** working in depths over 200 m. The gear used includes static gear on the sea floor with dhan poles on the surface. Vessels are mainly Spanish 30m to 40m overall length. Again, there is **no interaction expected** with this demersal fishery.

Tangle Gear netters:

Vessels targeting Monkfish could be expected in the vicinity of the proposed drilling location. However, they prefer to work along the edge of the bank in deep waters from 300 m to 2000 m. This is a year-round fishery and vessels are mainly Spanish, 30m – 40m overall length. This fishery employs static gear with dhan poles in the water for marking and retrieving the nets. The VMS data suggests that **little or no interaction can be expected** in this 30D6.

Seiners: These vessels will concentrate **approximately 60 – 100 km to the east of the proposed drilling location** in depths up to 300 m. Using seine nets, they target a mixed fishery including Hake, Whiting, Haddock and flatfish. Vessels are mainly Irish with overall length of 25 – 30m. Again, there is **no interaction expected** with this demersal fishery.

Pelagic fishery:

The **Irish pelagic fishery** will have finished their effort for Mackerel, Horse mackerel, Herring, Boarfish and Blue Whiting by the end of April, and therefore **no interaction is expected** with this fishing effort.

Dutch or Faroese Pelagic vessels may have a presence in and around the proposed drilling location during June-July targeting Horse mackerel and Blue Whiting. VMS data from 2014 – 2017 shows this effort is very low in 30D6. The likelihood of any **interaction with this fishery is very low.**

Some **Deepsea fisheries** can be expected in the area. As data has shown the Spanish and French landed a combined quota of ≤ 1000 tonnes into Irish ports in 2015, and this activity can also be expected in coming years. Deepwater species are caught using trawls.

The Albacore **Tuna** fishery is **the most possible** fishery to occur in and around the drilling operation. It is a fishery undertaken by **Irish** and **UK** vessels using mid- water trawls, and by both **Spanish** and **French** vessels using poles and lines (Trolls). The tuna fishery commences in July each year and typically finishes up at the end of September.

Historic VMS data available (*Pages 28 – 33*) plainly shows that the tuna shoals have not entered the area since 2014. From observation we know that the tuna has remained much further south in the past three years, off the coast of France. However, Tuna is a very mobile fishery which is predetermined by factors such as water temperatures, salinity and availability of food. The movements of the tuna shoals can be over a very wide area of our EEZ, and therefore can present again in the area in coming years. The tuna fleet comprises 100s of ‘pole & line’ vessels and trawlers, and such is the importance of the fishery that the Spanish government send a Hospital Ship to accompany their operations.

5. Recommendations

- Communication is key to fostering good working relations with fisheries. This includes disseminating information to fishery stakeholders as early as possible and ensuring that effective lines of communication are maintained during the drilling operations.
- It is recommended that the planned communications package as listed at 3.3 on page 27 should be implemented before drilling commences.
- A Spanish and French speaking person ashore with a working knowledge of both the fishing industry and drilling operations should be available in the event that liaison with foreign vessel owners is required.
- It is recommended that in order to avoid potential confusion, coordinates to be shared with the fishing industry are shown in WGS84 lat/long format.

6. Conclusion

The planned drilling activities will be in depths of approximately 2200 m some 232 kms off the west coast of Ireland. Fishing activity in the Licensing Option area and in the surrounding areas of the Porcupine Bank and Seabight have been examined, and the information in this report is in that context.

The Well location lies **approximately 30 km southeast** of the **Porcupine nephrops** fishing grounds, which is Ireland's second most valuable fishery and which is active from April to October. The fishing methods will be demersal bottom trawling, longlines and gillnetting. 30m – 40m vessels from UK, Spain and France may be seen **transiting** the survey area on their way to and from their home ports.

