



Maritime Traffic Survey - Winter 2013

Brims Tidal Array

(Technical Note)

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1. Introduction

1.1 Background

As part of the Navigation Risk Assessment of the proposed Brims Tide Array Project, 28 days of shipping data surrounding the Agreement for Lease (AfL) area is being gathered.

The data are being gathered over 2 x 14 day periods to give account to seasonal and tidal variations. This report presents analysis of the first 14 day survey which has been carried out on the island of Hoy, Orkney, between 22nd November and 6th December 2013. The data have been collected using radar, AIS and visual observations.

1.2 Abbreviations

The following abbreviations are used in the report:

AfL	-	Agreement for Lease
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
ETA	-	Estimated Time of Arrival
EU	-	European Union
IMO	-	International Maritime Organisation
MMSI	-	Mobile Maritime Service Identity
nm	-	Nautical Miles (1nm = 1,852 metres)
SOLAS	-	Safety of Life at Sea
VHF	-	Very High Frequency

2. Survey Set-up

2.1 Introduction

A maritime traffic survey of the proposed Brims tidal energy site was carried out near Judas Hill, Brims on the island of Hoy. The objective of the survey was to collect 14 days of shipping data in proximity to the Brims Agreement for Lease (AfL) area during Winter 2013.

The survey site was approximately 25m above sea level and 200m from the cliff edge. The location offered line-of-sight fully covering the Brims AfL area. The survey began on the morning of Friday 22nd November 2013 and concluded on Friday 6th December 2013.

The primary objective of the survey was to identify and validate the routing of vessels and the level of vessel activity in and around the Brims AfL area. This was achieved by recording in real-time the positions of vessels within range of the Automatic Identification System (AIS) receiver and ARPA radar, supplemented by observation of vessels within visual range to obtain information on type and size where the information was not available from AIS.

2.2 Survey Location

The radar and AIS were set up at co-ordinates 57° 46' 33.5" North, 03° 13' 30.06" West. The radar was mounted on scaffolding to give a more elevated view. The survey location relative to the Brims AfL area is shown in Figure 2.1.

The survey location is approximately 0.7nm from the closest part of the Brims AfL area and 2.9 nm from the furthest point.

Figure 2.2 presents the equipment setup at the site.

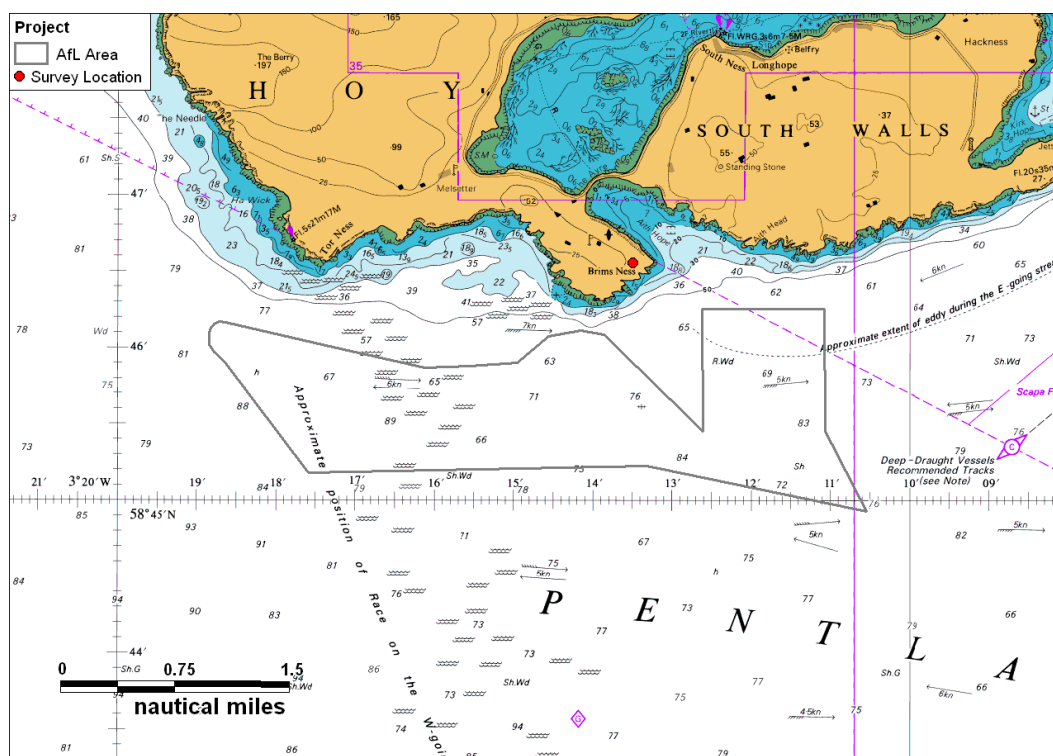


Figure 2.1 Chart Overview of Survey Location relative to Brims AfL Area



Figure 2.2 Equipment setup near Judas Hill

2.3 Equipment and Manning

Table 2.1 lists the equipment used to carry out the traffic survey.

Table 2.1 Equipment utilised in Traffic Survey

Equipment	Purpose
FR-1500 12 kW Mark 3 R Type Radar with 4ft Scanner and ARPA with integrated AIS	Tracking of targets (manually and automatically) up to a maximum of 10nm from the survey location.
Furuno GP-32	Global Positioning System used to determine the position of the survey and to input the information to the radar system.
Furuno AD-100 A-D Converter	Convert the heading of the scanner into digital coded bearing data to be used as input to the radar.
Nautical Compass	Used to verify heading.
Admiralty Charts, dividers and parallel ruler	Used for manual plotting and verification of position.
Monk Nautilus 7 x 50 Marine Binoculars & Nikon Spotting Scope (20-60x zoom)	Visual identification of vessels.
Digital Camera	Photographic evidence of targets (when possible)
AIS Receiver and VHF Antenna	To receive and record data from vessels transmitting AIS data. Tracks vessels fitted with AIS (majority of vessels > 300 GRT) within a range of approx. 20nm.
Notebook PCs	Connected to radar and AIS receiver for real-time recording of tracked target data. Tracked targets displayed on hydrographic charts and can be replayed at high speed when required.
Logbook	Written log of all manual targets acquired during survey as well as other notes such as visual identification information, weather conditions, etc.

The AIS system tracked targets 24 hours per day during the survey period. The radar was manned between approximately 06:00hrs and midnight, with targets not on AIS acquired manually. During this manned period a visual lookout was maintained and all observations were recorded in the logbook. Between midnight and 06:00hrs radar targets were acquired automatically by the radar, over an area defined by the watch-keepers, which encompassed the Brims AfL area.

2.4 AIS Description

Regulation 19 of SOLAS Chapter V - Carriage requirements for ship borne navigational systems and equipment - sets out navigational equipment to be carried on board ships, according to ship type. In 2000, IMO adopted a new requirement (as part of a revised chapter V) for ships to carry automatic identification systems (AIS). AIS is a system by which ships transmit data concerning their position, MMSI etc. on two individual 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.

The regulation requires AIS to be fitted aboard all ships of 300 gross tonnage and upwards engaged on international voyages, cargo ships of 500 gross tonnage and upwards not engaged on international voyages and passenger ships irrespective of size built on or after 1 July 2002. It also applies to ships engaged on international voyages constructed before 1 July 2002, according to the following timetable:

- passenger ships, not later than 1 July 2003;
- tankers, not later than the first survey for safety equipment on or after 1 July 2003;
- ships, other than passenger ships and tankers, of 50,000 gross tonnage and upwards, not later than 1 July 2004.

An amendment adopted by the Diplomatic Conference on Maritime Security in December 2002 states that ships, other than passenger ships and tankers, of 300 gross tonnage and upwards but less than 50,000 gross tonnage, will be required to fit AIS not later than the first safety equipment survey after 1 July 2004 or by 31 December 2004, whichever occurs earlier. Ships fitted with AIS shall maintain AIS in operation at all times except where international agreements, rules or standards provide for the protection of navigational information.

EU fishing vessels of 18m length and over have been required to carry AIS since 31st May 2013. New built fishing vessels of overall length exceeding 15 metres have been subject to the carrying requirement from 30 November 2010.

Both dynamic and static information are transmitted by the vessel. Table 2.2 presents the dynamic and static data provided via AIS.

Table 2.2 AIS Information

Static	Dynamic	Voyage related
MMSI	Position (Lat/Long)	Draught
IMO Number	Time	Hazardous Cargo (type)
Call Sign	Course over ground	Destination
Name	Speed over ground	ETA
Length and Beam	Heading	Route Plan
Type of Ship	Navigational Status	
Type of Nav Sensor	Rate of Turn	

2.5 Weather and Tidal Data

The weather was recorded in a logbook every 6 hours during the manned periods of the survey and is presented in Table 2.3. During the survey, daylight hours were typically between 8:00 and 16:00 hours. The wind direction was variable but predominantly from the south west. The wind speed was also highly variable throughout the survey period but was typically between Beaufort Force 2 and Beaufort Force 5. A maximum wind speed of Force 7-8 was recorded on 5th December 2013.

Visibility was generally in excess of 7nm however occasional fog was experienced. Sea state ranged from slight to rough.

