

**Seal Research Trust**



**Boat-based Photo Identification Project:  
Marine Life and Human Activity Surveys 'Other' Species  
2011 – 2022**



Common dolphin in crystal-clear calm seas, POLPIP survey, September 2020. Photo by Sue Sayer MBE.

**Data collected by Seal Research Trust with marine wildlife experts and citizen scientist survey volunteers.**

**Report written by Sarah Millward**

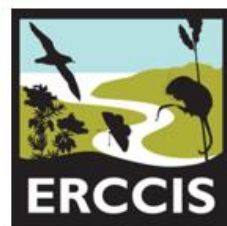
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## Seal Research Trust (SRT) Photo Identification Project (PIP): Marine Life and Human Activity Surveys 'other' species 2011 - 2022



### Summary

The Seal Research Trust (SRT), also known as Cornwall Seal Group Research Trust (CSGRT) is a multi-award winning, evidence-based marine conservation charity. We support seal conservation groups across the UK and are one of the founding members of the Seal Alliance, a seal protection action group that is dedicated to protecting seals and their habitats worldwide. SRT give seals a voice by providing evidence from the research and data collected by an extensive volunteer, citizen science network who routinely survey seals in their local area. Each seal has a unique fur pattern that enables it to be photo identified throughout its life. We collect photos of seals from SW Wales, Somerset, Devon, Cornwall and around to Dorset to add to our identification catalogues to build a picture of what our seals are doing, where they are going and when; this helps enable us to protect them and their ocean home.

Photo Identification Project Marine life and Human Activity (PIP) boat-based surveys are a collaborative project between SRT, Newquay Sea Safaris (NSS), Polzeath Marine Conservation Group (PMCG), and Newquay Marine Group (NMG) to monitor and identify seals and bottlenose dolphins; quantify marine plastics; quantify plankton levels; record and report all other marine megafauna encountered; count nesting sea birds on established ledges and monitor human activity levels. There are three joined and overlapping PIP transects along the north coast of Cornwall; collectively covering a 115km stretch of coast from west of St Ives to east of Boscastle.

Surveyed areas cover sites within the Bristol Channel Approaches Special Area of Conservation (SAC), and the Newquay and the Gannel, Padstow Bay and Surrounds, and Hartland Point to Tintagel Marine Conservation Zones (MCZs).

SRT has more than 10 years of 'other' species data (in addition to seals) obtained from these systematic PIP boat surveys; the three replicate transects have been surveyed four times per year (12 boat surveys a year) since 2011. Records include bottlenose dolphins, common dolphins, harbour porpoise, Risso's dolphins, sunfish, jellyfish and more.

This report focuses on mobile species (not including seals or birds) that utilise the north Cornish coast, using data collected by SRT between 2011 and 2022, detailing sightings and highlighting any apparent trends.

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**MARINE WILDLIFE CAN BE SUBJECT TO HUMAN DISTURBANCE, AS SUCH THE EXACT LOCATIONS AND OTHER DATA REVEALING SPECIFIC LOCATIONS HAVE BEEN REDACTED FROM THIS REPORT.**

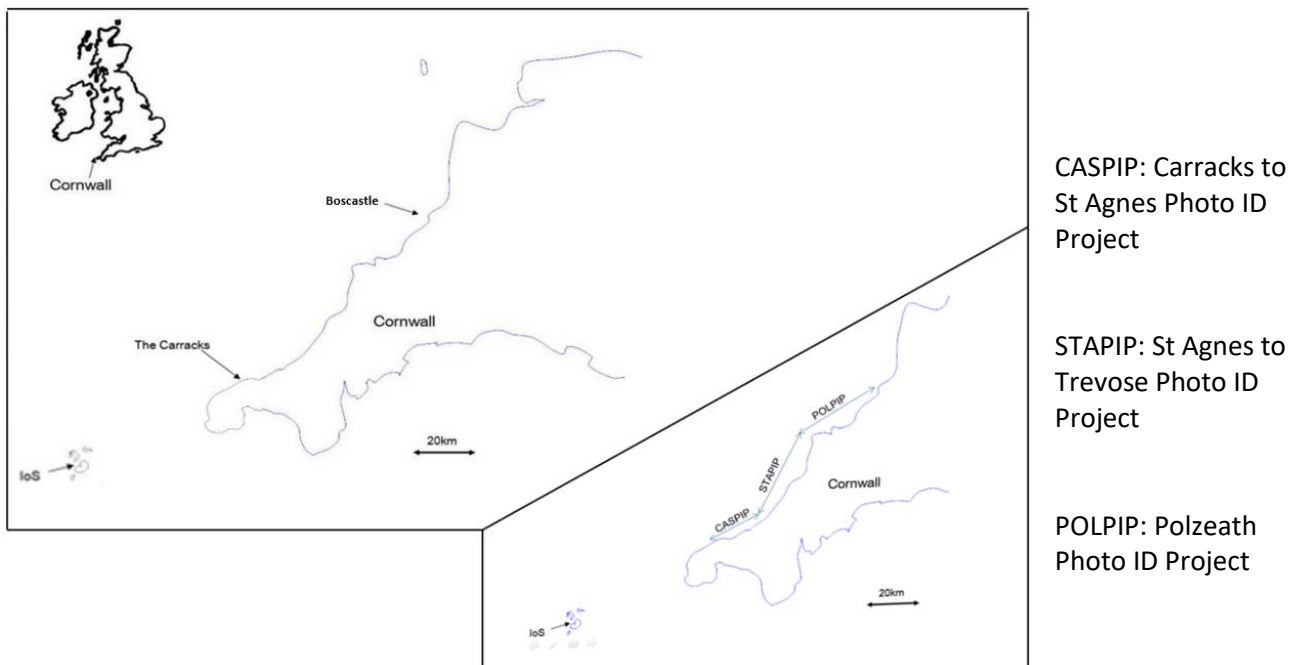
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## Introduction:

PIP boat surveys are a collaborative project between Seal Research Trust (SRT), Newquay Sea Safaris (NSS), Polzeath Marine Conservation Group (PMCG), and Newquay Marine Group (NMG) to monitor and identify seals and bottlenose dolphins; quantify marine plastics; review plankton levels; record and report all other marine megafauna encountered; count nesting sea birds on established ledges; and monitor human activity levels. There are three joined and overlapping seal PIPs along the north coast of Cornwall covering a 115km systematically repeated transect (**Figure 1.1**).

Launching from Padstow or Newquay, the aim of this project is to survey the stretch of coast from west of St Ives, to east of Boscastle. Transects cover or pass through: Aire Point to Carrick Du SSSI, Boscastle to Widemouth SSSI, Newquay and the Gannel MCZ, Padstow Bay and Surrounds MCZ, and Hartland Point to Tintagel MCZ. We aimed to repeat each of the three transects four times per year in January, April, July, and October. These surveys have been supported or financed by SRT, PMCG, Cornwall Wildlife Trust (CWT), British Divers Marine Life Rescue (BDMLR), Wave Hub, Cornwall College, University of Exeter, World Animal Protection, Patagonia, SeaChangers, LUSH, Tesco Bags of Help, and Heritage Lottery Fund, aboard NSS's wildlife safe accredited vessels, Atlantic Diver, or Atlantic Explorer.



**Figure 1.1** Map of Cornwall with locations of seal Photo Identification Projects (PIP).

PIP surveys aim to discover the following information:

- Sites used by seals in the sea and on land.
- The number of seals visiting the sites.
- Information about the age and sex class of seals, as well as information about anthropogenic impacts.
- Links to other seal sites in the Celtic Sea made by individual seals, using photo identification.
- The seasonality of seal site use.
- Risk posed to marine life by lost fishing gear.
- The location, quantity, and type of marine microplastics.
- Plankton levels.
- Human activity levels.
- The location and presence or absence of sea birds on nesting ledges and other marine megafauna.

Reports are written after each PIP survey. These reports help inform any conservation policy, advice and decisions being made about marine life in this area and motivate volunteers. This report will collate data gathered on 'other' species (not seals or seabirds), from 2011 when PIP surveys began, to 2022.

## Method: Other marine megafauna

Based on previous experience from boat based seal surveys, the following survey protocol was developed:

- To conduct monthly and more recently (2016 onwards) quarterly surveys, to coincide with seal census survey dates where possible (five set days in each of the following months: January, April, July and October).
- Surveys to be undertaken within a window of three hours either side of low tide.
- Boat to be operated following wildlife safe practice, by adhering to and exceeding protocols as set out in the Wildlife Safe (WiSe) Scheme, and the Cornwall Marine and Coastal Code.
- To record the following data, conditions permitting (**Figure 2.1**):
  - Location using waypoints on a handheld marine GPS,
  - species and group size,
  - maturity,
  - behaviour, for example: surfacing, normal swim, fast swim, feeding, leap/breach, tail slap, bow-ride, rest/milling, sexual, aggression,
  - evidence of entanglement, distinctive markings, marine debris, human activity and disturbance,
  - environment conditions, including: wind strength and direction, tide, sea state, swell, cloud, glare and visibility.
- Photographs of species to be taken using digital cameras with optical zoom lenses with optical image stabilisers, where sea, weather conditions, and marine life permit.
- Data to be transferred to MS Excel spreadsheets on return to shore and shared with the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) via the ORKS (Online Recording Kernow and Scilly) platform provided by Cornwall Wildlife Trust (CWT).

Additional methods on minimising disturbance when surveying seals and seal sites have not been detailed in this report but are strictly adhered to on all PIP surveys.

Boat Survey Form									
Date		Observer(s)					Lead Observer		
Depart harbour							Arrive harbour		
	Time	Wind Direction	Wind Strength	Sea State	Cloud	Glare	Visibility	Swell	Notes
Start									
End									
Sightings									
Time	Location (Lat / Long)	Way Point	Number of animals (min and max)	Species	Maturity	Bearing (compass bearing of first sighting)	Distance (distance of first sighting in meters)	Notes; gender (if known), behaviour, distinctive marks, photographs taken? Seen on land or in the sea?	
								On land <input type="radio"/> In the Sea <input type="radio"/>	

Figure 2.1 Example survey recording sheet for 'other' species data.

