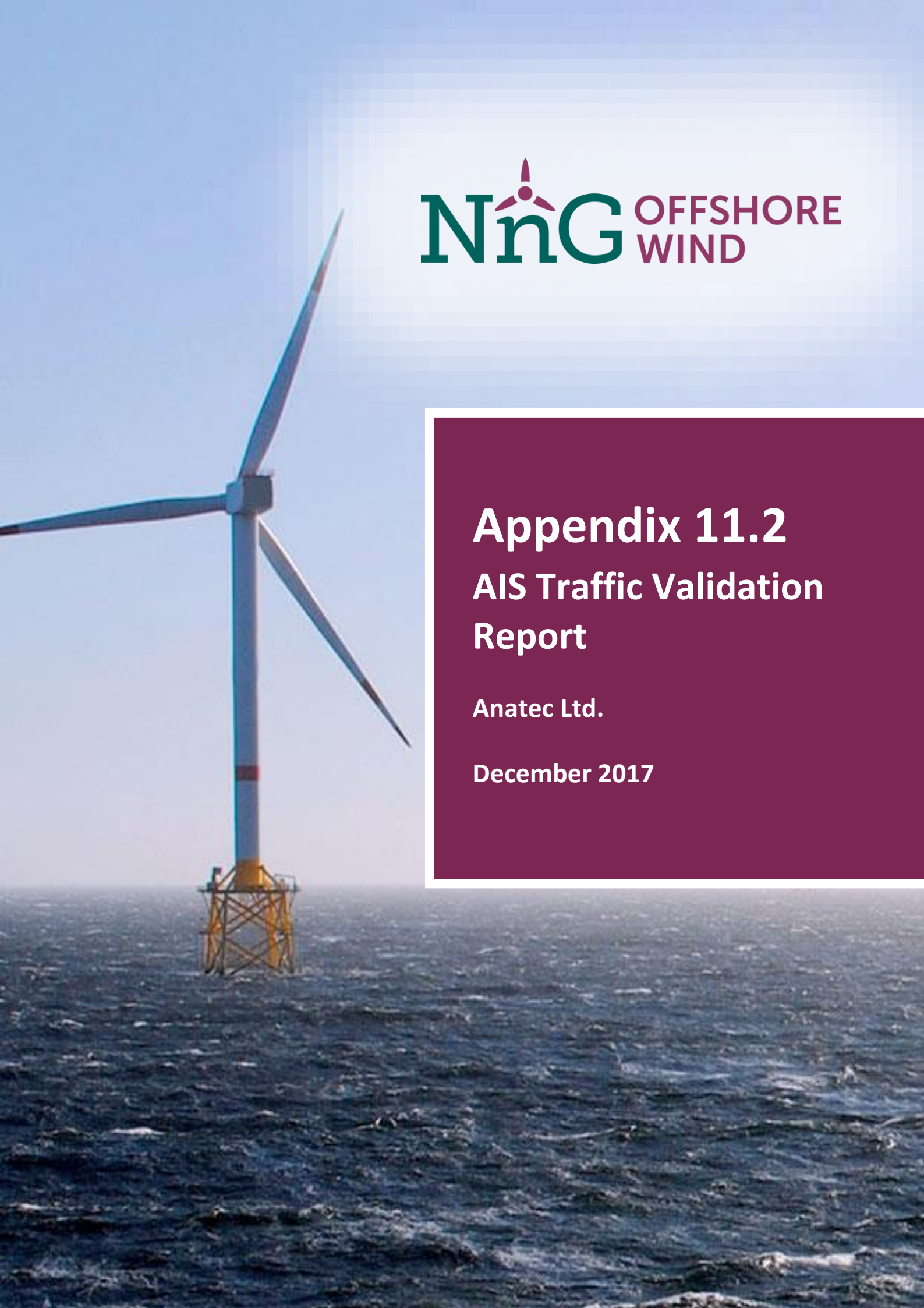

Appendix 11.2

AIS Traffic Validation Report

Anatec Ltd.

December 2017

Appendix 11.1
Neart na Gaoithe
Vessel Routeing Validation Study

Prepared by:	Anatec Limited
Presented to:	Mainstream Renewable Power
Date:	15th December 2017
Revision No.:	02
Reference:	A4018-NnG-TS-01

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Revision Number	Date	Summary of Change
00	5th July 2017	Initial Draft
01	4th December 2017	Addition of Offshore Export Cable Corridor
02	15th December 2017	Terminology Update

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Abbreviations

AIS	-	Automatic Identification System
FTOWDG	-	Forth and Tay Offshore Wind Developers Group
GRT	-	Gross Registered Tonnage
IMO	-	International Maritime Organisation
MAIB	-	Marine Accident Investigation Branch
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Notice
MMSI	-	Mobile Maritime Service Identity
m	-	Metre
MS-LOT	-	Marine Scotland Licensing Authority
NnG	-	Neart na Gaoithe
NnGOWL	-	Neart na Gaoithe Offshore Wind Ltd
NRA	-	Navigational Risk Assessment
NM	-	Nautical Mile
RNLI	-	Royal National Lifeboat Institution
SOLAS	-	Safety of Life at Sea Convention 1974 (as amended)
VHF	-	Very High Frequency

1. Introduction

1.1 Background

This document presents the results of a traffic validation exercise undertaken for the Neart na Gaoithe (NnG) Offshore Wind Farm with marine traffic survey data collected during 2016 used to validate the 2010/11 original survey data used in the Navigational Risk Assessment (NRA) (Anatec, 2012). Based on the time elapsed since the NRA, the 2016 data has been collected to satisfy the timing requirements for marine traffic data as outlined in the Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 543, prior to an application for consent for the Project.

It was agreed with the MCA that should the validation exercise find no considerable changes in traffic since the original survey, then the findings of the NRA would remain valid, and an updated NRA would not be necessary, subject to the following being provided as appendices to Chapter 11 Shipping and Navigation of the EIA Report:

- Traffic validation report;
- The original NRA; and
- An updated MGN543 checklist.

1.2 Scope of this Document

This document provides assessment of marine traffic data comprising 28 days of Automatic Identification System (AIS)[1] data collected from onshore receivers, and a comparison against the 2010/11 data (comprising AIS and radar data collected in vessel based survey over a 28 effective survey period in 2010, and 31 days of coastal AIS surveying in 2011).

All potential impacts associated with the Offshore Export Cables were scoped out at the Scoping Report (NnGOWL, 2017) stage, this was agreed by the Scottish Ministers in their Scoping Opinion (MS-LOT, 2017). However, analysis of the following within the Offshore Export Cable Corridor has also been included within this document in order to demonstrate the Project is fully compliant with the MGN543 checklist:

- Navigational features relative to the Offshore Export Cable Corridor;
- Assessment of commercial traffic, fishing activity, and recreational activity; and
- Marine incidents.

The Offshore Export Cable Corridor assessment is based on those data sources listed in Chapter 11: Shipping and Navigation.

[1] The 2016 validation data comprising AIS only was agreed with the MCA.

2. Validation Methodology

2.1 NnG Study Area

Figure 2.1 presents the location of the Wind Farm Area, located east of Fife Ness, and a 10 nautical mile (NM) buffer of the Wind Farm Area (hereafter referred to as the 'Wind Farm Study Area') used throughout the following analyses. Assessment of the Offshore Export Cable Corridor (provided in Section 7) has been undertaken within a 5NM buffer of the Offshore Export Cable Corridor (hereafter referred to as the 'Offshore Export Cable Study Area'), as shown in the figure.

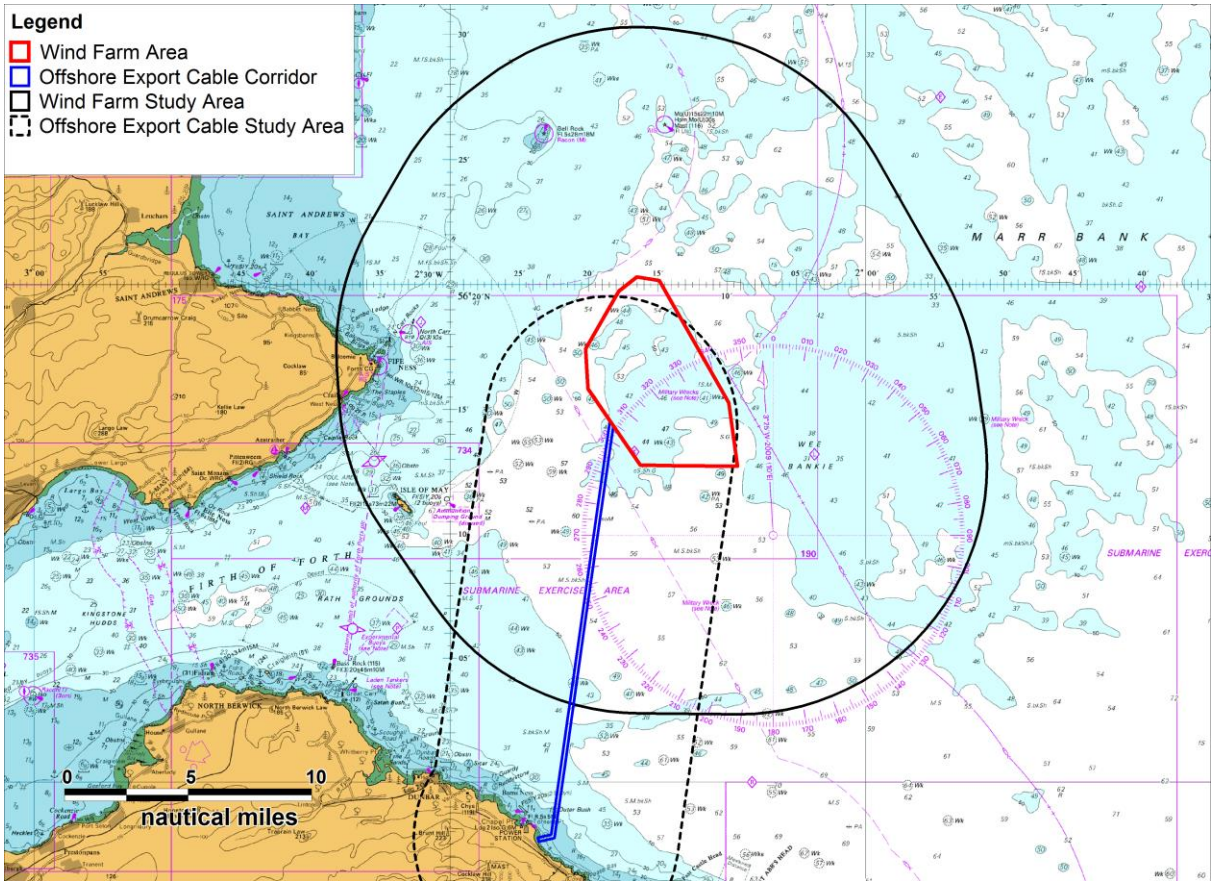

Figure 2.1 Project and Study Area Overview

2.2 AIS Data Summary

This report presents analysis of 28 days of AIS data within 10nm of the Wind Farm Area. The survey periods analysed are summarised in Table 2.1. These periods (14 days summer and 14 days winter) have been selected to account for both seasonal and tidal variations as per MGN 543.

Table 2.1 Summary of AIS Data used for validation

Survey	Survey Period	Data Type	Data Capture
Summer	06/06/2016 – 19/06/2016	AIS	14 days
Winter	05/12/2016 – 18/12/2016	AIS	14 days

2.3 Summary of AIS Carriage Requirements

Regulation 19 of Safety of Life at Sea (SOLAS 1974 as amended), Chapter V - Carriage requirements for vessel borne navigational systems and equipment - sets out navigational equipment to be carried on board vessels, according to vessel type. In 2000, the International Maritime Organisation (IMO) adopted a new requirement (as part of a revised chapter V) for vessels to carry AIS. AIS is a system by which vessels transmit data concerning their position, Mobile Maritime Service Identity (MMSI) etc. on two individual Very High Frequency (VHF) channels to the shore and other vessels, at very frequent intervals. The data is transmitted automatically via VHF to other vessels and coastal stations/authorities.

AIS is required onboard all vessels of more than 300 gross registered tonnage (GRT) engaged on international voyages, cargo vessels of more than 500 GRT not engaged on international voyages, passenger vessels irrespective of size built on or after the 1st July 2002, and fishing vessels equal to or greater than 15 metres (m) in length from the 31st May 2015 onwards. Prior to the 31st May 2015 fishing vessels equal to or greater than 18m in length were required to carry AIS. A proportion of smaller vessels (fishing and recreational vessels) also carry AIS voluntarily.

3. 2010/2011 NRA Survey Results

3.1 Introduction

This section presents analysis of the vessel tracks recorded during the 2010 and 2011 survey periods within the Wind Farm Study Area collected as part of the original NRA.

3.2 Survey Results

Figure 3.1 presents the vessel tracks, colour-coded by vessel type, recorded during both survey periods. Following this, Figure 3.2 presents the vessel type distribution for the two survey periods.

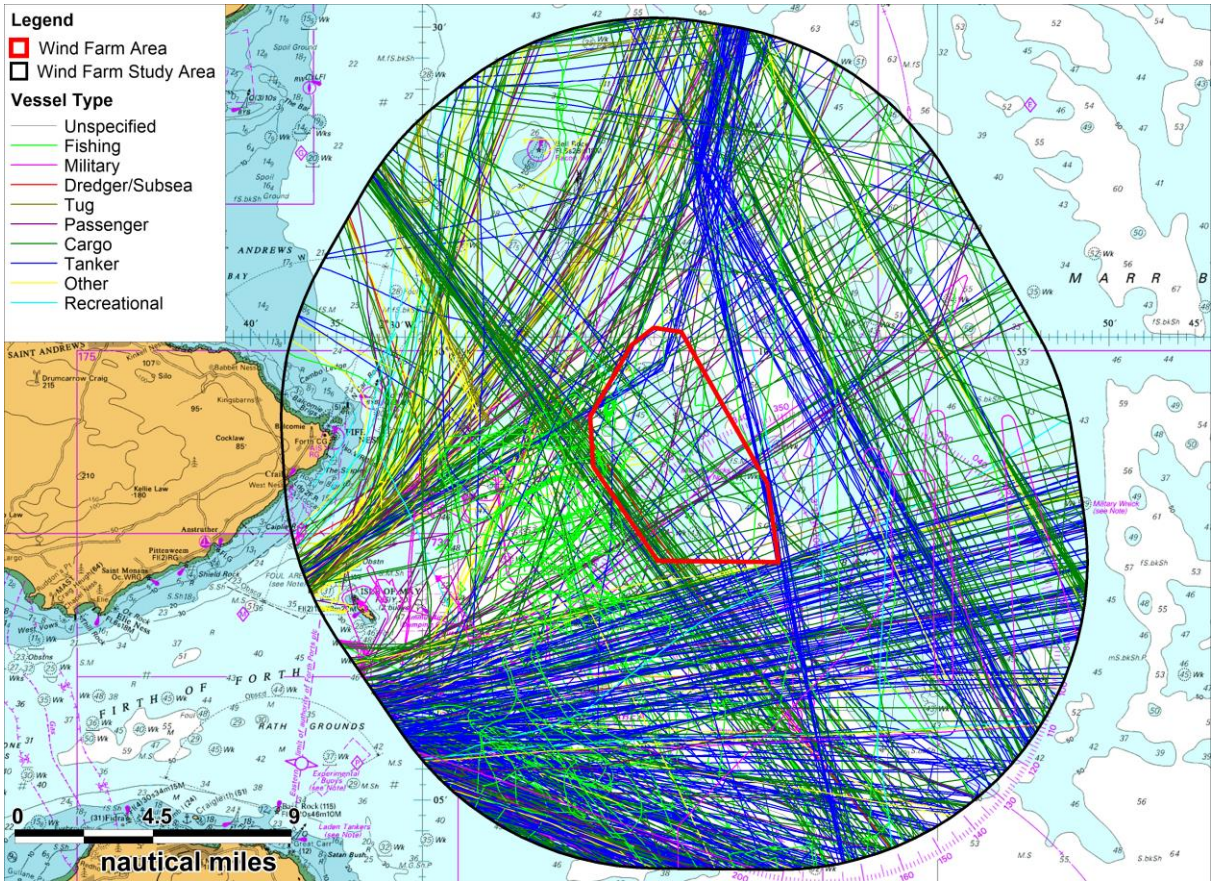

Figure 3.1 Vessel Type (60 Days 2010/2011)

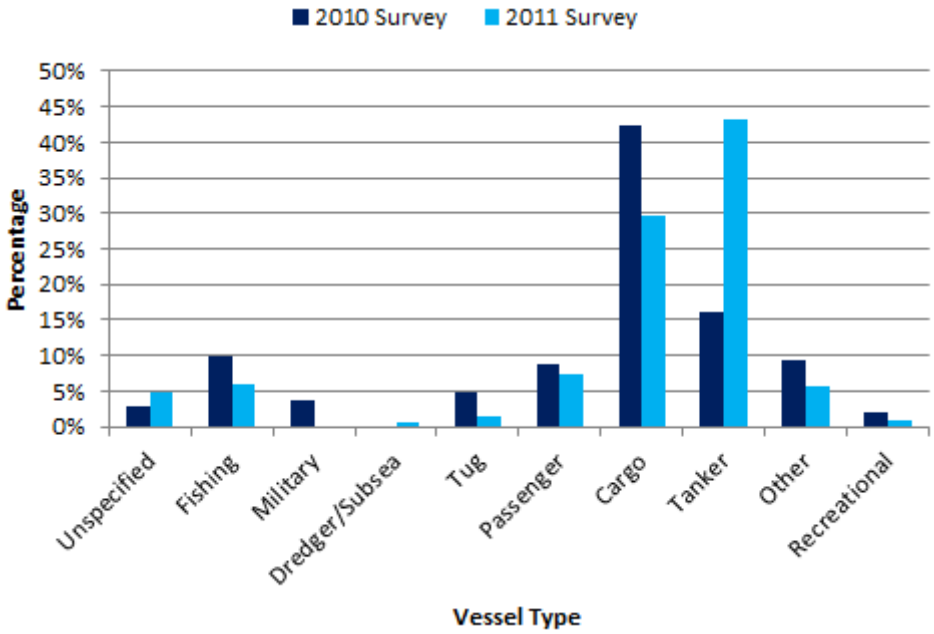

Figure 3.2 2010/11 Vessel Type Distribution

Throughout the combined survey periods, the most frequently recorded vessel types within the Wind Farm Study Area were cargo vessels (36%) and tankers (30%). Passenger vessels and fishing vessels contributed an average of 8% of frequently recorded vessel types across both survey periods, although each contributed a higher proportion in 2010.

