

Marine Institute Cetacean Monitoring

During the Western European Shelf Pelagic Acoustic Survey

June - July 2023

Lead Agency: Marine Institute

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Acronyms

CTD	conductivity, temperature and depth
DAHG	Department of Arts, Heritage and the Gaeltacht
DC	direct current
EU	European
FEAS	Fisheries Ecosystems Advisory Services
HAWG	Herring Assessment Working Group
ICES	International Council for the Exploration of the Sea
m	metres
MMO	marine mammal observer
MPA	Marine protected area
N	north
NPWS	National Parks and Wildlife Service
nm	nautical miles
ROV	remotely operated vehicle
RV	research vessel
SAC	Special area of conservation
UK	United Kingdom
W	west
WESPAS	Western European Shelf Pelagic Acoustic Survey
WGIPS	Working Group of International Pelagic Surveys
WGWIDE	Working Group Widely Distributed Stocks
°	degree

Executive Summary

UK and Irish waters are used by a variety of marine mammal species; however, species occurrence (*e.g.* range, distribution and abundance) remains poorly understood. Under the EU Habitats Directive, Ireland (an EU member state) is obliged to conduct surveillance of marine mammal species' occurrence in Irish waters to address this knowledge gap. APEM Ltd was contracted by Marine Institute to provide a marine mammal observer (MMO) to conduct visual observations during the annual Western European Shelf Pelagic Acoustic Survey (WESPAS). This campaign included a fisheries acoustic survey across the northeast Atlantic (from the southern Celtic Sea 47°N, to the northern Hebrides 58° N) over a six-week period running from 9th to 29th of June and the 2nd to 20th July 2023 onboard *RV Celtic Explorer*. As the sound characteristics of the acoustic survey equipment would not have an effect on marine mammals, no marine mammal mitigation was required.

Marine mammal watches were conducted using a standard line transect survey design while the vessel was travelling at a consistent speed (*ca.* 9–10 knots) and heading. Data recorded during the survey includes observer effort (including data on vessel location and environmental conditions) and marine mammal sightings observed during dedicated watches and incidental detections. The MMO's survey efforts were conducted in sea states less than or equal to a sea state six with visibility greater than 1 km.

A total of 438 hours and 53 minutes of visual survey effort was conducted by the MMO over the course of WESPAS 2023; 246 hours and 30 minutes of survey effort was conducted on Leg 1, while 192 hours and 23 minutes of survey effort was conducted on Leg 2. A total of 92 sightings were recorded during the survey. Eighty-four were recorded on survey effort during line transects, while eight sightings were incidental recordings by the MMO 'off-effort' or by other members of the crew. Marine mammal sightings to the species parvorder included two mysticetes and seven odontocetes. Mixed species encounters were recorded on one occasion. Other megafauna species encountered during the survey include the ocean sunfish and an unidentified shark species.

1. Introduction

1.1 Project Overview

The WESPAS program, conducted by Fisheries Ecosystems Advisory Services (FEAS) department of the Marine Institute consists of an acoustic survey targeting herring (*Clupea harengus*), boarfish (*Capros aper*) and horse mackerel (*Trachurus trachurus*) to provide stratified relative stock abundance estimates. These surveys have been conducted annually since 2016 with the present survey being the eighth survey in the series. WESPAS is the result of the Malin Shelf acoustic survey and the boarfish survey joining, which initially began in 2008 and 2011, respectively (O'Donnell *et al.*, 2022).

Acoustic and biological data from target species will be used to provide a fishery-independent measure of relative abundance of stocks within the survey area. Survey results will be presented to the ICES Working Group Widely Distributed Stocks (WGWIDE) in September 2023 and the ICES Herring Assessment Working Group (HAWG) March 2024. This survey is coordinated through ICES Working Group of International Pelagic Surveys (WGIPS) and adheres to internationally established protocols for fisheries acoustic surveys.

Irish and Hebridean waters are species-rich marine environments with complex coastlines and a variety of marine habitats, where more than a quarter of the world's marine mammal species are recorded. These habitats range from shallow continental shelf waters (<200 m water depth) to gullies and deep-water basins such as the Porcupine Bank (2,500 – 4,000 m water depth; Mazzini *et al.*, 2012). A total of 25 species of cetacean (whale, dolphin and porpoise) have been recorded in Irish waters (IWDG, 2023; **Table 1**) and 23 species in Hebridean waters (Hague *et al.*, 2020; HWDT, 2018). The following species are considered resident and are present year-round: fin whale (*Balaenoptera physalus*); killer whale (*Orcinus orca*); long-finned pilot whale (*Globicephala melas*); bottlenose dolphin (*Tursiops truncatus*); Risso's dolphin (*Grampus griseus*); white-beaked dolphin (*Lagenorhynchus albirostris*); Atlantic white-sided dolphin (*Lagenorhynchus acutus*); and harbour porpoise (*Phocoena phocoena*). It is possible that Cuvier's beaked whale (*Ziphius cavirostris*) and Sowerby's beaked whale (*Mesoplodon bidens*) breed within the deep-water gullies to the west of the continental shelf (Berrow, 2001). The following species are considered transient, but regularly visit Irish and UK waters during the summer months: humpback whale (*Megaptera novaeangliae*); minke whale (*Balaenoptera acutorostrata*); sperm whale (*Physeter macrocephalus*); short-beaked common dolphin (*Delphinus delphis*); and striped dolphin (*Stenella coeruleoalba*).

Cetaceans are protected under a range of national and international legislation. WESPAS stretches across waters belonging to different jurisdictions, notably Ireland and the UK, which are governed under different regulations. Many legislations are region-specific such as the Nature Conservation (Scotland) Act 2004 that builds upon the Wildlife and Countryside Act 1981 by further improving protection of cetaceans from intentional disturbance and incorporates risk from reckless disturbance. The Wildlife Act 1976 provides a legal framework in the Republic of Ireland for the conservation of wildlife and their

Table 1 Marine mammal species occurring in Irish and Hebridean waters and their conservation statuses. Sources: HWDT, 2018; Temple *et al.*, 2007; Wall *et al.*, 2013; Whooley, 2016.

Common name	Scientific name	Occurrence	Conservation Status (IUCN Europe)
<i>Mysticete</i>			
Humpback whale	<i>Megaptera novaeangliae</i>	May-Aug	Least concern
Blue whale	<i>Balaenoptera musculus</i>	July-March	Endangered
Fin whale	<i>Balaenoptera physalus</i>	All year	Near threatened
Sei whale	<i>Balaenoptera borealis</i>	All year	Endangered
Northern minke whale	<i>Balaenoptera acutorostrata</i>	All year	Least concern
Northern right whale	<i>Eubalaena glacialis</i>	Vagrant	Critical
Bowhead whale	<i>Balaena mysticetus</i>	Data deficient	Not assessed
<i>Odontocete</i>			
Sperm whale	<i>Physeter macrocephalus</i>	All year	Vulnerable
Pygmy sperm whale	<i>Kogia breviceps</i>	Vagrant	Not assessed
Killer whale	<i>Orcinus orca</i>	All year	Data deficient
False killer whale	<i>Pseudorca crassidens</i>	June-Nov	Not assessed
Long-finned pilot whale	<i>Globicephala melas</i>	All year	Data deficient
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	May-Aug	Least concern
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	May-Aug	Data deficient
Gervais' beaked whale	<i>Mesoplodon europaeus</i>	Vagrant	Data deficient
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	All year	Data deficient
True's beaked whale	<i>Mesoplodon mirus</i>	All year	Data deficient
Beluga	<i>Delphinapterus leucas</i>	Vagrant	Not assessed
Risso's dolphin	<i>Grampus griseus</i>	All year	Data deficient
Common bottlenose dolphin	<i>Tursiops truncatus</i>	All year	Data deficient
Short-beaked common dolphin	<i>Delphinus delphis</i>	All year	Data deficient
Striped dolphin	<i>Stenella coeruleoalba</i>	May-Sept	Data deficient
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	All year	Least concern
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	All year	Least concern
Harbour porpoise	<i>Phocoena phocoena</i>	All year	Vulnerable
<i>Pinniped</i>			
Grey seal	<i>Halichoerus grypus</i>	All year	Least concern
Common (harbour) seal	<i>Phoca vitulina</i>	All year	Least concern

habitats, conferring specific protection on seals, whales, dolphins and porpoises up to 12 nautical miles from the coast (NPWS, 2014). However, many international legislations are relevant to both jurisdictions such as the Convention on Conservation of Migratory Species of Wild Animals (Bonn Convention), ASCOBANS (Agreement on the Conservation of Small Cetaceans in the Baltic Sea and North Sea), OSPAR Convention (The Convention for the Protection of the Marine Environment of the North-East Atlantic) and CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora). Other regional legislation includes the EU Habitats Directive, which has been transposed into Irish (European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)) and UK (92/43/EEC) law, requiring designation of special areas of conservation (SAC) for key habitats and species, and providing strict protection to all cetacean species (listed under Annex IV).

Two species of pinniped inhabit Irish and UK waters year-round, harbour (*Phoca vitulina*) and grey (*Halichoerus grypus*) seals. Rare sightings of the following pinniped species have been recorded on the west coast of Ireland, but Irish and UK waters are not considered part of their natural home ranges, as these species are largely found in Arctic waters: walrus (*Odobenus rosmarus*); hooded seal (*Cystophora cristata*); bearded seal (*Erignathus barbatus*); and ringed seal (*Pusa hispida*). Four species (and subspecies) of seal are afforded protection under Annex II of the EC Habitats Directive; of relevance to this project are harbour seal and grey seal. All seals are protected species of the Wildlife Acts, 1976 and 2000 in Ireland.

The survey passed through or near to various SACs for bottlenose dolphin (*e.g.* Lower River Shannon SAC and West Connacht Coast SAC), harbour porpoise (*e.g.* Roaringwater Bay and Islands SAC, and Blasket Islands SAC), harbour seal (nine SACs across the west coast including: Rutland Island and Sound SAC, and Donegal Bay SAC) and grey seal (seven SACs across the west coast including: Roaringwater Bay and Islands SAC, and Blasket Islands SAC) in Irish waters. Scottish marine protected areas (MPAs) covered in the survey include the Sea of the Hebrides MPA, where minke whale and basking shark are protected features, the North-east Lewis MPA where Risso's dolphin is a protected feature, and the Inner Hebrides and the Minches SAC, where harbour porpoise is a protected feature.

Marine mammals account for 48% (Lysaght and Marnell, 2016) and 36% (Crawley *et al.*, 2020) of all native mammal species in Ireland and UK, respectively. Although there remain questions about the abundance, distribution and conservation status of some cetacean species occurring in Irish and UK waters, knowledge has improved for many in recent years (NPWS, 2019). Article 17 of the EU Habitats Directive requires member states to report on the conservation of habitats and species of community interest every six years, which promotes surveys such as the WESPAS programme to collect data to feed into these reports. WESPAS provides a unique opportunity for the surveillance of summer distribution of cetaceans alongside an acoustic survey targeting species which are prey to some marine mammals. The availability and distribution of prey is a key factor affecting the distribution of cetaceans, which is why it is important to collect these data at the same time.

WESPAS 2023 occurred over a six-week period beginning 9th June 2023 onboard the *RV Celtic Explorer* from the Northern Bay of Biscay (47° 30.742' N, 6° 10.989' W) to the northern Hebrides (58° 36.836' N, 7° 51.427' W). APEM Ltd was contracted by Marine Institute to carry out visual surveys for marine mammals, with one marine mammal observer (MMO) deployed for both survey legs (Leg 1: 09/06/2023 – 29/06/2023; Leg 2: 02/07/2023 – 20/07/2023). The MMO used standard effort-based sampling methods (Thomas *et al.*, 2010) for marine mammal detection along pre-determined survey transect lines. Refer to **Section 2** for further information on methodology and data collection.

1.2 Vessel

The *RV Celtic Explorer* (**Figure 1**) is a research vessel owned by the Irish Government and operated by Marine Institute. It is utilised to conduct fisheries acoustic research, oceanographic, hydrographic and geological investigations, buoy deep-water mooring, and remotely operated vehicle (ROV) operations. A vessel overview is included in **Table 2**.

Table 2 R.V. Celtic Explorer specifications.

Ships Name	R.V. Celtic Explorer
<i>Call Sign:</i>	EIGB
<i>Flag:</i>	Ireland
<i>Type:</i>	Fishing Trawler
<i>Built:</i>	2002
<i>Owner:</i>	Irish Government
<i>Classification:</i>	Research/Survey Vessel
<i>IMO</i>	9244439
<i>Length overall:</i>	65.5m
<i>Breadth:</i>	15.3m
<i>Draft(max):</i>	8.4m
<i>Gross Tonnage:</i>	2,425 t
<i>Cruising Speed:</i>	≥10 knots



Figure 1 The survey vessel, R.V. Celtic Explorer.

1.3 Equipment and sound emissions

Kongsberg Simrad Su90 omni-directional sonar and Simrad EK60 Echosounder were used to collect data on the aggregation, morphology and behaviour of target species. Equipment settings for the acoustic equipment were determined before the start of the survey program and were based on established settings employed by FEAS on previous surveys (O'Donnell *et al.*, 2004).

Acoustic data were collected primarily using the Simrad EK60 scientific echosounder. Simrad split-beam transducers were mounted within the vessel's drop keel and lowered to the working depth of 3.3 m below the vessel's hull or 8.8 m sub-surface.

Four operating frequencies were used during the survey (18, 38, 120 and 200 kHz) for trace recognition purposes, with the 38 kHz data used to generate the abundance estimate. Whilst on survey track, the vessel is normally propelled using direct current (DC) twin electric motor propulsion system with power supplied from one main diesel engine, so in effect providing "silent cruising" as compared to normal operations. During fishing operations, normal two-engine operations were employed to provide sufficient power to tow the net. No marine mammal mitigation was required for this survey.

2. Methodology

2.1 Line transect survey methodology

Marine mammal watches were conducted using a standard line transect survey design while the vessel was travelling at a consistent speed (*ca.* 9–10 knots) and heading. Line transect sampling is the most widely used method of distance sampling and a detailed reference of the methodology is provided by Thomas *et al.* (2010). In summary, the MMO searches the surrounding water for marine mammals while the vessel follows a predetermined route and records any animals and their distance to the line.

Transects were conducted between the southern Celtic Sea (northern Bay of Biscay) 47° 30.742' N, 6° 10.989' W to north of the Hebrides 58° 36.836' N, 7° 51.427' W (west of Scotland) and returned to Ireland through the Minch (**Figure 2**). Transects ran east to west and were 15 nautical miles (nm) apart, where possible. Due to the restricted area through the Minch (the strait separating mainland Scotland and the Outer Hebrides), transects followed a zig-zag pattern southward. When the vessel was stationary at hydrographic sampling stations, the MMO conducted their watch following a standard point-sampling survey design¹.

¹ Where the MMO conducts systematic searches for marine mammals with naked eye and reticle binocular scans surrounding the vessel to the horizon, for example, as per JNCC MMO approved training methods.

WESPAS 2023

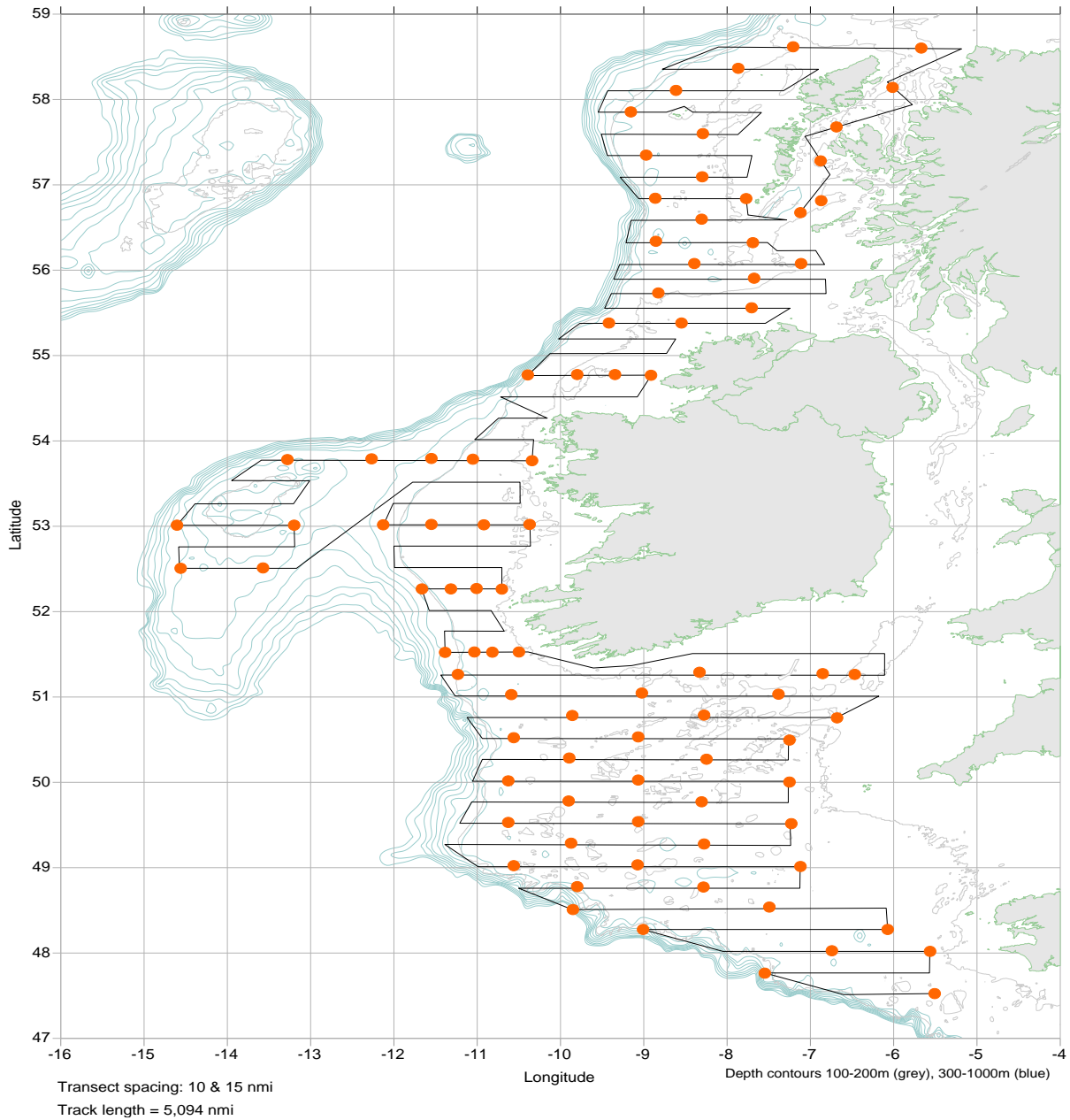


Figure 2 WESPAS survey track and location of predetermined hydrographic sampling stations (orange circles). Source: Marine Institute (2023).