Table 2.3 Weather throughout 14 Day Survey Period

Date	Time	Wind Direction	Beaufort Force	Sea State	Visibility (nm)	Comments
22/11/2013	12:00:00	WNW	4-5	Moderate	4	Rain showers
	18:00:00	WNW	2	Slight	7+	Clear night
	00:00:00	W	2-3	Slight	7+	Light showers
23/11/2013	06:00:00	W	2	Slight	7+	Light showers
	12:00:00	WNW	3-4	Slight	7+	Squall showers
	18:00:00	WNW	2-3	Slight	7+	Squall showers
	00:00:00	W	2	Slight	7+	Dry and clear
24/11/2013	06:00:00	W	1-2	Slight	7+	Dry and calm
	12:00:00	W	2	Slight	7+	Dry and clear
	18:00:00	W	2	Slight	7+	Dry and clear
	00:00:00	W	2	Slight	7+	Dry and clear
25/11/2013	06:00:00	WNW	2	Slight	7+	Clear
	12:00:00	WSW	3	Slight	7+	Wet and cloudy
	18:00:00	WSW	4	Moderate	5	Rain showers
	00:00:00	SW	2-3	Slight	7+	Dry
26/11/2013	06:00:00	W	5	Moderate	5	Heavy rain + gusts
	12:00:00	SW	4-5	Moderate	6	Cloudy + light showers
	18:00:00	SW	6-7	Moderate	5	Windy + rain showers
	00:00:00	SW	5-6	Moderate	7+	Clear
27/11/2013	06:00:00	SW	4-5	Moderate	7+	Clear
	12:00:00	SW	5-6	Rough	6	Cloudy and showers
	18:00:00	W	6-7	Moderate	6	Clear
	00:00:00	W	5-6	Moderate	7+	Clear

Date	Time	Wind Direction	Beaufort Force	Sea State	Visibility (nm)	Comments
28/11/2013	06:00:00	W	3	Slight	7+	Clear
	12:00:00	W	3	Slight	7+	Light cloud
	18:00:00	W	2	Slight	7+	Cloudy
	00:00:00	W	4	Moderate	7+	Light showers
29/11/2013	06:00:00	NW	6	Moderate	7+	Thunder and lightning
	12:00:00	NW	8	Rough	4	Squall showers
	18:00:00	WNW	6-7	Rough	4-5	Squall showers
	00:00:00	W	4	Moderate	7+	Dry
30/11/2013	06:00:00	NW	3	Slight	7+	Dry
	12:00:00	WSW	5	Moderate	7+	Rain showers
	18:00:00	WSW	6	Rough	4-5	Rain showers
	00:00:00	WSW	4-5	Moderate	7+	Dry
01/12/2013	06:00:00	WSW	4	Moderate	7+	Dry
	12:00:00	WSW	2	Slight	7+	Dry + light cloud
	18:00:00	SW	2	Slight	7+	Dry + light cloud
	00:00:00	SW	2	Slight	7+	Dry + light cloud
02/12/2013	06:00:00	WSW	2	Slight	7+	Dry
	12:00:00	SW	3	Slight	7+	Dry + light cloud
	18:00:00	SW	4	Moderate	7+	Dry + cloudy
	00:00:00	SW	4	Moderate	7+	Dry + Cloudy
03/12/2013	06:00:00	SW	3	Slight	4-5	Rain showers
	12:00:00	W	1-2	Slight	7+	Cloudy
	18:00:00	W	2-3	Slight	7+	Rain showers
	00:00:00	W	4-5	Moderate	7+	Rain showers

Date	Time	Wind Direction	Beaufort Force	Sea State	Visibility (nm)	Comments
04/12/2013	06:00:00	SWS	4	Moderate	7+	Rain Showers
	12:00:00	W	5-6	Rough	7+	Heavy squalls
	18:00:00	W	6-7	Rough	4-5	Heavy squalls
	00:00:00	W	6-7	Rough	7+	Heavy squalls
05/12/2013	06:00:00	W	7-8	Rough	7+	Heavy squalls
	12:00:00	NW	7-8	Rough	7+	Hail showers
	18:00:00	NW	7-8	Rough	7+	Hail showers
	00:00:00	NW	6-7	Rough	7+	Hail showers
06/12/2013	06:00:00	NW	6-7	Rough	7+	Dry

Table 2.4 , Figure 2.3 and Figure 2.4 provide tidal predictions for Widewall Bay, situated on the island of South Ronaldsay, which is the closest source of tidal data to the Brims AfL area. There was a spring tide on the 22nd November 2013

Table 2.4 Tidal Predictions for Widewall Bay during Survey Period

Date	Time	Water Height above Chart Datum (m)
22 November 2013	5:20	1.1
	11:51	3.3
	17:58	0.9
	0:21	3
23 November 2013	5:56	1.3
	12:30	3.2
	18:41	1.1
	1:05	2.8
24 November 2013	6:37	1.4
	13:14	3
	19:35	1.2
	1:56	2.7
25 November 2013	7:30	1.6
	14:07	2.9
	20:44	1.3
	2:58	2.6
26 November 2013	8:50	1.7
	15:11	2.8
	21:54	1.3
	4:05	2.7
27 November 2013	10:10	1.7
	16:18	2.8
	22:58	1.2
28 November 2013	5:08	2.8
	11:17	1.5
	17:21	2.9
	23:54	1
29 November 2013	6:04	3
	12:14	1.3
	18:18	3.1
	0:42	0.8
30 November 2013	6:56	3.2
	13:02	1.1
	19:12	3.3
	1:26	0.6
01 December 2013	7:43	3.5

Date	Time	Water Height above Chart Datum (m)
	13:47	0.8
	20:03	3.6
	2:09	0.5
02 December 2013	8:28	3.7
	14:30	0.5
	20:52	3.7
	2:52	0.4
03 December 2013	9:13	3.9
	15:15	0.3
	21:41	3.8
	3:36	0.4
04 December 2013	9:57	4
	16:02	0.2
	22:29	3.9
	4:21	0.5
05 December 2013	10:42	4
	16:51	0.2
	23:18	3.8

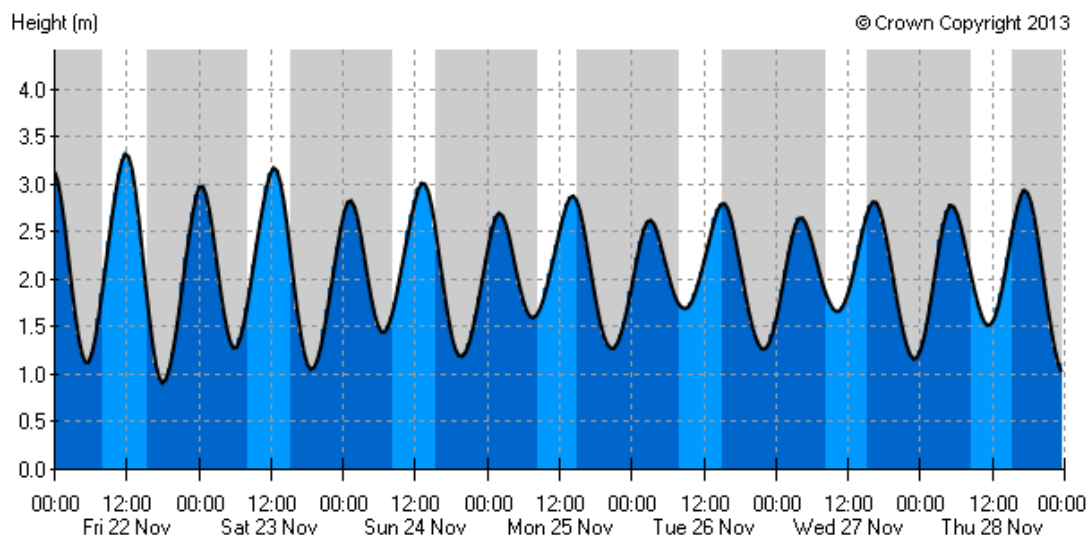


Figure 2.3 Tidal Predictions for Widewall Bay (22nd-28th November 2013)

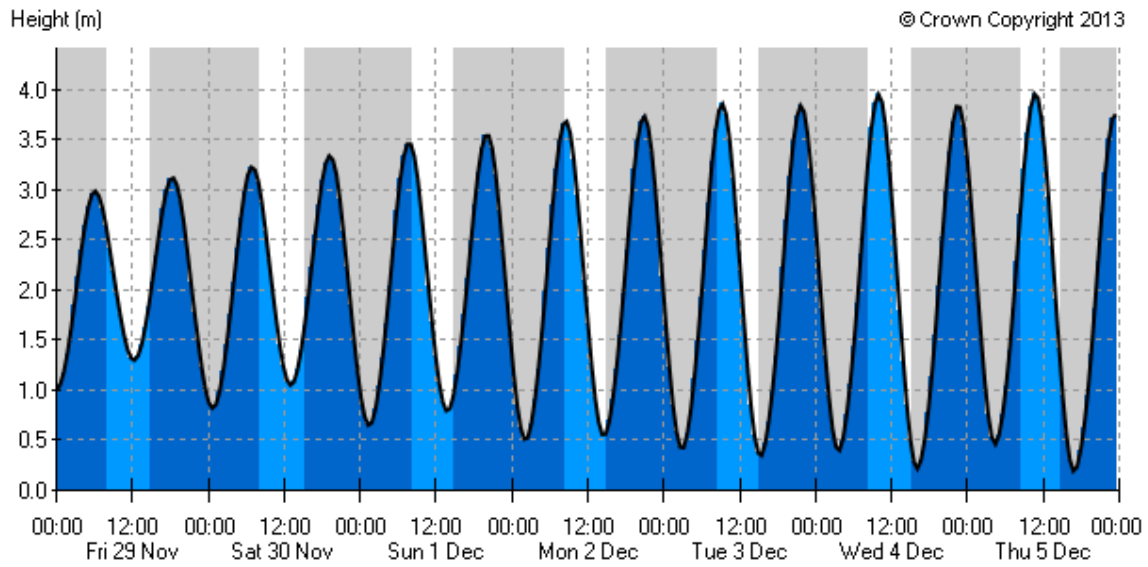


Figure 2.4 Tidal Predictions for Widewall Bay (29th November– 5th December 2013)

3. Survey Results

3.1 Introduction

This section presents the vessel tracks recorded by the radar and AIS during the 14 day survey period.