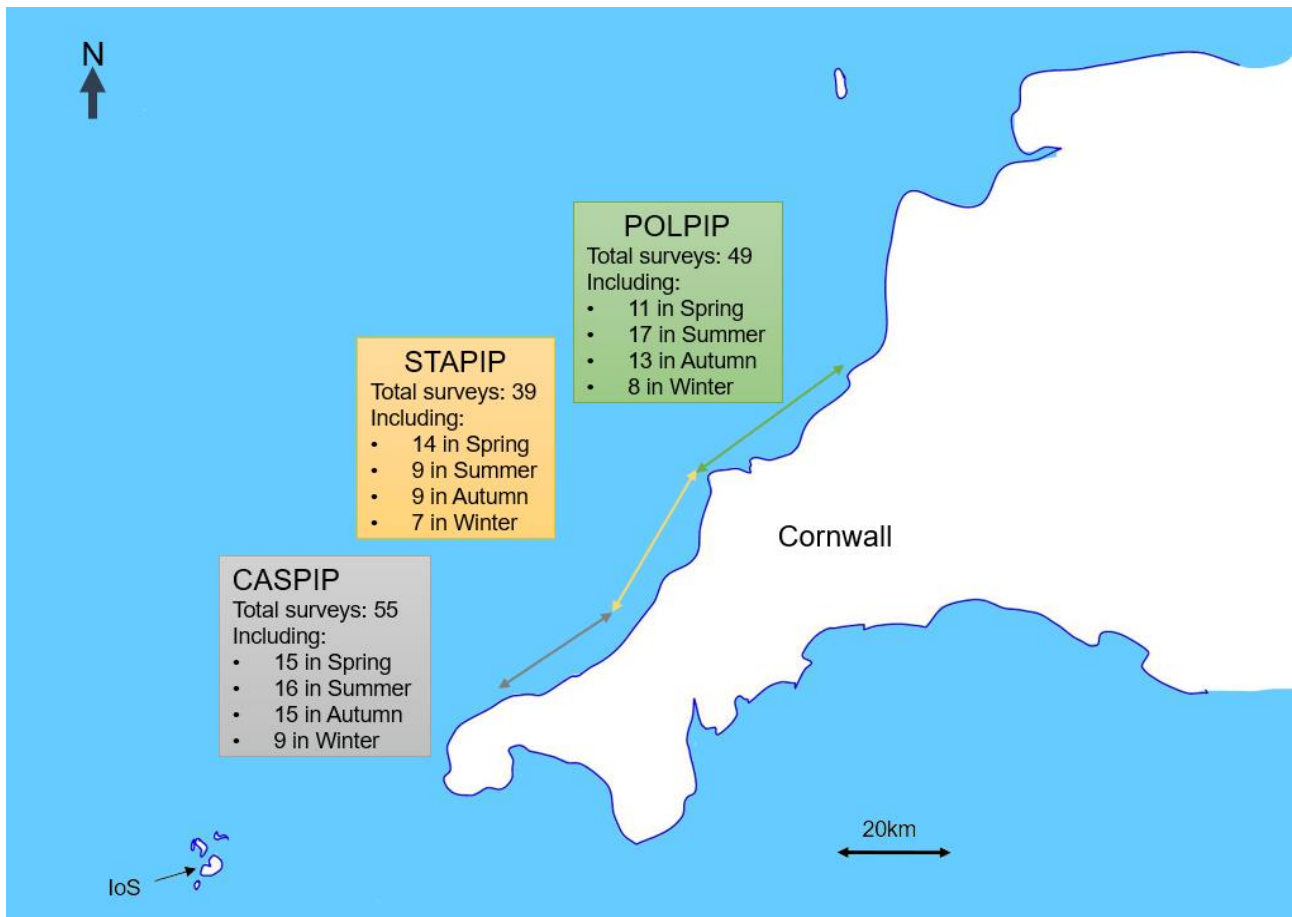
Routes taken for each survey are subject to change depending on conditions, but tend to be as follows:

- CASPIP: launching from Newquay, the boat heads west to St Agnes, where surveying begins. The boat stays 100m+ from the shore, continuing west at a slow speed of around five knots to the eastern end of St Ives Bay. The boat then travels to the end of the transect, west of St Ives Bay, and slowly surveys 100m+ from shore in an easterly direction back to Carbis Bay where surveying concludes.
- STAPIP: launching from Newquay, the boat travels east to offshore sites near Trevoze where surveying begins. It then heads back west staying 100m+ from the shore, slowly travelling to St Agnes and as far as Bawden Rocks where surveying concludes.
- POLPIP: launching from Padstow, the survey begins as the boat heads west out of the Camel Estuary and along the north coast to sites near Trevoze. The boat then travels back to the Camel Estuary surveying offshore sites before continuing east to beyond Boscastle where surveying concludes.

## Results: 2011 to 2022

### Survey effort

In total 143 systematic PIP surveys were conducted between 2011 to 2022 as follows: 55 CASPIP surveys, 39 STAPIP surveys and 49 POLPIP surveys. The seasonal distribution of surveys is as follows: 40 during spring months (March, April, and May), 42 during summer months (June, July, and August), 37 during autumn months (September, October, and November), and 24 during winter months (December, January, and February); (Figures 3.1, 3.2, 3.3a and b, and 3.4). Please note that surveys cannot always be completed in the designated month due to inclement sea and weather conditions.



**Figure 3.1** Map of Cornwall showing locations of PIP transects and seasonal distribution of survey effort.



**Figure 3.2** Varying conditions at sea experienced on PIP surveys. Photos by Sue Sayer MBE and Jasmina Goodair.

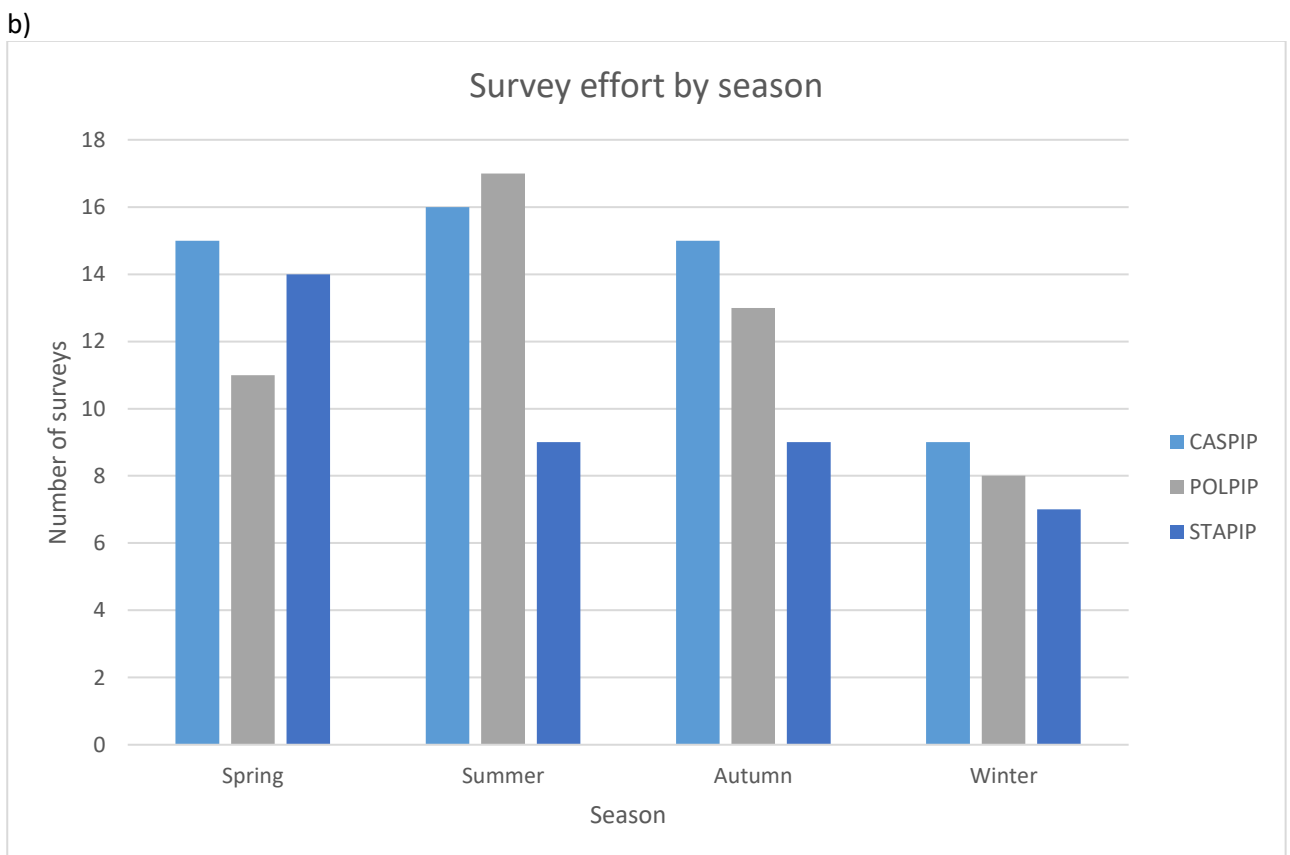
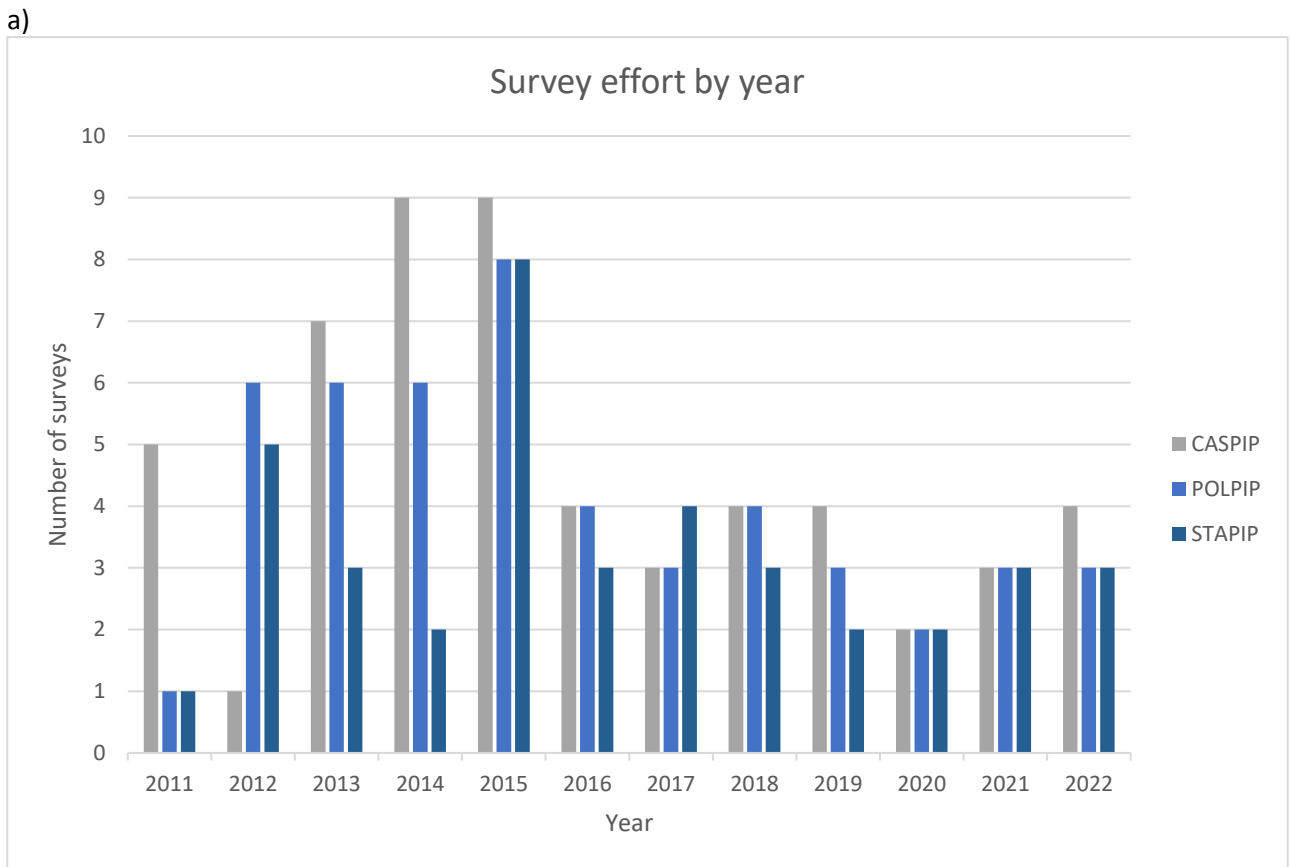


Figure 3.3 Transect survey effort by: a) year and b) season.





**Figure 3.4** Survey vessel: Atlantic Diver during a POLPIP survey. Photo by Malcolm Baker.

### Species observed

**Table 1.1** gives a broad overview of the species that were observed at least once on each PIP transect between 2011 to 2022. In terms of presence or absence, there appears to be a fairly even distribution along the north coast of Cornwall presented in this first glance look at the data.

Blue fin tuna and Risso’s dolphins have only been recorded on the POLPIP survey transect; and Portuguese man o’ war have been recorded on the CASPIP and STAPIP survey transects but not on POLPIP surveys.

Spatial and temporal abundance of each species will be looked at in closer detail on the following pages.