Visual watches were undertaken from the vessel's platform directly above the bridge, located 12 m above sea level, when weather conditions permitted. This platform provided the best 360° view of the water surrounding the vessel. During periods of unfavourable weather conditions (*e.g.* periods of precipitation), observations were conducted from the Monkey Island, an enclosed housing 17.45 m above sea level. This unit provided good visibility and allowed for a 120° field-of-view, port and starboard of the track line; however, there was limited visibility to the rear due to the housing, and to the front and sides of the vessel, where animals near the vessel could be missed. In adverse conditions (*e.g.* swell greater than 2 m) ascent to the Monkey Island or above bridge deck was not possible; in these cases, watches were conducted from the bridge at 10.63 m above sea level. Survey effort was concentrated in periods of sea state 6 or less, and in moderate or good visibility.

The MMO conducted daily watches over 12 of the *ca.* 17 hours of daylight (*ca.* sunrise 04:50 to sunset 21:45). For consistency, observations were carried out over a continuous watch between 05:00 – 17:30 UTC, with the exception of a 30-minute break for lunch and hourly visits to the bridge to record positioning data. Off-effort and incidental sightings from the MMO, crew and officers on watch were also recorded.

Marine mammal searches were conducted primarily with the naked eye, using 7x50 reticle binoculars to estimate number of animals and behaviour, and a Canon D7200 DSLR camera with 100–400 mm zoom lens to aid in species identification and to provide a record of the sighting. Species identification was confirmed by reference to accompanying field guides (*e.g.* Jefferson *et al.*, 2015). Distances to all sightings were estimated using calibrated reticle binoculars and/or range finder sticks (**Figure 3**).

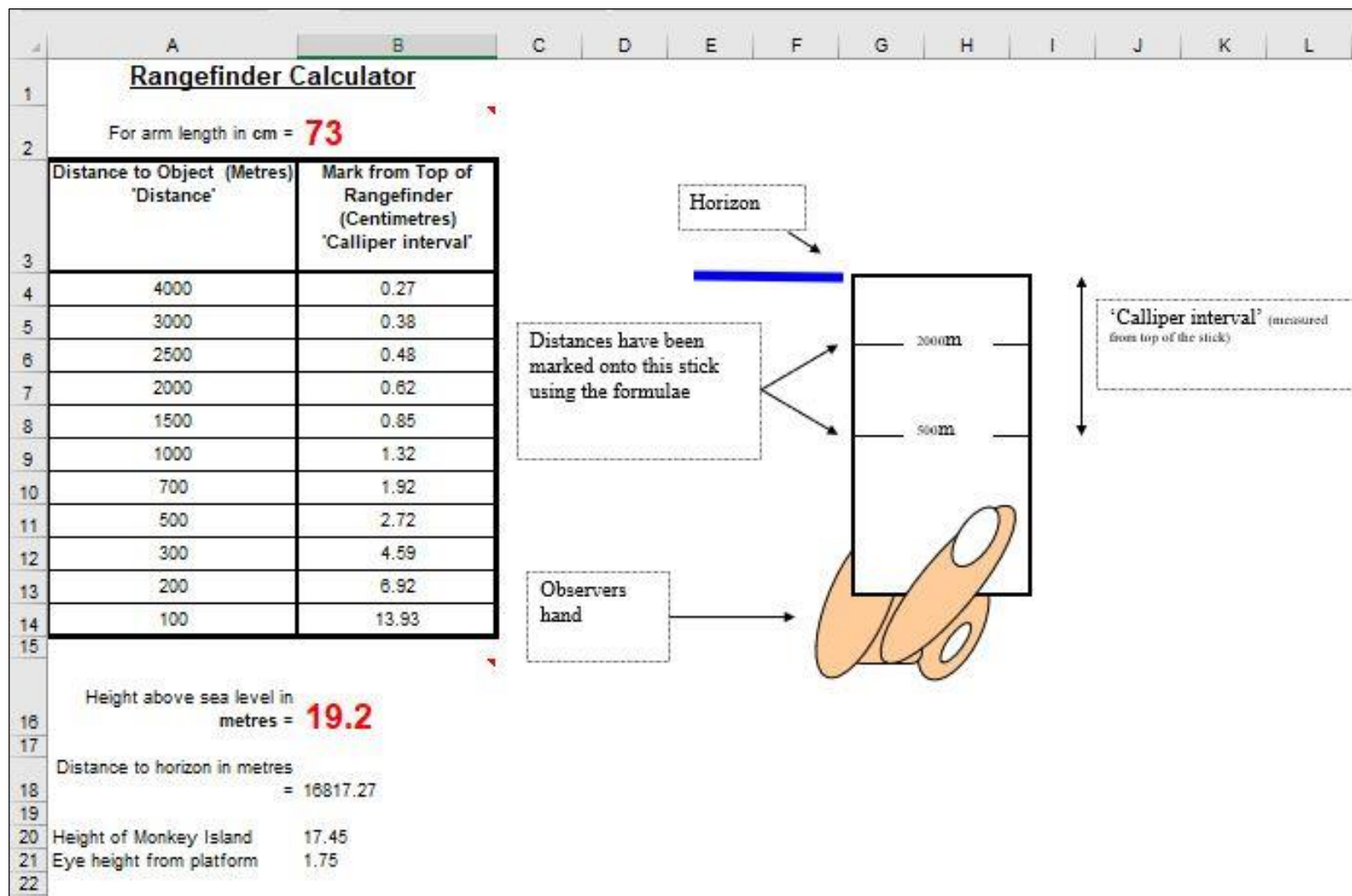


Figure 3 Example of rangefinder stick calculation and set up.

2.2 Data collection and recording

Data were recorded using standardised National Parks and Wildlife Service (NPWS) MMO recording forms and included information on:

- observer effort, noting periods of active observation;
- environmental conditions under which the survey effort took place; and
- any marine mammal sightings.

Environmental data were recorded at least hourly, or if there was a change in weather conditions. Environmental data included water depth, weather, wind direction, wind force (*i.e.* Beaufort scale), sea state, swell, visibility, and sun glare, alongside records of the vessel position and ship speed for each data entry.

Sightings data included GPS location, species identification and sighting cues (*e.g.* body parts, blows, feeding seabirds, splashes and sea surface disturbance), bearing and range from vessel, number of adults and calves, behaviour, direction of travel, and water depth. Comments were also recorded when marine mammals associated with birds or any other marine mammal species. Where species identification could not be confirmed, sightings were recorded to the most accurate taxonomic level (*e.g.* unidentified whale, unidentified dolphin) with confidence level of categorisation/identification noted (*e.g.* probable, possible).

Daily reports, detailing the total monitoring effort, any visual sightings, weather, and a 24-hour look ahead were submitted by the MMO to the APEM Ltd Project Manager for review.

3. Results

3.1 Effort

A total of 438 hours and 53 minutes of visual survey effort was conducted by the MMO over the course of WESPAS 2023; 246 hours and 30 minutes of survey effort was conducted on Leg 1, while 192 hours and 23 minutes of survey effort was conducted on Leg 2. **Figure 4** represents daily effort undertaken in good or poor visual conditions. No watches were conducted between 30th June and 1st July due to crew change in Galway and operations were halted due to severe weather on 16th July. Environmental data were collected a total of 468 times (at least once per hour on effort, or when weather conditions changed) during the survey. A summary of the MMO effort and vessel operations is provided in

Table 3.

Table 3 Marine mammal observation and operational summary.

Operations	Period (hours:minutes)
Total visual observation	438:53
Mobilisation	14:18
Demobilisation	12:38
Transit to survey	43:34
Transit from survey/to port	28:02
Calibrations	04:42
Mid-water trawling	52:31
Plankton dip + conductivity, temperature, and depth (CTD)	30:16
Standby weather	20:25

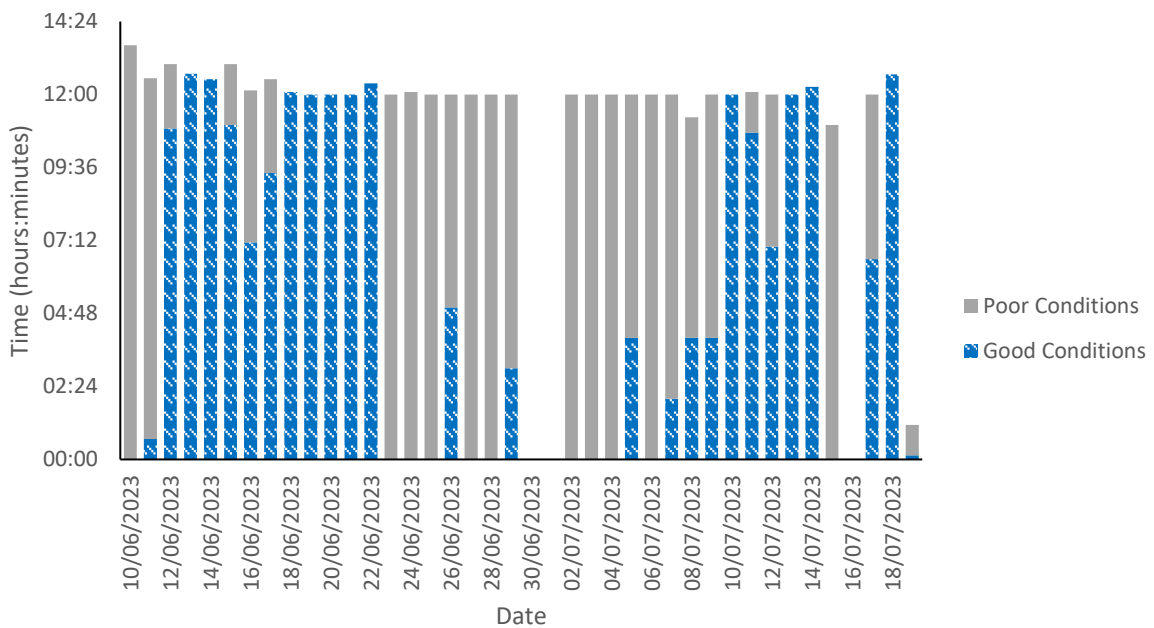


Figure 4 Daily visual effort against observation conditions undertaken during WESPAS 2023. ‘good’= ‘glassy/slight’ sea state, low swell and ‘good’ visibility. Any other combinations of these conditions were considered ‘poor’.

3.2 Environmental conditions

Weather conditions recorded during the survey were variable throughout, with predominantly slight (62% of the time) and choppy seas (32% of the time; **Figure 5**). Swell was predominantly medium (2-4 m for 86% of the time), with occasional periods of low (<2 metres for 16% of the time) and no large swell (>4 m) recorded (**Figure 6**). Wind strengths were generally between a Beaufort force of 3 to 6 (83% of the time), with Beaufort force 2 or less occurring only occasionally (12% of the time; **Figure 7**) and were predominantly south through north-westerly in direction (**Figure 8**). Visibility was predominantly good throughout (> 5 km for 68% of the time; **Figure 9**), with strong sun glare present 69% of the time (**Figure 10**).

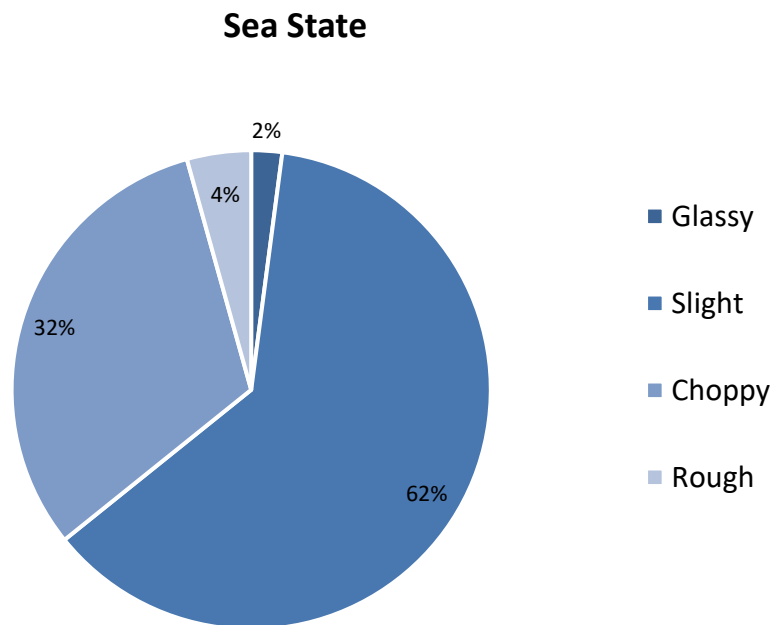


Figure 5 Sea state recorded during dedicated marine mammal monitoring.

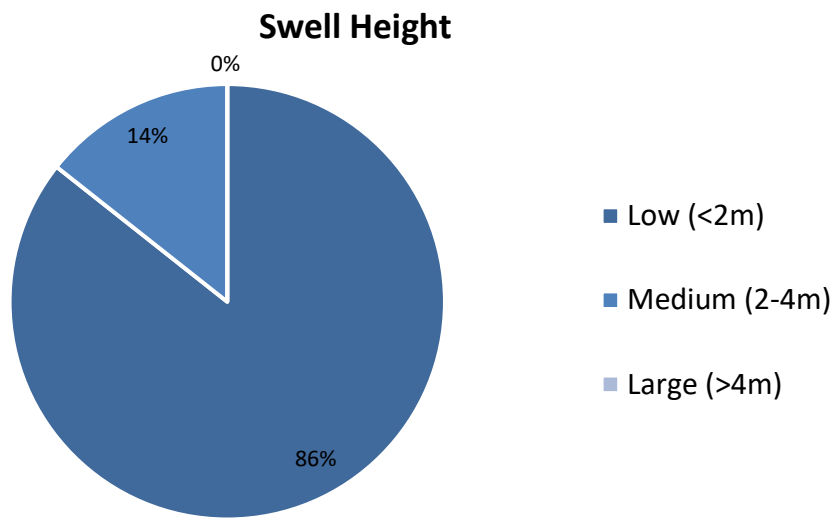


Figure 6 Swell height recorded during dedicated marine mammal monitoring.

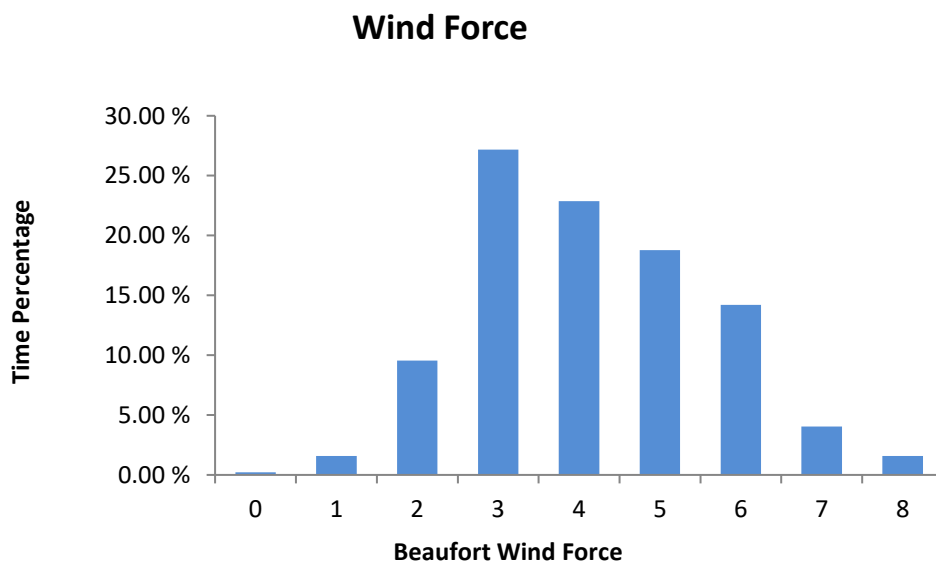


Figure 7 Beaufort wind force recorded during dedicated marine mammal monitoring.

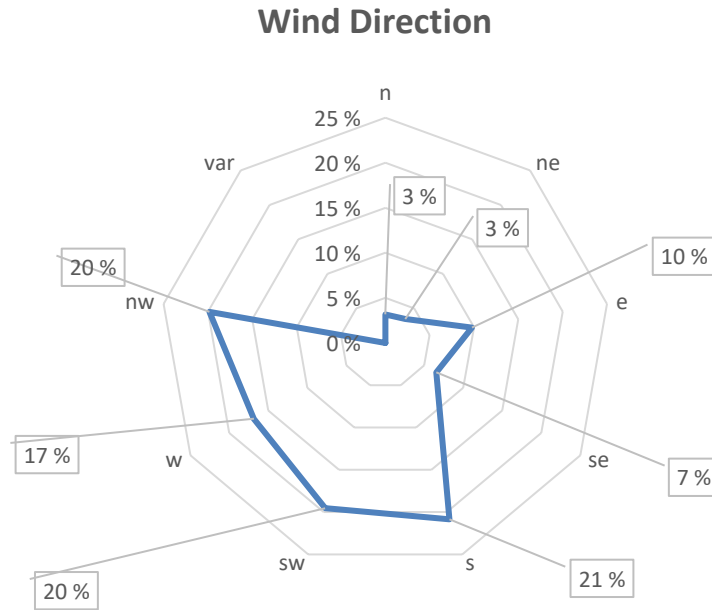


Figure 8 Wind direction recorded during dedicated marine mammal monitoring.

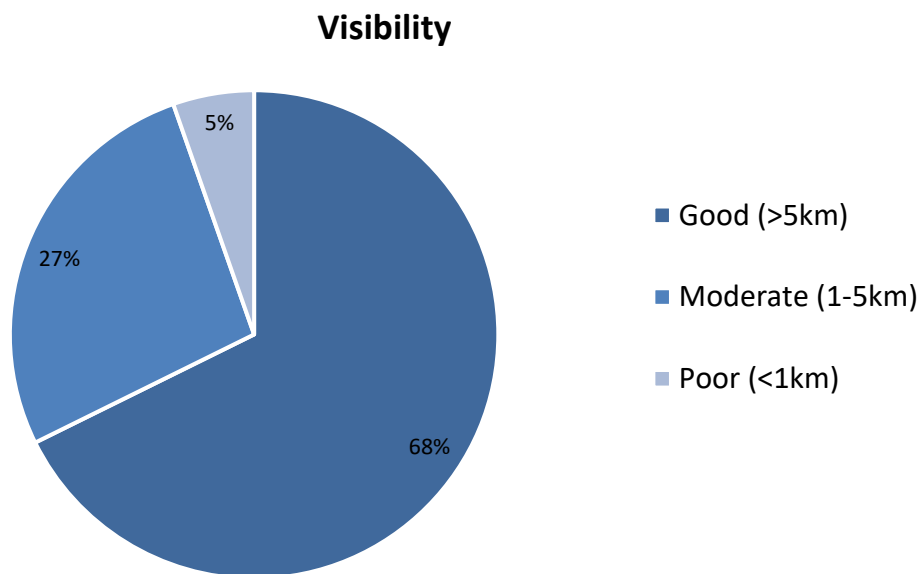


Figure 9 Visibility recorded during dedicated marine mammal monitoring.