As the AIS receiver tended to track vessels over a greater range than radar, and also provided more accurate information on position and ship characteristics, the AIS track has been used where the vessel was tracked by both systems. The radar-tracks (non-AIS) were then combined with the AIS data to create a single data set of all vessels.

Tracks have been colour-coded by vessel type. This information was available from the vast majority of vessels fitted with AIS. The non-AIS radar tracks are included in the data set have also been colour-coded based on visual observations where available.

The charts show all tracks within five nautical miles of the Brims AfL area. The analysis and discussion focuses on vessels passing within the Brims AfL area.

3.2 Tracks by Day and Type

An overview of all the combined tracks recorded throughout the survey period, colour-coded by vessel type, is presented in Figure 3.1.

Following this, a more detailed plot of vessel tracks in the vicinity of the Brims AfL area is presented in Figure 3.2.

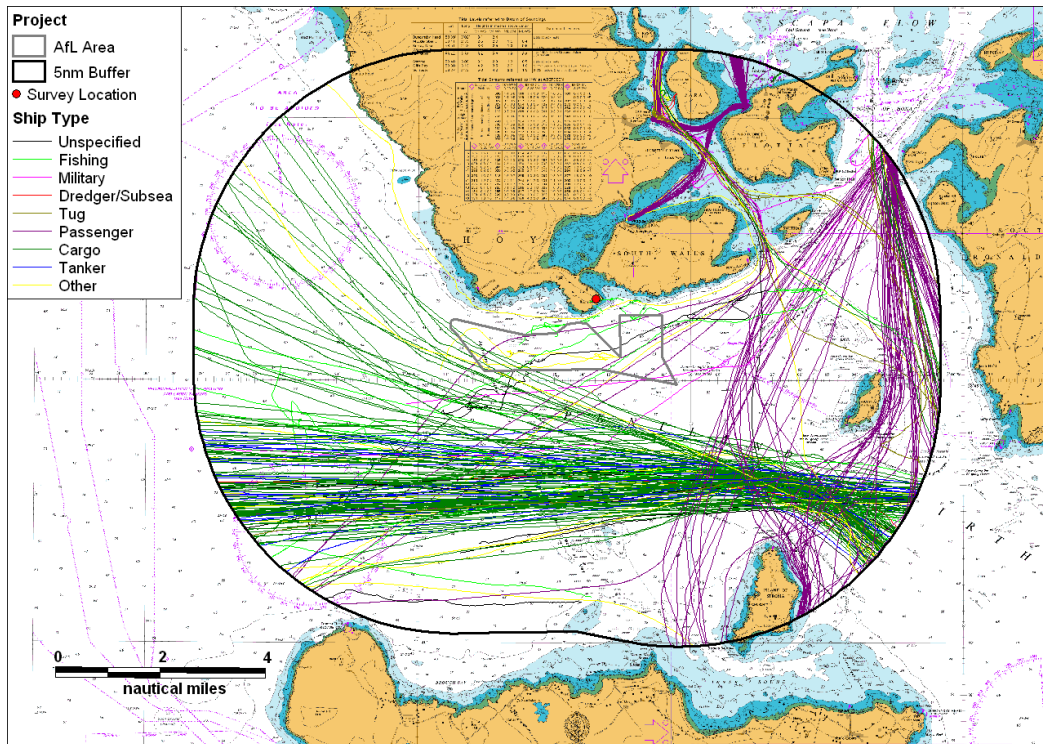


Figure 3.1 General Overview of Tracks in Proximity to the Brims AfL Area

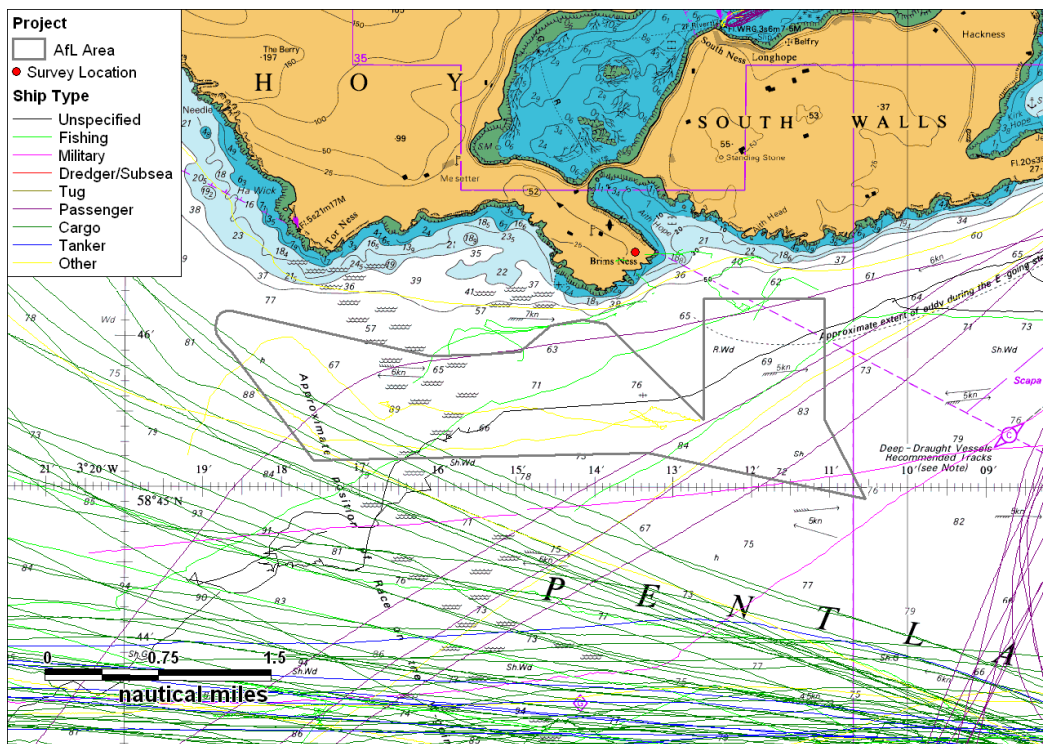


Figure 3.2 Detailed Overview of Tracks in Proximity to the Brims AfL Area

Within 5nm of the AfL area there was an average of 25 vessels per day. The majority of these were cargo ships and tankers using the Outer Sound of the Pentland Firth and passing south of the AfL area.

The daily number of vessels recorded passing within the Brims AfL area during the survey period is presented in Figure 3.3. (Note: the 22nd November and 6th December are half days due to survey equipment set-up and removal).

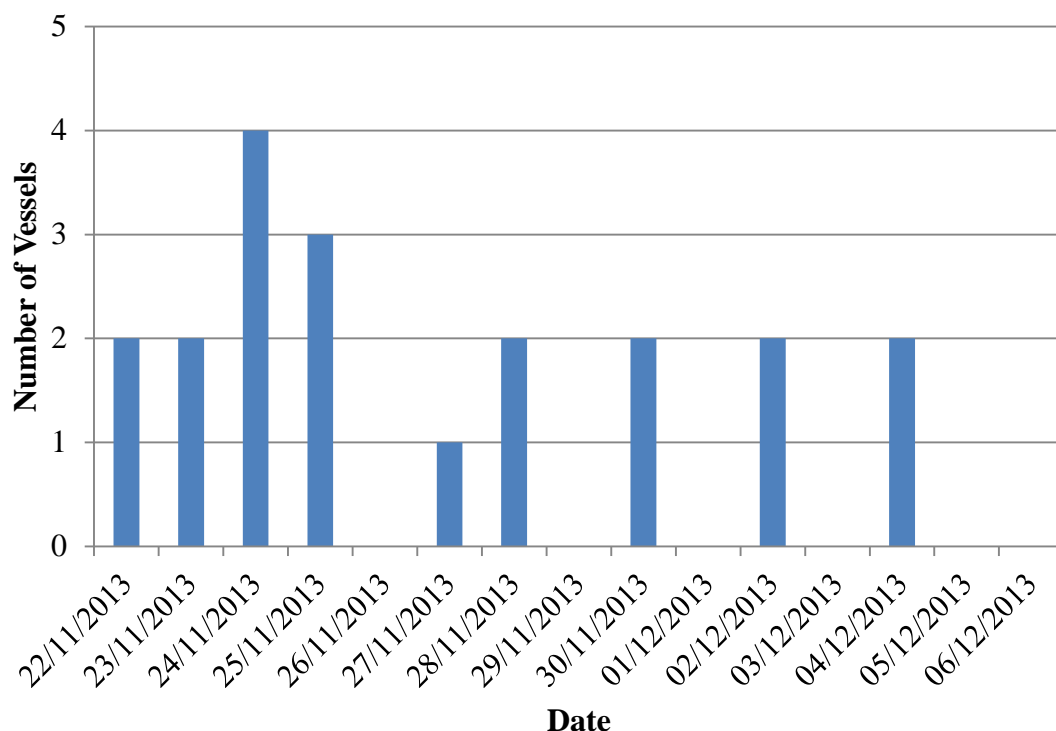


Figure 3.3 Unique Vessels per Day Passing within the Brims AfL Area

There were twenty vessels tracked through the site in total over the 14 days. The busiest day had four vessels with several days having no recorded activity within the site.