Species	Survey		
	CASPIP	STAPIP	POLPIP
Barrel jellyfish	✓	✓	✓
Blue-fin tuna			✓
Bottlenose dolphin	✓	✓	✓
Common dolphin	✓	✓	✓
Harbour porpoise	✓	✓	✓
Jellyfish (not including barrel)	✓	✓	✓
Portuguese man o’ war	✓	✓	
Risso’s dolphin			✓
Sunfish	✓	✓	✓
Unknown cetacean	✓	✓	✓

**Table 1.1** ‘Other’ species list and surveys on which they have been observed.

## Species:

### Bottlenose dolphin

Bottlenose dolphins have been observed a total of 13 times during 11 (8%) of the 143 PIP surveys. They have been recorded on all three survey transects and in all seasons. Group sizes ranged from single bottlenose dolphins (October 2016, October 2017, and July 2018), to pods of 11-20 (February 2015, January 2017, and February 2018).

Bottlenose dolphins were most frequently observed during winter months despite survey effort being at its lowest (as sea conditions tend to be rougher). In contrast, there was only one sighting of bottlenose dolphins during summer months, when PIP survey effort is at its highest. This sighting was a single dolphin (**Figures 4.1a, 4.2 and 3.3b; table 1.1**).

Most sightings occurred in the [REDACTED] area, surveyed as part of the CASPIP transect; and between [REDACTED] and [REDACTED], part of the STAPIP survey transect (**Figure 4.2**).

Lone bottlenose dolphins have been recorded three times on PIP surveys in consecutive years 2016, 2017 and 2018. During the CASPIP survey in October 2017, surveyors observed 'Splashy', a social solitary dolphin (an individual that chooses to interact primarily with people and watercraft over other dolphins) as he joined the survey vessel to bow ride (**Figure 4.3**). For more information on solitary dolphins, please see: Marine Connection: Lone rangers: A report on solitary dolphins and whales including recommendations for their protection:

<http://marineconnection.org/wp-content/uploads/2019/07/Lone-Rangers-Second-Edition-2019.pdf>

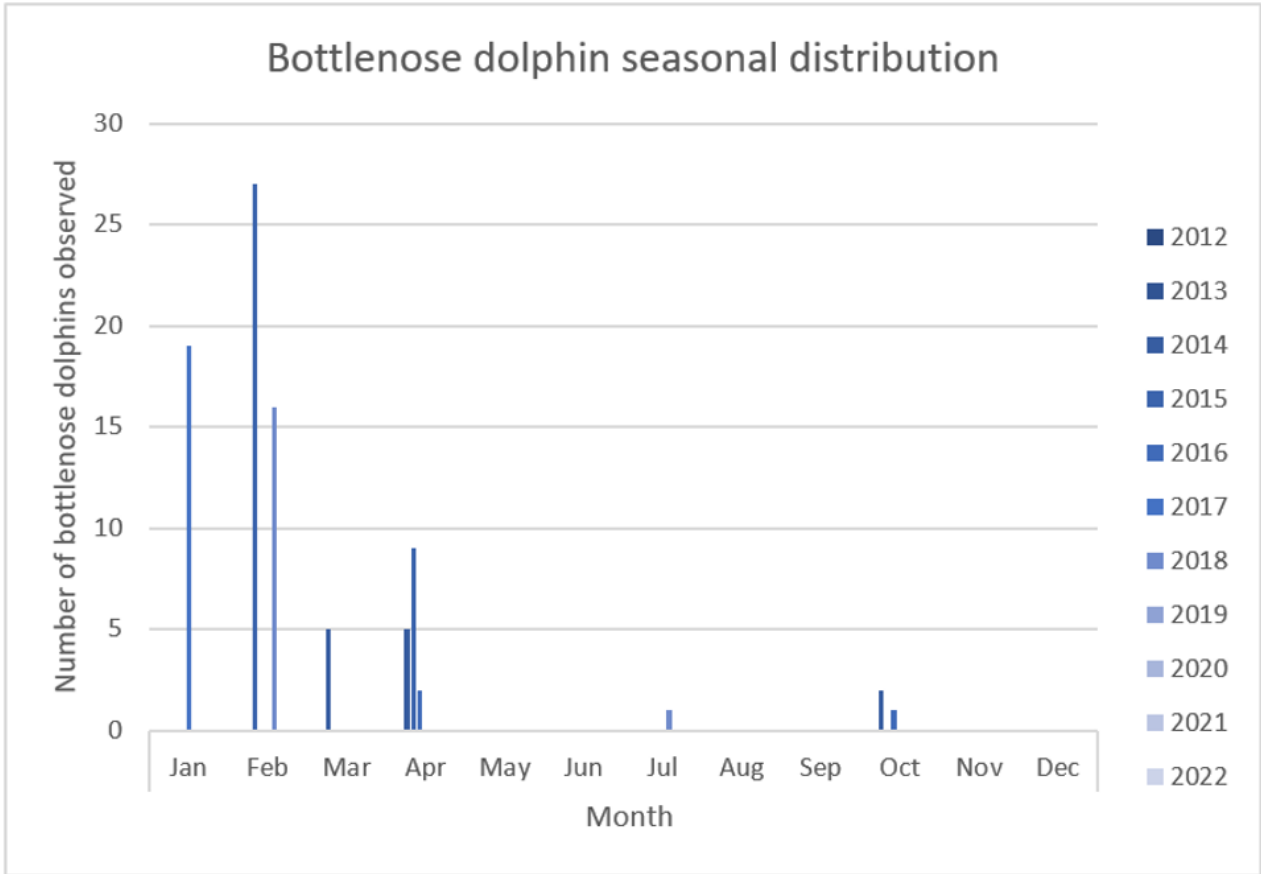
Bottlenose dolphin individuals can be photo identified. The dorsal fin, one of the first features on a dolphin's body to become visible as the animal surfaces is made up of collagen which is susceptible to damage such as scratches or tears along its trailing edge. These markings become notches and scars, unique and recognisable on an individual level.

Where possible, SRT have re-identified bottlenose dolphin individuals during post-survey photo analysis. Twelve individuals have been re-identified on PIP surveys: of these, two have been re-identified three times, one was re-identified twice, and nine were re-identified once. The highest number of re-IDs from a single survey was six out of eight bottlenose dolphins, on a CASPIP survey in April 2014 (**Figure 4.4**).

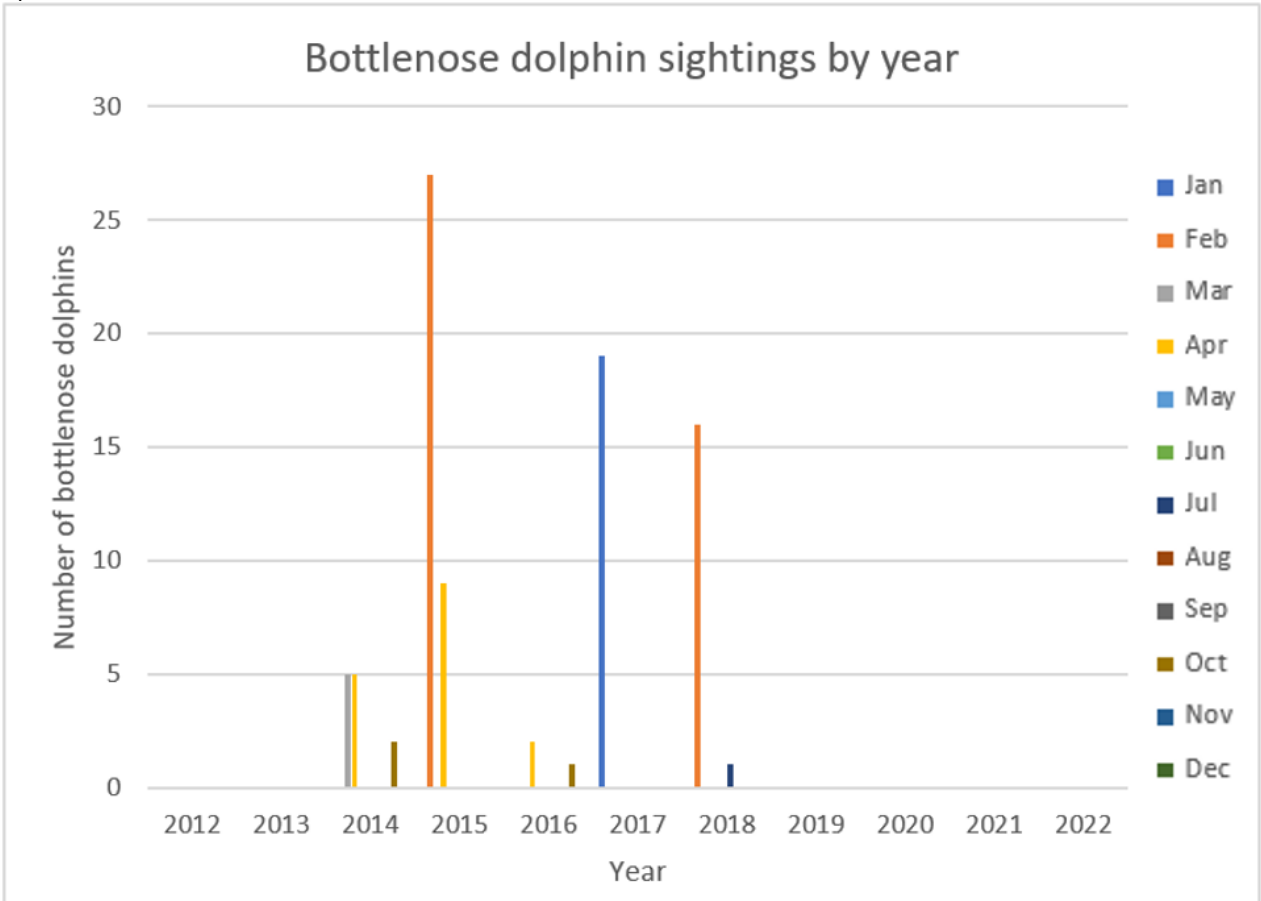
Cornwall has been home to a resident inshore pod of approximately 28 individuals; however, PIP surveyors have not observed bottlenose dolphins since 2018 (**Figure 4.1b**).

The South Coast Bottlenose Dolphin Consortium, a partnership of stakeholders lead by the Cornwall Wildlife Trust, was set up in 2016 to gather the information needed for their protection. SRT Bottlenose dolphin data is shared with the South Coast Bottlenose Dolphin Consortium, to be used for research and improved conservation of the bottlenose dolphin population of the southwest and beyond.

a)



b)



**Figure 4.1** a) Bottlenose dolphin seasonal distribution; b) Bottlenose dolphin sightings by year.



**Figure 4.2** Locations and numbers of bottlenose dolphins observed on PIP surveys across the meteorological seasons.



**Figure 4.3** 'Splashy', a social solitary male bottlenose dolphin, observed during CASPIP38, October 2017. Photo by Sue Sayer MBE.



**Figure 4.4** Examples of bottlenose dolphin fin Photo ID from SRT’s BND ID catalogue that has now been merged with the South Coast Bottlenose Dolphin Consortium’s Photo ID Catalogue. This post-survey photo analysis shows the re-identifications of individual bottlenose dolphins from April 2014’s CASPIP survey; catalogue photographs bordered with red for confirmation. Photos by Sue Sayer MBE.

## Common dolphin

Common dolphins have been observed a total of 80 times during 42 (29%) of the 143 PIP surveys. They have been recorded on all three survey transects and in all seasons. Group sizes ranged from single common dolphins, to much larger pods of 100 plus, in April 2015 and January 2022, and 200 plus in April 2022.

Common dolphins were most frequently recorded during the summer and autumn months but observed group sizes tended to be smaller. Common dolphins were least frequently recorded during winter and spring months when observed group sizes were often larger (**Figures 5.1 and 5.2; table 1.1**).