Sun Glare

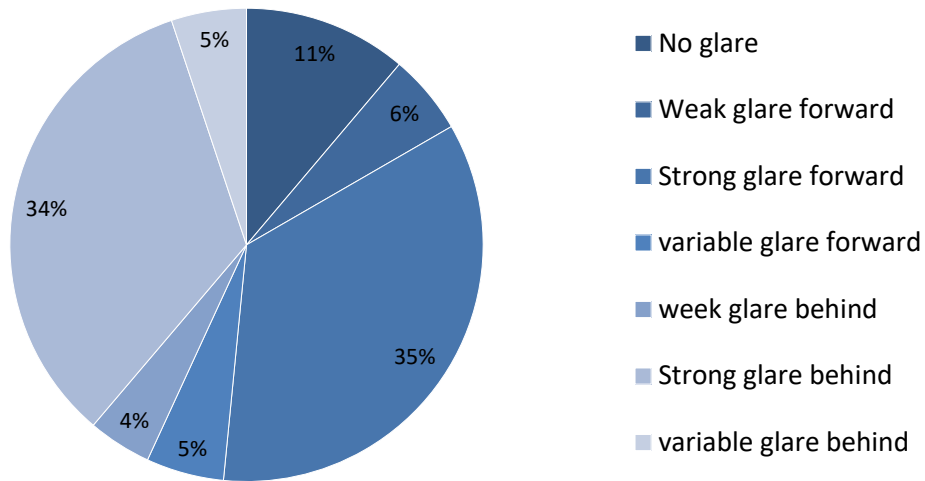


Figure 10 Sun glare recorded during dedicated marine mammal monitoring.

3.3 Sightings

A total of 92 visual sightings of cetaceans were recorded during the survey. No seal species were recorded. Of the cetacean species recorded, 83 were positively identified to species level, comprising nine different species: short-beaked common dolphin (*Delphinus delphis*); bottlenose dolphins (*Tursiops truncatus*); Risso’s dolphin (*Grampus griseus*); long-finned pilot whale (*Globicephala melas*); Atlantic white-sided dolphin (*Lagenorhynchus acutus*); white-beaked dolphin (*Lagenorhynchus albirostris*); sperm whale (*Physeter macrocephalus*); minke whale (*Balaenoptera acutorostrata*); and fin whale (*Balaenoptera physalus*).

Of the 92 sightings, 84 were recorded on survey effort during line transects, while eight sightings were incidental recordings by the MMO ‘off-effort’ or by other members of the crew. A summary of the species encountered during WESPAS 2023 can be seen in **Table 4**, and the distribution of sightings can be seen in Error! Reference source not found.x E.

Short-beaked common dolphins (*Delphinus delphis*; **Figure 11**) were the most frequently encountered and most abundant species, accounting for 56 encounters (61% of all sightings) comprising 495 individuals in total. Group sizes ranged from one individual to a group of 80. Seventeen of these encounters included calves, 14 of those where the group sizes ranged from 2–16 individuals had a single calf, one group of nine had two calves and a group of 13 had three calves. The largest pod encountered was 80 individuals: 74 adults with 6 calves. Sighting number 20 included a mixed group of seven common dolphins with an unidentified dolphin species near the continental slope off the south-west of the Republic of Ireland. Another mixed species encounter involved three adult common dolphins (sighting #84), five adult bottlenose dolphins (*Tursiops truncatus*; sighting #85) and two Risso's dolphins (*Grampus griseus*; sighting #83) all travelling southward from the northern region of the Minch. This was the only sighting of Risso's dolphins throughout the survey and was located near the North-east Lewis MPA where Risso's dolphins are a protected feature. Observed behaviours of the common dolphins ranged from travelling, porpoising, feeding (in the same prey patch as gannets) and interacting with the survey vessel by bow or wave riding. The observed distribution of this species included both coastal and offshore habitats and throughout the regions of the survey area.



Figure 11 Sighting #074 (12/07/23), short-beaked common dolphin (*Delphinus delphis*) porpoising. Distinguishing features: characteristic yellow and white figure of eight pattern on the flank.

Bottlenose dolphins (**Figure 12**) were the second most frequently observed and abundant species with 12 encounters (13% of all sightings) comprising 167 individuals. The largest pod encountered comprised 30 adults. Four groups ranging between 10 – 25 individuals had one or two calves. This species was sighted the most with other species. A group of 25 bottlenose dolphins was observed to be feeding in the same area as diving gannets and a whale (not identified to species level; sighting #31) south-west of Ireland near the continental slope. A smaller group was also observed feeding with a group of six adult pilot whales (sighting #38) in a similar location to the previous mixed species encounter. Observed behaviours included travelling, porpoising, aerial displays, lobtailing and feeding.

The observed distribution of this species included both coastal and offshore habitats throughout the regions of the survey area.



Figure 12 Sighting #013 (15/06/23), bottlenose dolphin (*Tursiops truncatus*) surfacing. Distinguishing features: tall falcate dorsal fin, uniform grey colouration across back and sides, lighter belly, and distinctly short stubby beak.

Long-finned pilot whales (*Globicephala melas*; **Figure 13**) were the third most frequently encountered and abundant species, with two encounters (2% of all sightings) comprising 17 individuals. In addition to the mixed sighting with bottlenose dolphin, as mentioned above, the second encounter included ten adults travelling east from the continental slope towards the west of Scotland. Both sightings occurred at the edge of the continental slope.

Other delphinid species encountered included: a lone Atlantic white-sided dolphin (*Lagenorhynchus acutus*; sighting #1) to the north of the Dingle Peninsula, Republic of Ireland; three adult white-beaked dolphin (*Lagenorhynchus albirostris*; sighting #69; **Figure 14**) to the north of Northern Ireland and two encounters of lone unidentified delphinid species (sightings #12 and #64).

One sperm whale (*Physeter macrocephalus*; sighting #70) was observed breaching once, where the whole body left the water, within 300 nm south-west of the Outer Hebrides. This observation occurred on the continental shelf within 154 m water depth.



Figure 13 Sighting #068 (10/07/23), long-finned pilot whales (*Globicephela melas*) with calf. Distinguishing features: bulbous head and rounded dorsal fin.

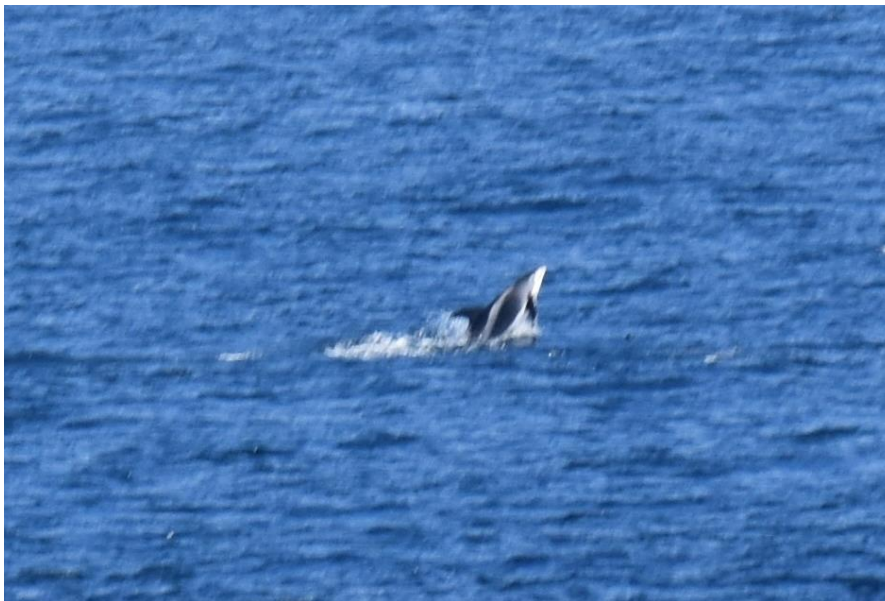


Figure 14 Sighting #069 (10/07/23), white-beaked dolphin (*Lagenorhynchus albirostris*). Distinguishing features: white markings on the flank and belly and rounded, tall dorsal fin.

Minke whales (*Balaenoptera acutorostrata*) were the most frequently sighted mysticete, accounting for seven sightings (8% of all sightings), comprising seven individuals. The observed distribution of this species included the south-west region of the Celtic Sea and the Minch. Every individual showed brief surfacing behaviour to breathe before diving and leaving the transit area.

Unidentified whales were the second most frequent whale observations with six encounters of sole travellers. Four of these were estimated to be over 2.5 km from the vessel with limited or no visuals of the body. Where no body part was observed, the sighting was recorded with note of whale blows. The observed distribution of whales not identified to species level included coastal and offshore habitats within the Celtic Sea and Minch.

A single sighting of a lone fin whale (*Balaenoptera physalus*; sighting #26) was recorded in the south of the Celtic Sea.

The ocean sunfish (*Mola mola*) and an unidentified shark (**Table 5**) were recorded within the Bay of Biscay, but their GPS locations were not taken.

Table 4 Summary of marine mammal sightings during the WESPAS 2023 (includes auxiliary and incidental sightings).

Common Name	Scientific Name	No. of sightings	No. of individuals	Group size/ range
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	1	1	1
Bottlenose dolphin	<i>Tursiops truncatus</i>	12	167	7
Common dolphin	<i>Delphinus delphis</i>	56	495	1-80
Common/ unidentified dolphin	<i>Delphinus delphis/</i> unknown delphinid	1	7	7
Fin whale	<i>Balaenoptera physalus</i>	1	1	1
Long finned pilot whale	<i>Globicephala melas</i>	2	17	6-11
Minke whale	<i>Balaenoptera acutorostrata</i>	7	7	1
Risso's dolphin	<i>Grampus griseus</i>	1	2	2
Sperm whale	<i>Physeter macrocephalus</i>	1	1	1
White beaked dolphin	<i>Lagenorhynchus albirostris</i>	1	3	3
Unidentified baleen whale	Mysticeti sp.	6	6	1
Unidentified cetacean	Cetacea sp.	1	1	1
Unidentified dolphin	Delphinid sp.	2	2	1
Total		92	710	

Table 5 Summary of other sightings during the WESPAS 2023.

Common Name	Scientific Name	No. of sightings	No. of individuals	Group size/ range
Ocean sunfish	<i>Mola mola</i>	1	1	1
Unidentified shark	Selachii sp.	1	1	1
Total		2	2	

4. Discussion

WESPAS 2023 successfully collected data on marine mammal occurrence during the annual fisheries acoustic survey. Nine marine mammal species were observed during the survey, which is similar to previous surveys (*i.e.* between 7 and 13 species; **Appendices C and D**). Although only one MMO was deployed during this year's survey, this year held the highest hours of survey effort. Number of sightings and individuals increased from the previous year and compares to results from WESPAS 2021, which were also higher than in 2022.

The cetacean fauna observed during WESPAS 2023 were predominantly delphinids, which constituted 87% of all sightings. Most sighting encounters occurred in the southern region of the Celtic Sea and during the passage through the Minch, two areas which are highlighted as cetacean hot spots (HWDT, 2018; Lacey *et al.* 2022). The sea conditions were also most favourable in these two areas; up until 22nd June sea state was 98% slight, and 2% glassy, compared with 43% slight, 49% choppy, and 8% rough after 22nd June. Conditions during the transit through the Minch were slight with good visibility for the duration. The area is also renowned for its diversity and abundance of cetaceans due to converging currents providing ideal conditions for the success of plankton, which in turn attracts large numbers of fishes, mammals, and seabirds (HWDT, 2018).

The following cetacean species have been sighted in at least six of the previous eight surveys: bottlenose dolphin; common dolphin; long-finned pilot whale; Risso's dolphin; fin whale; and minke whale. Atlantic white-sided dolphin (O'Donnell *et al.*, 2020b; 2021; 2023) and white-beaked dolphin (O'Donnell *et al.*, 2018; 2021; 2023) have been observed in three previous WESPAS surveys and sperm whales have only been sighted in one other survey year (O'Donnell *et al.*, 2020a). No new species of cetacean have been observed this year, which means the total number of marine mammal species encountered over the WESPAS remains 15.

Marine mammal species likely to occur in these regions that were not detected include harbour porpoise (*Phocoena phocoena*), killer whale (*Orcinus orca*), and harbour and grey seals. Harbour porpoise and killer whale were reported on the Hebridean Whale and Dolphin Trust citizen science app, 'whale track', on the same day and within the same region that *RV Celtic Explorer* surveyed through the Minch; however, there are a number of factors which could influence the detection of marine mammals. Examples include:

- As marine mammals remain underwater for long periods of time, MMOs are only able to visually observe individuals that breach the water's surface or if they are in surface waters directly below the observer;
- Weather can affect the ability to detect marine animals in a number of ways, with increasing sea state, wind force and decreasing visibility due to precipitation reducing the detection probability of marine animals (Forney, 2000), particularly those with inconspicuous surfacing behaviour (Palka, 1996);

- Observers experience a reduced chance of detecting low-profile marine mammals, such as harbour porpoise, in a Beaufort sea state greater than two (Gunnlaugsson *et al.*, 1988, as referenced in Teilmann, 2003). Larger cetaceans (*i.e.* dolphins and whales) can generally be sighted at and under a sea state four (Smith *et al.*, 2020);
- The height of the vantage point used for observation is a principal factor in determining how far an MMO can see and is consequently a limiting factor in observing marine mammals;
- There is a detection bias of sightings where the probability of detecting animals on the transect line will decrease with distance;
- Local disturbance from vessel presence and increased noise can also influence surface behaviour, avoidance behaviour, and disrupt foraging (Pirodda *et al.*, 2015); and
- Human error and/or observer fatigue.

Using only one MMO to conduct visual surveys increases the risk of missed detections due to observer fatigue, and their inability to scan 360° around the vessel. Two or more MMOs onboard the survey vessel would reduce the risk of observer fatigue, and increase the likelihood of detecting animals present on or near the transect line when MMO watches overlap (allowing 360° coverage). A second MMO would also increase the number of daylight hours where data could be collected while keeping to 12-hour shifts (*i.e.* the sun rises *ca.* 06:00 and sets *ca.* 21:00 during summer). It is understood that an ESAS observer was to join WESPAS 2023 to provide a second observer, but this did not happen due to crewing availability challenges.

WESPAS could also use a towed passive acoustic monitoring (PAM) system, which is viewed as a complementary observation method to aid MMOs in low visibility (*e.g.* night-time, fog or heavy precipitation; NPWS, 2014). Detection rates are shown to increase when complementary methods are used (Smith *et al.*, 2020). PAM can only detect individuals that are vocalising within range and directionality of the hydrophones during the monitoring period. Detectability of species can be reduced by masking caused by increased background noise levels due to vessel noise, heavy rainfall, or high sea states, for example. Some species will be difficult to detect, depending on the background noise and species behaviour, such as low frequency vocalisations of baleen whales (*e.g.* minke whale), which can be masked by vessel noise (Cholewiak *et al.*, 2018; Risch *et al.*, 2019), and seals are particularly difficult to detect due to their low vocalisation rates (Hayes *et al.*, 2004; Stone, 2015).

5. Recommendations

Increasing the number of MMOs onboard would be recommended for this survey. Additional observers would allow a rotational system to reduce observer fatigue, enable comfort and food breaks, and increase the area which can be surveyed at the same time. As this survey is conducted during summer months, one MMO is also unable to cover all hours of daylight, as shifts are typically kept to 12-hour days. It is also recommended that towed

PAM is used, and an experienced PAM operator is onboard, which would increase the likelihood of detection of marine mammals.

6. Acknowledgements

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Appendix A Effort recording forms.