Throughout the combined survey periods, there was an average of 14 unique vessels recorded per day within the Wind Farm Study Area. An average of two unique vessels per day (approximately 14% of vessels) was recorded intersecting the Wind Farm Area during the 2010 and 2011 study periods.

The average lengths of vessels recorded within the Wind Farm Study Area were 114m and 121m for the 2010 and 2011 survey periods, respectively. The majority of vessels were of lengths between 50 and 150m (approximately 73%).

The average draughts recorded within the Wind Farm Study Area were 5.9m and 6.1m for the 2010 and 2011 survey periods, respectively. The largest proportion of vessel tracks broadcast a draught between 4 and 6m (approximately 43%) in the combined survey periods, although a considerable proportion of vessels also had draughts between 6 and 8m (23%).

Average speeds recorded within the Wind Farm Study Area were 8.6 and 9.7 knots for the 2010 and 2011 survey periods, respectively. The largest proportion of vessel tracks were recorded transiting between 10 and 14 knots (approximately 34%) although a considerable proportion of vessels were also recorded with speeds between 6 and 10 knots (29%).

3.3 Main Routes

Based upon the 2010 and 2011 survey data, there are two main shipping routes passing in close proximity to the wind farm area which will be affected by the development, including traffic on approach/departure from the Firth of Tay and vessels on the coastal route from the north headed towards the Humber. All other vessels were considered not to be considerably affected as there is available sea room in the area to pass the site at a safe distance.

Figure 3.3 and Figure 3.4 present the vessel tracks on the two affected shipping routes, colour-coded by vessel type, and the mean route positions relative to the Wind Farm Area, respectively.

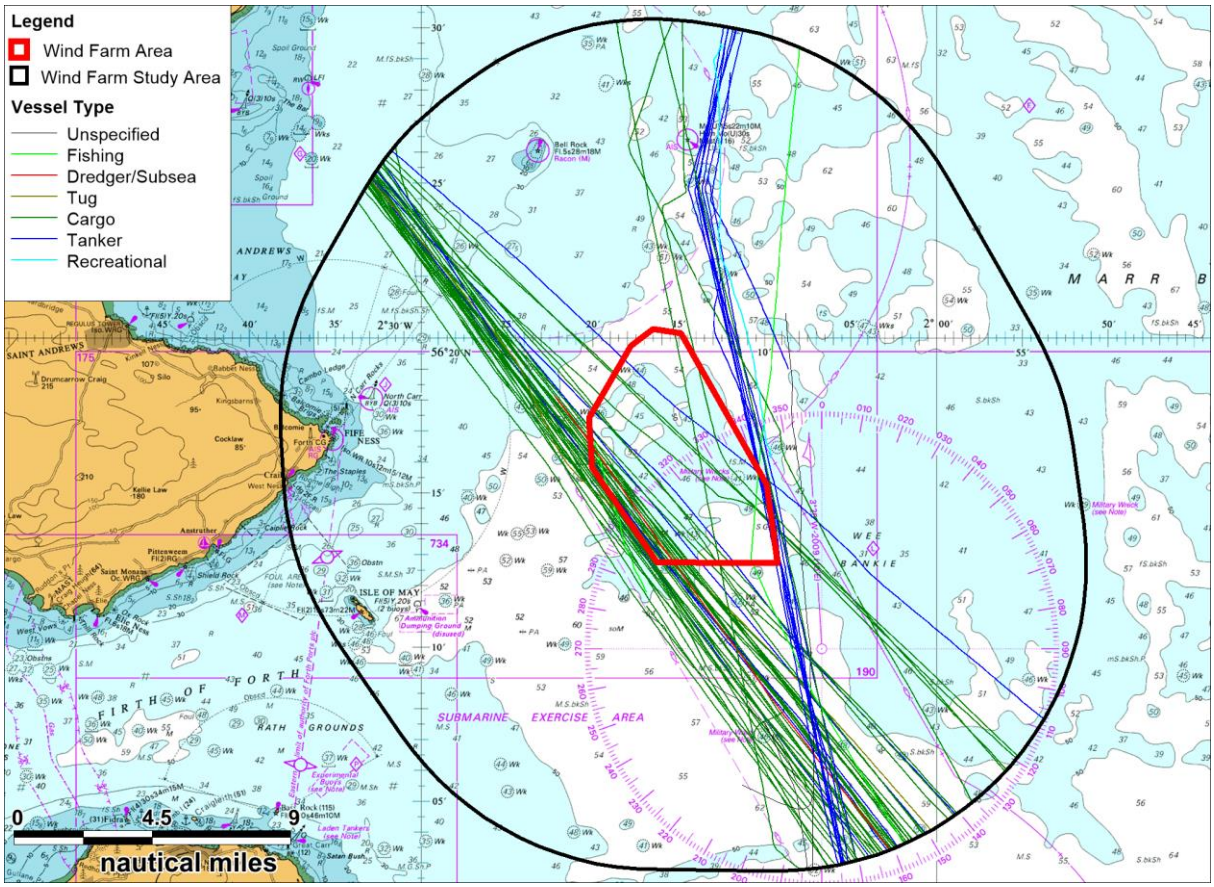

Figure 3.3 Survey Tracks by Type on Main Routes (2010/11)

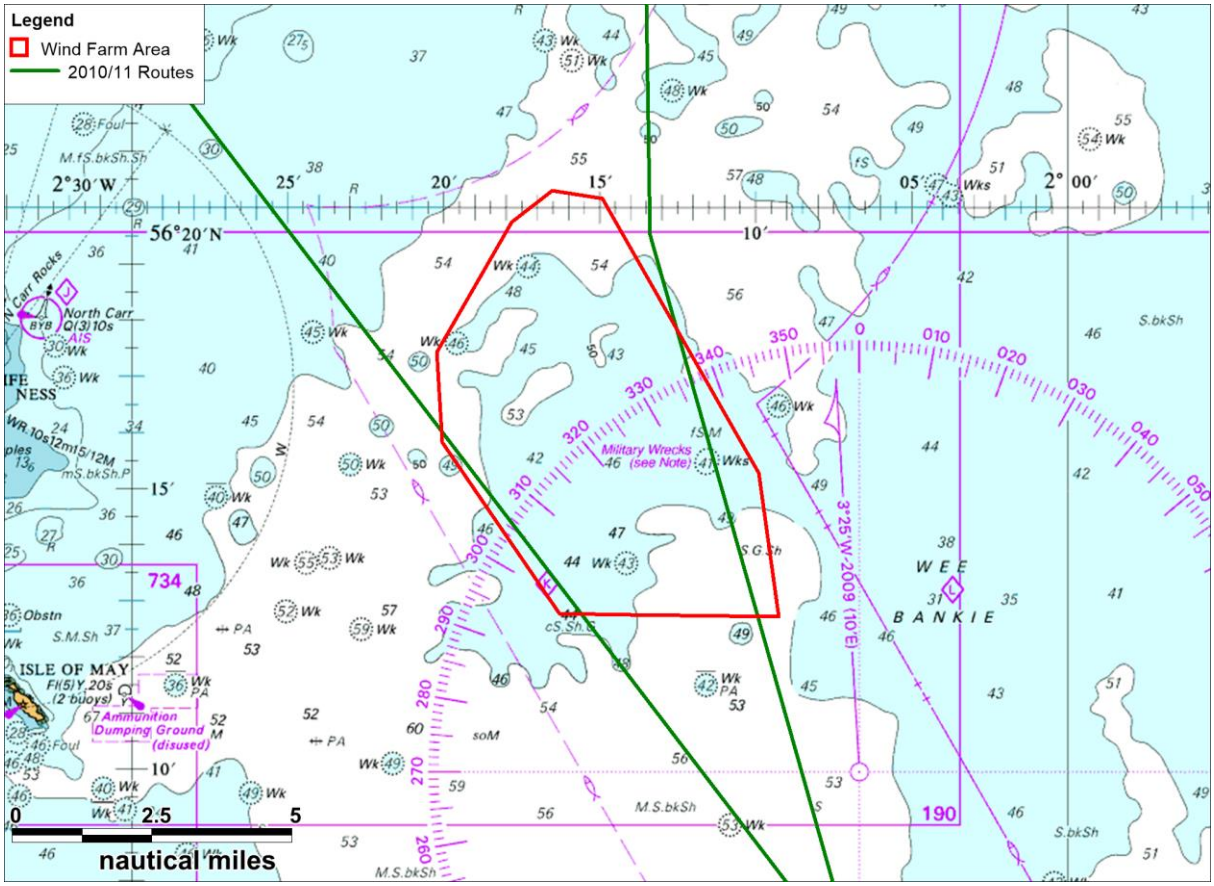

Figure 3.4 Mean Route Positions Relative to Site Boundary (2010/11)

Throughout the combined survey periods there was an average of just under one unique vessel per day using the Firth of Tay route and one unique vessel every three days on the coastal tanker route. Approximately 66% of the marine traffic was attributed to cargo vessels with tankers contributing 23%. All other vessel types did not contribute a considerable proportion (less than 5%) to the vessel type distribution. It is noted that the 'other' category in the 2010/11 data contains buoy-laying vessels, survey vessels and diving support vessels.

4. 2016 AIS Validation Results

4.1 Introduction

This section presents analysis of the vessel tracks recorded on AIS during June and December 2016. Assessments of vessel numbers, types and sizes are provided below for Wind Farm Study Area.

4.2 Vessel Type

An overview of the vessel tracks recorded within the Wind Farm Study Area, colour-coded by type, is presented in Figure 4.1. Following this, the vessel type distributions for the main vessel types for both study periods are presented in Figure 4.2.

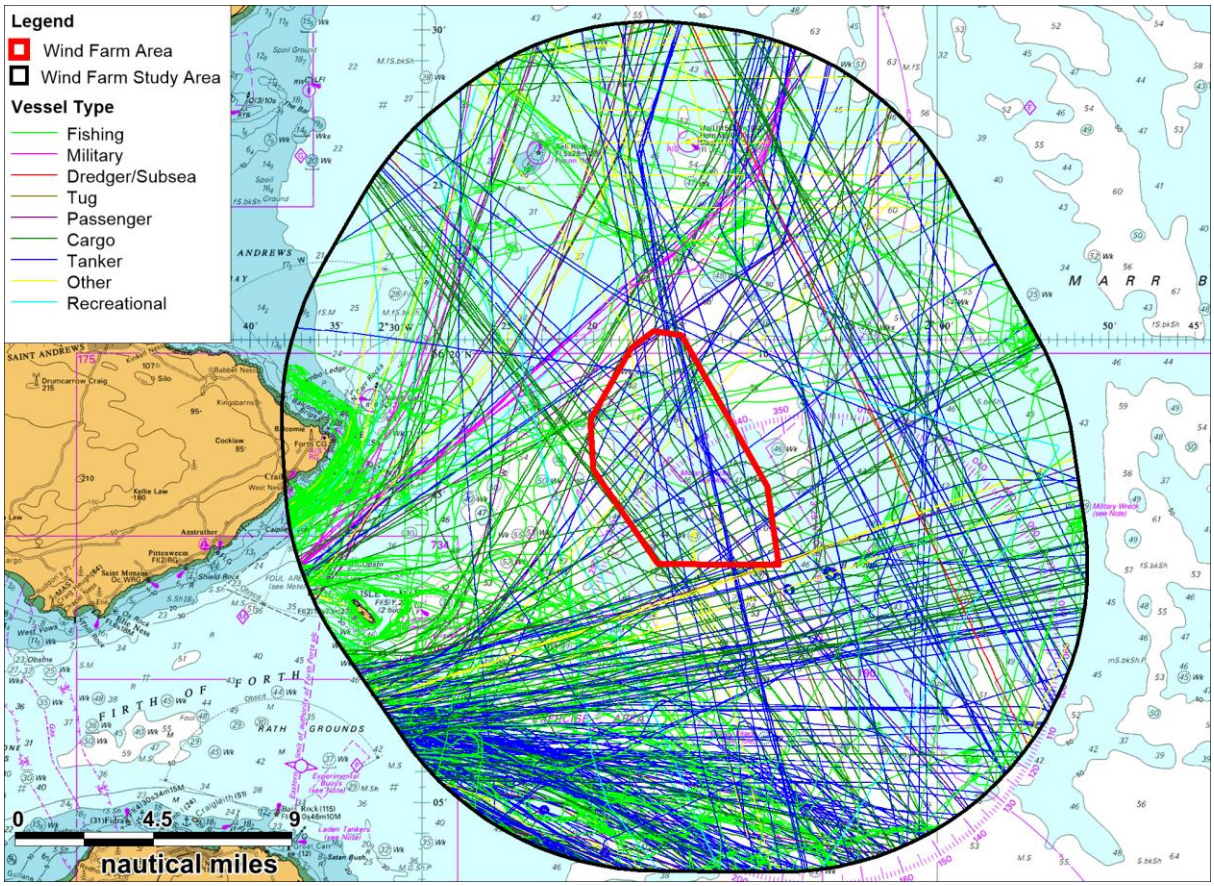

Figure 4.1 Vessel Type (28 days AIS 2016)

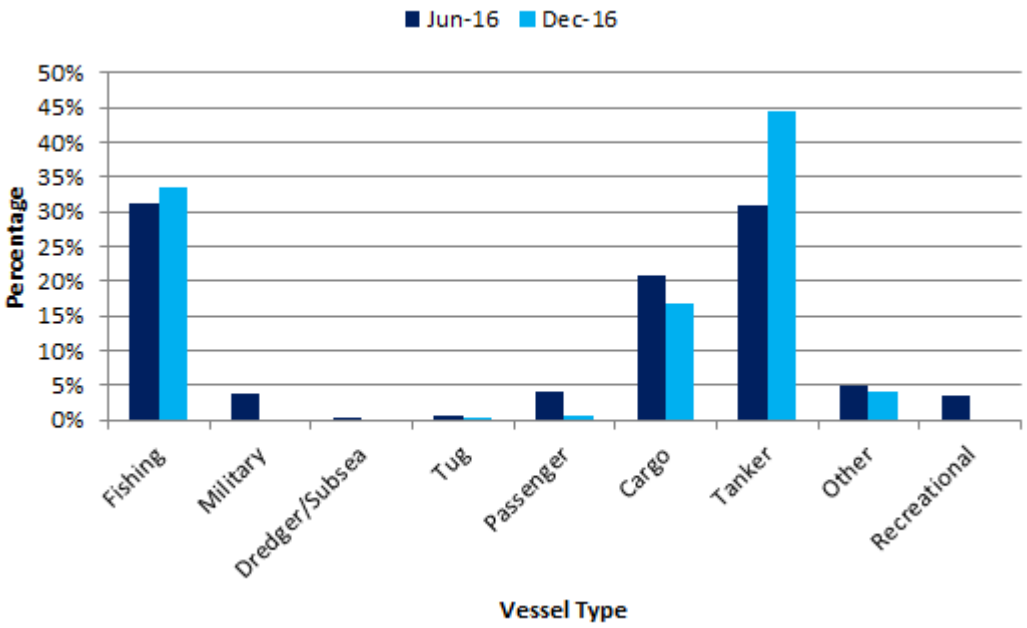

Figure 4.2 2016 Vessel Type Distribution

Throughout the combined study periods, the most frequently recorded vessel types within the Wind Farm Study Area were tankers (38%) followed by fishing vessels (32%) and cargo vessels (19%). All other vessel types were recorded much less frequently, each contributing less than 5% to the combined distribution.

