AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 – Appendix 13.1 Navigation Risk Assessment

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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AQUIND Interconnector

UK Marine Area

Appendix 13.1

Navigation Risk Assessment

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Presented to	Natural Power
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00	26 November 2018	Initial Draft
01	07 December 2018	Updated based on client comments
02	22 January 2019	Updated based on Scoping Responses
03	September/October 2019	Updated following PEIR responses and new project description/reviews

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Abbreviations Table

Abbreviation	Definition
ABP	Association of British Ports
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
ALB	All-weather Lifeboat
AtoN	Aid to Navigation
AW	AugustaWestland
BEIS	Department for Business, Energy and Industrial Strategy
CA	Cruising Association
CBRA	Cable Burial Risk Assessment
CEA	Cumulative Effects Assessment
CGOC	Coastguard Operations Centres
CHA	Competent Harbour Authority
CLV	Cable Lay Vessel
CNIS	Channel Navigation Information Service
COLREGS	International Regulations for Preventing Collisions at Sea
CoS	Chamber of Shipping
CPA	Closest Point of Approach
CRO	Coastguard Rescue Officer
CRT	Coastguard Rescue Team
DECC	Department for Energy and Climate Change
DfT	Department for Transport
DP	Dynamic Positioning
DWT	Deadweight Tonnage
ECA	Eastney Cruising Association
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EMI	Electromagnetic Interference

Abbreviation	Definition
ES	Environmental Statement
EU	European Union
FLO	Fisheries Liaison Officer
FSA	Formal Safety Assessment
GPS	Global Positioning System
GT	Gross Tonnage
HDD	Horizontal Directional Drilling
HMCG	Her Majesty's Coastguard
HRA	Habitats Regulations Assessment
HVDC	High Voltage Direct Current
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ILB	Inshore Lifeboats
IMO	International Maritime Organisation
IOGP	International Oil and Gas Producers Association
km	Kilometre
KP	Kilometre Point
kV	Kilovolt
m	Metre
LHB	Langstone Harbour Board
MAIB	Marine Accident Investigation Branch
MCA	Maritime & Coastguard Agency
MEHRA	Marine Environmental High Risk Area
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MoD	Ministry of Defence
MPS	Marine Policy Statement
MRCC	Maritime Rescue Coordination Centre
MSC	Maritime Safety Committee
NAVTEX	Navigational Telex

Abbreviation	Definition
NCI	National Coastwatch Institution
nmi	Nautical Mile
NMOC	National Maritime Operations Centre
NPS	National Policy Statement
NRA	Navigation Risk Assessment
NSIP	Nationally Significant Infrastructure Project
OGA	Oil and Gas Authority
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PWC	Personal Watercraft
QHM	Queen's Harbour Master
RNLI	Royal National Lifeboat Institution
RYA	Royal Yachting Association
SAR	Search and Rescue
SCRA	Solent Cruising and Racing Association
SOLAS	Safety of Life at Sea
TCE	The Crown Estate
TH	Trinity House
TJB	Transition Joint Bay
TSS	Traffic Separation Scheme
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
USA	United States of America
UXO	Unexploded Ordnance
VTS	Vessel Traffic Service
ZOI	Zone of Influence

1 Introduction

1.1 Project Summary

Anatec Ltd. was commissioned by Natural Power (on behalf of AQUIND Ltd.) to undertake a Navigation Risk Assessment (NRA) for a subsea High Voltage Direct Current (HVDC) power cable between Normandy in France and the south coast of England. This study focuses on the section of the Marine Cable Corridor in the United Kingdom (UK) Marine Area only.

The NRA presents an initial baseline assessment to identify navigational features and shipping activity in the vicinity of the Marine Cable Corridor. This, alongside consultation with local stakeholders, is then used to identify the potential impacts related to shipping and navigation associated with the construction, operation and maintenance, and decommissioning phases of the AQUIND Interconnector within the UK Marine Area (i.e. the Proposed Development). The significance of each impact is then determined using the Formal Safety Assessment (FSA) process (International Maritime Organization (IMO), 2002). The NRA forms the key technical appendix to Chapter 13 (Shipping, Navigation and Other Marine Users) of the Environmental Statement ('ES') Volume 1 (document reference 6.1.13).

1.2 Objectives

An NRA has been undertaken for the subsea HVDC cable corridor and includes:

- Overview of navigational features;
- Marine traffic analysis;
- FSA;
- Impacts on marine navigation and communication equipment; and
- Identification of mitigation measures.

2 Project Overview

The proposed AQUIND Interconnector will run between Normandy in France and the south coast of England, crossing the English Channel. The total length of the Marine Cable Corridor is approximately 187 kilometres (km). Within the UK Marine Area only, the Marine Cable Corridor is approximately 108 km from the UK Exclusive Economic Zone (EEZ) Median line to the Landfall at Eastney. This NRA is for the UK Marine Area only.

2.1 Cable Design & Installation

The Project will consist of four 320 kilovolt (kV) HVDC Marine Cables which are to be installed as two bundled pairs. In addition, two fibre optic data transmission cables will also be laid together within a shared trench (one per monopole pair). The two bundled Marine Cable pairs are expected to be installed with a typical separation distance of 50 metres (m).

Burial depths have been informed by the results of the geotechnical survey and information from the Cable Burial Risk Assessment (CBRA). Preliminary estimates suggest a target burial depth between 1.0 m and 3.0 m. Where the target burial depth is not achieved, non-burial protection, for example rock placement, mattresses, grout/rock bags or tubular protection, will be added to protect against vessel anchors, if deemed necessary. It is estimated that up to 11 km of the Marine Cable Route may require remedial non-burial protection. An additional 10% contingency for non-burial protection is being proposed to cover unforeseen repair and maintenance requirements over the first 15 years of operation.

The Landfall of the Marine Cables will be located off the coast at Eastney and will be constructed using Horizontal Directional Drilling (HDD) methods. Transition Joint Bays (TJBs) and associated equipment will be located above the Mean High Water Springs (MHWS) while the HDD exit/entry point within the marine environment is anticipated to be located between Kilometre Point (KP) 1 and 1.6 (approximately 0.5 nmi and 0.9 nmi from the start of the Marine Cable Corridor). The onshore works above MHWS are not included within this assessment. However, shipping, navigation and marine activities taking place in the coastal waters off the coast at Eastney will be assessed.

2.2 Project Timescale

The total Marine Cable installation process (including seabed preparation and HDD works) is anticipated to be completed over a period of approximately two and a half years. Cable installation operations will typically be limited to a 6-month window between April and September, however this may extend into the winter seasons due to developments in technology and operations, dependent on a number of conditions and subject to interactions with activities of other marine users and other limitations. Operations are expected to take place across 24 hours of the day, unless halted by weather or other disruptions.

Based on the worst-case Marine Cable installation programme, Marine Cable pre-installation works and HDD Landfall installation are scheduled to commence in Q3 2021,

with the Marine Cable installation commencing in Q2 2022. All works are anticipated to be completed by end of 2023.

2.3 Study Area

This assessment focusses on the Landfall and Marine Cable Corridor within the UK Marine Area.

The study area for the assessment of baseline data is defined as a 5 nmi buffer around the Marine Cable Corridor and is presented in Figure 2.1 alongside the Marine Cable Corridor in UK Marine Area.

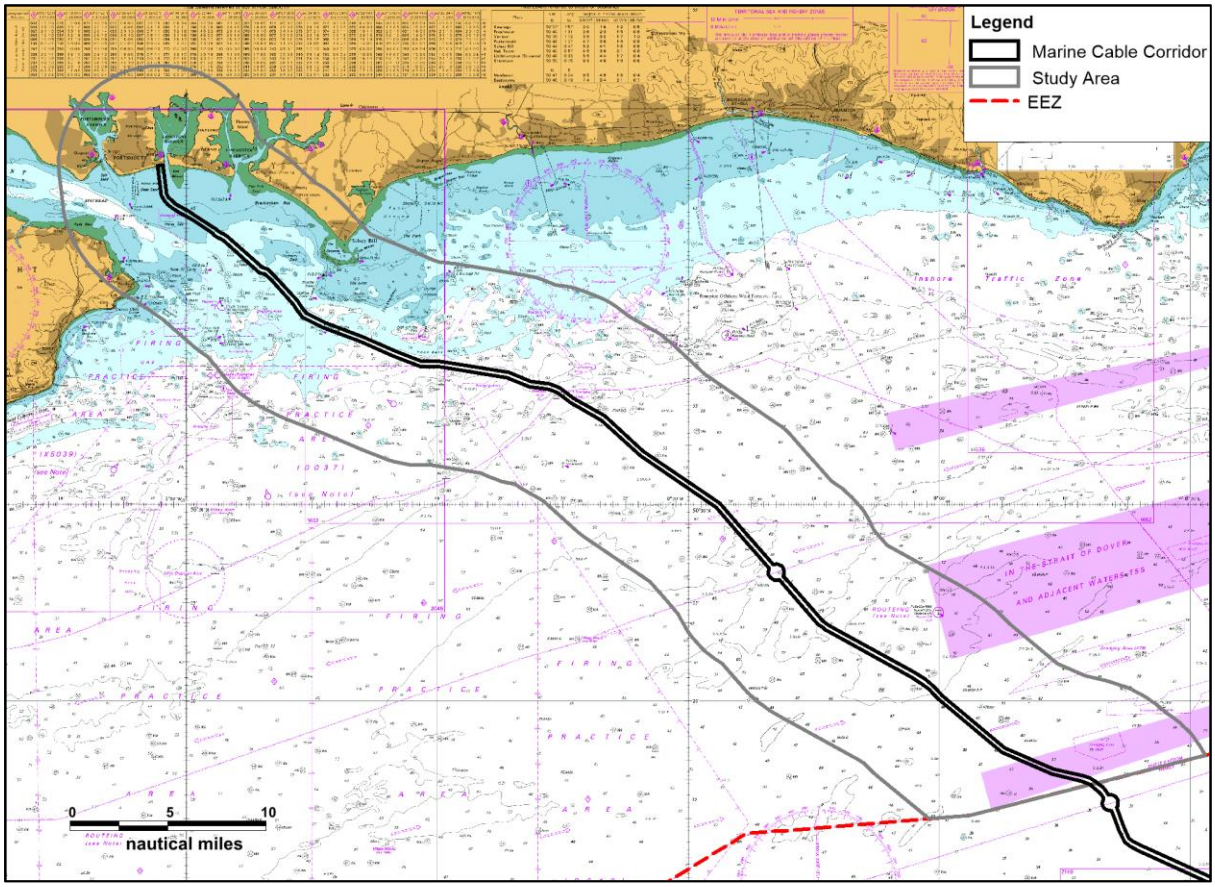

Figure 2.1 Study Area Overview

This is considered sufficient to provide an overview of shipping, navigation and marine users' activity in proximity to the Marine Cable Corridor. It should also be noted that any navigational features within 10 nmi have been considered in the baseline environment.

3 Guidance and Legislation

3.1 Legislation

The following legislation has been used for this assessment:

- United Nations Convention on the Law of the Sea (UNCLOS) (1982);
- Submarine Telegraph Act (1885); and
- International Regulations for Preventing Collisions at Sea (COLREGS) 1972/78, as implemented in the UK through Marine Shipping Notices (IMO, 1972/78).

3.2 Primary Guidance

The primary guidance document used during the assessment is given below:

- The FSA method used in this assessment complies with the IMO *Guidelines for Formal Safety Assessment (FSA) – MSC (Maritime Safety Committee)/Circ. 1023* (IMO, 2002).

3.3 Secondary Guidance

The secondary guidance documents used during the assessment are listed below:

- *MGN* (Marine Guidance Note) *543 Offshore Renewable Energy Installations – Guidance on UK Navigational Practice, Safety and Emergency Response Issues* (Maritime & Coastguard Agency (MCA), 2016)[1];
- *International Association of Marine Aids to Navigation* (AtoN) *and Lighthouse Authorities* (IALA) *Recommendation O-129 on the Marking of Man-Made Offshore Structures, Edition Two* (IALA, 2013).
- *Department for Transport – Maritime 2050, Navigating the Future (DfT, 2019).*

3.4 Policy

The following policies were also used during the assessment:

- EN-1 Overarching National Policy Statement (NPS) for Energy (Department for Energy and Climate Change (DECC), 2011);
- UK Marine Policy Statement (MPS) (2011);
- South Inshore and South Offshore Marine Plan (2018);
- Southampton Vessel Traffic Service (VTS);
- Dover Strait Traffic Separation Scheme (TSS);
- Channel Navigation Information Service (CNIS); and
- Dover Strait – Mandatory Reporting Area.

[1] Although this guidance is focused on offshore renewables, it highlights issues to be taken into consideration when assessing the effects of offshore developments on navigational safety and includes guidance on cable protection and burial within UK waters.

Details of each these policies are given below in Table 3.1

Table 3.1 Details of Relevant Policies

Policy	Details
EN-1 Overarching NPS for Energy	The EN-1 Overarching NPS for energy sets out the Government's policy for major energy infrastructure. Within this policy, the impact of offshore developments on military activities due to the presence of danger and exercise areas located across the UK Continental Shelf (UKCS) is considered. This impact is assessed in this NRA following review of the baseline data which identifies military defence exercise areas in proximity to the Proposed Development.
UK MPS	The UK MPS is a framework for preparing marine plans and taking decisions affecting the marine environment. Any decisions made should minimise any negative impacts on shipping activity, freedom of navigation and navigational safety. The Proposed Development has been designed to minimise the impact on shipping and other marine users with impacts fully assessed in this chapter.
South Inshore and Offshore Marine Plan	The South Marine Plan introduces a strategic approach to planning within the inshore and offshore waters between Folkestone in Kent and the River Dart in Devon. Any proposals for this area must put in place measures to minimise significant adverse impacts on the marine area, particularly within the Dover Strait TSS, and should not restrict current port / harbour activities and future growth. Impacts to shipping in this area are assessed in this chapter.
Southampton VTS	All vessels transiting to or within Port of Southampton's waters are under the control of the Harbour Authority to efficiently and effectively maintain navigational safety. The Proposed Development passes through this area and thus shipping in this area will be monitored via the VTS.
Dover Strait TSS	TSSs are used to separate traffic travelling in opposite directions in busy (or sensitive) areas of shipping. Rule 10 of COLREGS applies to TSSs adopted by the Organisation and does not relieve any vessel of her obligation under any other Rule. Inshore traffic zones of the TSS are not to be used under normal circumstances for through traffic if the lane in the TSS is safe to use. However, vessels which are less than 20 m in length and all sailing vessels may, under all circumstances, use inshore traffic zones.

Policy	Details
CNIS	The CNIS helps in the supervising of the maritime traffic crossing through the Dover Strait by way of a full-day, 24-hour radio and radar safety system. It is jointly operated by the UK and French administrations from the Dover Maritime Rescue Coordination Centre (MRCC) and CROSS Gris-Nez. They are assigned to keep the Dover Strait TSS under observation in addition to monitoring the flow of traffic. In the case of any vessel not following the stipulated guidelines whilst crossing the Strait, the CNIS are authorised to report this and undertake any corrective measures required.
Mandatory Reporting Area	The Dover Strait is a mandatory reporting area, meaning all vessels over 300 gross tonnes (GT) transiting through the area are required to report to either the Dover Strait MRCC (south-west lane) or CROSS Gris Nez (north-east lane).

4 Navigation Risk Assessment

4.1 FSA Methodology

The IMO FSA process approved under the IMO circular MSC/Circ.1023/MEPC/Circ.392 (IMO, 2002) has been applied within this study. This is a structured and systematic methodology based on risk analysis and cost benefit analysis (if applicable) and is recognised as industry best practice for navigational risk assessment. There are five basic steps within this process (this assessment focuses on Steps 1-3):

- Step 1: Identification of hazards (a list of all relevant accident scenarios with potential causes and outcomes);
- Step 2: Assessment of risks (evaluation of risk factors);
- Step 3: Risk control options (devising regulatory measures to control and reduce the identified risks);
- Step 4: Cost benefit analysis (determining cost effectiveness of risk control measures); and
- Step 5: Recommendations for decision-making (information about the hazards, their associated risks and the cost effectiveness of alternative risk control measures).

Figure 4.1 presents a flow diagram of the FSA methodology applied.

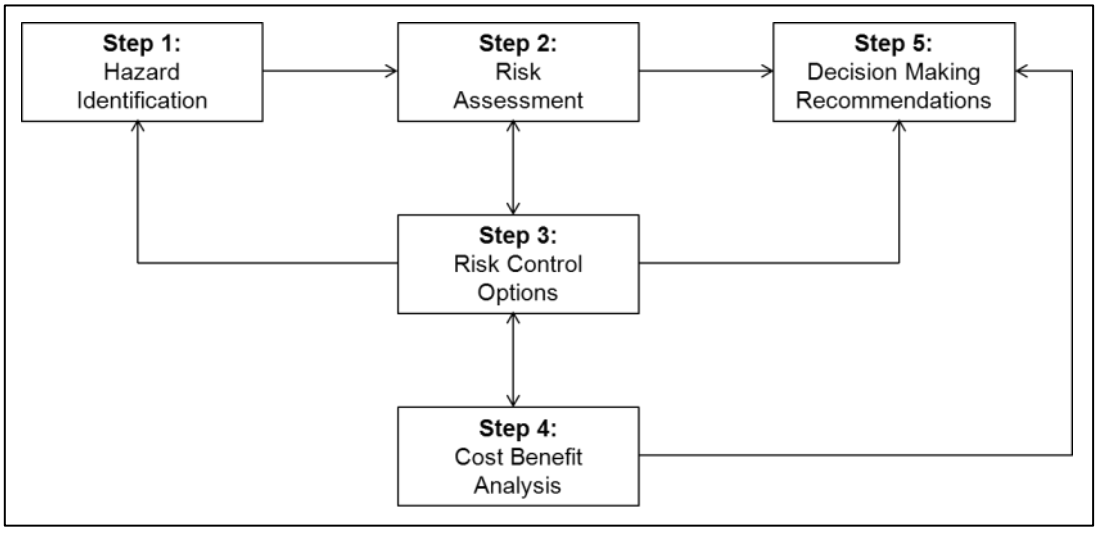

Figure 4.1 Formal Safety Assessment Process

The NRA uses a baseline assessment (established using the data sources listed in Section 5), in addition to consultation with local stakeholders and scoping responses and feedback on the Preliminary Environmental Information Report (PEIR), to identify potential impacts relevant to shipping and navigation receptors that may arise as a result of the Proposed Development.

The impacts have been identified by phase, i.e. construction phase and operation, repair and maintenance phase. It is noted that the impacts identified in the construction phase are also considered in the decommissioning phase. Where identified, the overall severity of consequence to the receptor and the frequency of occurrence has been determined. As this process incorporates a degree of subjectivity, the assessment uses the various sources provided within the NRA to inform the rankings assigned to each impact.

The severity of consequence has been assessed against the frequency of occurrence to provide the level of tolerability of the impact. Further detail of the assessment methodology is provided in Section 14.

4.2 Cumulative Effects Assessment Methodology

A Cumulative Effects Assessment (CEA) has been undertaken for shipping and navigation within this NRA; this includes impacts of activities associated with other marine operations in the area and other marine developments. It is noted that fishing, recreation and military transits have been considered as part of the baseline assessment. The cumulative effects that are considered are detailed in Section 16 of this report however, additional information is presented within Chapter 13 (Shipping, Navigation and Other Marine Users) and Chapter 29 (Cumulative Effects) of the ES Volume 1 (document reference 6.1.29). The CEA follows the Planning Inspectorate (PINS) Advice Note 17 (PINS, 2015).

4.3 Assumptions

The shipping and navigation baseline and impact assessment has been carried out based on the information available and consultation responses received at the time of preparation. Assessment has been undertaken based on the information provided within Chapter 3 (Description of the Proposed Development) of the ES Volume 1 (document reference 6.1.3) and using the worst case parameters presented in Appendix 3.2 (Marine Worst-Case Design Parameters) and Appendix 3.8 (Programme Onshore and Marine) of the ES Volume 3 (document references 6.3.3.2 and 6.3.3.8).

The following assumptions have been made in the impact assessment:

- There could be up to eight main CLV and up to 24 support vessels involved in cable installation works, however it is anticipated that not all vessels will be operating in the same area at the same time. Vessels involved in Landfall works (exit/entry point between KP 1.0 and KP 1.6) include up to seven support vessels and one jack up vessel or barge.
- The cables will not be left exposed for more than 1-2 months during installation.
- Vessels (in particular, dredgers) will not anchor directly over the cable once installed.
- Worst case scenarios are 30 months for route preparation (including disposal), two years for cable installation and 44 weeks for Landfall installation.
- Worst case scenario for cable repair is one repair every 10-12 years.

5 Data Sources

The main data sets used in this assessment are listed below, and described in detail in the following sections:

- Automatic Identification System (AIS) data;
- Marine Management Organisation (MMO) satellite fishing data;
- Royal National Lifeboat Institution (RNLI) incident data;
- Marine Accident Investigation Branch (MAIB) incident data;
- UK Admiralty Charts;
- *Admiralty Sailing Directions, Channel Pilot NP 27, 10th Edition* (United Kingdom Hydrographic Office (UKHO), 2014);
- *Admiralty Sailing Directions, Dover Strait Pilot NP 28, 10th Edition (UKHO, 2013).*
- *UK Coastal Atlas of Recreational Boating 2.0* (Royal Yachting Association (RYA), 2016);
- Marine aggregate dredging areas (The Crown Estate (TCE)); and
- Offshore wind farm (OWF) lease boundaries (TCE).

5.1 AIS Data

The baseline shipping analysis is based on an up-to-date data set consisting of six months of AIS data. This is broken into two distinct three month periods in order to cover seasonal variation (i.e. summer and winter period). The chosen periods (detailed below) ensure that the data for the area is recent.

- 1st December 2017 – 28th February 2018 (winter)
- 1st May 2018 – 31st July 2018 (summer)

AIS equipment is required to be fitted on all vessels of 300 GT and upwards engaged on international voyages, cargo vessels of 500 GT and upwards not engaged on international voyages, and passenger vessels irrespective of size, built on or after 1st July 2002. All European Union (EU) registered fishing vessels of length 15 m and above are required to carry AIS equipment under EU Directive 2002/59/EC, amended by Directives 2009/17/EC and 2011/15/EU. Smaller fishing vessels (below 15 m) as well as recreational craft are not required to carry AIS but a proportion does so voluntarily. It is also noted that military vessels are not obligated to broadcast on AIS at all times. Therefore, these vessels (e.g. fishing, recreational and military vessels) will be under-reported within the AIS data.

The reporting interval between position reports for a given vessel typically ranges between a few seconds and up to three minutes, depending on its speed and navigational status (less frequent for anchored and moored vessels).

5.2 Satellite Fishing Data

The MMO offers satellite coverage of all fishing vessels 15 m and over in a density-based grid for the UK. Two years of fishing data (2015 and 2016) was reviewed within proximity of the Marine Cable Corridor.

5.3 RNLI and MAIB Incident Data

The RNLI logs details of incidents it responds to, including the cause of the incident. Incident data was obtained from the RNLI for 10 years from 2005 to 2014 (RNLI, 2018).

All UK commercial vessels are required to report accidents to the MAIB. Non-UK vessels do not have to report unless they are in a UK port or are inside the UK 12 nautical mile (nmi) Territorial Waters and carrying passengers to a UK port. There are no requirements for non-commercial recreational craft to report accidents to the MAIB. The MAIB will record details of significant accidents of which they are notified by bodies such Her Majesty's Coastguard (HMCG), or by monitoring news and other information sources for relevant accidents. When reporting the location of incidents, the MAIB aim for 97% accuracy. Data were available from 2005 to 2014 via a freedom of information request.

5.4 UK Admiralty Charts

Admiralty charts are nautical charts issued by the UKHO. Charts have been used to identify navigational features in the area. The following are the main charts used in this study:

- 1652: Selsey Hill to Beachy Head
- 2036: The Solent and Southampton Water
- 2037: Eastern Approaches to the Solent
- 2045: Outer Approaches to the Solent
- 2450: Anvil Point to Beachy Head
- 2451: Newhaven to Dover and Cap d'Antifer to Cap Gris-Nez
- 2625: Approaches to Portsmouth
- 3418: Langstone and Chichester Harbours

5.5 Admiralty Sailing Directions

Admiralty Sailing Directions, also known as Pilot Books, are used by mariners to identify established routes when steaming on passage, as well as coastline features, anchorages, ports, etc. The Channel Pilot (UKHO, 2014), has been used in this assessment to identify the significant navigational features in the vicinity of the Marine Cable Corridor.

5.6 RYA Coastal Atlas UK

The RYA *UK Coastal Atlas of Recreational Boating 2.0* provides data relating to the recreational boating activity around the UK. The data set includes an intensity grid, general boating areas and offshore routes, as well as the locations of clubs, training centres and marinas. The intensity grid utilises AIS data from 2016.

5.7 Aggregate Dredging Areas

The marine aggregate dredging area layer was obtained from TCE. TCE are responsible for licensing capital and maintenance dredging projects which enable navigational channels to be created and maintained on the UK seabed. The latest available data is from April 2018.

5.8 Offshore Wind Farms

The OWF boundaries in proximity to the Proposed Development were obtained from TCE. The latest available layer is from August 2018.

5.9 Data Limitations

The main limitations associated with the data sets are outlined below.

- AIS Data
  - AIS equipment carriage is not mandatory for all vessels. Military vessels and smaller craft such as fishing vessels below 15 m in length and recreational craft are not required to carry AIS, and therefore will be under-represented within the analysis.
  - It is also noted that the coverage may be limited in periods where atmospheric pressure is low, where the range and pick up of AIS transmissions are reduced.
  - Trials carried out by Anatec in the North Sea found that a minority of fishing vessels do not broadcast on AIS at all times, especially when engaged in fishing, thus coverage of fishing vessels may be under-represented.
- Satellite Fishing Data
  - Only covers fishing vessels of 15m in length and above.
- Maritime Incident Data
  - Non-commercial recreational craft are not required to report accidents to the MAIB.

6 Consultation

6.1 Scoping

A scoping request was submitted to the MMO in February 2018 with regards to the Proposed Development as part of the consultation process. However, on 30th July 2018, the Secretary of State for the Department for Business, Energy and Industrial Strategy (BEIS) issued a direction confirming that the AQUIND Interconnector was a Nationally Significant Infrastructure Project (NSIP) and thus re-scoping was submitted to PINS in October 2018.

A Scoping Opinion was received on 7 December 2018. The issues raised from the PINS scoping in relation to shipping, navigation and other marine users, and how comments have been addressed, are summarised in Table 6.1. Scoping comments from other key consultees (i.e. MCA, Ministry of Defence (MoD), Langstone Harbour, MMO and Trinity House (TH)) are also included.

Table 6.1 Summary of Scoping Responses

Summary of Scoping Response	Where Addressed
PINS Comments	
The ES should clearly justify the selected study area of 2 nmi around the Proposed Development.	A Study Area of 5 nmi was chosen for the shipping and navigation baseline, as defined in Section 2.3. This is deemed appropriate to ensure all shipping activities that may be affected by the Proposed Development are assessed.
A wider anchoring assessment will be included in the NRA to determine the risk of emergency anchoring over the cable. ES should identify and assess impacts of additional cable protection methods, i.e. rock placement, where this would result in a likely significant effect. Assumptions applied such as locations and quantity of material should be explained in ES. Where uncertainty exists, this should be taken into account and explained.	Emergency anchoring has been qualitatively assessed in Section 14. Embedded mitigation measures assume that the cable is suitably protected by burial where feasible. In addition, where cable protection methods, e.g. rock placement, are required, these should not reduce water depths by more than 5%. A more detailed assessment should be carried out if any required rock protection is considered to present a hazard to shipping and navigation. The CBRA will be used to identify suitable protection measures.

Summary of Scoping Response	Where Addressed
Inspectorate acknowledges a baseline assessment will be presented in the NRA to identify the potential impacts relevant to shipping and navigation. ES should clearly state the impact assessment methodology applied to this chapter as it differs from the approach presented in the overarching assessment methodology.	The baseline is presented in Sections 7 through to 12. The impact assessment methodology is defined in Section 14.3.
Scoping Report does not define study area or likely Zone of Influence ('ZOI') for effects on other marine users. This should be clearly stated in the ES.	A study area of 5 nmi has been chosen for the baseline. This is deemed appropriate to ensure all relevant marine activities that may be affected by the Proposed Development are assessed. A ZOI of 5 nmi will be used for the CEA (Section 16).
Scoping Report identifies Rampion Wind Farm being located within 5 nmi but it is not clear whether effects on this wind farm are to be considered in ES and what these are likely to comprise.	No significant effects associated with the Proposed Development are predicted. As such, no potential effects on Rampion OWF are expected. Rampion OWF has been considered within the CEA (Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix) of the ES Volume 3 (document reference 6.3.13.2)).
Inspectorate notes baseline information and potential impacts/mitigation within Chapter 13 of Scoping Report includes recreational vessel data, with potential impacts and mitigation measures similar to that contained within Chapter 16 for recreational vessels. ES should avoid duplication but include appropriate cross-referencing between aspects.	Recreational activity has been assessed in Section 12. Chapters 16 (Other Marine Users) and 13 (Shipping and Navigation) of the Scoping Report have been combined for the ES.

Summary of Scoping Response	Where Addressed
Inspectorate notes that assumptions have been made regarding potential impacts and mitigation measures to conclude that there is unlikely to be significant transboundary effects; however, such effects are stated as yet to be explored in the corresponding aspect chapter. Limited information has also been provided with regard to location of potential sensitive receptors in other European Economic Area ('EEA') States. ES should include description of significant effects as a result of the Proposed Development, including transboundary effects.	Transboundary effects have been considered within this chapter. No significant transboundary effects have been identified.
ES should consider potential for cumulative impacts with proposals to redevelop the Fraser Range site at Eastney and the North Portsea Coastal Defence schemes.	North Portsea Coastal Defence has been considered within the CEA matrix (Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix) and not considered significant. Fraser Range site is an onshore development and is not considered to be a relevant project for the marine elements of the Proposed Development including shipping and navigation. The plans and projects considered as part of the CEA will be kept under review and, where required, updated as part of the final ES.
MCA Comments	
A detailed and current NRA is required before consent can be granted. This NRA should include appropriate risk mitigation measures and a detailed methodology to ensure the risk remains reduced to As Low As Reasonably Practicable ('ALARP'). This should also include assessments on collision risk, emergency response, marking and lighting during the works and promulgation of Notices to Mariners.	Detailed methodology and mitigation measures included in the FSA assessment process detailed in Section 14. The assessment considers collision risk, emergency response, marking and lighting and appropriate mitigation. The assessment uses baseline data, consultation, and expert opinion to identify the level of significance of each impact, taking embedded mitigation into account. Additional mitigation measures have been identified as necessary to reduce risks to ALARP levels.

Summary of Scoping Response	Where Addressed
The NRA must include considerations for the effects on vessel navigation and communication equipment, as well as any electromagnetic deviation on ships compasses. The MCA will accept a three degree deviation for 95% of the cable route. For the remaining 5% of the route no more than five degrees will be attained. The MCA would however expect a deviation survey post the cable being laid; this will confirm conformity with the consent condition (if given). The data must also be provided to the UKHO via a hydrographic note (H102), as they may want a precautionary notation on the appropriate Admiralty Charts.	The MCA requirement is included within mitigation measures in Section 14.4. The deviation of less than 5 degrees is included as embedded mitigation, while the requirement for post-construction surveys is included in additional mitigation measures.
Particular attention must be paid to cabling routes and burial depth for which a Burial Protection Index study must be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. Any consented cable protection works must ensure existing and future safe navigation is not compromised, accepting a maximum of 5% reduction in surrounding depth referenced to Chart Datum.	A CBRA has been undertaken to determine suitable protection for the cable. Burial or other protection of Marine Cables (e.g. rock placement) will not reduce the surrounding water depth by more than 5%. This is included as embedded mitigation in Section 14.4.
Noting that part of the cable route will transit through the South-Western end of the Dover TSS, a specific NRA for the area to be laid within the TSS must be provided in the ES. This will need to include a specific methodology with regards to the cable laying operation, and must be compliant with the COLREGs.	This section of Proposed Development is considered a high risk area. Quantitative assessment of vessel-vessel collision within the TSS is provided in Section 15.
The MCA notes that the current proposal seeks to lay a section of the pipe through a Separation Area. Under COLREGS Rule 10(e), this area is provisioned for vessels transiting in/out of a TSS, and for vessels in emergency distress, plus also fishing vessels. The use of trawlers and anchors also increases the risk of a cable strike before burial is complete.	Risk of cable strike from anchors and fishing gears is addressed within Section 14.

Summary of Scoping Response	Where Addressed
Rule 10(l) allows for an exemption for a "vessel restricted in her ability to manoeuvre" (defined in Rule 3 to include a cable laying vessel) during a specific cable laying operation. However this exemption may not extend to guard vessels, unless an exemption under Rule 10(k) (vessels engaged in the maintenance of the safety of navigation) can also be sought. Full consultation with MCA Dover CNIS will be requested, so that operations can be safely managed.	Initial consultation via attendance of the MCA Dover CNIS Working User Group (October 2018) was undertaken as part of the NRA process. Further details are included in Section 6.2.4. Additional consultation was undertaken during the s.42 consultation process.
The COLREGs are an internationally-accepted treaty and enshrined under UK law. Contraventions of the COLREGs may also constitute an offence and may be liable to prosecution by the MCA Enforcement Unit. Implications of these rules must also be considered within the ES for any future survey or maintenance works both prior and after completion.	Compliance with COLREGS and International Regulations for the Safety of Life at Sea (SOLAS) has been included within embedded mitigation during construction, operational and decommissioning stages (Section 14.4).
Cable laying operations are likely to impact traffic routes into the Solent area, and so the MCA-chaired NAB VTS area User Group must be fully consulted with at an early stage. The User Group includes other local stakeholders including ferries, dredging operators, harbour authorities, fishing associations and the RYA.	As above, consultation with the NAB User Group (via attendance at the User Group meeting in September 2018) has been undertaken as part of the NRA process. This is summarised in Section 6.2.1.
Particular emphasis must also be placed on considering any impacts to local military operations out of Portsmouth.	Impacts on military operations assessed in Section 14. Consultation with QHM (Queen's Harbour Master) Portsmouth has also been undertaken as part of the NRA process. Furthermore, the response from the MoD to the Scoping Opinion has been considered below and further engagement will be undertaken with the MoD as appropriate.

Summary of Scoping Response	Where Addressed
The MCA notes that the cable route through the English Channel will have a high probability of encountering UXO during laying operations. Appropriate safeguards should be put in place by the Proposer for safe disposal and mitigation where needed.	A separate standalone marine licence application will be made for safe disposal of Unexploded Ordinance (UXO).
MoD Comments	
The extent of maritime military practice and exercise areas within the vicinity of the Proposed Development has been identified in Scoping Report. The cable route will intersect Danger Area D037, the MoD has no concerns with the cable route passing through this area.	Military practice areas have been identified within baseline assessment in NRA. Potential impacts on military activities assessed in Section 14.
The potential for the offshore development area to contain historic disposal sites for explosive munitions has been identified and considered. In addition, the potential presence of unexploded ordnance ('UXO') has also been considered as a relevant consideration with respect to the installation of the cables and geophysical surveys.	A separate standalone marine licence application will be made for safe disposal of UXO.
Associated British Ports (ABP) have no comment or suggestions on the proposed scope of environmental assessment work. However, continued engagement on the progress and conclusions of the NRA is to be undertaken through the Nab VTS User Group.	Further engagement with ABP has been undertaken. See Section 6.3.
Langstone Harbour comments	
Langstone Harbour Board (LHB) had no further comments at this time on the Scoping Report relating to the Proposed Development.	N/A
MMO comments	
The MMO had no comments on the Scoping Report with regards to shipping and navigation.	N/A

Summary of Scoping Response	Where Addressed
Trinity House comments	
TH is content with the Scoping Report and have no further comments at this stage.	N/A

6.2 Meetings

This section presents the additional consultation undertaken for the NRA.

6.2.1 Nab User Group Meeting

The Nab User Group is comprised of representatives from the MCA, ABP Southampton, QHM Portsmouth and other users that utilise the Nab Channel such as dredging companies and ferry operators. This meeting was held on Tuesday 18th September 2018 at ABP Southampton.

An overview of the Proposed Development, including the baseline assessment was presented. Discussions on how the construction and/or operation of the marine cabling may impact shipping users in the area were undertaken in addition to any limitations of the baseline data.

A link to the PINS Scoping Report (AQUIND, 2018), which includes further details of the Proposed Development, was also forwarded to meeting attendees in November 2018. The NAB User Group was also consulted on the PEIR as part of the S. 42 consultation process and comment on the draft deemed Marine Licence was requested in July 2019 (see Section 6.3). An update via email on the Proposed Development was also provided to the Group in September 2019.

The main points raised during the September meeting are summarised below in Table 6.2

Table 6.2 Nab User Group Meeting Main Points

Point Raised	Where Addressed
Weekly updates of the progress of the project are to be communicated to ABP Southampton, QHM Portsmouth, MCA, and Langstone Harbour. In addition, any notices to fishermen should also be distributed to the above.	Liaison with local ports and harbours added as mitigation (Section 14.6).
It was queried whether the marine cabling will be left exposed for a period of time between laying and burial.	Plans still under review. As this remains a possibility at this stage, the impacts to an exposed cable have been assessed in Section 14.5.
The majority of the Solent lies within UK Search and Rescue (SAR) Zone 17 who will be responsible for coordinating the response for any SAR emergencies in the area.	Emergency response procedures are outlined in Section 8.
It was raised that activity from military vessels will be under-represented in the AIS baseline analysis and MoD should be consulted. However, it was also noted that little exercise activity occurs in close proximity to the proposed cable due to the large number of vessels and activities within the area.	Military activity identified in baseline assessment shown in Section 7.7 and Section 10.2. Impacts identified and assessed using this information in Section 14.5. MoD were consulted by PINS at Scoping and did not express any concerns with the Marine Cable route. Further engagement during pre-application will be undertaken as appropriate.
Anchoring activity, particularly from dredgers, is likely to occur in vicinity to cable whilst awaiting entrance to port.	Anchoring activity identified in the baseline assessment is presented in Section 10.7.
It was noted that recreational activity is under-represented in the AIS data and thus RYA to be consulted.	Consultation was undertaken with a representative of RYA (see Section 6.2.3 for details of meeting). Recreational activity from AIS and additional desk-top sources, including RYA Coastal Atlas, is presented in Section 12.

6.2.2 Trinity House Meeting

A meeting was held on Tuesday 2nd October 2018 at Trinity House (TH), with representatives from TH, Langstone Harbour, Cruising Association (CA) and Chamber of Shipping (CoS).

An overview of the Proposed Development, including the baseline assessment was presented. The impacts to recreational users, vessels utilising Langstone Harbour and general shipping were discussed.

The main points raised are summarised below in Table 6.3. A link to the PINS Scoping Report (AQUIND, 2018), which includes further details of the Proposed Development, was also forwarded to meeting attendees in November 2018.

Table 6.3 Meeting Main Points

Main Point	Where Addressed
Concerns were raised over any reduction in water depth that may arise either through the use of cable protection measures or due to trenching.	Project is aware of MCA conditions regarding any water depth reductions. Included as embedded mitigation in Section 14.4.
Queried if installation works could avoid Cowes Week if possible, due to the large number of vessels in the area during this time.	Research into future dates of Cowes Week presented in Section 12.3, and such periods will be avoided where possible. (Section 14.6)
It was noted that due to the number of vessels operating in the area a guard vessel should be utilised during cable installation with radio warnings broadcast.	These have been added as embedded mitigation measures (see Section 14.4).
It was noted that recreational vessels may not be aware of Notice to Mariners, and thus local marinas should also be notified.	This has been added as embedded mitigation (see Section 14.4).
Noted that recreational vessels in AIS data were significantly under-represented due to many not broadcasting on AIS.	Additional information including RYA Coastal Atlas, and other publicly available information assessed in Section 12 to account for this under-representation.
Possible recreational anchoring activity could occur near Langstone Harbour entrance. It was stated that the CA suggest a burial depth of 1 – 1.5 m is achieved as some recreational anchors can penetrate to depths up to 1 m, where water depths are less than 10 m. [2]	Consultation responses taken into consideration when assessing impacts associated with vessel anchors in Section 14.5.

[2] It is noted that this is only likely to occur in very soft seabed and consequences of recreational anchors are not considered significant.

Main Point	Where Addressed
Estimated that 500-600 dredgers per annum anchor whilst waiting for the tide to enter port (4-6 hours) in vicinity of cable corridor.	Noted. Consultation responses taken into consideration when assessing impacts associated with vessel anchors in Section 14.5.
August is the busiest month for recreational vessels with a large number crossing over the cable corridor on an east-west route.	Noted. Recreational activity reviewed in Section 12.
There are a number of regattas in the area and hence a number of race marks.	Recreational activity, including popular regattas and locations of race marks presented in Section 12.
Approximately 12-18 charter angling boats operate out of Langstone Harbour.	Noted. Recreational activity reviewed in Section 12.

6.2.3 Royal Yachting Association Meeting

A meeting with a representative from the RYA was held on Tuesday 2nd October 2018 in London. An overview of the Proposed Development, including the baseline assessment, was presented. The impacts the Project will have on recreational users were discussed.

The main points raised are summarised below in Table 6.4. A link to the PINS Scoping Report (AQUIND, 2018), which includes further details of the Proposed Development, was also forwarded to meeting attendees in November 2018.

Table 6.4 RYA Meeting Main Points

Main Point	Where Addressed
Recreational vessels pass very close to the coast in proximity to the cable Landfall, therefore would not like to see obstructions within 5 m contour.	Noted. Impact on recreational vessels, particularly within coastal waters, assessed in Section 14.5.
A large number of recreational vessels will use the shortcut through the submarine barrier which brings them close to the coast. Area is very busy during the summer months.	Noted. Recreational activity reviewed in Section 12.
Local sailing clubs should be informed of any planned activities.	Included as additional mitigation in Section 14.6.
Numerous races and regattas hosted by Chichester Harbour, Southsea Marina and Incheon Yacht Club will take place within vicinity of the Proposed Development.	Noted. Recreational activity reviewed in Section 12.
Concern expressed over potential impacts in marine electronics.	Noted. Impact on marine electronics assessed in Section 14.5.

6.2.4 Dover Strait User Working Group – Conference Call

A conference call was held with the Dover Strait User Working Group on 17th October 2018. An overview of the Proposed Development was presented, including details of the baseline environment.

No major comments were made during this conference call; however, it was noted that the Marine Cable Corridor had been routed to avoid major dredging areas, anchorages, and routeing measures with the exception of the section of cable through the north east bound lane of the Dover Strait TSS.

A link to the PINS Scoping Report (AQUIND, 2018), which includes further details of the Proposed Development, was also forwarded to meeting attendees in November 2018. The Dover Strait User Group was also consulted on the PEIR as part of the S. 42 consultation process and comment on the draft deemed Marine Licence was requested in July 2019 (see Section 6.3).

6.3 PEIR Consultation

Consultation on the PEIR was undertaken between February and May 2019. The issues raised in relation to shipping, navigation and other marine users, and how comments have been addressed, are summarised in Table 6.5.

Table 6.1 Summary of PEIR Consultation Responses

Organisation	Summary of PEIR Response	Addressed
MMO	It is noted that other legitimate users of the sea are also likely to be significantly affected in relation to exclusion zones and navigation, particularly in the Solent which is an already difficult area to safely navigate. In particular oil tankers servicing ExxonMobil Fawley Oil Refinery Marchwood, commercial freight container ships utilising ABP Southampton dock facilities and Portsmouth Harbour dock facilities, Brittany Ferries operating cross channel routes between Portsmouth and various French ports, Royal Navy and RFA vessels operating from HMNB Portsmouth as well as many thousands of recreational vessels. The number of recreational vessels swells considerably for events such as Southampton boat show (occurs annually – one of the largest on water boat shows in Europe) and Cowes Week (occurs annually – the largest sailing regatta of its kind in the world, with up to 8000 competitors in over 1000 boats competing in up to 40 sailing races per day around the Isle Of Wight).	As part of the s. 42 consultation, communications were sent to ExxonMobil , ABP Southampton, International Port of Portsmouth, QHM Portsmouth and Brittany Ferries amongst many other stakeholders such as other ferry companies (Gosport, DFDS and Condor) aggregate companies, sailing and yacht clubs. We also sent email reminders to these organisations after the consultation period had ended to remind them that they still can make a representation on the proposals if they had not responded. See Consultation Report (Document Ref. 5.1) for further details. Tankers, container ships and ferries are all included in the AIS data set and have therefore been considered in the impact assessment. The assessment also considers disruption to military activities due to the proximity to Portsmouth and disruption to recreational activities due to the large number of recreational vessels in the area. The dates of the Cowes Week and Southampton Boat Show have been considered by the project design team. Scheduling of any construction works to avoid significant races (e.g. Cowes Week, Round the

Organisation	Summary of PEIR Response	Addressed
		Island Race) if possible is included as additional mitigation (Section 14.6).
Southern IFCA	Recommend continued consultation with Southern IFCAs Recreational Angling Sector Group.	The Applicant has engaged with the recreational angling sector through meetings, phone calls and emails throughout 2019. The information gathered from these consultations has helped inform an impact assessment to provide more detail regarding the potential effects on recreational angling. This information is presented within Chapter 13 Shipping, Navigation and Other Marine Users.
BMAPA	No consideration given to the potential for the proposed project to impact on those areas of marine sand and gravel resource that may be considered for use in the future.	Discussions have been ongoing with the aggregate dredging companies most likely to be impacted by the works: Cemex, Volker, Kendall's Wharf and Tarmac. These companies have indicated that they do not have concerns regarding the Proposed Development. In order to minimise impacts to the aggregate industry, the cable route was refined to avoid current aggregate dredging interests such as the former Horsetail dredging area and the route was also moved closer to IFA2 to avoid rocky seabed/fishing grounds and minimise 'sterilisation' of the seabed between the two proposed cables (AQUIND Interconnector and IFA2). Any potential areas of interest would be determined by TCE, the current leasing round does not indicate that any of the

Organisation	Summary of PEIR Response	Addressed
		proposed leasing areas will be along the route of the Proposed Development. TCE has been consulted and in their investigations of the potential for impact to future resource, they have not raised any concerns about potential impacts on future resource resulting from the Proposed Development. The Applicant has a signed Option Agreement and agreed Lease with TCE.
TH	Further consideration for marking requirements to be given when marine licence application is made. Any marine craft used in the works to exhibit signals as per colregs. TH to be advised of any AtoN affected by the project and any requirements to relocate any AtoNs to be approved by TH.	Noted. TH were consulted on the draft Deemed Marine Licence ('dML') and have provided input.
Tudor Sailing Club	Tudor Sailing Club has concerns regarding the possible routes of Section 7, as the possible routes appear to include going through the grounds of our very active sailing club and also passing up the Broom Channel of Langstone Harbour through our cruiser moorings, causing potential damage to the channel, our moorings and possibly our boats, depending on the time of year that the work is undertaken.	Disruption to recreational activities assessed in Section 14.5.
Ministry of Defence	The offshore cable route will intersect military Danger Area D037 however we have no safeguarding concerns with the cable route passing through this danger area. We have no other offshore safeguarding concerns with this proposal however historic explosive munitions disposal sites and UXO should be taken into account.	Disruption to military activities assessed in Section 14.5.
RYA	No substantive comments at this stage.	N/A

Organisation	Summary of PEIR Response	Addressed
	Welcome further communications as the proposal develops.	
Brittany Ferries	We are not planning to submit a response.	N/A
Tarmac	We have considered the interconnector route in relation to our aggregate dredging licence areas and concluded that it is sufficiently distant from these areas so we do not have any comments to make. We were consulted earlier on in the process, with TCE, and provided some input to the route planning then.	N/A
Cemex	Initial view is that it is unlikely that any of our vessels would choose to routinely anchor in any area which would impact on the interconnector route.	Taken into consideration in assessment of anchor dragging impacts (Section 14.5).
Cachalot Charters	Request that construction works for the section of cable in the area behind the Nab tower scheduled for winter if possible.	The location of the area behind the Nab tower, down to the puller buoy Bullocks Patch has been considered in the baseline in Section 13.5 of Chapter 13. Impacts to fish ecology have been assessed in Chapter 9 Fish and Shellfish.