Regulatory reference number	Ship/platform name	Date	Visual watch or PAM?	Observer's / operator's name(s)	Time of start of watch (UTC)	Time of end of watch (UTC)	Start position - degrees latitude	Start position - minutes latitude	Start position - north/south	Start position - degrees longitude	Start position - minutes longitude	Start position - east/west	Depth of water at start position (metres)	End position - degrees latitude	End position - minutes latitude	End position - north/south	End position - degrees longitude	End position - minutes longitude	End position - east/west	Depth of water at end position (metres)	Speed of vessel (knots)	Source activity	Wind direction	Wind force (Beaufort)	Sea state	Swell	Visibility (visual watch only)	Sunglare (visual watch only)	Comments	Flag record
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	4:40	5:40	52	11.47	n	10	32.30	w	61.0	52	2.59	n	10	42.97	w	70.0	10.8	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	5:40	6:30	52	2.59	n	10	42.97	w	70.0	51	53.33	n	10	38.74	w	75.0	9.8	n	e	6	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	6:30	7:00	51	53.33	n	10	38.74	w	75.0	51	48.73	n	10	36.79	w	112.0	9.8	n	e	5	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	7:00	7:50	51	48.73	n	10	36.79	w	112.0	51	42.50	n	10	31.02	w	105.0	9.9	n	e	3	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	7:50	8:50	51	42.50	n	10	31.02	w	105.0	51	36.21	n	10	20.92	w	106.0	9.8	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	8:50	9:26	51	36.21	n	10	20.92	w	106.0	51	33.09	n	10	13.62	w	85.0	9.0	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	9:26	10:25	51	33.09	n	10	13.62	w	85.0	51	31.67	n	9	57.75	w	71.0	9.4	n	se	4	s	o	p	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	10:25	11:25	51	31.67	n	9	57.75	w	71.0	51	32.96	n	9	43.86	w	51.0	10.4	n	e	4	s	o	p	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	11:25	12:25	51	32.96	n	9	43.86	w	51.0	51	34.65	n	9	38.91	w	36.0	7.9	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	12:25	13:20	51	34.65	n	9	38.91	w	36.0	51	34.64	n	9	38.91	w	36.0	0.0	n	se	5	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	13:20	14:20	51	34.64	n	9	38.91	w	36.0	51	34.64	n	9	38.91	w	36.0	0.0	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	14:20	15:20	51	34.64	n	9	38.91	w	36.0	51	34.64	n	9	38.91	w	36.0	0.0	n	e	5	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	15:20	16:20	51	34.64	n	9	38.91	w	36.0	51	34.64	n	9	38.91	w	36.0	0.0	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	16:20	17:20	51	34.64	n	9	38.91	w	36.0	51	34.64	n	9	38.91	w	36.0	0.0	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	10/06/2023	v	Jamie Whitefield	17:20	18:17	51	34.64	n	9	38.91	w	36.0	51	32.92	n	9	43.94	w	50.8	0.0	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	4:45	5:35	49	56.09	n	8	58.05	w	136.0	49	49.29	n	8	53.62	w	139.0	7.2	n	sw	3	s	o	m	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	5:35	6:30	49	49.29	n	8	53.62	w	139.0	49	41.54	n	8	48.74	w	143.0	9.4	n	sw	3	s	o	m	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	6:30	7:30	49	41.54	n	8	48.74	w	143.0	49	32.40	n	8	43.39	w	152.0	10.2	n	sw	3	s	o	m	s		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	7:30	8:03	49	32.40	n	8	43.39	w	152.0	49	22.74	n	8	37.75	w	149.0	10.0	n	sw	3	s	o	m	s		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	8:03	8:43	49	22.74	n	8	37.75	w	149.0	49	20.31	n	8	36.35	w	146.0	9.7	n	sw	3	s	o	g	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	8:43	9:32	49	20.31	n	8	36.35	w	146.0	49	12.65	n	8	31.66	w	152.0	9.6	n	sw	3	s	o	p	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	9:32	9:44	49	12.65	n	8	31.66	w	152.0	49	11.51	n	8	30.92	w	153.0	10.2	n	sw	2	s	o	m	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	9:44	10:44	49	11.51	n	8	30.92	w	153.0	49	6.12	n	8	27.19	w	151.0	3.9	n	sw	3	s	o	p	w		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	10:44	11:27	49	6.12	n	8	27.19	w	151.0	49	0.57	n	8	24.20	w	146.0	10.0	n	sw	2	s	o	p	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	11:27	12:27	49	0.57	n	8	24.20	w	146.0	48	50.28	n	8	18.49	w	161.0	10.6	n	sw	3	s	o	m	w		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	12:27	13:27	48	50.28	n	8	18.49	w	161.0	48	40.21	n	8	12.87	w	174.0	10.5	n	sw	2	s	o	m	w		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	13:27	14:27	48	40.21	n	8	12.87	w	174.0	48	30.99	n	8	5.03	w	176.0	11.2	n	sw	2	s	o	m	n		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	14:27	15:27	48	30.99	n	8	5.03	w	176.0	48	31.58	n	8	6.40	w	168.0	10.3	n	sw	2	s	o	m	w		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	15:27	16:27	48	31.58	n	8	6.40	w	168.0	48	30.96	n	8	12.49	w	181.0	2.5	n	s	0	g	o	m	w		
P00011497	Celtic Explorer	11/06/2023	v	Jamie Whitefield	4:45	5:35	48	19.76	n	8	1.39	w	172.5	48	25.08	n	8	0.84	w	177.4	8.3	n	sw	1	s	o	m	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	4:45	5:45	48	45.27	n	10	2.83	w	257.0	48	45.56	n	9	48.39	w	189.0	9.9	n	e	4	s	o	m	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	5:45	6:45	48	45.56	n	9	48.39	w	189.0	48	45.63	n	9	40.03	w	180.0	4.9	n	e	4	s	o	g	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	6:45	7:43	48	45.63	n	9	40.03	w	180.0	48	45.52	n	9	25.20	w	175.0	10.0	n	e	3	s	o	g	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	7:43	7:46	48	45.52	n	9	25.20	w	175.0	48	45.54	n	9	24.64	w	174.0	9.9	n	e	3	s	o	m	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	7:46	8:05	48	45.54	n	9	24.64	w	174.0	48	45.63	n	9	19.72	w	174.0	10.0	n	e	3	s	o	p	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	8:05	8:50	48	45.63	n	9	19.72	w	174.0	48	45.62	n	9	16.82	w	169.0	10.1	n	e	3	s	o	m	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	8:50	9:50	48	45.62	n	9	16.82	w	169.0	48	45.42	n	9	21.77	w	177.0	3.6	n	e	3	s	o	g	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	9:50	10:50	48	45.42	n	9	21.77	w	177.0	48	45.52	n	9	12.05	w	168.0	3.2	n	e	3	s	o	g	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	10:50	11:50	48	45.52	n	9	12.05	w	168.0	48	45.66	n	8	56.05	w	172.0	11.0	n	e	3	s	o	g	s		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	11:50	12:50	48	45.66	n	8	56.05	w	172.0	48	45.65	n	8	39.34	w	156.0	11.1	n	se	3	s	o	g	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	12:50	13:50	48	45.65	n	8	39.34	w	156.0	48	45.47	n	8	23.25	w	167.0	10.4	n	e	3	s	o	g	n		



P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	13:50	14:50	48	45.47	n	8	23.25	w	167.0	48	45.54	n	8	17.03	w	146.0	10.9	h	e	3	s	o	g	n		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	14:50	15:50	48	45.64	n	8	17.03	w	146.0	48	45.53	n	7	59.51	w	167.0	4.4	h	e	2	s	o	g	w		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	15:50	16:50	48	45.53	n	7	59.51	w	167.0	48	45.60	n	7	44.48	w	160.0	10.0	n	ne	3	s	o	g	w		
P00011497	Celtic Explorer	12/06/2023	v	Jamie Whitefield	16:50	17:45	48	45.60	n	7	44.48	w	160.0	48	45.56	n	7	31.14	w	140.0	10.4	n	ne	3	s	o	g	s		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	4:49	5:49	49	0.68	n	8	12.25	w	146.0	49	0.66	n	8	28.84	w	155.0	10.9	n	ne	3	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	5:49	6:45	49	0.66	n	8	28.84	w	155.0	49	0.65	n	8	44.18	w	161.0	10.9	n	ne	1	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	6:45	7:45	49	0.65	n	8	44.18	w	161.0	49	0.69	n	9	0.91	w	158.0	10.9	n	ne	2	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	7:45	8:45	49	0.69	n	9	0.91	w	158.0	49	0.71	n	9	9.06	w	160.0	10.5	n	nw	2	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	8:45	9:45	49	0.71	n	9	9.06	w	160.0	48	59.14	n	8	57.97	w	162.0	10.7	n	w	2	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	9:45	10:45	48	59.14	n	8	57.97	w	162.0	48	49.15	n	8	44.90	w	168.0	10.5	n	n	2	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	10:45	11:45	48	49.15	n	8	44.90	w	168.0	48	42.88	n	8	31.85	w	173.0	10.9	n	nw	2	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	11:45	12:45	48	42.88	n	8	31.85	w	173.0	48	36.28	n	8	18.33	w	182.0	11.1	n	w	4	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	12:45	13:45	48	36.28	n	8	18.33	w	182.0	48	31.00	n	8	3.94	w	177.0	11.2	n	nw	4	s	o	g	w		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	13:45	14:45	48	31.00	n	8	3.94	w	177.0	48	31.10	n	7	47.24	w	148.0	11.1	n	nw	4	s	o	g	w		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	14:45	15:45	48	31.10	n	7	47.24	w	148.0	48	31.14	n	7	32.00	w	166.0	10.7	n	nw	4	s	o	g	w		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	15:45	16:45	48	31.14	n	7	32.00	w	166.0	48	31.18	n	7	24.40	w	167.0	10.4	n	n	4	s	o	g	n		
P00011497	Celtic Explorer	13/06/2023	v	Jamie Whitefield	16:45	17:30	48	31.18	n	7	24.40	w	167.0	48	31.18	n	7	16.18	w	163.0	9.9	n	n	4	s	o	g	n		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	6:30	7:30	48	16.61	n	6	56.63	w	15.0	48	16.44	n	7	12.03	w	172.0	10.9	n	nw	4	s	o	g	n		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	7:30	8:30	48	16.44	n	7	12.03	w	172.0	48	16.70	n	7	27.83	w	179.0	10.9	n	nw	3	s	o	g	n		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	8:30	9:30	48	16.70	n	7	27.83	w	179.0	48	16.55	n	7	43.69	w	197.0	10.8	n	nw	3	s	o	g	n		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	9:30	10:30	48	16.55	n	7	43.69	w	197.0	48	16.58	n	7	51.57	w	167.0	10.8	n	w	4	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	10:30	11:30	48	16.58	n	7	51.57	w	167.0	48	16.64	n	7	47.04	w	181.0	5.6	n	w	4	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	11:30	12:30	48	16.64	n	7	47.04	w	181.0	48	16.59	n	8	1.59	w	197.0	9.0	n	w	3	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	12:30	13:30	48	16.59	n	8	1.59	w	197.0	48	16.54	n	8	16.31	w	210.0	9.9	n	sw	3	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	13:30	14:30	48	16.54	n	8	16.31	w	210.0	48	16.54	n	8	31.00	w	190.0	9.9	n	w	2	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	14:30	15:30	48	16.54	n	8	31.00	w	190.0	48	16.49	n	8	34.86	w	180.0	9.9	n	s	2	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	15:30	16:30	48	16.49	n	8	34.86	w	180.0	48	16.49	n	8	40.86	w	183.0	3.8	n	s	2	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	16:30	17:30	48	16.49	n	8	40.86	w	183.0	48	16.59	n	8	57.34	w	215.0	11.0	n	s	3	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	17:30	18:30	48	16.59	n	8	57.34	w	215.0	48	15.50	n	8	57.33	w	256.0	11.0	n	s	3	s	o	g	w		
P00011497	Celtic Explorer	14/06/2023	v	Jamie Whitefield	18:30	19:00	48	15.50	n	8	57.33	w	256.0	48	13.74	n	8	50.44	w	245.0	10.5	n	s	3	s	o	g	w		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	4:55	5:55	48	1.16	n	7	19.40	w	182.0	48	1.17	n	7	3.97	w	131.0	10.6	n	e	1	g	o	g	w		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	5:55	6:55	48	1.17	n	7	3.97	w	131.0	48	1.22	n	6	49.04	w	141.0	10.2	n	n	1	g	o	m	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	6:55	7:55	48	1.22	n	6	49.04	w	141.0	48	1.23	n	6	41.03	w	167.0	11.0	n	nw	1	g	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	7:55	8:55	48	1.23	n	6	41.03	w	167.0	48	1.19	n	6	26.04	w	145.0	10.0	n	nw	1	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	8:55	9:55	48	1.19	n	6	26.04	w	145.0	48	1.25	n	6	29.84	w	162.0	8.0	n	nw	1	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	9:55	10:55	48	1.25	n	6	29.84	w	162.0	48	1.20	n	6	17.52	w	151.0	2.2	n	nw	2	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	10:55	11:55	48	1.20	n	6	17.52	w	151.0	48	1.10	n	6	0.72	w	142.0	11.3	n	nw	2	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	11:55	12:55	48	1.10	n	6	0.72	w	142.0	48	1.13	n	5	48.44	w	140.0	7.7	n	nw	2	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	12:55	13:55	48	1.13	n	5	48.44	w	140.0	47	54.63	n	5	41.88	w	138.0	0.2	n	nw	3	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	13:55	14:55	47	54.63	n	5	41.88	w	138.0	47	45.90	n	5	35.15	w	139.0	11.1	n	nw	2	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	14:55	15:55	47	45.90	n	5	35.15	w	139.0	47	45.90	n	5	50.58	w	142.0	10.0	n	nw	3	s	o	g	s		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	15:55	16:55	47	45.90	n	5	50.58	w	142.0	47	45.90	n	6	5.26	w	153.0	9.6	n	nw	2	s	o	g	w		
P00011497	Celtic Explorer	15/06/2023	v	Jamie Whitefield	16:55	17:55	47	45.90	n	6	5.26	w	153.0	47	46.03	n	6	22.28	w	162.0	10.8	n	w	2	s	o	m	w		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	4:52	5:52	47	30.74	n	6	10.98	w	163.0	47	31.17	n	5	54.88	w	143.0	10.2	n	s	2	s	o	m	n		

P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	5:52	6:52	47	31.17	n	5	54.88	w	143.0	47	31.37	n	5	39.98	w	140.0	10.5	n	s	2	s	o	m	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	6:52	7:52	47	31.37	n	5	39.98	w	140.0	47	31.45	n	5	30.48	w	147.0	10.1	n	s	2	g	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	7:52	9:00	47	31.45	n	5	30.48	w	147.0	47	32.70	n	5	46.53	w	149.0	0.3	n	s	2	g	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	9:00	10:00	47	32.70	n	5	46.53	w	149.0	47	33.68	n	6	0.47	w	156.0	10.5	n	sw	2	g	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	10:00	11:00	47	33.68	n	6	0.47	w	156.0	47	35.04	n	6	17.34	w	150.0	10.0	n	s	2	g	o	m	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	11:00	12:00	47	35.04	n	6	17.34	w	150.0	47	36.25	n	6	32.47	w	184.0	11.0	n	s	3	s	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	12:00	13:00	47	36.25	n	6	32.47	w	184.0	47	36.73	n	6	37.87	w	189.0	10.0	n	s	3	s	o	m	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	13:00	14:00	47	36.73	n	6	37.87	w	189.0	47	36.84	n	6	38.56	w	191.0	3.7	n	s	3	s	o	m	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	14:00	14:16	47	36.84	n	6	38.56	w	191.0	47	37.08	n	6	42.32	w	188.0	10.0	n	s	3	s	o	g	w		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	14:16	15:00	47	37.08	n	6	42.32	w	188.0	47	37.64	n	6	52.72	w	176.0	9.6	n	se	3	s	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	15:00	16:00	47	37.64	n	6	52.72	w	176.0	47	38.63	n	7	6.89	w	171.0	9.9	n	se	3	s	o	g	n		
P00011497	Celtic Explorer	16/06/2023	v	Jamie Whitefield	16:00	17:00	47	38.63	n	6	6.89	w	171.0	47	39.66	n	7	21.47	w	175.0	10.0	n	sw	3	s	o	g	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	5:00	5:25	49	0.73	n	9	20.14	w	158.0	49	0.67	n	9	24.76	w	164.0	9.9	n	sw	4	s	o	g	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	5:25	6:25	49	0.67	n	9	24.76	w	164.0	49	0.67	n	9	39.70	w	169.0	10.0	n	sw	3	s	o	g	w		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	6:25	7:25	49	0.67	n	9	39.70	w	169.0	49	0.63	n	9	56.10	w	168.0	10.4	n	sw	3	s	o	g	w		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	7:25	8:25	49	0.63	n	9	56.10	w	168.0	49	0.65	n	10	12.21	w	158.0	10.6	n	s	3	s	o	g	w		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	8:25	9:25	49	0.65	n	10	12.21	w	158.0	49	0.68	n	10	28.04	w	161.0	10.5	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	9:25	10:25	49	0.68	n	10	28.04	w	161.0	49	0.64	n	10	37.47	w	148.0	10.5	n	s	3	s	o	g	s		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	10:25	11:25	49	0.64	n	10	37.47	w	148.0	49	0.59	n	10	53.09	w	181.0	10.5	n	s	3	s	o	g	s		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	11:25	12:25	49	0.59	n	10	53.09	w	181.0	49	0.60	n	10	51.05	w	167.0	10.3	n	s	3	s	o	g	s		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	12:25	13:25	49	0.60	n	10	51.05	w	167.0	49	0.64	n	10	57.21	w	135.0	4.3	n	s	2	s	o	g	s		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	13:25	14:25	49	0.64	n	10	57.21	w	135.0	49	0.43	n	11	8.45	w	202.0	10.0	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	14:25	14:35	49	0.43	n	11	8.45	w	202.0	49	0.70	n	11	10.38	w	214.0	11.0	n	s	4	s	o	m	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	14:35	14:53	49	0.70	n	11	10.38	w	214.0	49	9.00	n	11	13.83	w	254.0	10.9	n	s	4	s	o	m	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	14:53	15:53	49	9.00	n	11	13.83	w	254.0	49	16.50	n	11	21.31	w	320.0	11.0	n	s	4	s	o	m	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	15:53	16:53	49	16.50	n	11	21.31	w	320.0	49	16.50	n	11	21.31	w	190.0	10.6	n	s	3	s	o	m	n		
P00011497	Celtic Explorer	17/06/2023	v	Jamie Whitefield	16:53	17:30	49	16.50	n	11	21.31	w	190.0	49	16.29	n	10	55.94	w	180.0	10.6	n	s	3	s	o	m	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	4:50	5:50	49	15.93	n	9	5.24	w	156.0	49	15.96	n	8	48.26	w	153.0	11.2	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	5:50	6:50	49	15.96	n	8	48.26	w	153.0	49	15.95	n	8	48.68	w	151.0	11.1	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	6:50	7:50	49	15.95	n	8	48.68	w	151.0	49	15.83	n	8	38.55	w	150.0	1.0	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	7:50	8:50	49	15.83	n	8	38.55	w	150.0	49	15.87	n	8	23.33	w	148.0	10.4	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	8:50	9:30	49	15.87	n	8	23.33	w	148.0	49	15.77	n	8	16.95	w	115.0	10.4	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	9:30	10:30	49	15.77	n	8	16.95	w	115.0	49	15.83	n	8	6.36	w	146.0	0.1	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	10:30	11:30	49	15.83	n	8	6.36	w	146.0	49	15.87	n	7	50.56	w	134.0	10.0	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	11:30	12:30	49	15.87	n	7	50.56	w	134.0	49	15.88	n	7	34.78	w	136.0	10.0	n	s	4	s	o	g	s		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	12:30	13:30	49	15.88	n	7	34.78	w	136.0	49	18.20	n	7	22.77	w	135.0	10.6	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	13:30	14:30	49	18.20	n	7	22.77	w	135.0	49	29.88	n	7	22.80	w	131.0	11.7	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	14:30	15:20	49	29.88	n	7	22.80	w	131.0	49	30.83	n	7	27.73	w	133.0	11.2	n	s	4	s	o	g	n		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	15:20	16:20	49	30.83	n	7	27.73	w	133.0	49	30.88	n	7	42.32	w	132.0	9.6	n	s	4	s	o	g	w		
P00011497	Celtic Explorer	18/06/2023	v	Jamie Whitefield	16:20	16:55	49	30.88	n	7	42.32	w	132.0	49	30.89	n	7	49.94	w	140.0	9.1	n	s	5	s	o	g	w		
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	4:55	5:55	49	31.00	n	9	41.64	w	126.0	49	31.05	n	9	56.53	w	166.0	9.7	n	s	5	s	o	g	n		
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	5:55	6:55	49	31.05	n	9	56.53	w	166.0	49	31.07	n	10	10.36	w	122.0	9.1	n	s	5	s	o	g	s		
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	6:55	7:55	49	31.07	n	10	10.36	w	122.0	49	31.02	n	10	24.99	w	141.0	9.6	n	s	4	s	o	g	s		
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	7:55	8:55	49	31.02	n	10	24.99	w	141.0	49	31.17	n	10	37.53	w	150.0	9.8	n	s	4	s	o	g	s		