There has been a considerable reduction in the contribution of cargo vessels although tankers remain a dominant vessel type in the distribution of vessel types. Fishing vessels have considerably increased to become the second most dominant vessel type. Upon closer examination, approximately 84% of fishing vessels recorded within the Wind Farm Study Area were below 18m in length. Therefore the large increase seen in the recent data is most likely due to the stricter AIS carriage requirements imposed in May 2015 (see Section 2.3).

In order to provide a more direct number comparison between the two data sets, 14 days from September and October 2010 and 14 days from July 2011 have been selected to determine the change in numbers of the main vessel types.

Fishing vessels - for the 28 day period selected from the original data, there was less than one unique fishing vessel per day recorded throughout the period, whereas the new 2016 data recorded a total of 7 unique fishing vessels per day. See section 5.5.

Tankers - there was also an approximate increase of 42% in tanker traffic with 163 recorded (summed for 28 days) in 2010/11 data compared to 231 recorded in the 2016 data – see section 5.2

Cargo vessels - numbers decreased from 143 unique vessels (summed for period) in the original study to 114 in the new study. Recreational traffic also increased with three unique vessels recorded in the original data compared to 10 in the 2016 data. See section 5.3.

Other vessel types - no considerable changes in vessel numbers. Overall this comparison, agrees well with the distribution change seen in the new data compared to the original data.

It can be concluded that the vessel type distribution has changed from the 2010/11 NRA survey data. For example, the relative proportion of cargo vessels has decreased by 17% whilst tankers have increased by 8%. As stated above, the 24% increase in fishing vessels is most likely due to the increased uptake of AIS systems by smaller craft. Similar results were seen when excluding fishing vessels from the analysis: a 6% increase in contribution from tankers and a 20% decrease from cargo vessels. The direct comparison of numbers produced similar results which validate the change in distribution.

A detailed comparison between numbers of each of the main vessel types within the Wind Farm Study Area per day is given in Section 5.

4.3 Vessel Count

Figure 4.3 presents the daily unique vessel count throughout both study periods intersecting both the Wind Farm Study Area and the Wind Farm Area.

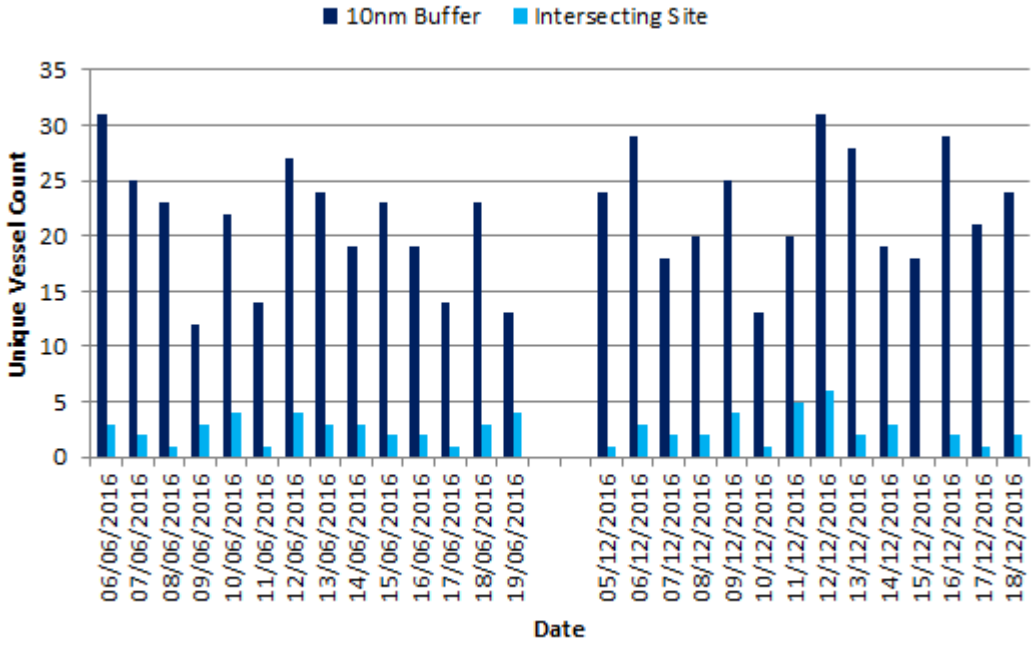

Figure 4.3 2016 Unique Vessel Daily Count

Throughout the combined study periods, an average of 22 unique vessels per day were recorded passing within the Wind Farm Study Area. This corresponds to an approximate increase of eight unique vessels per day when compared with the original 2010/11 NRA survey data (average of 14 unique vessels per day).

Averages of approximately 14% (three unique vessels per day) of vessels were recorded intersecting the Wind Farm Area during the combined 2016 study periods. This corresponds to an approximate increase of one unique vessel per day compared with the original 2010/11 NRA survey data (two unique vessels per day representing approximately 15% of vessel movements).

The busiest day throughout the 2016 study periods, within the Wind Farm Study Area, was the 12th December 2016 when a total of 31 unique vessels were recorded. The busiest day within the Wind Farm Area was also the 12th December 2016, when a total of six unique vessels were recorded.

It can therefore be concluded that the total number of vessel movements within the Wind Farm Study Area has increased considerably (approximately 57%) in the newer 2016 AIS data and the total number of vessel movements within the Wind Farm Area has also increased considerably (approximately 50%). However, these large increases in vessel numbers can be attributed to the considerable increase in smaller fishing craft now carrying AIS (12 unique

fishing vessels recorded on AIS in original data set compared to 48 unique vessels recorded on AIS in new data).

4.4 Vessel Length

Figure 4.4 presents the vessel tracks, colour-coded by vessel length, recorded within the Wind Farm Study Area during the two study periods. Following this, Figure 4.5 presents the vessel length distribution for each study period.

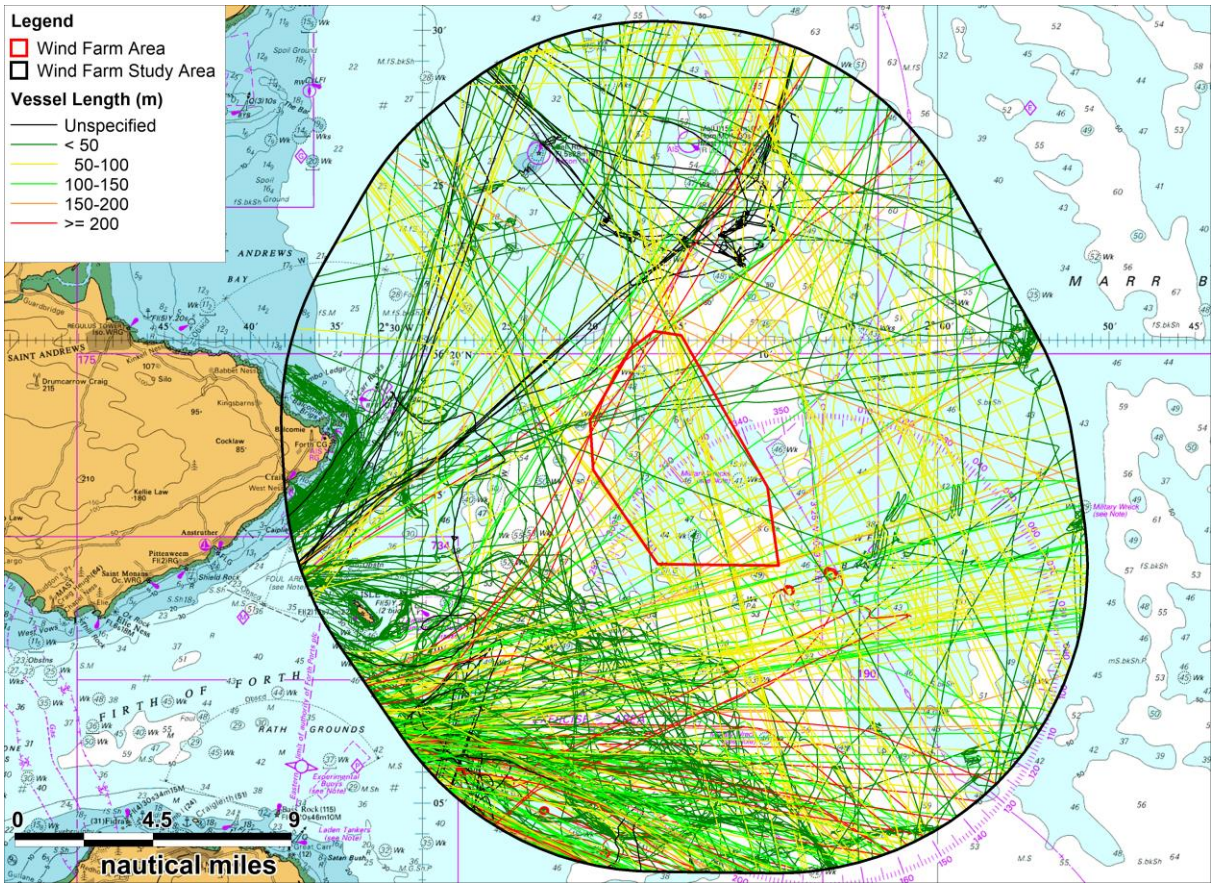

Figure 4.4 Vessel Length (28 Days AIS 2016)

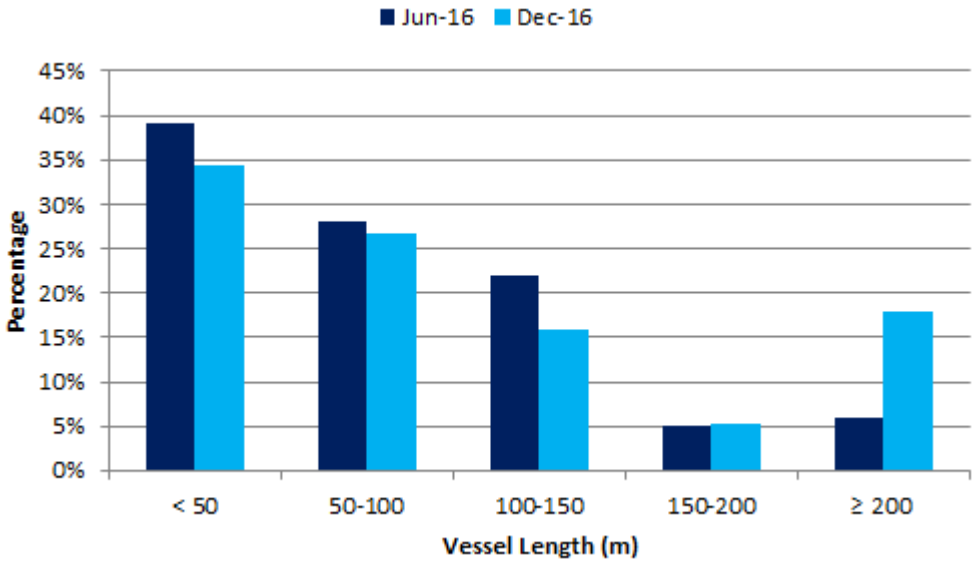

Figure 4.5 2016 Vessel Length Distribution

The average length of vessels recorded within the Wind Farm Study Area throughout June 2016 was 81.1m and throughout December 2016 was 104.8m.

The average length of vessels recorded throughout the 2010 survey period was 114m and throughout the 2011 survey period was 121m, with the majority (approximately 64%) of vessels less than 100m in length.

It can therefore be concluded that the average vessel length in 2016 (approximately 93m) is comparatively smaller than in the original 2010/11 NRA data which had an overall average vessel length of 117.5m. The lower average could, again, be considerably impacted by the large number of small craft (particularly fishing vessels) in the Wind Farm Study Area.

4.5 Vessel Draught

Figure 4.6 presents the vessel tracks, colour-coded by vessel draught, recorded throughout the combined 2016 study period. Following this, Figure 4.7 presents the vessel draught distribution for each study period. It is noted that a large proportion (approximately 40%) of vessel tracks could not be associated with a draught and have therefore been excluded from Figure 4.6 and the analysis which follows. The majority of vessels not associated with a draught were small fishing vessels as well as some recreational craft.

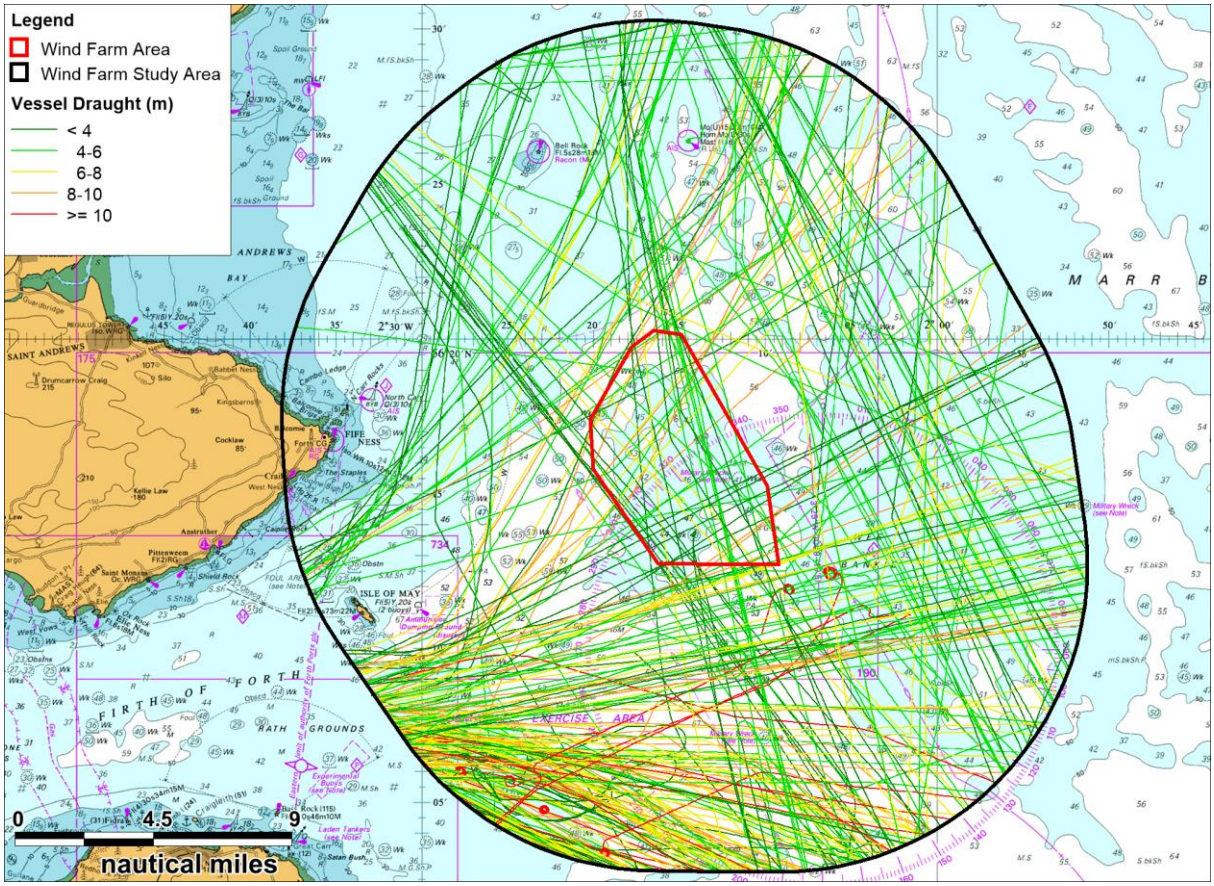

Figure 4.6 Vessel Draught (28 days AIS 2016)

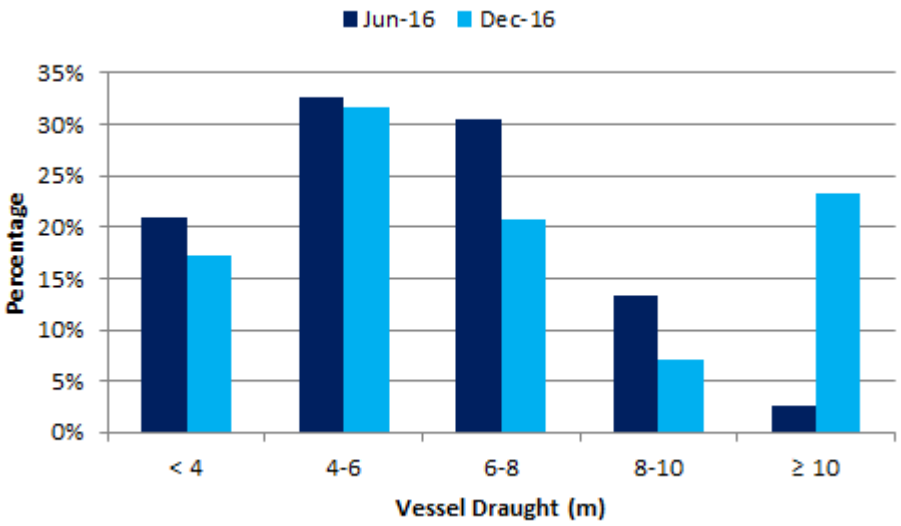

Figure 4.7 2016 Vessel Draught Distribution

The average draught of vessels (excluding those which did not broadcast a draught) recorded within the Wind Farm Study Area throughout the 2016 study periods were 5.7m (June 2016) and 6.9m (December 2016).