Of the twenty vessels that passed through the Brims AfL, six were fishing vessels, five cargo vessels, four passenger vessels, one military, three classed as “other” and one unidentified.

3.4 Ship Size

Based on the information available from AIS and visual observation of the radar targets (where possible), the tracks colour-coded by length are presented in Figure 3.4 and Figure 3.5.

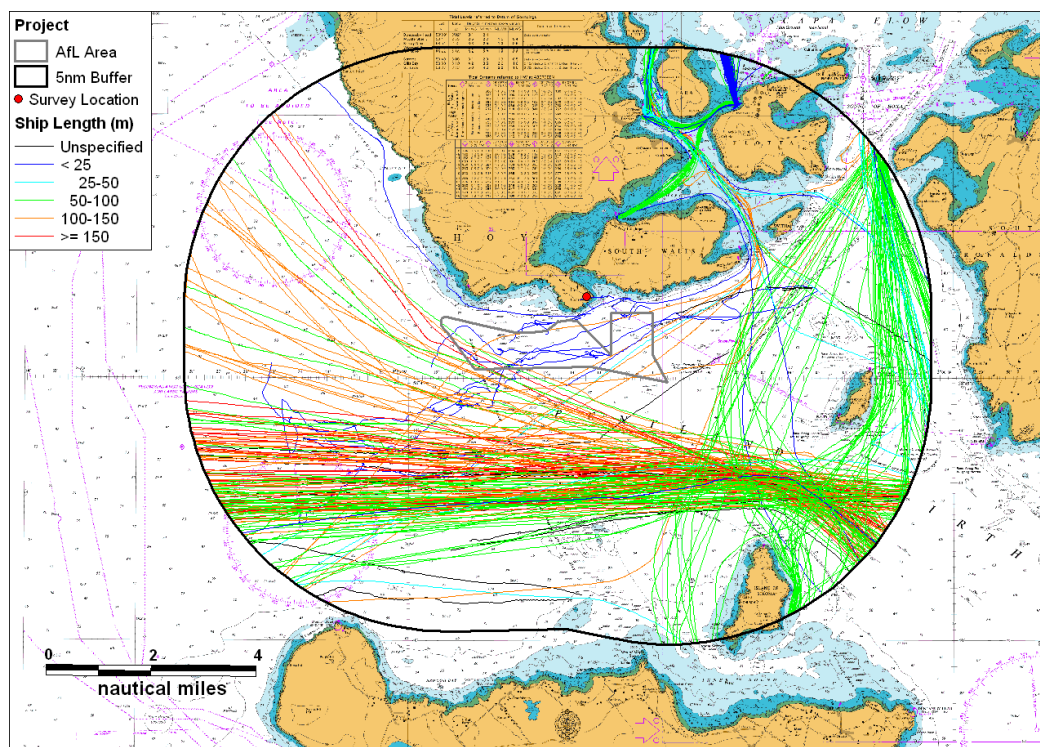


Figure 3.4 General Overview of Tracks colour coded by Ship Length

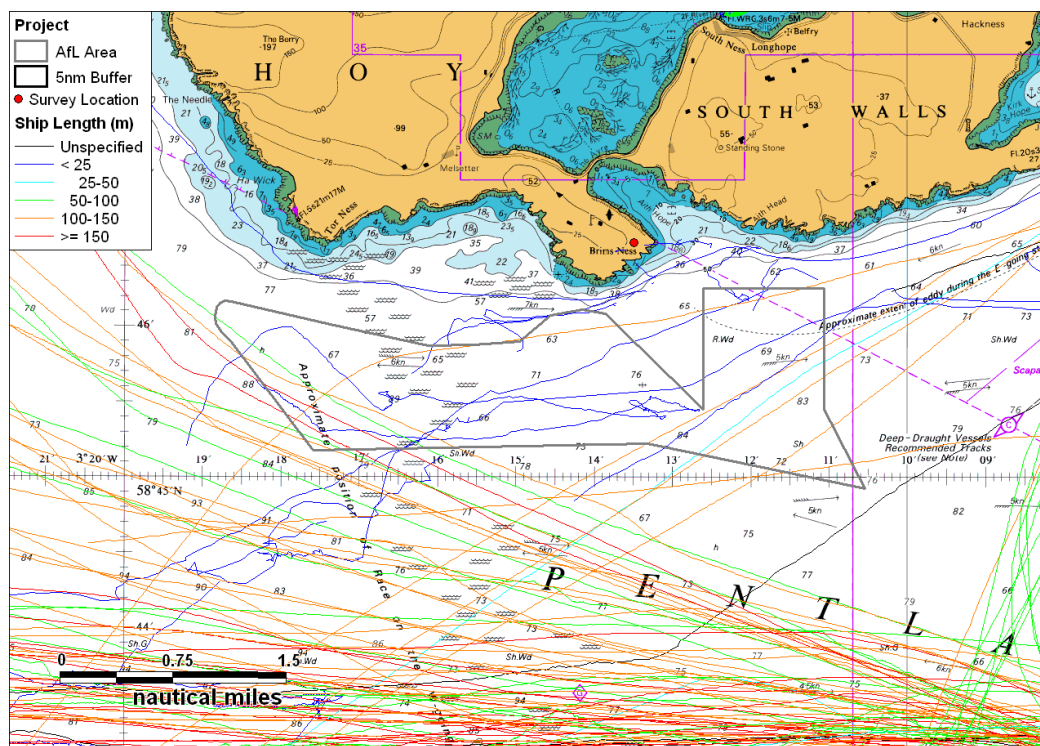


Figure 3.5 Detailed Overview of Tracks colour coded by Ship Length

The longest vessel tracked passing within the Brims AfL area was the 165m cargo vessel *Godafoss* which passed through the AfL area on 12th December 2013 travelling to Rotterdam. A photo of the *Godafoss* vessel is shown in Figure 3.6 Eight of the vessels that passed through the Brims AfL were <25m, one was between 25m and 50m, two were between 50m and 100m, four were between 100m and 125m, three were between 125m and 150m, and 2 were > 150m.



Figure 3.6 Library Photo of the Container Vessel *Godafoss*

Based on the information available from AIS, the tracks colour-coded by draught are presented in Figure 3.7 and Figure 3.8.