The MCA and Southampton ABP provided feedback on the PEIR in August 2019. Table 6.6 presents the comments made and how they have been addressed. The MCA also provided feedback on the draft dML which has been incorporated into the submitted dML.

Table 6.6 Summary of MCA and Southampton ABP Consultation PEIR Responses

Summary of MCA Response	Where Addressed
Page 13-3 Local Policy; it should be noted that the cable route runs through the NAB VTS area, rather than within Southampton's SHA port limits as stated. NAB VTS is managed by Southampton VTS on behalf of the MCA. Part of this route section is also within the SHA area of QHM Portsmouth.	Noted. The pilotage limits are presented in 7.1.

Summary of MCA Response	Where Addressed
We note that the cable and any protection methods should not reduce the surrounding depth referenced to Chart Datum by more than 5%. Where this cannot be met please discuss with MCA to consider whether alternative risk mitigation need to be out in place. Under no circumstances should depth reductions compromise safe navigation.	Burial or other protection of Marine Cables (e.g. rock placement) will not reduce the surrounding water depth by more than 5%. This is included as embedded mitigation in Section 14.4. Where this cannot be met, discussions will be held with the MCA and TH as drafted in the dML.
We welcome the intent to consult further with MCA (13.7.1.4) and if required post construction conduct an electromagnetic deviation survey to confirm the expected deviation. We note that some sections of the cable route, particularly on the approach to Langstone Harbour, follows marine traffic flows as so may pose an interference risk to the navigation systems of some smaller vessels. Particular attention should be paid here, and further discussion may be needed with relevant stakeholders. As per our recent email correspondence, the deviation thresholds apply to the whole navigable cable route, rather than just within UK waters.	The impact on compass deviation is assessed in Section 14.5.2. and in Section 13.6.4 of Chapter 13.
It should be noted that the proposed rolling 500m exclusion zone is not legally enforceable and would require the voluntary consent of other vessels. We note however the presence of a guard vessel and the use of communications including VHF and Notices to Mariners by way of mitigation.	The 'Exclusion zone' refers to minimum safe passing distances that will be requested for cable lay vessels (CLVs). This is included as embedded mitigation.
We would request that the specific methodology for the cable laying operation within the Dover Straits TSS be approved by Dover CNIS, in consultation with the Dover Straits TSS Working Group forum.	Once the Principal Contractor/s and final design are determined, a specific methodology will be prepared in consultation with the Dover Straits TSS Working Group and the Dover CNIS. The detailed methodology will be submitted as part of the Cable Installation Plan to the MMO for approval as part of the dML requirements.

Summary of MCA Response	Where Addressed
Summary of ABP Response	**Where Addressed**
Marine traffic volumes appear low though size indicates local-coastal traffic only Nonetheless assumptions and risk tables at 13-44 through 13-51 (attached) are reasonable	Noted. Full details of vessel traffic provided in Section 10 and in Section 13.5 of Chapter 13..
Disruptions to arrivals-departures: of particular note Langstone ops are tidally constrained - impact may be significant.	Further consultation has been undertaken with Langstone Harbour, QHM Portsmouth and Kendall's Wharf to discuss impacts to these vessels. In a meeting held on 9th October with Langstone Harbour Harbour Master, it has been agreed that regular engagement between AQUIND Ltd (and its representatives) and Langstone Harbour Commissioners is undertaken throughout DCO examination. This would allow further discussion and detail to be provided to Langstone Harbour Commissioners including further detail on works programme, method statements / vessel movements, possible anchor spreads / plans and lighting and markings. Engagement should also include QHM Portsmouth as the proposed Landfall works are within their Port Limits. See Consultation Report (Document Ref. 5.1).
Mitigation includes rolling 500-700m exclusion zone. Liaison with local ports and harbours appears a tad loose. One for the group to consider but may be value in positive control through a procedure or controlling authority. In particular Langstone may wish to limit operations across the harbour entrance. Alternative is nominate Southampton (Nab) VTS as co-ordinating hub - see attached authority limits.	
Do not consider the recent Bembridge marine conservation area significant but note construction passes through a 'special area of conservation' https://sac.jncc.gov.uk/site/UK0030059 Don't see direct reference to either.	N/A
Per above - no significant concern for Nab VTS operations	N/A

Summary of MCA Response	Where Addressed
Summary of Bembridge Angling Club Response	**Where Addressed**
The planned route seems to go right across the area known as "Bullocks Patch" to the east of the deep water shipping channel that takes large vessels past the Nab Tower. Bullocks Patch is an extremely popular angling spot from late spring to mid-summer as it is one of the few nesting areas for Black Bream between the Nab Tower & Selsey Bill. From the point of view of the members of Bembridge Angling Club, I see no other major issues with the proposed route.	The location of the Bullocks patch is an important angling area that has been considered in Section 13.5 baseline within Chapter 13. The impact to black seabream spawning (and Bullocks Patch) has been considered in Chapter 9 Fish and Shellfish.

7 Navigational Features

7.1 Ports & Pilotage Limits

Figure 7.1 and Figure 7.2 presents the ports, harbours and pilotage limits located within close proximity to the Marine Cable Corridor and Landfall.

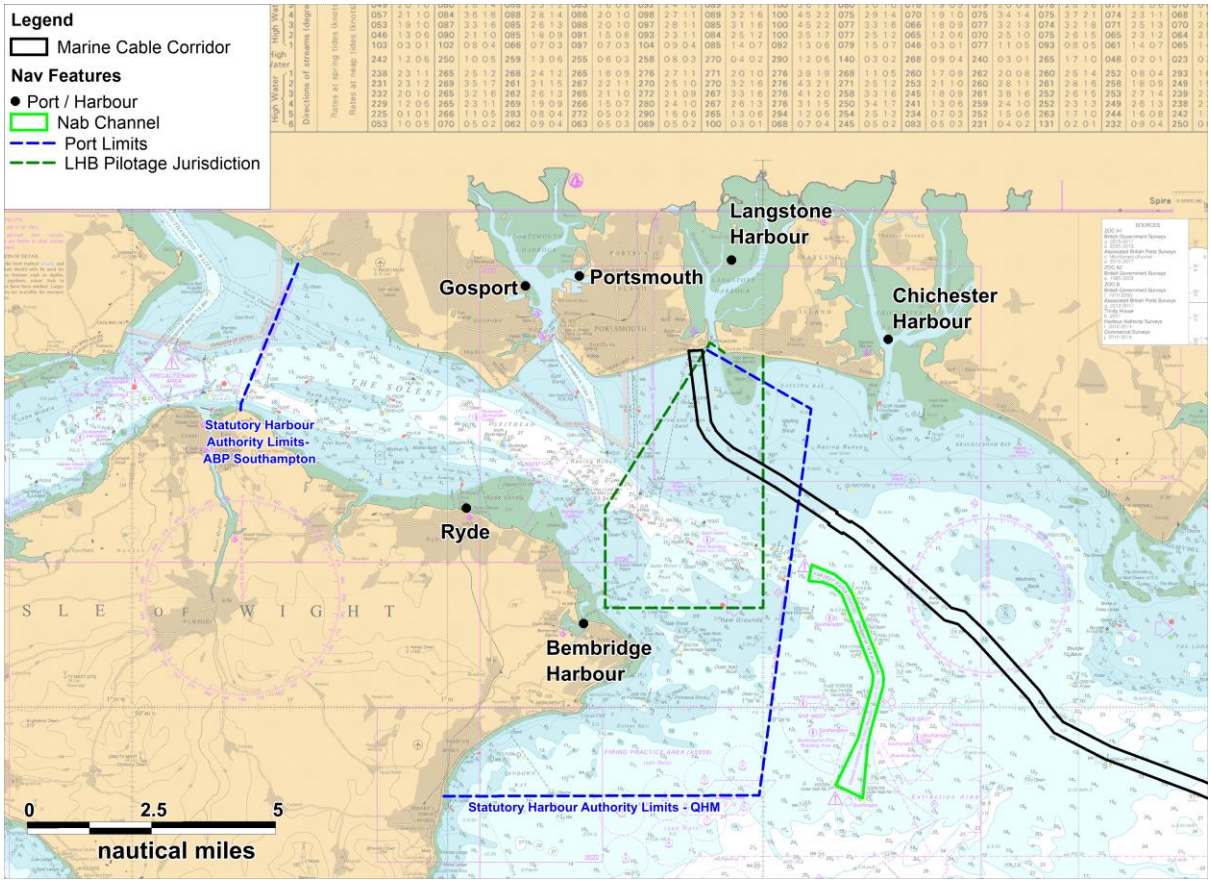

Figure 7.1 Ports and Harbours

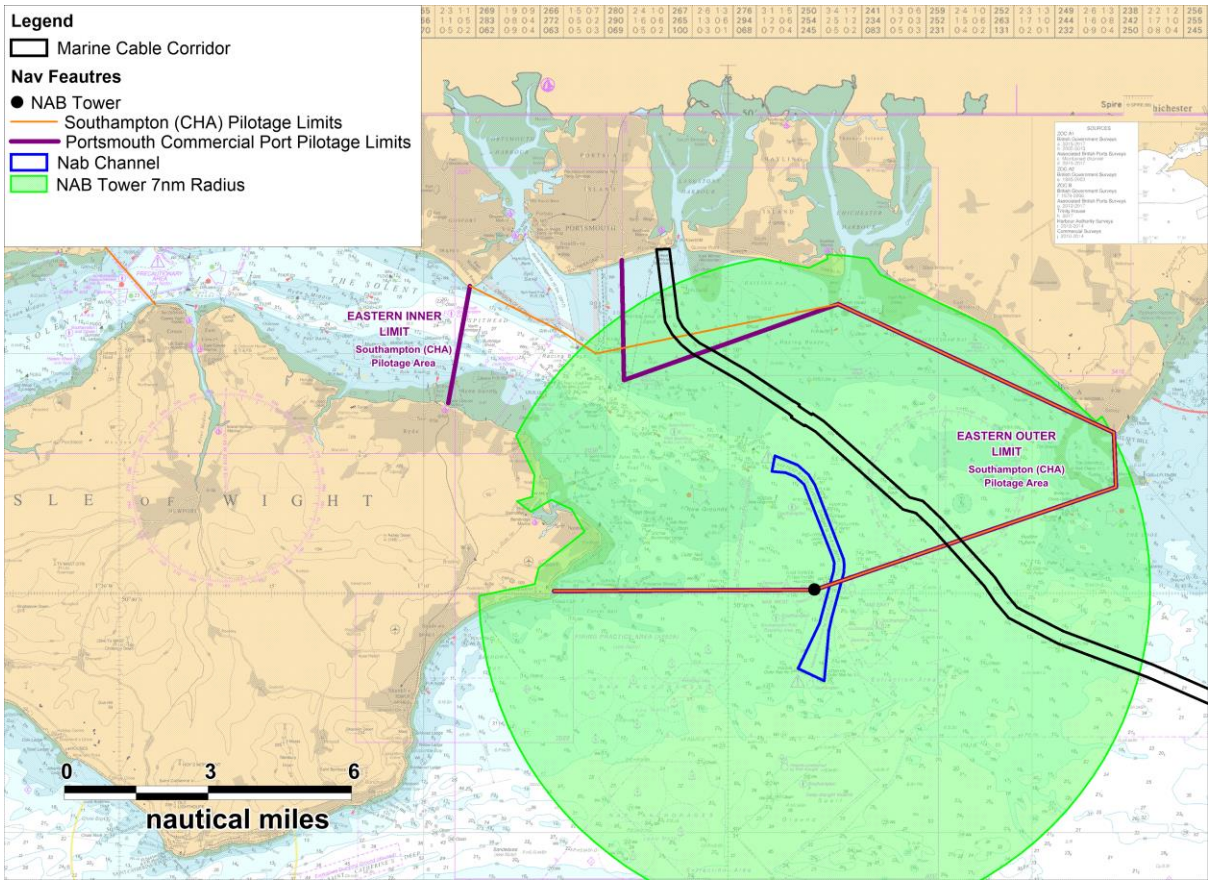

Figure 7.2 Pilotage Limits

The closest major port to the Marine Cable Corridor is the Port of Portsmouth. This is a major naval base which is home to nearly two-thirds of the Royal Navy's surface ships. In addition, the port is also a dynamic commercial port which accommodates ferries transiting between the UK and France, Spain or the Channel Islands. The cable route passes through statutory harbour limits for QHM Portsmouth, pilotage areas for QHM Portsmouth, ABP Southampton, LHB and the Nab VTS (managed by Southampton VTS for the MCA). Vessels within these areas will be operating with the VTS information service provided, carrying a pilot or a Pilot Exemption Certificate (PEC). This means all vessels will be monitored and considered to have a level of local knowledge (directly or through the pilot on-board).

Langstone Harbour is situated directly north of the cable Landfall and is mainly used by fishing and recreational vessels. Recreational activities supported include yachting, motor cruising, etc. It is noted the Landfall of the cable corridor lies within the LHB area of pilotage jurisdiction, with the pilot boarding point located approximately 0.2 nmi south of the cable corridor.

There is a maintained depth channel (Nab Channel) located approximately 0.8 nmi south of the cable corridor. The Nab Channel, associated with the eastern approach to Portsmouth and the Solent, is approximately 5 nmi in length and is intended for deeply-laden inward-bound tankers, large container vessels and other vessels constrained by their draught.

Accordingly, other vessels should keep clear of the Nab Channel and not impede the safety of deep-draught vessels navigating in the area.

7.2 Anchorage Areas

Admiralty Charts and the Channel Pilot Book (UKHO, 2014) were used to identify any anchorage areas within 10 nmi of the cable corridor. Those identified are presented below in Figure 7.3.

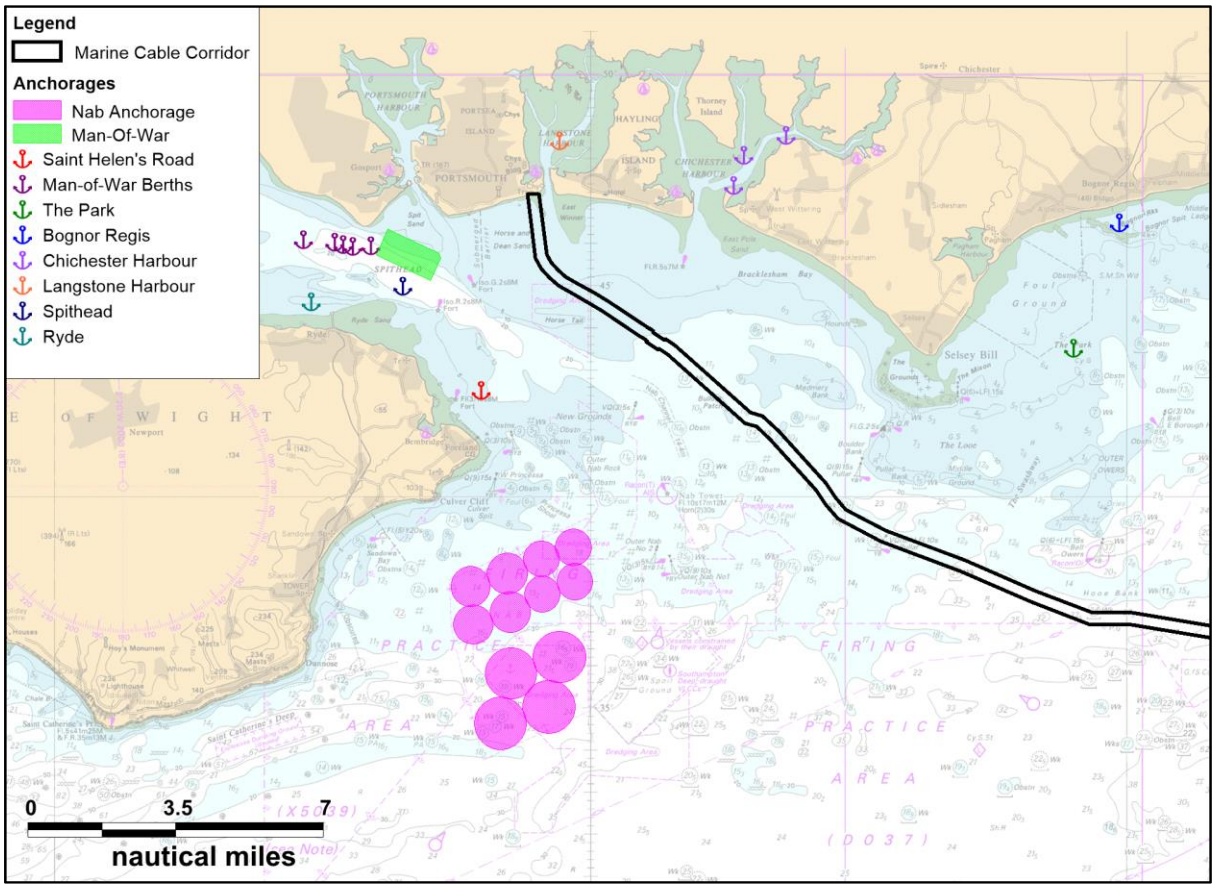

Figure 7.3 Anchorages within 10 nmi of Marine Cable Corridor

There were multiple anchorage areas identified within 10 nmi of the Marine Cable Corridor. The closest include small vessel anchorages available in Langstone and Chichester Harbour to the north and north east of the cable Landfall, as well as the Man-of-War and Spithead Anchorages located approximately 2-3 nmi west of the Marine Cable Corridor.

Details of the anchorage areas are given in Table 7.1.

Table 7.1 Anchorage Area Details

Anchorage Area	Description
Nab Anchorage Berths	This area contains 12 anchorage berths in depths ranging between 14 and 34 m with mixed seabed composition. It is noted that in strong winds, the nature of the holding ground is such that vessels may drag anchor. These berths lie between approximately 5-10 nmi south west of the Marine Cable Corridor.
Man-of-War	This warship anchorage lies approximately 2 nmi west of the Marine Cable Corridor with additional berths located to the west, outside the charted limits. This area offers anchorage depths between 5 and 24 m. Merchant vessels may only anchor here with the consent of the QHM Portsmouth.
Saint Helen's Road	This anchorage lies east north east of Saint Helen's Fort (approximately 3.5 nmi south west of the Marine Cable Corridor) and offers depths of around 11 m. Smaller vessels may also anchor closer inshore.
The Park	Located approximately 5.5 nmi north east of the cable corridor between Outer Owers and the foul ground fronting the entrance of Pagham Harbour. Offers excellent holding ground of stiff clay under a thin layer of gravel. However, anchorage not recommended for larger vessels due to frequent and sudden shifts of wind.
Bognor Regis	Usable by mariners in craft of light draught in offshore winds.
Chichester Harbour	Three available anchorage areas for vessels up to 30 m in length and draught of 2.7 m.
Langstone Harbour	Anchorage for small commercial craft available in Langstone Channel, approximately 1-2 nmi north of cable Landfall. Additionally, pleasure craft can anchor in Russell's Lake and in other minor creeks.
Spithead	Located approximately 3 nmi west of the cable corridor and offers anchorage to a large number of vessels. Vessels requiring depths greater than 10 m must obtain permission from QHM Portsmouth, with the exception of an emergency situation.
Ryde	Small anchorage with depths ranging between 5 and 9 m. It is noted anchoring is prohibited in approach channels to Ryde Pier.

7.3 IMO Routeing Measures

Figure 7.4 presents the IMO Routeing Measures identified within proximity to the Marine Cable Corridor.

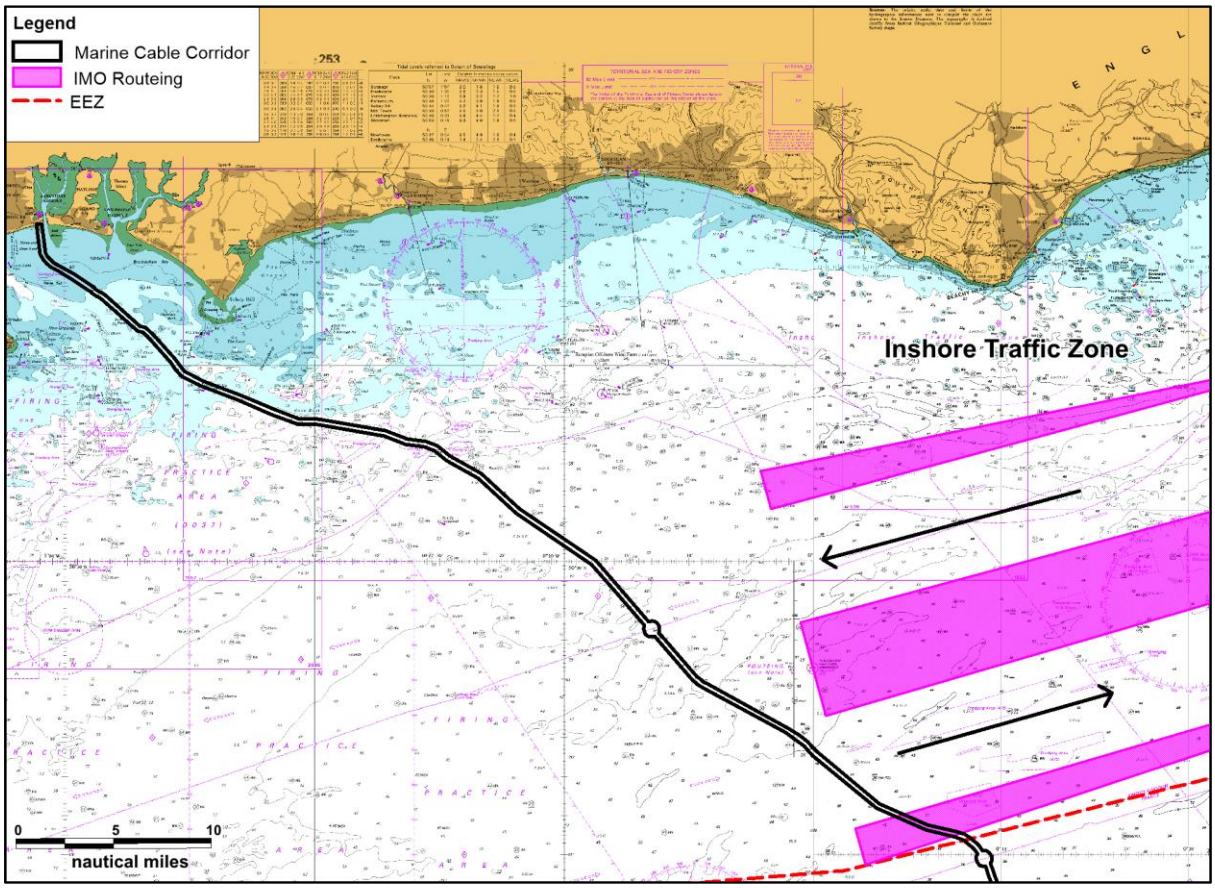

Figure 7.4 IMO Routeing Measures

TSSs are used to separate traffic travelling in opposite directions in busy (or sensitive) areas of shipping. Inshore traffic zones are not to be used under normal circumstances for through traffic if the lane in the TSS is safe to use. However, vessels which are less than 20 m in length and all sailing vessels may, under all circumstances, use inshore traffic zones.

The majority of the Dover Strait TSS lies to the east of the Marine Cable Corridor; however a section does intersect the northbound lane close to the UK-France boundary. This is considered a high-risk area due to the significant commercial traffic utilising the TSS. In addition, the Marine Cable Corridor also passes through a separation area which is largely utilised by vessels transiting in/out of the TSS, vessels in distress and fishing vessels. Therefore, there may be an increased risk to the cable from anchor strike from vessels in an emergency, and/or fishing gear snagging in this area. This is discussed in more detail in Section 14.5.

7.4 Aggregate Dredging Areas

The aggregate dredging areas identified in proximity to the Marine Cable Corridor are presented in Figure 7.5.

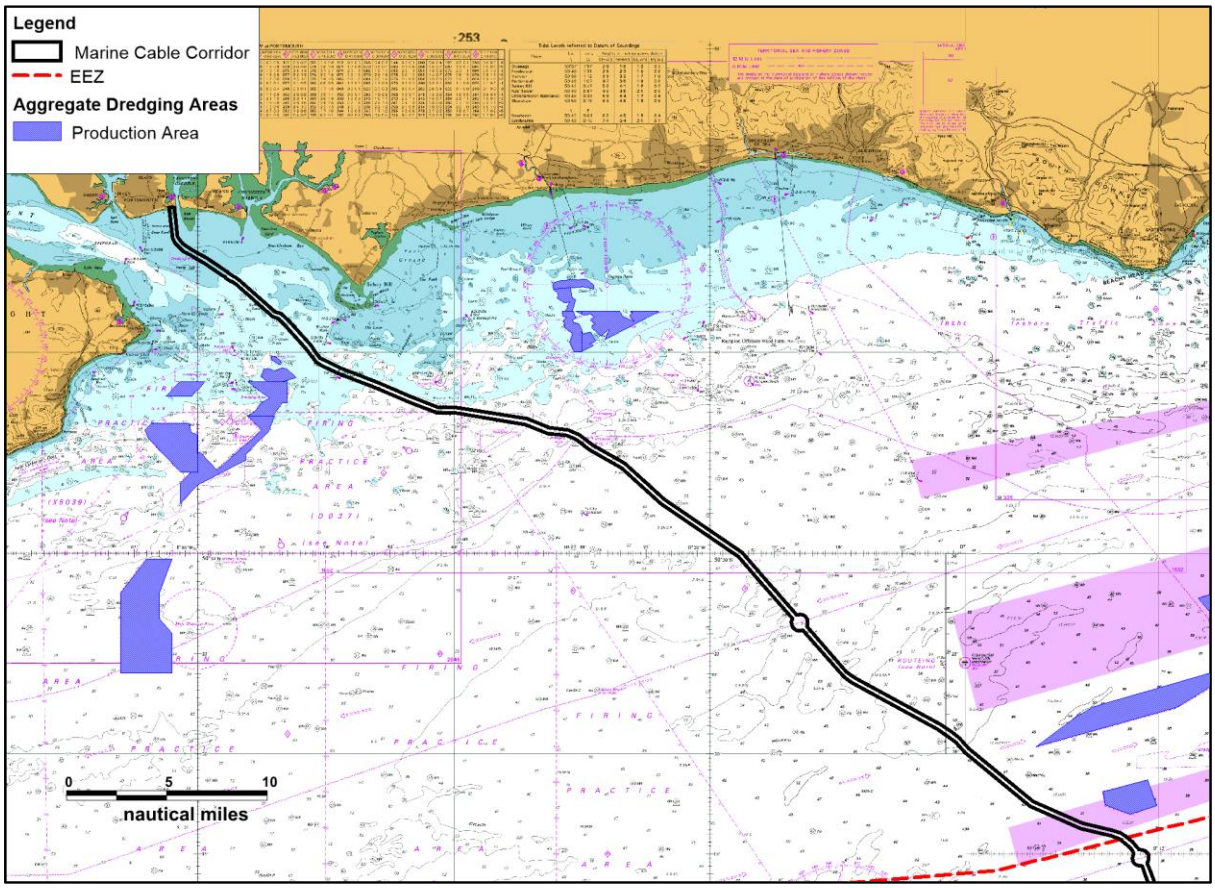

Figure 7.5 Aggregate Dredging Areas (TCE, 2018)

It can be seen from Figure 7.5 that all aggregate dredging areas identified are in production. No exploration and option areas were located within the vicinity of the Marine Cable Corridor. The two closest production areas (area numbers 395/1 and 395/2) are located approximately 1.3 nmi west of the cable corridor. These are jointly operated by Tarmac Marine Ltd and Kendall Bros (Portsmouth) Ltd (now known as Aggregate Industries UK). In addition, the production area 461 operated by Volker Dredging Ltd., is located approximately 1.5 nmi east of the Marine Cable Corridor in the Dover Strait TSS.

7.5 Disposal Sites

Figure 7.6 presents the disposal sites located within the vicinity of the Marine Cable Corridor.

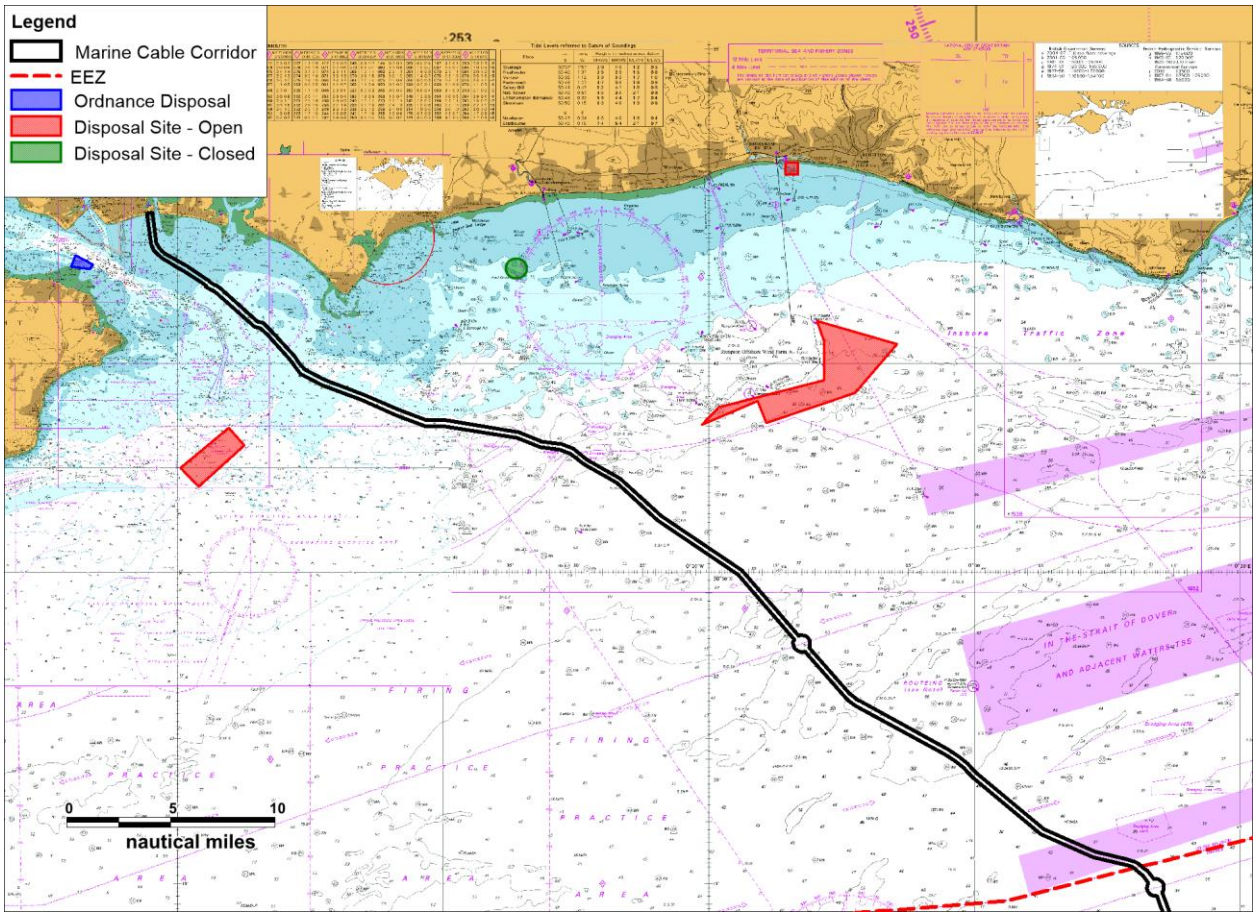

Figure 7.6 Disposal Sites

The closest disposal site (Nab Tower Disposal Ground) is located approximately 4.4 nmi south west of the Marine Cable Corridor. A disposal site adjacent to Rampion OWF (see Section 7.8) is located approximately 4.7 nmi east of the Marine Cable Corridor. It is also noted there is an ordnance disposal site located approximately 3 nmi west of the Marine Cable Corridor in the Solent.

7.6 Subsea Cables

Figure 7.7 presents subsea cables within proximity to the Marine Cable Corridor.

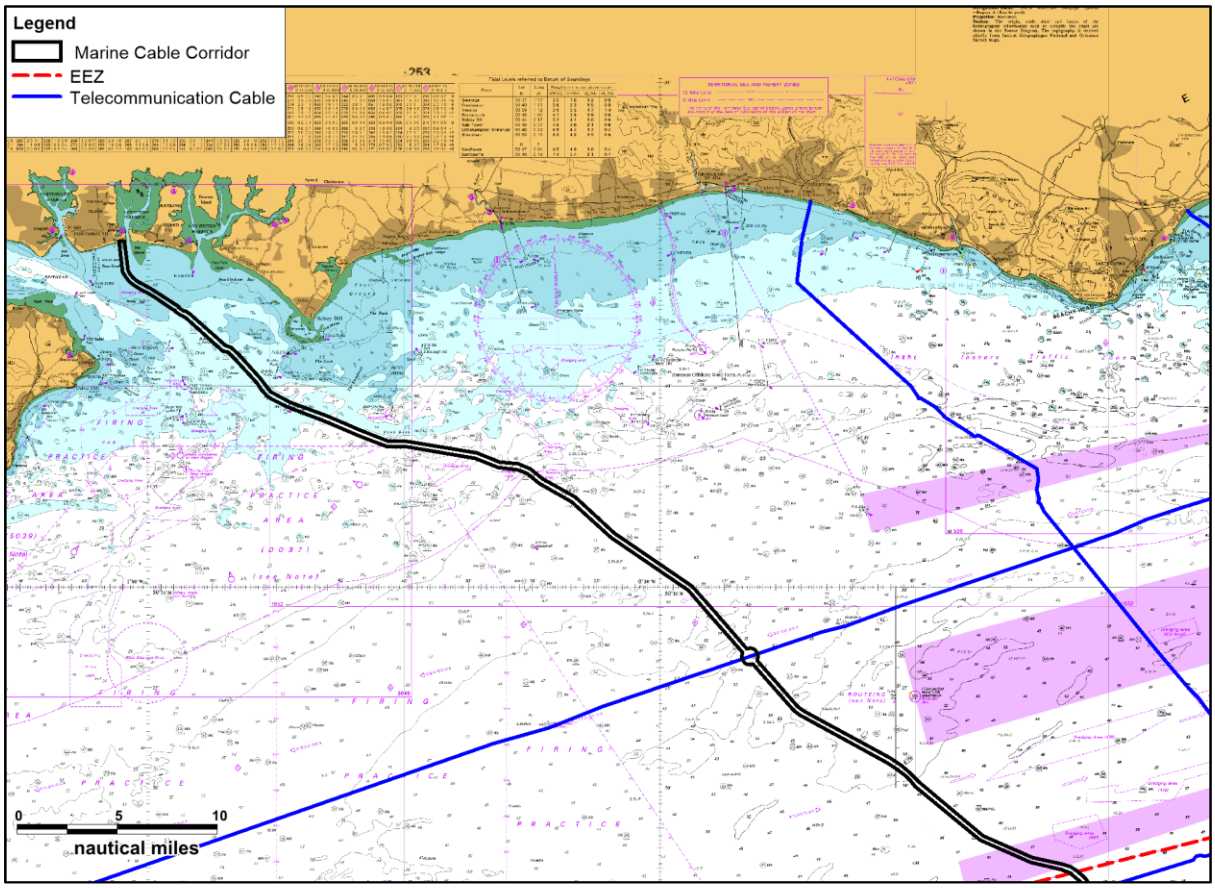

Figure 7.7 Subsea Cables

One subsea telecommunication cable, operated by Atlantic Crossing which connects the United States of America (USA) with three European countries, intersects the Marine Cable Corridor.

7.7 Military Practice Zones

The UK MoD practice and exercise areas in proximity to the Marine Cable Corridor are presented in Figure 7.8.

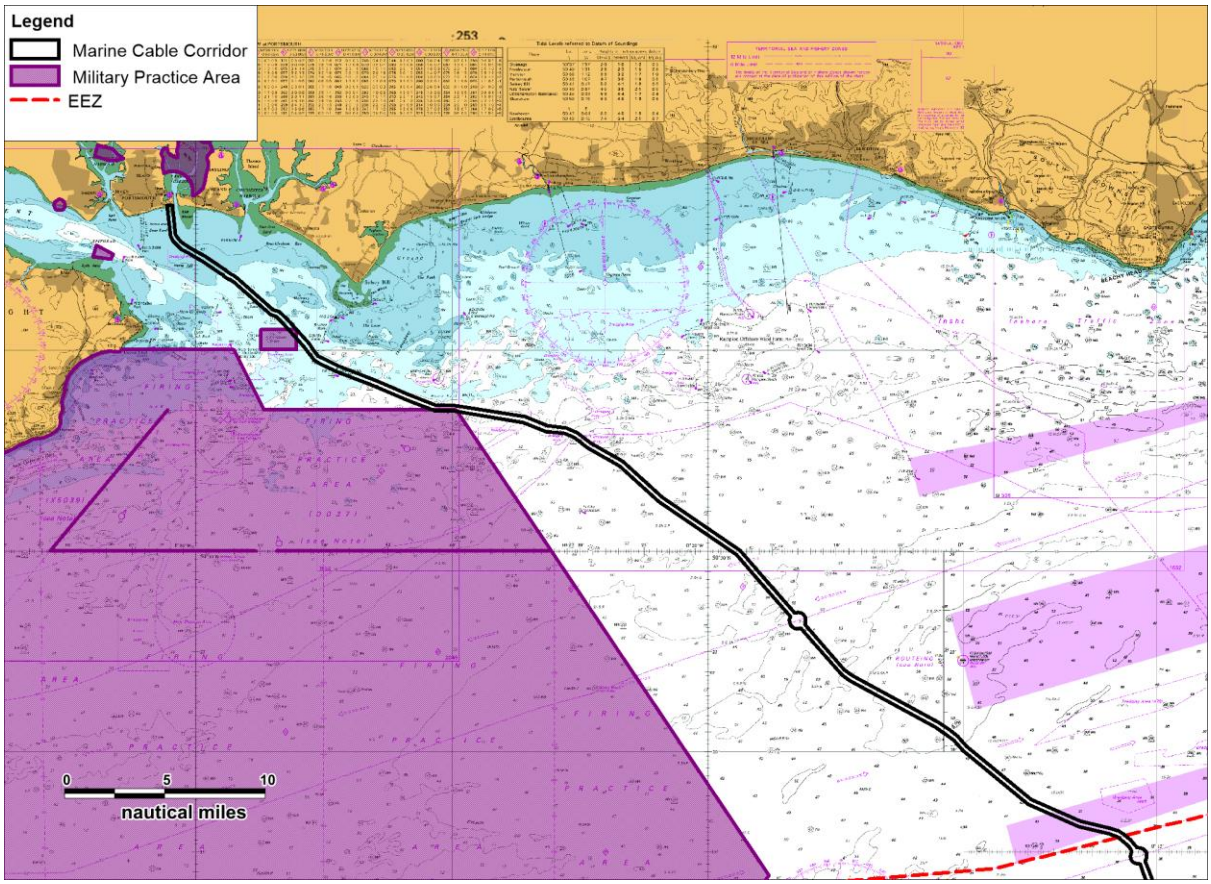

Figure 7.8 Military Practice Areas

It can be seen that two military firing practice areas intersect the cable corridor. It is noted there are no restrictions placed on the right to transit the firing practice areas at any time. The firing practice areas are operated using a clear range procedure; exercises and firing only take place when the areas are considered to be clear of all shipping.

It is also noted that Portsmouth is a major naval base and thus local military operations may also occur within proximity of the cable Landfall.

7.8 Offshore Wind Farms

OWFs within proximity to the cable corridor are presented in Figure 7.9.

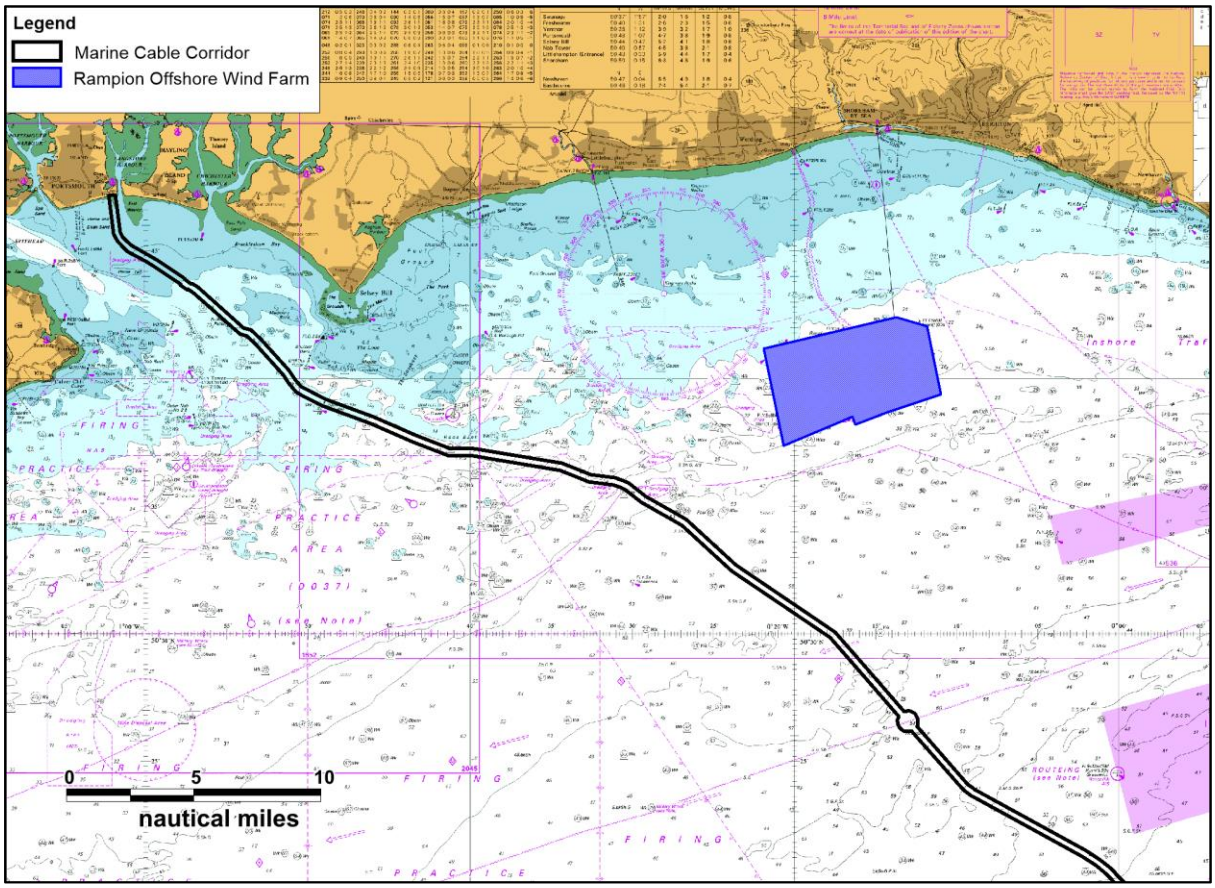

Figure 7.9 Offshore Wind Farms

The Rampion OWF western boundary is located approximately 6.5 nmi east of the cable corridor and is the only wind farm within proximity. This wind farm has begun generating power. An extension to this wind farm is proposed under the recent Crown Estate leasing however the development has not yet reached scoping or application stage. .

7.9 Oil & Gas Licence Blocks

There are currently no operators of the licence blocks within close proximity to the Marine Cable Corridor. The closest blocks are greater than 41 km to the west of the Marine Cable Corridor beyond the Isle of Wight.

7.10 Marine Environmental High Risk Areas

Marine Environmental High Risk Areas (MEHRAs) are areas that have been identified by the UK Government as areas of environmental sensitivity and at high risk of pollution from vessels. The UK Government expects mariners to take note of MEHRAs and either keep well clear or, where this not practicable, exercise an even higher degree of care than usual when passing nearby. The closest MEHRA is located approximately 11 nmi west of the cable Landfall, along the north-west coast of the Isle of Wight.

7.11 Wrecks

The locations of wrecks on UKHO charts, identified within proximity to the Marine Cable Corridor are presented below in Figure 7.10.

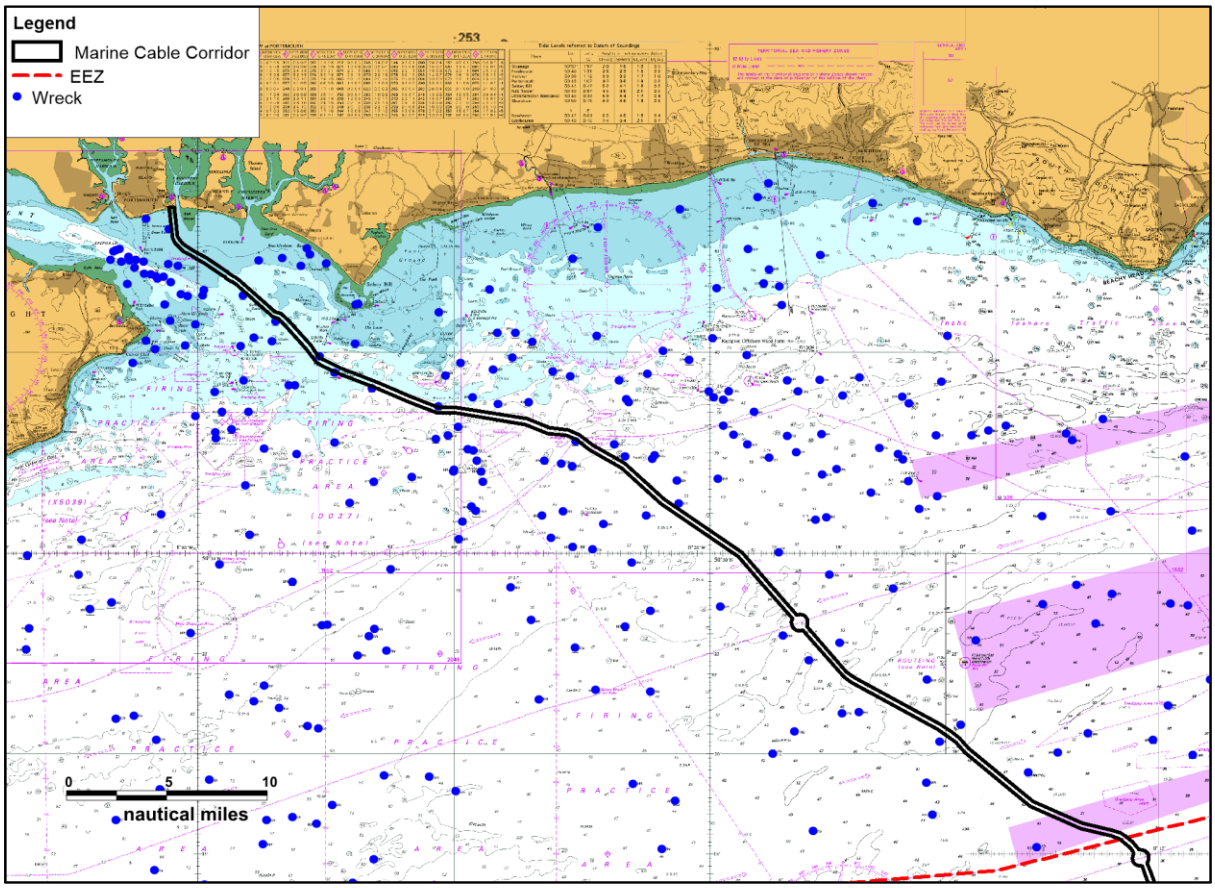

Figure 7.10 Charted Wrecks

It can be seen that there are numerous charted wrecks in the area, six of which touch the Marine Cable Corridor. There are no designated protected wrecks within the Marine Cable Corridor. The Mary Rose is the closest protected wreck site located approximately 4.7 km west of the Marine Cable Corridor.