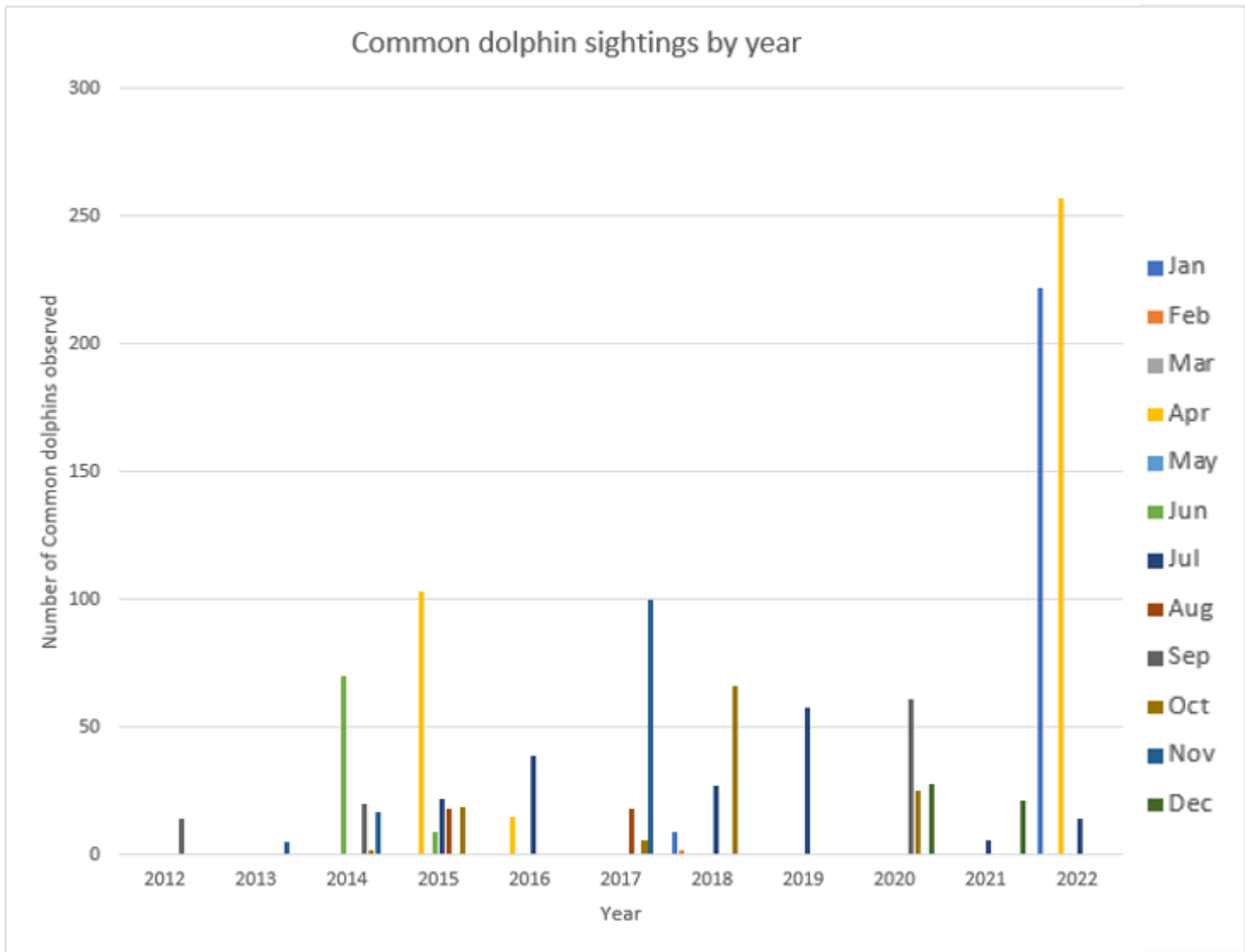
Frequently, surveyors have recorded a wide range of ages within common dolphin pods, from calves with visible foetal folds to much larger mature individuals that bear the scars gained over their lifetime (**Figure 5.4**).

Most sightings occurred in the areas between [REDACTED] and [REDACTED] (POLPIP), [REDACTED] and [REDACTED] (STAPIP), and [REDACTED] (CASPIP); (**Figure 5.1**).

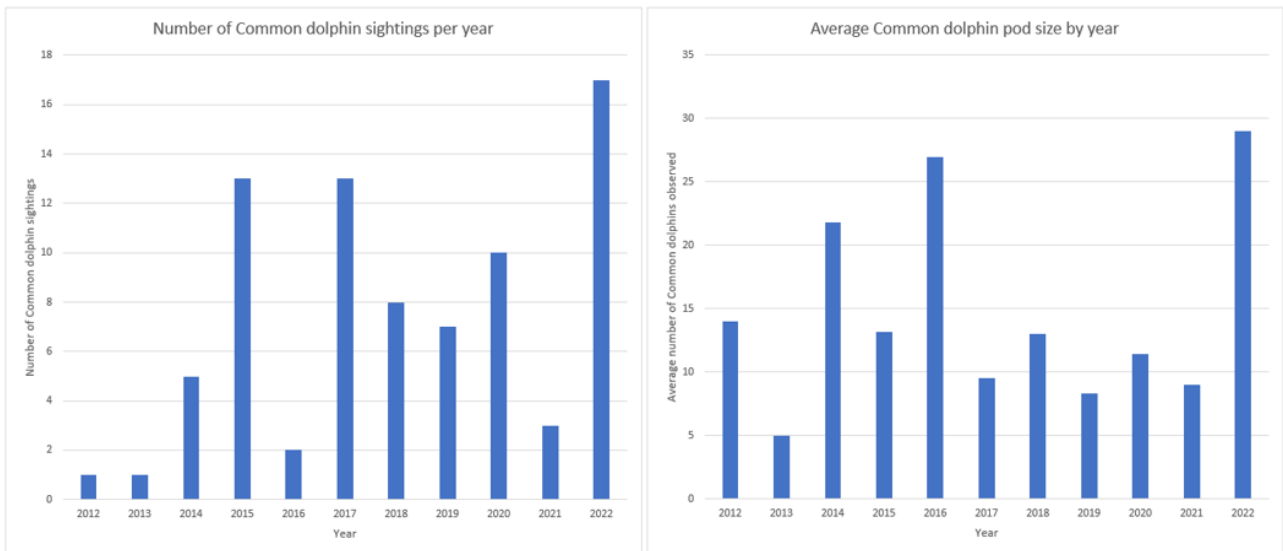
Common dolphins were seen in larger numbers during PIP surveys in 2022 both in terms of frequency of sightings and average pod size (**Figures 5.2 and 5.3**). The larger number of sightings for 2022 becomes more evident when compared with years 2016 and 2021 alongside survey effort which is approximately the same for each of these same years (**Figures 5.3 and 3.3a**).



**Figure 5.1** Locations and numbers of common dolphins observed on PIP surveys across the meteorological seasons.



**Figure 5.2** Common dolphin sightings by year.



**Figure 5.3** Number of common dolphin sightings per year; and average common dolphin pod size by year.

Common dolphins were observed five times on April 2022's POLPIP survey, during which a range of behaviours were recorded. The dolphins were observed feeding, as Gannets dived in, to feed on the bait-ball from above. It was also during this survey that the larger pod of over 200 common dolphins approached the survey vessel breaching as they did so. POLPIP coordinator/seal recorder, Sarah Millward filmed the encounter on a waterproof GoPro camera. Footage shows the dolphins bow riding; where vocalisations, 'clicks and whistles' that the dolphins use to communicate with each other can be heard. A substantial wound on the upper part of the peduncle (muscular tail section located between the dorsal fin and the flukes) on one of the dolphins could clearly be seen. Defecation was also observed (**Figure 5.5**).

Common dolphins recorded on PIP surveys have frequently been observed displaying inquisitive behaviour suggesting curiosity towards the surveyors as well as the survey vessel. Often when bow riding, the dolphins turn onto one side to look up and observe the surveyors who are watching them (**Figure 5.6**).

Dolphin disturbance was witnessed in [REDACTED] during a CASPIP survey in July 2018. Hire-boat users were seen stopping to observe common dolphins, then promptly changing course, direction, and speed to pursue the dolphins, harassing them into the bay. This behaviour was immediately reported to the boat hire company involved, and to Cornwall Marine and Coastal Code Group (CMCCG). The hire company acted promptly, sending out their patrol RIB requesting the boats return to the harbour. The CMCCG promote best practice with an aim to minimise effects of human activity on marine and coastal wildlife. CMCCG comprises SRT, CWT, RSPB, National Trust, Marine Strandings Network (MSN), British Divers Marine Life Rescue (BDMLR), Cornwall Council, Devon and Cornwall Police Marine and Coastal Policing Team, the Marine Management Organisation (MMO) and Natural England.



**Figure 5.4** Upper photos: common dolphin calf with evident pale foetal fold lines, swimming alongside an adult, possibly it's mother. Photos by Adrian Langdon. Lower photo: Adult common dolphins with multiple scars, including rake marks inflicted by other dolphins. Photo by Sarah Millward.





**Figure 5.5** Common dolphins observed during POLPIP survey, April 2022: Breaching alongside the survey vessel (top left), bow-riding (top right), tail wound (bottom left), and defecation (bottom right). Upper photos by Adrian Langdon, lower photos by Sarah Millward.



**Figure 5.6** It became clear to surveyors on the September 2020 POLPIP survey that they were also being observed by the dolphins. The clarity and calmness of the water gave the dolphins the perfect opportunity to turn on their sides then glide along effortlessly whilst looking up at surveyors. The dolphins appeared relaxed, playful and curious. Photo by Sarah Millward.

## Harbour porpoise

Harbour porpoise have been observed a total of 76 times during 36 (25%) of the 143 PIP surveys. They have been recorded on all three survey transects and in all seasons. Group sizes have been much smaller than the common dolphin sightings. Single harbour porpoise were observed on 39 occasions, groups of two, three or four individuals were observed 30 times, and larger pods of 8-14 harbour porpoise were observed seven times.

Harbour porpoise were most frequently recorded during autumn and winter months. Larger pods (n=8-14) were observed only in these seasons. Far fewer harbour porpoise were observed throughout the spring and summer months, during which time observed group sizes were also smaller (n=1-4), (**Figures 6.1, 6.2 and 6.3; table 1.1**).