P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	8:55	9:55	49	31.17	n	10	37.53	w	150.0	49	31.16	n	10	33.26	w	163.0	0.2	n	sw	4	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	9:55	10:55	49	31.16	n	10	33.26	w	163.0	49	30.96	n	10	42.60	w	154.0	2.7	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	10:55	11:55	49	30.96	n	10	42.60	w	154.0	49	31.16	n	10	48.89	w	164.0	1.4	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	11:55	12:55	49	31.16	n	10	48.89	w	164.0	49	31.14	n	11	3.99	w	205.0	10.6	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	12:55	13:55	49	31.14	n	11	3.99	w	205.0	49	35.17	n	11	10.54	w	272.0	9.8	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	13:55	14:55	49	35.17	n	11	10.54	w	272.0	49	45.33	n	11	4.48	w	323.0	10.5	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	14:55	15:55	49	45.33	n	11	4.48	w	323.0	49	46.23	n	10	49.74	w	171.0	10.3	n	s	3	s	o	g	s
P00011497	Celtic Explorer	19/06/2023	v	Jamie Whitefield	15:55	16:55	49	46.23	n	10	49.74	w	171.0	49	46.16	n	10	33.78	w	146.0	10.8	n	s	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	4:55	5:55	49	45.92	n	8	57.94	w	153.0	49	45.89	n	8	42.18	w	132.0	11.2	n	s	3	s	o	g	w
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	5:55	6:55	49	45.89	n	8	42.18	w	132.0	49	45.84	n	8	24.84	w	146.0	11.2	n	s	2	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	6:55	7:55	49	45.84	n	8	24.84	w	146.0	49	45.89	n	8	16.80	w	140.0	11.1	n	s	2	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	7:55	8:55	49	45.89	n	8	16.80	w	140.0	49	45.83	n	7	59.92	w	127.0	11.0	n	s	2	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	8:55	9:55	49	45.83	n	7	59.92	w	127.0	49	45.84	n	7	44.49	w	132.0	10.5	n	s	2	g	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	9:55	10:55	49	45.84	n	7	44.49	w	132.0	49	45.82	n	7	29.28	w	127.0	10.3	n	w	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	10:55	11:55	49	45.82	n	7	29.28	w	127.0	49	47.08	n	7	15.96	w	122.0	10.1	n	w	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	11:55	12:55	49	47.08	n	7	15.96	w	122.0	49	57.18	n	7	15.92	w	117.0	10.1	n	w	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	12:55	13:55	49	57.18	n	7	15.92	w	117.0	50	0.71	n	7	17.60	w	118.0	10.3	n	w	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	13:55	14:55	50	0.71	n	7	17.60	w	118.0	50	0.84	n	7	33.30	w	122.0	10.0	n	w	4	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	14:55	15:55	50	0.84	n	7	33.30	w	122.0	50	0.79	n	7	49.10	w	114.0	10.0	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	20/06/2023	v	Jamie Whitefield	15:55	16:55	50	0.79	n	7	49.10	w	114.0	50	0.87	n	9	45.05	w	127.0	10.0	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	4:55	5:55	50	0.87	n	9	45.05	w	127.0	50	0.73	n	9	59.43	w	150.0	9.8	n	sw	3	s	o	g	w
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	5:55	6:55	50	0.73	n	9	59.43	w	150.0	50	0.72	n	10	16.37	w	130.0	10.2	n	sw	3	s	o	g	w
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	6:55	7:55	50	0.72	n	10	16.37	w	130.0	50	0.73	n	10	30.00	w	148.0	9.8	n	w	3	s	o	g	w
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	7:55	8:55	50	0.73	n	10	30.00	w	148.0	50	0.73	n	10	30.00	w	148.0	3.2	n	w	3	s	o	g	w
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	8:55	9:55	50	0.73	n	10	30.00	w	148.0	50	0.46	n	10	25.56	w	141.0	3.2	n	w	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	9:55	10:55	50	0.46	n	10	25.56	w	141.0	50	0.80	n	10	41.41	w	160.0	2.1	n	w	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	10:55	11:55	50	0.80	n	10	41.41	w	160.0	50	0.69	n	10	58.46	w	247.0	10.6	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	11:55	12:55	50	0.69	n	10	58.46	w	247.0	50	7.90	n	11	8.98	w	485.0	10.7	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	12:55	13:55	50	7.90	n	11	8.98	w	485.0	50	12.44	n	11	13.05	w	1043.0	0.1	n	s	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	13:55	14:55	50	12.44	n	11	13.05	w	1043.0	50	14.21	n	11	5.31	w	465.0	10.4	n	s	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	14:55	15:55	50	14.21	n	11	5.31	w	465.0	50	16.20	n	10	48.50	w	197.0	10.9	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	21/06/2023	v	Jamie Whitefield	15:55	16:55	50	16.20	n	10	48.50	w	197.0	50	16.10	n	10	31.90	w	156.0	11.1	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	4:58	5:58	50	16.12	n	8	24.45	w	132.0	50	15.76	n	8	14.67	w	131.0	10.9	n	sw	2	s	o	g	w
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	5:58	6:50	50	15.76	n	8	14.67	w	131.0	50	15.81	n	7	59.55	w	121.0	0.2	n	s	3	s	o	g	w
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	6:50	7:50	50	15.81	n	7	59.55	w	121.0	50	15.79	n	7	41.57	w	96.4	11.0	n	sw	2	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	7:50	8:50	50	15.79	n	7	41.57	w	96.4	50	15.70	n	7	29.06	w	108.0	11.3	n	sw	2	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	8:50	9:50	50	15.70	n	7	29.06	w	108.0	50	15.78	n	7	33.22	w	103.0	3.7	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	9:50	10:50	50	15.78	n	7	33.22	w	103.0	50	15.73	n	7	16.35	w	113.0	8.6	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	10:50	11:50	50	15.73	n	7	16.35	w	113.0	50	25.05	n	7	15.79	w	110.0	10.3	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	11:50	12:50	50	25.05	n	7	15.79	w	110.0	50	30.51	n	7	19.77	w	105.0	10.2	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	12:50	13:50	50	30.51	n	7	19.77	w	105.0	50	30.63	n	7	34.32	w	106.0	0.1	n	sw	3	s	o	g	s
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	13:50	14:50	50	30.63	n	7	34.32	w	106.0	50	30.74	n	7	48.03	w	121.0	10.7	n	sw	3	s	o	g	w
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	14:50	15:50	50	30.74	n	7	48.03	w	121.0	50	30.74	n	7	45.90	w	119.0	3.1	n	sw	3	s	o	g	w
P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	15:50	16:50	50	30.74	n	7	45.90	w	119.0	50	30.63	n	8	0.76	w	125.0	10.0	n	sw	3	s	o	g	w

P00011497	Celtic Explorer	22/06/2023	v	Jamie Whitefield	16:50	17:20	50	30.63	n		8	0.76	w	125.0	50	30.66	n		8	8.24	w	109.0	9.7	n	sw	4	s	o	g	w		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	4:45	5:03	50	30.73	n		9	19.92	w	129.0	50	30.73	n		9	23.10	w	130.0	7.1	n	s	7	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	5:03	6:03	50	30.73	n		9	23.10	w	130.0	50	30.76	n		9	32.05	w	111.0	5.7	n	s	6	c	m	p	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	6:03	6:50	50	30.76	n		9	32.05	w	111.0	50	30.79	n		9	40.47	w	123.0	6.2	n	s	6	c	m	p	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	6:50	7:50	50	30.79	n		9	40.47	w	123.0	50	30.74	n		9	51.05	w	135.0	5.9	n	s	6	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	7:50	8:50	50	30.74	n		9	51.05	w	135.0	50	30.69	n		9	50.21	w	136.0	7.7	n	s	6	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	8:50	9:50	50	30.69	n		9	50.21	w	136.0	50	30.79	n		9	54.98	w	141.0	4.3	n	sw	6	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	9:50	10:50	50	30.79	n		9	54.98	w	141.0	50	30.76	n		10	7.67	w	152.0	8.3	n	s	6	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	10:50	11:50	50	30.76	n		10	7.67	w	152.0	50	30.77	n		10	20.28	w	163.0	8.5	n	s	7	c	m	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	11:50	12:50	50	30.77	n		10	20.28	w	163.0	50	30.85	n		10	33.53	w	167.0	8.9	n	s	6	c	m	p	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	12:50	13:40	50	30.85	n		10	33.53	w	167.0	50	30.97	n		10	40.17	w	174.0	6.9	n	s	6	c	o	p	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	13:40	14:25	50	30.97	n		10	40.17	w	174.0	50	31.03	n		10	49.78	w	213.0	8.2	n	s	6	c	o	p	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	14:25	15:25	50	31.03	n		10	49.78	w	213.0	50	35.29	n		10	59.45	w	422.0	6.5	n	s	6	c	o	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	15:25	16:25	50	35.29	n		10	59.45	w	422.0	50	43.89	n		11	5.94	w	495.0	9.7	n	sw	6	c	o	m	n		
P00011497	Celtic Explorer	23/06/2023	v	Jamie Whitefield	16:25	16:45	50	43.89	n		11	5.94	w	495.0	50	45.74	n		11	6.57	w	252.0	9.4	n	sw	6	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	4:55	5:20	50	45.73	n		8	53.56	w	124.0	50	45.67	n		8	46.93	w	118.0	10.9	n	s	5	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	5:20	6:00	50	45.67	n		8	46.93	w	118.0	50	45.68	n		8	36.10	w	122.0	10.5	n	s	4	c	o	p	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	6:00	7:00	50	45.68	n		8	36.10	w	122.0	50	45.69	n		8	19.88	w	115.0	10.6	n	s	5	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	7:00	8:00	50	45.69	n		8	19.88	w	115.0	50	45.70	n		8	10.62	w	114.0	10.6	n	s	4	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	8:00	9:00	50	45.70	n		8	10.62	w	114.0	50	45.63	n		7	54.27	w	111.0	10.6	n	s	4	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	9:00	10:00	50	45.63	n		7	54.27	w	111.0	50	45.56	n		7	51.79	w	114.0	9.8	n	s	5	c	o	m	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	10:00	11:00	50	45.56	n		7	51.79	w	114.0	50	45.75	n		7	50.07	w	111.0	4.1	n	s	4	c	o	g	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	11:00	12:00	50	45.75	n		7	50.07	w	111.0	50	45.60	n		7	34.22	w	108.0	10.0	n	s	4	c	o	g	n		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	12:00	13:00	50	45.60	n		7	34.22	w	108.0	50	45.70	n		7	18.63	w	108.0	9.9	n	s	4	c	o	g	w		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	13:00	14:00	50	45.70	n		7	18.63	w	108.0	50	45.72	n		7	1.98	w	103.0	10.1	n	s	4	c	o	g	w		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	14:00	15:00	50	45.72	n		7	1.98	w	103.0	50	45.73	n		6	46.05	w	99.0	10.0	n	s	4	c	o	g	w		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	15:00	16:00	50	45.73	n		6	46.05	w	99.0	50	46.60	n		6	38.93	w	99.0	10.0	n	s	4	c	o	g	s		
P00011497	Celtic Explorer	24/06/2023	v	Jamie Whitefield	16:00	17:00	50	46.60	n		6	38.93	w	99.0	50	52.90	n		6	26.22	w	108.0	10.6	n	se	4	c	o	g	s		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	4:50	5:50	51	0.64	n		7	44.14	w	108.0	51	0.67	n		7	55.84	w	108.0	8.6	n	s	6	c	o	m	n		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	5:50	6:12	51	0.67	n		7	55.84	w	108.0	51	0.65	n		8	0.09	w	106.0	7.2	n	s	6	c	o	m	n		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	6:12	6:50	51	0.65	n		8	0.09	w	106.0	51	0.62	n		8	7.42	w	105.0	7.5	n	sw	5	c	o	p	n		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	6:50	7:50	51	0.62	n		8	7.42	w	105.0	51	0.57	n		8	18.30	w	114.0	6.6	n	w	5	c	o	m	n		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	7:50	8:50	51	0.57	n		8	18.30	w	114.0	51	0.65	n		8	29.11	w	117.0	6.2	n	w	5	c	o	g	s		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	8:50	9:50	51	0.65	n		8	29.11	w	117.0	51	0.64	n		8	42.15	w	118.0	7.1	n	w	5	c	o	g	s		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	9:50	10:50	51	0.64	n		8	42.15	w	118.0	51	0.65	n		8	52.12	w	120.0	8.6	n	w	5	c	o	g	s		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	10:50	11:50	51	0.65	n		8	52.12	w	120.0	51	7.35	n		8	52.10	w	115.0	0.1	n	w	5	c	o	g	s		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	11:50	12:50	51	7.35	n		8	52.10	w	115.0	51	0.59	n		8	54.40	w	116.0	9.1	n	sw	6	c	o	g	w		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	12:50	13:50	51	0.59	n		8	54.40	w	116.0	51	0.72	n		9	8.16	w	122.0	9.0	n	sw	6	c	o	g	w		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	13:50	14:50	51	0.72	n		9	8.16	w	122.0	51	0.71	n		9	20.87	w	122.0	8.4	n	w	5	c	o	g	w		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	14:50	15:50	51	0.71	n		9	20.87	w	122.0	51	0.67	n		9	33.54	w	124.0	7.9	n	w	6	c	o	g	w		
P00011497	Celtic Explorer	25/06/2023	v	Jamie Whitefield	15:50	16:50	51	0.67	n		9	33.54	w	124.0	51	0.20	n		9	43.43	w	127.0	6.6	n	w	6	c	o	g	s		
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	4:50	5:50	51	0.83	n		10	53.82	w	181.0	51	0.75	n		11	3.29	w	186.0	5.8	n	sw	5	c	m	g	n		
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	5:50	6:50	51	0.75	n		11	3.29	w	186.0	51	0.72	n		11	14.19	w	214.0	6.3	n	sw	5	c	m	g	n		
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	6:50	7:50	51	0.72	n		11	14.19	w	214.0	51	7.85	n		11	20.82	w	253.0	6.8	n	w	6	c	m	g	n		

P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	7:50	8:50	51	7.85	n	11	20.82	w	253.0	51	15.18	n	11	26.24	w	330.0	8.7	n	sw	5	c	m	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	8:50	9:50	51	15.18	n	11	26.24	w	330.0	51	15.41	n	11	19.14	w	225.0	8.4	n	sw	5	c	m	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	9:50	10:50	51	15.41	n	11	19.14	w	225.0	51	15.64	n	11	22.26	w	252.0	5.6	n	sw	5	c	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	10:50	11:50	51	15.64	n	11	22.26	w	252.0	51	15.42	n	11	13.98	w	207.0	9.6	n	sw	5	c	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	11:50	12:50	51	15.42	n	11	13.98	w	207.0	51	15.49	n	11	0.03	w	188.0	0.7	n	sw	5	s	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	12:50	13:50	51	15.49	n	11	0.03	w	188.0	51	15.55	n	10	43.71	w	172.0	9.9	n	sw	5	s	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	13:50	14:50	51	15.55	n	10	43.71	w	172.0	51	15.52	n	10	27.89	w	150.0	10.0	n	sw	5	s	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	14:50	15:50	51	15.52	n	10	27.89	w	150.0	51	15.41	n	10	13.34	w	134.0	10.0	n	sw	4	s	o	g	n
P00011497	Celtic Explorer	26/06/2023	v	Jamie Whitefield	15:50	16:50	51	15.41	n	10	13.34	w	134.0	51	15.91	n	10	18.01	w	136.0	2.8	n	sw	5	s	o	g	s
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	4:50	5:50	51	15.46	n	8	5.42	w	101.0	51	15.38	n	7	49.15	w	97.2	10.7	n	sw	6	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	5:50	6:50	51	15.38	n	7	49.15	w	97.2	51	15.48	n	7	31.05	w	94.5	10.7	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	6:50	7:50	51	15.48	n	7	31.05	w	94.5	51	15.42	n	7	14.56	w	92.5	10.6	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	7:50	8:50	51	15.42	n	7	14.56	w	92.5	51	15.36	n	6	59.44	w	95.5	10.6	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	8:50	9:50	51	15.36	n	6	59.44	w	95.5	51	15.75	n	7	3.96	w	94.9	2.8	n	sw	6	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	9:50	10:50	51	15.75	n	7	3.96	w	94.9	51	15.38	n	6	51.20	w	93.7	9.0	n	sw	4	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	10:50	11:50	51	15.38	n	6	51.20	w	93.7	51	15.35	n	6	39.69	w	92.0	0.0	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	11:50	12:50	51	15.35	n	6	39.69	w	92.0	51	15.35	n	6	28.07	w	127.0	10.2	n	sw	4	c	o	p	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	12:50	13:50	51	15.35	n	6	28.07	w	127.0	51	21.08	n	6	25.29	w	130.0	0.5	n	sw	4	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	13:50	14:50	51	21.08	n	6	25.29	w	130.0	51	30.66	n	6	25.74	w	87.6	9.9	n	sw	6	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	14:50	15:50	51	30.66	n	6	25.74	w	87.6	51	30.62	n	6	39.84	w	84.4	7.8	n	sw	6	c	o	m	n
P00011497	Celtic Explorer	27/06/2023	v	Jamie Whitefield	15:50	16:50	51	30.62	n	6	39.84	w	84.4	51	30.60	n	6	52.56	w	78.4	8.4	n	sw	7	c	o	m	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	5:00	6:00	51	25.68	n	8	50.08	w	91.9	51	23.45	n	9	1.67	w	97.9	7.0	n	nw	5	c	o	p	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	6:00	7:00	51	23.45	n	9	1.67	w	97.9	51	21.75	n	9	14.30	w	78.1	9.0	n	nw	6	c	o	p	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	7:00	8:00	51	21.75	n	9	14.30	w	78.1	51	20.94	n	9	26.90	w	84.9	8.6	n	nw	6	c	o	m	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	8:00	9:00	51	20.94	n	9	26.90	w	84.9	51	21.57	n	9	40.93	w	70.3	7.9	n	nw	5	c	o	g	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	9:00	10:00	51	21.57	n	9	40.93	w	70.3	51	24.13	n	9	52.00	w	68.0	8.1	n	nw	6	c	o	g	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	10:00	11:00	51	24.13	n	9	52.00	w	68.0	51	27.61	n	10	5.99	w	76.0	8.4	n	nw	6	c	o	g	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	11:00	12:00	51	27.61	n	10	5.99	w	76.0	51	30.12	n	10	16.68	w	98.0	8.3	n	nw	6	c	o	g	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	12:00	13:00	51	30.12	n	10	16.68	w	98.0	51	31.66	n	10	29.45	w	131.0	8.1	n	nw	5	c	o	g	n
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	13:00	14:00	51	31.66	n	10	29.45	w	131.0	51	31.60	n	10	38.40	w	151.0	8.8	n	nw	5	c	o	g	w
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	14:00	15:00	51	31.60	n	10	38.40	w	151.0	51	31.48	n	10	38.30	w	153.0	8.4	n	nw	5	c	o	g	w
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	15:00	16:00	51	31.48	n	10	38.30	w	153.0	51	31.57	n	10	43.63	w	159.0	3.6	n	nw	5	c	o	g	w
P00011497	Celtic Explorer	28/06/2023	v	Jamie Whitefield	16:00	17:00	51	31.57	n	10	43.63	w	159.0	51	31.55	n	10	49.28	w	170.0	8.0	n	nw	5	c	o	g	s
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	5:00	6:00	52	0.65	n	11	18.70	w	186.0	52	0.75	n	11	31.83	w	272.0	9.0	n	nw	4	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	6:00	7:00	52	0.75	n	11	31.83	w	272.0	52	7.62	n	11	36.81	w	285.0	7.4	n	nw	6	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	7:00	8:00	52	7.62	n	11	36.81	w	285.0	52	15.90	n	11	39.94	w	245.0	9.4	n	w	5	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	8:00	9:00	52	15.90	n	11	39.94	w	245.0	52	15.94	n	11	30.67	w	180.0	2.1	n	w	5	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	9:00	10:00	52	15.94	n	11	30.67	w	180.0	52	15.98	n	11	18.98	w	150.0	10.5	n	w	4	s	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	10:00	11:00	52	15.98	n	11	18.98	w	150.0	52	16.04	n	11	5.33	w	137.0	0.0	n	sw	5	s	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	11:00	12:00	52	16.04	n	11	5.33	w	137.0	52	16.05	n	10	56.24	w	134.0	10.3	n	sw	5	s	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	12:00	13:00	52	16.05	n	10	56.24	w	134.0	52	16.29	n	10	58.46	w	134.0	10.6	n	sw	5	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	13:00	14:00	52	16.29	n	10	58.46	w	134.0	52	16.07	n	10	42.27	w	112.0	1.1	n	sw	6	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	14:00	15:00	52	16.07	n	10	42.27	w	112.0	52	20.65	n	10	41.98	w	109.0	3.2	n	sw	6	c	o	g	n
P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	15:00	16:00	52	20.65	n	10	41.98	w	109.0	52	29.97	n	10	42.26	w	116.0	9.5	n	sw	6	c	o	g	n