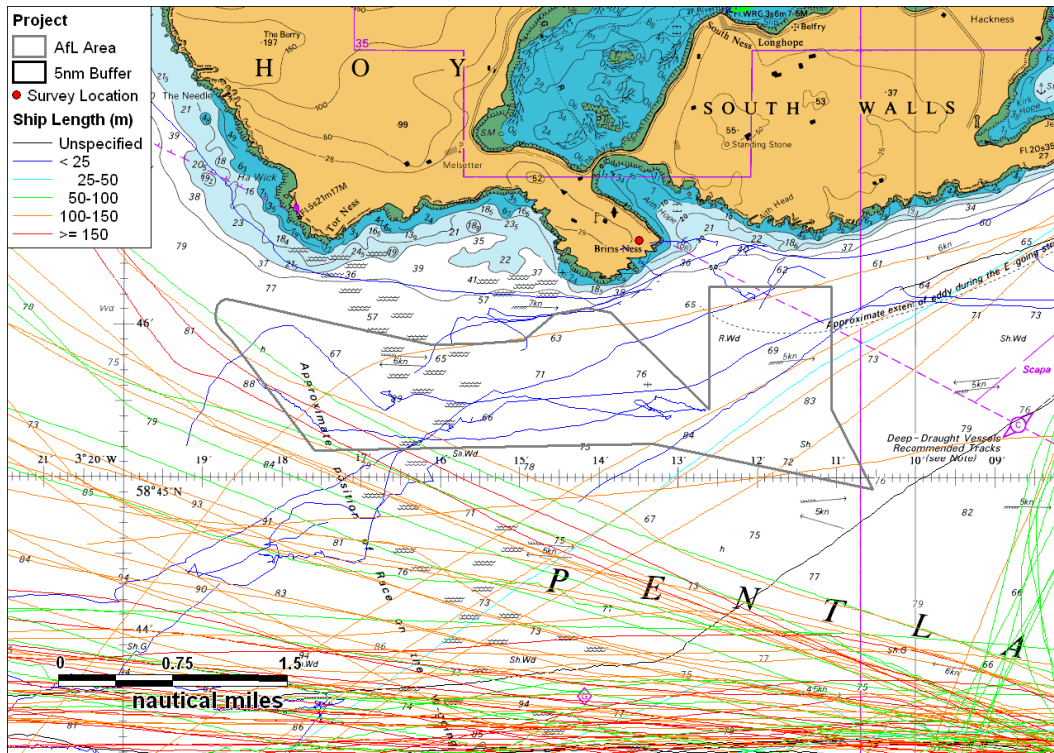


Figure 3.7 General Overview of Tracks colour coded by Ship Draught

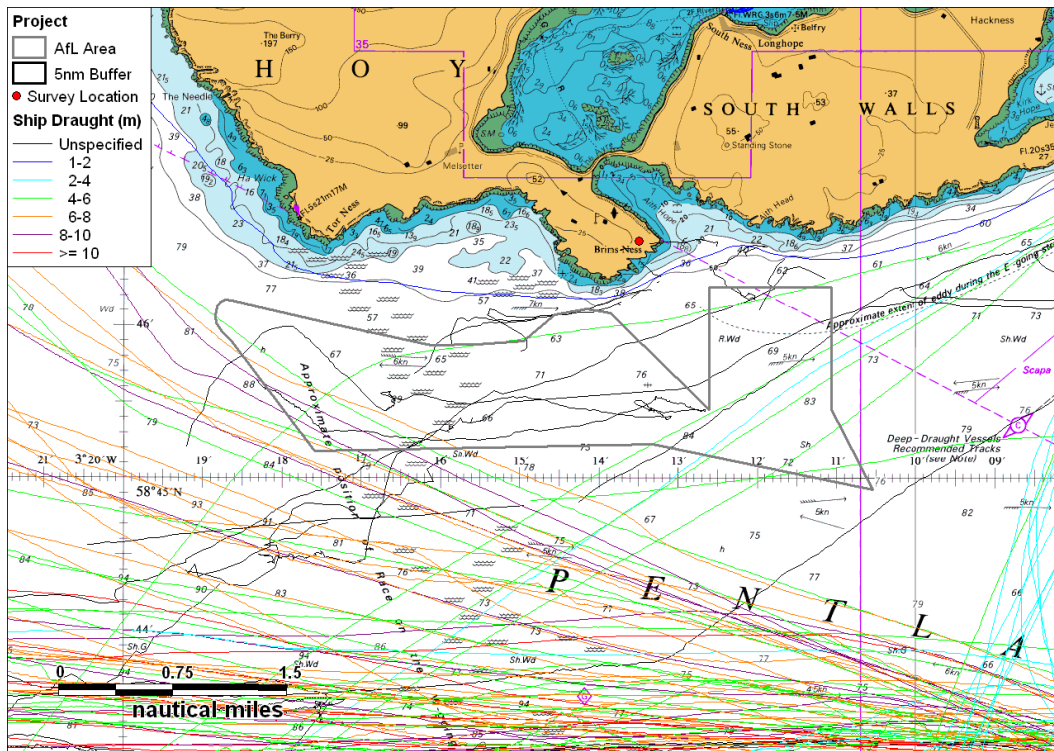


Figure 3.8 Detailed Overview of Tracks colour coded by Ship Draught

In the AfL during the survey, six vessels were recorded with a draught of 5m or greater and six between 2-5m. The deepest draught was the cargo vessel *Godafoss* (9.1m) heading to Rotterdam.

The draught of the non-AIS vessel tracks were unspecified, however, these were visually identified as small vessels of less than 5m draught.

Within 5nm, thirteen vessels were recorded with a draught of 10m or greater, but these did not enter the Brims AfL.

3.5 Average Course

Vessel tracks, colour coded by average course, are presented below.

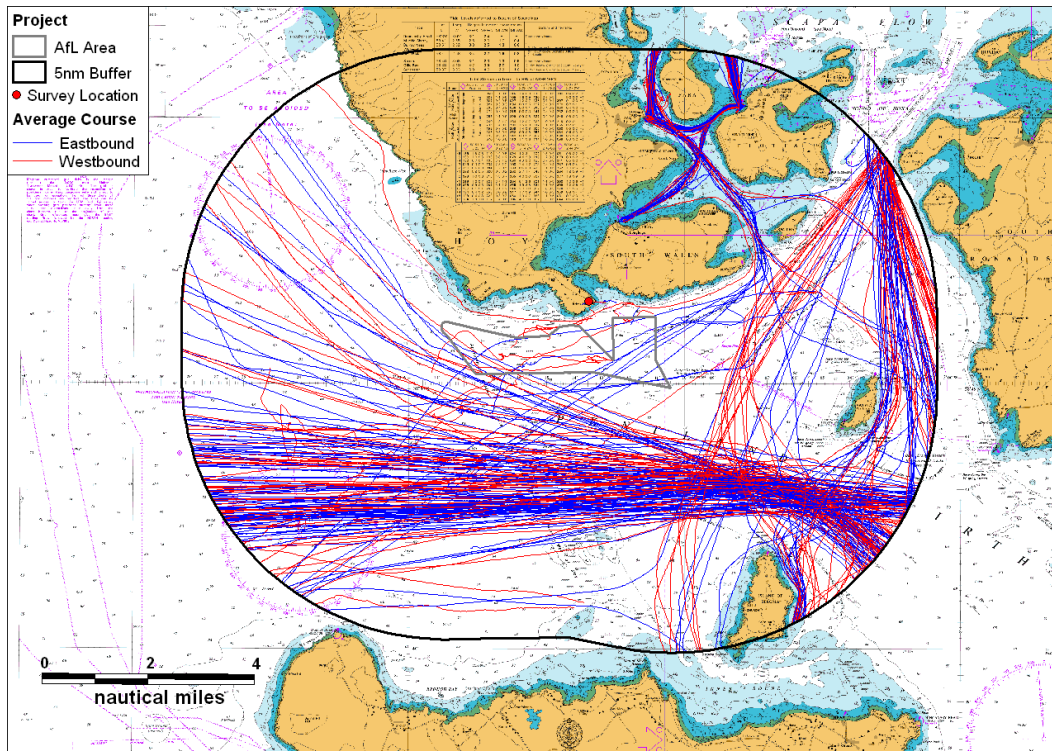


Figure 3.9 General Over of Tracks colour coded by Average Course

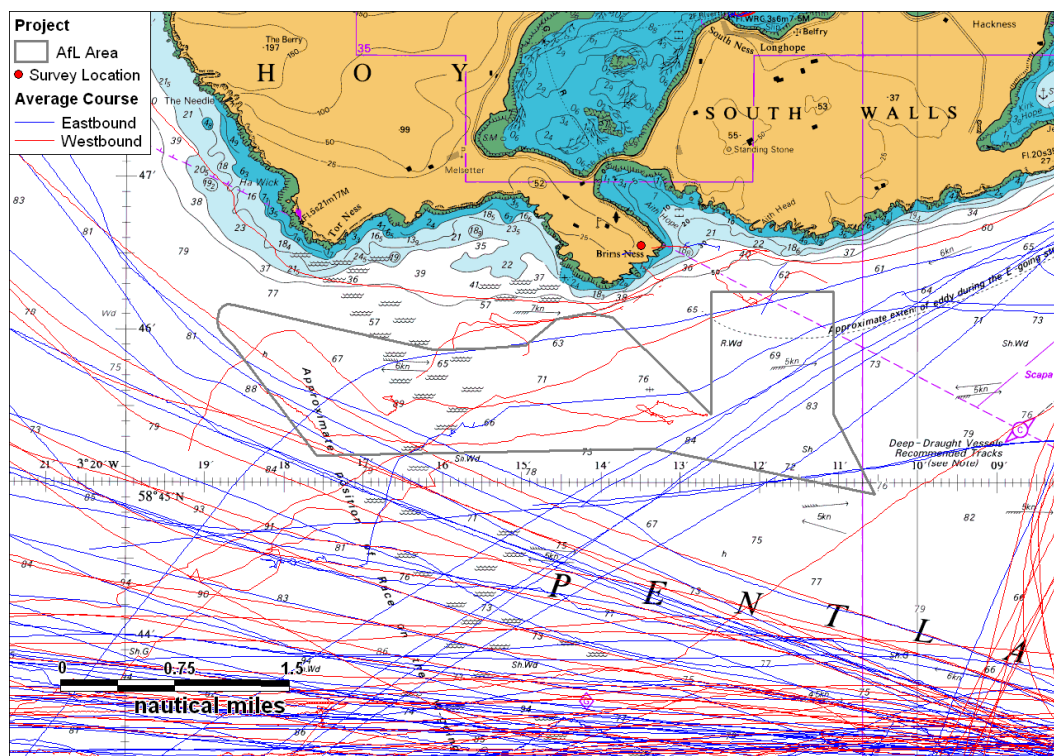


Figure 3.10 Detailed Over of Tracks colour coded by Average Course

Overall, 61% of traffic passing within the Brims AfL area was travelling generally eastbound and 39% westbound.

3.6 Average Speed

Vessel tracks, colour-coded by average speed, are presented in Figure 3.11 and Figure 3.12.