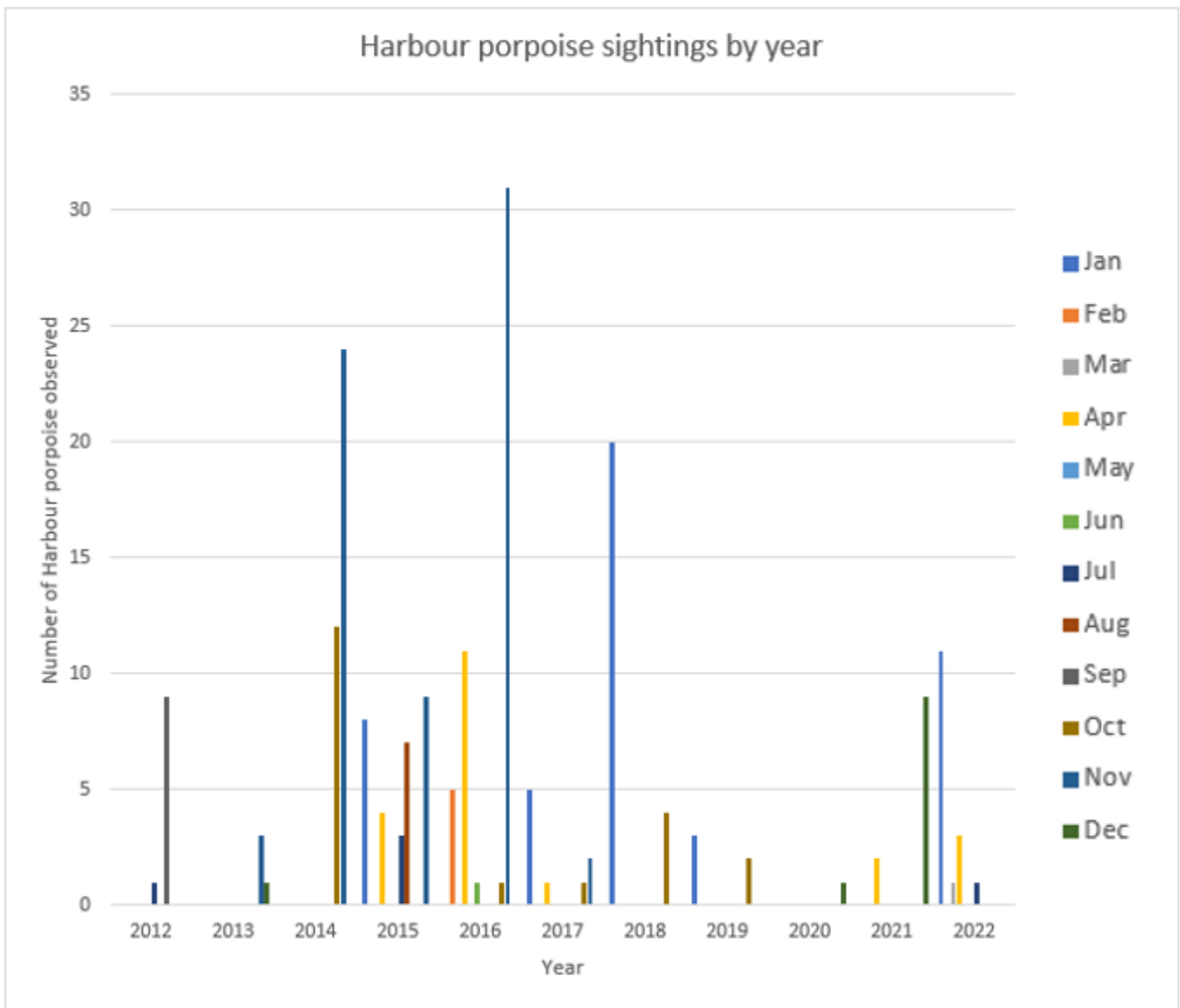
Most sightings occurred around the [REDACTED] area, between [REDACTED] and stretching up to past [REDACTED]. During a POLPIP survey in January 2018, harbour porpoise were recorded nine times along this stretch of coast in group sizes ranging from 1-8 individuals (**Figure 6.1**).

Larger pods of 8-14 harbour porpoise were observed only in the years 2012, 2014 and 2016. Almost all sightings from 2017-2022 have been of groups of 1-3 individuals. Two sightings during this time were of four harbour porpoise, these occurred in January 2018 and January 2022 (**Figure 6.3**).

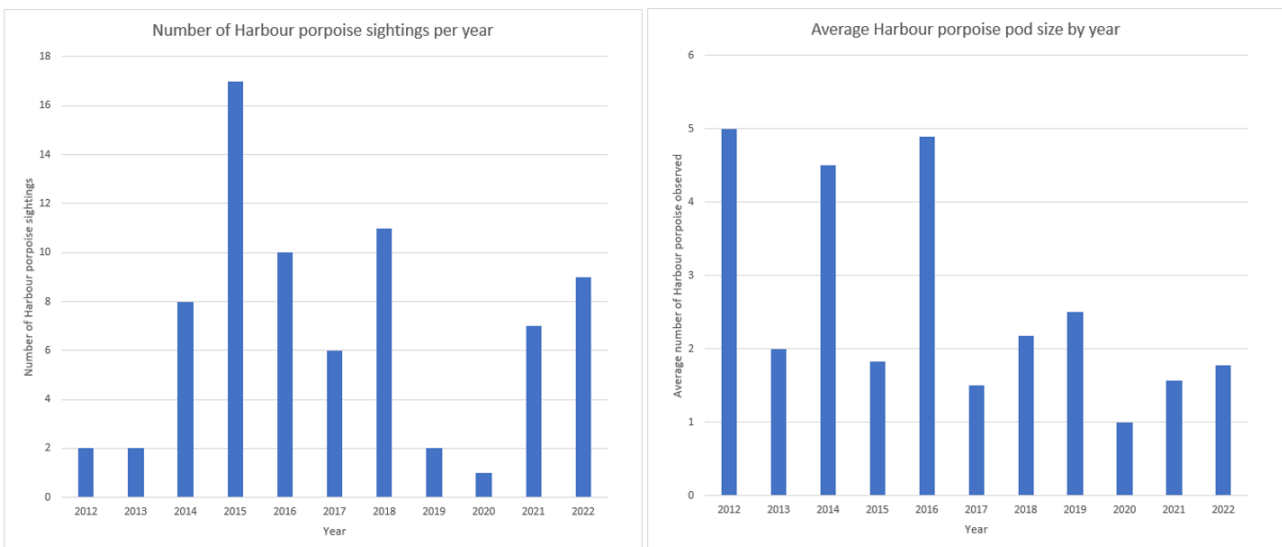
Harbour porpoise have been observed as being usually shy and elusive, with most sightings being only brief and recorded at around 100m or more from the survey vessel. Few sightings have been close to the boat. However, during the February 2016 POLPIP survey, four harbour porpoise surfaced 30m away from the boat whilst feeding. They continued their journey breaking the surface of the water several more times before swimming far out of sight (**Figures 6.4 and 6.5**).



**Figure 6.1** Locations and numbers of harbour porpoise observed on PIP surveys across the meteorological seasons.



**Figure 6.2** Harbour porpoise sightings by year.



**Figure 6.3** Number of harbour porpoise sightings per year; and average harbour porpoise pod size by year.



**Figure 6.4** Photographs of the same harbour porpoise observed during POLPIP survey, February 2014. Perspective photo (left) taken by Sarah Millward; species confirmation photo (right) by Sue Sayer MBE.



**Figure 6.5** Harbour porpoise observed during POLPIP survey, October 2014. Photo by Sue Sayer MBE.

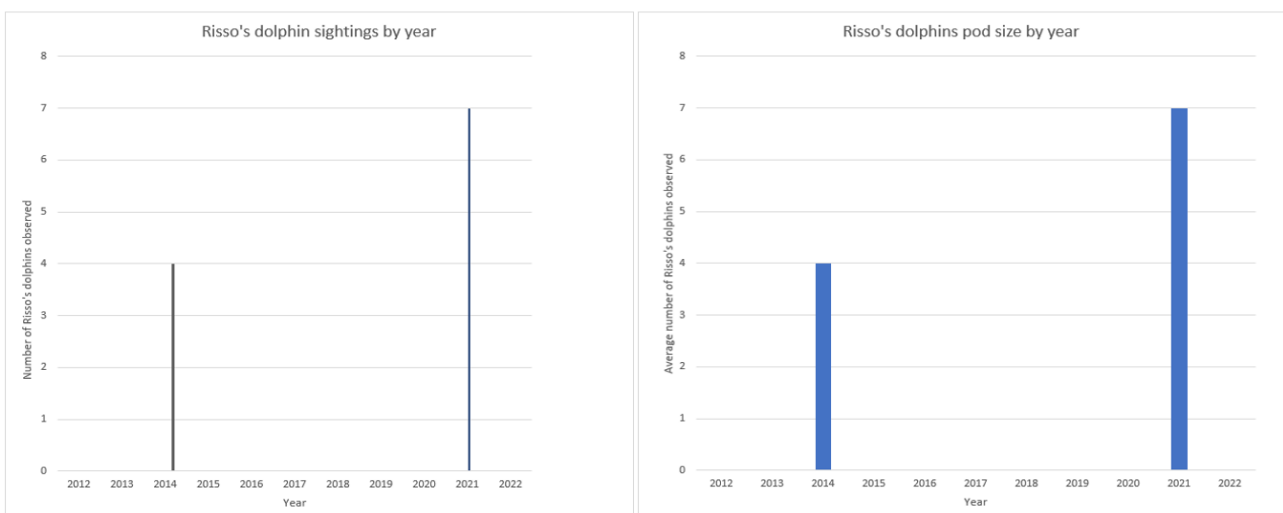
## Risso's dolphin

With only two sightings, one each on two separate surveys of 143 (1.4% of surveys), Risso's dolphins have seldomly been seen by PIP surveyors along the north coast of Cornwall. They have only been recorded on the POLPIP transect survey: once in autumn (September 2014), and once in summer (July 2021).

The first record was a small pod of four individuals, seen close to [REDACTED]. The second was a pod containing a minimum of seven individuals, seen [REDACTED]. This pod included a calf, and individuals were observed body slamming and breaching high out of the water (**Figures 7.1, 7.2, 7.3 and 7.4; table 1.1**).



**Figure 7.1** Locations and numbers of Risso's dolphins observed on PIP surveys across the meteorological seasons.



**Figure 7.2** Risso's dolphin sightings by year.



**Figure 7.3** Risso's dolphins observed during POLPIP survey, September 2014. Photo by Sue Sayer MBE.



**Figure 7.4** Risso's dolphin observed breaching clear of the water's surface during POLPIP survey, July 2021. Photo by Adrian Langdon.

## Sunfish

Ocean sunfish have been observed a total of 65 times during 22 (15%) of the 143 PIP surveys. They have been recorded on all three survey transects, and all except three have been sightings of solitary sunfish. Two sunfish within proximity to each other, but not interacting with one another, have been observed near to each of these locations: [REDACTED], [REDACTED] and [REDACTED].