P00011497	Celtic Explorer	29/06/2023	v	Jamie Whitefield	16:00	17:00	52	29.97	n	10	42.26	w	116.0	52	30.96	n	10	54.82	w	128.0	9.2	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	5:00	6:00	53	1.05	n	11	6.93	w	132.0	53	1.11	n	11	18.32	w	133.0	7.7	n	w	6	c	m	m	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	6:00	7:00	53	1.11	n	11	18.32	w	133.0	53	1.09	n	11	16.60	w	128.0	7.1	n	w	6	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	7:00	8:00	53	1.09	n	11	16.60	w	128.0	53	1.03	n	11	10.83	w	130.0	4.0	n	w	6	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	8:00	9:00	53	1.03	n	11	10.83	w	130.0	53	1.04	n	11	20.24	w	131.0	3.3	n	w	5	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	9:00	10:00	53	1.04	n	11	20.24	w	131.0	53	1.08	n	11	30.95	w	130.0	5.3	n	w	6	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	10:00	11:00	53	1.08	n	11	30.95	w	130.0	53	1.08	n	11	33.96	w	270.0	6.2	n	w	7	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	11:00	12:00	53	1.08	n	11	33.96	w	270.0	53	1.09	n	11	43.68	w	273.0	5.1	n	w	7	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	12:00	13:00	53	1.09	n	11	43.68	w	273.0	53	1.05	n	11	53.99	w	274.0	6.2	n	w	6	c	m	m	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	13:00	14:00	53	1.05	n	11	53.99	w	274.0	53	1.06	n	12	4.27	w	272.0	6.4	n	w	7	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	14:00	15:00	53	1.06	n	12	4.27	w	272.0	53	1.20	n	12	7.37	w	270.0	6.3	n	w	6	c	m	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	15:00	16:00	53	1.20	n	12	7.37	w	270.0	53	9.50	n	12	3.67	w	237.0	6.1	n	w	6	c	o	g	n
P00011497	Celtic Explorer	02/07/2023	v	Jamie Whitefield	16:00	17:00	53	9.50	n	12	3.67	w	237.0	53	16.14	n	11	56.67	w	237.0	9.0	n	w	6	c	o	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	5:00	6:00	53	31.05	n	10	54.24	w	268.0	53	31.06	n	11	5.88	w	265.0	7.6	n	w	6	c	m	m	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	6:00	7:00	53	31.06	n	11	5.88	w	265.0	53	31.04	n	11	13.41	w	272.0	7.7	n	w	6	c	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	7:00	8:00	53	31.04	n	11	13.41	w	272.0	53	31.27	n	11	11.09	w	266.0	4.1	n	nw	6	c	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	8:00	9:00	53	31.27	n	11	11.09	w	266.0	53	31.01	n	11	21.67	w	271.0	3.3	n	nw	7	r	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	9:00	10:00	53	31.01	n	11	21.67	w	271.0	53	31.07	n	11	31.28	w	270.0	5.9	n	nw	7	c	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	10:00	11:00	53	31.07	n	11	31.28	w	270.0	53	30.99	n	11	41.15	w	274.0	6.2	n	w	7	c	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	11:00	12:00	53	30.99	n	11	41.15	w	274.0	53	29.51	n	11	51.00	w	270.0	5.3	n	w	7	r	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	12:00	13:00	53	29.51	n	11	51.00	w	270.0	53	25.98	n	12	1.04	w	238.0	6.1	n	w	6	c	m	g	n
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	13:00	14:00	53	25.98	n	12	1.04	w	238.0	53	22.18	n	12	11.74	w	236.0	7.1	n	w	6	r	m	g	w
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	14:00	15:00	53	22.18	n	12	11.74	w	236.0	53	18.06	n	12	23.06	w	236.0	7.1	n	w	6	r	m	g	w
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	15:00	16:00	53	18.06	n	12	23.06	w	236.0	53	14.37	n	12	33.50	w	237.0	8.1	n	w	6	c	m	g	w
P00011497	Celtic Explorer	03/07/2023	v	Jamie Whitefield	16:00	17:00	53	14.37	n	12	33.50	w	237.0	53	11.30	n	12	42.26	w	241.0	6.4	n	w	6	c	m	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	5:00	6:00	53	15.75	n	14	23.25	w	210.0	53	15.78	n	14	14.44	w	212.0	0.1	n	nw	5	c	o	m	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	6:00	7:00	53	15.78	n	14	14.44	w	212.0	53	15.91	n	13	56.48	w	164.0	10.8	n	nw	5	c	o	m	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	7:00	7:40	53	15.91	n	13	56.48	w	164.0	53	15.89	n	13	45.55	w	167.0	10.7	n	nw	5	c	o	m	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	7:40	8:00	53	15.89	n	13	45.55	w	167.0	53	16.01	n	13	39.15	w	168.0	10.6	n	nw	5	s	o	p	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	8:00	9:00	53	16.01	n	13	39.15	w	168.0	53	15.98	n	13	21.33	w	212.0	10.5	n	nw	5	s	o	m	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	9:00	10:00	53	15.98	n	13	21.33	w	212.0	53	20.19	n	13	9.33	w	242.0	10.8	n	nw	5	c	o	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	10:00	11:00	53	20.19	n	13	9.33	w	242.0	53	27.66	n	13	3.66	w	212.0	9.0	n	nw	6	c	o	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	11:00	12:00	53	27.66	n	13	3.66	w	212.0	53	31.90	n	13	6.80	w	220.0	8.9	n	nw	5	c	o	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	12:00	13:00	53	31.90	n	13	6.80	w	220.0	53	32.05	n	13	20.68	w	183.0	8.9	n	nw	5	s	m	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	13:00	14:00	53	32.05	n	13	20.68	w	183.0	53	32.00	n	13	26.24	w	167.0	8.7	n	nw	5	s	m	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	14:00	15:00	53	32.00	n	13	26.24	w	167.0	53	31.56	n	13	21.40	w	183.0	4.0	n	nw	6	c	m	m	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	15:00	16:00	53	31.56	n	13	21.40	w	183.0	53	32.13	n	13	35.03	w	206.0	1.0	n	nw	5	c	m	g	n
P00011497	Celtic Explorer	04/07/2023	v	Jamie Whitefield	16:00	17:00	53	32.13	n	13	35.03	w	206.0	53	46.31	n	13	46.31	w	244.0	8.2	n	nw	6	c	m	m	w
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	5:00	6:00	53	46.30	n	11	33.13	w	268.0	53	46.23	n	11	26.71	w	249.0	0.2	n	w	5	s	o	g	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	6:00	7:00	53	46.23	n	11	26.71	w	249.0	53	46.23	n	11	8.81	w	182.0	10.2	n	nw	5	s	o	g	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	7:00	8:00	53	46.23	n	11	8.81	w	182.0	53	46.23	n	11	8.03	w	179.0	10.0	n	w	5	s	o	g	w
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	8:00	9:00	53	46.23	n	11	8.03	w	179.0	53	46.21	n	11	7.09	w	175.0	4.4	n	w	5	s	o	g	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	9:00	10:00	53	46.21	n	11	7.09	w	175.0	53	46.19	n	10	59.86	w	154.0	10.2	n	w	5	c	o	g	w
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	10:00	11:00	53	46.19	n	10	59.86	w	154.0	53	46.22	n	10	42.11	w	132.0	10.4	n	w	4	c	o	g	w

P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	11:00	12:00	53	46.22	n	10	42.11	w	132.0	53	46.09	n	10	24.24	w	71.0	10.2	n	w	5	c	o	m	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	12:00	13:00	53	46.09	n	10	24.24	w	71.0	53	43.93	n	10	20.17	w	66.0	10.3	n	w	4	c	o	g	w
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	13:00	14:00	53	43.93	n	10	20.17	w	66.0	53	57.94	n	10	19.54	w	80.7	9.3	n	w	6	c	o	g	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	14:00	15:00	53	57.94	n	10	19.54	w	80.7	54	0.94	n	10	26.11	w	90.4	9.2	n	sw	5	c	o	m	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	15:00	16:00	54	0.94	n	10	26.11	w	90.4	54	0.98	n	10	39.03	w	135.0	7.0	n	w	5	c	o	p	n
P00011497	Celtic Explorer	05/07/2023	v	Jamie Whitefield	16:00	17:00	54	0.98	n	10	39.03	w	135.0	54	0.92	n	10	51.27	w	185.0	7.3	n	w	5	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	5:00	6:00	54	30.95	n	10	24.25	w	118.0	54	31.03	n	10	8.29	w	106.0	9.8	n	w	5	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	6:00	7:00	54	31.03	n	10	8.29	w	106.0	54	31.04	n	9	51.38	w	99.3	10.2	n	w	4	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	7:00	8:00	54	31.04	n	9	51.38	w	99.3	54	30.93	n	9	43.26	w	95.8	9.4	n	w	5	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	8:00	9:00	54	30.93	n	9	43.26	w	95.8	54	31.40	n	9	50.04	w	97.3	4.4	n	w	6	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	9:00	10:00	54	31.40	n	9	50.04	w	97.3	54	31.04	n	9	39.45	w	93.3	3.9	n	se	6	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	10:00	11:00	54	31.04	n	9	39.45	w	93.3	54	30.97	n	9	24.45	w	84.3	9.1	n	se	6	c	o	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	11:00	12:00	54	30.97	n	9	24.45	w	84.3	54	31.00	n	9	4.12	w	84.0	9.3	n	se	6	c	m	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	12:00	13:00	54	31.00	n	9	4.12	w	84.0	54	38.48	n	8	59.66	w	83.9	9.6	n	se	6	c	m	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	13:00	14:00	54	38.48	n	8	59.66	w	83.9	54	46.30	n	8	54.49	w	57.5	10.8	n	se	7	r	m	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	14:00	15:00	54	46.30	n	8	54.49	w	57.5	54	46.29	n	9	9.76	w	78.0	0.1	n	se	9	r	m	m	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	15:00	16:00	54	46.29	n	9	9.76	w	78.0	54	46.32	n	9	20.60	w	81.0	8.7	n	se	8	r	m	p	n
P00011497	Celtic Explorer	06/07/2023	v	Jamie Whitefield	16:00	17:00	54	46.32	n	9	20.60	w	81.0	54	46.13	n	9	36.92	w	96.0	8.6	n	se	8	r	m	p	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	5:00	6:00	55	1.35	n	9	38.55	w	110.0	55	1.49	n	9	22.20	w	90.3	11.2	n	sw	5	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	6:00	7:00	55	1.49	n	9	22.20	w	90.3	55	1.57	n	9	1.48	w	82.1	10.7	n	sw	4	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	7:00	8:00	55	1.57	n	9	1.48	w	82.1	55	1.71	n	8	43.40	w	72.8	11.0	n	sw	4	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	8:00	9:00	55	1.71	n	8	43.40	w	72.8	55	11.18	n	8	37.22	w	77.3	8.9	n	s	3	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	9:00	10:00	55	11.18	n	8	37.22	w	77.3	55	11.76	n	8	51.61	w	89.6	10.5	n	s	3	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	10:00	11:00	55	11.76	n	8	51.61	w	89.6	55	11.75	n	9	8.00	w	96.1	10.0	n	s	3	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	11:00	12:00	55	11.75	n	9	8.00	w	96.1	55	11.78	n	9	27.24	w	97.3	9.4	n	se	2	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	12:00	13:00	55	11.78	n	9	27.24	w	97.3	55	11.75	n	9	42.04	w	112.0	10.0	n	e	4	s	o	p	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	13:00	14:00	55	11.75	n	9	42.04	w	112.0	55	11.51	n	9	42.34	w	110.0	9.8	n	e	2	s	o	p	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	14:00	15:00	55	11.51	n	9	42.34	w	110.0	55	11.73	n	9	51.71	w	143.0	3.7	n	se	2	s	o	m	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	15:00	16:00	55	11.73	n	9	51.71	w	143.0	55	15.10	n	9	56.61	w	261.0	9.9	n	se	3	s	o	g	n
P00011497	Celtic Explorer	07/07/2023	v	Jamie Whitefield	16:00	17:00	55	15.10	n	9	56.61	w	261.0	55	22.46	n	9	46.30	w	215.0	10.4	n	se	5	s	o	g	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	5:00	6:00	55	22.78	n	7	39.37	w	56.0	55	22.78	n	7	53.98	w	52.0	9.2	n	se	6	c	o	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	6:00	7:00	55	22.78	n	7	53.98	w	52.0	55	22.70	n	7	55.85	w	57.0	9.3	n	se	6	c	o	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	7:00	8:00	55	22.70	n	7	55.85	w	57.0	55	22.83	n	7	57.39	w	59.3	4.0	n	se	7	c	o	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	8:00	9:00	55	22.83	n	7	57.39	w	59.3	55	23.01	n	7	57.95	w	60.5	9.0	n	se	7	r	o	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	9:00	10:00	55	23.01	n	7	57.95	w	60.5	55	22.65	n	7	56.82	w	58.8	4.8	n	se	7	r	m	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	10:00	10:55	55	22.65	n	7	56.82	w	58.8	55	23.38	n	7	58.03	w	70.3	3.7	n	s	8	c	m	m	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	10:55	11:15	55	23.38	n	7	58.03	w	70.3	55	22.77	n	7	52.20	w	52.3	9.6	n	s	7	c	o	p	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	12:15	13:15	55	24.11	n	7	29.82	w	42.5	55	30.75	n	7	18.65	w	47.0	11.5	n	s	6	c	o	g	n
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	13:15	14:15	55	30.75	n	7	18.65	w	47.0	55	33.41	n	7	24.99	w	55.0	11.4	n	s	4	s	o	g	w
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	14:15	15:15	55	33.41	n	7	24.99	w	55.0	55	33.33	n	7	42.31	w	58.0	9.5	n	s	4	s	o	g	w
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	15:15	16:15	55	33.33	n	7	42.31	w	58.0	55	33.41	n	7	55.12	w	67.5	2.1	n	se	4	s	o	g	w
P00011497	Celtic Explorer	08/07/2023	v	Jamie Whitefield	16:15	17:15	55	33.41	n	7	55.12	w	67.5	55	33.37	n	8	11.44	w	74.3	10.3	n	s	2	s	o	g	w
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	5:00	6:00	55	43.62	n	8	58.57	w	111.0	55	43.63	n	8	53.03	w	106.0	3.8	n	n	4	s	o	m	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	6:00	7:00	55	43.63	n	8	53.03	w	106.0	55	43.66	n	8	44.53	w	98.1	10.8	n	n	3	s	o	m	n