The average draught of vessels recorded during the original survey periods were 5.9m and 6.1m in 2010 and 2011, respectively. The majority (43%) of vessels recorded had draughts between 4 and 6m with a considerable proportion (23%) of vessels recording draughts between 6 and 8m.

It can therefore be concluded that the average vessel draught has increased slightly in the newer 2016 AIS data (average increase of 0.3m across both 2016 study periods). Furthermore the distribution of vessel draughts has altered. Vessels with a draught of 4 to 6m contribute comparatively less (average decrease of 11% across 2016 data) and vessels with a draught greater than 10m contribute comparatively more (average increase of 10% across 2016 data) in the recent 2016 data compared to the original 2010/11 survey data.

4.6 Vessel Speed

Figure 4.8 presents the vessel tracks, colour-coded by average vessel speed, recorded within the Wind Farm Study Area throughout the combined 2016 study period. Following this, Figure 4.9 presents the corresponding vessel speed distribution. It is noted that approximately 34% of vessel tracks could not be associated with a speed and have therefore been excluded from Figure 4.9 and the analysis which follows.

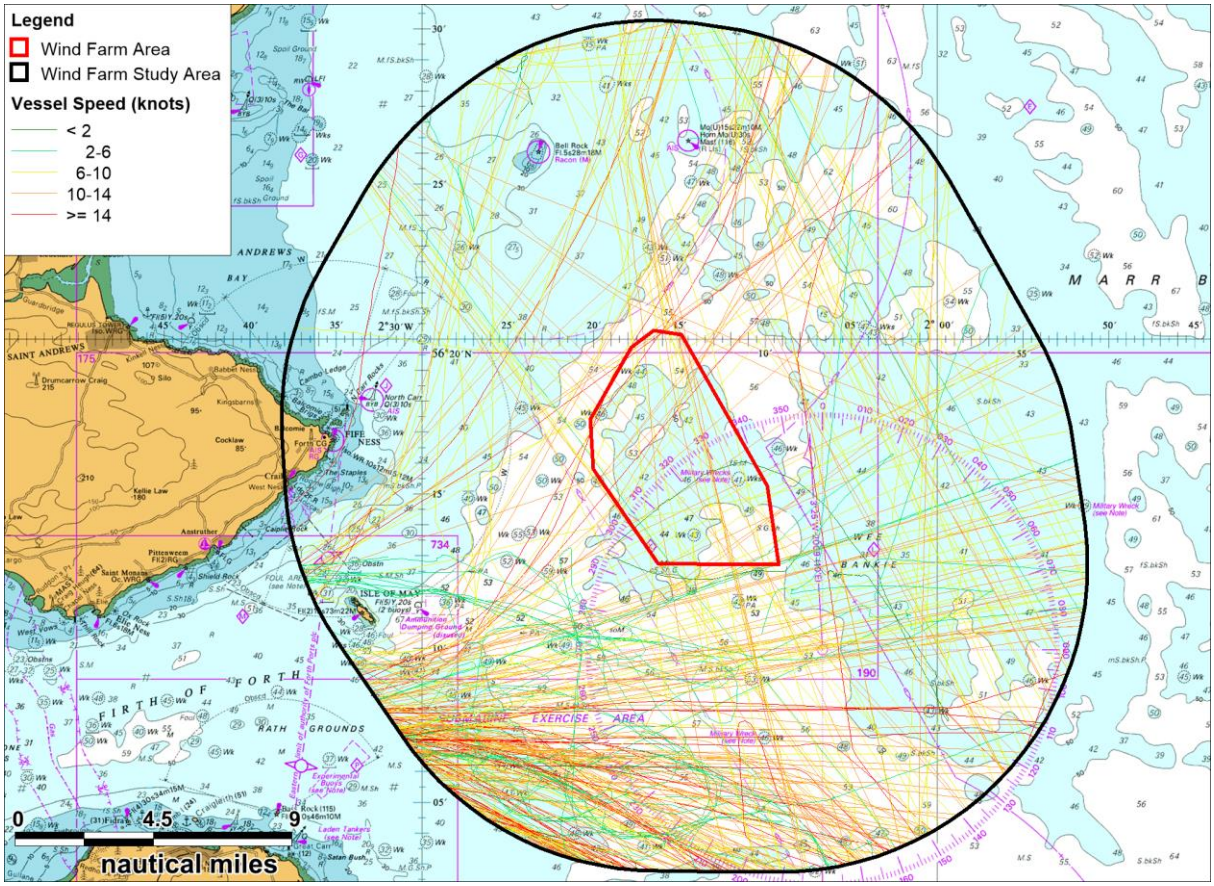

Figure 4.8 Vessel Speed (28 Days 2016)

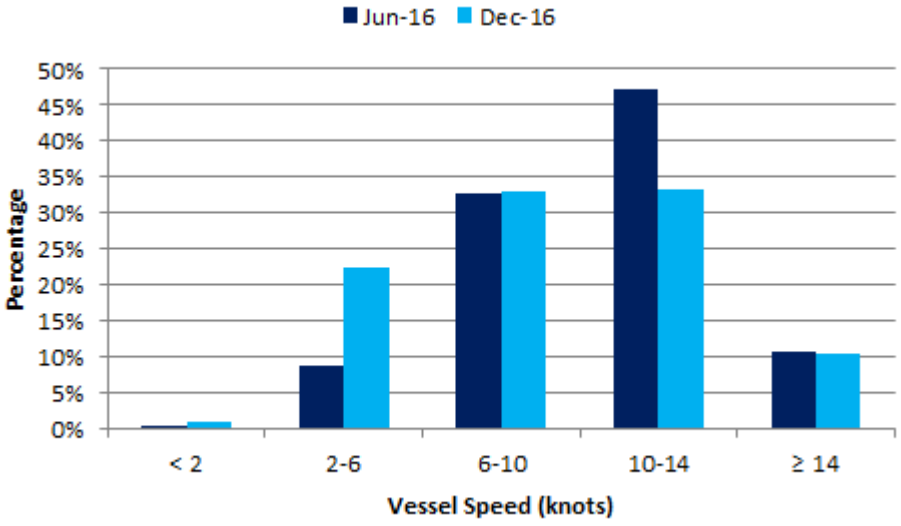

Figure 4.9 Vessel Speed Distribution

The average speed recorded in the Wind Farm Study Area, excluding unspecified speeds, throughout the 2016 study periods were 10.3 knots (June 2016) and 9.2 knots (December 2016), respectively.

The average speeds recorded during the original survey periods were 8.6 and 9.7 knots in 2010 and 2011, respectively. A considerable proportion of tracks (34%) had speeds recorded between 6 and 10 knots as well as between 10 and 14 knots (34%).

It can therefore be concluded that the distributions of the recent 2016 data sets and the original data sets are comparative. It is noted that vessels deemed to be at anchor were removed from the analysis.

5. Detailed Review by Vessel Type - 2016

5.1 Introduction

The following sub-sections present a more detailed analysis of the main vessel types recorded throughout the 2016 validation AIS data.

5.2 Tankers

Figure 5.1 presents the tanker tracks, colour-coded by tanker type, recorded within the Wind Farm Study Area throughout the 28 day study period. Tankers accounted for approximately 38% of marine traffic throughout the survey periods with a 14% higher contribution in winter than in summer.

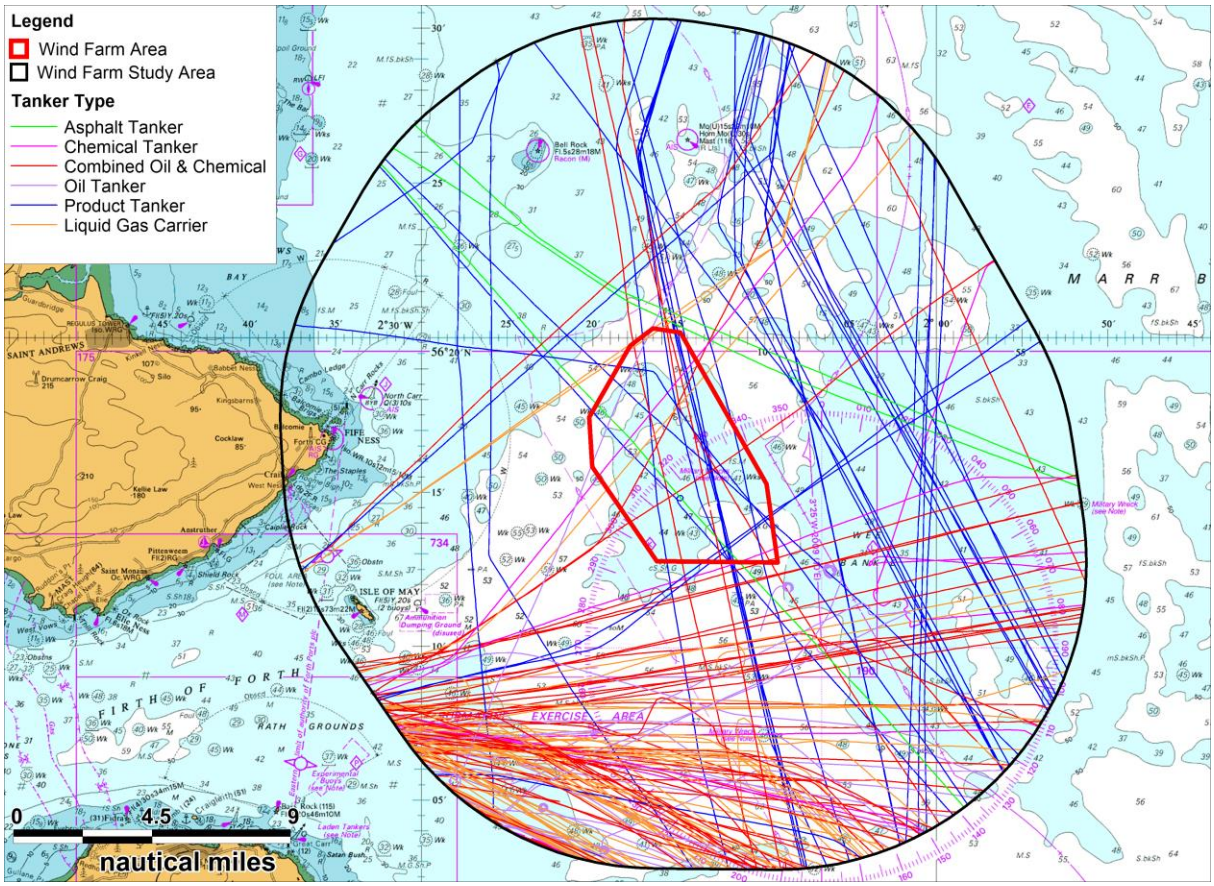

Figure 5.1 Tanker Types (28 days AIS 2016)

The most frequently recorded tanker type within the Wind Farm Study Area was oil tankers (28%). Liquefied gas carriers (26%) and combined oil & chemical tankers (25%) also represented a considerable proportion of the tankers recorded.

The most frequently recorded tanker type intersecting the Wind Farm Area was product tankers (48%) and combined oil & chemical tankers (26%).

Throughout the combined 2016 study periods, there was an average of eight unique tankers per day recorded within the Wind Farm Study Area. Of these vessels, an average of one unique tanker per day was recorded intersecting the Wind Farm Area.

5.3 Cargo Vessels

Numerous cargo vessel types were recorded within the Wind Farm Study Area including general cargo, container vessels and offshore supply vessels. Cargo vessels accounted for approximately 19% of marine traffic throughout the combined 2016 study periods. Figure 5.2 presents the tracks of cargo vessels, colour-coded by cargo vessel type, recorded within the Wind Farm Study Area.

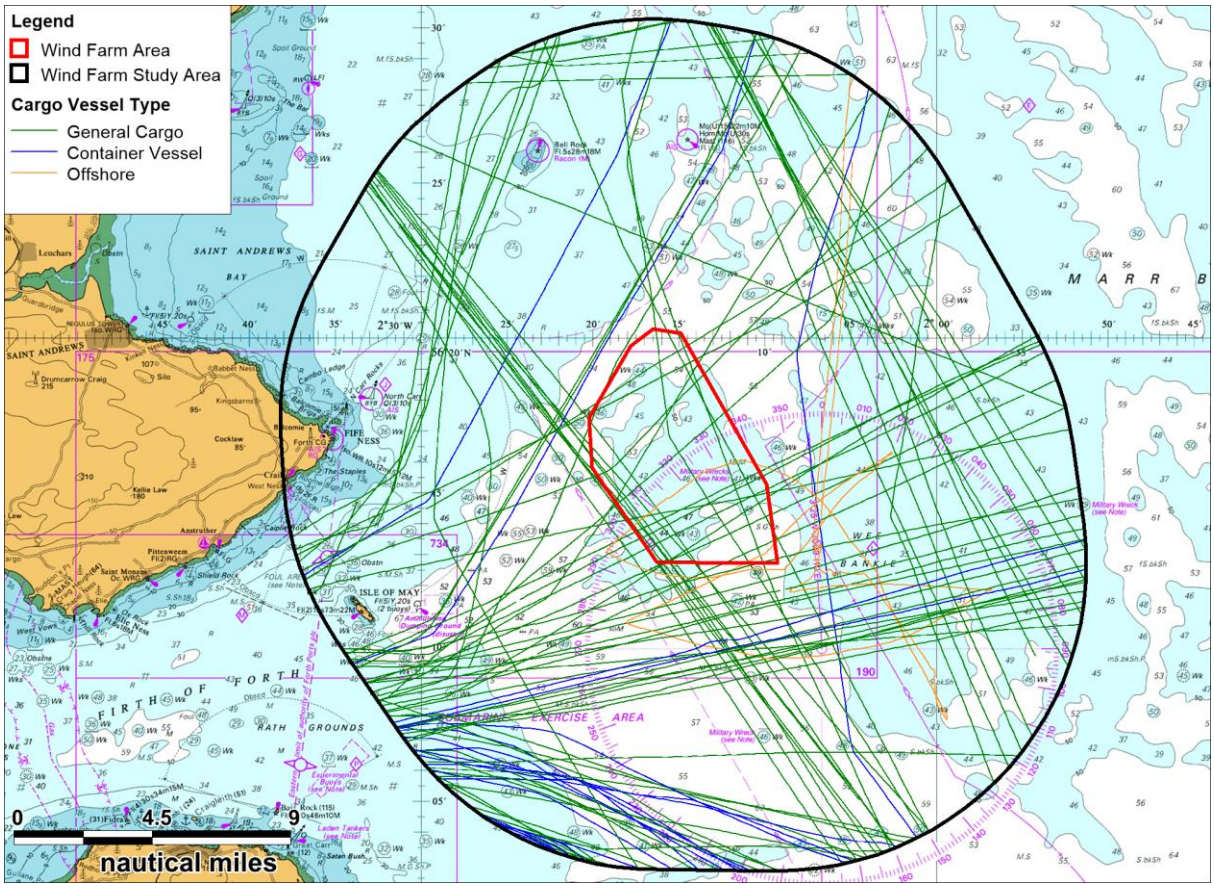

Figure 5.2 Cargo Vessel by Type (28 days AIS 2016)

The dominant cargo vessel type recorded within the Wind Farm Study Area was general cargo vessels (79%). Container vessels (18%) and offshore supply vessels (3%) did not contribute as considerably within the two study periods.