8 Emergency Response Overview and Assessment

This section summarises the existing SAR resources in proximity to the Proposed Development.

8.1 RNLI

The RNLI is organised into six divisions, with the relevant region for the Proposed Development being the East division. Based out of more than 230 stations, there are more than 350 lifeboats across the RNLI fleet, including both all-weather lifeboats (ALBs) and inshore lifeboats (ILBs). There are numerous RNLI stations within proximity of the Project which are presented in Figure 8.1. Details of the type of lifeboats operating out of these stations are given in Table 8.1. At each station, lifeboats are available on a 24-hour basis throughout the year.

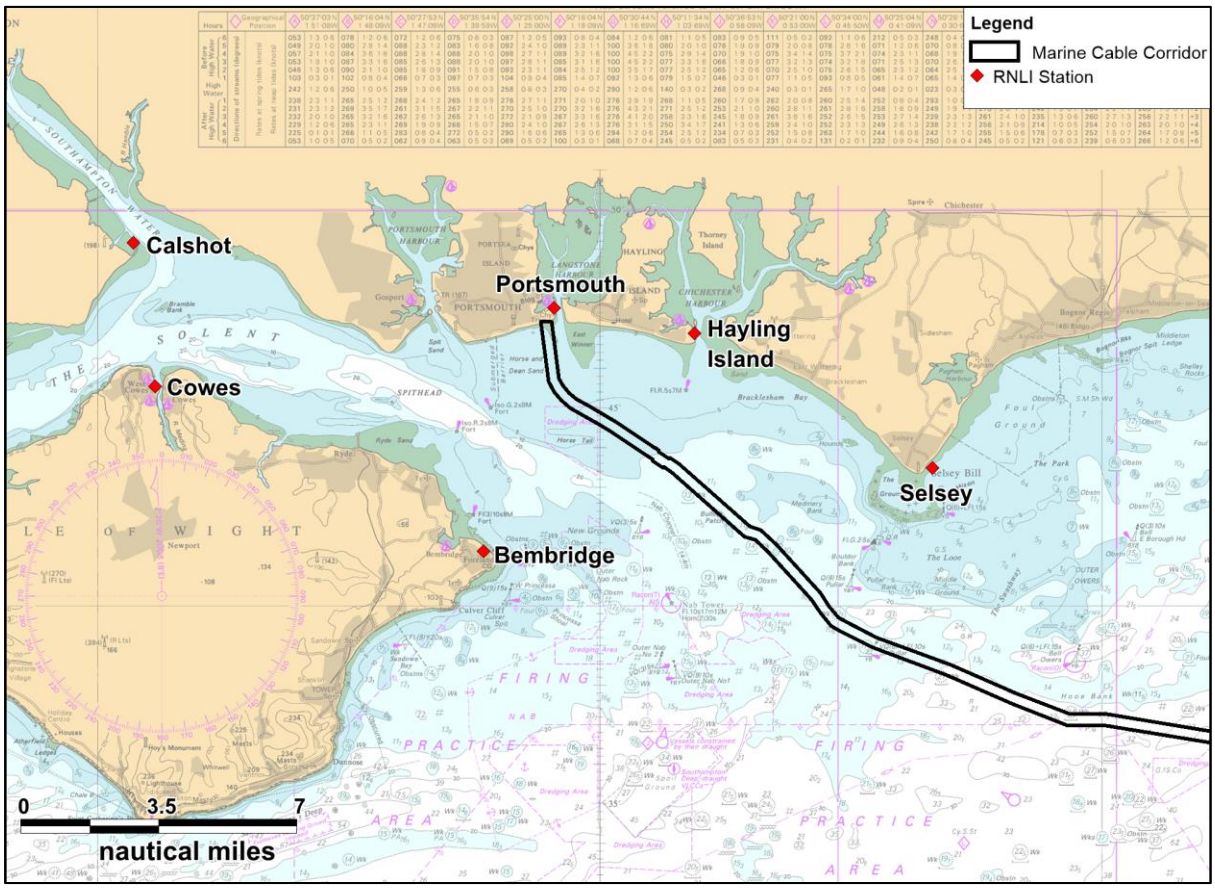

Figure 8.1 RNLI Lifeboat Stations (RNLI, 2018)

Table 8.1 UK Lifeboats Operated from RNLI Stations

Station	Lifeboats	ALB Class	ILB Class	Distance from Marine Cable Corridor (Closest Point) (nmi)
Bembridge	ALB & ILB	Tamar	D Class	4.4
Calshot	ILB	-	D Class B Class Atlantic	10.5
Cowes	ILB	-	B Class Atlantic	9.9
Hayling Island	ILB	-	D Class B Class Atlantic	3.0
Portsmouth	ILB	-	D Class B Class Atlantic	0.3
Selsey	ALB & ILB	Shannon	D Class	4.5

8.2 Her Majesty's Coastguard Stations

HMCG, a division of the MCA, is responsible for requesting and tasking SAR resources made available to other authorities and coordinating the subsequent SAR operations (unless they fall within military jurisdiction).

The HMCG coordinates SAR through a network of 11 Coastguard Operations Centres (CGOC), including a National Maritime Operations Centre (NMOC) based in Hampshire. A corps of over 3,500 volunteer Coastguard Rescue Officers (CROs) around the UK from over 352 local Coastguard Rescue Teams (CRT) are involved in coastal rescue, searches and surveillance.

The majority of the Solent lies within UK SAR Zone 17 who are responsible for coordinating the response to any SAR emergencies within the area around the Project. The nearest rescue coordination centre to the Marine Cable Landfall is the Fareham NMOC.

8.3 SAR Helicopters

In March 2013, the Bristow Group were awarded the contract by the MCA (as an executive agency of the Department for Transport (DfT)) to provide helicopter SAR operations in the UK over a ten-year period. Bristow have now been operating the service since April 2015. There are ten base locations for the SAR helicopter service. The nearest SAR helicopter base to the Project is the Lee-on-Solent base, located approximately 6 nmi west of the Marine Cable Landfall (see Figure 8.2). This base operates two Leonardo Augusta Westland (AW) 189 aircraft.

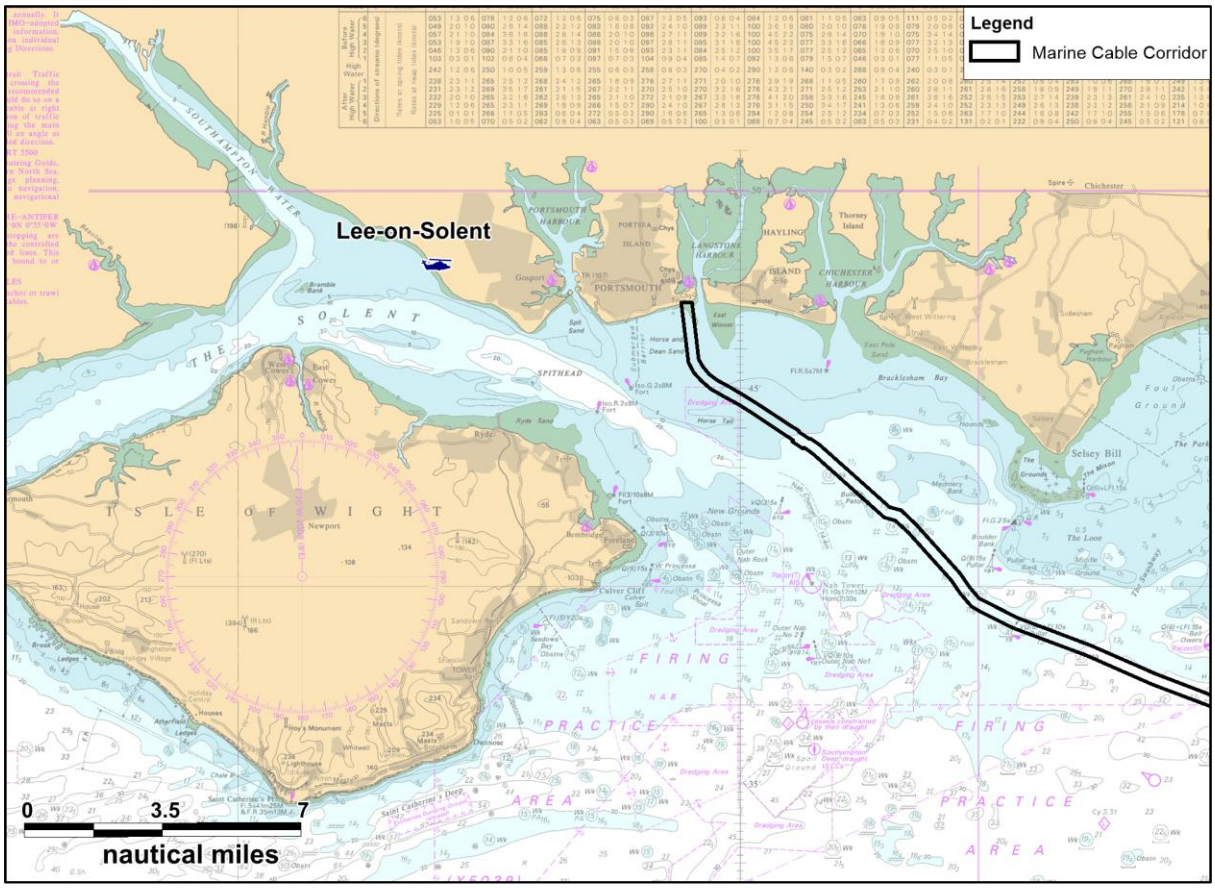

Figure 8.2 Lee-on-Solent SAR Helicopter Base

8.4 Emergency Towing Vessels, Fire and Salvage

The MCA has no dedicated emergency towing vessels. Private towing companies may be asked to assist a drifting vessel as well as wreck removal, cargo recovery, towage and pollution prevention. These private vessels are situated throughout UK waters and ports.

The responsibility for dealing with fires lies with the vessel's operating company. The vessel's operating company is obligated to have a safety management system in place. HM Coastguard will monitor any situation for risk to life or marine pollution. SAR assets will be tasked to assist if the fire has not been dealt with or commercial salvers tasked to assist in saving the vessel and cargo if required.

8.5 National Coastwatch Institution

The National Coastwatch Institution (NCI) is a voluntary organisation founded in 1994 following the closure of smaller coastguard stations. A total of 55 stations are currently active on the English and Welsh coasts.

There are three NCI stations located in the Solent which are presented below in Figure 8.3.

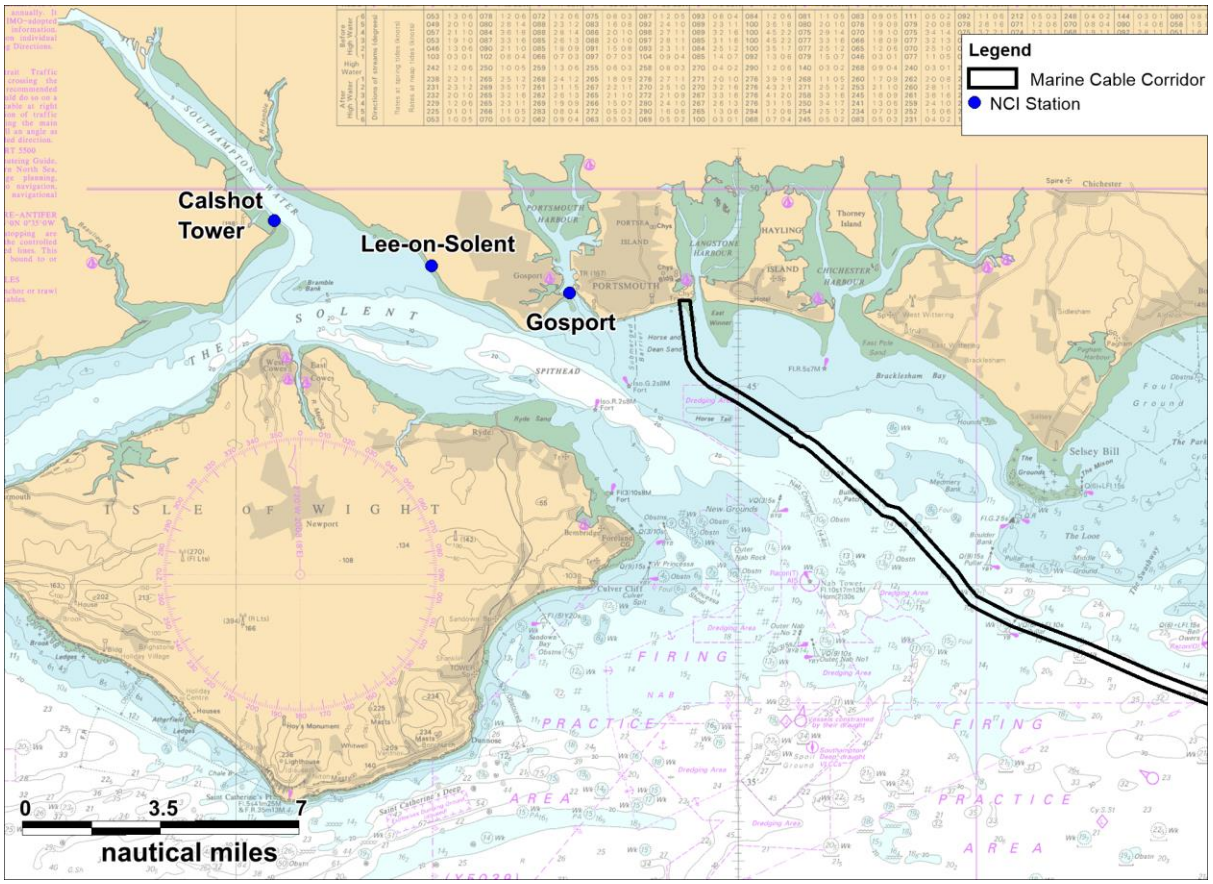

Figure 8.3 NCI Stations

8.6 SOLFIRE Marine Emergency Plan

SOLFIRE (Solent and Southampton Water Marine Emergency Plan) is a contingency plan developed to deal with any marine emergency or non-routeing incidents occurring within the SOLFIRE Command Areas as shown in Figure 8.4.

This emergency plan has been produced jointly by the Harbour Authorities of Southampton and Portsmouth, in consultation and agreement with the MCA, other emergency services and relevant local authorities.

The plan is a voluntary scheme intended to provide the command, control and communications structure to draw together and coordinate adequate resources to deal with any marine emergency occurring within the SOLFIRE Command Area. It is to be supplemented by other contingency and action plans held by the emergency services, local authorities, commercial facilities and marine related companies which will be activated as necessary.

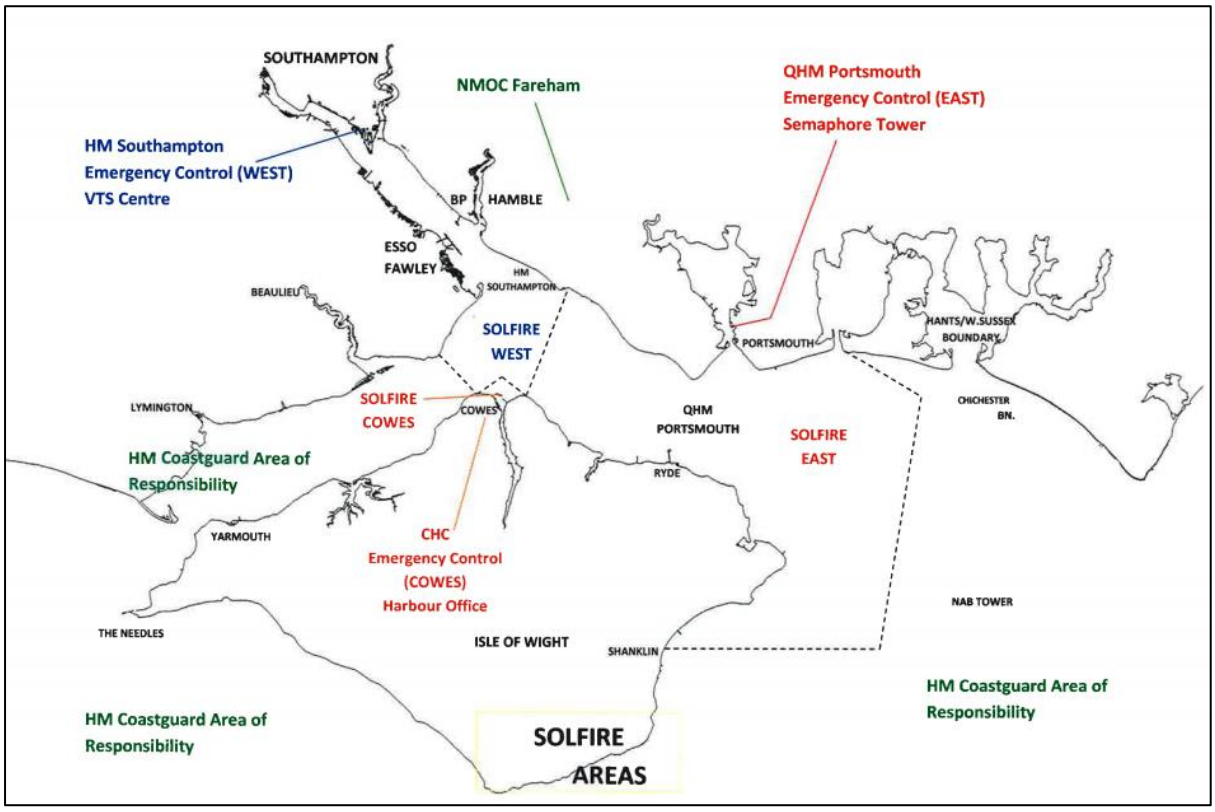

Figure 8.4 SOLFIRE Command Areas (Southampton VTS, 2016)

The SOLFIRE plan is divided into three command area, SOLFIRE West, SOLFIRE East and SOLFIRE Cowes (depicted in the figure above).

The responses are initiated by relevant authorities within the area – HM Southampton in SOLFIRE West, QHM Portsmouth in SOLFIRE East and HM Cowes in SOLFIRE Cowes.

The response provided by SOLFIRE will be graded according to defined classifications (detailed in Table 8.2) of marine emergency or incident and the initial response will be graded primarily by the level of resources required to deal with the incident and by its probable impact on land based authorities. The incident may be upgraded / downgraded at any time by the initiating authority or the emergency services as is deemed appropriate or as the circumstance dictates.

Table 8.2 Classification of Marine Emergency SOLFIRE

Class	Definition
SOLFIRE Alert	A precautionary level of response which may be instigated by any of the initiating authorities or HM Coastguard Operations Centre and gives indication to the others that a situation is developing which could lead to one of the following classifications.

Class	Definition
Class A SOLFIRE	An incident that can be dealt with by the initiating authority using resources readily available and with little or no impact on land based authorities.
Class B SOLFIRE	An incident that can be dealt with by resources readily available but where the initiating authority needs some assistance from one or more land based emergency services. No significant impact is anticipated on other land-based authorities but they should consider themselves alerted.
Class C SOLFIRE	An incident where there is expected to be a significant impact on land-based authorities and where a multi-agency tactical level of coordination is considered necessary and elements of the National Maritime Contingency Plan may be activated.
Class D SOLFIRE	A major incident requiring the full resources of the SOLFIRE Plan and a coordinated response from both initiating authorities and land-based agencies, with potential for activation of the National Maritime Contingency Plan.

When SOLFIRE is activated, the priorities are saving of life, minimising risk to the environment and safety of navigation.

9 Maritime Incidents

This section presents a historical review of RNLI and MAIB incident data from 2005 to 2014 within the study area. This analysis is intended to provide a general indication as to whether the study area is of low or high risk in terms of maritime incidents. If the area was found to be a particularly high risk area for incidents, this may indicate that the Proposed Development could exacerbate the existing maritime safety risks in the area, particularly during the construction phase. During normal operations there is not likely to be an increased maritime safety risk as the cable should be suitably buried and/or protected.

9.1 MAIB

Figure 9.1 presents all MAIB incidents recorded within the study area between 2005 and 2014.

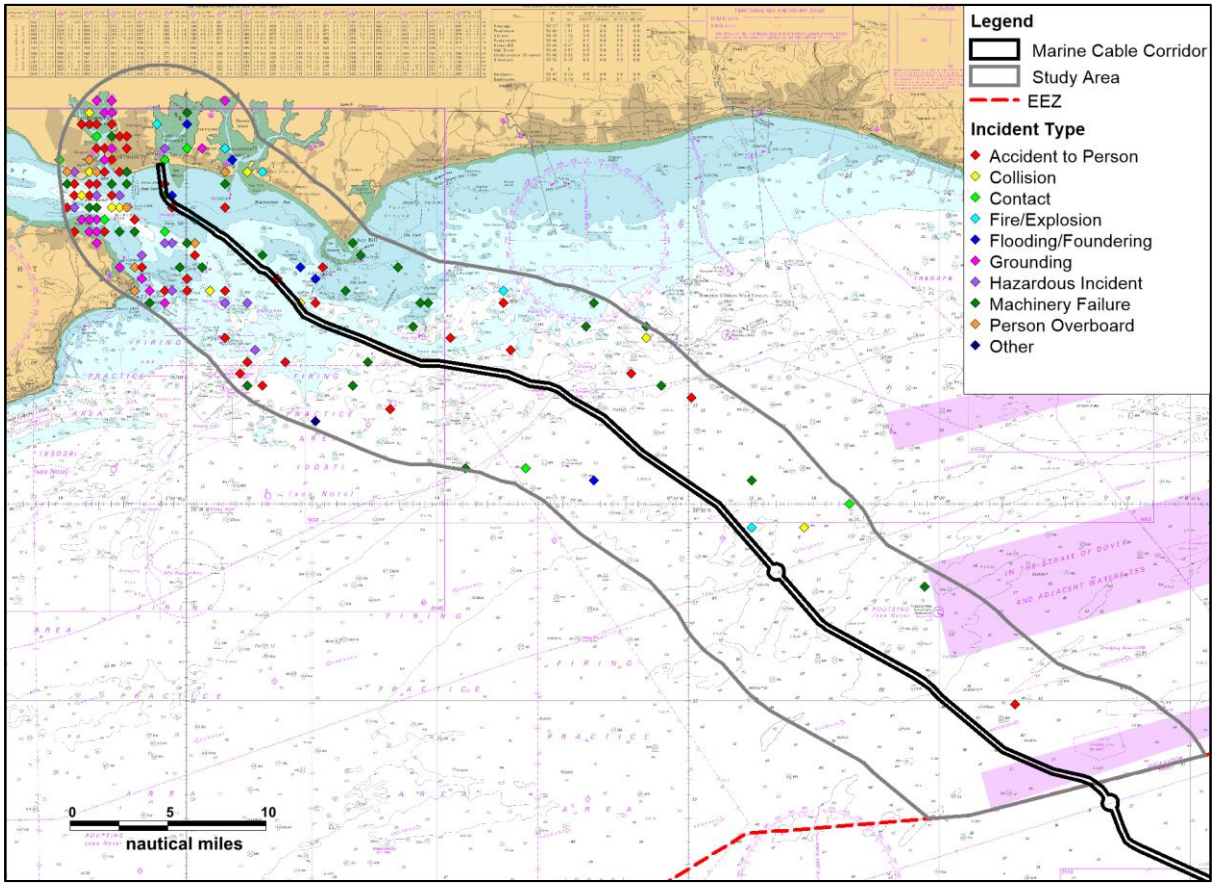

Figure 9.1 MAIB Incidents (2005-2014)

A total of 361 unique incidents were recorded within the study area between 2005 and 2014, 84% of which were recorded within 5 km of the coast. Four of these incidents were recorded within the Marine Cable Corridor. These included two accidents to persons, one machinery failure and one fire/explosion. The distribution of all incidents by type is presented in Figure 9.2.

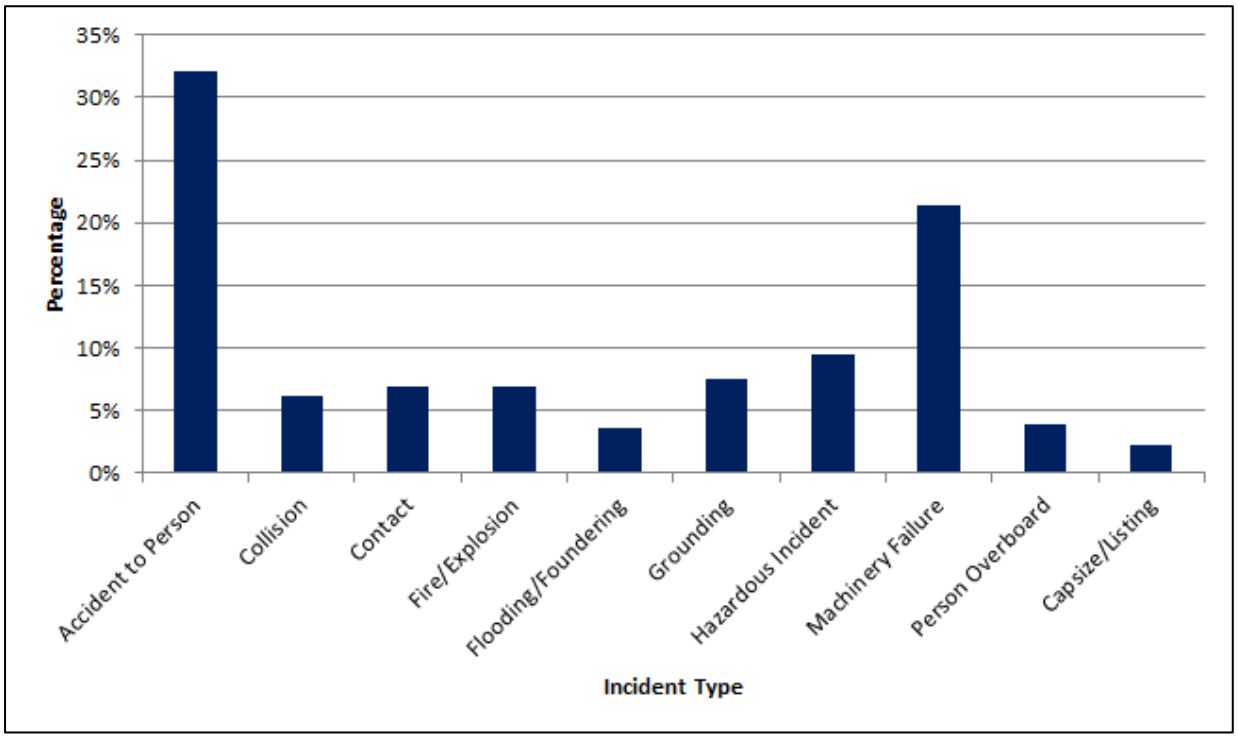

Figure 9.2 MAIB Incident Type Distribution (2005-2014)

The most frequently recorded incident types included accident to person (32%) followed by machinery failure (21%). Incident types that have the potential to impact the subsea cabling include foundering, grounding, and machinery failure that may lead to a vessel dropping its anchor in an emergency. It is also noted, collisions or contacts over the Marine Cable Corridor may also pose a risk as such incidents could potentially cause a vessel to founder over the cable.

The distribution of all incidents by vessel type is presented in Figure 9.2 below. Vessels in the “Other (commercial)” category, which includes small commercial sailing vessels, local port vessels, dredgers etc., were involved in approximately 42% of incidents recorded. Other vessels frequently involved in maritime incidents recorded were passenger vessels (32%) and fishing vessels (10%).

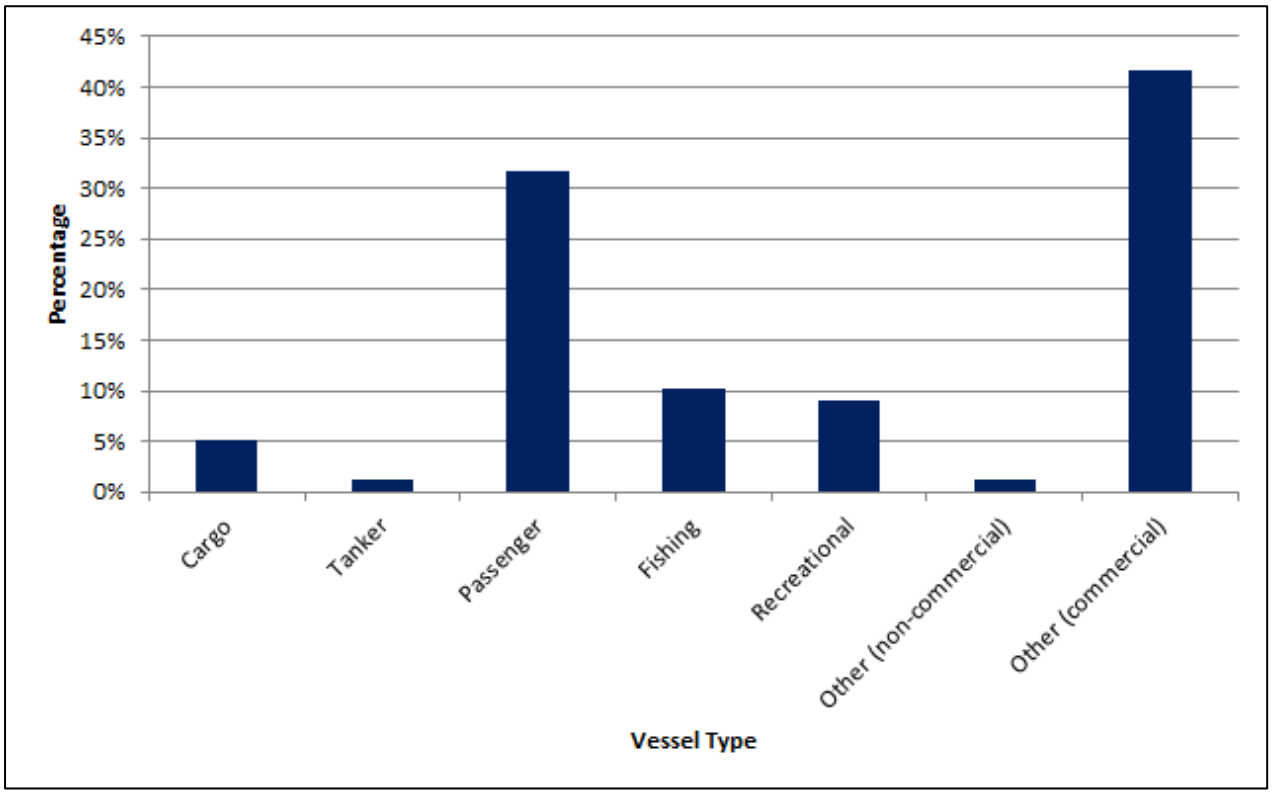

Figure 9.3 MAIB Incidents by Vessel Type Distribution (2005-2014)

9.2 RNLI

Figure 9.4 presents all RNLI incidents recorded within the study area between 2005 and 2014.

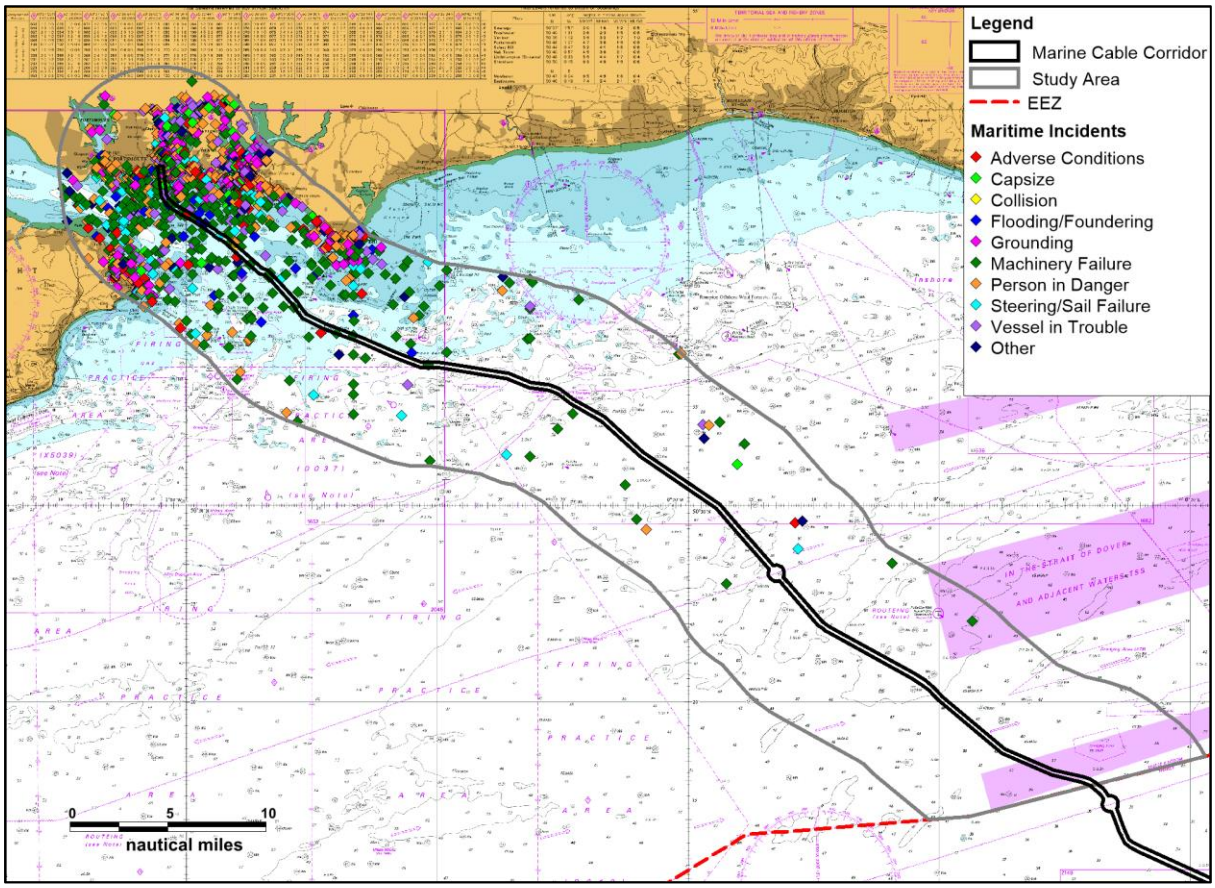

Figure 9.4 RNLI Incidents (2005-2014)

There was a total of 1,636 unique incidents recorded by the RNLI within the study area during the ten year study period, 91% of which were recorded within 5 km of the coast. A total of 48 unique incidents were recorded within the Marine Cable Corridor. Figure 9.5 presents the incident type distribution for all incidents recorded.

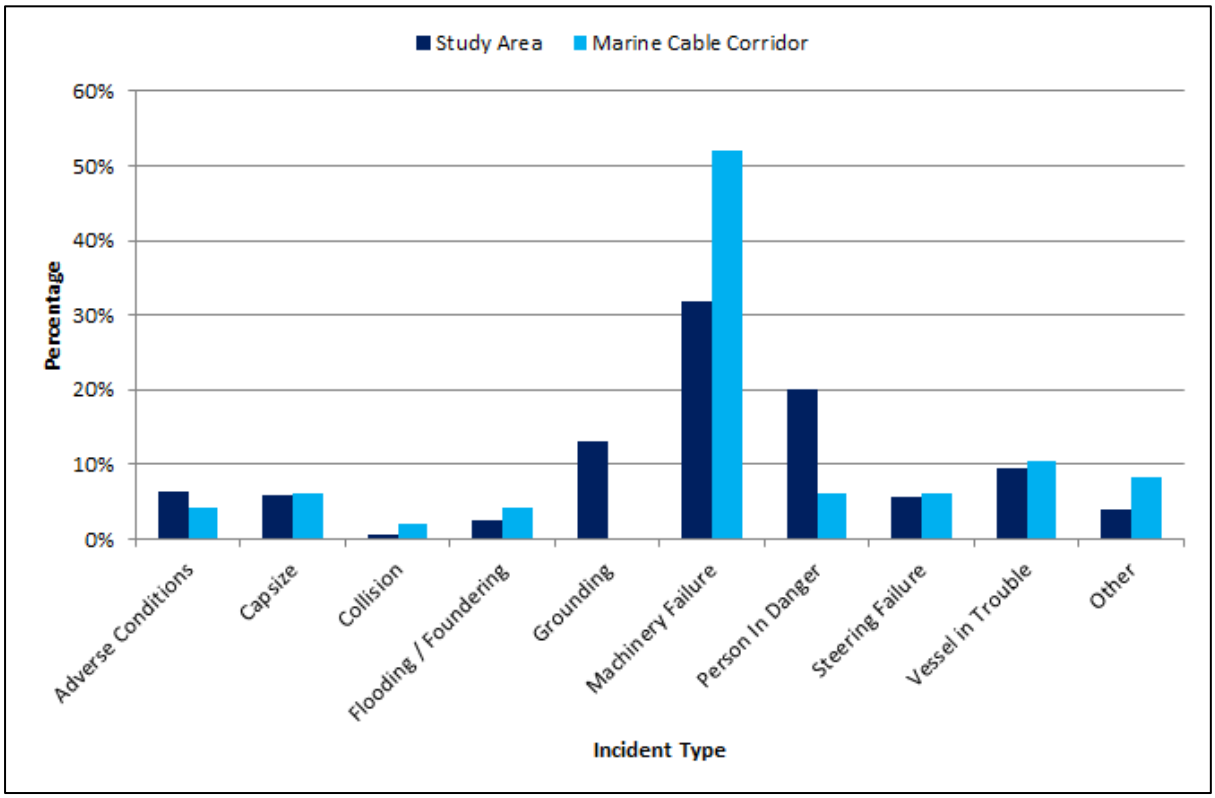

Figure 9.5 RNLI Incident Type Distribution (2005-2014)

Machinery failure (32%) was the most frequently recorded incident type in the study area, followed by person in danger (20%) and grounding (13%). Within the Marine Cable Corridor only, machinery failure accounted for over half (52%) of the incidents. Due to the abundance of activity in the area, it is possible vessels may drop their anchor if suffering from machinery failure to avoid potential collisions. This could cause damage should this occur over the cable.

The distribution of all incidents by vessel type is presented in Figure 9.2. The majority of incidents recorded in the entire study area involved recreational vessels (62%), followed by person in danger (22%). This mirrors the result for within the Marine Cable Corridor only where recreational vessels were involved in 81% of incidents.

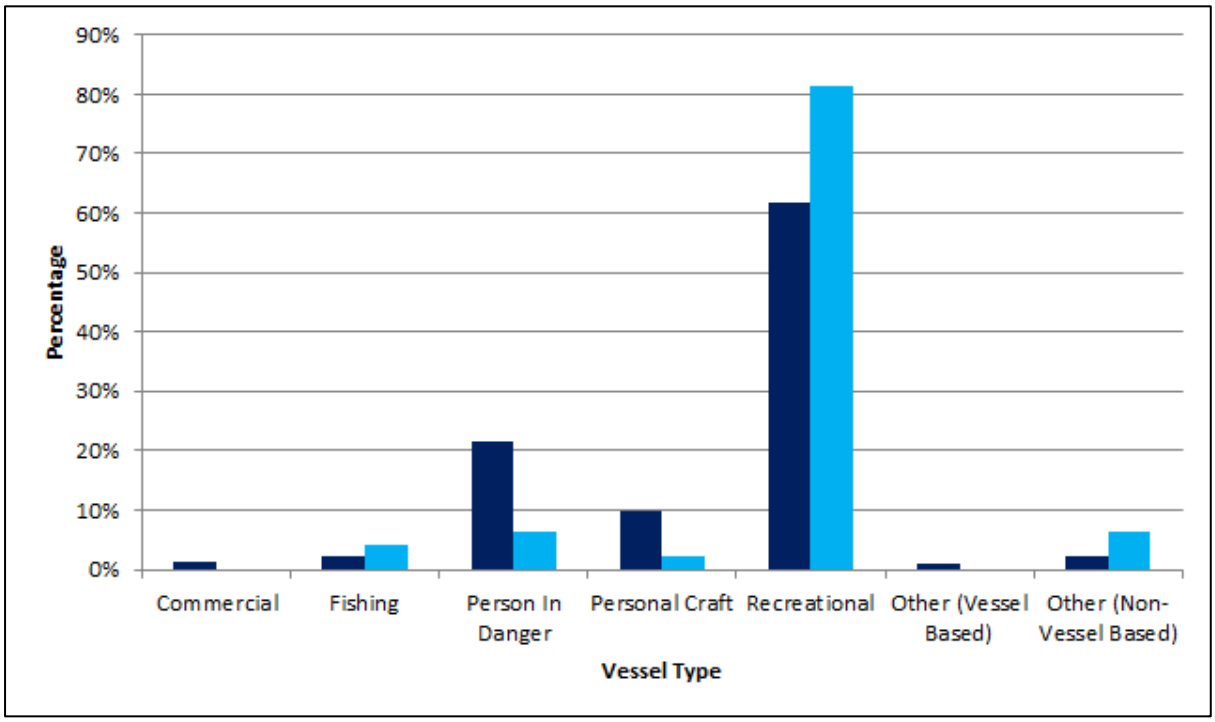

Figure 9.6 RNLI Incidents by Vessel Type (2005-2014)

10 Baseline Shipping Analysis

10.1 Introduction

This section presents the analysis of the AIS shipping data. Assessment of vessel numbers, types, sizes and density are provided below. An AIS data set consisting of six months (three months summer and three months winter) was used to provide up-to-date coverage of the study area, as well as account for any seasonal trends. The time periods used are given below:

- 1st December 2017 – 28th February 2018 (winter)
- 1st May – 31st July 2018 (summer)

Vessels moored in port or operating within harbours only were removed from all analysis; however, vessels transiting into or exiting the ports/harbours have been included. Tracks from vessels carrying out temporary works such as seabed surveys have also been excluded from the analysis.

10.2 Vessel Type

Figure 10.1 and Figure 10.2 present the AIS tracks recorded within the study area, colour-coded by vessel type, for the summer and winter periods, respectively. Figure 10.3 then presents the vessel type distribution (excluding < 1% unspecified).

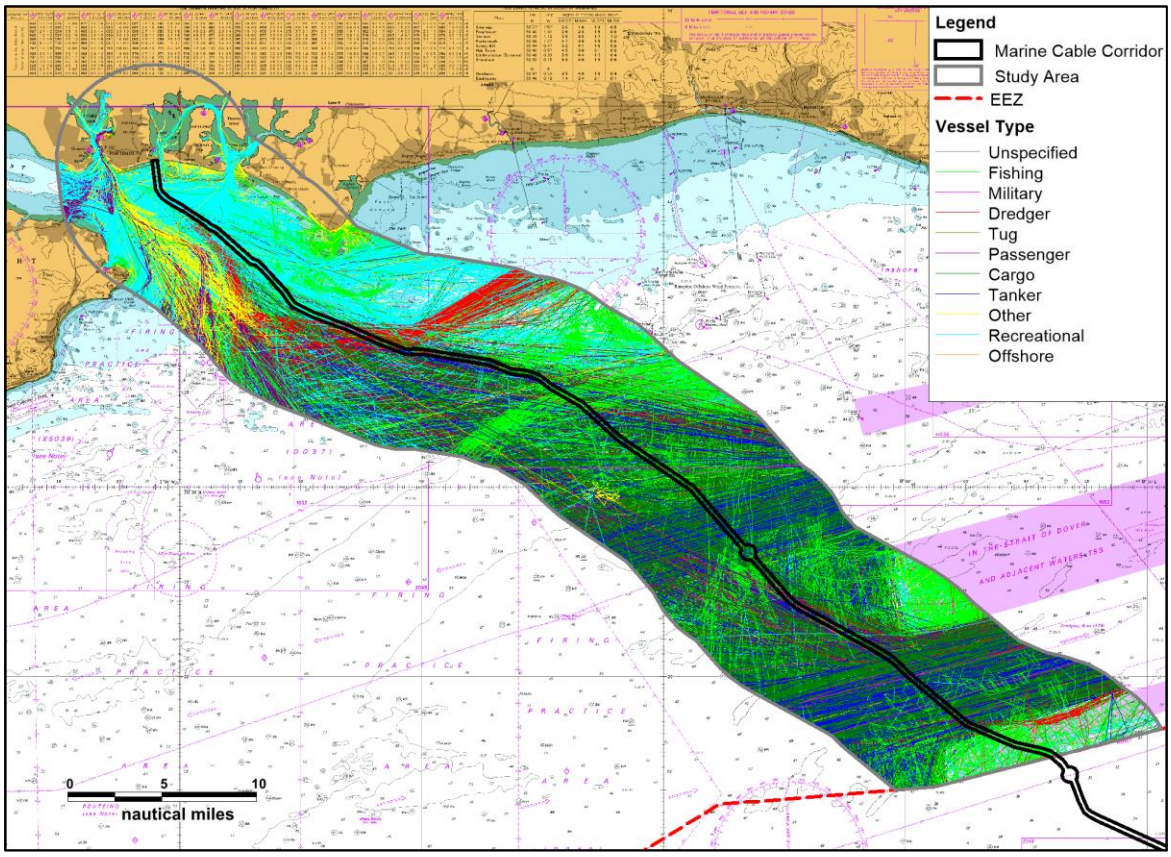

Figure 10.1 AIS Tracks by Vessel Type – Three Months (Summer)

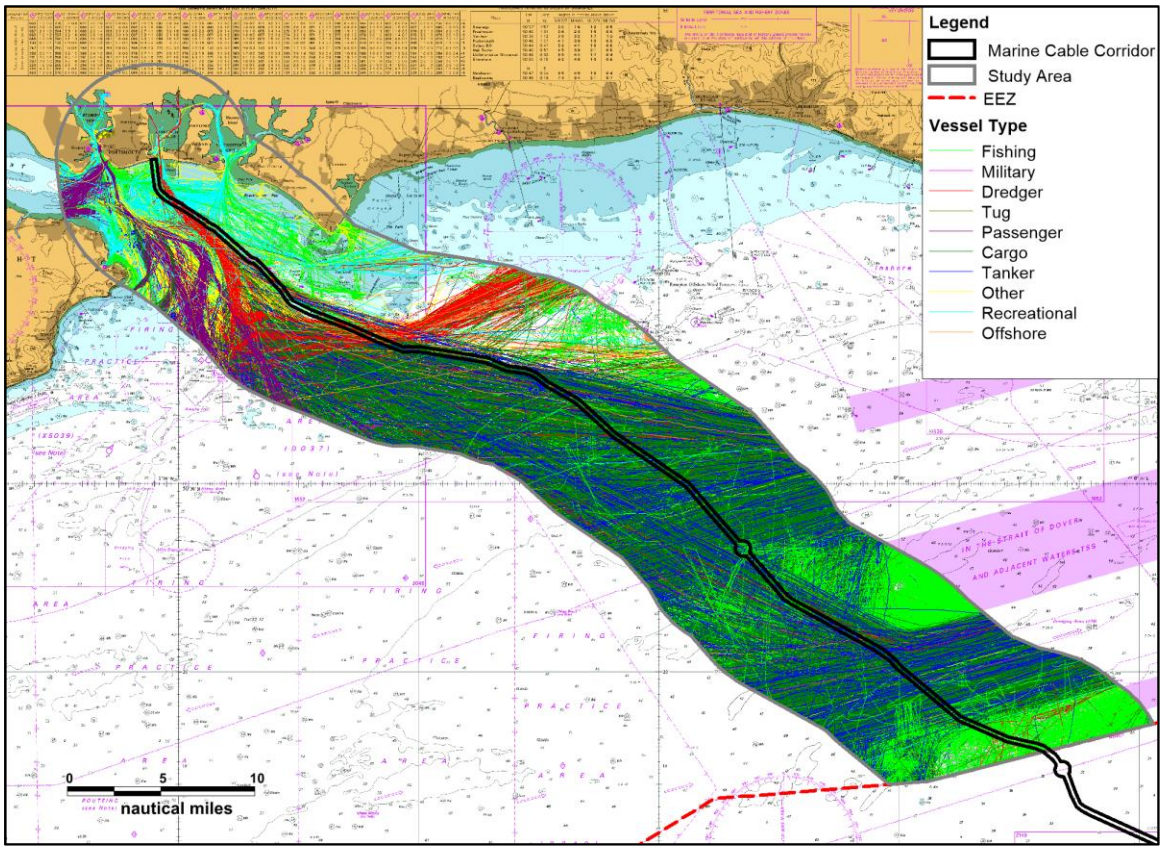

Figure 10.2 AIS Tracks by Vessel Type – Three Months (Winter)

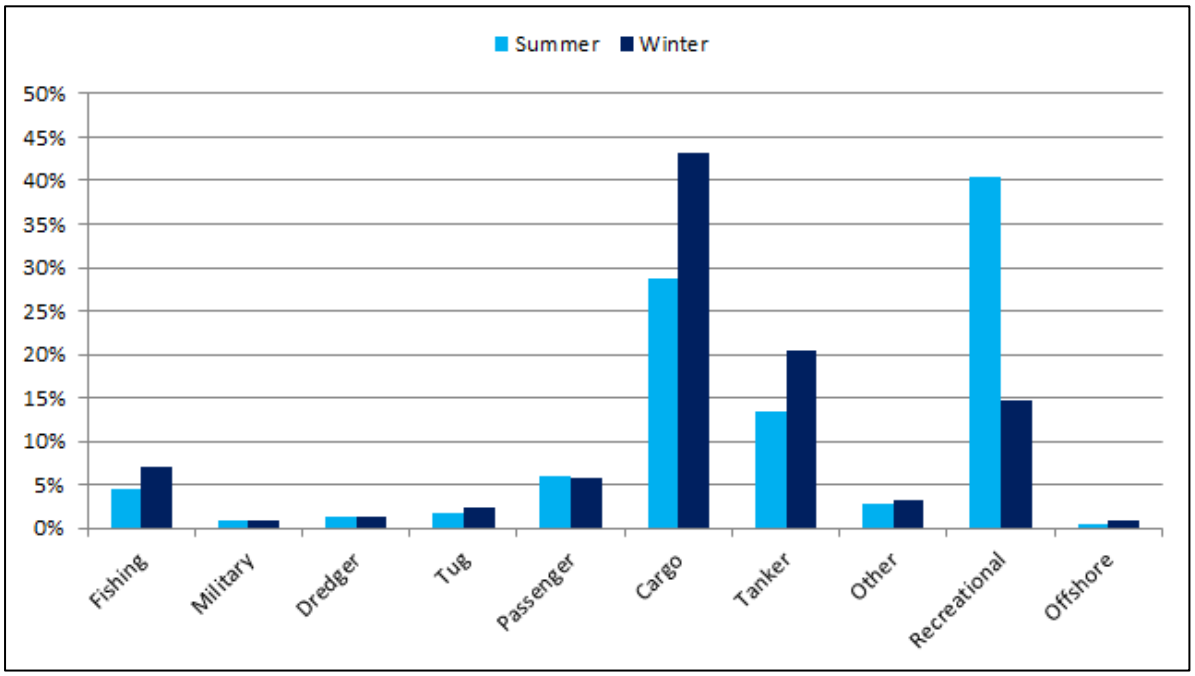

Figure 10.3 AIS Vessel Type Distribution

In summer, recreational vessels (40%) were the most frequently recorded, followed by cargo vessels (29%) and tankers (13%). In winter, cargo vessels (43%) were the most frequently recorded followed by tankers (20%) and recreational vessels (15%). Vessels in the 'other' category include pilot vessels, RNLI lifeboats, research and survey vessels in transit, etc.