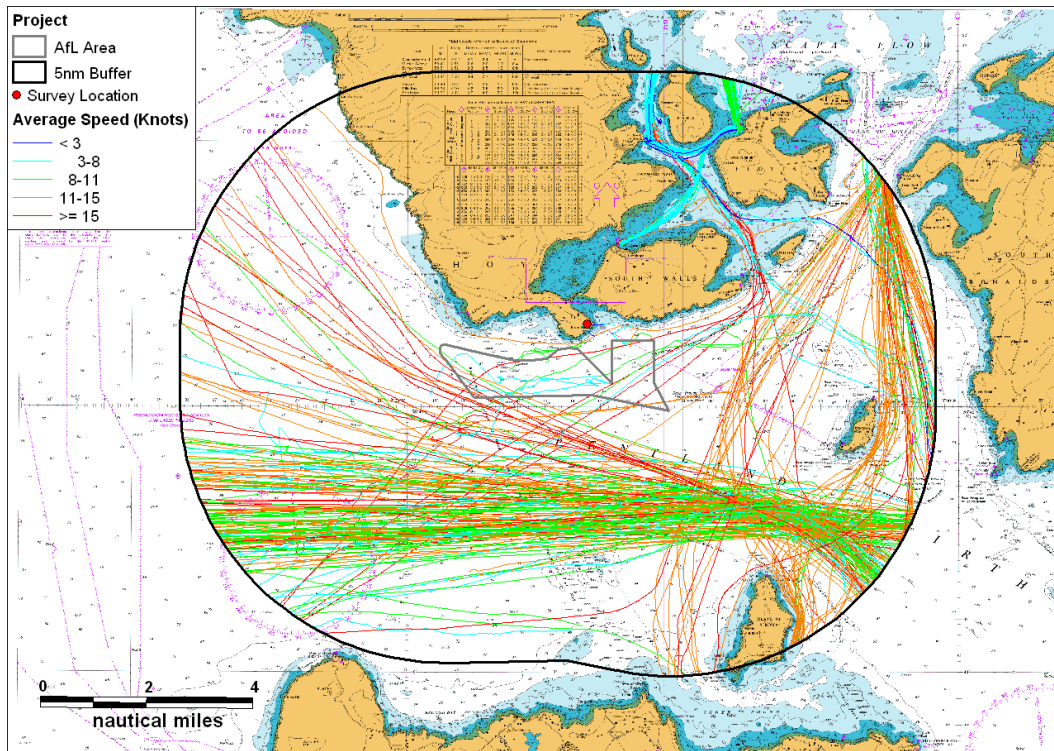


Figure 3.11 General Overview of Tracks colour coded by Average Speed

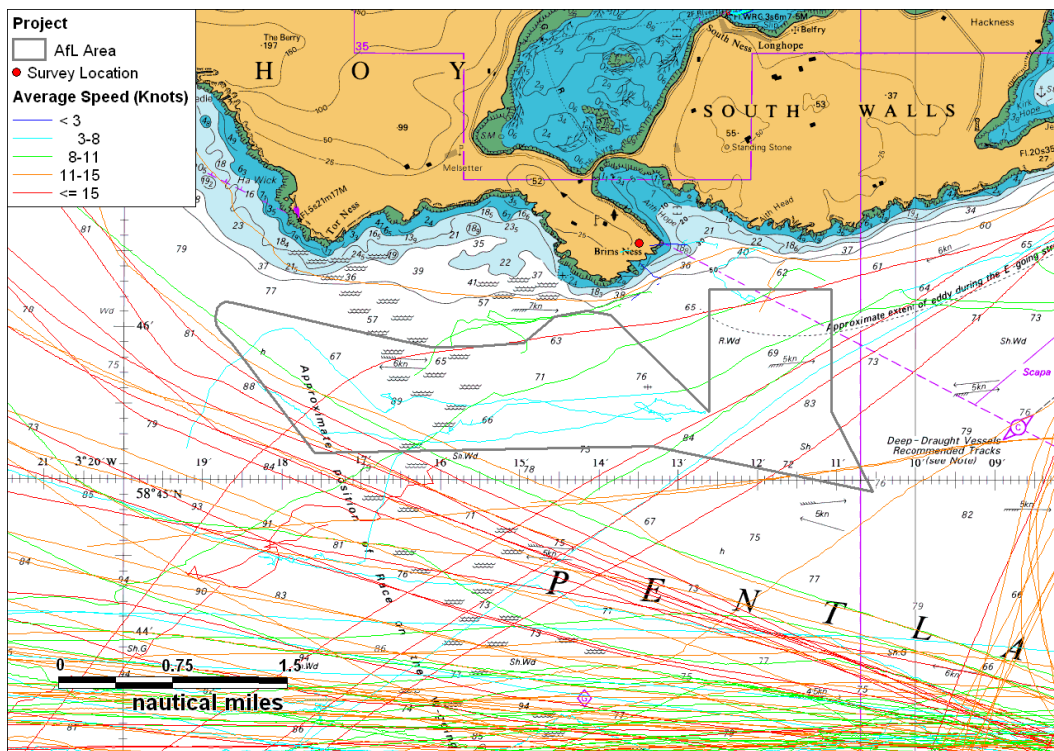


Figure 3.12 Detailed Overview of Tracks colour coded by Average Speed

The average speed of vessels within 5nm was 9.3 knots, with the fastest vessel, *RNLI Lifeboat 17-46*, travelling at 27.3 knots. The average speed reflects that the majority of vessels were on passage.

The average speed of tracks crossing the Brims AfL Area was 11.7 knots. The ferries were recorded travelling through the site between 15-17 knots.

The fastest vessel tracked passing within the Brims AfL area was the container ship *Dettifoss*, with an average speed of 21.1 knots. This vessel was recorded heading east to Rotterdam on 24th November 2013. A photo of the vessel taken during the survey is shown in Figure 3.13.



Figure 3.13 Photo of the Cargo Vessel *Dettifoss* taken on 24th November 2013

3.7 Destination

Destinations were broadcast by all 12 AIS targets passing within the Brims AfL area. The passenger vessel *Hamnavoe* made regular journeys between Stromness and Scrabster. Reykjavik was the destination of cargo vessels *Selfoss* and *Laxfoss* and Rotterdam was the destination of cargo vessels *Godafoss* and *Dettifoss*.

Within 5nm the most common destination was Flotta, which was the stated destination for 17 vessels. Other common destinations were Gills Bay (12) and St Margarets Hope (12) used by the *Pentalina* ferry, Aberdeen (8), and Immingham (8).

3.8 Vessels crossing AfL Area

Twenty vessel tracks passed through the Brims AfL area during the 14 day survey period. Twelve were broadcasting on AIS and the other eight were tracked on radar. Details on the vessels are presented in Table 3.1.

Table 3.1 Vessels Passing within the Brims AfL Area

Name (or Description)	Type	Number of Transits	Length (m)	Draught (m)	AIS
Hamnavoe	Ferry	4	112	4.4	Yes
Caspian Hope	Fishing	2	8	N/A	No
Selfoss	Cargo	2	127	7.3	Yes
Guiding Light	Fishing	2	12.9	N/A	No
Blue Hulled Potter	Fishing	1	<25	N/A	No
Dettifoss	Cargo	1	164	8.6	Yes
Godafoss	Cargo	1	165	9.1	Yes
Helen Burnie	Multi-purpose Support Vessel	1	25	2.5	Yes
Hirta	Fisheries Patrol	1	84	5.4	Yes
HMS Northumberland	Military	1	133	4.9	Yes
Laxfoss	Cargo	1	80	5	Yes
Samantha Jane	Fishing	1	12.6	N/A	No
Welcome Home	Sea angling charter	1	<25	N/A	No
Unidentified Vessel	Unspecified	1	<25	N/A	No

The Northlink ferry *Hamnavoe* made four transits when travelling between Stromness and Scrabster. Other vessels with multiple transits included the fishing vessels *Caspian Hope* (2) and *Guiding Light* (2) and the cargo vessel *Selfoss* (2). A photo of the vessel *Caspian Hope* is shown in Figure 3.14.

The unidentified vessel was recorded on radar in darkness and therefore could not be visually observed. It is noted this vessel was returning towards Scapa Flow, which the *Samantha Jane* had been observed departing a few hours earlier that day.



Figure 3.14 Photo of the Fishing Vessel *Caspian Hope*

3.9 Visually Observed Targets

In addition to the recorded radar and AIS data, visual recordings were made of a small number of vessel positions that on occasion were not continuously tracked by the radar, for example, due to clutter and the small size of the target making them difficult to acquire.

These positions were in most cases taken from the radar (range and bearing) as returns were visible on the screen even when the radar could not continuously track the targets.

The logged vessel positions, colour-coded by vessel type, are presented in Figure 3.15.