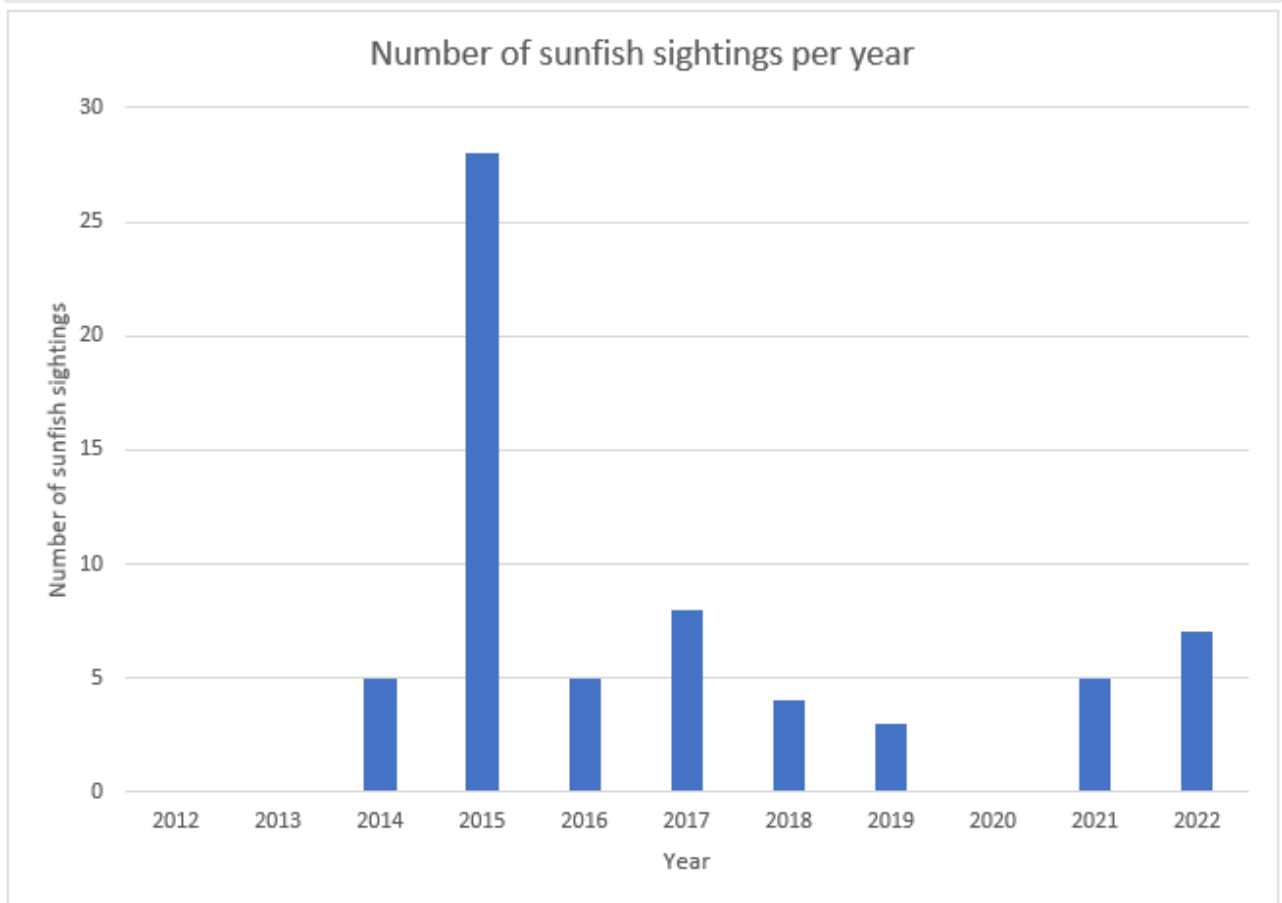
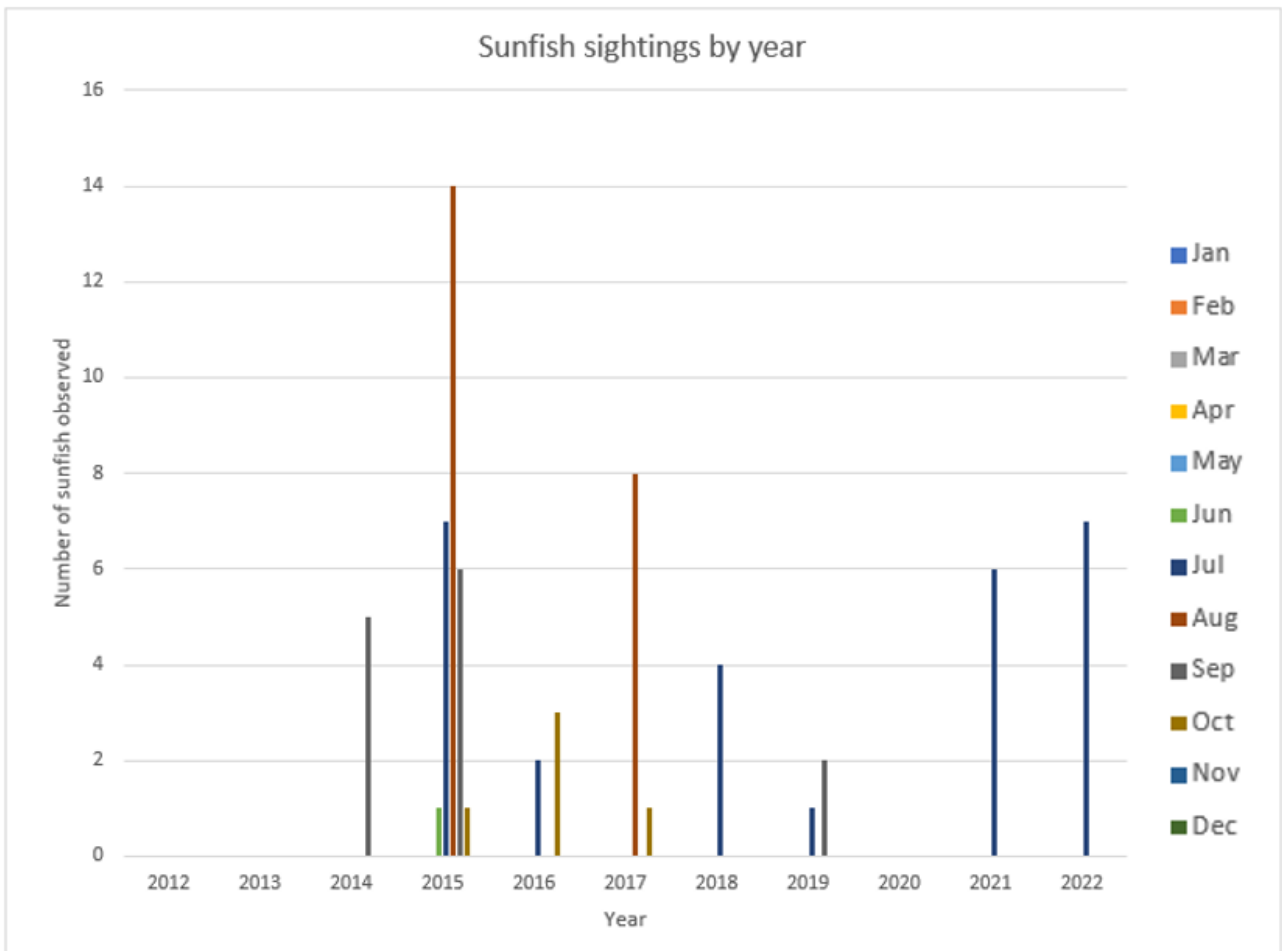
Sunfish have only been observed during the summer and autumn months. Spatially, sunfish appear to have a fairly even distribution along the north coast of Cornwall. This is backed up by multiple sightings of sunfish at regular intervals during summer and autumn PIP surveys; for example, sunfish were observed eight times during a CASPIP survey in August 2015. Sightings during the autumn have been closer to the shore than sightings in the summer (**Figures 8.1, 8.2 and 8.3; table 1.1**).

The highest number of sunfish sightings occurred in 2015, however, this also coincides with survey effort, which was also at its highest during the summer of 2015 (**Figures 8.2, 3.3a and 3.3b**).

Most sunfish observed on PIP surveys are estimated to be between 50-60cm in their diameter.



**Figure 8.1** Locations and numbers of Ocean sunfish observed on PIP surveys across the meteorological seasons.



**Figure 8.2** Sunfish sightings by year.





**Figure 8.3** Sunfish observed on a CASPIP survey, August 2015. Photo by Kate Hockley.

## Barrel jellyfish

Barrel jellyfish have been observed a total of 44 times during 19 (13%) of the 143 PIP surveys. They have been recorded on all three survey transects and in all seasons.

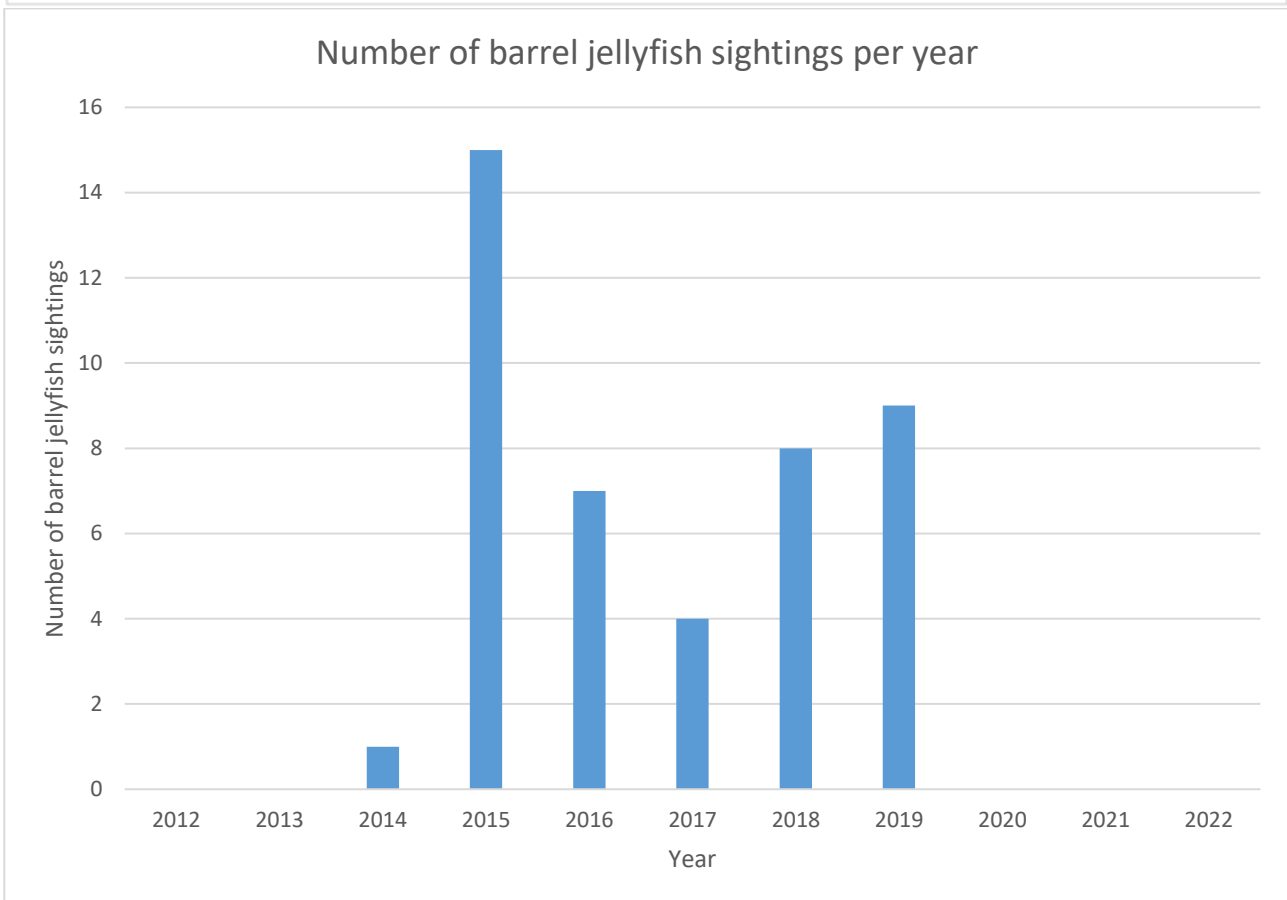
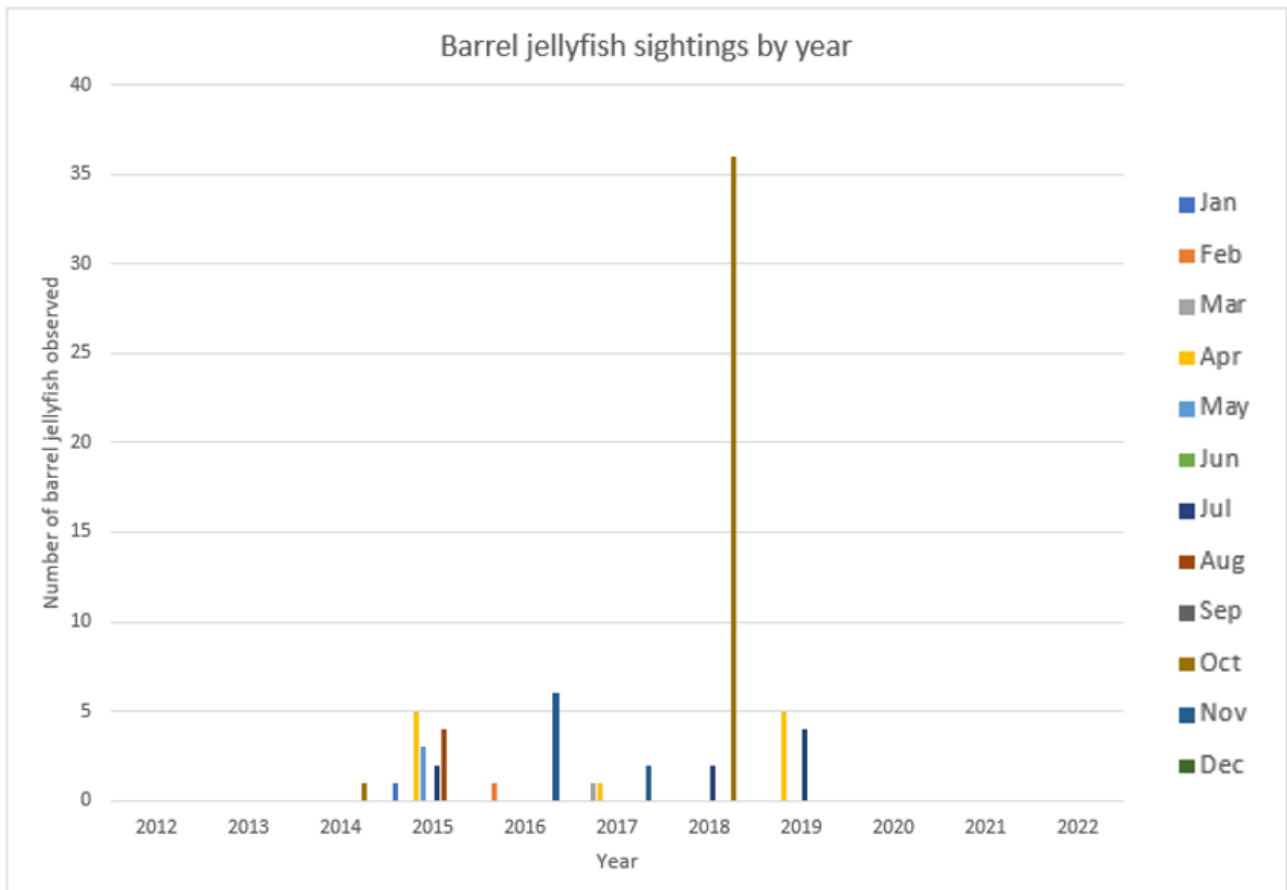
Barrel jellyfish appear to have a more even spatial distribution in the spring months. During the summer months most sightings of barrel jellyfish on PIP surveys have been along the stretch of coast between [REDACTED] to past [REDACTED]. Barrel jellyfish have only been seen in any number on the eastern side of [REDACTED] during spring and autumn PIP surveys; and there have only been two sightings of barrel jellyfish on PIP surveys during winter months (**Figures 9.1, 9.2 and 9.3; table 1.1**).