The following subsections present the tracks of commercial vessels and passenger vessels to provide clearer visuals of vessel routeing. It is noted fishing vessels and recreational vessels are assessed separately in Sections 11 and 12, respectively.

10.2.1 Commercial Vessels

Figure 10.4 presents the tracks of commercial vessels recorded within the study area, colour-coded by vessel type, during the six month study period.

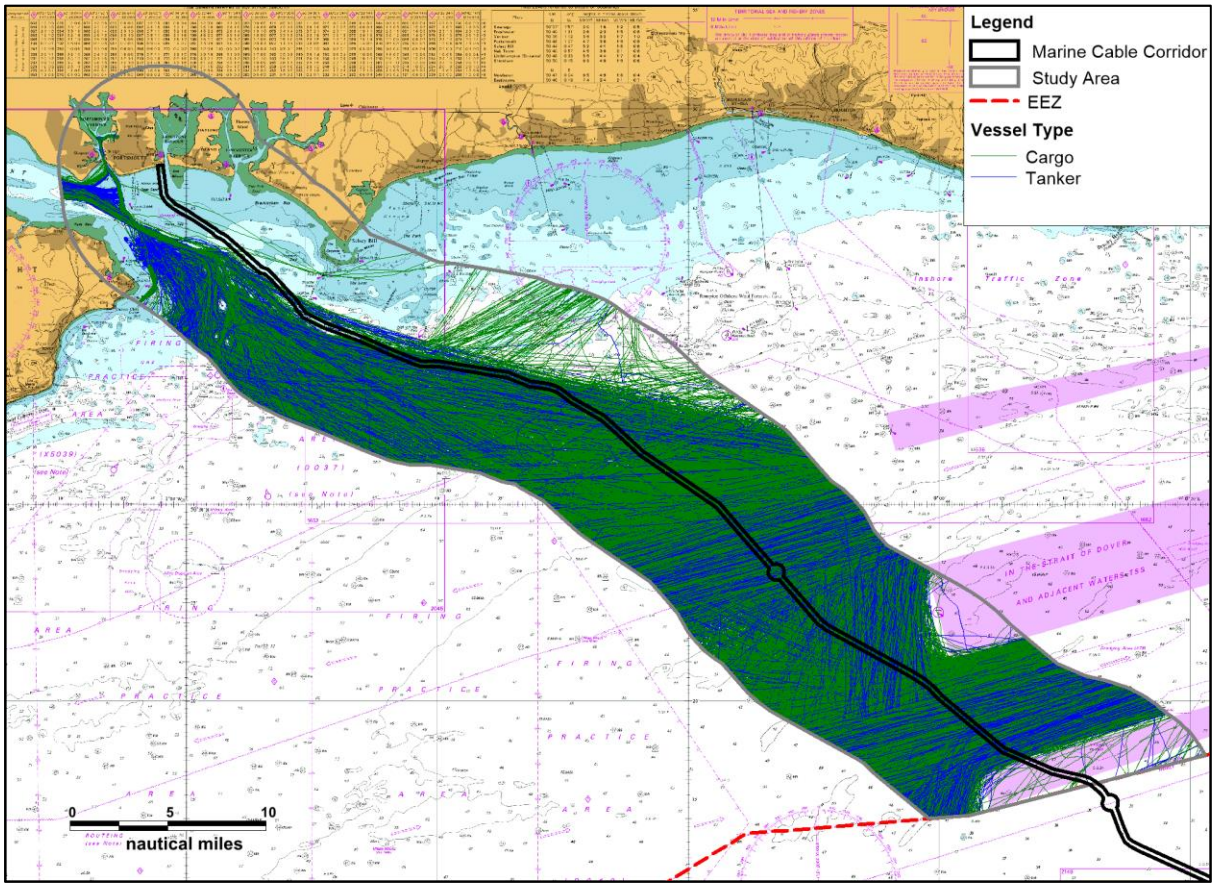

Figure 10.4 Commercial Vessel Tracks – Six Months (Summer & Winter)

It can be seen that commercial traffic is busy in the majority of the study area with particularly highly trafficked areas including the shipping lanes associated with the Dover Strait TSS, as well as the approaches into nearby major ports such as Portsmouth and Southampton.

10.2.2 Passenger Vessels

Figure 10.5 presents the passenger vessel tracks recorded within the study area throughout the entire six month period.

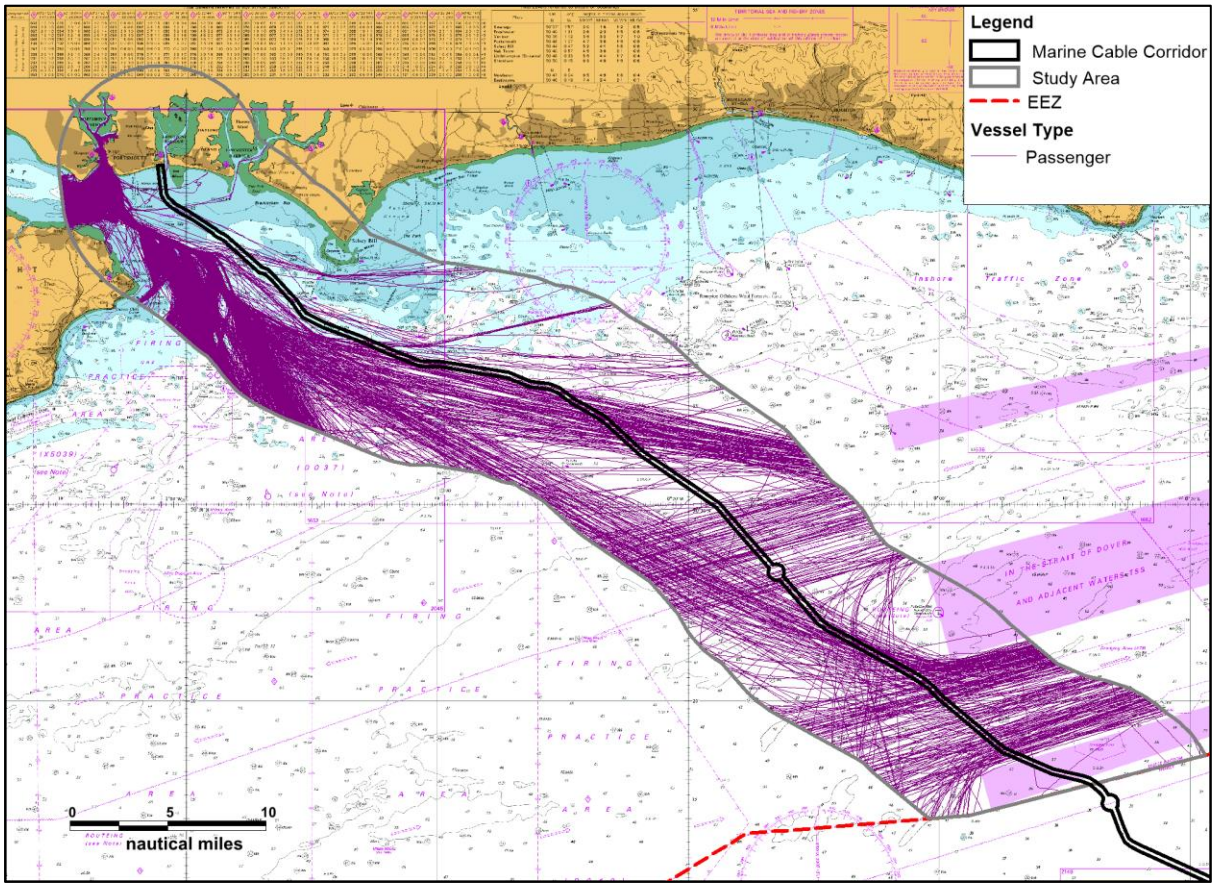

Figure 10.5 Passenger Vessel Tracks – Six Months (Summer & Winter)

It can be seen that a high density of passenger vessels is associated with the Solent area. This is due to the regular ferry operators (such as Wightlink) transiting between the Isle of Wight and Portsmouth. In addition, passenger vessels also utilise the shipping lanes of the TSS.

10.2.3 Detailed Analysis

Figure 10.6 and Figure 10.7 present the AIS vessel tracks recorded in summer and winter close to the coast to detail the traffic occurring within close proximity to the proposed HDD works. The HDD exit/entry point is estimated to be between KP1 and KP1.6 and thus KP1 and KP2 are given as reference points in the figure.

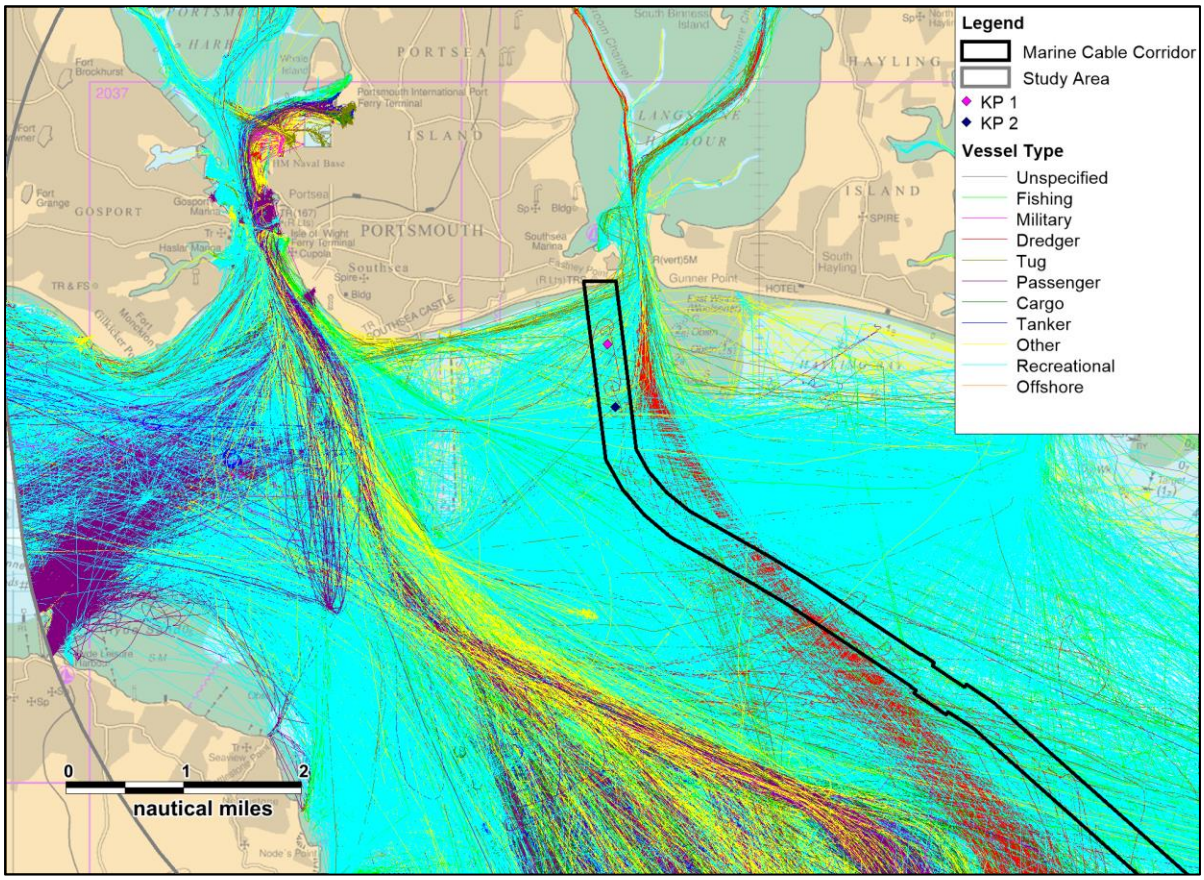

Figure 10.6 Detailed View of AIS Tracks by Vessel Type – Three Months (Summer)

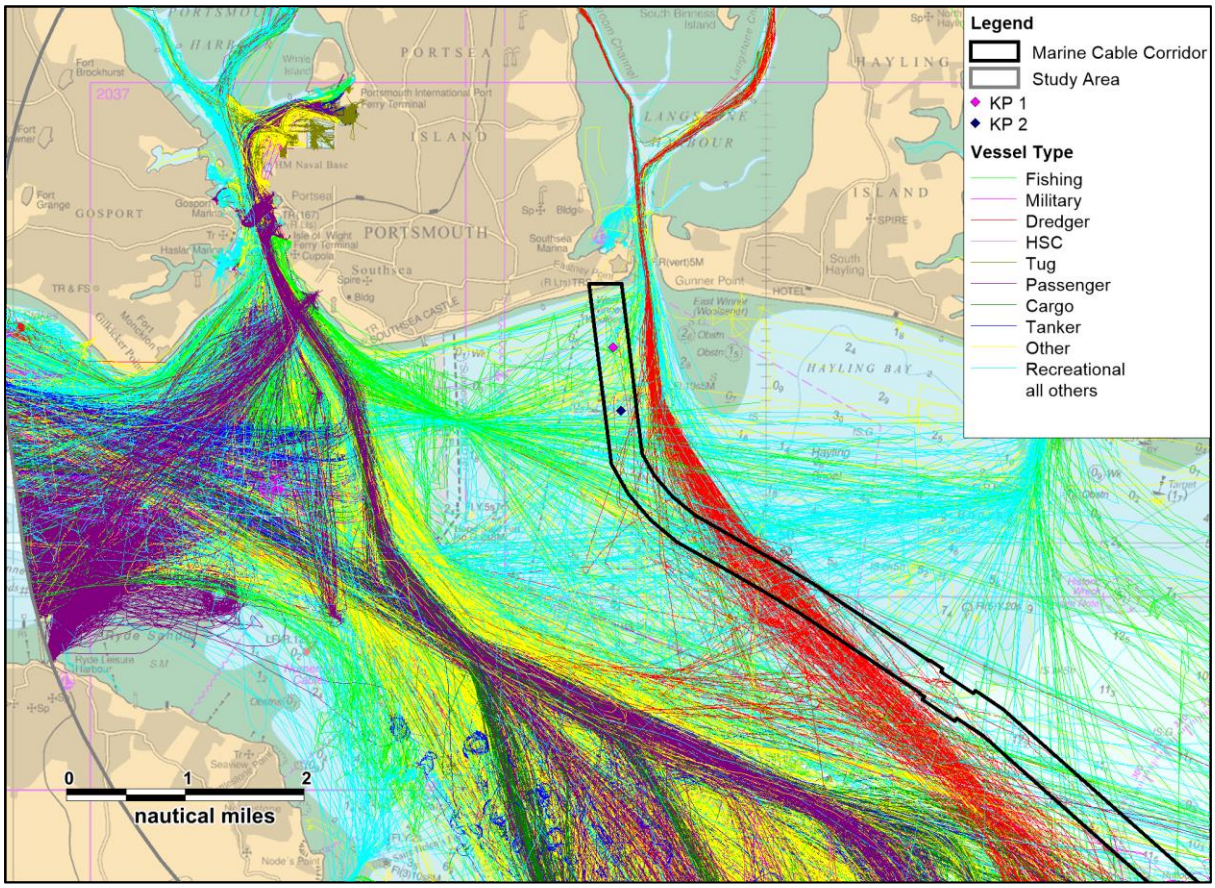

Figure 10.7 Detailed View of AIS Tracks by Vessel Type – Three Months (Winter)

It can be seen that the majority of activity crossing within proximity to the HDD exit/entry point (between KP1 and KP1.6) is recreational craft, particularly in summer. In addition, a number of fishing vessels, small 'other' craft such as pilot vessels and lifeboats, and dredgers were seen close to the site of the proposed works.

10.3 Vessel Numbers

Figure 10.8 presents the average number of unique vessels recorded in the study area per day for each month of the study period. This avoids double-counting vessels exiting and re-entering the study area on the same day.

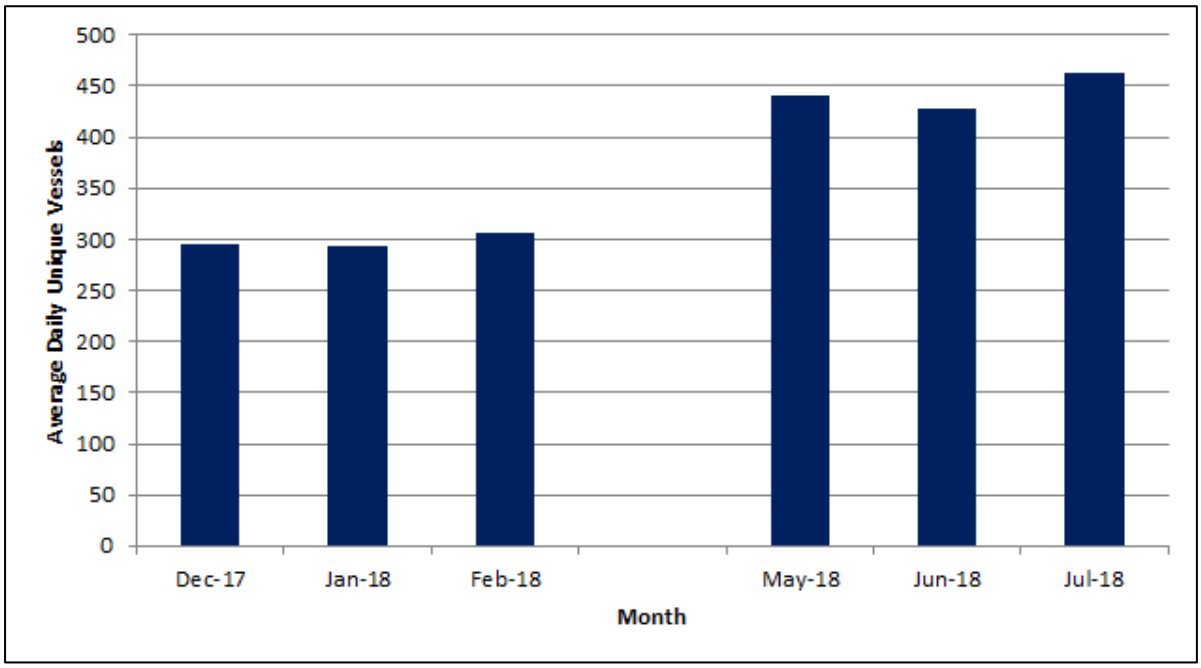

Figure 10.8 Average Daily Vessel Count per Month

Overall, the traffic recorded in the summer period was significantly higher with an average of 444 unique vessels recorded per day, compared to 299 unique vessels per day recorded in winter. July was the busiest month of the study period whilst December and January were the quietest.

The busiest day recorded was the 7th July 2018 when a total of 803 unique vessels were recorded in the study area. The quietest day was the 26th December 2017 when a total of 191 unique vessels were recorded in the study area. Figure 10.9 and Figure 10.10 present the tracks recorded on the busiest and quietest days, respectively.

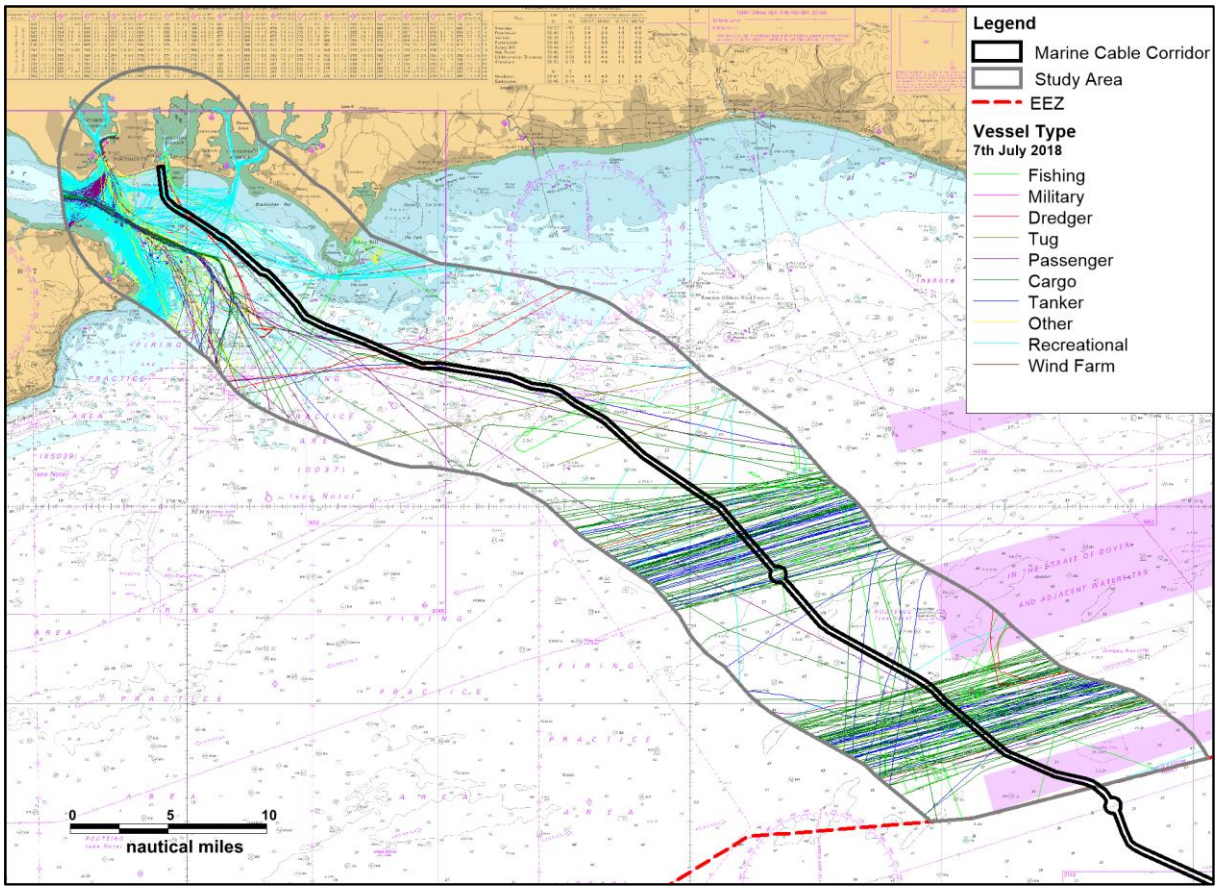

Figure 10.9 AIS Tracks on Busiest Day – 7th July 2018

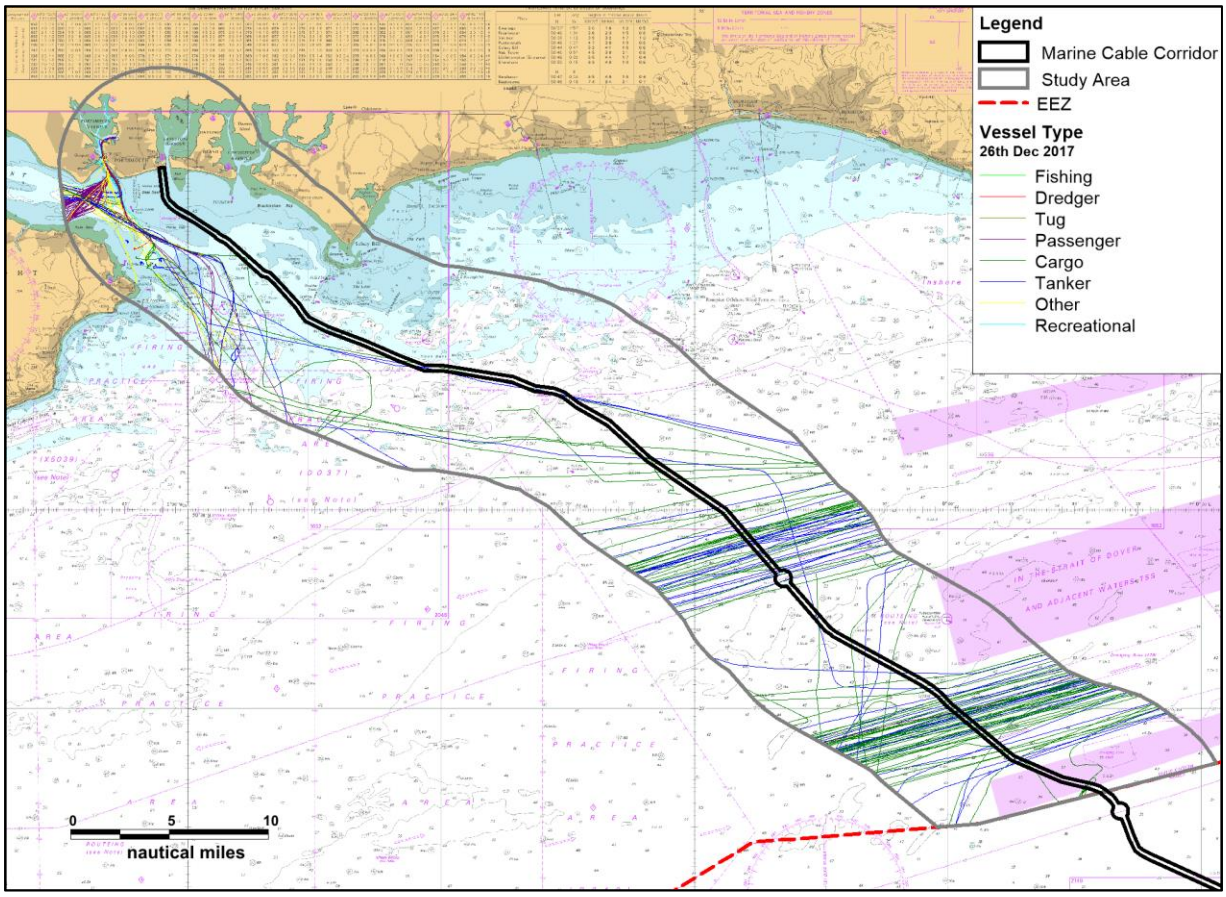

Figure 10.10 AIS Tracks on Quietest Day – 26th December 2017

10.4 Vessel Density

Figure 10.11 and Figure 10.12 present the vessel density in the study area for the summer and winter periods, respectively. This is based on the number of track intersects per cell of a 1 km×1 km grid covering the study area. The ranges have been kept consistent between the two seasonal periods to allow comparisons to be made.

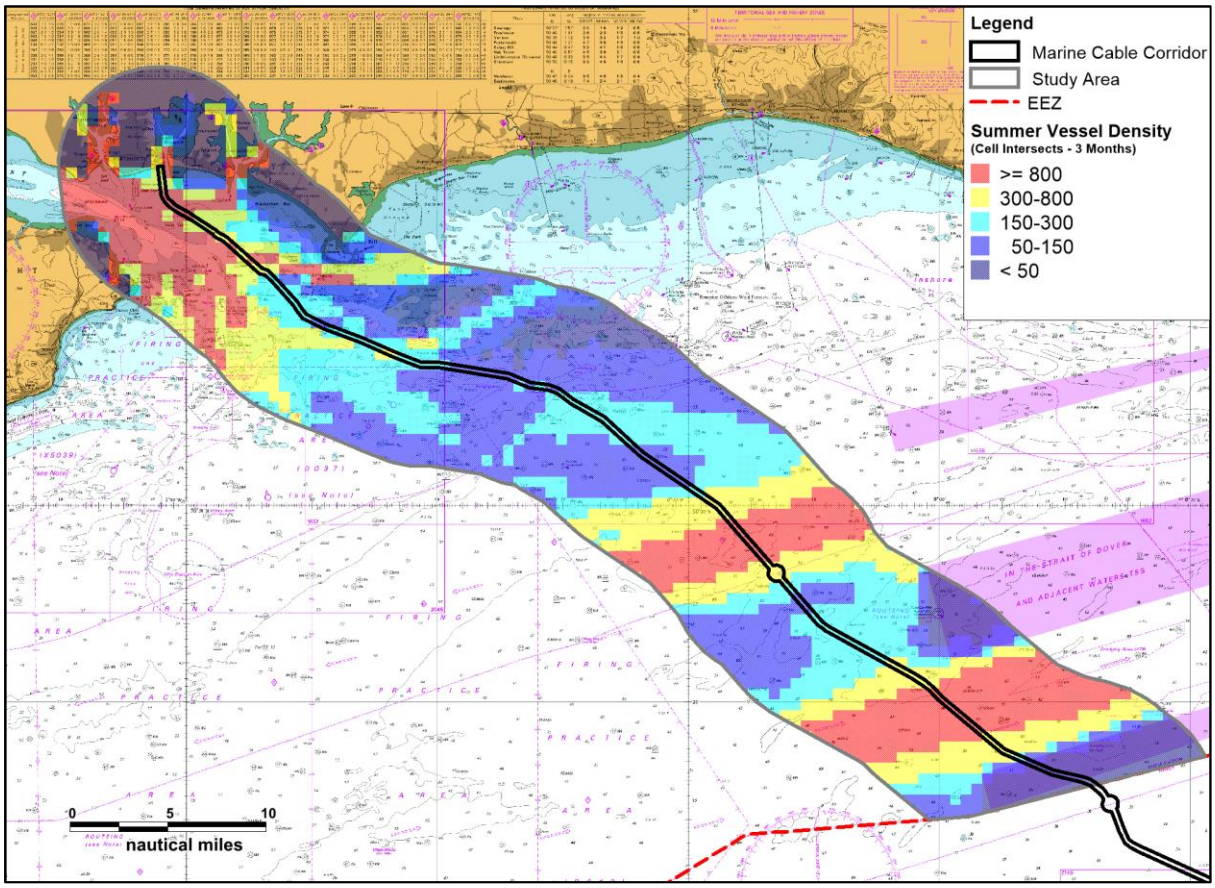

Figure 10.11 AIS Vessel Density – Three Months (Summer)

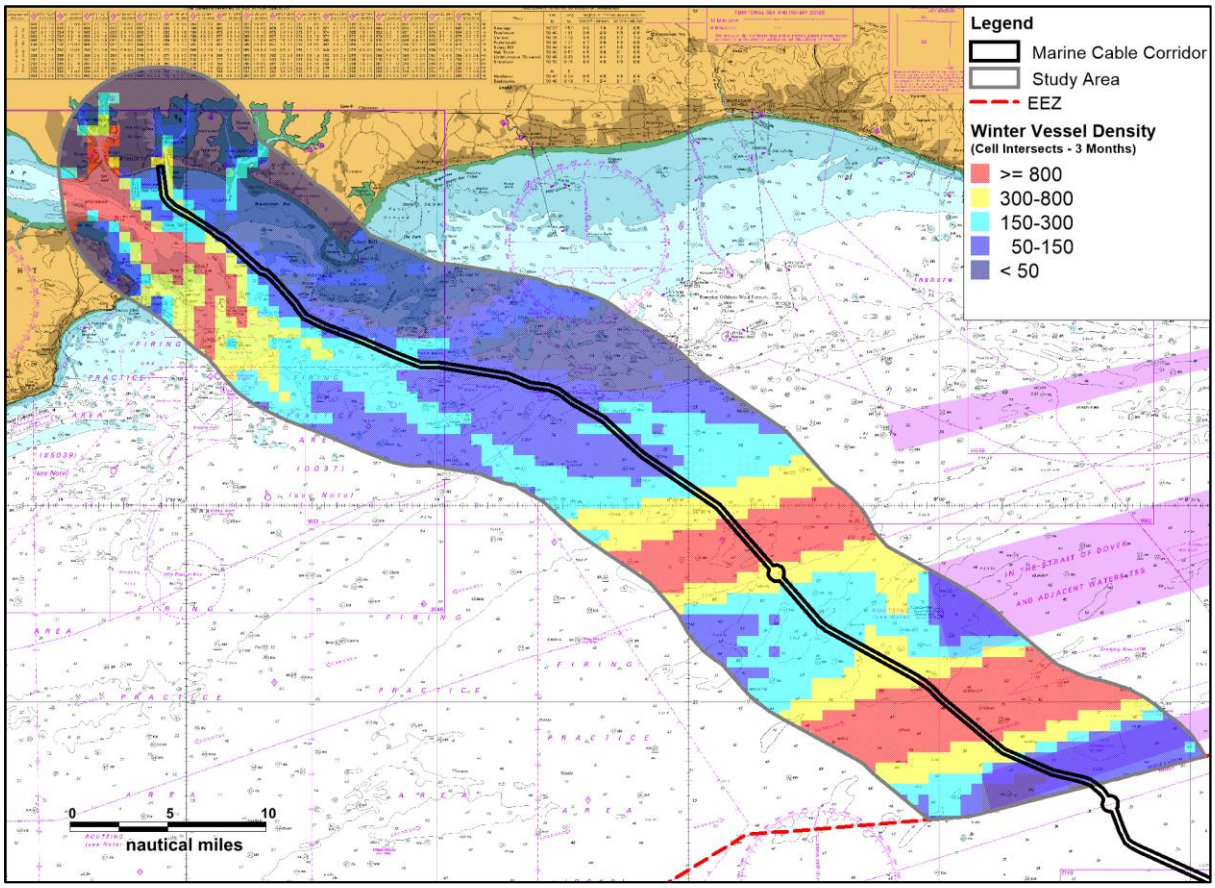

Figure 10.12 AIS Vessel Density – Three Months (Winter)

High density areas in both the summer and winter periods include the shipping lanes associated with the Dover Strait TSS. In addition to this, high density was also seen near the Landfall due to the large amount of recreational activity (particularly in summer) in the area as well as vessels on approach to ports such as Portsmouth and Southampton.

10.5 Vessel Sizes

10.5.1 Vessel Length

Figure 10.13 presents the AIS tracks recorded in the study area, colour-coded by vessel length, for both summer and winter periods. Following this, Figure 10.14 presents the vessel length distribution, based on unique vessels per day (excluding 1% unspecified).

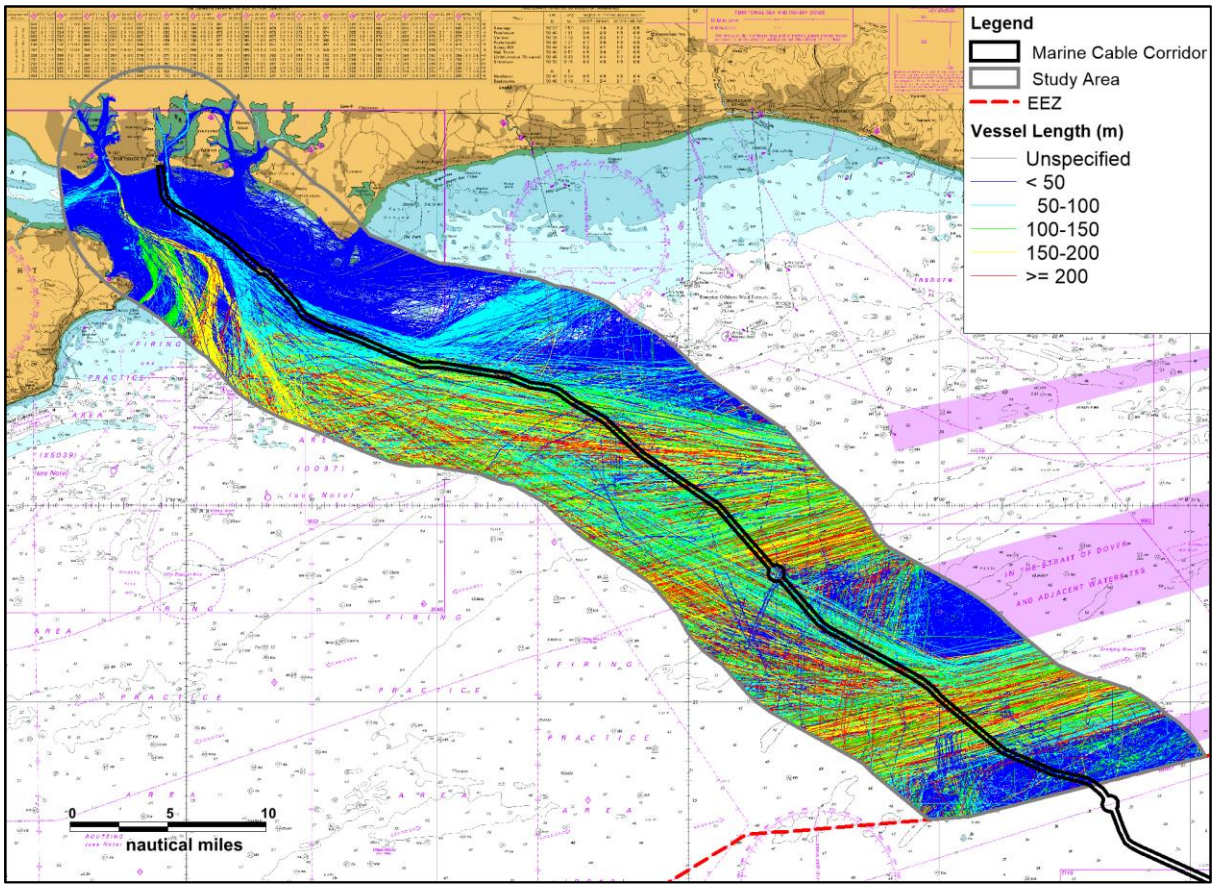

Figure 10.13 AIS Tracks by Vessel Length – Six Months (Summer & Winter)

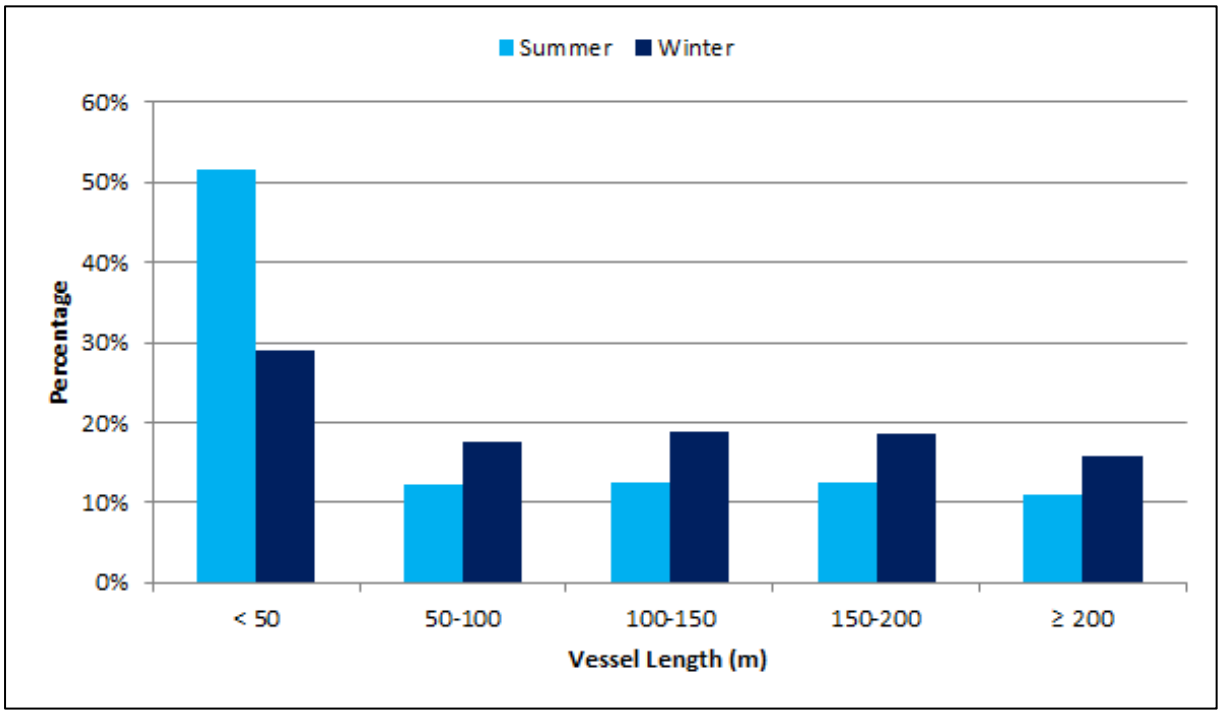

Figure 10.14 AIS Vessel Length Distribution

The average vessel length recorded in the study area was 86 m in summer and 120 m in winter. The difference between periods is likely due to the larger number of smaller vessels (i.e. recreational craft) recorded in the summer period. It can be seen that approximately half (52%) of vessels in summer were recorded with lengths less than 50 m.

The longest vessels recorded in the study area included a number of large container vessels with lengths of 400 m. Some examples include the *MSC Vivanna*, *CSCL Globe* and *Al Dahna*.

10.5.2 Vessel Draught

Figure 10.15 presents the AIS tracks recorded in the study area, colour-coded by vessel draught, for both summer and winter periods. Following this, Figure 10.16 presents the vessel draught distribution. It is noted that a large proportion of vessels (approximately 45%) did not broadcast a draught and thus have not been included in the distribution analysis. The majority of vessels without draught information were small fishing vessels and recreational craft which are expected to have small draughts (i.e. likely less than 5 m).