The most frequently recorded cargo vessel type intersecting the Wind Farm Area was general cargo vessels (92%) and offshore supply vessels (8%).

Throughout the combined study period an average of four unique cargo vessels per day were recorded within the Wind Farm Study Area, compared to five unique vessels in the original data. Of the vessels recorded in the 2016 data, an average of one unique vessel per day was

recorded intersecting the Wind Farm Area. Therefore, it can be concluded that the average numbers of cargo vessels recorded within the area of interest has decreased in comparison to the original 2010/11 data.

5.4 Passenger Vessels

Figure 5.3 presents the passenger vessel tracks recorded within the Wind Farm Study Area throughout the combined 2016 study periods. Passenger vessels accounted for approximately 2% of overall tracks within the Wind Farm Study Area for the combined survey periods, with traffic considerably higher in the summer.

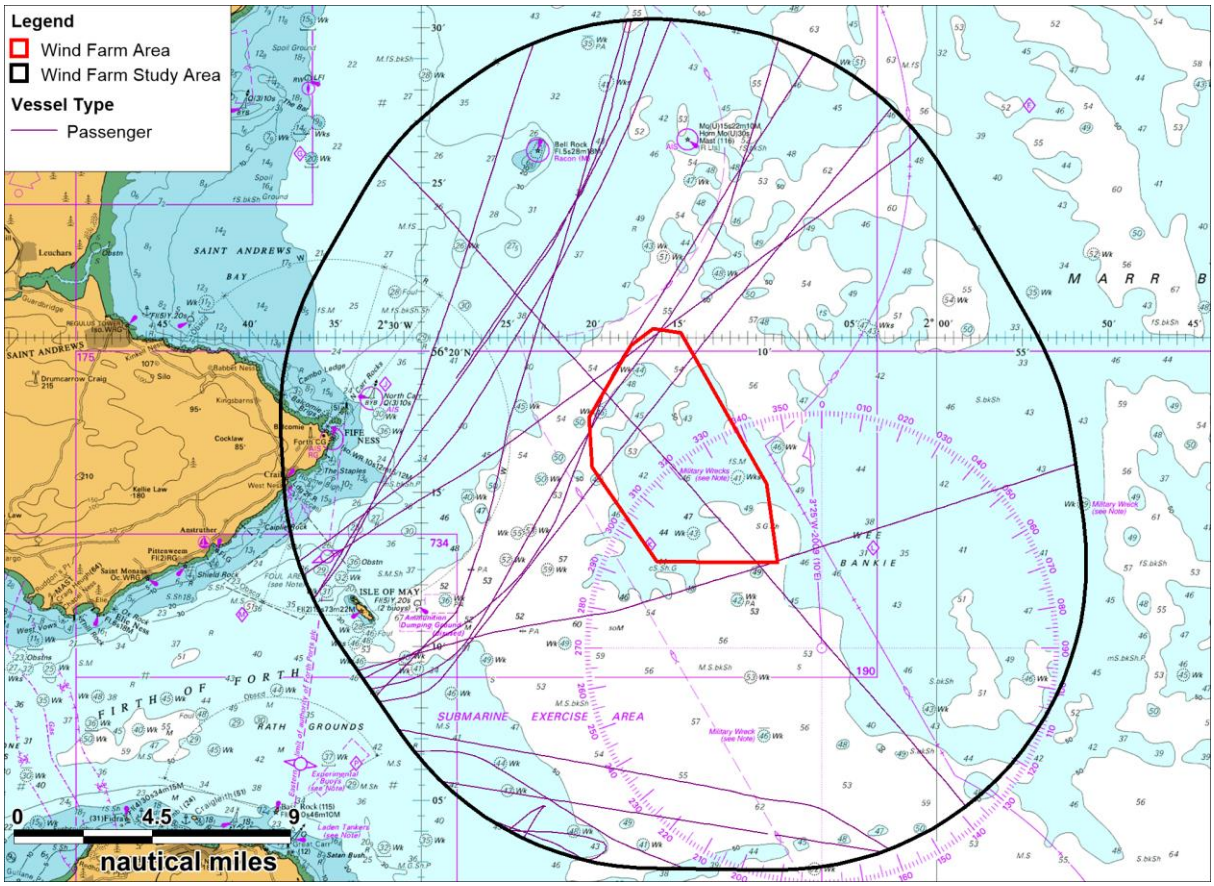

Figure 5.3 Passenger Vessels (28 Days AIS 2016)

There was an average of one passenger vessel per day within the Wind Farm Study Area during the summer (June 2016) and approximately one passenger vessel every seven days during the winter (December 2016). Six unique vessels were recorded intersecting the Wind Farm Area which corresponds to one unique passenger vessel every four to five days. This is an increase in movements from the original data set which recorded eight unique passenger vessels intersecting the site (average of one vessel every seven to eight days).

5.5 Fishing Vessels

Figure 5.4 presents the tracks of fishing vessels which were recorded within the Wind Farm Study Area during the 2016 study periods. Fishing vessels represented approximately 32% of

the overall traffic within the Wind Farm Study Area for the two periods combined. Seasonal variation was not apparent.

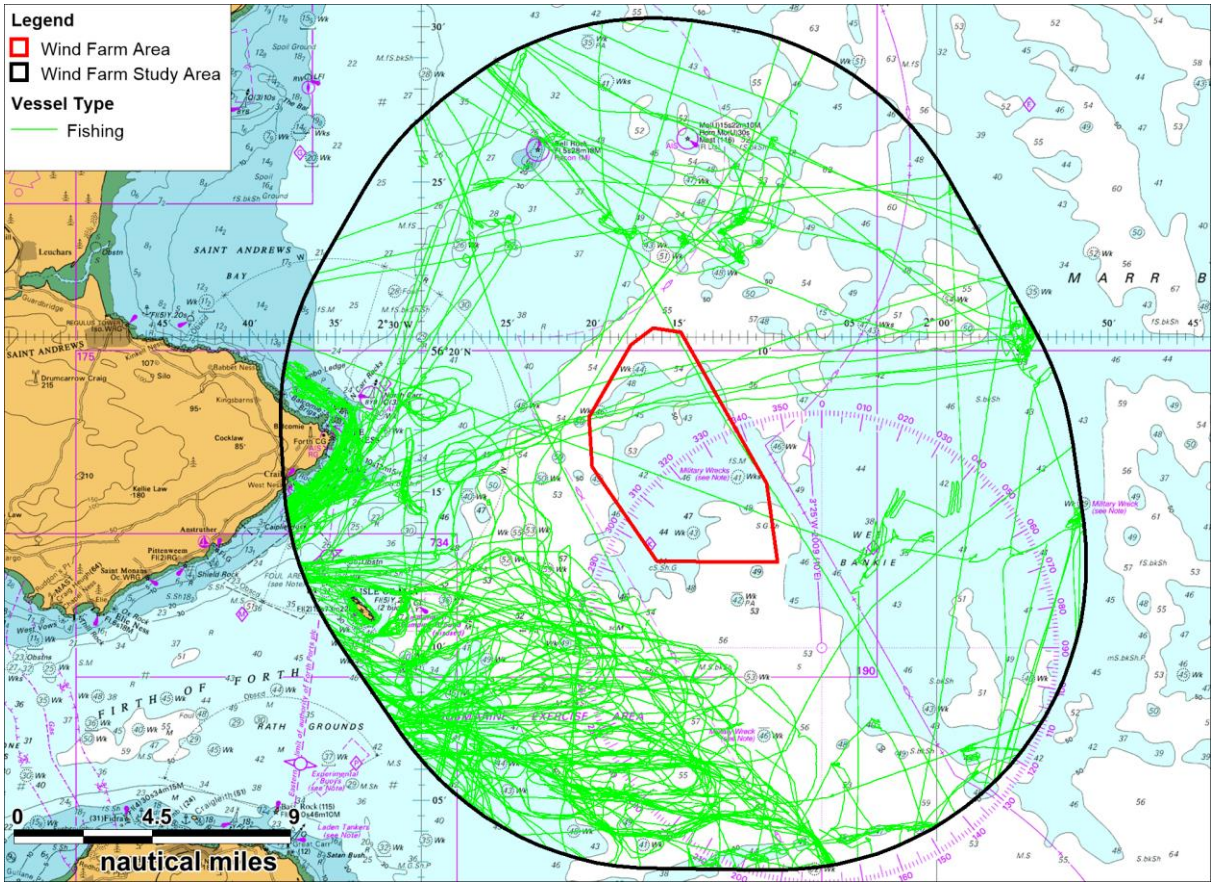

Figure 5.4 Fishing Vessels (28 days AIS 2016)

There was an average of seven unique fishing vessels per day recorded during the two study periods within the Wind Farm Study Area compared to one per day recorded in the original data set (AIS only). Of the identified gear-types, the most common gear-types recorded within the Wind Farm Study Area were boat dredgers (55%), demersal trawlers (23%) and twin trawlers (23%).

The vast majority of fishing activity was recorded west and south of the site. Very little activity was recorded within the site with only three unique vessels recorded transiting through. There was an average of one vessel recorded transiting through the site every six days which is a decrease from the one vessel every five days recorded in the original data set. Therefore, although fishing has increased within the Wind Farm Study Area overall, it can be concluded that activity within the site has decreased.

5.6 Recreational Vessels

The tracks of recreational vessels, colour-coded by recreational type, within the Wind Farm Study Area for the combined 2016 study periods are presented in Figure 5.5. Recreational vessels represented approximately 2% (3% in June and less than 1% in December 2016) of

the overall marine traffic within the Wind Farm Study Area for the combined 2016 study periods.

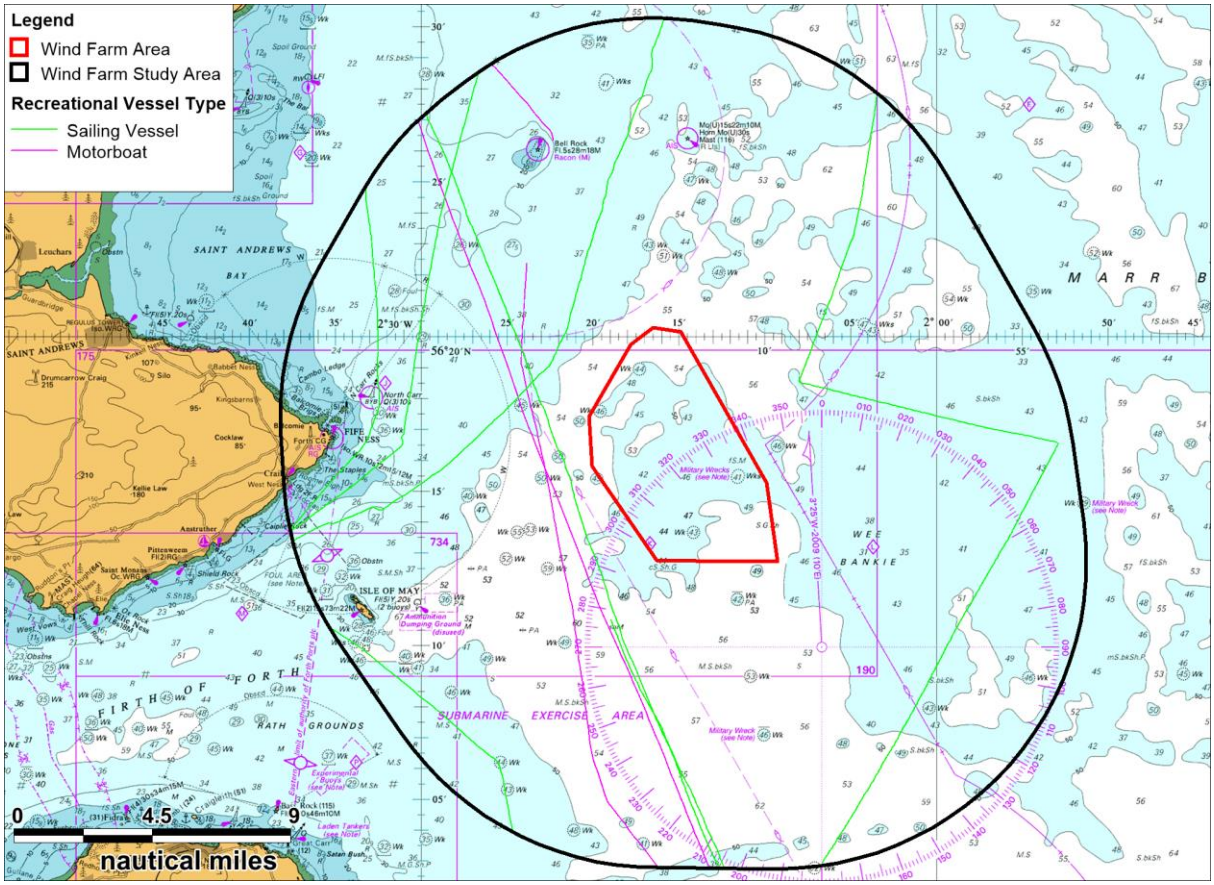

Figure 5.5 Recreational Vessels by Type (28 days 2016)

The majority of the recreational vessels recorded in the Wind Farm Study Area were sailing vessels whilst the remaining were motorboats. No recreational vessels were recorded intersecting the Wind Farm Area. There was an average of one recreational vessel per day within the summer period (June 2016) but no recreational vessels were recorded in the winter period (December 2016). In the original data, recreational vessels were only recorded within the 2010 survey with an average of approximately one vessel every two days. Therefore, it can be concluded that there has been an increase in recreational movements in summer.

5.7 Intersecting Vessels

Figure 5.6 presents the vessel tracks recorded during June and December 2016, colour-coded by types, which were identified to pass within the Wind Farm Area.

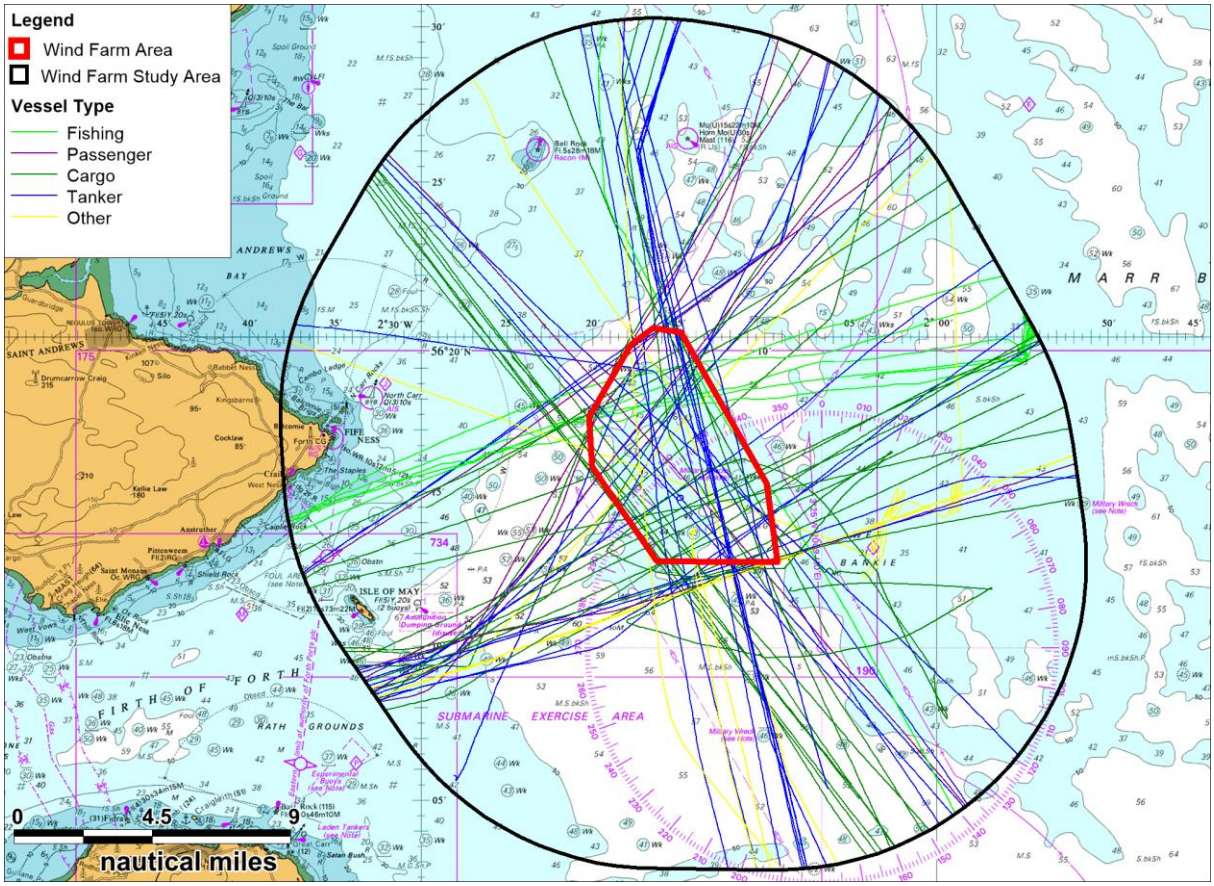

Figure 5.6 Tracks |Intersecting the NnG Wind Farm Site Boundary (28 Days AIS 2016)

A total of 70 tracks from 50 unique vessels were recorded intersecting the Wind Farm Area, corresponding to an average of three vessels per day. This is a slight increase from the original data set which recorded an average of two vessels per day. The most common type of vessels passing throughout the site in the new data were tankers (39%) and cargo vessels (37%), which is comparative to the original data.