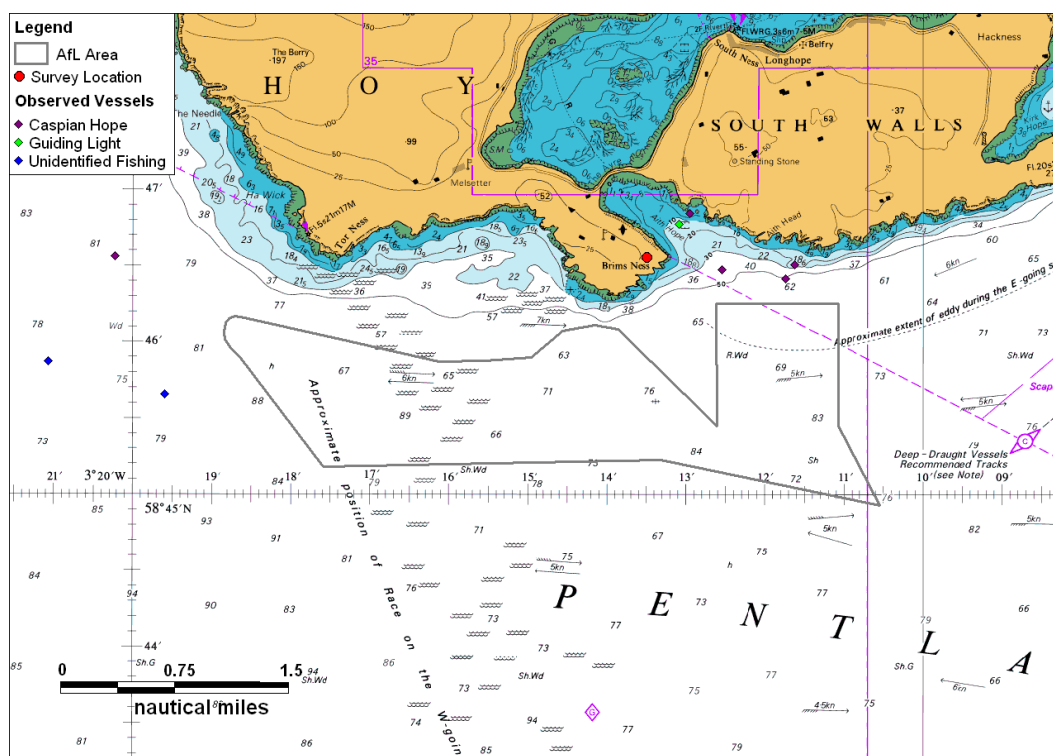


Figure 3.15 Plot of Visually Logged Vessels

There were a total of twenty manual observations made during the survey, sixteen of which were the fishing vessel *Caspian Hope* (pictured in Figure 4.4), seen on the 23rd, 24th, 25th and 28th of November. This vessel moored in Aith Hope at night and usually went to Aith Head for fishing operations during the day (a cluster of the points in Aith Head overlap). On two occasions it was seen travelling towards Tor Ness.

The *Guiding Light* was observed twice, mooring in Aith Hope on the 23rd of November and leaving its mooring in Aith Hope on the 25th November. Two of the visual observations were of an unidentified fishing vessel to the west of the Afl.

4. Detailed Review by Vessel Type

4.1 Introduction

This section presents more detailed analysis of the two weeks of survey data by vessel type.

4.2 Passenger Vessels

The passenger vessels tracked passing within the vicinity of the Brims AfL area are shown in Figure 4.1.

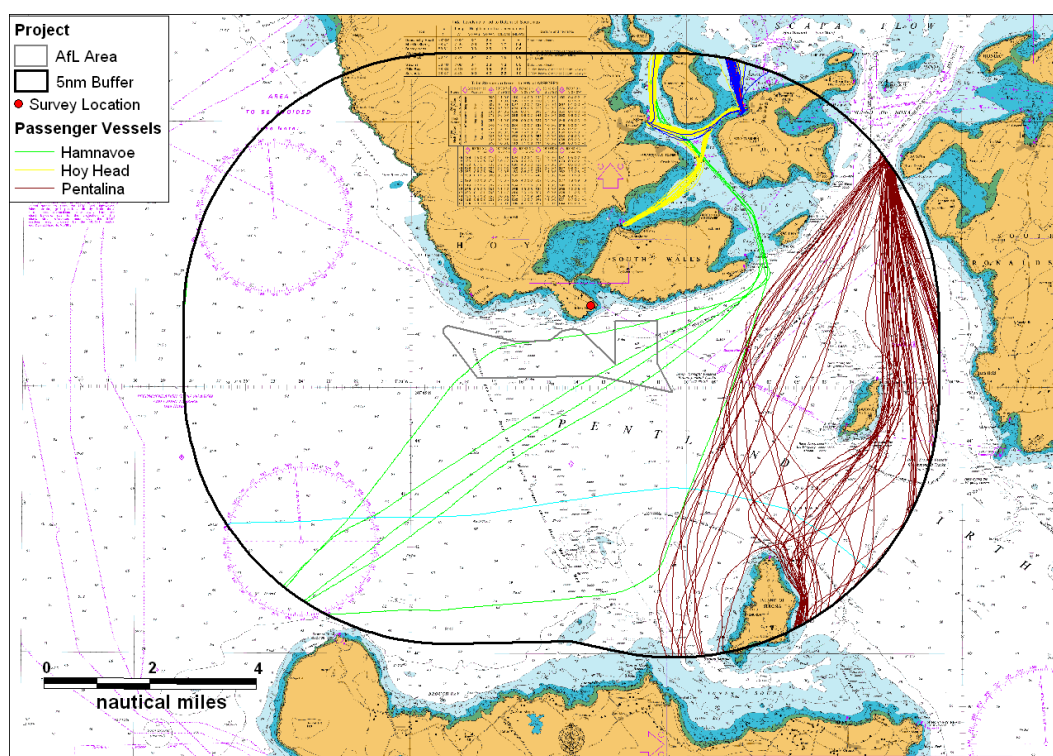


Figure 4.1 Passenger Vessels Tracks recorded during Brims Survey

The *Hamnavoe* was the only passenger vessel passing through the AfL and passed through during periods of bad weather. The *Pentalina* between Gills Bay and St Margaret's Hope came within 1.4nm of the AfL. Hoy Head kept well to the north when running between Houton and Lyness.

A photo of the *Hamnavoe* taken during the survey is shown in Figure 4.2.



Figure 4.2 Photo of Orkney Ferry *Hamnavoe* taken on 27th November 2013

4.3 Fishing Vessels

Fishing vessels within the Brims AfL area were all recorded on radar, as AIS is only mandatory for EU fishing vessels of 18m in length and over and all fishing vessels recorded during the survey were smaller than this. The tracks are presented in Figure 4.3. Tracks of vessels operating near the coast were seen on occasion to merge with land or the tide, requiring the track to be cancelled and the target to be reacquired. This mainly happened in the south west area of the site.

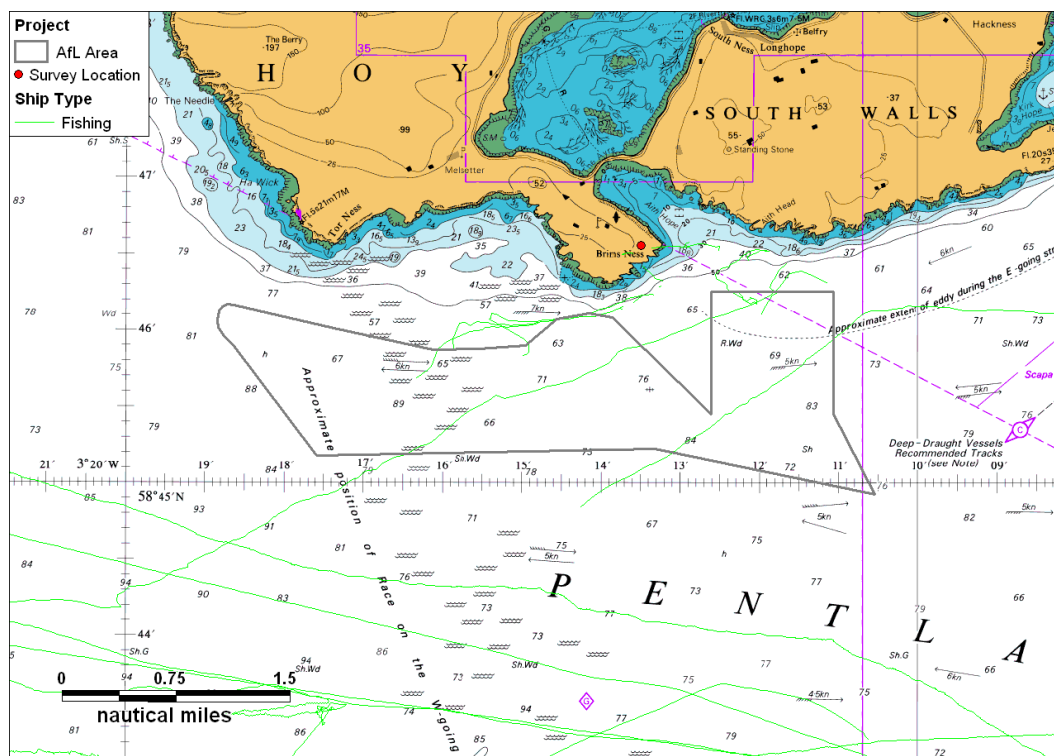


Figure 4.3 Fishing Vessels identified during Survey

The majority of fishing vessels tracked passing within the Brims AfL area were steaming. The *Caspian Hope* was seen on two separate occasions, including once hauling pots on the eastern edge of the site. Other vessels identified included the *Guiding Light* (twice) and the *Samantha Jane*. A photo of the *Guiding Light* as it passed the survey site is presented in Figure 4.4.



Figure 4.4 Photo of *Guiding Light* taken on the 23rd of November 2013

4.4 Cargo Vessels

A total of five cargo vessels were recorded passing through the site. They are displayed in Figure 4.5.