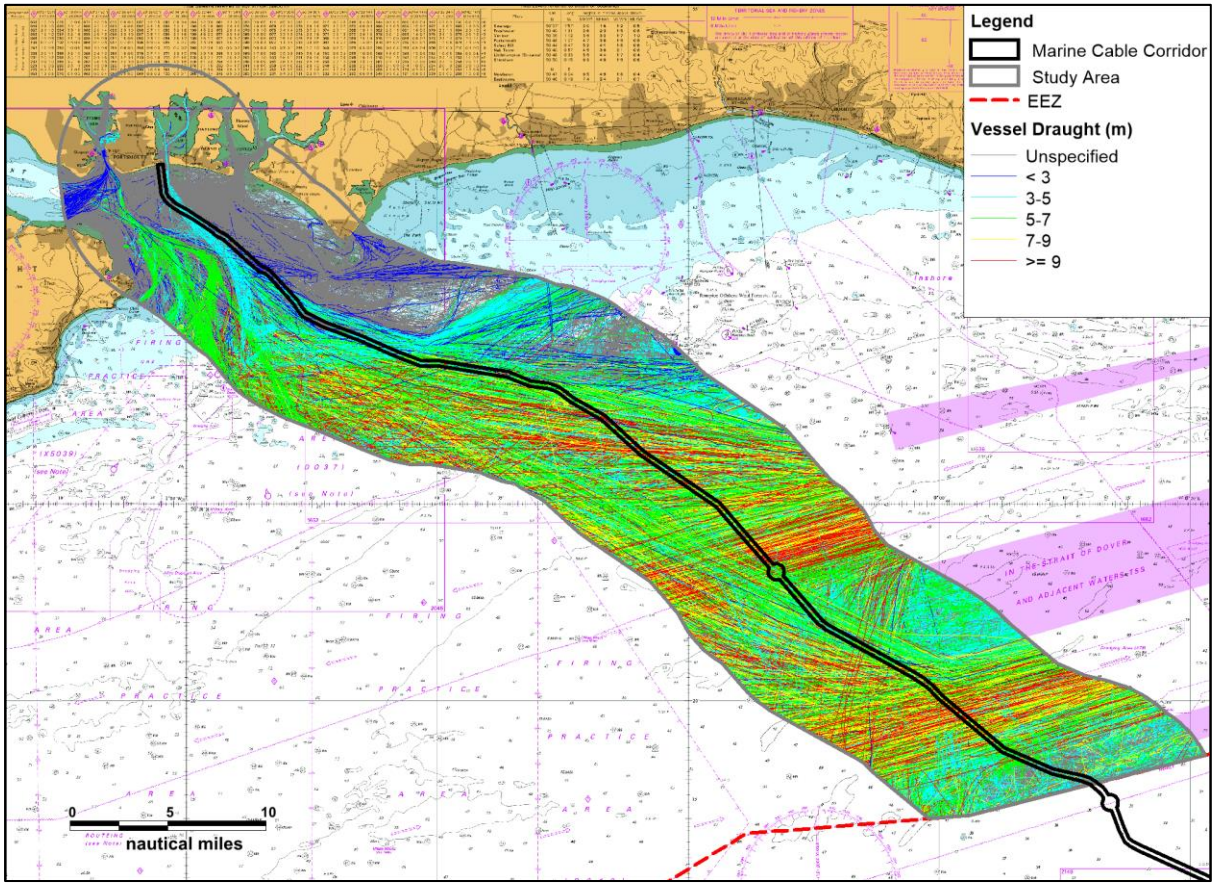

Figure 10.15 AIS Tracks by Vessel Draught – Six Months (Summer & Winter)

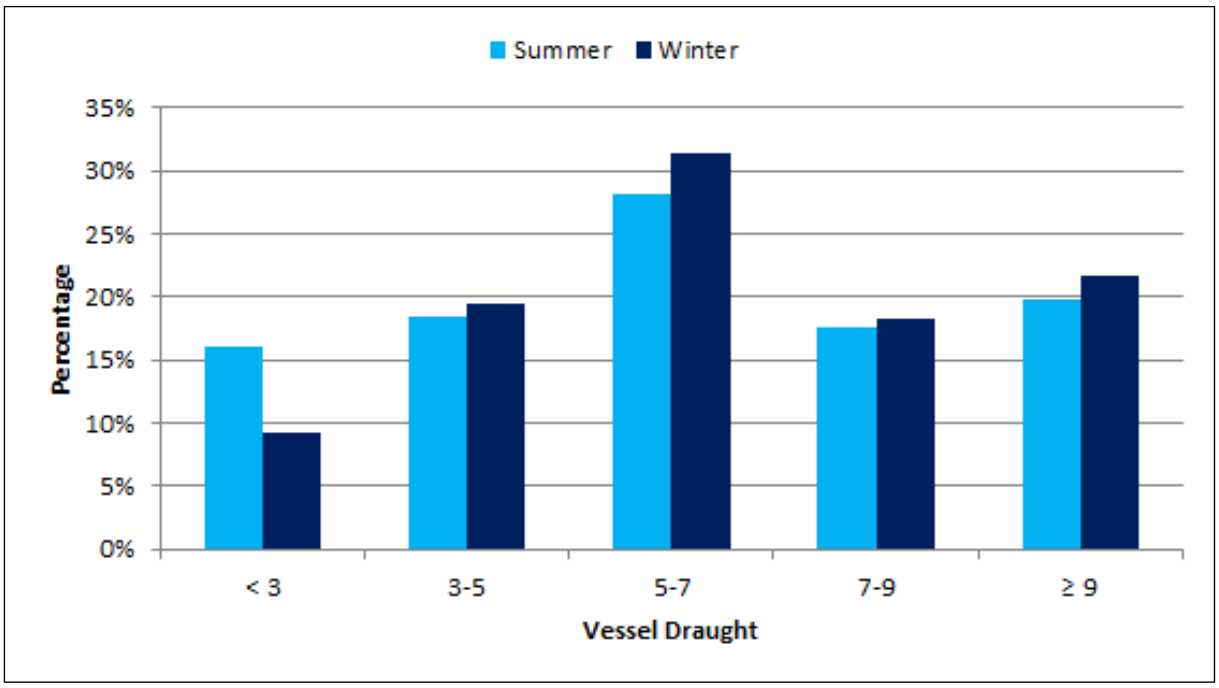

Figure 10.16 AIS Vessel Draught Distribution

The average vessel draught recorded in the study area was between 6 and 7 m for both summer and winter periods. This similarity is likely due to the large number of small vessels not broadcasting a draught, particularly in summer.

The vessels with the deepest draughts recorded were the 330 m crude oil tankers *Fida* and *Horse*, each broadcasting a draught of 22 m. Within proximity of the coast (approximately 5 nmi), the largest draught broadcast was from the 400 m container vessel, *Tihama*, at 15.5 m. Within the Marine Cable Corridor, the dredger vessel, *Karissa*, was recorded with a draught of 4.1 m, approximately 3 nmi from the land fall in shallower water depths between 6 and 7 m.

10.5.3 Vessel DWT

Figure 10.17 presents the AIS tracks recorded in the study area, colour-coded by dead weight tonnage (DWT), for both summer and winter periods. This is not broadcast on AIS and, where possible, has been researched separately by Anatec based upon the ship identity information. In some cases (approximately 40% of the combined six months), approximations were based on the vessel type and dimensions (mainly for small fishing vessels and recreational craft estimated to be less than 500 DWT).

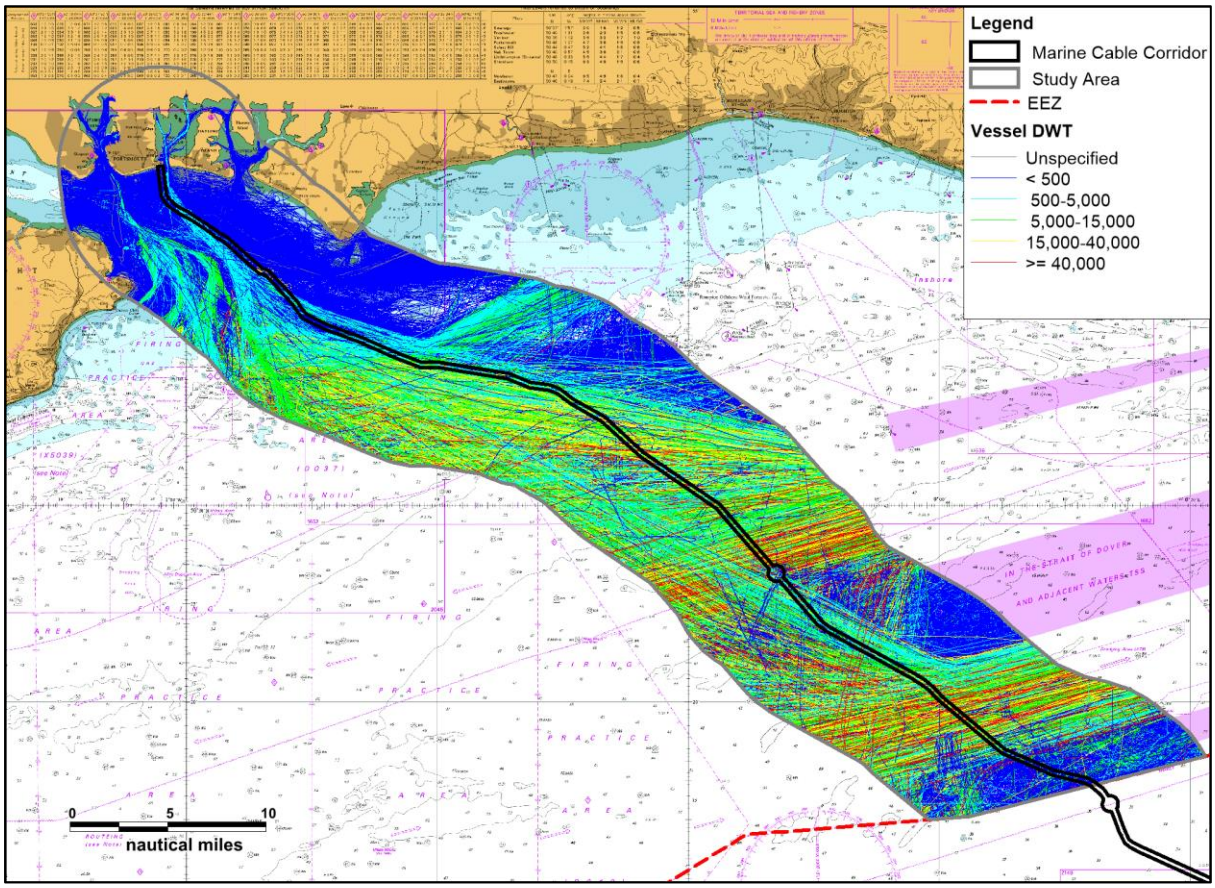

Figure 10.17 AIS Vessel Tracks by DWT – Six Months (Summer & Winter)

Figure 10.18 presents the vessel DWT distribution, including estimated DWT, based on unique vessels per day.

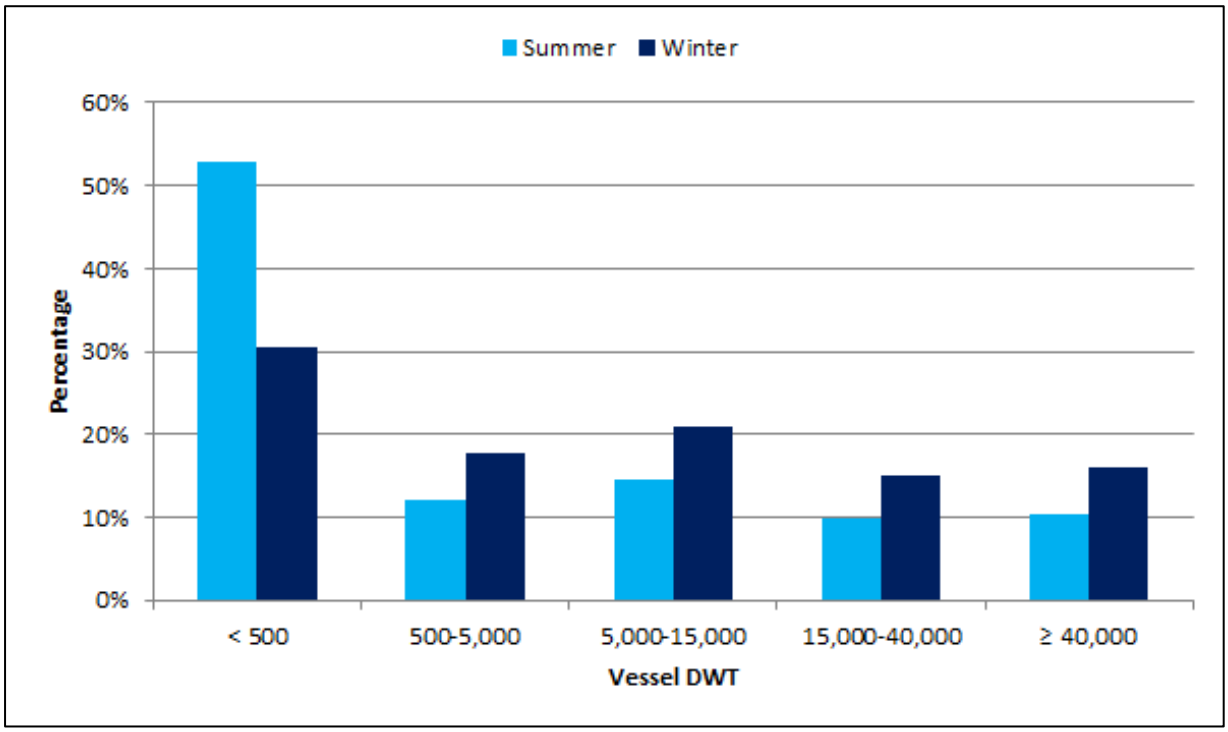

Figure 10.18 AIS Vessel DWT Distribution

It can be seen that over half (53%) of vessels recorded in summer were identified or estimated to have DWT less than 500. This is reflective of the high number of small recreational craft recorded in the study area. The largest vessel recorded with a DWT of 323,183 was the crude oil tanker *Sara*. This vessel was recorded on two occasions in the winter period, utilising the shipping lanes associated with the Dover Strait TSS.

10.6 Vessel Speed

Figure 10.19 presents the AIS tracks recorded within the study area, colour-coded by average speed, for both summer and winter periods. Following this, Figure 10.20 presents the average speed distribution, excluding 13% unspecified.

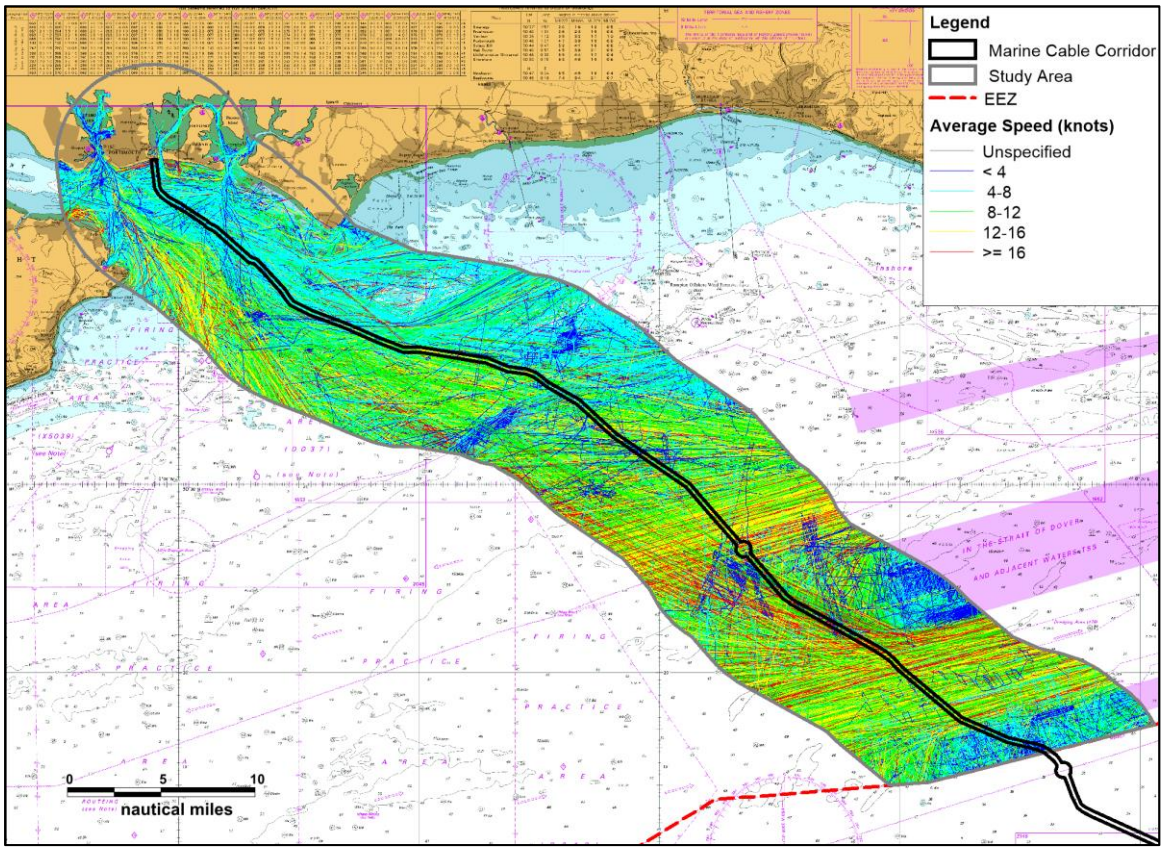

Figure 10.19 AIS Vessel Tracks by Average Speed – Six Months (Summer & Winter)

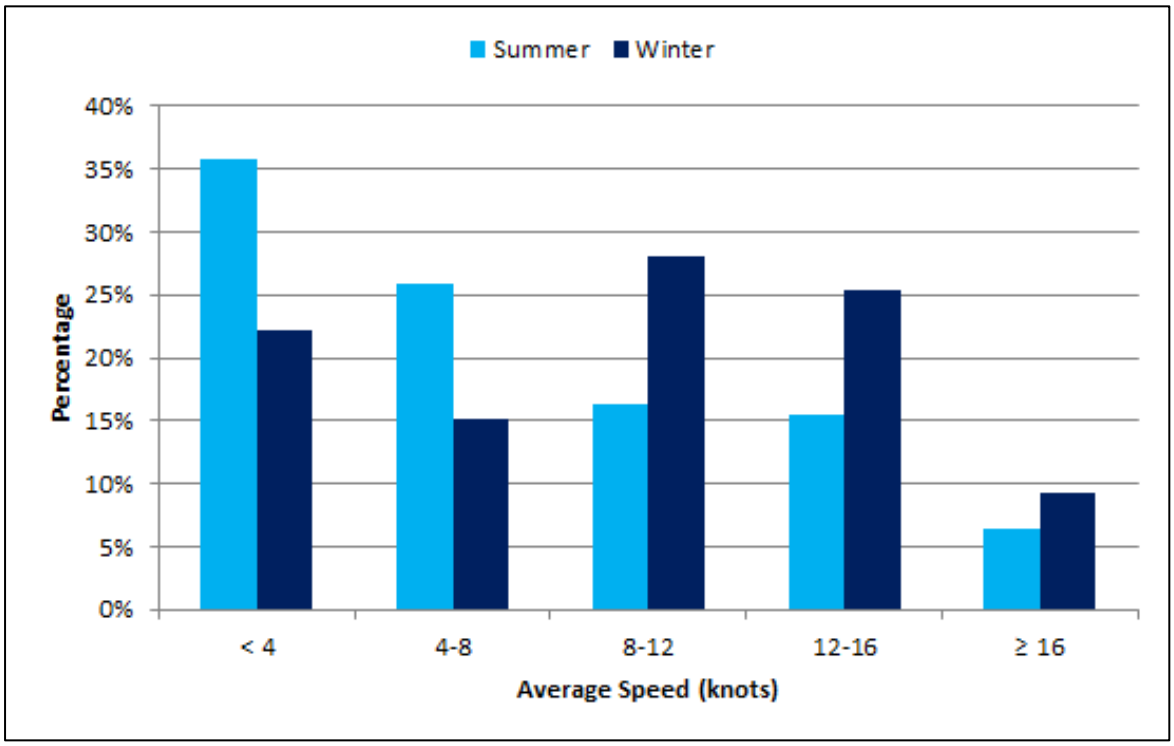

Figure 10.20 AIS Average Vessel Speed Distribution

The average speed recorded in the summer and winter periods were 6.8 knots and 9.1 knots, respectively. In summer, the largest proportion of vessels were recorded with speeds less than four knots (36%), whilst in winter the largest proportion recorded speeds between 8 and 12 knots.

10.7 Anchored Vessels

Vessels can transmit their navigation status via AIS; however, they do not always do so accurately. In order to produce a reliable set of anchored vessels within the study area, all AIS tracks from vessels within the AIS data that transmitted their navigation status as 'At Anchor' were checked to ensure their behaviour matched that of an anchored vessel. In addition, AIS tracks from vessels which transmitted a navigation status other than 'At Anchor' were used as input to Anatec's Speed Analysis model. The program uses a predefined set of parameters to detect any tracks that may be from an anchored vessel based on their speed and course. This output is then manually checked, and any tracks that can be confirmed as coming from an anchored vessel are combined with those 'At Anchor' tracks which were already verified.

Figure 10.21 presents the tracks of all vessels deemed to be at anchor within the study area throughout the entire six month study period, colour-coded by vessel type.

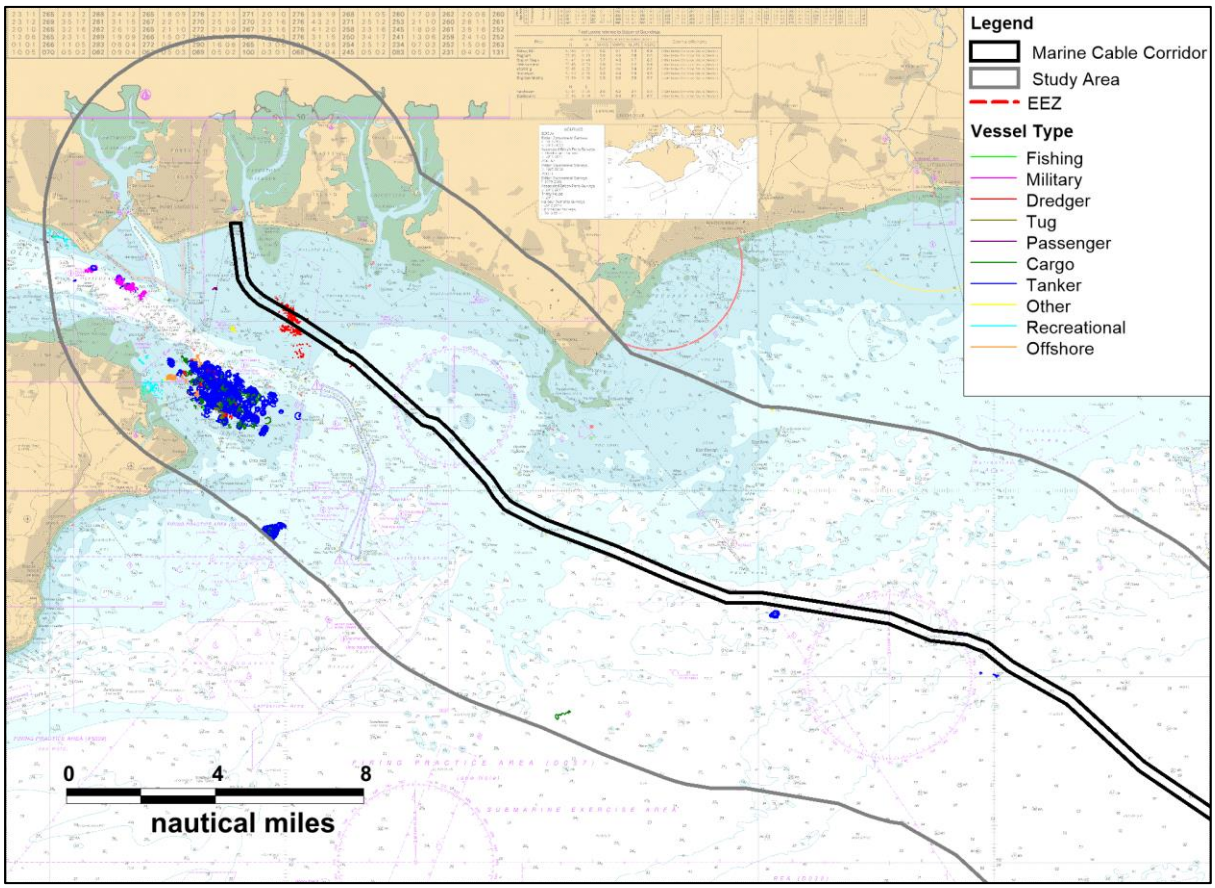

Figure 10.21 Anchored Vessels by Type – Six Months (Summer & Winter)

The majority of anchoring activity recorded within the study area is associated with the Saint Helen's Road anchorage located south of the Marine Cable Corridor (as shown in Figure 7.3). Vessels at anchor were awaiting entrance to ports such as Fawley, Southampton and Portsmouth. Anchoring activity from two hopper dredgers, *Karissa* and *Sand Fulmar*, was also recorded within the cable corridor. These vessels were recorded at anchor on multiple occasions throughout the study period with DWTs of 2,628 and 9,153, respectively.

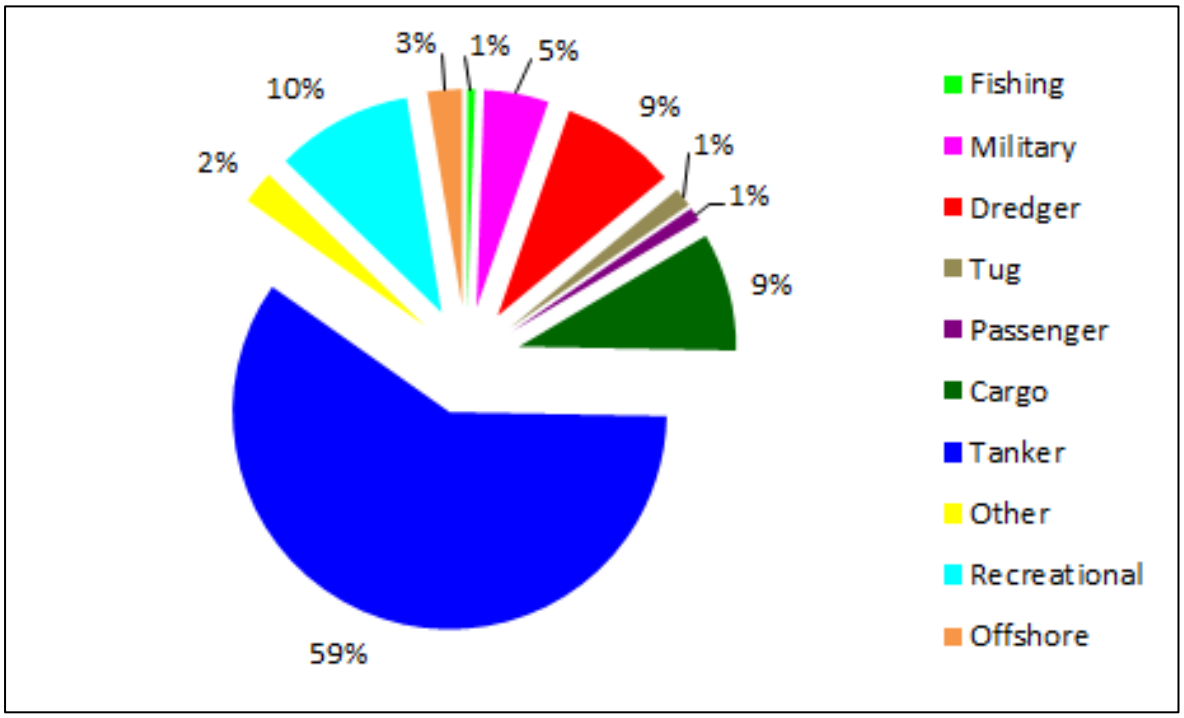

Figure 10.22 Anchored Vessel Type Distribution

Tankers (59%) were the most frequently recorded vessels at anchor, followed by recreational craft (10%), cargo vessels (9%) and dredgers (9%).

It is noted that no recreational craft had a navigation status set to at anchor; however upon review of behaviour and speed of particular tracks, it was estimated several vessels were at anchor off the coast of the Isle of Wight (Priory and Seagrove Bay) and in Stokes Bay (off Gosport). As mentioned previously, recreational craft are not obligated to broadcast on AIS and thus it is likely anchoring activity from these small vessels is under-represented. Consultation with the CA revealed recreational vessels are also likely to anchor near the Langstone Harbour entrance and thus within close proximity to the cable Landfall.

Figure 10.23 presents all vessels deemed to be at anchor within the study area, colour-coded by vessel DWT, for the entire six month study period. Following this, the distribution of vessel DWT is presented in Figure 10.24.

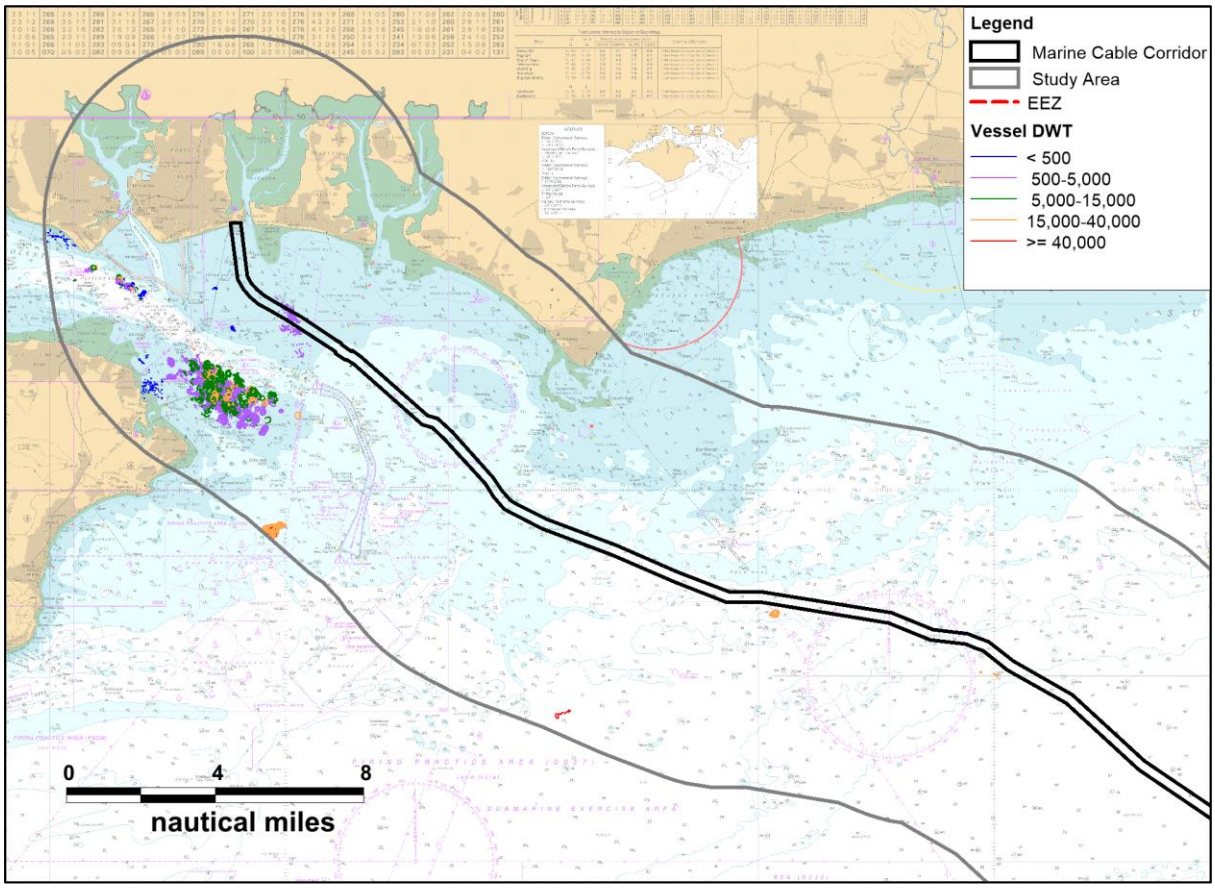

Figure 10.23 Anchored Vessels by DWT – Six Months (Summer & Winter)

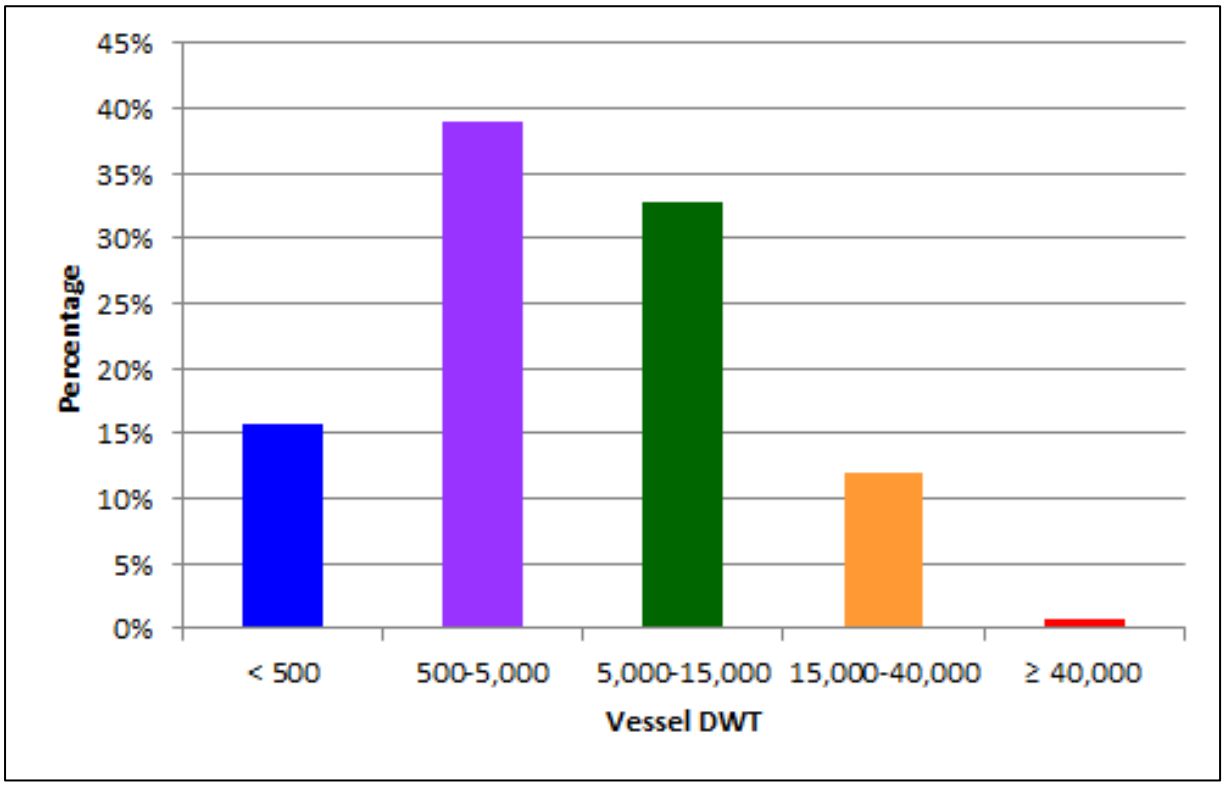

Figure 10.24 Anchored Vessel DWT Distribution

The majority of vessels (87%) had DWT less than 15,000. The largest vessel recorded at anchor was the large container vessel, *MSC Sveva,* at 199,272 DWT. This vessel was recorded at anchor approximately 4.5 nmi south of the Marine Cable Corridor on the 6th December 2017.

There were two dredgers recorded at anchor within the Marine Cable Corridor and another two within close proximity (i.e. 50-200 m). Three of these vessels had DWT between 1,500 and 3,000 DWT. One vessel, the *Sand Fulmar*, was recorded at anchor within the Marine Cable Corridor on the 16th July 2018, with a DWT of 9,128.

10.8 Dredging Activity

Figure 10.25 presents the estimated active dredging recorded in the study area for the whole study period. Estimations were based on behaviour, navigation status, destination and speed of tracks.

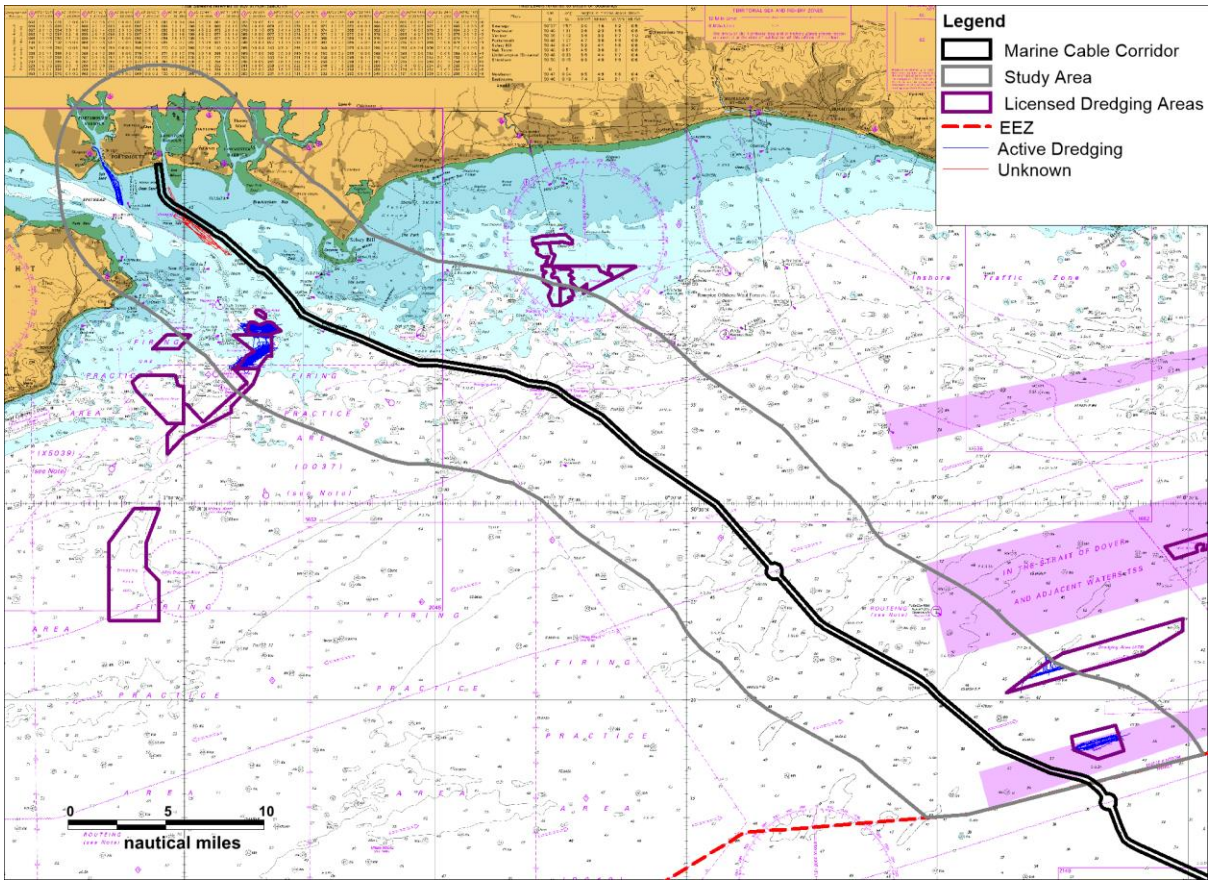

Figure 10.25 Dredging Activity

It is noted that the majority of dredgers recorded in the data set were transiting through the study area and thus have not been included in the above figure. There was some dredging activity associated with the Port of Portsmouth, the Dover Strait TSS lanes and the Nab dredge areas.

It is noted that the *Arco Dee* was recorded intersecting the Marine Cable Corridor, however it was unclear whether the vessel was actively dredging. Following consultation with local stakeholders, it was concluded that the vessel was awaiting entrance to Langstone Harbour. The Langstone Harbour Master estimated that there are approximately 500-600 dredgers per annum which anchor within the area around the Marine Cable Corridor for 4-6 hours, whilst awaiting entrance to the harbour.

11 Baseline Fishing Analysis

This section presents a review of the baseline fishing activity recorded within the study area. It is noted that there is a more detailed commercial fisheries study found in Chapter 12 of the ES.

11.1 AIS Analysis

11.1.1 Vessel Gear Type

Figure 11.1 presents the AIS fishing tracks recorded in the study area, colour-coded by gear type, for the entire six month study period. Following this, Figure 11.2 presents the gear type distribution, based on unique vessels per day (excluding 10% unspecified).

The most frequently recorded gear types include pots and traps (29%), boat dredges (24%) and beam trawlers (18%).

Demersal gear types present the highest risk to subsea cables as they tow their gear along the seabed. Demersal gear types accounted for approximately 62% of all gear types within the study area. Demersal gear types include beam trawlers, single, paired and twin demersal trawlers, boat dredges and Scottish seines.

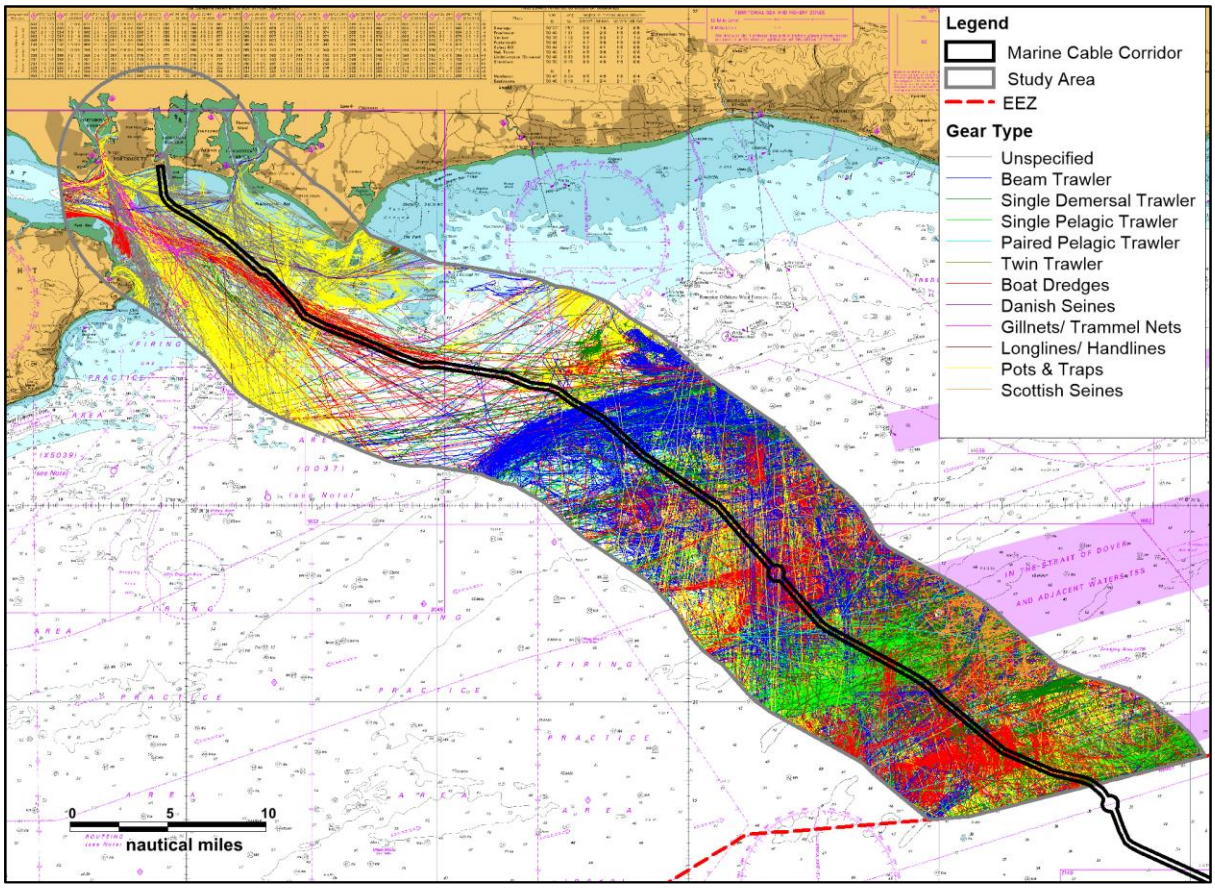

Figure 11.1 AIS Fishing Tracks by Gear Type

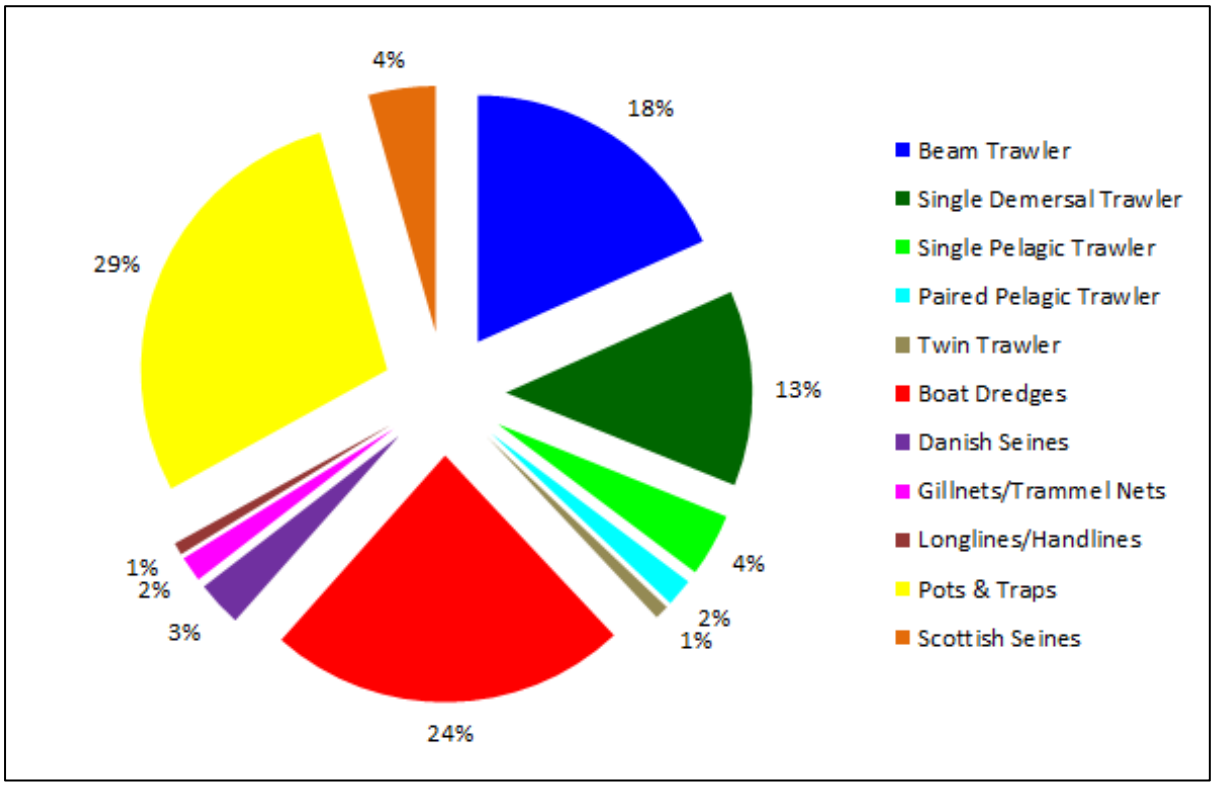

Figure 11.2 AIS Fishing Gear Type Distribution

11.1.2 Vessel Numbers

Figure 11.3 presents the average number of unique fishing vessels recorded per day within the study area, for each month in the study period.

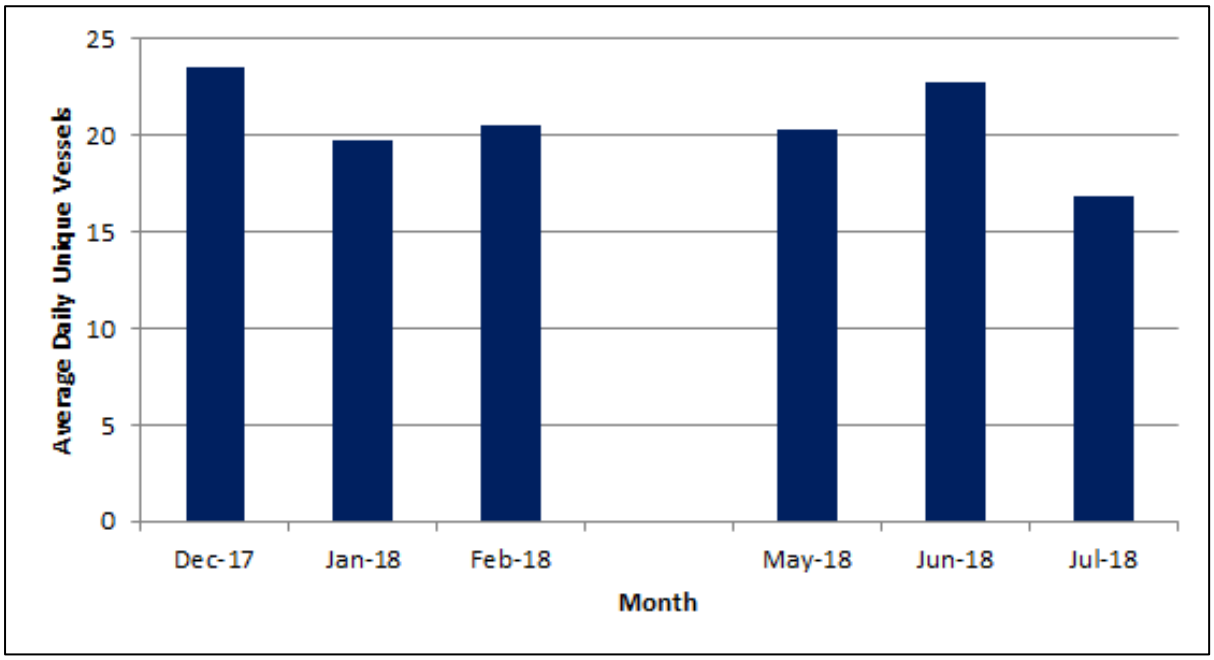

Figure 11.3 Average Daily Fishing Vessel Count per Month

There was an average of 20 unique fishing vessels recorded per day within the study area over the entire study period. The quietest month was July with an average of 17 unique vessels per day whilst December was the busiest with an average of 23 unique vessels per day.