5.8 Anchored Vessels

Anchored vessels can be identified based on the AIS navigational status which is programmed on the AIS transmitter on board a vessel. Information is manually entered into the AIS; therefore it is common for vessels not to update the navigational status if they are anchored only for a short period of time. For this reason, those vessels which travelled at a speed of less than one knot for more than 30 minutes were assumed to be at anchor and were included in the following analysis.

Figure 5.7 presents the tracks of vessels deemed to be at anchor within the Wind Farm Study Area, during the 2016 study periods.

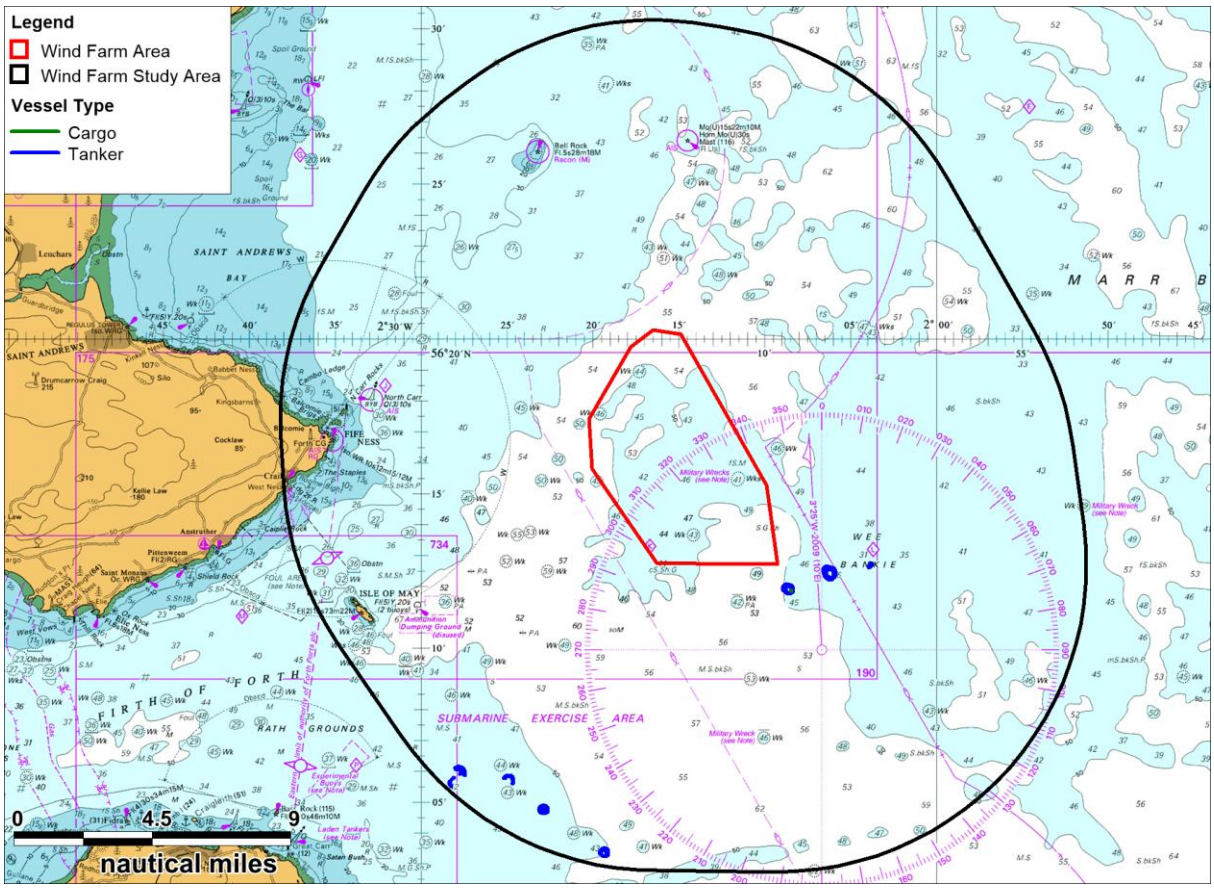

Figure 5.7 Anchored Vessels (28 days 2016)

Throughout the 2016 study periods there was an average of two unique vessels per day at anchor. The vast majority of vessels recorded at anchor were tankers (96%) with cargo vessels only accounting for the remaining 4%. The majority of anchoring recorded in the Wind Farm Study Area were vessels awaiting orders at the Dunbar anchorage. No vessels were deemed to be at anchor within the Wind Farm Area. The four vessels anchored close to the Wind Farm Area were all recorded in the winter (December 2016) study period with a combined duration of 408 hours, taking into account AIS data collection downtime.

It is noted that the analysis of anchored vessels in the original NRA study, is not directly comparable as it spanned a period of nine months within a study area defined for the Offshore Export Cable Corridor (at the time of writing). Nevertheless, both data sets did not record any vessels at anchor within the Wind Farm Area.

5.9 Summary of vessel type review

A summary detailing the number of unique vessels per day for each main vessel type, recorded within the Wind Farm Study Area and intersecting the Wind Farm Area is given below in Table 5.1.

Table 5.1 Detailed Comparison of Main Vessel Types

	Vessel Type	2010/11 Data	2016 Data
Wind Farm Study Area	Tanker	5 per day	8 per day
	Cargo	5 per day	4 per day
	Fishing	1 per day	7 per day
	Recreational	1 every 2-3 days	1 per day
Wind Farm Area	Tanker	1 every 2 days	1 per day
	Cargo	2 per day	1 per day
	Fishing	1 every 5 days	1 every 6 days
	Passenger	1 every 7-8 days	1 every 4-5 days
	All	2 per day	3 per day

Within the Wind Farm Area, there has been an increase in the number of tankers transiting through. This can be attributed to the slight deviation in the coastal tanker route caused by the installation of the Inch Cape Met Mast (more information provided in Section 6). Tankers now pass directly through the Wind Farm Area as opposed to the east, as seen in the original data. An increase of three tankers per day (60%) was recorded in the new 2016 data compared to the original data, within the Wind Farm Study Area.

A density plot (using a 500m x 500m grid) has been presented in Figure 5.8 to identify the areas in which tanker traffic was most abundant.

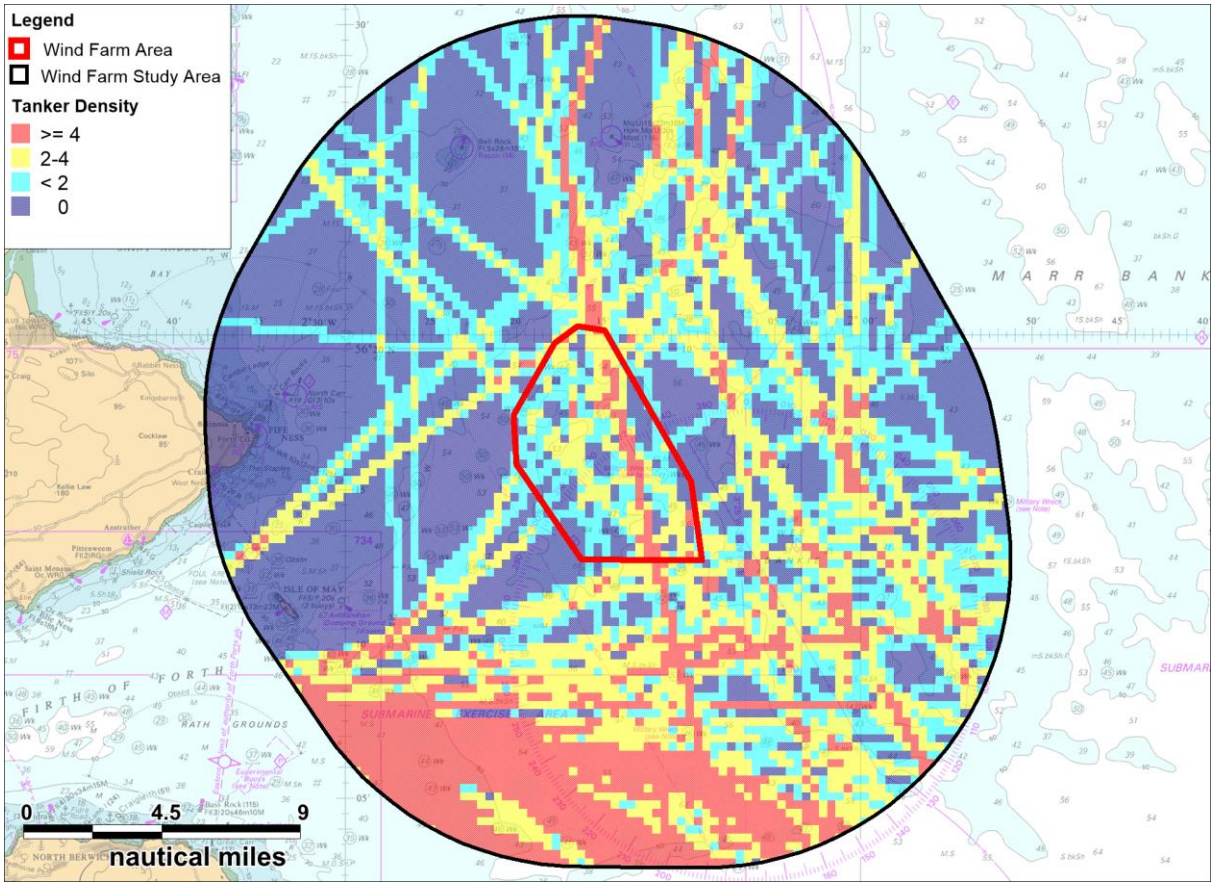

Figure 5.8 Tanker Density (From 28 Days AIS 2016)

The majority of the high density areas (where four or more vessels intersect a cell) lie to the south of the Wind Farm Area. High density is also seen on the coastal tanker route, which passes directly through the site (see Section 6 for more details on specified tanker route). Therefore showing that although there has been a change of routeing within the Wind Farm Area the increases in numbers of tankers within the Wind Farm Study Area are further to the south on main routes to / from the Firth of Forth.

The number of cargo vessels recorded intersecting the site, as well as within the Wind Farm Study Area, has decreased by one unique vessel per day. This is similar to the decrease seen in fishing vessels transiting through the site despite the considerable increase of fishing activity recorded within the overall Wind Farm Study Area.

The number of passenger vessels intersecting the site has increased from the original 2010/11 survey data, with an average of one vessel every four to five days recorded in 2016. No recreational vessels were recorded intersecting the Wind Farm Area. Therefore, it can be concluded that the overall vessel activity within the Wind Farm Area has increased, with an average of three vessels per day transiting through the area in 2016.

6. Main Routes

The 2016 AIS data was also used to determine whether any alterations had been made to the main routes passing within close proximity to the Wind Farm Area. Based on the analysis of the recent shipping data, the majority of traffic still passes well clear of the Wind Farm Area and thus will not be notably affected. Traffic passing to the north and south of the Wind Farm Area has available sea room to avoid the wind farm when constructed and thus minimal impact is expected for these vessels. The two main routes that could be affected by the presence of the wind farm are the north west to south east shipping lane to/from the Firth of Tay and the coastal traffic travelling between Humber and northern Scottish ports such as Aberdeen, Peterhead and Lerwick. The AIS tracks of the vessels transiting on the Firth of Tay route and the tanker coastal route for the two study periods are presented in Figure 6.1. The previous routes are presented in Figure 6.2 to give a clear comparison between the two data sets.

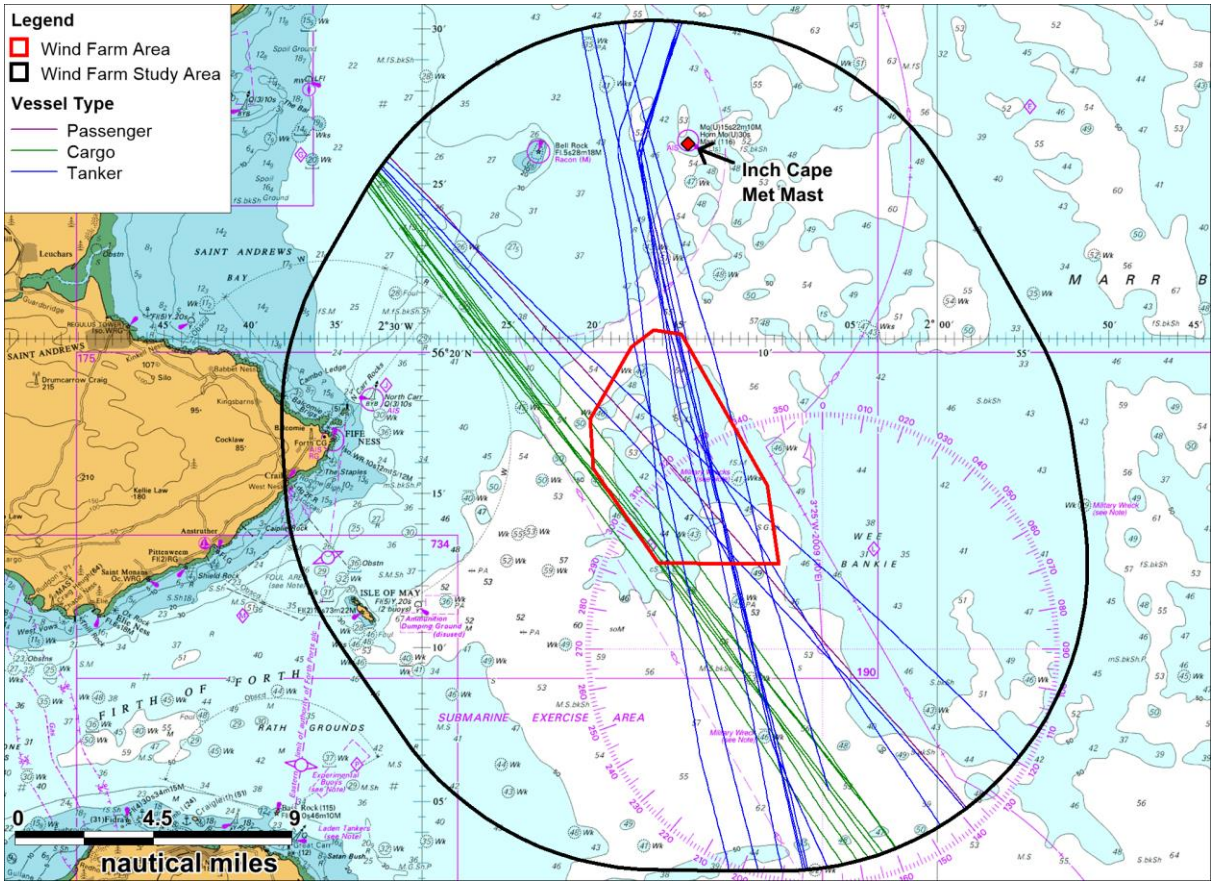

Figure 6.1 Tracks by Type on Main Routes Affected by Wind Farm (28 Days AIS 2016)