The Well location lies **approximately 60 – 100 km to the west** of the **extensive pan-EU demersal fishing grounds** on the slope of the Irish continental shelf. On the slope of the shelf leading into the Porcupine Seabight there is a popular fishing area for vessels from Ireland, Spain, France and the UK targeting megrim, monkfish (angler), ling and hake. These fleets will be working to the east of the Well area in and around the BSA, and will not overlap with the planned drilling operation.

Some **Pelagic** activity could be expected near the area by Dutch or Faroe pelagic vessels targeting horse mackerel and Blue Whiting. Any likelihood of **interaction with these vessels is very low**.

Deepwater species quota allocations will be taken during the summer months, and lower levels of deepsea fishing activity around Iolar location can be expected.

The migratory path of the **tuna**, which follow the Gulf Stream, could **possibly be active** in the area. Spanish line & pole vessels, and French, UK and Irish mid-water trawlers can be expected. Vessels taking part in this fishery work both during daylight hours and at night. Whilst not fishing, these vessels can be encountered drifting and watch keepers / lookouts on these vessels are not always easily contactable during these times of rest. **The likelihood of interaction with the tuna fishery is greater between the end of July and September.**

Commercial vessels in transit may also be encountered.

The Marine Institute or fishing Industry will generally conduct different fish surveys during summer months each year, and details can be found at <http://www.marine.ie/Home/site-area/infrastructure-facilities/research-vessels/vessel-schedules>

Reference Documents

- *Irish Marine Institute* - <http://www.marine.ie/Home/home?language=en>
- *ICES* - <http://www.ices.dk/marine-data/Pages/default.aspx>
- *Marine Institute - Atlas of Commercial Fisheries around Ireland V2 -2014* <http://oar.marine.ie/handle/10793/958>
- *Bord Iascaigh Mhara – Fisheries Management Map 2017* <http://www.bim.ie/>
- *Food and Agriculture Organisation of the United Nations* - <http://www.fao.org/fishery/area/Area27/en>
- <https://www.msc.org/healthy-oceans/sustainable-fishing/fishing-methods-and-gear-types/>
- *Bord Iascaigh Mhara – 2016 Annual seafood report* <http://www.bim.ie/our-services/grow-your-business/>
- *Petroleum Affairs Division – IOSEA 5 study* [https://www.dccae.gov.ie/en-ie/natural-resources/topics/Oil-Gas-Exploration-Production/environment/strategic-environmental-assessment/Pages/Irish-Offshore-Environmental-Assessment-\(IOSEA\)-5.aspx](https://www.dccae.gov.ie/en-ie/natural-resources/topics/Oil-Gas-Exploration-Production/environment/strategic-environmental-assessment/Pages/Irish-Offshore-Environmental-Assessment-(IOSEA)-5.aspx)
- *Irish Pelagic Fish* – www.irishpelagicfish.com
- *Pescanova S.A.* www.pescanova.com
- *Sea Fisheries Protection Agency* www.sfpa.ie

DISCLAIMER

This report has been prepared by Sinbad Offshore Support Ltd for Xodus Group UK on behalf of Nexen Petroleum U.K. Ltd and is general information about fishery activities in the waters offshore Ireland.

While due care has been used in the preparation of information, Sinbad Offshore Support Ltd has no legal responsibility for the content of the information so provided (including, without limitation, as to the quality, accuracy, completeness or fitness for any particular purpose of such information).

No guarantee, representation or warranty whatsoever is given, express or implied, relating to any of the content of this report. Sinbad Offshore Support Ltd does not accept any liability for error or omission or for any loss or damage caused, arising directly or indirectly, in connection with reliance on the use of such information.

List of Abbreviations

ANIFPO	-	Anglo-North Irish Fish Producers Organisation
BIM	-	Bord Iascaigh Mhara
DCCAE	-	Dept of Communications, Climate action & Environment
DTTAS	-	Dept. of Transport, Tourism & Sport
EIS	-	Environmental Impact Statement
EEZ	-	Exclusive Economic Zone
FEL	-	Frontier Exploration Licence
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