11.1.3 Vessel Length

Figure 11.4 presents the AIS fishing tracks recorded within the study area, colour-coded by vessel length, for both summer and winter periods. Following this, Figure 11.5 presents the fishing vessel length distribution, based on unique vessels per day.

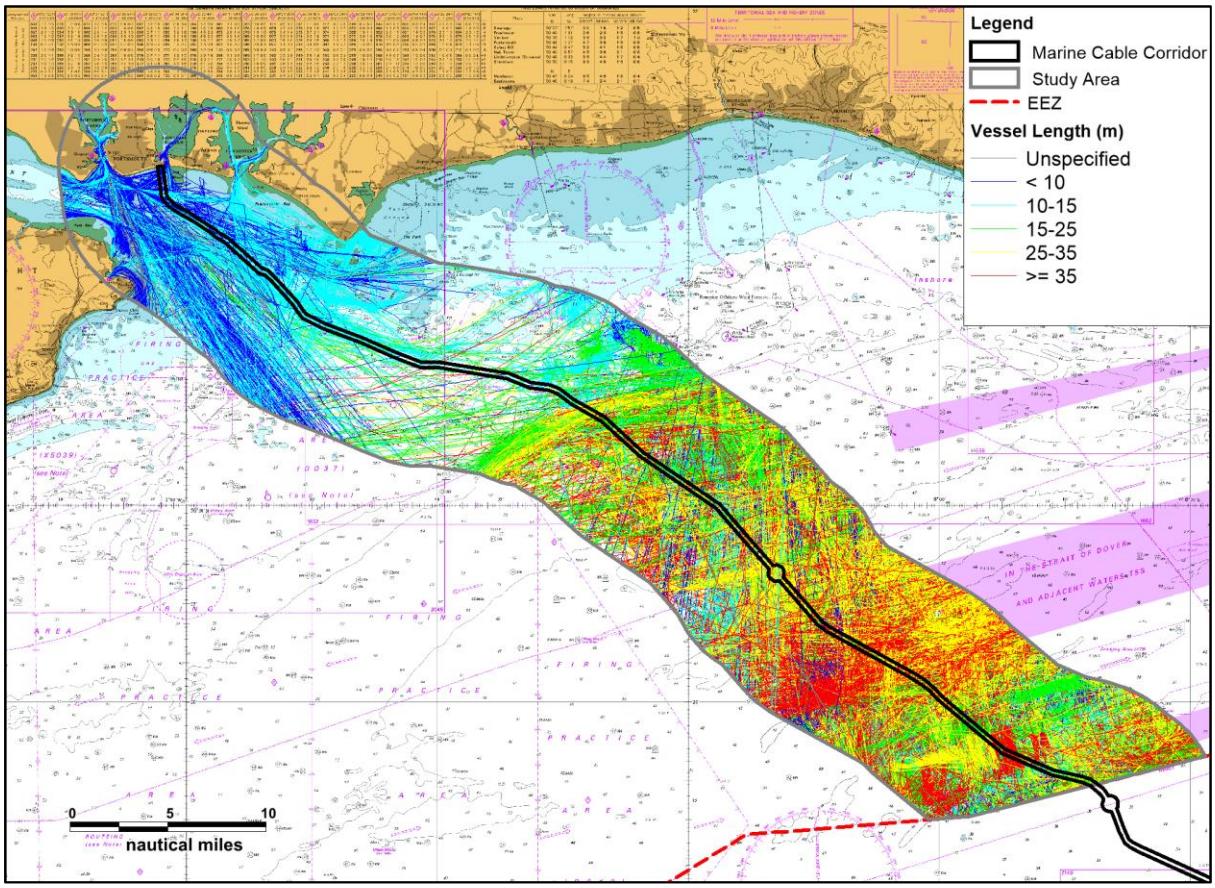

Figure 11.4 AIS Fishing Tracks by Vessel Length

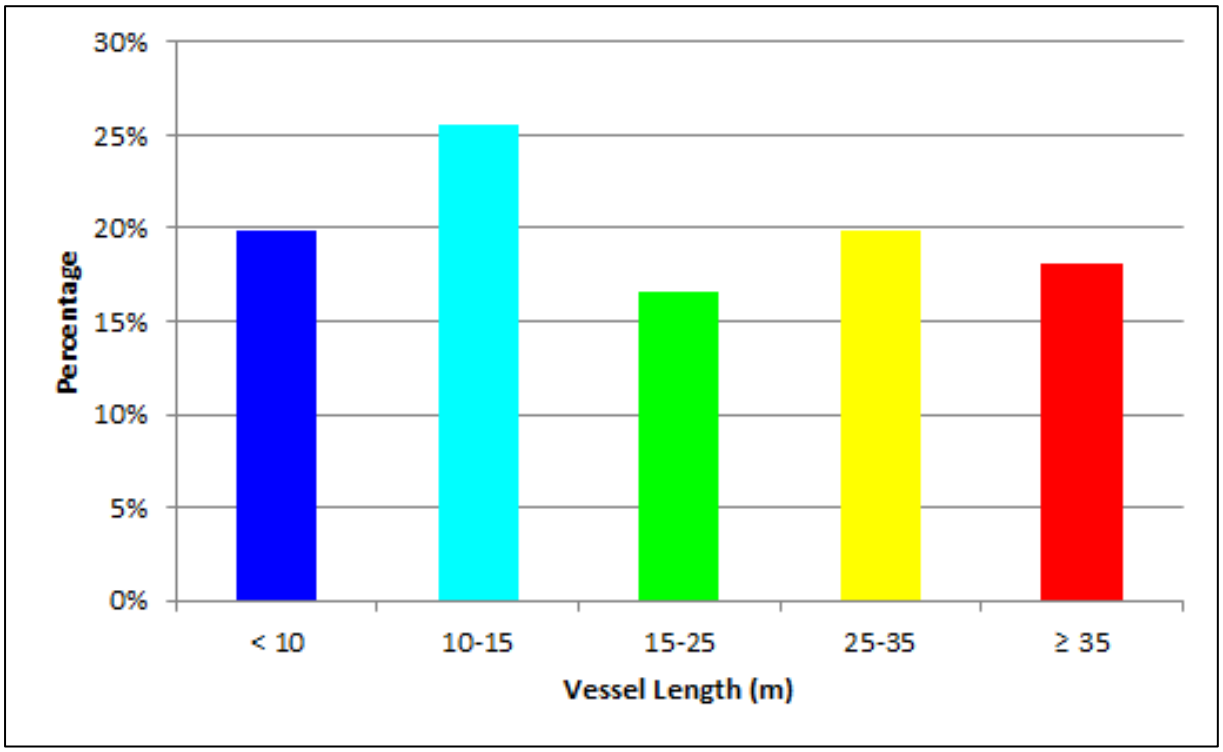

Figure 11.5 AIS Fishing Vessel Length Distribution

The average fishing vessel length recorded in the study area was 24 m. Approximately 46% of vessels were recorded with lengths less than 15 m and thus were carrying AIS voluntarily.

11.1.4 Vessel Nationality

Figure 11.6 presents the fishing vessel nationality distribution, based on unique vessels per day. The majority (66%) of vessels were registered in the UK. Other nationalities recorded in the study area include Belgian, French and Dutch fishing vessels.

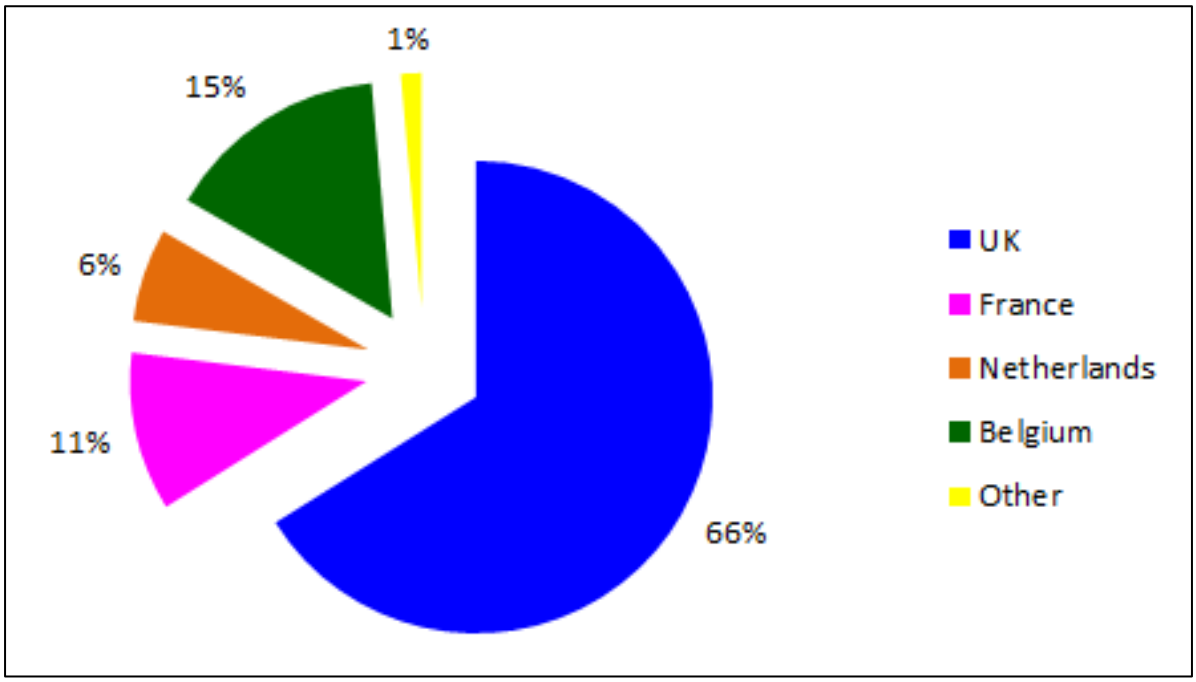

Figure 11.6 AIS Fishing Vessel Nationality Distribution

11.1.5 Vessel Speed

Figure 11.7 presents the AIS fishing tracks recorded in the study area, colour-coded by average speed, for both summer and winter. Following this, Figure 11.8 presents the average speed distribution, excluding 14% unspecified.

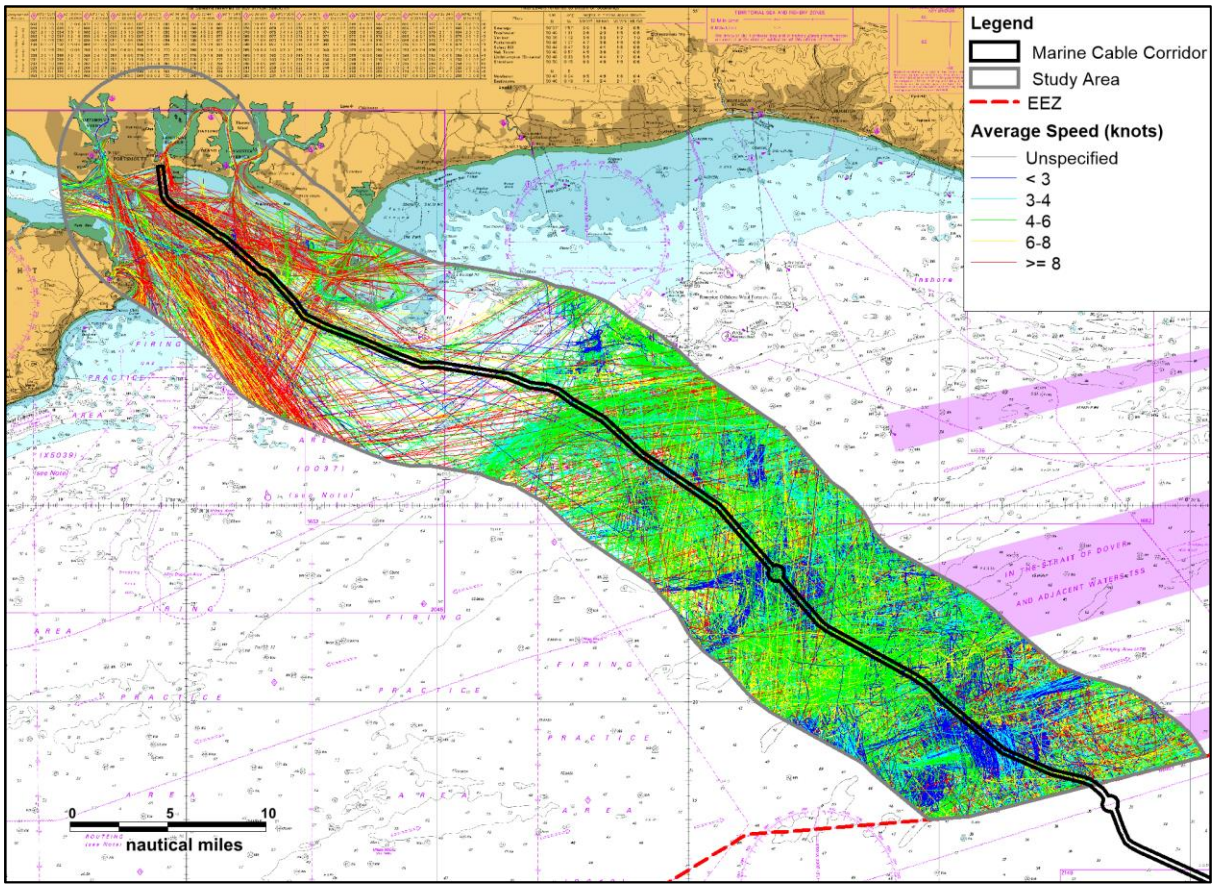

Figure 11.7 AIS Fishing Tracks by Average Speed

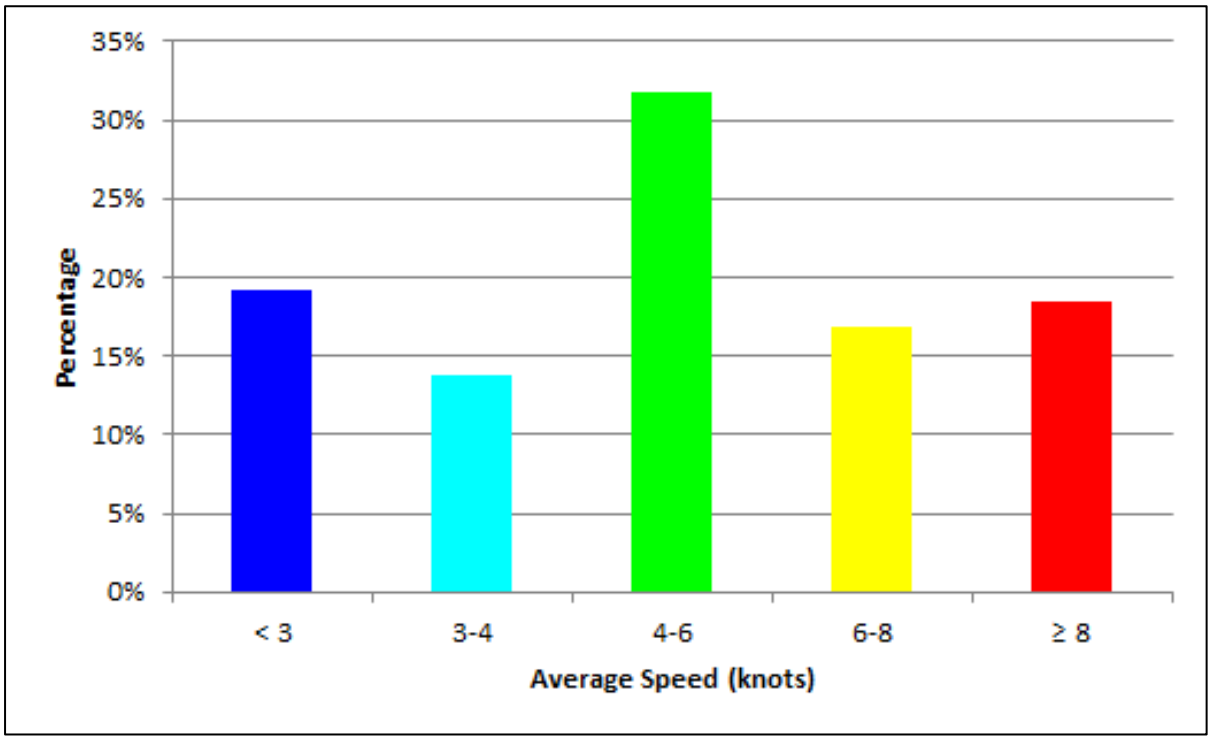

Figure 11.8 AIS Fishing Vessel Average Speed Distribution

The average speed recorded in the study area was 5.4 knots. The majority of vessels (65%) recorded speeds less than six knots. It is estimated that vessels recorded with speeds less than six knots could potentially be engaged in fishing activities whilst those with higher speeds (i.e. greater than six knots) are likely transiting through the area.

Therefore, an analysis was carried out to determine whether demersal vessels recorded in the study area were actively fishing, using a combination of speed analysis, navigation information and behaviour of tracks. The tracks deemed to be potentially engaged in fishing activities are presented in Figure 11.9. It is noted that vessels with unspecified gear types have been included in the figure below as these could operate demersal gears.

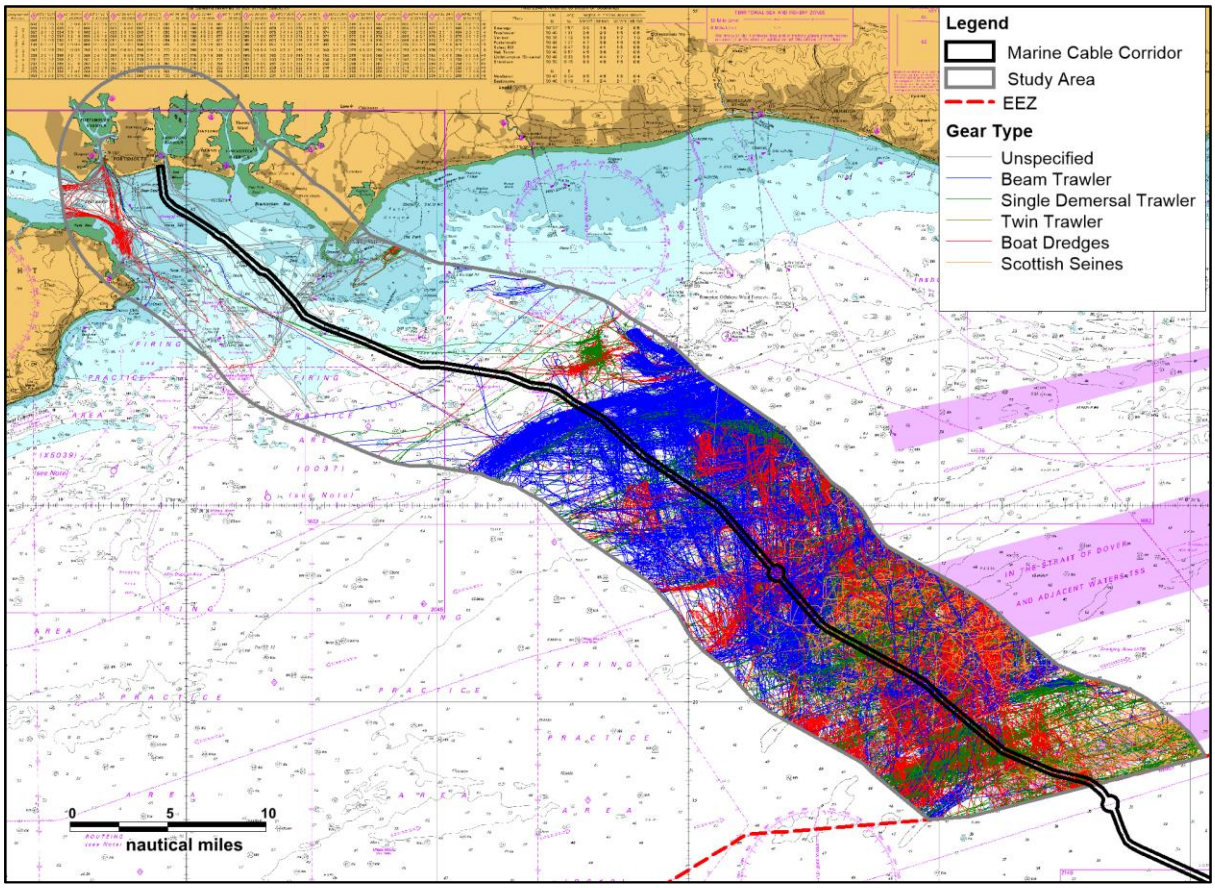

Figure 11.9 Demersal Gear Types Estimated to be Actively Fishing

It can be seen from the figure above that the waters within and around the Dover Strait TSS are the busy areas for vessels actively engaged in fishing.

11.2 Satellite Analysis

This section presents a review of satellite fishing data provided by the MMO for 2015 and 2016. It is noted that data for 2017 was not yet available at the time of writing. Figure 11.10 and Figure 11.11 present the fishing intensity grids, colour-coded by total time spent in the rectangle, for 2015 and 2016, respectively. It is noted that the ranges have been kept constant to allow accurate comparisons to be made between the two years.

The intensity grids correlate well with the AIS data which shows the highest density of fishing activity occurring further from the coast, and in close proximity to the Dover Strait TSS.

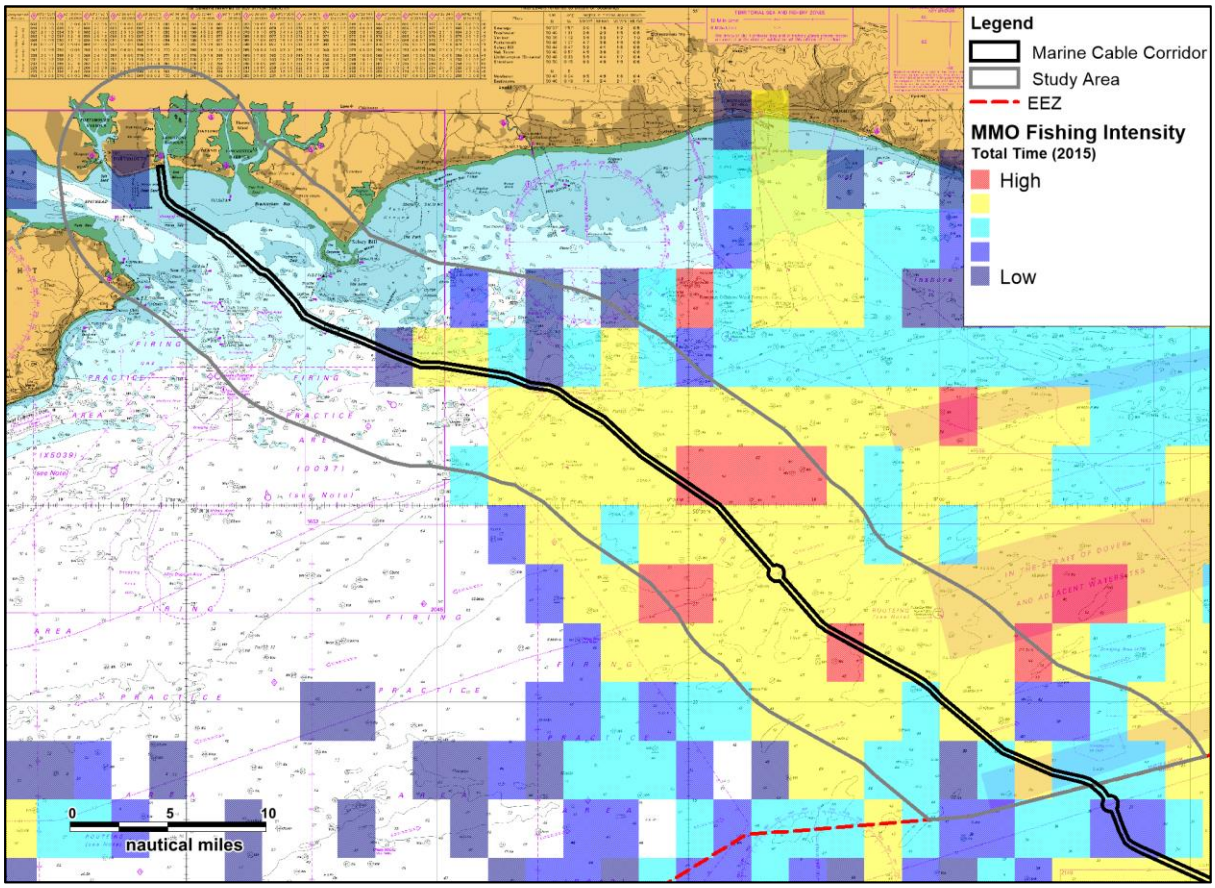

Figure 11.10 MMO Fishing Intensity Grid (2015)

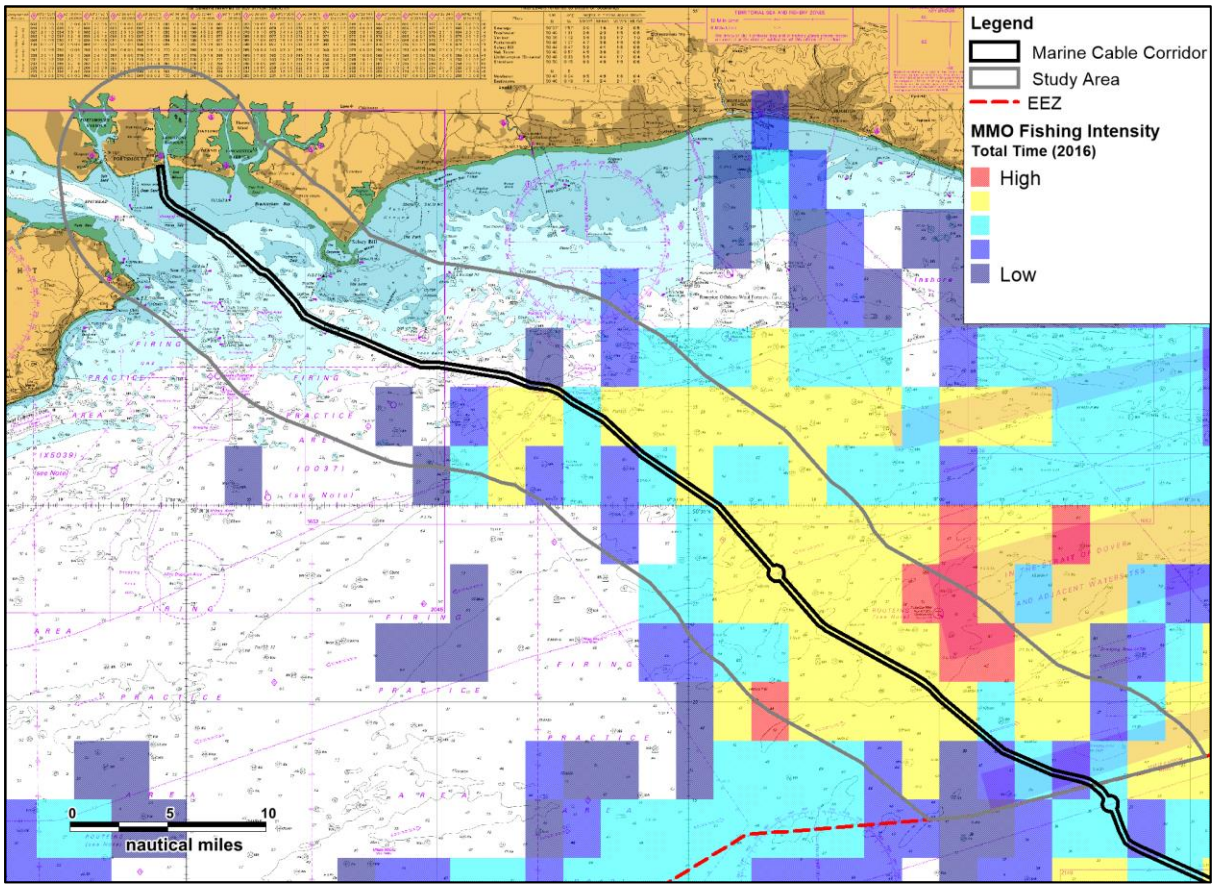

Figure 11.11 MMO Fishing Intensity Grid (2016)

It is noted that the more recent 2016 satellite data also included information relating to the gear types used within each rectangle; however, this was not available for earlier data (i.e. 2015 or earlier). Therefore, Figure 11.12 presents the intensity grid based on the demersal activity within each rectangle for 2016.

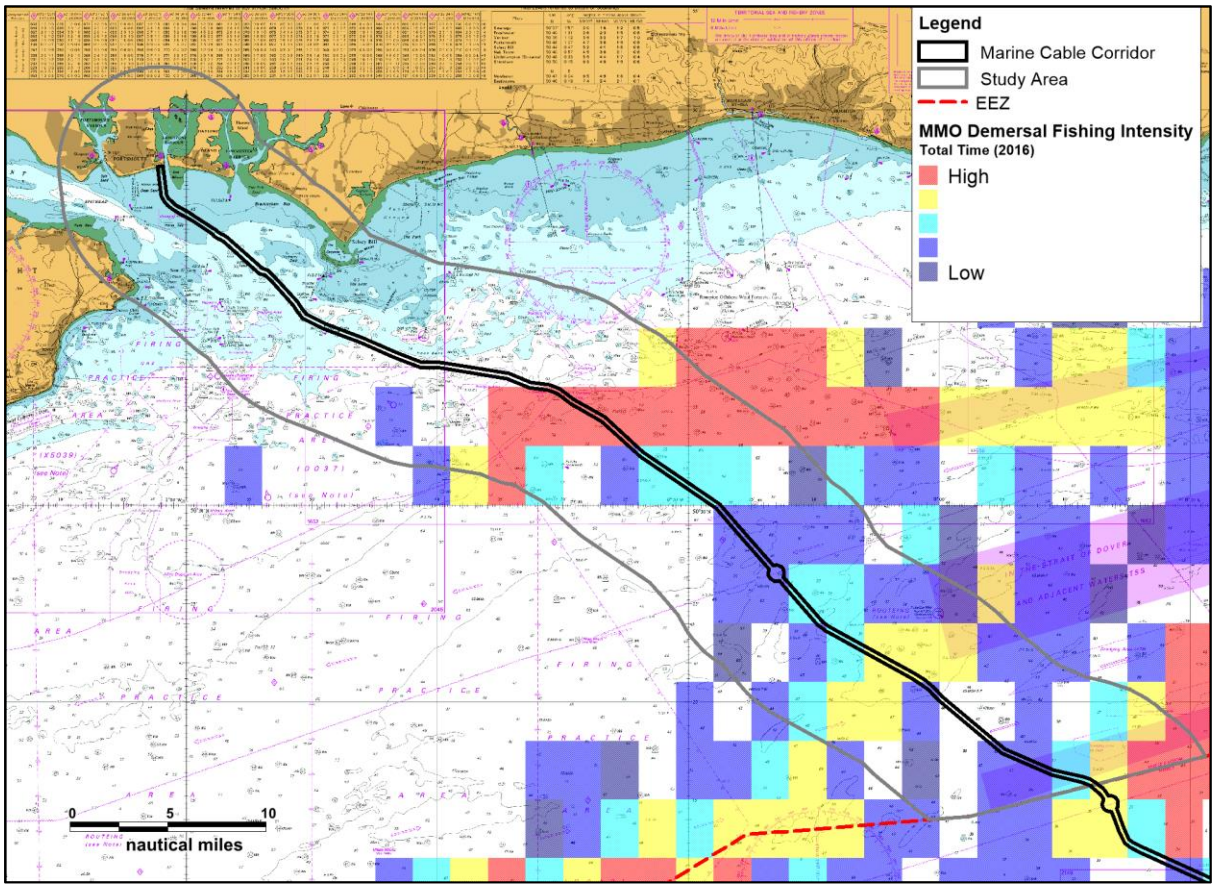

Figure 11.12 MMO Demersal Fishing Intensity Grid (2016)

It can be seen that the figure above correlates well overall with the AIS data (see Figure 11.9). The significant activity recorded just north of the Dover Strait TSS mirrors the location of the beam trawler activity recorded in the more recent AIS data.

12 Recreational Activity

This section reviews the baseline recreational vessel activity and facilities in the vicinity of the Proposed Development based on AIS, RYA data and other publicly available information.

12.1 AIS Analysis

The AIS tracks of recreational vessels recorded in the study area during the six month study period, colour-coded by vessel length, are presented in Figure 12.1. Following this, Figure 12.2 presents the density of recreational vessels based on the number of track intersects per cell of a 1 km × 1 km grid.

It is again noted that the carriage of AIS equipment is not compulsory for recreational vessels and thus they will be under-represented in the following analysis.

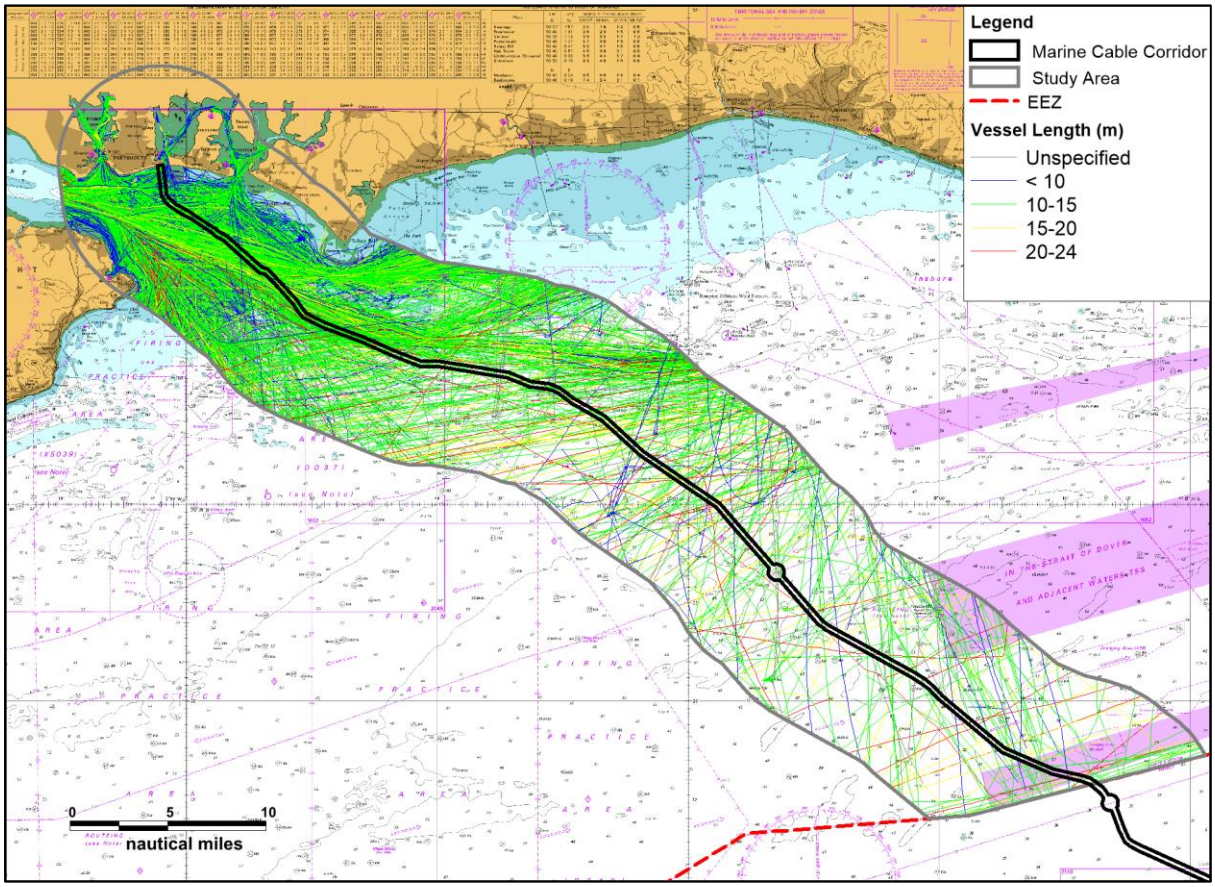

Figure 12.1 AIS Recreational Tracks by Vessel Length – Six Months (Summer & Winter)

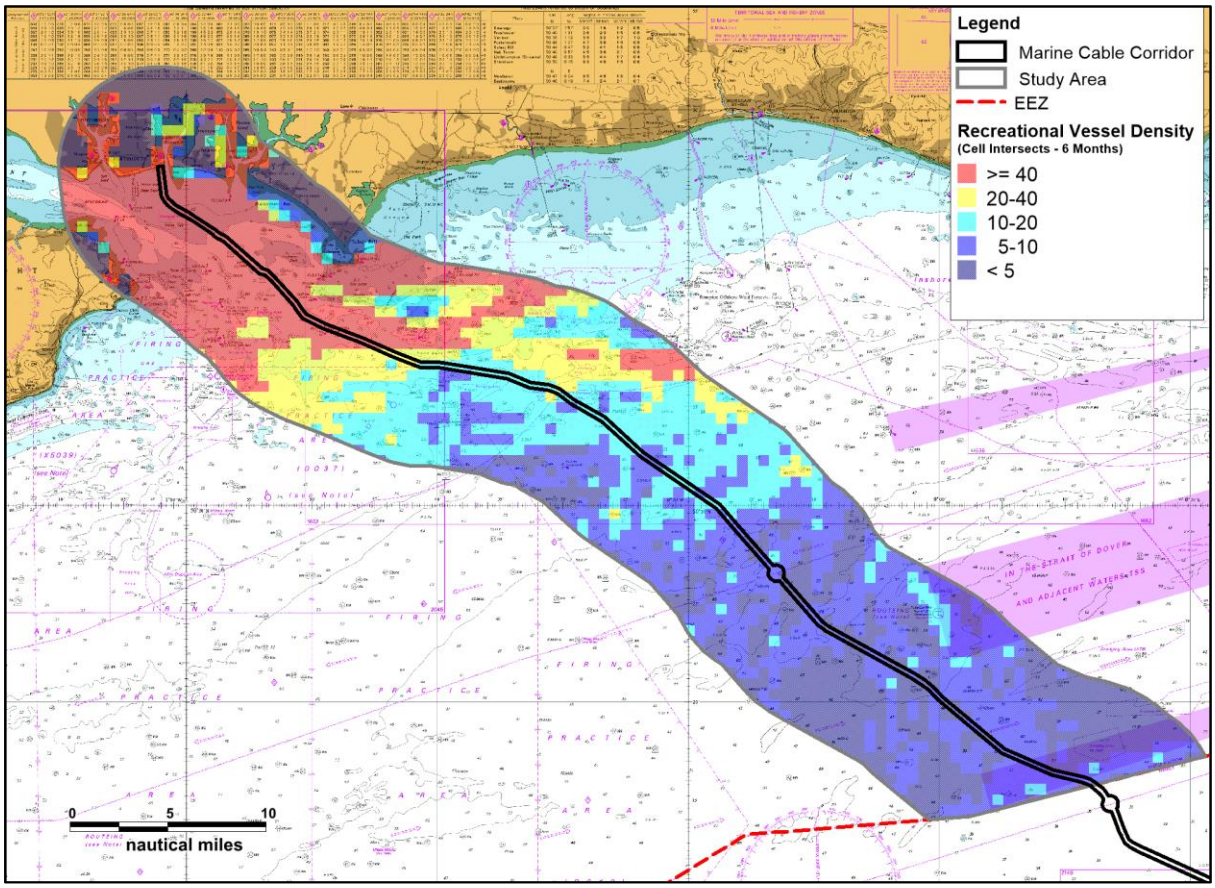

Figure 12.2 Recreational Vessel Density – Six Months (Summer & Winter)

It can be seen that the highest density of recreational traffic was in coastal waters (within approximately 14 nmi of the coast) with fewer crossings of the Marine Cable Corridor further offshore.

There was an average of 179 unique recreational vessels per day recorded in summer (May - July 2018) compared to 44 recorded in winter (December 2017 – February 2018). Figure 12.3 presents the average number of unique recreational vessels recorded in the study area per day for each month of the study period.

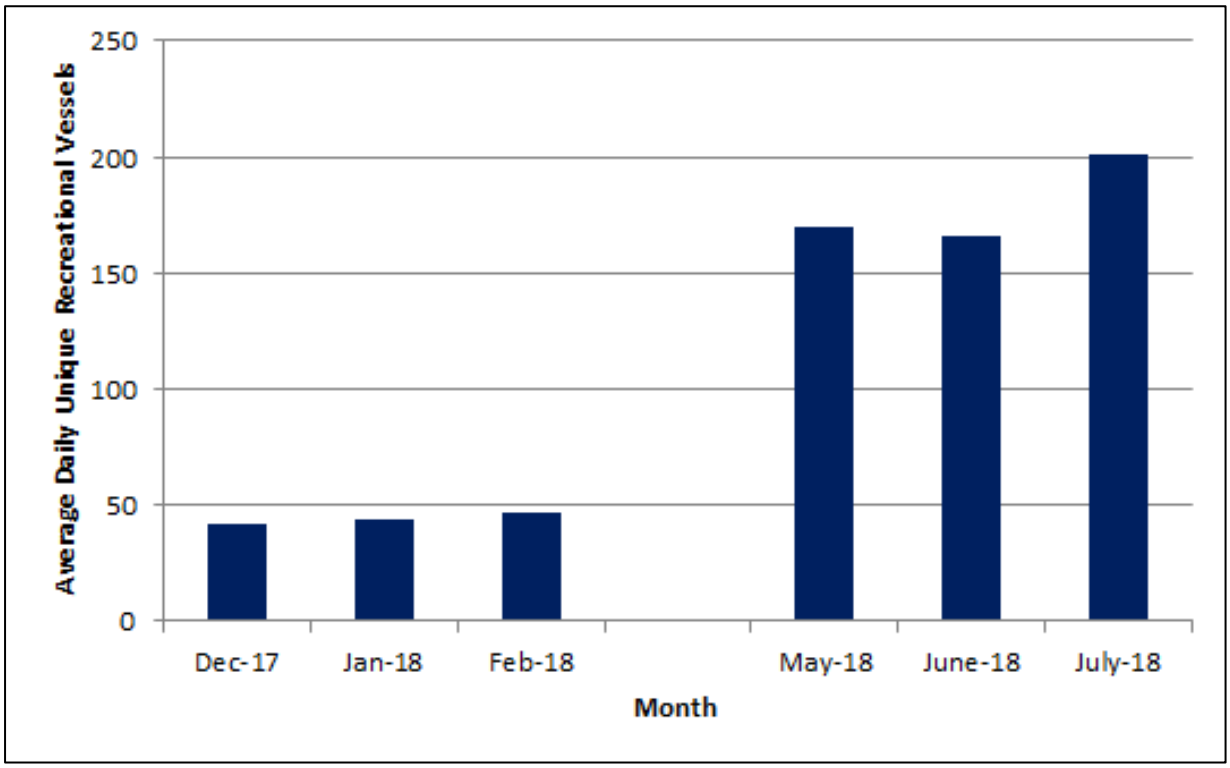

Figure 12.3 Average Daily Recreational Vessel Count per Month

With regard to vessel lengths, the average recreational vessel length recorded in the study area was 12 m. The majority of vessels recorded (77%) had lengths between 10 and 15 m.

It was noted in consultation that a large number of recreational vessels will use the shortcut through the submarine barrier which brings them close to the coast. This can be seen in the AIS data presented in Figure 12.4. The submarine barrier is located approximately 1 nmi west of the cable Landfall.

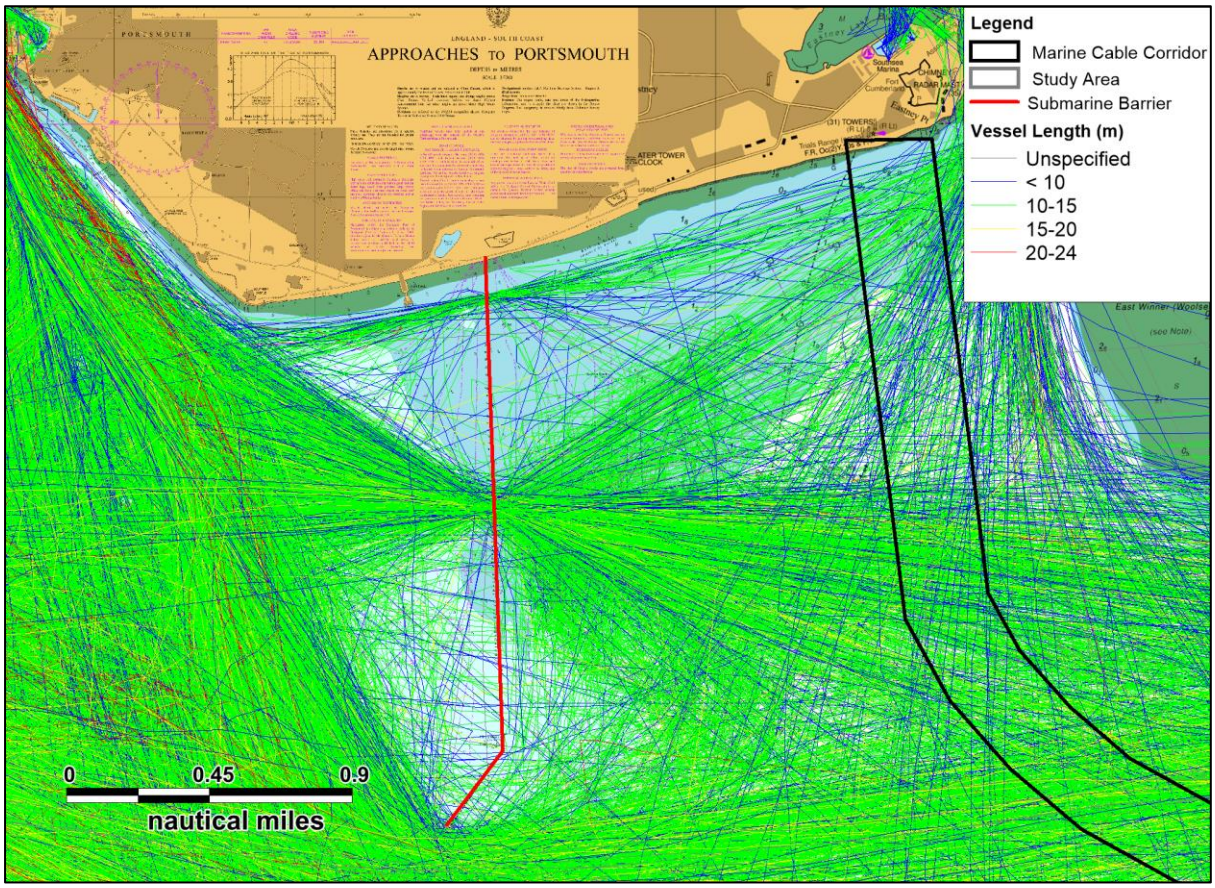

Figure 12.4 Recreational Tracks passing through Submarine Barrier

12.2 RYA Data

The RYA *Coastal Atlas of Recreational Boating* includes an indication of recreational boating activity around the UK based on data obtained in 2016 (RYA, 2016). The data set includes an intensity grid, general boating areas, offshore routes, as well as the locations of clubs, training centres and marinas.