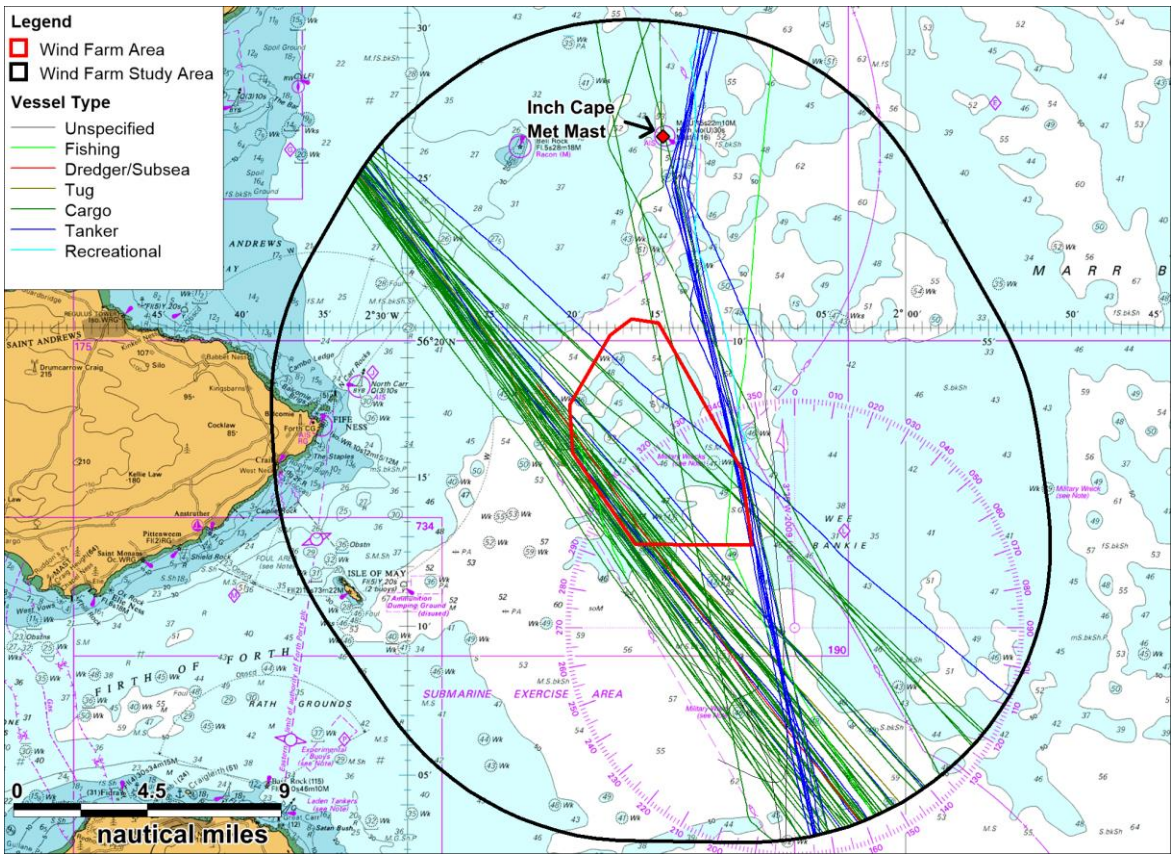

Figure 6.2 Tracks by Type on Main Routes Affected by the Wind Farm (60 Days AIS 2010/2011)

Throughout the combined 2016 study periods, there was an average of one unique vessel every two days using the Firth of Tay route. The majority of vessels using this route are cargo vessels (69%) followed by tankers (23%) and passenger vessels (8%). There was an average of one unique vessel every three to four days transiting along the coastal route. The majority (90%) of vessels are tankers with the remaining 10% from cargo vessels.

In comparison to the original data sets, there were less vessels recorded using the Firth of Tay route in 2016, whilst the coastal route had a similar number of transits. For example, the 2010/2011 data recorded, on average, just under one unique vessel per day using the Firth of Tay route (one every two days in 2016 data) and one vessel every three days on the coastal route (one every three to four days in 2016 data).There is a small alteration to the mean route position on the coastal route in the recent 2016 data with vessels transiting directly through the north of the site as opposed to the far east as seen in the previous data sets (2010/2011). This is due to the installation of the Inch Cape Met Mast (illustrated in Figure 6.1 and Figure 6.2) which was not present during the original study period (2010/2011). Nevertheless, the anticipated route proposed in the original NRA (Anatec, 2012) would still remain valid; however the deviation from the original route will now be larger.

Figure 6.3 presents the 90th percentiles for the two current shipping routes (2016) whilst Figure 6.4, presents the anticipated future routes alongside the currently used routes.

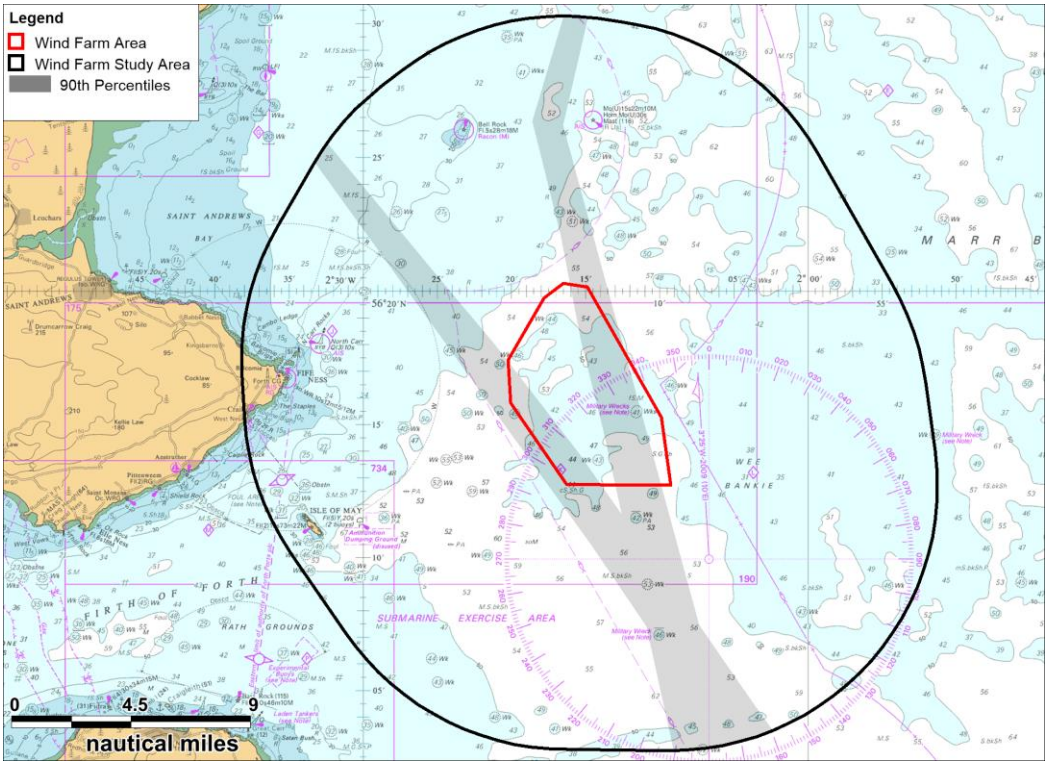

Figure 6.3 Main Route 90th Percentiles (2016)

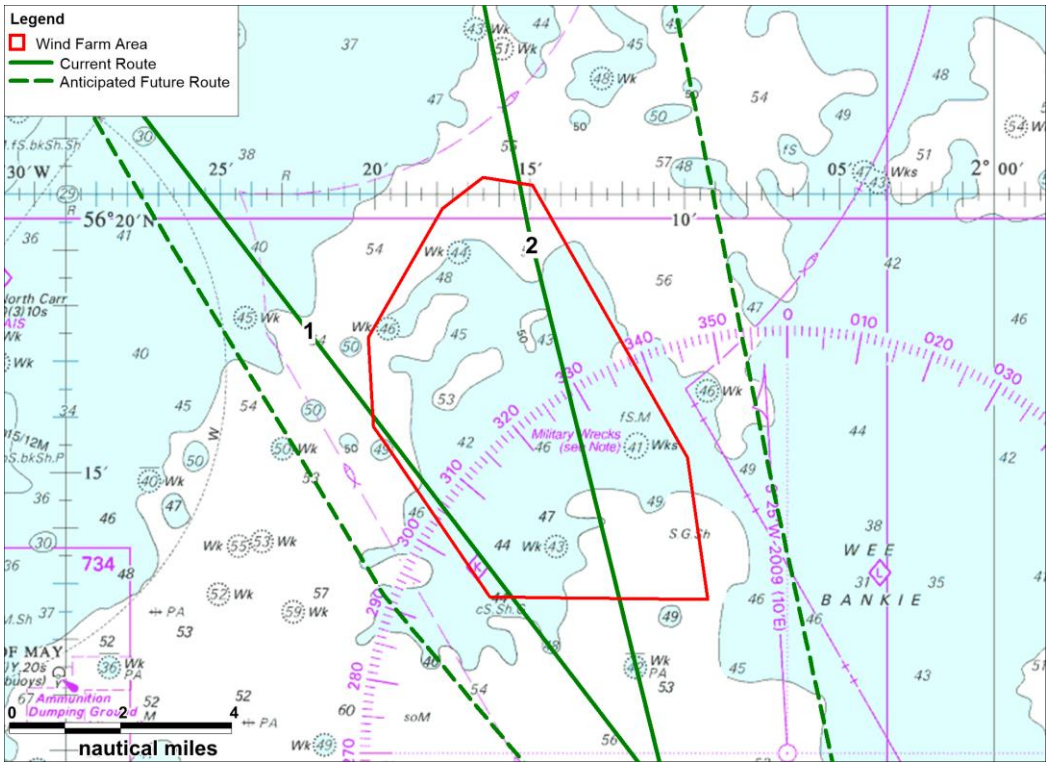

Figure 6.4 Current and Anticipated Route Positions

7. Offshore Export Cable Corridor Assessment

7.1 Introduction

This section provides a baseline assessment of the Offshore Export Cable Corridor, based on the data sources listed in Chapter 11: Shipping and Navigation. This assessment has not been included in the Chapter on the basis that all impacts to shipping and navigation receptors associated with the Offshore Export Cable were scoped out of the EIA (NnGOWL, 2017; MS-LOT, 2017), however for reference, and to demonstrate full compliance with MGN543, the assessment has been included in this appendix.

Assessment has been undertaken within a 5NM buffer of the Offshore Export Cable Corridor (the Offshore Export Cable Study Area).

7.2 Navigational Features

Navigational features within the area are shown relative to the Offshore Export Cable Corridor and Offshore Export Cable Study Area in Figure 7.1.

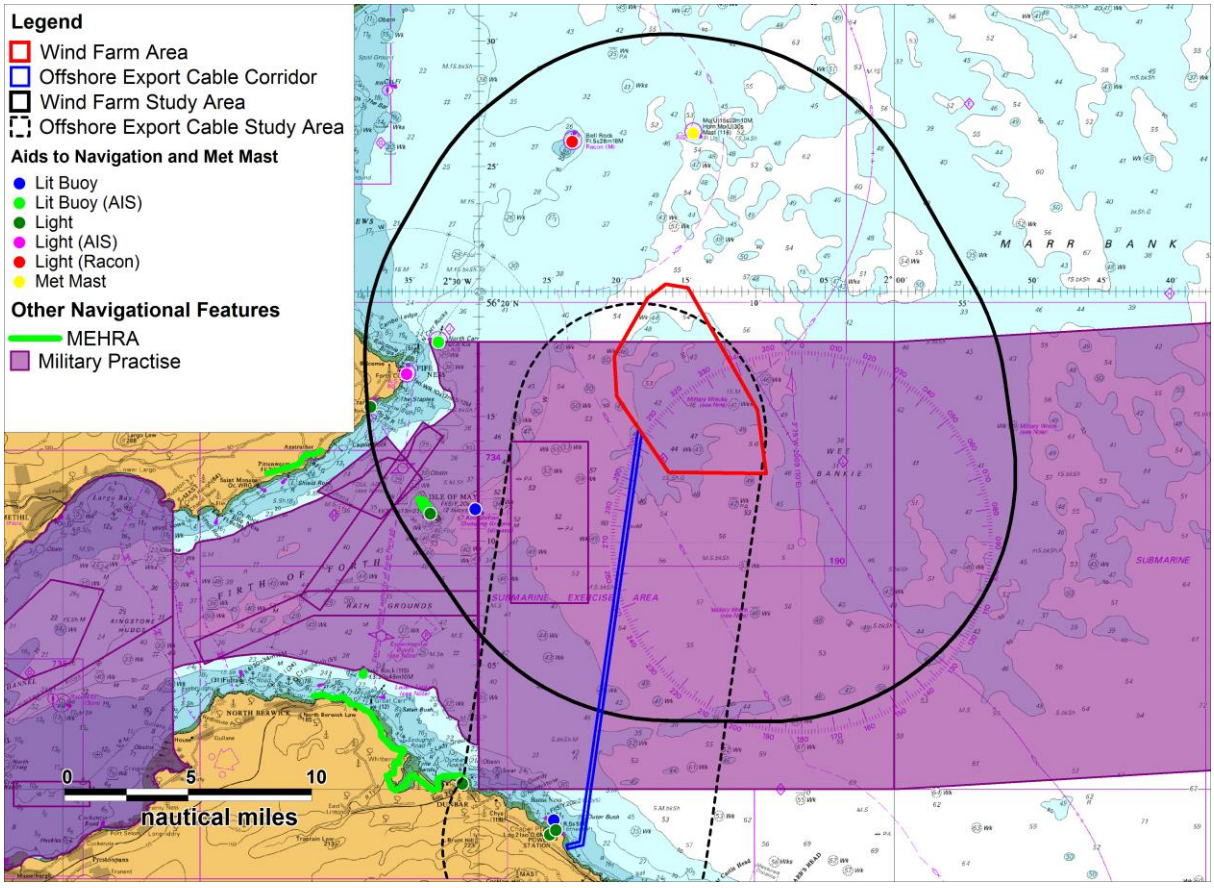

Figure 7.1 Navigational Features – Offshore Export Cable Corridor

The Offshore Export Cable landfall is positioned approximately 1NM from two onshore lights (positioned in proximity to the Torness Power Station), and a lit buoy. There is also an onshore light stationed at Dunbar, at the western extent of the Offshore Export Cable Study Area intersection with the coast.

A Marine Environmental High Risk Area (MEHRA) lies within the Offshore Export Cable Study Area, covering the St Abb's Head and Eyemouth coastlines. This area has been designated as a MEHRA based on a high concentration of vulnerable seabirds, and a range of fishing and amenity/economic activities.

The majority of the Offshore Export Cable Corridor is positioned within a military practice area (UKHO-PEXA-X5641), which is designated as an area used for 'general practice'. A note on Admiralty Charts indicates that submarine practise is also undertaken within the area.

7.3 Commercial Traffic

The Offshore Export Cable Corridor is intersected by busy commercial traffic routes south of the Wind Farm Area used by vessels associated with ports in the Firth of Forth, as illustrated in Sections 5.2 and 5.3. This traffic was observed to enter / exit the Forth south of the Isle of May. Marine traffic data was only assessed up to 10NM from the Wind Farm Area, and the coastal area of Offshore Export Cable Corridor is therefore not covered, however it is likely that commercial vessels will avoid coastal areas, instead choosing waters with more appropriate water depths to avoid the risk of grounding.

7.4 Anchoring Vessels

There are no charted anchorages within the Offshore Export Cable Study Area, however it is noted that Admiralty Charts indicate anchorage can be obtained at Dunbar Roads (positioned just outside of the Offshore Export Cable Study Area). Vessels using this anchorage may therefore anchor within the confines of the Offshore Export Cable Study Area, however are unlikely to have any interaction with the Offshore Export Cable itself. A portion of the anchoring activity from tankers recorded within the marine traffic survey data occurred within the Offshore Export Cable Study Area, with the closest located within 1NM of the Offshore Export Cable Corridor itself. As these vessels are not using a charted anchorage, actual positions of anchoring may vary, and tankers may therefore have anchored within the Offshore Export Cable Corridor during other parts of 2016 (outwith the marine traffic survey period).

7.5 Fishing Vessels

The 2016 marine traffic survey data showed demersal trawling and dredging occurring within the Offshore Export Cable Corridor south of the Wind Farm Area (see Figure 5.4). Both these gear types have the capacity to interact with subsea cables. Similar trawling and dredging activity was recorded within the sightings data. Considerable activity was also recorded in the satellite data south of the Wind Farm Area, and at speeds suggesting active fishing, with activity observed to be less within the Wind Farm Area itself, as shown in Figure 7.2. However, as gear type information was not available within the satellite data, the type of activity could not be confirmed.