P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	7:00	8:00	55	43.66	n	8	44.53	w	98.1	55	43.63	n	8	25.68	w	102.0	11.1	n	e	2	s	o	m	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	8:00	9:00	55	43.63	n	8	25.68	w	102.0	55	43.66	n	8	6.03	w	96.6	11.0	n	s	3	s	o	g	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	9:00	10:00	55	43.66	n	8	6.03	w	96.6	55	43.63	n	8	59.14	w	90.1	11.1	n	s	4	s	o	g	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	10:00	11:00	55	43.63	n	8	59.14	w	90.1	55	43.55	n	8	4.76	w	95.3	3.7	n	s	3	s	o	g	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	11:30	12:30	55	43.41	n	7	59.19	w	92.0	55	43.61	n	7	37.93	w	58.5	10.6	n	e	3	s	o	g	w
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	12:30	13:30	55	43.61	n	7	37.93	w	58.5	55	43.60	n	7	22.30	w	61.5	11.0	n	e	4	s	o	m	w
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	13:30	14:30	55	43.60	n	7	22.30	w	61.5	55	43.56	n	6	1.18	w	41.8	10.5	n	e	4	s	o	m	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	14:30	15:30	55	43.56	n	6	1.18	w	41.8	55	45.07	n	6	48.91	w	41.5	10.5	n	e	4	c	o	m	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	15:30	16:30	55	45.07	n	6	48.91	w	41.5	55	53.86	n	7	49.20	w	42.5	9.2	n	s	6	c	o	m	n
P00011497	Celtic Explorer	09/07/2023	v	Jamie Whitefield	16:30	17:30	55	53.86	n	7	49.20	w	42.5	55	53.77	n	8	8.70	w	56.5	7.8	n	se	6	c	o	g	n
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	5:00	6:00	55	53.77	n	8	27.76	w	127.0	55	53.78	n	8	47.19	w	124.0	9.8	n	s	3	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	6:00	7:00	55	53.78	n	8	47.19	w	124.0	55	53.83	n	9	7.16	w	163.0	10.4	n	s	3	s	o	g	s
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	7:00	8:00	55	53.83	n	9	7.16	w	163.0	55	53.25	n	9	15.89	w	232.0	9.7	n	se	3	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	8:00	9:00	55	53.25	n	9	15.89	w	232.0	55	56.33	n	9	13.11	w	195.0	9.7	n	e	3	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	9:00	10:00	55	56.33	n	9	13.11	w	195.0	55	3.34	n	9	7.42	w	713.0	2.0	n	se	2	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	10:00	11:00	55	3.34	n	9	7.42	w	713.0	56	4.06	n	9	2.85	w	153.0	10.7	n	se	4	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	11:00	12:00	56	4.06	n	9	2.85	w	153.0	56	41.00	n	8	41.00	w	132.0	10.5	n	se	4	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	12:15	13:00	56	4.85	n	8	32.83	w	132.0	56	4.06	n	8	24.79	w	145.0	10.1	n	e	3	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	13:00	14:00	56	4.06	n	8	24.79	w	145.0	56	4.14	n	8	29.77	w	133.0	3.1	n	e	2	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	14:00	15:00	56	4.14	n	8	29.77	w	133.0	56	4.05	n	8	23.62	w	146.0	1.2	n	e	1	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	15:00	16:00	56	4.05	n	8	23.62	w	146.0	56	4.06	n	8	9.33	w	132.0	9.0	n	e	3	s	o	g	w
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	16:00	17:00	56	4.06	n	8	9.33	w	132.0	56	4.15	n	7	54.17	w	96.0	9.9	n	e	3	s	o	g	n
P00011497	Celtic Explorer	10/07/2023	v	Jamie Whitefield	17:00	17:15	56	4.15	n	7	54.17	w	96.0	56	4.04	n	7	45.43	w	116.0	10.1	n	e	3	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	5:00	6:00	56	19.50	n	7	41.33	w	141.0	56	19.50	n	7	51.99	w	146.0	2.1	n	nw	4	s	o	m	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	6:00	7:00	56	19.50	n	7	51.99	w	146.0	56	19.48	n	7	58.01	w	170.0	9.9	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	7:00	8:00	56	19.48	n	7	58.01	w	170.0	56	19.43	n	7	54.67	w	160.0	3.9	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	8:00	9:00	56	19.43	n	7	54.67	w	160.0	56	19.48	n	8	10.80	w	90.0	8.6	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	9:00	10:00	56	19.48	n	8	10.80	w	90.0	56	19.43	n	8	23.29	w	150.0	8.7	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	10:00	11:00	56	19.43	n	8	23.29	w	150.0	56	19.42	n	8	17.01	w	152.0	4.2	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	11:15	12:00	56	19.32	n	8	21.23	w	152.0	56	19.39	n	8	32.86	w	142.0	9.0	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	12:00	13:00	56	19.39	n	8	32.86	w	142.0	56	19.38	n	8	50.02	w	137.0	9.7	n	nw	3	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	13:00	13:20	56	19.38	n	8	50.02	w	137.0	56	19.42	n	8	50.49	w	137.0	5.9	n	w	3	s	o	m	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	13:20	14:20	56	19.42	n	8	50.49	w	137.0	56	19.36	n	9	6.18	w	168.0	0.0	n	nw	3	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	14:20	15:20	56	19.36	n	9	6.18	w	168.0	56	24.81	n	9	11.53	w	252.0	9.7	n	w	4	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	15:20	16:20	56	24.81	n	9	11.53	w	252.0	56	35.14	n	9	8.12	w	564.0	9.9	n	w	3	s	o	g	n
P00011497	Celtic Explorer	11/07/2023	v	Jamie Whitefield	16:20	17:20	56	35.14	n	9	8.12	w	564.0	56	35.14	n	8	49.32	w	133.0	10.3	n	w	3	s	o	g	n
P00011496	Celtic Explorer	12/07/2023	v	Jamie Whitefield	5:00	6:00	56	35.29	n	7	59.44	w	104.0	56	35.42	n	7	43.04	w	120.0	9.8	n	w	3	s	o	m	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	6:00	7:00	56	35.42	n	7	43.04	w	120.0	56	35.37	n	7	26.57	w	180.0	9.7	n	w	3	s	o	m	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	7:00	8:00	56	35.37	n	7	26.57	w	180.0	56	35.39	n	7	23.65	w	167.0	10.5	n	nw	3	s	o	m	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	8:00	9:00	56	35.39	n	7	23.65	w	167.0	56	35.27	n	7	32.10	w	193.0	9.7	n	nw	4	s	o	g	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	9:00	10:00	56	35.27	n	7	32.10	w	193.0	56	35.32	n	7	38.71	w	183.0	3.0	n	nw	3	s	o	g	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	10:00	11:00	56	35.32	n	7	38.71	w	183.0	56	36.97	n	7	44.58	w	86.4	3.9	n	nw	2	s	o	g	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	11:25	12:00	56	41.17	n	7	45.10	w	52.0	56	46.53	n	7	45.48	w	39.2	9.2	n	nw	2	s	o	g	n
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	12:00	13:00	56	46.53	n	7	45.48	w	39.2	56	50.37	n	7	50.00	w	69.2	9.2	n	nw	3	s	o	g	n



P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	13:00	14:00	56	50.37	n	7	50.00	w	69.2	56	50.35	n	8	6.22	w	129.0	8.6	n	nw	3	s	o	g	n		
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	14:00	15:00	56	50.35	n	8	6.22	w	129.0	56	50.33	n	8	23.43	w	127.0	8.6	n	nw	3	c	o	g	n		
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	15:00	16:00	56	50.33	n	8	23.43	w	127.0	56	50.28	n	8	37.90	w	126.0	9.5	n	nw	3	c	o	g	n		
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	16:00	17:00	56	50.28	n	8	37.90	w	126.0	56	50.42	n	8	52.06	w	125.0	9.6	n	w	3	s	o	g	w		
P00011497	Celtic Explorer	12/07/2023	v	Jamie Whitefield	17:00	17:25	56	50.42	n	8	52.06	w	125.0	56	50.34	n	8	56.33	w	125.0	2.0	n	w	3	s	o	g	w		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	5:00	6:00	57	5.49	n	8	58.92	w	134.0	57	5.50	n	9	3.96	w	136.0	4.4	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	6:00	7:00	57	5.50	n	9	3.96	w	136.0	57	5.57	n	9	8.54	w	167.0	4.3	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	7:00	8:00	57	5.57	n	9	8.54	w	167.0	57	5.49	n	8	52.34	w	134.0	9.5	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	8:00	9:00	57	5.49	n	8	52.34	w	134.0	57	5.49	n	8	33.33	w	132.0	10.2	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	9:00	10:00	57	5.49	n	8	33.33	w	132.0	57	5.42	n	8	17.96	w	139.0	10.4	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	10:00	11:00	57	5.42	n	8	17.96	w	139.0	57	5.48	n	8	12.23	w	136.0	0.1	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	11:00	11:30	57	5.48	n	8	12.23	w	136.0	56	5.45	n	8	16.08	w	137.0	8.6	n	nw	3	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	12:00	13:00	57	5.27	n	8	18.05	w	138.0	57	5.45	n	7	59.56	w	106.0	10.3	n	nw	3	s	o	g	w		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	13:00	14:00	57	5.45	n	7	59.56	w	106.0	57	7.82	n	7	44.88	w	71.0	9.7	n	nw	4	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	14:00	15:00	57	7.82	n	7	44.88	w	71.0	57	17.42	n	7	42.75	w	58.0	9.7	n	nw	3	s	o	g	s		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	15:00	16:00	57	17.42	n	7	42.75	w	58.0	57	20.66	n	7	53.98	w	94.2	9.8	n	w	3	s	o	g	w		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	16:00	17:00	57	20.66	n	7	53.98	w	94.2	57	20.61	n	8	13.78	w	116.0	10.0	n	sw	3	s	o	g	w		
P00011497	Celtic Explorer	13/07/2023	v	Jamie Whitefield	17:00	17:30	57	20.61	n	8	13.78	w	116.0	57	20.64	n	8	25.11	w	146.0	5.0	n	sw	3	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	5:00	6:00	57	25.04	n	9	28.13	w	152.0	57	35.62	n	8	46.34	w	161.0	7.8	n	e	4	s	o	g	w		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	6:00	7:00	57	35.62	n	8	46.34	w	161.0	57	35.83	n	8	51.27	w	157.0	4.2	n	e	3	s	o	g	s		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	7:00	8:00	57	35.83	n	8	51.27	w	157.0	57	35.53	n	8	33.71	w	156.0	8.7	n	e	5	s	o	g	s		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	8:00	9:00	57	35.53	n	8	33.71	w	156.0	57	35.54	n	8	38.62	w	162.0	9.2	n	e	5	s	o	g	w		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	9:00	10:30	57	35.54	n	8	38.62	w	162.0	57	35.54	n	8	19.83	w	152.0	2.1	n	e	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	10:30	11:00	57	35.54	n	8	19.83	w	152.0	57	35.75	n	8	17.64	w	142.0	9.2	n	e	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	11:00	11:30	57	35.75	n	8	17.64	w	142.0	57	35.64	n	8	9.55	w	91.0	6.1	n	ne	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	12:00	13:00	57	35.47	n	8	1.28	w	86.0	57	39.08	n	7	48.13	w	59.5	9.3	n	ne	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	13:00	14:00	57	39.08	n	7	48.13	w	59.5	57	48.19	n	7	38.08	w	89.0	9.1	n	ne	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	14:00	15:00	57	48.19	n	7	38.08	w	89.0	57	51.00	n	7	47.88	w	87.4	9.9	n	ne	5	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	15:00	16:00	57	51.00	n	7	47.88	w	87.4	57	51.13	n	8	6.39	w	106.5	9.9	n	e	3	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	16:00	17:00	57	51.13	n	8	6.39	w	106.5	57	51.16	n	8	24.16	w	68.9	10.2	n	ne	3	s	o	g	n		
P00011497	Celtic Explorer	14/07/2023	v	Jamie Whitefield	17:00	17:45	57	51.16	n	8	24.16	w	68.9	57	50.84	n	8	39.12	w	89.0	9.9	n	ne	4	s	o	g	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	5:00	6:00	58	16.56	n	7	34.14	w	44.0	58	6.17	n	8	44.11	w	144.0	0.0	n	n	7	r	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	6:00	7:00	58	6.17	n	8	44.11	w	144.0	58	6.19	n	8	36.75	w	143.0	5.3	n	ne	7	r	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	7:00	8:00	58	6.19	n	8	36.75	w	143.0	58	6.19	n	8	31.70	w	140.0	1.5	n	ne	8	r	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	8:00	9:00	58	6.19	n	8	31.70	w	140.0	58	6.14	n	8	24.58	w	143.0	3.5	n	ne	9	r	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	9:00	10:00	58	6.14	n	8	24.58	w	143.0	58	6.11	n	8	17.62	w	140.0	3.9	n	ne	8	r	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	10:00	11:00	58	6.11	n	8	17.62	w	140.0	58	6.15	n	8	9.97	w	132.0	4.0	n	ne	8	r	m	p	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	11:00	12:00	58	6.15	n	8	9.97	w	132.0	58	6.23	n	8	1.93	w	123.0	4.5	n	n	8	r	m	p	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	12:00	13:00	58	6.23	n	8	1.93	w	123.0	58	6.16	n	7	51.53	w	88.0	4.6	n	n	7	r	m	p	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	14:00	15:00	58	6.15	n	7	42.15	w	80.0	58	6.16	n	7	30.28	w	79.0	5.8	n	n	7	r	m	p	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	15:00	16:00	58	6.16	n	7	30.28	w	79.0	58	6.17	n	7	30.09	w	79.0	6.9	n	n	6	c	m	m	n		
P00011497	Celtic Explorer	15/07/2023	v	Jamie Whitefield	16:00	17:00	58	6.17	n	7	30.09	w	79.0	58	6.15	n	7	35.52	w	68.0	3.7	n	n	5	c	m	m	n		
P00011497	Celtic Explorer	16/07/2023	v	Jamie Whitefield	5:00	5:00	58	1.06	n	7	34.14	w	44.0	58	1.06	n	7	34.14	w	44.0	0.0	n	nw	7	r	m	m	n		Sheltered in DP Flannan Isles
P00011497	Celtic Explorer	16/07/2023	v	Jamie Whitefield	9:00	9:00	58	1.06	n	7	34.14	w	44.0	58	1.06	n	7	34.14	w	44.0	0.0	n	nw	7	r	m	m	n		Sheltered in DP Flannan Isles

P00011497	Celtic Explorer	16/07/2023	v	Jamie Whitefield	11:00	11:00	58	18.62	n	6	52.25	w	25.0	58	18.62	n	6	52.25	w	25.0	4.8	n	nw	7	r	m	m	n	Transit to Loch Carloway
P00011497	Celtic Explorer	16/07/2023	v	Jamie Whitefield	14:00	14:00	58	16.60	n	6	48.90	w	20.0	58	16.60	n	6	48.90	w	20.0	0.0	n	nw	6	c	o	m	n	Sheltered in DP Loch Carloway
P00011497	Celtic Explorer	16/07/2023	v	Jamie Whitefield	17:00	17:00	58	16.60	n	6	48.90	w	20.0	58	16.60	n	6	48.90	w	20.0	0.0	n	nw	5	c	o	m	n	Sheltered in DP Loch Carloway
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	5:00	6:00	58	21.36	n	7	59.66	w	144.0	58	21.37	n	8	14.64	w	165.0	9.0	n	nw	5	c	m	m	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	6:00	7:00	58	21.37	n	8	14.64	w	165.0	58	21.42	n	8	18.54	w	169.0	9.3	n	nw	5	c	m	m	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	7:00	8:00	58	21.42	n	8	18.54	w	169.0	58	21.34	n	8	16.16	w	167.0	4.9	n	nw	5	c	m	m	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	8:00	9:00	58	21.34	n	8	16.16	w	167.0	58	21.28	n	8	35.22	w	215.0	9.6	n	n	5	c	m	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	9:00	10:00	58	21.28	n	8	35.22	w	215.0	58	23.05	n	8	42.17	w	295.0	9.5	n	nw	4	s	o	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	10:00	11:00	58	23.05	n	8	42.17	w	295.0	58	28.33	n	8	28.53	w	309.0	8.7	n	nw	5	c	o	g	w	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	11:30	12:30	58	30.66	n	8	22.74	w	316.0	58	30.66	n	8	22.74	w	316.0	8.9	n	nw	5	s	o	g	w	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	12:30	13:25	58	35.77	n	8	9.35	w	321.0	58	35.77	n	8	9.35	w	321.0	9.1	n	nw	5	s	o	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	13:25	13:50	58	36.84	n	7	51.43	w	144.0	58	36.84	n	7	51.43	w	144.0	9.7	n	nw	5	s	o	p	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	13:50	14:50	58	36.80	n	7	44.53	w	136.0	58	36.80	n	7	44.53	w	136.0	9.9	n	nw	5	s	o	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	14:50	15:50	58	36.69	n	7	25.76	w	116.0	58	36.69	n	7	25.76	w	116.0	10.0	n	nw	4	s	o	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	15:50	16:50	58	36.58	n	7	12.57	w	97.4	58	36.58	n	7	12.57	w	97.4	0.2	n	nw	5	s	o	g	n	
P00011497	Celtic Explorer	17/07/2023	v	Jamie Whitefield	16:50	17:30	58	36.47	n	6	56.14	w	96.2	58	36.47	n	6	56.14	w	96.2	10.2	n	nw	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	5:00	6:00	58	35.39	n	5	18.71	w	63.8	58	26.68	n	5	31.79	w	111.0	9.9	n	sw	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	6:00	7:00	58	26.68	n	5	31.79	w	111.0	58	25.48	n	5	34.48	w	114.0	9.5	n	w	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	7:00	8:00	58	25.48	n	5	34.48	w	114.0	58	26.82	n	5	30.93	w	110.6	4.1	n	sw	4	s	o	g	s	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	8:00	9:00	58	26.82	n	5	30.93	w	110.6	58	20.68	n	5	45.39	w	111.0	6.7	n	sw	4	s	o	g	w	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	9:00	10:00	58	20.68	n	5	45.39	w	111.0	58	14.99	n	5	58.17	w	122.0	9.3	n	sw	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	10:00	11:00	58	14.99	n	5	58.17	w	122.0	58	8.70	n	6	0.31	w	106.0	6.0	n	sw	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	11:20	12:00	58	8.60	n	6	0.33	w	106.6	58	2.66	n	5	53.52	w	97.0	10.2	n	sw	4	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	12:00	13:00	58	2.66	n	5	53.52	w	97.0	57	54.80	n	5	52.89	w	124.0	9.8	n	s	4	s	o	g	w	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	13:00	14:00	57	54.80	n	5	52.89	w	124.0	57	49.84	n	6	9.73	w	118.0	10.6	n	sw	3	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	14:00	15:00	57	49.84	n	6	9.73	w	118.0	57	45.98	n	6	25.91	w	108.0	10.5	n	w	3	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	15:00	16:00	57	45.98	n	6	25.91	w	108.0	57	40.61	n	6	41.30	w	144.0	2.3	n	sw	3	s	o	g	n	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	16:00	17:00	57	40.61	n	6	41.30	w	144.0	57	37.71	n	6	51.31	w	102.0	9.7	n	w	3	s	o	g	s	
P00011497	Celtic Explorer	18/07/2023	v	Jamie Whitefield	17:00	18:00	57	37.71	n	6	51.31	w	102.0	57	31.48	n	7	1.67	w	104.0	10.0	n	nw	3	s	o	g	s	
P00011497	Celtic Explorer	19/07/2023	v	Jamie Whitefield	5:00	6:00	56	49.37	n	7	0.24	w	158.0	56	40.45	n	7	7.43	w	173.0	9.6	n	n	3	s	o	m	n	
P00011497	Celtic Explorer	19/07/2023	v	Jamie Whitefield	6:00	6:08	56	40.45	n	7	7.43	w	173.0	56	40.50	n	7	7.50	w	162.0	1.5	n	n	3	s	o	g	n	

Appendix B Sighting recording forms.