Figure 12.5 presents the intensity grid for recreational activity within proximity of the Marine Cable Corridor.

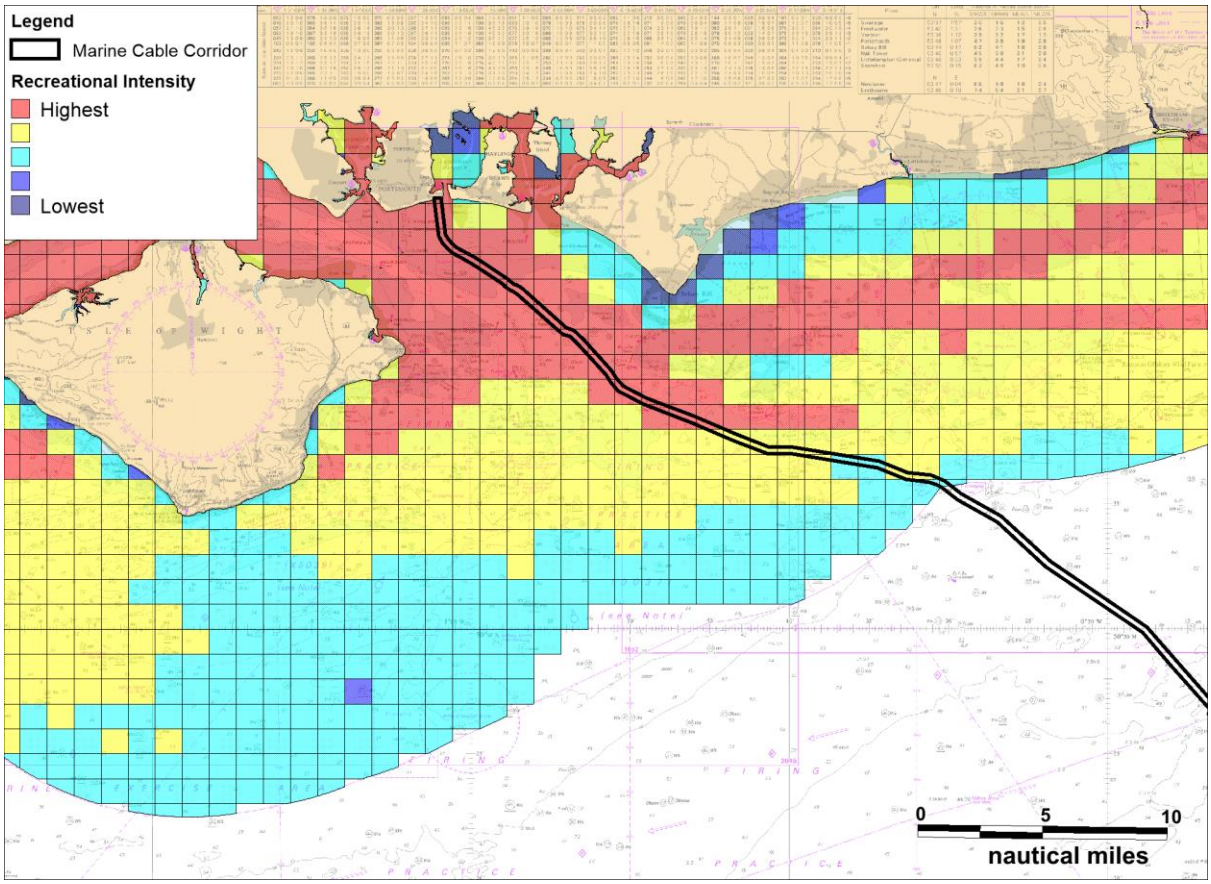

Figure 12.5 RYA Intensity Grid (RYA, 2016)

It can be seen that the Solent is a particularly high intensity area with lower intensity seen further from the coast. This agrees well with the more recent AIS data presented above (see Figure 12.1 and Figure 12.2) for the area.

Figure 12.6 presents a general overview of RYA facilities within proximity of the Marine Cable Corridor, as well as general boating areas.

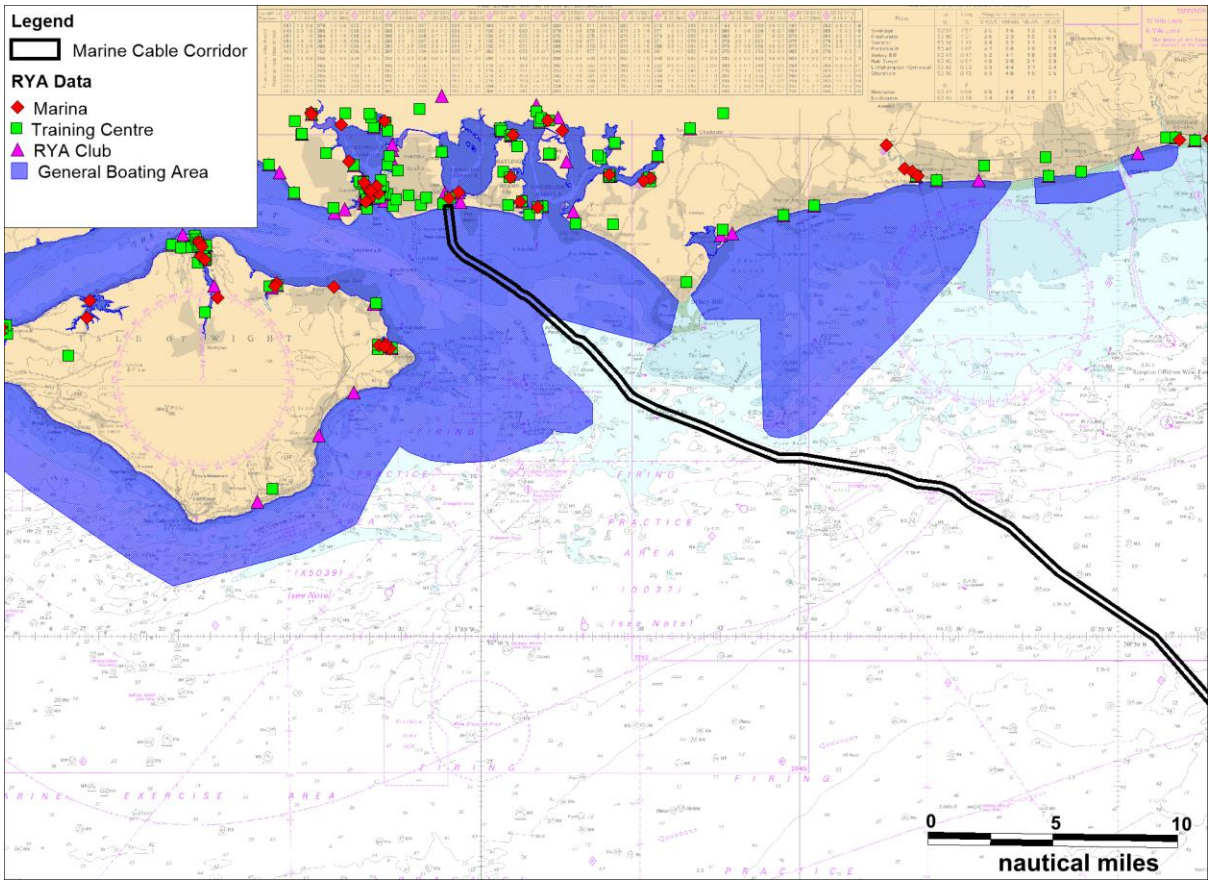

Figure 12.6 RYA Data (RYA, 2016)

It can be seen from Figure 12.6 that there are numerous recreational facilities within the study area. Section 12.3 details the local facilities within close proximity to the cable Landfall.

12.3 Local Facilities & Activities

There are numerous marinas located within Langstone and Chichester Harbour with the closest to the Landfall being Southsea Marina. Southsea Marina provides wet and dry berthing for up to 300 boats. In-water berthing is available for vessels up to 18 m in length and with a maximum draught of 2.5 m, whilst dry berthing accommodates vessels up to 10 m in length.

In addition, several recreational clubs including sailing and angling clubs are located within Langstone Harbour. These are detailed below in Table 12.1. Chapter 13 of the ES provides further details on recreational angling interests.

Table 12.1 Recreational Clubs in Langstone Harbour

Sailing & Cruising	Fishing	Water-skiing
Tudor Sailing Club	Langstone Harbour Fishermen's Association	Langstone Harbour Waterskiers Association
Locks Sailing Club	Havant Sea Angling Club	
Hayling Ferry Sailing Club	Storehouse Lake Angling Club	
Langstone Sailing Club	Southsea Sea Angling Club	
Eastney Cruising Association (ECA)		
Portsmouth & Langstone Sailing Association		
Langstone Cutters Rowing Club		

Swimming activities are undertaken off Eastney Beach to the west of the Landfall, as well as off Hayling Island to the east. This is usually undertaken during the summer months when the water is at its warmest.

Figure 12.7 presents the recreational facilities within close proximity to the Marine Cable Corridor Landfall.

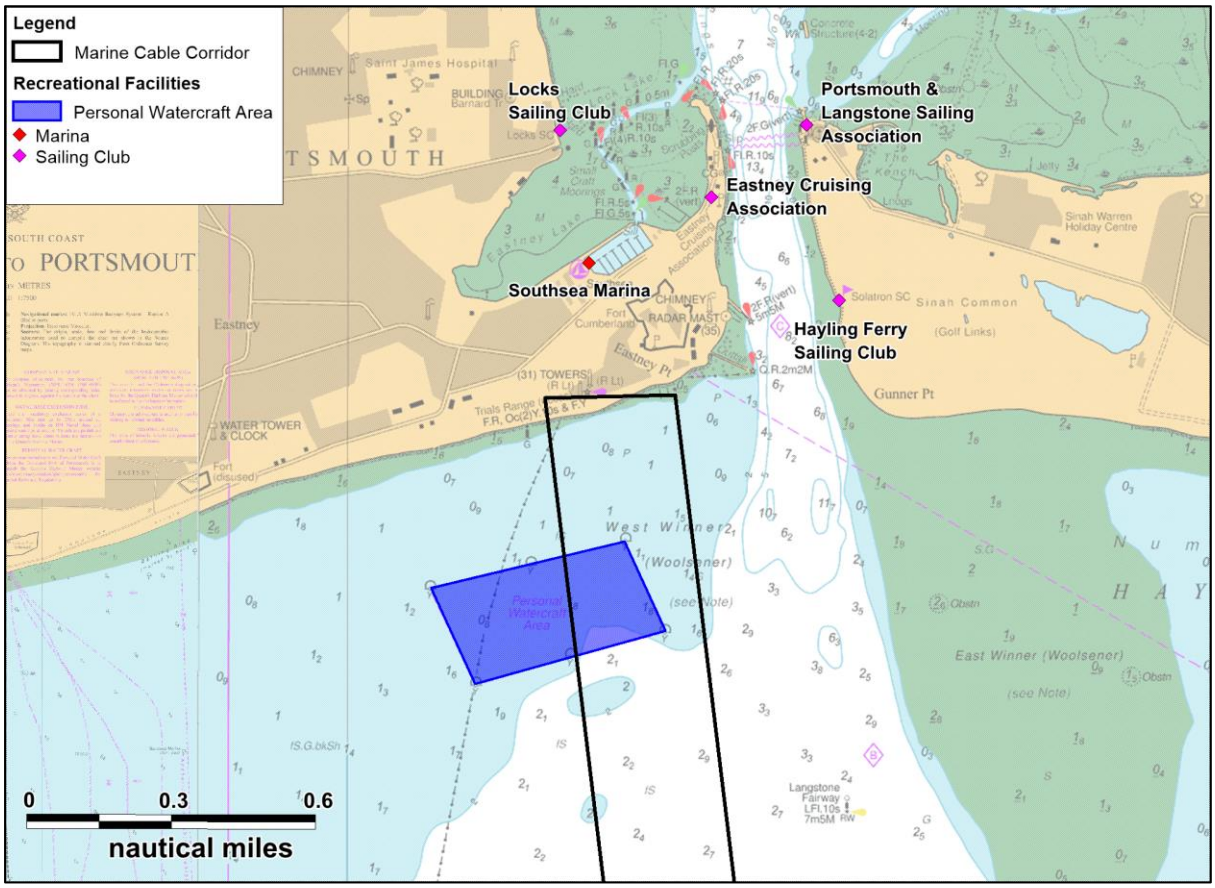

Figure 12.7 Recreational Facilities

A personal watercraft (PWC) area is established 600 m south of the beach at Eastney and 400 m west of the approaches to the Langstone Harbour entrance. It can be seen from Figure 12.7 that the Marine Cable Corridor intersects this area. Within this area, PWC will operate at high speeds and therefore other water users should take care when entering. Within this area, PWC are not restricted to the 10 knot speed limit which is applied within 0.5 nmi of the coast and within harbours.

The ECA accommodates over 500 vessels of all types including sailing and motor cruisers, fishing, catamarans, etc. The ECA hosts three main events including Round the Isle of Wight, the ECA Regatta Race and the Nab Tower Race, in addition to various other seasonal races.

The Hayling Ferry Club is located at the entrance to Langstone Harbour and has a mixed handicap fleet of catamarans and monohulls. The club hosts the Solent Fort Race which starts and ends at Langstone Harbour entrance, thus within close proximity to the cable Landfall.

Figure 12.8 below presents navigational and racing markers used by recreational vessels whilst competing in races in the Solent. This data was obtained via the Solent Cruising and Racing Association (SCRA) website.

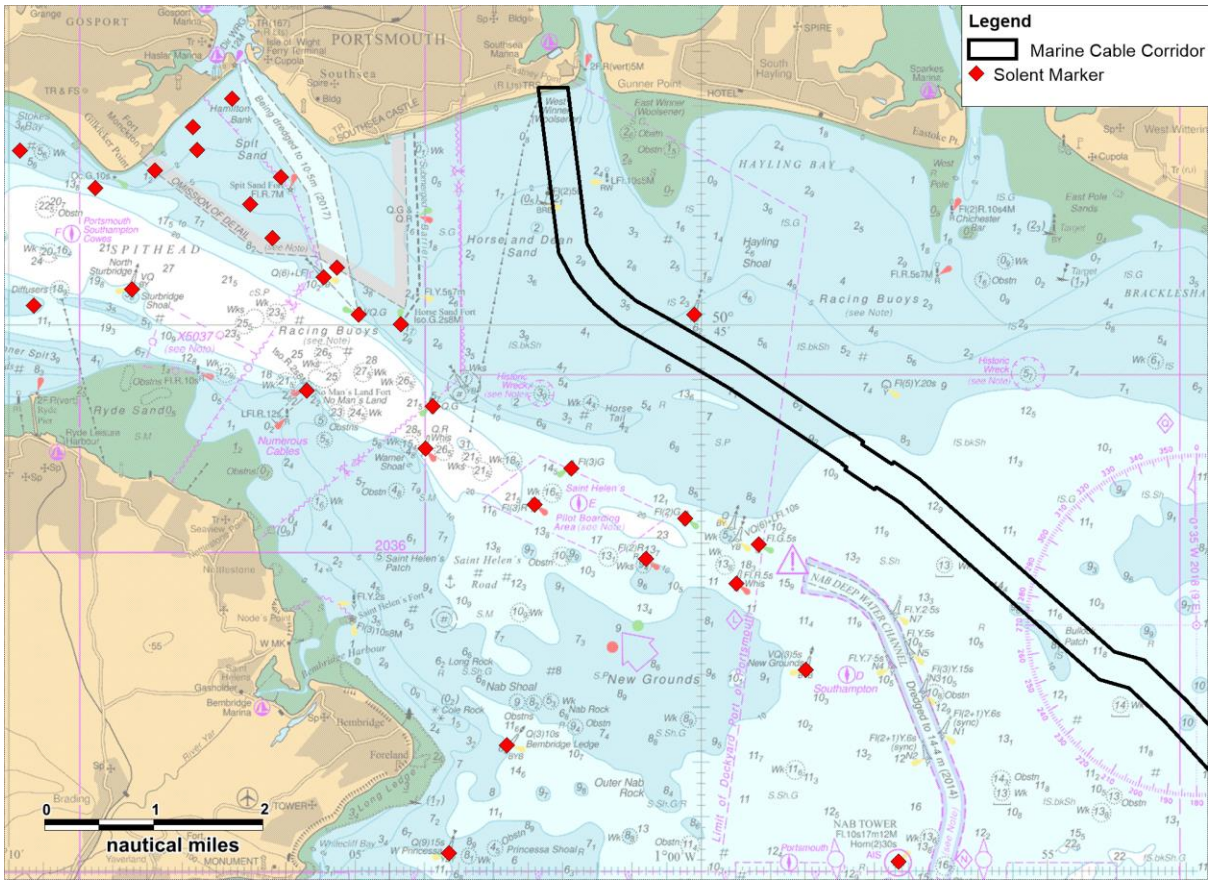

Figure 12.8 Solent Markers (SCRA, 2018)

It can be seen that the majority of markers are located to the west of the Marine Cable Corridor. The existence of the buoy located approximately 0.1 nmi north east of the Marine Cable Corridor suggests there could be recreational activity in the area which is verified by the AIS data seen above in Section 12.1. Two of the largest race events that take place within the Solent include Cowes Week and the Round the Island Race.

Cowes Week is one of the UK's longest running and most successful sporting events held in early August every year. There are between 800 and 1,000 boats that race every day for eight days within the Solent. The dates for the upcoming events are presented below in Table 12.2.

Table 12.2 Cowes Week Future Dates

Year	Dates
2019	10th – 17th August
2020	8th – 15th August
2021	31st July – 7th August

The annual Round the Island Race is a one-day yacht race around the Isle of Wight. The race regularly attracts over 1,400 boats making it one of the largest yacht races in the world. It is

noted that the Marine Cable Corridor is in close proximity to the race course (i.e. within 4 nmi). The dates of future races are presented below in Table 12.3.

Table 12.3 Round the Island Race Future Dates

Year	Date
2019	Saturday 29th June
2020	Saturday 30th May
2021	Saturday 3rd July
2022	Saturday 25th June

In addition to racing marks, there are several boat fishing marks for the sea angling industry located within the Solent (see Figure 12.9 for approximate locations). These marks are used to inform angler fishermen about good locations of different species. Sea angling is popular within the Solent, with charted boats available from Langstone Harbour, Portsmouth, Gosport, etc. Some local clubs in the area include Gosport and District Angling Club, Wessex Specimen Group, Elmore Angling Club, etc. Further consideration of these interests is provided within Chapter 13 Shipping, Navigation and Other Marine Users.

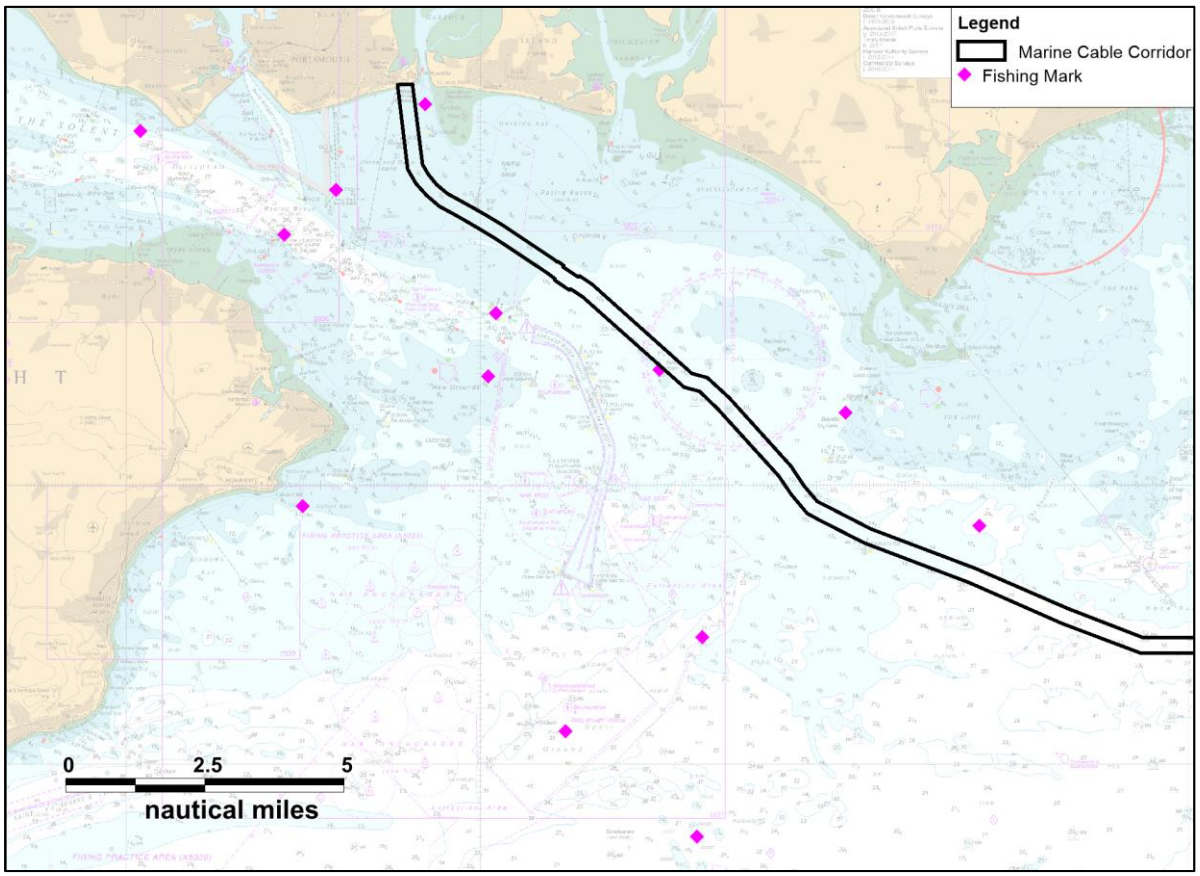

Figure 12.9 Fishing Marks (Approximate)

13 Future Baseline

Baseline data have been obtained from the collation of existing information. The existing baseline is informed by data that are 'current' and a future baseline is informed by an extrapolation of the currently available data by reference to policy and plans, other proposal applications and expert judgement.

A brief review of vessel traffic calling at major ports relevant to the area was carried out to determine the trends in shipping in the past years. Typical destinations broadcast by commercial vessels utilizing the TSS include Le Havre, Rotterdam, Southampton, Portsmouth, Antwerp, etc. Although declining trends were identified in the total traffic visiting some of the UK ports, others European ports such as Rotterdam and Antwerp showed fairly consistent growth despite declines in certain commodities e.g. dry bulk. Despite any declines, forecasts for 2030 predict growth in international trade (Oxera, 2015).

In previous studies, a predicted increase of 10% has conservatively been assumed for the future change in shipping. It is noted that the growth in UK shipping in particular is uncertain due to the many unknowns surrounding the decision to leave the EU and therefore, this may affect the traffic transiting through the TSS and other commercial shipping activity.

Fishing activity was significant with the baseline assessment, however trends are difficult to predict and can depend on various influencing factors such as fish stocks, quotas, etc. Fishing activity could change significantly if new legislation is introduced post-Brexit.

In addition, further information to the existing environmental conditions may evolve where there is linkage to and/or reliance upon other projects/plans being implemented prior to the construction of the Proposed Development under assessment. Appendix 13.2 identifies such projects/plans and considers them through a CEA and in doing so, their ability to modify the existing baseline is also considered. A good example of this is the ABP Southampton Master Plan 2016 – 2035 (ABP, 2016), which has been considered with regards to whether it may affect the future baseline but was determined that any possible changes are not expected to be significant.

14 Impact Assessment

14.1 Introduction

This section identifies aspects of the Proposed Development which have the potential to affect shipping and navigation, and the methodology used to assess them.

14.2 Impacts Overview

The impacts identified based on the shipping and navigation baseline assessment and stakeholder consultation are summarised and listed below in Table 14.1. The impacts are grouped by stage, i.e. construction, operation (including repair and maintenance) and decommissioning stages.

Table 14.1 Assessed Impacts

Stage	Impact
Construction / Decommissioning	Increased collision risk to third party vessels with any vessel associated with the cable installation works that is restricted in manoeuvrability (including seabed preparation, cable installation activities (including trials of cable installation equipment), HDD works, cable protection, etc.).
	Cable installation activities cause disruption to passing vessel routeing/timetables, as well as increased collision risk between third parties due to route deviations.
	Cable installation activities cause disruption to port arrivals/departures.
	Cable installation activities cause disruption to fishing activity.
	Cable installation activities cause disruption to marine aggregate dredging activities.
	Cable installation activities cause disruption to military exercises including local operations out of Portsmouth.
	Cable installation activities cause disruption to recreational activities.
	A vessel drags anchor onto exposed cable.
	A vessel drops anchor in an emergency onto exposed cable.
	A vessel founders (sinks) onto exposed cable.
	A vessel drops an object e.g. container, onto exposed cable.
	A vessel engaged in fishing snags its gear on exposed cable.
Operation and	A vessel drags anchor over the cable.

Stage	Impact
Maintenance	A vessel drops anchor in an emergency over the cable.
	A vessel founders (sinks) onto the cable.
	A vessel drops an object e.g. container, onto the cable.
	A vessel grounds due to reduced under keel clearance.
	A vessel engaged in fishing snags its gear on the cable or associated cable protection.
	Collision of a passing vessel with a vessel associated with maintenance works/monitoring of the cable.
	Cable maintenance works cause disruption to passing vessel routeing/timetables, as well as increased collision risk between third parties due to route deviations.
	Cable maintenance works cause disruption to port arrivals/departures.
	Cable maintenance works cause disruption to fishing activity.
	Cable maintenance works cause disruption to marine aggregate dredging activities.
	Cable maintenance works cause disruption to military exercises including local operations out of Portsmouth.
	Cable maintenance works cause disruption to recreational activities.
	Interference with magnetic compass onboard passing vessels.

Decommissioning is assumed to have similar (or lesser) impacts than construction. The decommissioning of the cables may be subject to a separate assessment as part of a stand-alone marine licence application nearer the time, and therefore has not been assessed in detail. In the event that cables need to be repaired or maintained, the activities required to undertake the works will be undertaken in line with Section 3.2.9 of Chapter 3 Description of the Proposed Development and are considered similar to the effects (although much reduced in scale and shorter in duration) that may arise during construction.

14.3 Assessment Methodology

The impact assessment process has been evaluated using the IMO FSA methodology (IMO, 2002). The FSA assigns each impact a “severity of consequence” and “frequency of occurrence” to evaluate the significance during the construction, operation and maintenance and decommissioning phases of the Proposed Development. The definitions used in the FSA to evaluate the consequence and frequency of impacts are presented in Table 14.2 and Table 14.3, respectively.

Table 14.2 Severity of Consequence

Severity	Definition
Catastrophic	▪ Total loss of a vessel or crew; and ▪ Extensive environmental damage.
Serious	▪ Loss of a crew member, or multiple serious injuries; ▪ Major damage to infrastructure or vessel; ▪ Major environmental damage; and ▪ Major national business, operation or reputation impacts.
Moderate	▪ Serious injury to person; ▪ Notable damage to infrastructure or vessel; ▪ Significant environmental damage; and ▪ Considerable business, operation, or reputation impact.
Minor	▪ Slight injury(s) to person; ▪ Minor damage to infrastructure or vessel; ▪ Minor environmental damage; and ▪ Minor business, operation, or reputation impact.
Negligible	▪ No injury to persons; ▪ No significant damage to infrastructure or vessel; ▪ No environmental damage; and ▪ No significant operational impacts.

Table 14.3 Frequency of Occurrence

Frequency	Definition
Frequent	Will occur on a regular basis during the project.
Reasonably Probable	Extremely likely to happen during the project span.
Remote	Likely to happen during the project span.
Extremely Unlikely	Unlikely to happen but not exceptional.
Negligible	Only likely to happen in exceptional circumstances.

The severity of consequence and frequency of occurrence rankings are then used to determine the level of significance for each impact during each of the three phases of the Proposed Development. The overall significance of impacts has been assessed as “Unacceptable”, “Tolerable” or “Broadly Acceptable” with the definitions of these given in Table 14.5. The risk matrix used to assign significance is presented below.

Table 14.4 Risk Matrix

Frequency						
	Frequent	Tolerable	Tolerable	Unacceptable	Unacceptable	Unacceptable
	Reasonably Probable	Broadly Acceptable	Tolerable	Tolerable	Unacceptable	Unacceptable
	Remote	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable	Unacceptable
	Extremely Unlikely	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable
	Negligible	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable
		Negligible	Minor	Moderate	Serious	Catastrophic
		Severity				

Table 14.5 Significance Definitions

Significance	Definition
Unacceptable (High Risk)	Generally regarded as unacceptable whatever the level of benefit associated with the activity. The term '**unacceptable**' is considered to be '**significant**' and would require risk mitigation or design modification to reduce to tolerable ('ALARP').
Tolerable (Moderate Risk)	The term '**tolerable**' is considered to be '**not significant'**, however there is an expectation that such risks are properly assessed, appropriate control measures are in place, residual risks are ALARP and that risks are periodically reviewed to monitor if further controls are appropriate
Broadly Acceptable (Low Risk)	The term '**broadly acceptable'** is considered to be '**not significant'** and impacts are regarded as acceptable and adequately controlled.

14.4 Embedded Mitigation Measures

14.4.1 Construction / Decommissioning Stage

This section details the embedded mitigation measures that are assumed to be in place prior to the construction and decommissioning stages, as part of the FSA process.

- Circulation of information via Notices to Mariners, Radio Navigational Warnings, Navigational Telex (NAVTEX), and/or broadcast warnings in advance of and during the marine works. Information will also be circulated to local marinas in the area and notices will include a description of the work being carried out.
- CLV will display appropriate marks and lights, and broadcast their status on AIS at all times, to indicate the nature of the work in progress, and highlight their restricted manoeuvrability.

- Temporary aids to navigation (AtoN) (e.g. marker buoys) will be deployed (if required and under agreement with TH) to guide vessels around any areas of installation, repair/maintenance or decommissioning activity.
- Guard vessel(s) will be employed to work alongside the installation vessel(s) during any work carried out. The guard vessel(s) will alert third party vessels to the presence of the installation or decommissioning activity and provide assistance in the event of an emergency.
- Compliance with COLREGS (IMO, 1972) and the International regulations for the SOLAS (IMO, 1974).
- Minimum safe passing distances of 500 m around dynamically positioning (DP) vessels and up to 700 m around barges that require anchor spreads will be requested during the construction stage and monitored by the guard vessel(s).
- Where cable exposures exist that would result in significant risk to receptors, guard vessels will be used until the risk has been mitigated, e.g. by burial and/or other protection methods.
- Liaison with local ports and harbours, in particular close liaison will be required with the Langstone Harbour Authority to ensure procedures are put in place to manage access to the port when works are being undertaken in areas adjacent to the harbour entrance.
- Agreement of Cable Burial and Installation Plan (through the dML) including;
    - detailed methodology for installation within the Dover Straits TSS in consultation with Dover CNIS and the Dover Straits TSS Working Group forum.
    - any procedures required to manage access to the Langstone Harbour when works are being undertaken in areas adjacent to the harbour entrance.
- A Fisheries Liaison Officer (FLO) will be in place.

14.4.2 Operation (Including Repair and Maintenance) Stage

The embedded mitigation measures assumed to be in place during the operation (including repair and maintenance) stage are detailed below:

- The Proposed Development will be clearly marked on nautical charts in line with UKHO standards, with associated note/warning.
- Details of the Marine Cable locations and associated infrastructure e.g. cable protection will be included in fishermen's awareness charts issued by Kingfisher.
- Marine Cables will be suitably protected, e.g., buried where feasible, to help protect against snagging from fishing gear and risk from vessel anchors. Burial depths are informed by a CBRA, with target burial depths between 1.0 m and 3.0 m). Non-burial protection will be used where target burial depths are not achieved, if considered necessary.
- Circulation of information via NtM, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings in advance of and during maintenance works. Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out.

- Maintenance vessels compliance with COLREGS (IMO, 1972) and the International regulations for the SOLAS (IMO, 1974).
- Liaison with local ports and harbours during maintenance works.
- Any cable protection measures used (e.g. rock placement) will not reduce the existing water depths by greater than 5%.
- Compass deviation effects will be minimised through cable design and separation distance.

14.5 Identified Impacts

This section outlines the impacts (summarised in Table 14.1) that have been considered as part of the FSA process.

14.5.1 Construction/Decommissioning Impacts

Increased Collision Risk (Passing Vessel with Construction Vessel)

There is an increased collision risk created during the construction phase for all passing traffic due to the presence of vessels associated with the construction phase of the marine cabling. The nature of cable installation, and other construction activities, requires large, slow moving vessels, such as CLVs, cable lay barges (CLBs), trench support vessels, anchor handler vessel, which will be restricted in their ability to manoeuvre. Therefore, these vessels may have limited capability in taking avoidance action from a passing vessel on a collision course, should such a situation arise. Due to their size and mobility in comparison, smaller vessels associated with the construction phase, e.g. guard vessels and tugs, are considered to pose a lesser risk of collision than that of the cable installation vessels. There could be up to eight main cable lay/trench support vessels and up to 24 support vessels involved in cable installation works, however it is anticipated that not all vessels will be operating in the same area at the same time.

In addition, the vessels associated with the works for the HDD exit/entry point at Landfall will also increase collision risk. The works will take place within 1.6 km of the coast (exit/entry point between KP 1.0 and 1.6). Vessels predicted to be involved in these works include up to seven support vessels and one jack up vessel or barge.

The collision risk is likely to be greater in higher density shipping areas. From the baseline assessment, the highest risk areas are the shipping lanes associated with the Dover Strait TSS which are assessed in more detail in the following section (Section 15). In addition, the Landfall section of the Marine Cable Corridor which intersects the approaches to Portsmouth and Southampton ports is also higher risk due to vessels entering/exiting these ports. Recreational and fishing vessels are also particularly abundant within these areas.

Consequences of a vessel to vessel collision could range from minor damage to vessel infrastructure, to men overboard, vessel foundering and risk of injury or fatality in the worst case.

It is expected that the majority of vessels in the area will be aware of the construction work before encountering the project vessels through embedded mitigation measures (circulation of information such as Radio Navigation Warnings and NAVTEX). This will assist vessels in reviewing their passage prior to disembarking, and revising their passage plans if necessary. During a voyage, any passing vessels in the vicinity will become aware of the installation work via marking and lighting and AIS broadcasts from construction vessel(s), assuming the passing vessel has an AIS unit fitted. The installation and guard vessels will maintain visual, radar and AIS watches; if a passing vessel is projected to be on a collision course, or their projected closest point of approach (CPA) is within the recommended safe passing distance, the guard vessels will have procedures in place to contact the vessel and request a safe clearance.

All vessels are also expected to comply with COLREGS and SOLAS. In addition, the Cable Burial and Installation Plan will include a specific methodology for cable installation in the TSS and procedures for Langstone Harbour.

The frequency of this impact is considered to be Remote and the severity Serious, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Disruption to Vessel Routeing/Timetables

Installation of the Marine Cables and associated vessels may cause disruption to vessel routeing/timetables. This will significantly affect busy areas of shipping such as the Dover Strait TSS. Vessels on approach to the ports of Portsmouth or Southampton may also be re-routed due to the presence of installation vessels. The risk of a collision between two third-party vessels may also be increased as a result of route deviation.

Through circulation of information, the vast majority of vessels should be aware of the cable work in advance, allowing routes to be planned with minimal impact on schedules. Temporary aids to navigation (if deemed necessary) will aid in routeing vessels around installation activity. Liaison with local ports and harbours, in particular Portsmouth and Southampton, will help minimise impacts associated with these areas where sea room is limited. In addition, the Cable Burial and Installation Plan will include a specific methodology for cable installation in the TSS and procedures for Langstone Harbour.

The frequency of this impact is considered to be Reasonably Probable, and the severity Minor, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Disruption to Port Arrivals/Departures

There may be a disruption to port arrivals and/or departures due to the presence of installation vessels associated with the Proposed Development. Additionally, the jack up vessel associated with the HDD works at the cable Landfall will cause disruption to vessels entering/exiting Langstone Harbour in particular, due to minimum safe passing distances (currently proposed to be 500/700 m).

Embedded mitigation measures such as circulation of information and liaison with local port and harbour masters e.g. Portsmouth, Southampton, Langstone, etc., will ensure the majority of vessels and all local ports will be aware of the construction works. In particular, close liaison has been undertaken and will continue with the Langstone Harbour Authority to ensure procedures are put in place to manage access to the port when works are being undertaken in areas adjacent to the harbour entrance.

The frequency of this impact is considered to be Reasonably Probable and the severity Minor, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Disruption to Fishing Activities

From the baseline analysis, fishing vessels were observed along the Marine Cable Corridor with similar levels recorded during both seasonal periods. Vessels engaged in fishing operations were recorded further offshore whilst those closer to shore appeared to be in transit. From review of AIS, satellite data and scoping responses, the Dover Strait TSS lanes and separation zones are particularly busy with demersal activity. However, it is noted that small fishing vessel activity (< 15 m) will be under-represented in coastal waters due to the AIS carriage requirements under EU Directive 2002/59/EC, amended by Directives 2009/17/EC and 2011/15/EU. Any small vessels engaged in fishing operations in shallow coastal waters near the cable Landfall may also be displaced due to the HDD works.

It is expected that embedded mitigation measures such as circulation of information (including Kingfisher) as well as the presence of guard vessels will notify sea users of any construction works. In addition, the appointment of a FLO will aid in ensuring local fishermen are made aware of the installation of the cabling and associated infrastructure e.g. cable protection.

The frequency of this impact is considered to be Reasonably Probable and the severity Minor, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Disruption to Aggregate Dredging Activities

From the baseline analysis, there are a number of aggregate dredging areas within proximity to the Marine Cable Corridor although there are none that intersect. It is noted that the *Arco Dee* was recorded intersecting the Marine Cable Corridor; however, it was concluded following consultation with local stakeholders that this vessel was awaiting entrance to Langstone as opposed to actively dredging.

Dredging activity associated with navigational channels on entrance to ports such as Langstone Harbour may also be disrupted due to the necessity of HDD works at the cable Landfall. In addition, any dredgers awaiting entrance to Langstone Harbour, as seen in the baseline assessment, may be displaced during cable installation and HDD works. AS previously mentioned, close liaison has been undertaken and will continue with the

Langstone Harbour Authority to ensure procedures are put in place to manage access to the port when works are being undertaken in areas adjacent to the harbour entrance.

It is also noted there is a disposal site located approximately 4.3 nmi south of the Marine Cable Corridor where vessels may dispose of dredged material. Due to the distance of this site from the installation works, there is not anticipated to be any significant impact on this activity from construction vessels.

Therefore, the possibility of disruption to aggregate dredging activities will be minimal. Embedded mitigation measures such as circulation of information will notify dredgers of any construction works within proximity.

The frequency of this impact is considered to be Extremely Unlikely and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation.

Disruption to Military Exercises

Two designated military exercise and firing practice areas intersect the Marine Cable Corridor. These areas are operated under a clear range procedure, that is, no firing will take place unless the area is considered to be clear of all shipping. Therefore, no firing is expected to be undertaken while there is construction work ongoing within the area.

As the port of Portsmouth is a significant military base there may also be local military operations in the vicinity of the cable Landfall. However, consultation revealed there is little exercise activity carried out in proximity to the Marine Cable Corridor due to the large number of vessels and other activities (i.e. fishing and recreational) within the area.

Assuming embedded mitigation measures (e.g. circulation of information) are in place preceding any installation works, it is likely the installation work timetable will be taken into consideration by the MoD if any exercises were scheduled to take place within the area. Liaison with QHM Portsmouth will also aid in ensuring the MoD are fully aware of the installation timetable.

The frequency of this impact is considered to be Remote and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation.

Disruption to Recreational Activities

From the baseline assessment, there was significant recreational activity identified within the study area, particularly in the summer period. Recreational vessels were recorded along the entire length of the Marine Cable Corridor but were particularly abundant within coastal waters.

In addition to the jet skis and recreational bathers found in this area, there are charter angling boats operating within the coastal areas due to the abundance of boats available at nearby ports, in addition to the local angling clubs. It is noted that recreational activity is largely under-represented in the AIS data due to AIS carriage requirements. In addition, the

Marine Cable Corridor intersects a PWC area located 400 m west of the approach to Langstone Harbour. Further information on the potential disruption to recreational angling is provided within Chapter 13 Shipping, Navigation and Other Marine Users.

Therefore, the installation of marine cabling will disrupt recreational activity, particularly within inshore waters, and require temporary closures of the PWC area. The HDD drilling exit/entry point is anticipated to be between KP1.0 and KP1.6; therefore the vessels associated with this operation will disrupt recreational activities particularly close to shore.. Significant recreational race events such as Cowes Week and the Round the Island Race as well as many other regattas also take place within the vicinity of the Marine Cable Corridor and thus may also be disrupted should construction works overlap spatially and temporally.

Mitigation measures such as circulation of information (e.g. NtMs) and liaison with local harbours and marinas, as well as the presence of guard vessels will notify sea users of construction works. However, it is noted that recreational vessels may be less aware of the construction works than larger, commercial vessels and thus relevant local marinas should also be notified of all construction works. In addition, planning construction works to avoid significant sailing races (e.g. Cowes Week, Round the Island Race) would also aid in reducing disruption to recreational activity where possible.

The frequency of this impact is considered to be Reasonably Probable and the severity Minor, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation

Anchor Dragging onto Exposed Cable

There is a risk that an anchored vessel will lose its holding ground and subsequently drag anchor over the cable. Significant anchoring activity was recorded at the Saint Helen's Road anchorage charted approximately 3.5 nmi south of the Marine Cable Corridor, however vessels were also recorded at anchor between 2 and 3 nmi from the corridor. The majority of vessels recorded were tankers with less than 15,000 DWT. Two dredgers (2,628 DWT and 9,153 DWT respectively) were recorded at anchor within the Marine Cable Corridor whilst a further two were also recorded within close proximity (between 50 m and 200 m). During consultation with Langstone Harbour it was estimated that approximately 500-600 dredgers per annum anchor in the vicinity of the Marine Cable Corridor whilst waiting for the tide to enter port. In addition, it was noted that anchoring from recreational craft is likely to occur near the Langstone Harbour entrance. It is noted that these vessels at anchor within or close to the Marine Cable Corridor will be temporarily displaced during construction works including HDD Landfall works.

During construction, if the chosen burial technique is pre-lay trenching or free-lay burial, there may be a period of time after laying when the Marine Cables are exposed and not protected through burial or other means such as rock placement. This period, anticipated not to exceed 1-2 months, represents a potentially higher risk of interaction from vessel anchors with the exposed cable.

While exposed, any vessel anchor could interact with the cables. If an anchor becomes snagged on the cables, there could be a risk of injury in trying to free it. If the anchor cannot be freed the safest action is to slip it, and not attempt to raise or cut the cable. Smaller vessels may be at risk of losing stability and capsizing in the worst case.

Mitigation includes circulation of information to make mariners aware of the exposed cable and use of guard vessels where cable exposures are considered to present significant risk to navigation.

The frequency of this impact is considered to be Remote due to the potential for the cables to be exposed, but taking into account all embedded mitigation measures. Consultation with relevant dredging companies indicated that the dredgers recorded at anchor whilst waiting to enter Langstone Harbour will avoid anchoring directly over the cables after they have been installed, however they may still anchor in close proximity. The severity is considered to be Serious, taking into account mitigation. This results in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Emergency Anchoring onto Exposed Cable

If a passing vessel suffers engine failure, there is a possibility that it may drop anchor to avoid drifting into an emergency situation such as a collision or grounding. This is more likely to occur in the shallower, coastal waters where there is a higher risk of grounding, or in the vicinity of the TSS where vessels may choose to drift out of the busy shipping lanes before dropping anchor. In open waters where depths are deeper and anchoring may not be feasible, the vessel is more likely to attempt to either fix the problem or await assistance

From the baseline analysis, the intersection of the cable with the TSS shipping lanes and separation area poses a high risk area for emergency anchoring in addition to the shallow coastal waters where traffic levels are high (particularly in summer). The separation areas of the TSS can often be utilised by vessels in distress and thus there is a higher risk of emergency anchoring. Review of maritime incident data within the study area revealed machinery failure was a frequent incident type, particularly within coastal waters.

During the period where the cables may be exposed (estimated not to exceed 1-2 months), any anchor could interact with the cable. If the anchor fouls the cable, there could be a risk of trying to free it. Smaller vessels may be at risk of losing stability and capsizing in the worst case. If the anchor cannot be freed it should be slipped, and no attempt made to raise or cut the cable.

Mitigation includes circulation of information to make mariners aware of the exposed cable and use of guard vessels where cable exposures are considered to present significant risk to navigation.

The frequency of this impact is considered to be Remote due to the potential for the cable to be exposed, but taking into account all embedded mitigation measures. The severity is considered to be Serious, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Vessel Foundering onto Exposed Cable

Foundering refers to a vessel (passing vessels, recreational vessels, fishing vessels) losing its structural integrity and subsequently sinking over the marine cabling. Areas along the cable where traffic levels are higher generally correspond to areas of higher foundering risk. This includes coastal waters where small craft activity is particularly abundant and within the TSS shipping lanes.

Historically, fishing vessels have been seen to have the greatest risk of foundering, particularly in bad weather. It is also noted that other small vessels such as recreational craft have a higher risk of foundering compared to larger vessels. From the baseline assessment, fishing vessels contribute a small proportion of vessel traffic whilst recreational vessels were the most frequently recorded in the summer period. As noted previously, these vessels are likely under-represented.

From the maritime incident data (MAIB and RNLI) there were a small proportion of incidents recorded within the study area due to flooding or foundering. There were two incidents involving leaks resulting in flooding recorded within the Marine Cable Corridor; however, assistance was provided in advance of foundering.

Should a vessel founder over the marine cabling whilst it is left exposed (estimated to be up to 1 or 2 months), the consequence would be potential damage to the cable.

During the construction period, mariners may not be as aware of the newly laid cable although this can be mitigated through circulation of information.

The frequency of this impact is considered to be Remote and the severity Moderate, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Dropped Object from Vessel onto Exposed Cable

This impact refers to a vessel dropping an object over exposed marine cabling. Areas where traffic levels are higher, for example the Dover Strait TSS lanes, generally correspond to areas of higher dropped object risk. Passing vessels that carry containers on deck such as container ships pose a higher risk of dropping an object.

An incident is most likely to occur in heavy seas due to cargo being shifted. There is also the possibility of smaller objects being dropped, e.g., from a fishing vessel operating in the area, but this is unlikely to threaten the cable. The area most likely to be the highest risk from dropped objects is within and around the TSS shipping lanes, utilised by larger container ships.

During the period where the cable may be exposed (estimated to be up to 1-2 months), any dropped object may impact the cable.

During the construction period, mariners may not be as aware of the newly laid cable although this can be mitigated through circulation of information.

The frequency of this temporary impact is considered to be Remote and the severity Moderate, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Fishing Gear Snagging on Exposed Cable

Fishing vessels carrying demersal gear that interacts with the seabed when deployed are at risk of snagging on subsea cables. Demersal gear types identified in the baseline assessment include demersal trawlers, beam trawlers, boat dredges and Scottish seines which, together, contributed approximately 62% of the total distribution in the area. The highest risk areas of snagging are waters further offshore in the vicinity of the Dover Strait TSS, particularly within the separation areas, where vessels were engaged in fishing activities.