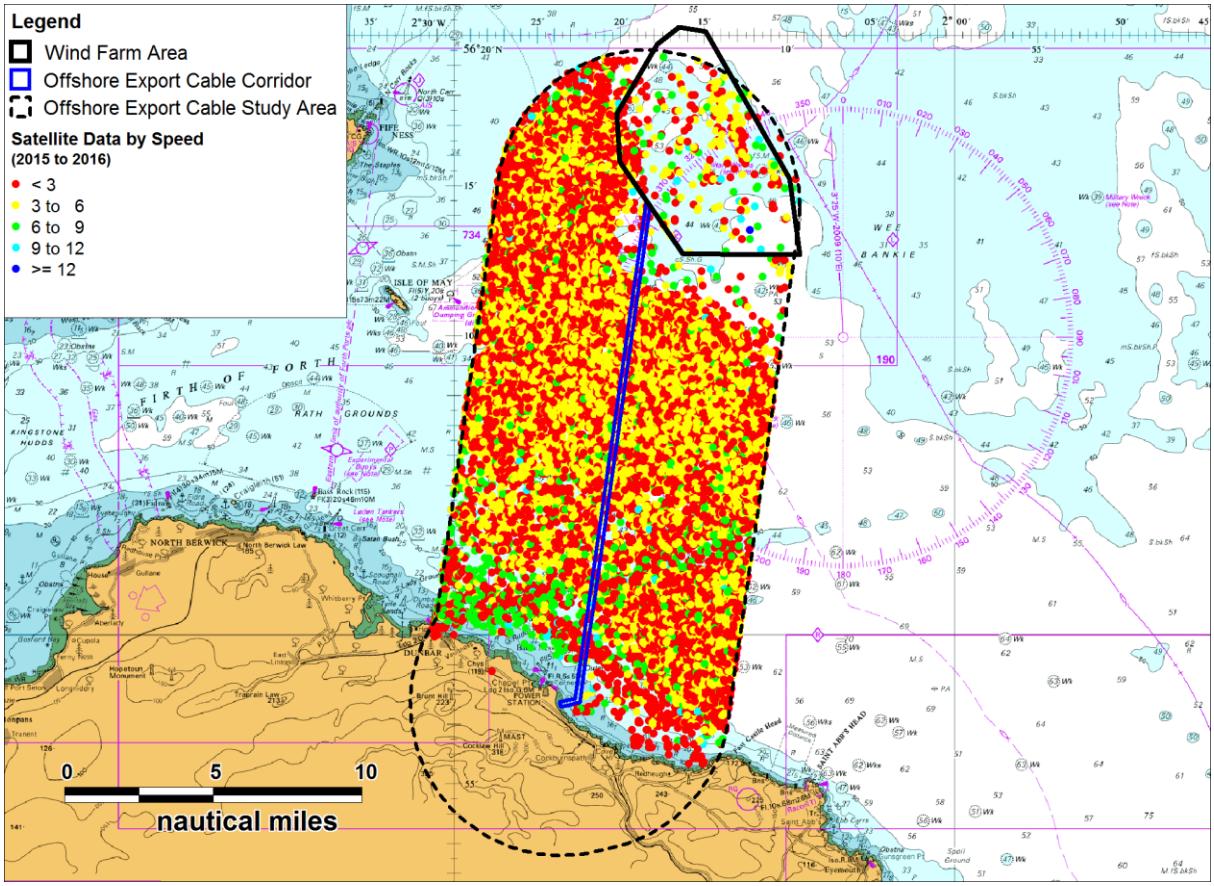

Figure 7.2 Satellite Fishing Data – 2015 and 2016

7.6 Recreational Vessels

Recreational activity within the Offshore Export Cable Corridor has primarily been assessed using the RYA Coastal Atlas (RYA 2016), which is presented in Figure 7.3. The Coastal Atlas shows recreational activity within the Offshore Export Cable Study Area to be of highest density coastally, near the landfall. It is noted that density at the landfall itself was low.

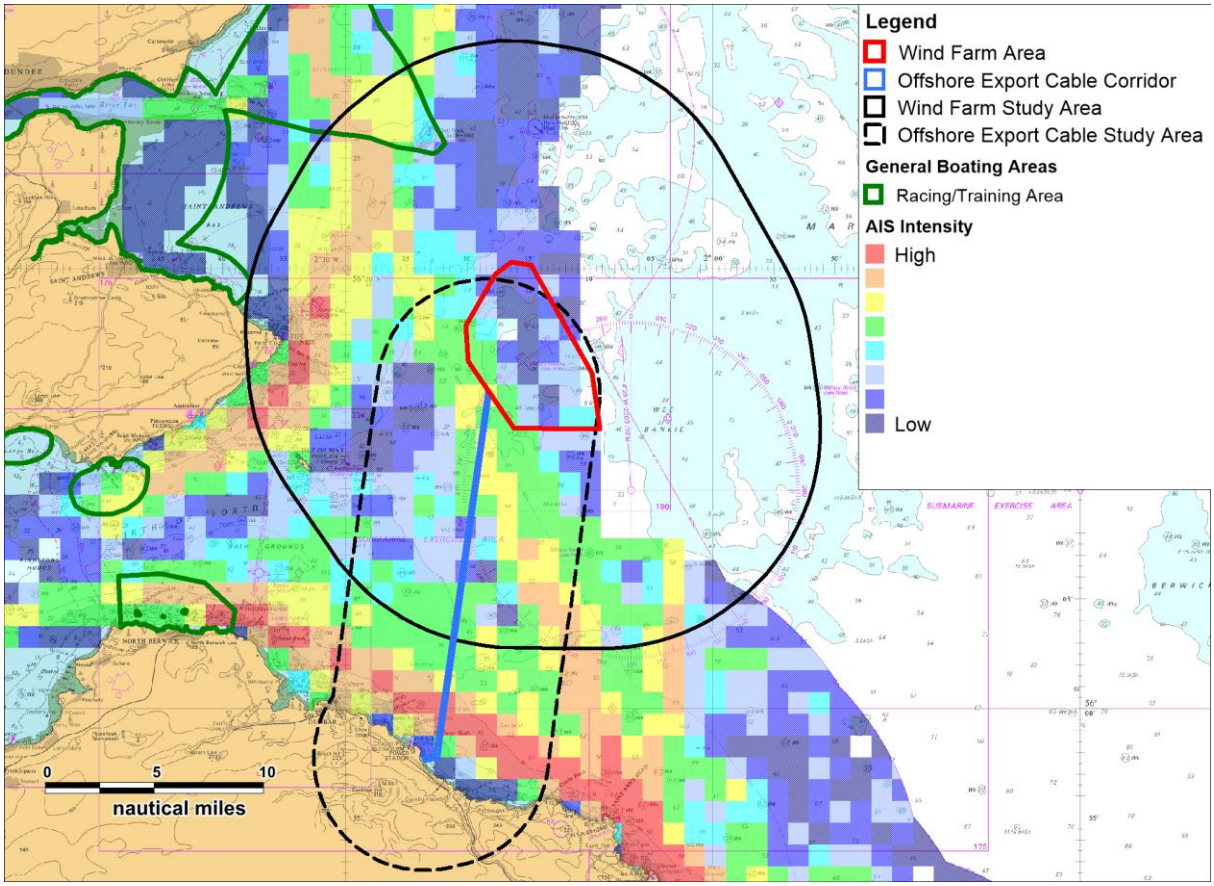

Figure 7.3 RYA Coastal Atlas 2016

7.7 Maritime Incidents

Maritime incident data recorded by the MAIB and RNLI as occurring within the boundaries of the Offshore Export Cable Study Area between 2005 and 2014 are presented in Figure 7.4 and Figure 7.5 respectively. Further details of these data sources are provided in Chapter 11: Shipping and Navigation.

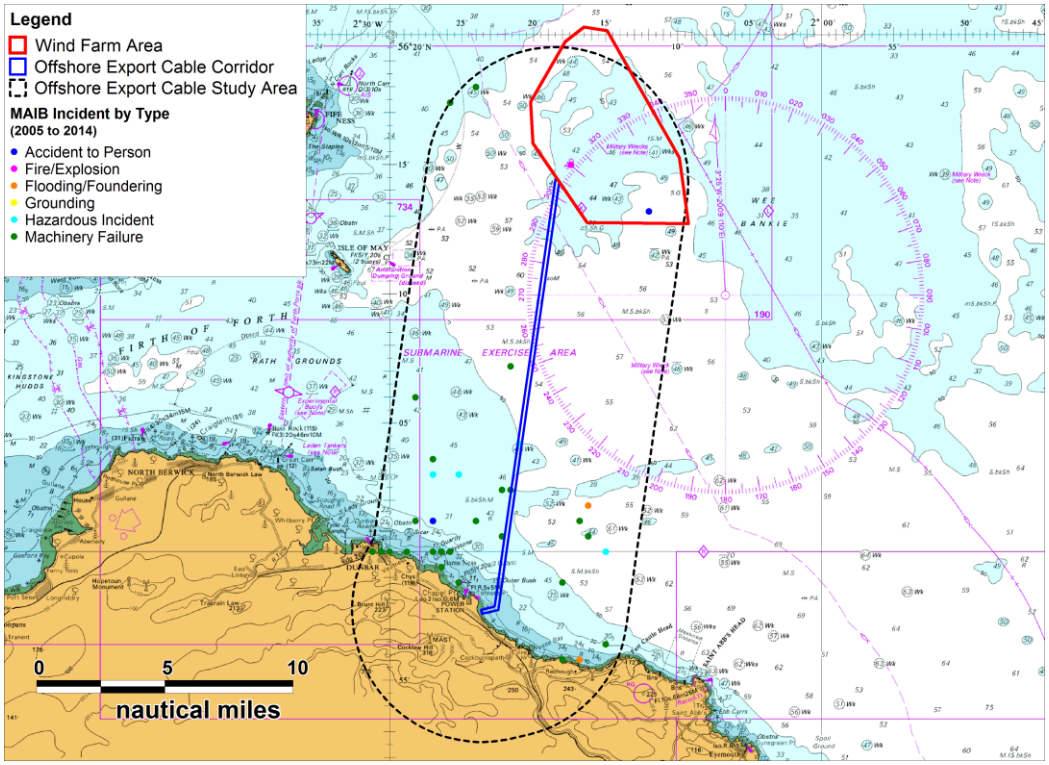

Figure 7.4 MAIB Incidents by Type (2005 to 2014)

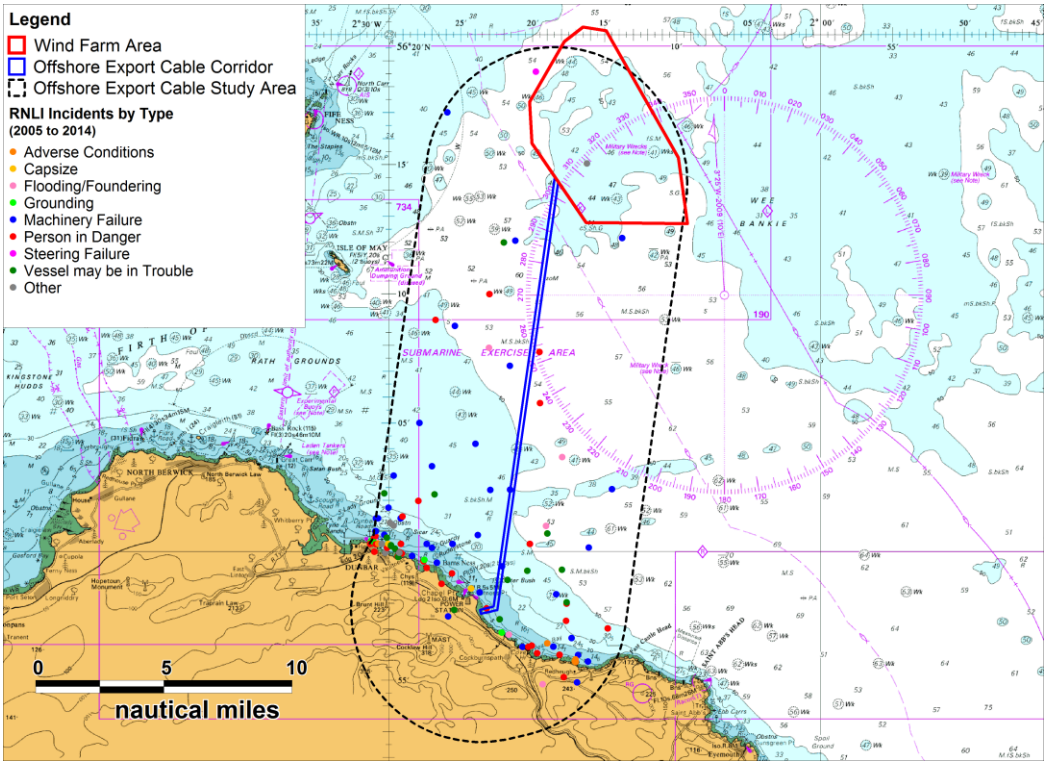

Figure 7.5 RNLI Incidents by Type (2005 to 2014)

A total of 39 incidents were recorded by the MAIB as occurring within the Offshore Export Cable Study Area between 2005 and 2014, one of which occurred within the Offshore Export Cable Corridor itself. This was detailed as a 'Hazardous Incident' involving a fishing vessel and a commercial vessel. Other incidents of relevance to a subsea cable included two 'Groundings', and two 'Flooding / Foundering' occurrences. Such incidents could lead to cable interaction, however it is noted that none of the four recorded incidents occurred within 2NM of the Offshore Export Cable Corridor, and that groundings are only likely to occur in coastal waters (where water depth is shallow).

The RNLI data indicated a total of 122 incidents within the Offshore Export Cable Study Area between 2005 and 2014, two of which were recorded within the Offshore Export Cable Corridor itself. One was a fishing vessel with a fouled propeller approximatively 2NM from shore, and the other involved an individual stranded on the cliffs. It is not clear what the fishing vessel propeller was fouled on. Of note were five incidents of a 'Stranding or Grounding', all occurring coastally.

8. Conclusions

This report has presented analysis of 28 days (14 days June 2016 and 14 days December 2016) of AIS data within 10NM of the Wind Farm Area in order to validate the findings of the original 2010 and 2011 NRA.

Throughout the 2016 study periods, tankers (38%) and fishing vessels (32%) were the most common vessel types recorded within the Wind Farm Study Area, followed by cargo vessels (19%). All other vessel types recorded within the area including passenger, recreational, military and other vessels contributed less than 5% to the overall vessel type distribution. It is noted the 'other' category within the 2016 data contains RNLI Lifeboats, dive vessels and buoy-laying vessels. Throughout the 2010 and 2011 data used in the original NRA assessment, the most common vessel types were cargo vessels (36%) and tankers (30%). Therefore, a considerable change to the dominant vessel types can be seen with cargo vessels decreasing their representation by 17%. This change in vessel type distribution is due in part to new AIS carriage requirements which saw a large increase in fishing vessel representation. However, excluding fishing vessels from the analysis produced similar results as tankers had an increased contribution of 6% whilst cargo vessels had a 20% decrease in contribution.

During both summer and winter study periods in 2016, an average of 22 unique vessels were recorded within the Wind Farm Study Area. This represents an approximate increase of eight unique vessels per day when compared with the original 2010/2011 data (an average of 14 unique vessels per day). There was an average of three unique vessels per day recorded intersecting the Wind Farm Area in the combined 2016 data sets. This is an increase from the two unique vessels recorded intersecting the Wind Farm Area in the original NRA assessment. It can therefore be concluded that the total number of vessel movements within the Wind Farm Study Area and in the Wind Farm Area has increased, but not significantly.

The Firth of Tay route (labelled as Route 1 in Figure 6.4) had lower vessels numbers in the 2016 data with only one unique vessel every two days whilst the original data had one unique vessel per day using the route. The coastal tanker route (labelled as Route 2 in Figure 6.4) had a similar number of unique vessels (approximately one unique vessel every three to four days) in the recent 2016 data and the original 2010/2011 data sets. There was no alteration in the mean position of the Firth of Tay (Route 1) in 2016; however a change is apparent in Route 2. This has resulted in vessels passing straight through the centre of the Wind Farm Area as opposed to the more easterly route seen in the 2010/2011 data, due to the Inch Cape Met Mast. However, as before, considerable sea room is available for the traffic using this coastal route to deviate to the east of the Wind Farm Area once construction commences. Vessels transiting the Firth of Tay route also have sea room available to the west of the site boundary to pass the Wind Farm Area at a safe distance as seen in the original NRA assessment.

It can therefore be concluded, the impact of NnG Offshore Wind Farm on vessel routeing has not altered significantly from the results given in the original NRA assessment; but that there have been some notable changes to traffic patterns in the area.

9. References

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