Regulatory reference number	Ship/platform name	Sighting number	Date	Time at start of encounter (UTC)	Time at end of encounter (UTC)	Were animals detected visually and/or acoustically?	How were the animals first detected?	Observer's/operator's name	Position - degrees latitude	Position - minutes latitude	Position - north/south	Position - degrees longitude	Position - minutes longitude	Position - east/west	Water depth (metres)	Species or species group	Description (visual sighting only)	Bearing to animal	Range of animal (metres)	Total number	Number of adults (visual sightings only)	Number of calves (visual sightings only)	Behaviour (visual sightings only)	Direction of travel (relative to ship)	Direction of travel (compass points)	Altitude/ source activity when animal first detected	Altitude/ source activity when animal last detected	Closes distance of animal from observers	Time of closest approach (UTC)	First observed distance (m)	Closest observed distance (m)	Last observed distance (m)	What action was taken?	Length of pod/shoot (if relevant)	Estimated loss of production (if relevant) due to this	Comments	Flag record							
P00011497	Celtic Explorer	1	10/06/2023	5:42	5:43	v	v	Jamie Whitefield	52	11.47	n	10	32.30	w	61.0	Atlantic White-sided Dolphin	Tall sickle dorsal, dark grey upper, white flank, yellow stripe on tail stock	260	50	1	1	0	Travelling, small breaches	s	e				5:42				n											
P00011497	Celtic Explorer	2	10/06/2023	8:34	8:36	v	v	Jamie Whitefield	51	44.26	n	10	34.21	w	106.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	70	200	2	2	0	Porpoising	s	e				8:36				n											
P00011497	Celtic Explorer	3	10/06/2023	10:57	10:57	v	v	Jamie Whitefield	51	32.46	n	10	5.41	w	75.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	270	10	2	2	0	Porpoising	s	e				10:57				n											
P00011497	Celtic Explorer	4	10/06/2023	12:03	12:04	v	v	Jamie Whitefield	51	31.60	n	9	47.63	w	62.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	250	30	3	2	1	Porpoising	s	ne				12:04				n											
P00011497	Celtic Explorer	5	10/06/2023	18:17	18:19	v	i	Jamie Whitefield	51	32.92	n	9	43.94	w	50.8	Minke Whale	Tall falcate dorsal, uppers dark grey, lighter flanks, white band on flipper	10	250	1	1	0	Several surface rolls followed by dive	o	e				18:17				n											
P00011497	Celtic Explorer	6	12/06/2023	8:34	8:36	v	v	Jamie Whitefield	48	45.46	n	9	27.25	w	176.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	170	900	4	4	0	Porpoising	o	w				8:34				n											
P00011497	Celtic Explorer	7	13/06/2023	4:00	4:03	v	i	2nd Mate	49	5.00	n	7	57.40	w	130.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	300	200	8	8	0	Travelling, small breaches, porpoising	a	ne				4:00				n											
P00011497	Celtic Explorer	8	13/06/2023	8:35	8:36	v	v	Jamie Whitefield	49	0.70	n	8	58.01	w	154.0	Minke Whale	Tall falcate dorsal, uppers dark grey, lighter flanks	315	500	1	1	0	Several surface rolls, blow on surfacing, dive	o	e				8:35				n											
P00011497	Celtic Explorer	9	14/06/2023	14:28	14:28	v	v	Jamie Whitefield	48	16.56	n	8	30.36	w	183.0	Minke Whale	Tall falcate dorsal, uppers dark grey, lighter flanks	180	75	1	1	0	Several surface rolls, dive	o	e				14:28				n											
P00011497	Celtic Explorer	10	14/06/2023	14:31	14:36	v	v	Jamie Whitefield	48	16.51	n	8	32.34	w	188.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	170	250	5	4	1	Travelling, small breaches, porpoising	v	var				14:31				n											

P00011497	Celtic Explorer	47	22/06/2023	20:40	20:41	v	i	Officer on Watch	50	32.00	n	8	30.30	w	110.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	290	100	20	20	0	Travelling, porpoising	c	ne	20:41	n
P00011497	Celtic Explorer	48	24/06/2023	7:48	7:48	v	v	Jamie Whitefield	50	45.70	n	8	13.52	w	115.0	Unknown sp	Falcate fin	30	1200	1	1	0	Brief surface of fin	o	w	7:48	n
P00011497	Celtic Explorer	49	27/06/2023	7:05	7:05	v	v	Jamie Whitefield	51	15.45	n	7	26.59	w	94.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	20	10	5	5	0	Porpoising alongside, dived under bow	s	e	7:05	n
P00011497	Celtic Explorer	50	27/06/2023	7:34	7:35	v	v	Jamie Whitefield	51	15.43	n	7	18.20	w	93.5	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	90	300	10	10	0	Porpoising toward vessel, dived under bow	t	w	7:35	n
P00011497	Celtic Explorer	51	27/06/2023	13:37	13:37	v	i	Officer on Watch	51	19.05	n	6	25.23	w	87.0	Unk Whale	Blow sighted only, no body	0	1500	1	1	0	Single blow	x	var	13:37	n
P00011497	Celtic Explorer	52	28/06/2023	7:01	7:01	v	v	Jamie Whitefield	51	20.86	n	9	28.66	w	84.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	350	5	3	3	0	No surface, wave riding, dived under bow	s	w	7:01	n
P00011497	Celtic Explorer	53	28/06/2023	7:06	7:06	v	v	Jamie Whitefield	51	20.80	n	9	29.98	w	84.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	100	70	4	4	0	No porpoising, dived under bow	o	e	7:06	n
P00011497	Celtic Explorer	54	28/06/2023	9:20	9:21	v	v	Jamie Whitefield	51	22.39	n	9	44.59	w	74.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	340	15	5	5	0	No surface, dived under bow	t	s	9:21	n
P00011497	Celtic Explorer	55	28/06/2023	11:47	11:48	v	v	Jamie Whitefield	51	29.52	n	10	14.07	w	105.0	Bottlenose Dolphin	Large, robust, tall falcate dorsal, grey upper, lighter flanks, stubby beak	80	1200	2	2	0	Feeding, jumping clear	v	var	11:48	n
P00011497	Celtic Explorer	56	05/07/2023	12:53	12:53	v	v	Jamie Whitefield	53	46.84	n	10	20.24	w	66.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	270	80	4	4	0	No surfacing, fins only, dived under bow	t	e	12:53	n
P00011497	Celtic Explorer	57	05/07/2023	13:27	13:27	v	v	Jamie Whitefield	53	51.91	n	10	19.97	w	66.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	0	100	1	1	0	Brief porpoising, possibly more than 1 animal	c	w	13:27	n
P00011497	Celtic Explorer	58	05/07/2023	14:04	14:05	v	v	Jamie Whitefield	53	57.59	n	10	19.59	w	80.0	Bottlenose Dolphin	Large, robust, tall falcate dorsal, grey upper, lighter flanks, stubby beak	45	700	2	2	0	Porpoising	o	se	14:04	n

P00011497	Celtic Explorer	73	12/07/2023	8:23	8:25	v	v	Jamie Whitefield	56	35.34	n	7	31.80	w	173.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	200	50	2	2	1	Approached vessel from behind, bow ride	s	w	8:25	n
P00011497	Celtic Explorer	74	12/07/2023	9:42	9:47	v	v	Jamie Whitefield	56	35.34	n	7	31.16	w	193.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	140	1300	8	7	1	Porping, var dir, breaching, acrobatic	v	var	9:46	n
P00011497	Celtic Explorer	75	12/07/2023	14:42	14:45	v	v	Jamie Whitefield	56	50.33	n	8	16.78	w	133.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	170	800	5	5	0	Porpoising, approached vessel, wave riding under	t	n	14:45	n
P00011497	Celtic Explorer	76	18/07/2023	8:23	8:23	v	v	Jamie Whitefield	58	24.72	n	5	36.31	w	110.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	0	60	4	3	1	Porpoising toward vessel, dived under bow	t	s	8:23	n
P00011497	Celtic Explorer	77	18/07/2023	8:39	8:39	v	v	Jamie Whitefield	58	22.91	n	5	40.35	w	115.0	Minke Whale	Uppers dark grey, falcate dorsal 2/3rds along back	330	600	1	1	0	2 x surface rolls and blows	o	nw	8:39	n
P00011497	Celtic Explorer	78	18/07/2023	8:59	9:02	v	v	Jamie Whitefield	58	20.68	n	5	45.39	w	122.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	180	100	20	20	0	Porpoising toward vessel, bow/wave riding	t	var	9:02	n
P00011497	Celtic Explorer	79	18/07/2023	9:17	9:18	v	v	Jamie Whitefield	58	19.37	n	5	48.32	w	116.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	170	400	3	3	0	Porpoising	s	sw	9:18	n
P00011497	Celtic Explorer	80	18/07/2023	9:52	9:59	v	v	Jamie Whitefield	58	15.88	n	5	56.16	w	122.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	135	600	16	16	1	Porpoising, crossed bow, travelled alongside	v	var	9:55	n
P00011497	Celtic Explorer	81	18/07/2023	10:22	10:23	v	v	Jamie Whitefield	58	13.01	n	6	2.97	w	120.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	110	400	6	6	0	Porpoising, crossed bow, 2 groups of 3	c	ne	10:23	n
P00011497	Celtic Explorer	82	18/07/2023	10:31	10:32	v	v	Jamie Whitefield	58	11.99	n	6	3.80	w	121.0	Short-beaked Common Dolphin	Tall falcate dorsal, dark grey upper, figure 8 on flanks yellow/pale grey	160	40	8	8	0	Porpoising, bow riding, crossed bow, split up	t	var	10:32	n
P00011497	Celtic Explorer	83	18/07/2023	13:18	13:22	v	v	Jamie Whitefield	57	54.09	n	5	56.42	w	122.0	Risso Dolphin	Large, blunt head, tall falcate dorsal, patchy dark/light colour	10	800	2	2	0	Surface rolls, mixed with BND and common	o	s	13:18	n

Appendix C Cetacean sighting records from the Western European Shelf Pelagic Acoustic Survey from 2016-2023 (O'Donnell et al., 2016; 2017;2018; 2020a; 2020b; 2021; 2022).

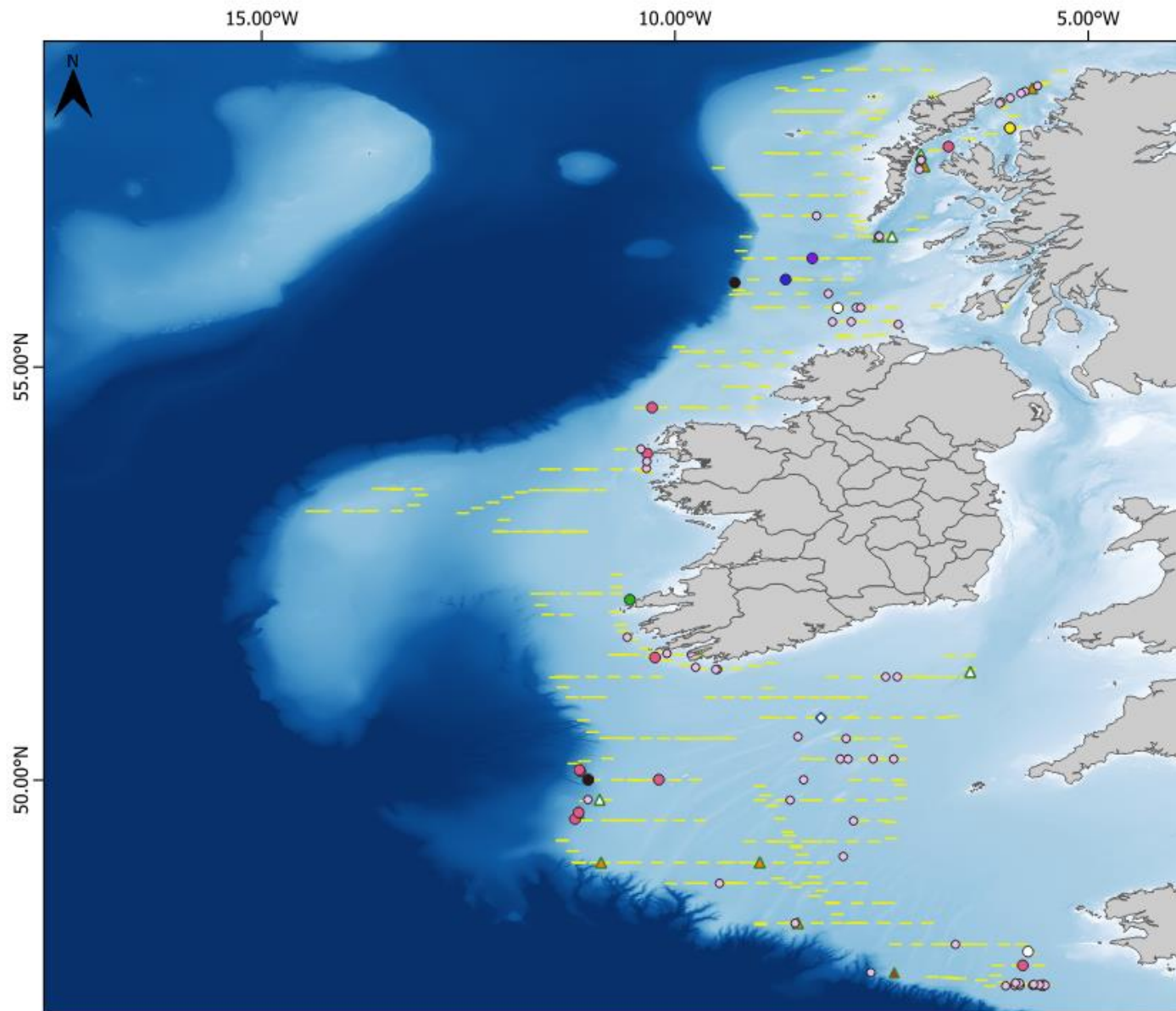
Common Name	Species name	2023		2022		2021		2020		2019		2018		2017		2016	
		No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	1	1			1	25	4	48			1	3				
Bottlenose dolphin	<i>Tursiops truncatus</i>	12	167	2	15	8	92	15	259	3	57	6	125	7	63	7	93
Common dolphin	<i>Delphinus delphis</i>	56	495	12	213	27	502	68	1922	63	1705	34	468	66	979	162	1290
Common/ striped dolphin	<i>D. delphinus/S. coeruleoalba</i>											1	1				
Common/ unidentified dolphin	<i>Delphinus delphis/ unknown delphinid</i>	1	7														
False killer whale	<i>Pseudorca crassidens</i>					1	2										
Fin whale	<i>Balaenoptera physalus</i>	1	1	2	3	5	12	33	38	4	15			4	5	4	5
Harbour porpoise	<i>Phocoena phocoena</i>					1	2			1	4			5	9	4	7
Humpback whale	<i>Megaptera novaeangliae</i>			1	2	3	10	11	19			1	1	2	3	2	2
Killer whale	<i>Orcinus orca</i>													1	3	1	1
Long finned pilot whale	<i>Globicephala melas</i>	2	17			5	20	2	55	2	11	4	40			15	95
Minke whale	<i>Balaenoptera acutorostrata</i>	7	7	6	7	27	44	57	61	16	18	44	52	22	25	29	31
Risso's dolphin	<i>Grampus griseus</i>	1	2	1	7	8	46	5	25			5	47	7	56	2	7
Sowerby's beaked whale	<i>Mesoplodon bidens</i>															1	3
Sperm whale	<i>Physeter macrocephalus</i>	1	1							1	1						
Striped dolphin	<i>Stenella coeruleoalba</i>															2	11
White beaked dolphin	<i>Lagenorhynchus albirostris</i>	1	3			2	7					4	10			14	95
Unid Baleen Whale	<i>Mysticeti sp.</i>	6	6					20	20	5	8	5	5	3	3	5	6
Unid Beaked Whale	<i>Ziphiidae sp.</i>															1	1
Unid Cetacean	<i>Cetacea sp.</i>	1	1			2	4	1	1			2	2	3	3	4	7
Unid Dolphin	<i>Delphinid sp.</i>	2	2	5	7	5	49	6	39	9	88	20	192	20	142	18	59
Unid Large Whale										1	1	2	2				
Unid Small Whale						1	1					1	1	3	3	2	2
	Total	92	710	29	254	96	816	222	2487	105	1908	128	950	143	1294	273	1715
Grey Seal	<i>Halichoerus grypus</i>			1	1	5	5	6	7			3	4	7	7	6	7
Harbour Seal	<i>Phoca vitulina</i>					1	1							2	3		
Unidentified Seal	<i>Pinniped sp.</i>											2	2	3	3		
	Total			1	1	6	6	6	7			5	6	12	13	6	7
Decomposing Carcass	<i>Unid. marine mammal</i>											2	2				
	Total											2	2				
	Grand Total	92	710	30	255	102	822	228	2494	105	1908	133	956	155	1307	279	1722

Appendix D Other megafauna sighting records from the Western European Shelf Pelagic Acoustic Survey from 2016-2023

(O'Donnell et al., 2016; 2017;2018; 2020a; 2020b; 2021; 2022).

Common Name	Species name	2023		2022		2021		2020		2019		2018		2017		2016	
		No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.	No. of Sightings	No. of ind.
Basking shark	<i>Cetorhinus maximus</i>							1	1			1	1	2	2	6	8
Blue shark	<i>Prionace glauca</i>					1	4	1	1	2	2	4	4	8	8		
Leatherback turtle	<i>Dermochelys coriacea</i>					1	1					2	2	1	1		
Ocean sunfish	<i>Mola mola</i>	1	1			8	8	1	1	17	17	25	25	12	18		
Porbeagle shark	<i>Lamna nasus</i>											1	1				
Thresher shark	<i>Alopias vulpinus</i>													1	1		
Smooth Hammerhead Shark	<i>Sphyrna zygaena</i>										1	1					
Tuna sp.	<i>Thunnus sp.</i>										1	7	1	1			
Unidentified Fish	<i>Teleost sp.</i>											1	2	1	1		
Unidentified Shark	<i>Selachii sp.</i>	1	1					1	1	2	2	1	1	4	4		
	Total	2	2	0	0	10	13	4	4	23	29	36	37	29	35	6	8

Appendix E WESPAS 2023 sightings.



APEM Group

WESPAS 2023
P00011497

WESPAS 2023 Sightings

Legend

- Atlantic white-sided dolphin
- Bottlenose dolphin
- Risso's dolphin
- Short-beaked common dolphin
- White-beaked dolphin
- common dolphin & unidentified delphinid
- Long-finned pilot whale
- Sperm whale
- ▲ Minke whale
- ▲ Fin whale
- ◇ Unidentified cetacean
- Unidentified dolphin
- △ Unidentified whale
- Survey effort



Notes

Basemap: GEBCO
 Compilation Group (2023)
 GEBCO 2023 Grid
 (doi:10.5285/f98b053b-0cbc-e053-6c86abc0af7b)
 Coordinate System:
 WGS 84

0 4,000 8,000 km

0 40 80 NM

Scale: 1:1534024340 Date: 18/08/2023 Drawn by: TC Checked by: HH Approved by: HH

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Figure Reference: WESPAS 2023 Sightings

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Further details available on www.emff.marine.ie

Managing Authority EMFF 2014-2020	Specified Public Beneficiary Body
<p data-bbox="252 853 740 927">Department of Agriculture Food & the Marine</p> <p data-bbox="220 976 772 1008">Clogheen, Clonakilty, Co. Cork. P85 TX47</p> <p data-bbox="320 1055 671 1086">Tel: (+)353 (0)23 885 9500</p> <p data-bbox="312 1133 679 1164">www.agriculture.gov.ie/emff</p>	<p data-bbox="999 853 1203 884">Marine Institute</p> <p data-bbox="820 976 1382 1008">Rinville, Oranmore, Co. Galway, H91 R673</p> <p data-bbox="911 1055 1291 1086">Phone: (+)353 (0)91 38 7200</p> <p data-bbox="1002 1133 1198 1164">www.marine.ie</p>



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An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



EUROPEAN UNION
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Foras na Mara
Marine Institute