There is a higher risk of snagging from demersal fishing gear if the cable is exposed. Consequences of snagging could range from damage to gear and the cable, loss of stability due to lines being put under strain and in the worst case, capsize of vessel, men overboard and risk of injury or fatality. For example, a risk of capsize could occur if the vessel attempted to free its gear by raising the cable rather than slipping the gear.

It is expected that mitigation including having an FLO in place, circulation of information (via Kingfisher and local communications) will help ensure fishermen are aware of the hazard and avoid fishing over the exposed cable. In addition, guard vessels will be used in any areas where cable exposures are considered to present significant risk to fishing gear snagging.

The frequency of this impact is considered to be Remote assuming the cables are left exposed for a period of time (anticipated not to exceed 1-2 months), but taking into account all embedded mitigation, and the severity Serious, resulting in an overall ranking of **Tolerable**.

14.5.2 Operation and Maintenance Impacts

In the event that cables need to be repaired or maintained, the activities required to undertake the works will be undertaken in line with Section 3.2.9 of Chapter 3 (Description of the Proposed Development). Disruption to other activities and marine users such as ports/harbours, fishing, military activities, aggregates and recreational activities and recreational angling are considered to be similar to the effects that may arise during construction although much reduced in scale and shorter in duration.

Anchor Dragging

Following the installation of the marine cabling, there is a risk that an anchored vessel will lose its holding ground and subsequently drag anchor over the cable.

The majority of anchoring recorded in the baseline assessment was associated with the Saint Helen's Road anchorage charted approximately 3.5 nmi south of the Marine Cable Corridor, however vessels were also recorded at anchor between 2 and 3 nmi, from the corridor. The majority of vessels recorded here were tankers with sizes between 500 and 15,000 DWT. In addition, two dredgers (2,628 DWT and 9,153 DWT respectively) were

recorded at anchor within the Marine Cable Corridor with a further two recorded within close proximity. During consultation with Langstone Harbour it was estimated that approximately 500-600 dredgers per annum anchor in the vicinity of the Marine Cable Corridor whilst waiting for the tide to enter port. In addition, it was noted that anchoring from recreational craft is likely to occur near the Langstone Harbour entrance

It is generally assumed that larger vessels are likely to cause more damage to a buried cable than a smaller vessel as their anchors are able to penetrate deeper. The anchors of small vessels such as fishing and recreational craft are unlikely to deeply penetrate the seabed. However, consultation with the CA revealed that some recreational anchors are able to penetrate to depths up to 1 m. This penetration depth is considered to be deeper than generally assumed for recreational vessels but may be possible in very soft mud or clay. It is also noted that should a small vessel anchor interact with the cable, a snagging may occur and threaten the stability of the vessel. This does not apply to larger vessels, which would be expected to sever/damage the cable rather than snag.

Embedded mitigation will include circulation of information including marking cables on nautical charts which will alert mariners to the presence of the cable. Following the installation and charting of the marine cabling, it is expected that vessels will not plan to anchor in its immediate proximity. Burial depths have been informed by the results of the geotechnical survey and information from the CBRA. Preliminary estimates suggest a target burial depth between 1.0 m and 3.0 m. It is assumed that the target burial is higher where the risk from larger vessels dragging anchor is considered to be significant. Where the target burial depth is not achieved, non-burial protection, for example rock placement, mattresses, grout/rock bags or tubular protection, will be added to protect against vessel anchors, if deemed necessary. It is estimated that up to 11 km of the Marine Cable Route may require remedial non-burial protection. An additional 10% (11 km) contingency for non-burial protection is also being proposed to cover unforeseen repair and maintenance requirements over the first 15 years of operation.

The frequency of this impact is considered to be Extremely Unlikely during the operational stage, assuming the cables are marked on navigational charts and suitably protected from vessel anchors through burial and/or non-burial protection measures. Consultation with relevant dredging companies indicated that the dredger recorded at anchor whilst awaiting entrance to Langstone Harbour will avoid anchoring directly over the cables once they have been installed. The severity is considered to be Serious, resulting in an overall ranking of **Tolerable**, taking into account all embedded mitigation.

Emergency Anchoring

If a vessel suffers engine failure, there is a chance it may drop anchor to avoid drifting into an emergency situation such as a collision or grounding. Should this happen in the vicinity of the marine cabling, the anchor may come into contact with the cable.

A vessel suffering engine failure is only likely to drop anchor if there is immediate danger nearby. This is more likely to occur in the shallower, coastal waters where there is a higher

risk of grounding, or in the vicinity of the TSS where vessels may choose to drift out of the busy shipping lanes before dropping anchor. In open waters where depths are deeper and anchoring may not be feasible, the vessel is more likely to attempt to either fix the problem or await assistance.

From the baseline analysis, the intersection of the cable with the TSS shipping lanes and separation area poses a high risk area for emergency anchoring in addition to the shallower coastal waters where traffic levels are high (particularly in summer). The separation areas of the TSS can often be utilised by vessels in distress and thus there is a higher risk of emergency anchoring. Review of maritime incident data within the study area revealed machinery failure was a frequent incident type, particularly within coastal waters.

Larger anchors associated with commercial vessels are the biggest threat to the cable, as they are capable of penetrating deeper into the seabed and can cause greater damage than smaller anchors (e.g. those associated with recreational craft) if contact is made. The CBRA has identified target burial depths between 1.0 m and 3.0 m to mitigate this risk.

The frequency of this impact is considered to be Extremely Unlikely during the operational stage, as even in an emergency, Masters should consult charts before dropping anchor, and therefore avoid anchoring directly over the cables. Additionally, this takes into account the planned protection informed by a CBRA (burial to at least 1.0 m and higher in high density areas of shipping). The severity is considered to be Serious, resulting in an overall ranking of **Tolerable**, taking into account embedded mitigation.

Vessel Foundering

Foundering refers to a vessel (passing vessels, recreational vessels, fishing vessels) losing its structural integrity, and subsequently sinking over the marine cabling. Areas along the cable where traffic levels are higher generally correspond to areas of higher foundering risk. This includes coastal waters where small craft activity is particularly abundant and within the TSS shipping lanes.

Historically, fishing vessels have been seen to have the greatest risk of foundering, particularly in bad weather. It is also noted that other small vessels such as recreational craft have a higher risk of foundering compared to larger vessels. From the baseline assessment, fishing vessels contribute a small proportion of vessel traffic whilst recreational vessels were the most frequently recorded in the summer period. As noted previously, these vessels are likely under-represented.

From the maritime incident data (MAIB and RNLI) there were a small proportion of incidents recorded within the study area due to flooding or foundering. There were two incidents involving leaks resulting in flooding recorded within the Marine Cable Corridor; however assistance was provided in advance of foundering.

Should a vessel founder over the marine cabling, the consequence would be potential damage to the cable. Burial of the cable (and/or non-burial protection) may provide a degree of protection against damage from smaller vessels.

The frequency of this impact is considered to be Extremely Unlikely and the severity Moderate, resulting in an overall ranking of **Broadly Acceptable**, taking into account embedded mitigation.

Dropped Object from Vessel

This hazard refers to a vessel dropping an object over the cables. Areas along the cable where traffic levels are higher, for example the Dover Strait TSS lanes, generally correspond to areas of higher dropped object risk. Passing vessels that carry containers on deck such as container ships pose a higher risk of dropping an object.

An incident is most likely to occur in heavy seas, due to cargo being shifted. There is also the possibility of smaller objects being dropped, e.g., from a fishing vessel operating in the area, but this is unlikely to threaten the cables, as they will be buried. Therefore, from the baseline assessment, the Dover Strait TSS and surrounding waters are likely to be the highest risk areas from dropped objects.

The frequency of this impact is considered to be Extremely Unlikely, assuming the cables are suitably protected through burial and/or non-burial protection measures and the severity Moderate, resulting in an overall ranking of **Broadly Acceptable**, taking into account embedded mitigation.

Vessel Grounding due to Reduced Under Keel Clearance

This impact refers to a vessel grounding due to reduced under keel clearance associated with cable crossing points and protection methods, which could lead to subsequent capsize, injury, loss of life, oil spill, etc. In general, the higher risk areas are coastal waters where water depths are shallower. Approximately 9 km of cable lies in shallow waters with depths less than 10 m.

The worst case type of non-burial protection in terms of reduced under keel clearance is rock placement, which could be between 0.5 m and 1.5 m in height.

In line with MCA guidance, it is not planned to reduce the existing water depth by more than 5% along any section of the cabling. Recreational and fishing vessels are the most abundant vessels recorded within the shallow waters; however, some larger dredgers were also recorded intersecting the Marine Cable Corridor.

The maximum draught recorded navigating within approximately 5 nmi off the coast was 15.5 m. A dredger was recorded within the Marine Cable Corridor approximately 3 nmi from the cable Landfall with a draught of 4.1 m in depths of approximately 6-7 m. These vessels with deeper draughts could be at risk of grounding if there is significant reduction in water depths. The majority of small craft with shallower draughts are considered to be less of a risk; however due to the shallow water depths it is recommended that minimal reduction is achieved.

The frequency of this impact is considered to be Extremely Unlikely, and the severity Serious resulting in an overall ranking of **Tolerable**, taking into account embedded mitigation.

Fishing Gear Snagging

Fishing vessels carrying demersal gear that interacts with the seabed when deployed are at risk of snagging on subsea cables. Approximately 62% of fishing vessels broadcasting on AIS in the study area were carrying demersal gear, including demersal trawlers, beam trawlers, boat dredges and Scottish seines. A detailed analysis revealed the high density areas of demersal activity occurred further from the coast in offshore waters around the Dover Strait TSS, particularly within the separation areas, where vessels were engaged in fishing activities. The depiction of cables on nautical and Kingfisher charts (embedded mitigation measures) may discourage fishing in the cable's vicinity; however evidence shows this is not always the case with installed cables as often it is assumed they are adequately protected against over-trawling.

If a fishing vessel snags its gear on a cable, the crew should attempt to make contact with the Coastguard, and if possible the cable operator. However, as it is extremely likely that the crew will be advised to abandon the gear, attempts will sometimes be made to free the gear without consulting the authorities. This can cause further damage to the cable and gear, poses a risk of injury including electrocution if the cable is raised or cut, and can threaten the stability of the vessel due to lines being put under strain, and in the worst case lead to capsize and loss of life. Cable protection such as burial and rock placement is assumed to provide effective mitigation.

Embedded mitigation measures include marking the cable on navigational charts and in Kingfisher awareness charts, and suitable protection of the cable via burial (initial target depths between 1.0 m and 3.0 m) or other non-burial protection measures.

The frequency of this impact is considered to be Extremely Unlikely and the severity Serious, resulting in an overall ranking of **Tolerable**, taking into account embedded mitigation.

Increased Collision Risk (Passing Vessel with Repair/Maintenance/Survey Vessel)

The final Marine Cable Route and cable protection measures (e.g. burial between 1.0 m and 3.0 m or other non-burial protection measures) will be designed to minimise the requirement for regular inspection surveys. However, it is anticipated that inspection surveys will be undertaken every 6-12 months for the first 2-5 years, reducing to once every 1-5 years during the remaining life of the Project.

In addition, the Project has been designed so that routine maintenance in not required during the operational lifetime. However, there may be a requirement to undertake unplanned repair works. An indicative worst-case is anticipated to be one repair every 10-12 years. The requirement of such surveys and maintenance works provides important mitigation against cable interaction; however, it will require vessel(s) working over the cable route which results in an increased collision risk with all passing traffic.

Assuming circulation of any intended works is undertaken in advance, and that all vessels are compliant with COLREGS, the risk is not considered to be significant. It is noted that maintenance/monitoring work is expected to be less disruptive and span a shorter period than cable installation (during the construction period).

The frequency of this temporary impact is considered to be Extremely Unlikely given the short duration of maintenance works. The severity is considered to be Serious, resulting in an overall ranking of **Tolerable**, taking into account embedded mitigation.

Disruption to Vessel Routeing/Timetables

Any maintenance works or surveys during the operational phase may cause disruption to vessel routeing/timetables, particularly if extensive maintenance is required in areas of high density (e.g. TSS, approaches to ports).

Mitigation measures include circulation of information, temporary aids to navigation (if deemed necessary) and liaison with local ports and harbours.

As the worst-case is one repair every 10-12 years, and the time period for the works is likely to be smaller than for construction, the frequency of this impact is considered to be Remote, and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation.

Disruption to Port Arrivals/Departures

Maintenance works or surveys could also cause disruption to port arrivals/departures, if these were required close to the cable Landfall.

Embedded mitigation measures such as circulation of information and liaison with local port and harbour masters e.g. Portsmouth, Southampton, Langstone, etc., will ensure the majority of vessels and all local ports will be aware of any maintenance works or surveys.

The frequency of this impact is considered to be Remote and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation.

Disruption to Fishing Activities

Fishing activities may also be disrupted by maintenance works or surveys, particularly in those areas identified as having a high density of fishing activities.

It is expected that embedded mitigation measures such as circulation of information (including Kingfisher) will notify sea users of any maintenance works or surveys.

As the requirement for maintenance and/or surveys is not likely to be frequent and the time period for the works much shorter than for construction works, the frequency of this impact is considered to be Remote and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation.

Disruption to Aggregate Dredging Activities

Disruption to aggregate dredging activities association with maintenance works or surveys is expected to be lesser than during construction, due to the temporary nature of the works.

The frequency of this impact is considered to be Extremely Unlikely and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation, including circulation of information.

Disruption to Military Exercises

Disruption to military activities association with maintenance works or surveys is expected to be lesser than during construction, due to the temporary nature of the works.

The frequency of this impact is considered to be Extremely Unlikely and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation (i.e. circulation of information and liaison with QHM Portsmouth).

Disruption to Recreational Activities

Maintenance works or surveys could cause disruption to recreational activities including recreational angling activities, particularly in those areas identified as having a high density of recreational activity, e.g. closer to the shore.

Mitigation measures such as circulation of information (e.g. NtMs) will notify sea users of maintenance or survey works. However, it is noted that recreational vessels may be less aware of the construction works than larger, commercial vessels and thus relevant local harbours and marinas should also be notified of any works.

As the worst-case is one repair every 10-12 years, and the time period for the works is likely to be smaller than for construction, the frequency of this impact is considered to be Remote and the severity Minor, resulting in an overall ranking of **Broadly Acceptable**, taking into account all embedded mitigation

Magnetic Compass Interference

The static magnetic fields created by HVDC cables can interact with the earth's natural magnetic field, which can result in interference with magnetic navigational equipment, particularly in shallow waters. The MCA has advised through consultation that a deviation of three degrees will be accepted for 95% of the whole cable route between the UK and France and a five degree deviation accepted for the remaining 5% of the whole cable route.

The vast majority of commercial traffic uses Global Positioning System (GPS) and non-magnetic gyrocompasses as the primary means of navigation, which are unaffected by Electromagnetic Interference (EMI). Therefore, it is considered unlikely that any created interference will have a significant impact on vessel navigation. However, magnetic compasses still serve as an essential means of navigation in the event of power loss or as a secondary source, and some smaller craft (fishing or leisure) may rely on it as their sole

means of navigation, especially in bad visibility or at night. The important factors that affect the resultant deviation are:

- Water depth;
- Burial depth;
- Spacing or separation of the two cables in a pair; and/or
- Cable route alignment relative to the earth's magnetic field.

Approximately 9 km (KP0-KP9) of the Marine Cable lies within waters depths less than 10 m which may result in appreciable interference. Recreational and fishing vessels are the most abundant vessels recorded within this area. These smaller vessels may rely on magnetic compasses as their sole means of navigation.

The potential effects of any electromagnetic fields on navigation etc. will be minimised through project design including the choice of cable protection. The cable route rarely progresses in the same direction as the flow of traffic such that any deviations would be a short term effect to affected vessels rather than a greater disruption. In shallower waters in some areas the cable route is running more parallel to traffic however, for the majority of this section of cable route, the cable burial depths are anticipated to be sufficient so as not result in effects. With anticipated burial depths of between 1.0 m and 3.0 m or other non-burial protection measures and a typical separation distance of 50 m between the bundled pairs, compass deviation is anticipated to be less than a 3 degree variation for 95% of the cable route and no more than a 5 degree electromagnetic variation for the remaining 5% of the cable route.

The frequency of this impact is considered to be Frequent, with severity Minor, resulting in an overall ranking of **Tolerable**, taking into account embedded mitigation.

14.5.3 Decommissioning

It is noted that any decommissioning activities will be determined by the relevant legislation and guidance available at the time of decommissioning. Options for decommissioning at this point in time include leaving the subsea cables in situ, removal of the entire subsea cables, or removal of sections of the subsea cables. Each option will be evaluated and should cabling be removed, the construction operation would be reversed and thus all temporary impacts assessed in the construction phase will apply.

14.6 Additional Mitigation

This section recommends additional mitigation measures to bring impacts assessed as Tolerable to ALARP. It is noted that impacts that were assessed as Broadly Acceptable may also benefit from the additional mitigation.

Additional mitigation measures during the construction stage are as follows:

- Minimising the period of time the Marine Cables are left exposed, where possible.

- Targeted circulation of information about the Proposed Development to regular commercial operators (e.g. ferries) prior to marine works commencing;
- Circulation of information to relevant local sailing clubs along the south coast of the UK to increase the likelihood that sailors are made aware of the temporary installation work.
- Scheduling of any marine cabling works to avoid significant races (e.g. Cowes Week, Round the Island Race) where possible.

Additional mitigation measures to bring impacts assessed as tolerable to ALARP during the operational stage are presented below:

- Further consultation with the MCA if compass deviations are expected to exceed five degrees in the final cable design. The MCA also require a post-lay survey to prove any deviation.

14.7 Residual Effects

The residual effects are summarised in Table 17.1. These take into account industry-standard embedded mitigation measures described in Section 14.4 and additional mitigation measures required to reduce the risk to ALARP. In summary, no residual effects have been determined to be unacceptable or significant.

14.7.1 CONSTRUCTION AND DECOMMISSIONING

With no additional mitigation measures in place, all impacts identified in Section 13.6 during construction and decommissioning were assessed to be tolerable or broadly acceptable (**not significant)**. However**,** additional mitigation measures could be adopted to downgrade the effects to ALARP. Such measures include minimising the duration of any exposed cable during installation and targeted circulation of information to relevant parties.

14.7.2 OPERATION (INCLUDING REPAIR/MAINTENANCE)

With no additional mitigation measures in place, all impacts identified in Section 13.6 during operation or during any repair and maintenance activities were assessed to be tolerable or broadly acceptable (**not significant**). However, additional mitigation measures bring impacts assessed as Tolerable to ALARP include further consultation with the MCA if compass deviations are expected to exceed five degrees in the final Marine Cable design. The MCA also require a post-lay survey to prove any deviation.

15 Collision Frequency Assessment

15.1 Introduction

The vessel-to-vessel collision frequency for the construction of the AQUIND Interconnector within the Dover Strait TSS was estimated using Anatec's COLLRISK model. COLLRISK is referenced by the International Oil and Gas Producers Association (IOGP) in the Risk Assessment Data Directory under "Best practice collision risk modelling for passing vessels" (IOGP, 2010).

Firstly, the baseline frequency was assessed taking into account the baseline shipping identified in the TSS from the AIS vessel traffic (see Section 10). The additional traffic associated with the installation operations within the TSS was then simulated and added to the model to estimate the revised frequency, i.e. baseline plus cable installation vessels. The total collision frequency for the cable installation vessels was then calculated.

Although each of the two cable pairs may be installed by a separate contractor, it is assumed that only one installation contractor will be working within one shipping lane within the TSS area at a time.

15.2 Assessment Overview

The collision frequency assessment was run for typical cable installation and trenching support vessels, based on information provided by the project team; the CLV *Maersk Connector,* and the trenching support vessel *Volantis*. The details and assumptions made regarding the operations are presented below in Table 15.1. It is noted that as the same speed is assumed for each vessel, should the cable be trenched and buried post-lay, the risk of vessel collision during the trenching operation will be the same as for the cable installation operation.

Table 15.1 Installation Vessel Details

Operation	Vessel Name	DWT	Vessel Speed Assumption
Cable Lay	*Maersk Connector*	9,300	100 m per hour[3]
Trenching Support Vessel	*Volantis*	5,200	100 m per hour

The section of cable assessed (based on the centreline of the cable corridor) is presented below in Figure 15.1.

[3] It is noted that due to the absence of operational speed information on the CLV, an assumption of 100m per hour has been made based on the given speed of the trenching support vessel.

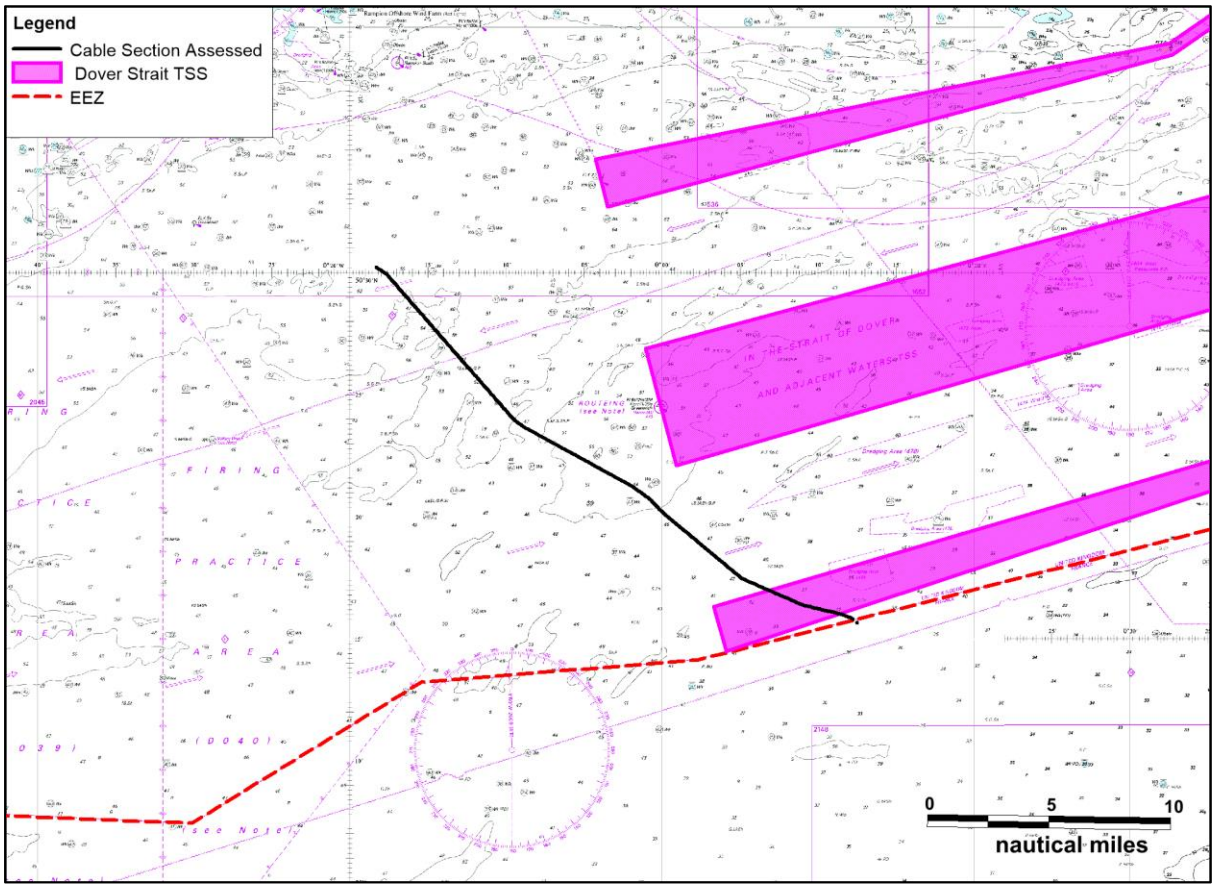

Figure 15.1 Section of Marine Cable Corridor Assessed in Vessel-to-Vessel

15.3 Results

The duration of the cable installation for this section was estimated based on a lay speed of 100m per hour over a length of approximately 45.8 km, giving a duration of 458 hours for the operation.

Table 15.2 presents the vessel to vessel collision frequency for the cable installation vessel with third party vessels. This is presented for the entire operation, and on an annual-equivalent basis (i.e. assuming that the installation vessel is operating for one year).

Table 15.2 Vessel to Vessel Collision Frequency – Cable Lay

Operation	Collision Frequency	
	Cable Lay Operation	Annual
Cable Lay	2.4×10^{-4}	4.6×10^{-3} (1 in 217 years)

The operational collision risk for the cable lay operation (approximately 458 hours) is estimated to be 2.4×10^{-4}. It is noted that the vessels utilising the TSS should be aware of

the cable installation due to circulation of information and the presence of a guard vessel(s), and therefore are likely to be operating with greater caution during this time; however, this was not taken into consideration in the risk modelling.

To put this result into context, historical incident data for the entire Dover Strait TSS was reviewed. Over a twenty year period, there were approximately 23 collision or contact incidents reported by the MAIB. This results in an average of one collision or contact per year within the TSS. Looking in detail at incidents around the cable section modelled (i.e. reviewing the ten years of MAIB data reported in Section 9), there was one collision and one contact incident reported within the Dover Strait TSS, resulting in an average of one collision/contact every five years.

Therefore, it can be concluded that the addition of the cable installation vessel, in comparison to the baseline environment of the TSS, is minimal and thus the increase in collision frequency is not considered significant.

16 Cumulative Effect Assessment

The CEA has been undertaken with regards to PINs Advice Note 17. The matrix for shipping and navigation which has been used to identify possible cumulative effects with other projects is located in Appendix 13.2 of the ES. Figures that illustrate the locations of the projects assessed are Figures 29.1-29.5 of the ES. The ZOI has been defined as the study area used in the baseline assessment, i.e. 5 nmi buffer of the Marine Cable Corridor. Further consideration of projects that are within the ZOI and that are anticipated to overlap temporally with the Proposed Development are provided below.

It is noted no transboundary effects were identified.

16.1 Cumulative Effects

IFA-2 HVDC Interconnector

The IFA-2 HVDC interconnector is being developed by the National Grid and aims to connect the electricity systems between Great Britain and France using HVDC subsea cables between Hampshire, UK and Normandy, France (MLA/2016/00209/1). The project is currently under construction and is expected to be fully operational in 2020.

The IFA-2 interconnector is located approximately 400 m (at its closest point) from the Proposed Development, on approach to the Solent area. As marine construction works for the Proposed Development are not anticipated to start until at least December 2021, there is not expected to be any overlap in construction periods between the two projects.

However, there may be an increase in collision risk between vessels and/or disruption to vessel routeing if maintenance/repair works were required over the IFA-2 interconnector whilst construction works were ongoing for the Proposed Development. If both operators follow best practice guidelines, then the cumulative effects are not anticipated to be significant, due to the temporary nature of the works, and therefore impacts are ranked as **Tolerable**.

RNLI Portsmouth Lifeboat Station Repairs

The RNLI Portsmouth Lifeboat station is undergoing maintenance works over a ten-year period that continues until May 2027 (marine licence reference MLA/2017/00041/1). Works involve the maintenance of moorings, pontoon berths, station boathouses, safety of lifeboat launches and beach lifeguard units. In addition, the works include minor beach re-profiling and navigational dredging. This station is located in close proximity to the cable Landfall, approximately 980 m to the north.

If navigational dredging or maintenance works requiring vessels were to occur at the same time as the cable installation, there may be an increased disruption to vessel navigation into Langstone Harbour (particularly for small craft such as recreational and fishing vessels). In addition, disruption to port arrivals and departures (Langstone Harbour) may also be

increased if construction periods overlapped. This however, is expected to be minimal and thus ranked as **Tolerable** due to the scale and temporary nature of the works.

Fraser Range Development

An application (MLA/2019/00249) has been submitted to develop the former Royal Naval gunnery and research site at Fraser Range. The majority of the works are onshore, however marine works specifically involve the creation of a rock revetment and improvements to the existing seawall. Works will be undertaken on a tidal basis (approximately four hours either side of Low Water) using earthmoving equipment (such as tracked excavators and wheeled dump trucks). Rocks will be delivered using a boat (with offloading approximately 1-2 hours either side of High Water). The seawall works are anticipated to take approximately 8 to 10 months within the period July 2019 to July 2022.

The Fraser Range works boundary overlaps the Marine Cable Corridor, but is in excess of 1 km from the Landfall HDD exit/entry marine works. There may be increased disruption to vessel routeing and port arrivals/departures at Langstone Harbour associated with vessels delivering rocks to the Fraser Range works if timings overlap with the construction period for the Proposed Development. However, this is expected to be minimal due to the scale and temporary nature of the works and therefore ranked as **Tolerable**.

South Hayling Beach Management Plan

The aim of this development (marine licence reference MLA/2017/00104) is to maintain the beach height and profile at Eastoke, through beach nourishment, during campaigns lasting 2-4 weeks each. The project is located approximately 660 m from the Marine Cable Corridor at its closest point and campaigns are anticipated to take place in early March and/or September each year (2017-2022). Impacts include increased vessel to vessel collision risk due to the presence of a number of large, slow moving vessels in the area; disruption to vessel routeing within coastal waters in particular, and disruption to small craft activities such as fishing and recreational. The beach works are currently scheduled to end in 2022 and thus cumulative effects are not significant due to the temporary nature of the works. Therefore the cumulative effects with this project are ranked as **Tolerable.**

Southsea Coastal Flood and Erosion Risk Management Scheme

This scheme (MLA/2019/00316) will provide a 1 in 200 year standard of protection from flooding. Works comprise of a combination of vertical sea wall, raising and realignment of the promenade and associated highway, construction of stepped revetment, rock armour revetments and groynes, secondary defence walls and bunds, beach widening and all associated works and landscaping. The project is located approximately 750 m from the Marine Cable Corridor at its closest points.

Impacts include increased vessel to vessel collision risk due to the presence of a number of large, slow moving vessels in the area, disruption to vessel routeing within coastal waters in particular, and disruption to small craft activities such as fishing and recreational.

The construction methodology is predominantly landward in nature located to the west of the Proposed Development within the vicinity of the Portsmouth Harbour navigation channel and use of marine vessels will only be used for delivery of construction material, rock armour and beach material. Accordingly, the works will be highly localised and the construction sequence for the Southsea Scheme (Chapter 3 of the Southsea ES) currently shows that the closest works to the Proposed Development (i.e. sub-frontages 5 and 6) will be undertaken during 2023 and 2024 when Landfall works for the Proposed Development will already be completed. The cumulative effects are therefore not considered significant and ranked as **Tolerable**.

Portsmouth Maintenance Dredging and Disposal

This project (MLA/2017/00478) involves the maintenance of navigable depths in the approaches, berths and basins at Portsmouth (approximately 1.5 km from the Marine Cable Corridor) including disposal of dredged material. A trailing suction hopper dredger will be utilised for the works. These works are licensed until July 2028 and thus there is likely to be an overlap with the construction period of the Proposed Development.

Due to the close proximity of these works with the Project, there may be an increased risk of collision with slow-moving vessels and increased disruption to vessel routeing in and out of Portsmouth. In addition, there is likely to be disruption to fishing and recreational craft operating in the area.

However, dredging associated with this port is included within the baseline assessment with no significant effects predicted. Therefore, there is not expected to be any cumulative effects should construction works overlap with dredging works.

ABP Southampton – Navigational Maintenance Dredge – Nab Channel

This is a renewed licence (MLA/2014/00592/2) in order to maintain safe navigation of the Southampton harbour and its approaches. Dredging activity will occur approximately 2 km from the Project and is licensed until October 2025. Therefore, there could be potential overlap in dredging works with the construction phase of the Proposed Development.

As above, this will include an increased number of larger, slow-moving vessels in the area which may cause disruption to local activities and/or vessel routeing, as well as an increased risk of vessel collision.

As above, dredging associated with ports have been included in the baseline assessment with no significant impact, therefore there are not expected to be any cumulative effects.

Other Maintenance Dredging Projects

Other maintenance dredging works planned in local ports, harbours and marinas within the ZOI that are anticipated to overlap with construction works for the proposed development are listed below:

- Haslar Marina maintenance dredging

- Sparkes Marina maintenance dredging
- Gosport Marine maintenance dredging
- Northney Marina maintenance dredging
- Port Solent Approach Channel dredge
- Bedhampton Approach Channel and Berth maintenance dredge – inner and outer areas
- Royal Naval Sailing Association (RNSA) maintenance dredging – Alliance, Haslar Pontoon and Hornet
- Gosport Ferry Clarence Wharf maintenance dredging
- Trafalgar Wharf Approach Channel dredging
- Ryde Harbour maintenance dredging – harbour entrance and harbour arm
- Dredging and pontoon installation, Camber Dock, Portsmouth

There may be a slight increase in disruption to activities and/or vessel routeing as well as a small increase in collision risk if construction works for the Proposed Development are carried out at the same time. However, due to the small scale and temporary nature of the works, as well as the distance between the Proposed Development and the projects, the cumulative effects are ranked as **Tolerable,** and not considered to be significant.

Licensed Aggregate Dredging Areas

There are various dredging companies that have renewed their licence for aggregate dredging areas within proximity of the Project. The closest is Area 395, operated by Tarmac Marine Dredging Ltd., located approximately 2 km west of the Project.

Should dredging activities occur during the construction period of the Project, there may be a slight increase in collision risk due to the presence of large slow-moving vessels associated with both operations. However, these licensed areas have also been considered within the baseline assessment with no significant impact. Therefore, no cumulative effects are anticipated.

ABP Southampton Port Developments

The master plan for the port of Southampton (ABP, 2016) details the need for developments to accommodate future trends in shipping up to 2035. Potential developments that are being considered include new storage facilities for bulk carriers in addition to multi-deck facilities for car storage. Continuing increase of storage capacity could potentially lead to changes in future traffic to that identified using the 2017/2018 AIS data. For example, the number and/or size of vessels visiting the port could increase in the future. It is noted however that any changes in shipping are not expected to be significant, and there is insufficient information regarding potential development to undertake a meaningful assessment in any case.

Liaison with ABP Southampton, as well as other local ports and harbours i.e. Portsmouth, during the Project will help manage any potential cumulative issues.

Trafalgar Wharf Dry Stack Pontoons

This project (MLA/2016/00392) involves the extension of the existing pontoon at Trafalgar Wharf to increase the number of berthing pontoons. A new pontoon will be installed, the location of which has been chosen so that it does not impact on the through navigation for the local moorings and the rest of the site. The location is within the existing licence dredge area and will remain floating.

The installation works will take two weeks and will be undertaken over high water periods to minimise any impacts on navigation.

Due to the location of these works relative to the Proposed Development, no cumulative effects are anticipated.

Warship Hazardous Prize Project Group

This project (MLA/2014/00476/1) relates to archaeological investigation of the protected wreck *Hazardous Prize 1706*, which lies close inshore in shallow water in Bracklesham Bay, West Sussex.

Archaeological works and any movement of vessels to and from the wreck could lead to the potential for cumulative impacts associated with disruption to fishing and recreational activities. As the wreck is located in shallow waters, and therefore fishing and recreational activities in this area are expected to be minimal, the cumulative effect is not considered to be significant.

AQUIND HVDC Interconnector (France)

The installation of the French section of the AQUIND Interconnector will have similar impacts to those identified in this study, affecting vessels operating in French waters. Whilst a proportion of vessels may operate on both sides of the median line, and hence encounter the project in UK and French waters, no significant cumulative effects are anticipated on the basis that suitable mitigation measures, including protection, will be applied over the entire length of the cable.

Rampion Wind Farm Extension

The extension to Rampion Wind Farm is in the very early stages of planning. TCE recently confirmed that Rampion Extension is one of seven extension OWF projects that will progress to undertaking project specific environmental assessments to inform planning consent applications, following the conclusions of the TCE plan level Habitat Regulations Assessment (HRA). No information regarding the proposed timescales is available and therefore it is not possible to make a meaningful assessment at this stage, however if more information becomes available, the cumulative effects will be assessed.

17 Summary

Following a review of the baseline environment in the vicinity of the Proposed Development , an NRA has been undertaken to assess the effect of the Project on shipping and navigation. The assessment provides an overview of the predicted navigation issues arising from the construction, operation and decommissioning of the cables. The findings of the NRA are summarised below.

Six months of AIS data has been analysed to establish the baseline shipping behaviours prior to the cable installation. Three months of summer and three months of winter data from 2017 and 2018 has been used to ensure the data is up-to-date and accounts for any seasonal variation in shipping.

During the three month summer period, an average of 444 unique vessels per day was recorded in the study area. Recreational vessels accounted for 40% of the vessels recorded in the summer period, followed by cargo vessels (29%) and tankers (13%). During the three month winter period, an average of 299 unique vessels per day was recorded in the study area. Cargo vessels accounted for 43% of the vessels recorded in the winter period, followed by tankers (20%) and recreational craft (15%).

Anchoring activity was high within the study area, with the majority of vessels recorded in the Saint Helen's Road anchorage located 3.5 nmi south of the Marine Cable Corridor. Two dredgers were also recorded at anchor within the Marine Cable Corridor. The busiest areas in terms of shipping were aligned with the Dover Strait TSS and approaches into nearby major ports such as Portsmouth and Southampton.

Fishing activity was generally higher in waters in and around the Dover Strait TSS, with approximately 62% of vessels carrying demersal gears. It is noted that smaller vessels such as fishing and recreational craft will be under-represented in the AIS data.

Consultation was carried out with key navigational stakeholders and consultation is ongoing and will continue. Based on the baseline assessment, stakeholder consultation and general industry experience, the impacts associated with the different phases of the planned cable were assessed. All hazards were assessed as either Tolerable or Broadly Acceptable based upon the embedded mitigation measures.

The impacts considered within the preceding assessment are summarised in Table 17.1. The assessment takes into account planned mitigation.

Table 17.1 Summary Table of Impacts

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Construction/ Decommissioning	Increased collision risk to third party vessels with a vessel associated with the cable installation.	Remote	Serious	Tolerable	▪ Circulation of information; ▪ Suitable marking and lighting of construction vessels; ▪ Temporary AtoNs; ▪ Guard vessels; ▪ Compliance with COLREGS; ▪ Temporary rolling recommended safe passing distance around construction vessels; and ▪ Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	▪ Targeted circulation of information to regular commercial ferry operators and local sailing clubs.	Tolerable (ALARP)

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Construction/ Decommissioning	Cable installation causes disruption to passing vessel routeing/ timetables, as well as increased collision risk between third parties due to route deviations.	Reasonably Probable	Minor	Tolerable	▪ Circulation of information; ▪ Temporary AtoNs; ▪ Liaison with local ports/harbours; and ▪ Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	▪ Targeted circulation of information to regular commercial ferry operators.	Tolerable (ALARP)
Passing Traffic	Construction/ Decommissioning	Cable installation causes disruption to port arrivals/departures.	Reasonably Probable	Minor	Tolerable	▪ Circulation of information; ▪ Liaison with local ports/harbours; and ▪ Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	Not Applicable	Tolerable

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Construction/ Decommissioning	A vessel drops anchor in an emergency onto exposed cable.	Remote	Serious	Tolerable	▪ Circulation of information; and ▪ Guard vessels for exposed cable.	▪ Minimising duration cable is exposed.	Tolerable (ALARP)
Passing Traffic	Construction/ Decommissioning	A vessel founders (sinks) onto exposed cable.	Remote	Moderate	Tolerable	▪ Circulation of information.	▪ Minimising duration cable is exposed.	Tolerable (ALARP)
Passing Traffic	Construction/ Decommissioning	A vessel drops an object e.g. container, onto exposed cable.	Remote	Moderate	Tolerable	▪ Circulation of information; and ▪ Compliance with SOLAS for stowage and securing of cargo.	▪ Minimising duration cable is exposed.	Tolerable (ALARP)
Fishing Vessels	Construction/ Decommissioning	Cable installation causes disruption to fishing activity.	Reasonably Probable	Minor	Tolerable	▪ Circulation of information including Kingfisher; ▪ Presence of guard vessels; and ▪ Appointment of FLO.	Not Applicable	Tolerable
Fishing Vessels	Construction/ Decommissioning	Fishing gear snags on exposed cable.	Remote	Serious	Tolerable	▪ Appointment of FLO; ▪ Circulation of information; and ▪ Guard vessels for exposed cable.	▪ Minimising duration cable is exposed.	Tolerable (ALARP)

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Dredgers	Construction/ Decommissioning	Cable installation causes disruption to marine aggregate dredging activities.	Extremely Unlikely	Minor	Broadly Acceptable	▪ Circulation of information.	Not Applicable	Broadly Acceptable
Military Vessels	Construction/ Decommissioning	Cable installation causes disruption to military exercises including local operations out of Portsmouth.	Remote	Minor	Broadly Acceptable	▪ Circulation of information; and ▪ Liaison with QHM Portsmouth.	Not Applicable	Broadly Acceptable
Recreational Vessels	Construction/ Decommissioning	Cable installation causes disruption to recreational activities.	Reasonably Probable	Minor	Tolerable	▪ Liaison with local harbours and marinas; ▪ Presence of guard vessels; and ▪ Circulation of information.	▪ Targeted circulation of information to local clubs; and ▪ Cable installation schedule to avoid significant races If possible.	Tolerable (ALARP)
Anchoring Vessels	Construction/ Decommissioning	A vessel drags anchor onto exposed cable.	Remote	Serious	Tolerable	▪ Circulation of information; ▪ Guard vessels for exposed cable.	▪ Minimising duration cable is exposed.	Tolerable (ALARP)
Passing Traffic	Operation and maintenance	A vessel drops anchor in an emergency over the cable.	Extremely Unlikely	Serious	Tolerable	▪ Cable protection measures; and ▪ Chart depiction.	Not Applicable	Tolerable

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Operation and maintenance	A vessel founders (sinks) onto the cable.	Extremely Unlikely	Moderate	Broadly Acceptable	▪ Cable protection measures.	Not Applicable	Broadly Acceptable
Passing Traffic	Operation and maintenance	A vessel drops an object e.g. container, onto the cable.	Extremely Unlikely	Moderate	Broadly Acceptable	▪ Cable protection measures.	Not Applicable	Broadly Acceptable
Passing Traffic	Operation and maintenance	A vessel grounds due to reduced under keel clearance.	Extremely Unlikely	Serious	Tolerable	▪ Chart depiction; and ▪ Less than 5% reduction in water depth.	Not Applicable	Tolerable
Passing Traffic	Operation and maintenance	Collision of a passing vessel with a vessel associated with maintenance works/monitoring of the cable.	Extremely Unlikely	Serious	Tolerable	▪ Circulation of information; and ▪ Compliance with COLREGS.	Not Applicable	Tolerable
Passing Traffic	Operation and maintenance	Disruption to vessel routeing/timetables during maintenance works	Remote	Minor	Broadly Acceptable	▪ Circulation of information; ▪ Temporary AtoNs; and ▪ Liaison with local ports/harbours.	Not Applicable	Broadly Acceptable

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Operation and maintenance	Disruption to port arrivals/departures during maintenance works	Remote	Minor	Broadly Acceptable	▪ Circulation of information; and ▪ Liaison with local ports/harbours.	Not Applicable	Broadly Acceptable
Passing Traffic	Operation and maintenance	Interference with magnetic compass onboard passing vessels.	Frequent	Minor	Tolerable	▪ Minimising cable separation; and ▪ Cable protection plan.	▪ Further consultation with MCA, post-lay survey.	Tolerable (ALARP)
Dredgers	Operation and maintenance	Disruption to aggregate dredging activities during maintenance works	Extremely Unlikely	Minor	Broadly Acceptable	▪ Circulation of information.	Not Applicable	Broadly Acceptable
Military Vessels	Operation and maintenance	Disruption to military exercises during maintenance works	Extremely Unlikely	Minor	Broadly Acceptable	▪ Circulation of information; and ▪ Liaison with QHM Portsmouth.	Not Applicable	Broadly Acceptable
Recreational Vessels	Operation and maintenance	Disruption to recreational activities during maintenance works	Remote	Minor	Broadly Acceptable	▪ Liaison with local harbours and marinas; and ▪ Circulation of information.	Not Applicable	Broadly Acceptable
Fishing Vessels	Operation and maintenance	Disruption to fishing activities	Remote	Minor	Broadly Acceptable	▪ Circulation of information including through Kingfisher bulletins.	Not Applicable	Broadly Acceptable

Receptor	Phase	Impact Description	Frequency of Occurrence	Severity of Consequence	Impact Significance	Embedded Mitigation	Additional Mitigation	Residual Effects
Fishing Vessels	Operation and maintenance	A vessel engaged in fishing snags its gear on the cable or associated cable protection.	Extremely Unlikely	Serious	Tolerable	▪ Chart depiction; ▪ Details of cables included in Kingfisher awareness charts; and ▪ Cable protection measures.	Not Applicable	Tolerable
Anchoring Vessels	Operation and maintenance	A vessel drags anchor over the cable.	Extremely Unlikely	Serious	Tolerable	▪ Cable protection measures; and ▪ Chart depiction.	Not Applicable	Tolerable

18 References

AQUIND (2018). *AQUIND Interconnector, EIA Scoping Report*. PINS Ref.: EN020022

Associated British Ports (ABP) (2016). *Port of Southampton Port Master Plan 2016 – 2035*.

Department for Transport (2019). *Maritime 50, Navigating the Future.*

International Association of Marine Aids to Navigation (AtoN) and Lighthouse Authorities (IALA) (2013). *Recommendation O-129 on the marking of man-made offshore structures*. IALA, Paris.

International Maritime Organisation (IMO) (1972/78). *International Regulations for Preventing Collisions at Sea 1972 (COLREGS)*. IMO, London.

International Maritime Organisation (IMO) (2002). *Guidelines for Formal Safety Assessment, MSC/Circ. 1023*. IMO, London.

International Oil and Gas Producers Association (IGOP) (2010). *Risk Assessment Directory, Ship/Installation Collisions, Report No. 434*.

Maritime and Coastguard Agency (MCA) (2016). *Marine Guidance Note 543 – MGN 543 Offshore renewable energy installations (OREIs). Guidance on UK navigational practice, safety and emergency response issues*. MCA, Southampton.

Marine Management Organisation (MMO). *Fishing Activity for UK Vessels 15m and over* 2015/2016 [online]. Available at: < https://data.gov.uk/> [Accessed September 2018].

Oxera (2015). International Competitiveness of the UK Maritime Sector.

Planning Inspectorate (PINS) (2015). *Advice Note 17: Cumulative Effects Assessment.*

Recreational Yachting Association (RYA) (2018). *UK Costal Atlas of Recreational Boating 2.0*. Available at: <http://marine.gov.scot/data/rya-uk-coastal-atlas-recreational-boating-20-user-guide-pdf> [Accessed October 2018].

Southampton VTS. *Solent and Southampton Water, Marine Emergency Plan – SOLFIRE*. Available at: <http://www.southamptonvts.co.uk/Port_Information/Emergency_Planning/Solfire/> [Accessed October 2018].

The Crown Estate (TCE). *Marine Minerals* [online]. Available at: <https://www.thecrownestate.co.uk/> [Accessed September 2018].

The Solent Cruising and Racing Association (SCRA) (2018). Available at: <http://www.scra.org.uk/> [Accessed October 2018].

United Kingdom Hydrographic Office (UKHO) (2013). *Admiralty Sailing Directions – Dover Strait Pilot, NP 28, 10th Edition*. UKHO, Taunton.