The highest number of barrel jellyfish recorded in one survey was 36, during a POLPIP survey in October 2018. At times during this survey, sightings were so frequent that it seemed as though the vessel were passing 'blooms' of single and spaced apart barrel jellyfish. All except two sightings of single barrel jellyfish recorded in 2018 were on this POLPIP survey in October. All other sightings of barrel jellyfish have been single jellyfish, and no more than six observed per survey.

Barrel jellyfish sightings were consistent between the years of 2015 to 2019. However, they have not been recorded on a PIP survey since 2019 (**Figure 9.2**).



**Figure 9.1** Locations and numbers of barrel jellyfish observed on PIP surveys across the meteorological seasons.



**Figure 9.2** Barrel jellyfish sightings by year. Barrel jellyfish have not been seen on PIP surveys since 2019.



**Figure 9.3** Barrel jellyfish observed during PIP survey, 2015, viewed from tentacles, looking up towards the bell. Photo by Sue Sayer MBE.

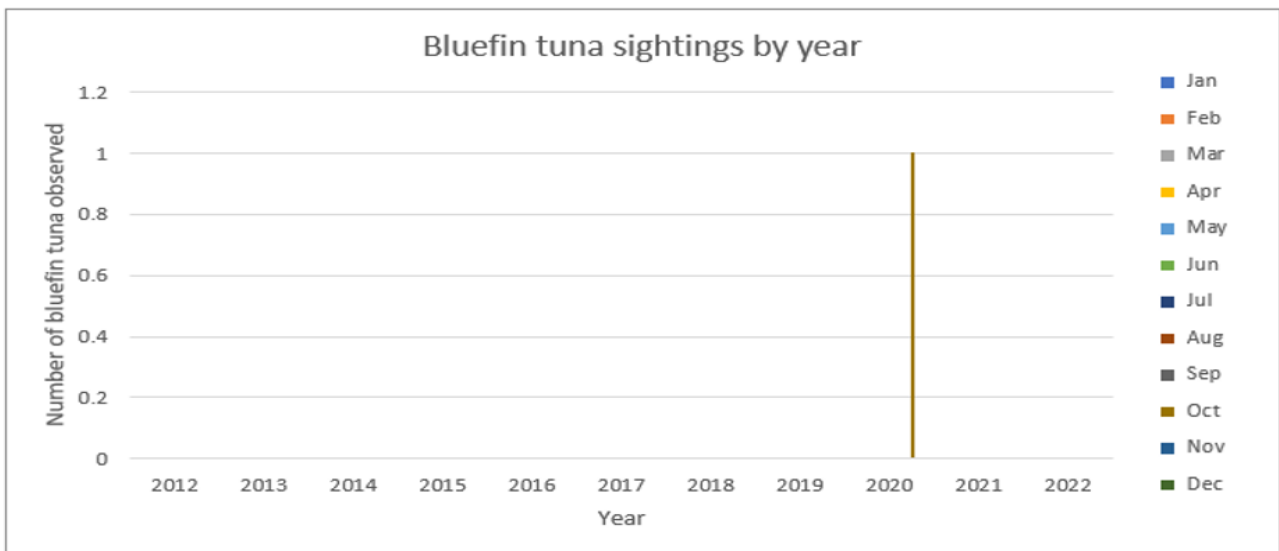
## Atlantic bluefin tuna

Atlantic bluefin tuna have been recorded only once during a PIP survey (0.7% of surveys) on the north coast of Cornwall. This sighting occurred near to [REDACTED] on an October (autumn) POLPIP survey in 2020.

The sighting was brief but definite: a single tuna breached from the water approximately 50 metres from the survey vessel (Figures 10.1, 10.2; table 1.1).



**Figure 10.1** Locations and numbers of bluefin tuna observed on PIP surveys across the meteorological seasons.



**Figure 10.2** Atlantic bluefin tuna sightings by year.

## Jellyfish (excluding barrel)

All species of jellyfish except barrel jellyfish have been grouped together in this one category. These species typically include moon, blue and compass jellyfish.

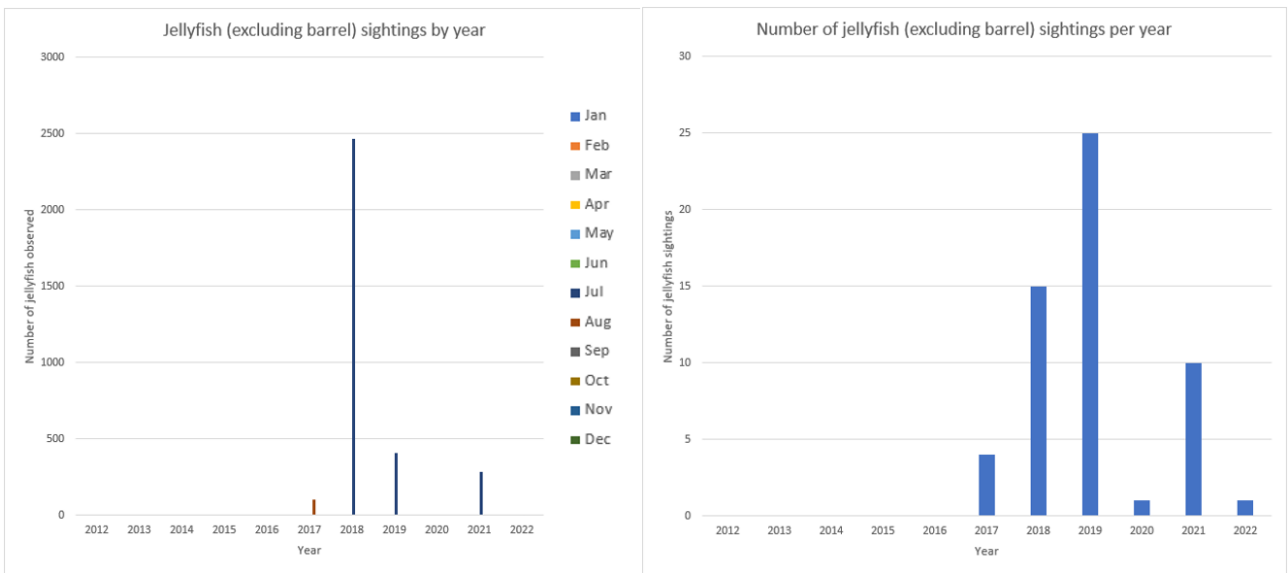
Jellyfish have been observed a total of 57 times during 12 (8%) of the 143 PIP surveys. They have been recorded on all three survey transects and all except one sighting have been during the summer months. One stray moon jellyfish was recorded on an autumn POLPIP survey in September 2020.

Although jellyfish appear to have a fairly even spatial distribution, there appear to be 'hotspots' where there are higher concentrations of jellyfish recorded; and there are stretches of coast where none have been recorded.

The highest number of jellyfish were recorded in 2018; during this year, surveyors twice recorded smacks of jellyfish in excess of 1000 individuals. However, sightings of jellyfish were higher in 2019, when surveyors observed jellyfish 25 times in three summer surveys (**Figures 11.1, 11.2 and 11.3; table 1.1**).



**Figure 11.1** Locations and numbers of jellyfish observed on PIP surveys across the meteorological seasons.



**Figure 11.2** Jellyfish sightings by year.



**Figure 11.3** Compass jellyfish observed during STAPIP survey, July 2022. Photo by Adrian Langdon.

## Portuguese man o' war

Portuguese man o' war have been observed a total of 25 times during 6 (4%) of the 143 PIP surveys.

They have only been observed on surveys since 2017 and only along the section of coast west of [REDACTED] down to beyond [REDACTED]. Portuguese man o' war have not been observed on POLPIP surveys.

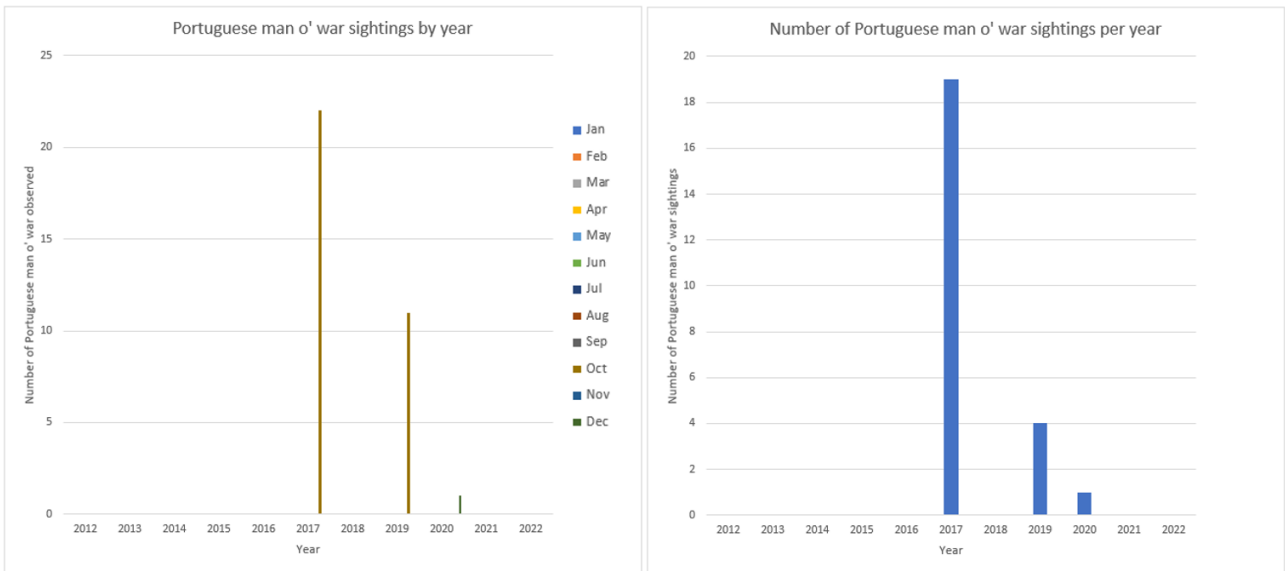
All sightings, except one, were recorded during autumn PIP surveys, and interestingly, all in the month of October. One Portuguese man o' war was observed on a STAPIP survey in December 2020.