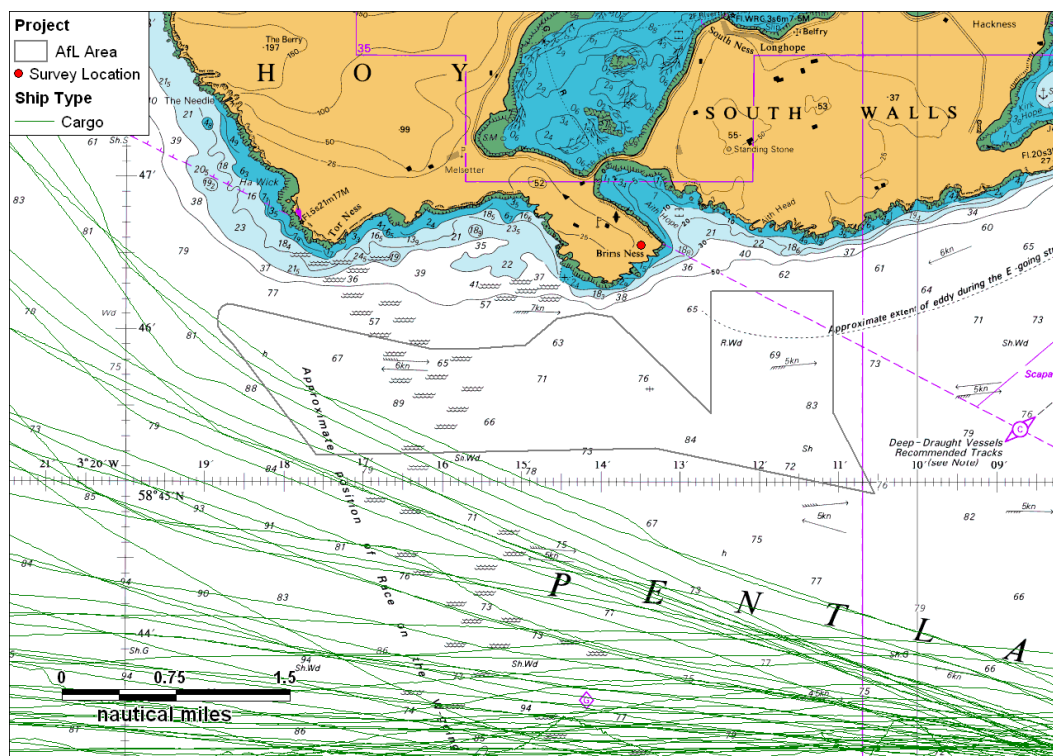


Figure 4.5 Cargo Vessels identified during Survey

All cargo vessels recorded in the site travelled through the south west corner and passed west of Hoy. The most frequently recorded cargo vessel was the *Selfoss* which transited the site twice, the first time travelling NW to Reykjavik and the second time SE to Immingham. The other cargo vessels that transited the site are the *Dettifoss* and the *Godafoss*, which were both travelling eastbound to Rotterdam, and *Laxfoss* which was travelling westbound to Reykjavik

4.5 Tankers

Figure 4.6 presents a chart overview of all tanker vessels recorded during the survey.

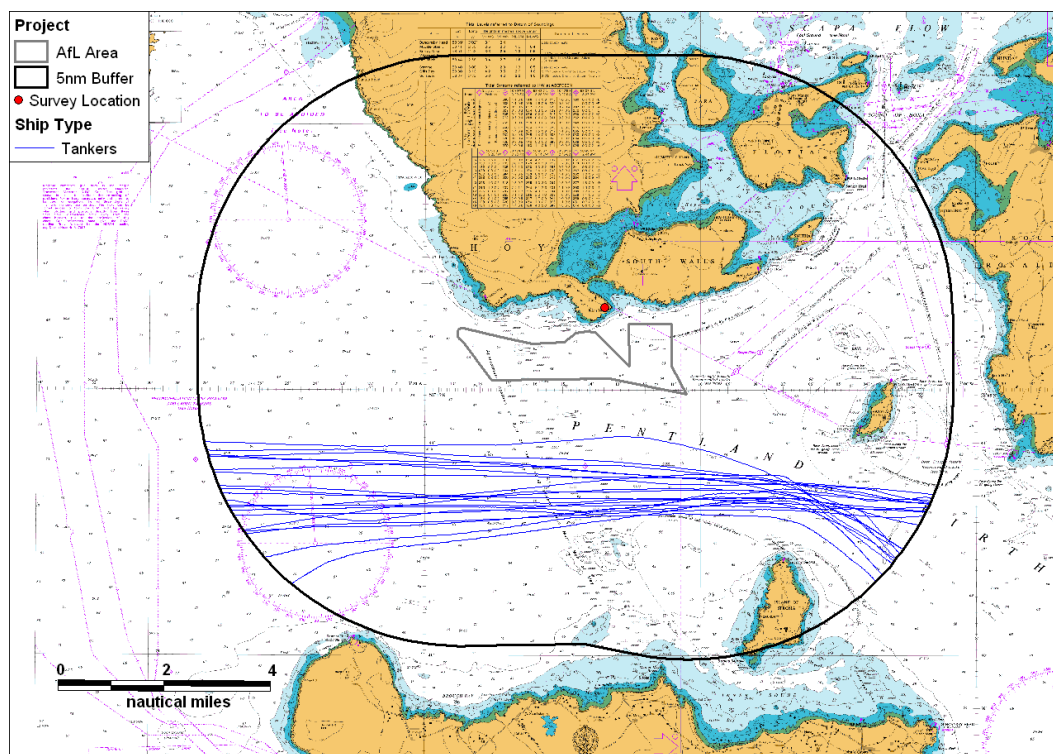


Figure 4.6 Tankers identified during Survey

There were no tankers recorded within the Brims AfL during the time of the survey. All were using the Outer Sound of the Pentland Firth.

4.6 All Other Vessels

Figure 4.7 presents a chart overview of the other vessels recorded during the survey.

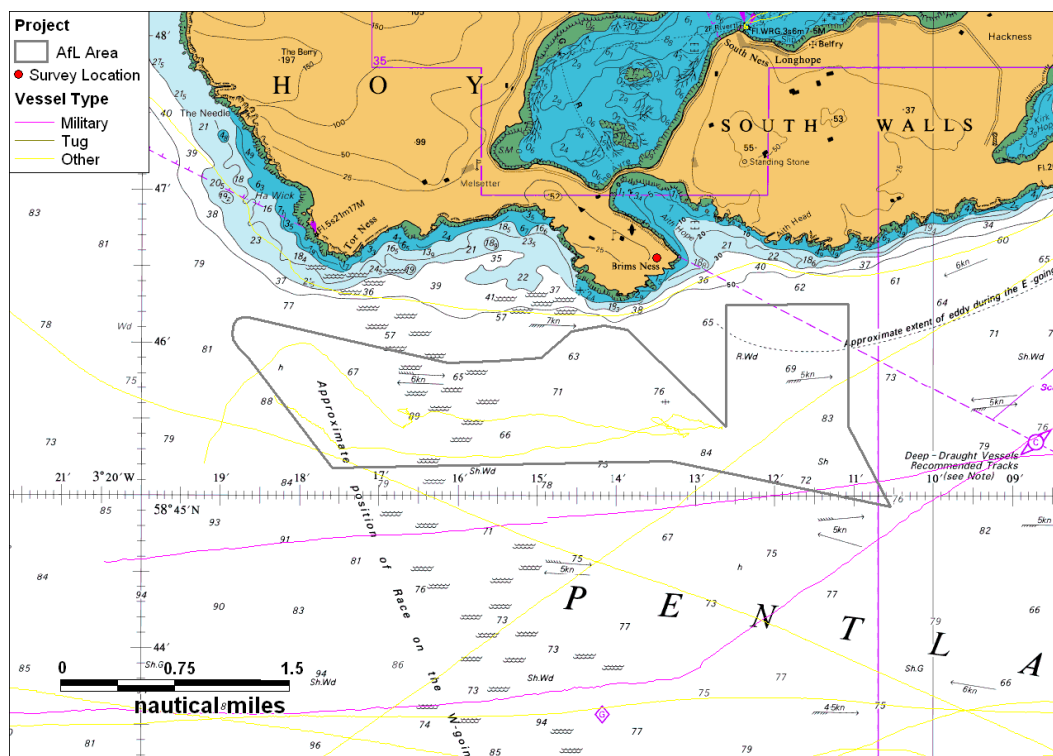


Figure 4.7 All Other Vessels Logged during Brims Survey

During the survey period, there was one military, and three ‘other’ vessel tracks recorded through the Brims AfL.

The ‘other’ tracks included a small recreational sea angling charter vessel called *Welcome Home* based in Stromness; a Fisheries patrol vessel called *Hirta*; and a multipurpose support vessel called *Helen Burnie*. The military vessel tracked was the *HMS Northumberland*, which passed through the south east corner of the site. Photos of *Welcome Home* and the *Hirta* taken during the survey are presented in Figure 4.8 and Figure 4.9.



Figure 4.8 Photo of Sea Angling Vessel *Welcome Home* taken on 24th November 2013



Figure 4.9 Photo of Fisheries Patrol Vessel *Hirta* taken on 23rd November 2013

5. Conclusions

This report has presented analysis of 14-days radar and AIS surveying of the proposed Brims tidal energy site. The survey was carried out near Judas Hill, Brims, Island of Hoy between the 22nd November and 6th December 2013.

Throughout the survey period, 20 unique tracks were recorded crossing the Brims AfL area. The most common vessels were fishing (6), cargo (5) and passenger (4).

A further 14-day survey is planned in summer 2014 to provide the data required for the Navigation Risk Assessment, meeting the MCA requirements.