Most sightings (n=21) have been of a single colonial hydrozoan, two Portuguese man o' war have been observed three times, and eight were observed closer to shore west of [REDACTED] on a STAPIP survey in 2019 (Figures 12.1, 12.2 and 12.3; table 1.1).



**Figure 12.1** Locations and numbers of Portuguese man o' war observed on PIP surveys across the meteorological seasons.





**Figure 11.2** Portuguese man o' war sightings by year.



**Figure 12.3** Portuguese man o' war observed during CASPIP survey, October 2019. Photo by Adrian Langdon.

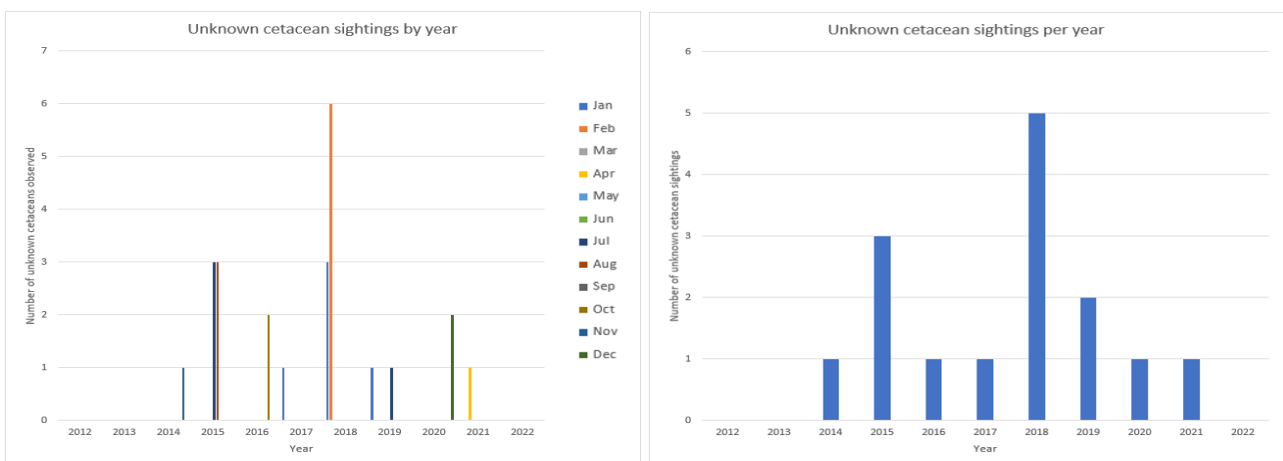
### Unknown cetacean (sighting confirmed, species unconfirmed)

Unknown cetaceans have been observed a total of 15 times during 11 (8%) of the 143 PIP surveys. They have been recorded on all three survey transects and in all seasons. Group sizes ranged from one to three: one unknown cetacean was recorded eight times, two were observed five times and three were recorded twice. More than half of all unknown cetacean sightings (n=8) were recorded during winter PIP surveys.

Unknown cetaceans have been observed consistently across the survey years. Most sightings occurred in the [REDACTED] area, offshore from the coast of [REDACTED], and between [REDACTED] and [REDACTED] (Figures 13.1 and 13.2; table 1.1).



**Figure 13.1** Locations and numbers of unknown cetaceans observed on PIP surveys across the meteorological seasons.



**Figure 13.2** Unknown cetacean sightings by year.

## Discussion

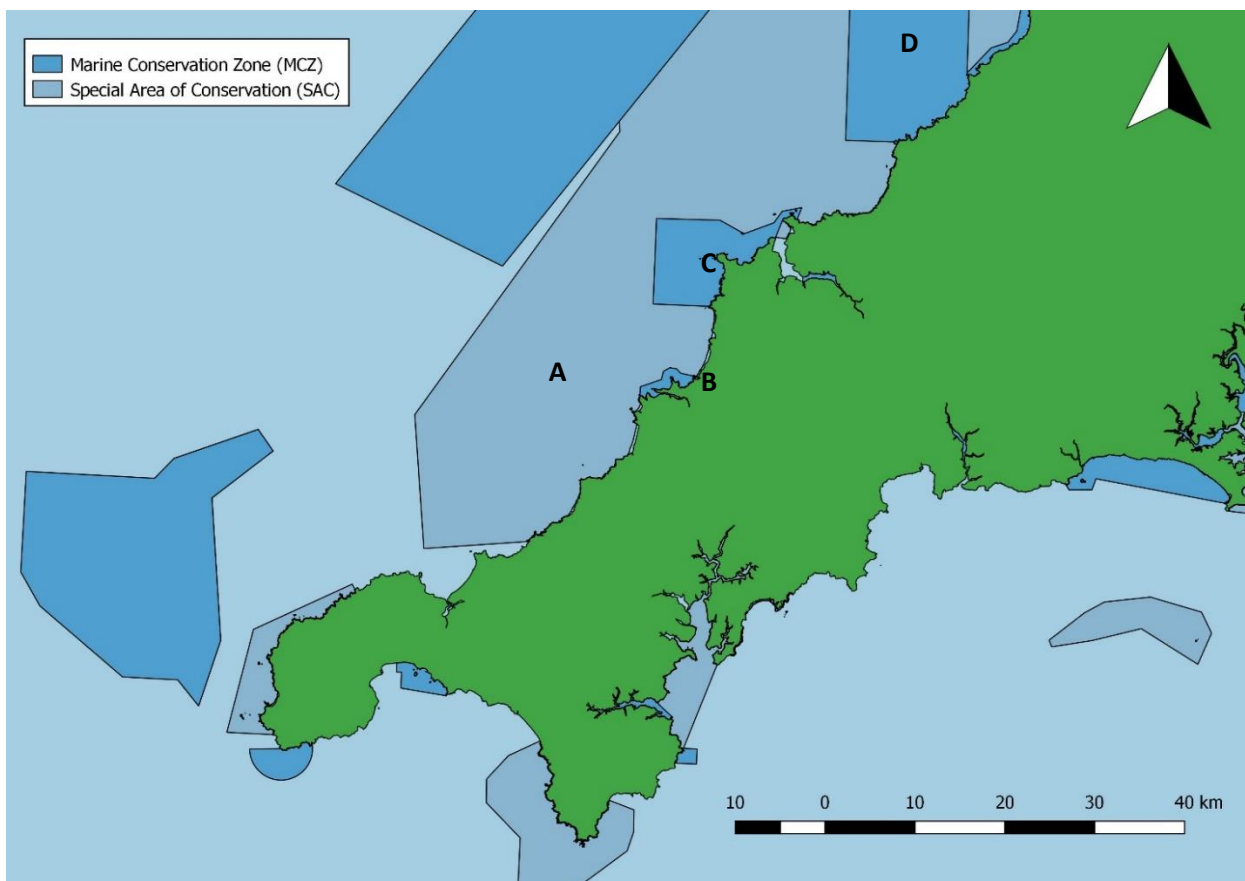
### Marine Conservation

It is hoped that data gathered on PIP boat surveys will continue to better inform any conservation policy, advice and decisions being made about marine life in this area on the north coast of Cornwall. Data is shared with the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) and is available on the National Biodiversity Network (NBN).

In 2016 SRT produced a report of harbour porpoise sightings from POLPIP surveys, in support of the designation of the Bristol Channel Approaches SAC. The site, spanning the Bristol Channel between the northern coast of Cornwall into Carmarthen Bay in Wales, was designated in February 2019 for harbour porpoise.

Data from PIP boat surveys was supplied as supporting information to re-enforce the ecological value of proposed MCZs prior to the designation of the Padstow Bay and Surrounds MCZ in November 2013, and both the Hartland Point to Tintagel, and the Newquay and the Gannel MCZs designated in January 2016.

These sites are known for their high biodiversity and have been designated to protect wildlife and the important habitats they depend on (**Figure 14.1**).



**Figure 14.1** Locations of Marine Protected Areas (MPAs), including:

- A) Bristol Channel Approaches SAC
- B) Newquay and the Gannel MCZ
- C) Padstow Bay and Surrounds MCZ
- D) Hartland Point to Tintagel MCZ

Map (figure 14.1) contains Joint Nature Conservation Committee data © copyright and database right [2020]. Contains Natural England data © copyright and database right [2020]. Contains NatureScot data © copyright and database right [2020]. Contains Natural Resource Wales data © copyright and database right [2018]. Contains Northern Ireland Environment Agency data © copyright and database right [2019]. Contains UK Hydrographic Office data © copyright and database right [2020]. Contains Ordnance Survey data © copyright and database right [2020].

## Surveys: effort and frequency

During their pilot years, PIP surveys took place on three different survey vessels: CASPIP aboard a BDMLR RIB from Hayle, POLPIP on a RIB from Rock, and STAPIP aboard the Atlantic Diver from Newquay. For this reason, all three survey transects were initially only able to take place from late spring to early autumn due to the challenges of sea conditions during winter months being too great for surveying by RIB. This changed in 2013 when it was agreed that all surveys would take place aboard the Atlantic Diver; allowing for winter surveys to be completed, and a more consistent survey protocol to be followed across all three survey transects.

However, the challenges of sea and weather conditions continue, and it seems increasingly necessary for PIP coordinators to postpone and reschedule surveys based on forecasts. Sometimes poor forecasts persist relentlessly, and surveys must be cancelled. Climate change appears to be playing a part in more extreme weather events. Survey reschedules have occurred in all seasons, but more frequently in winter months. Despite this, survey effort remains respectably high.

Initial protocols included conducting monthly surveys. In 2016 this frequency shifted to quarterly surveying, due to lack of funding. Surveying all three PIP transects once each meteorological season has proven to be the most sustainable way to balance research with survey costs.

## Species

### Bottlenose dolphin

Most sightings of bottlenose dolphins occurred in the [REDACTED] area, an area currently without any formal marine protection; and between [REDACTED] and [REDACTED], an area within the Bristol Channel Approaches SAC (Figure 14.1).

Despite previous frequent sightings, Cornwall's inshore resident pod of bottlenose dolphins have not been seen by PIP surveyors since 2018. Photo ID makes it possible to track migration patterns of bottlenose dolphins. Using photo ID confirmation, this pod has more recently been sighted, repeatedly along the coast of Sussex, with additional sightings on the coasts of Hampshire, the Isle of Wight, and Kent. These sightings have been reported to the South Coast Bottlenose Dolphin Consortium.

Bottlenose dolphins are a mobile species, capable of travelling vast distances between areas of suitable residence; and little is known about the reasoning behind this recent shift from north Cornwall to southeast England. Several factors may be contributors, both environmental and anthropogenic, such as availability of prey on the north coast of Cornwall, changes in human activity levels, noise pollution, and local climate change.

CWT Seaquest Southwest data has also shown a decline in bottlenose dolphin sighting reports since 2017.

For more information, see their latest report:

[https://www.cornwallwildlifetrust.org.uk/sites/default/files/2022-07/Seaquest%20Report%202021.%20FINALx\\_0.pdf](https://www.cornwallwildlifetrust.org.uk/sites/default/files/2022-07/Seaquest%20Report%202021.%20FINALx_0.pdf)

Bottlenose dolphins eat a variety of prey, including fish, squid, and crustaceans. In recent years the river Camel has seen a decline in salmon and other fish that bottlenose dolphins may have been feeding on. This decline of fish in the Camel was addressed, with the launch of a collaboration project between the Westcountry Rivers Trust, the Environment Agency, Natural England, and South West Water. The restoration project, with a budget of £2.2 million aimed to improve the river habitat and remove physical barriers; making it easier for the fish to migrate and spawn. In addition to this, the Environment Agency introduced protection byelaws in 2019 on the river Camel to allow stocks to recover to sustainable levels.

For information on the restoration project see: <https://wrt.org.uk/2-2-million-project-to-restore-freshwater-fish-habitats-in-cornish-rivers/>

For Centre for Environment Fisheries and Aquaculture Science (CEFAS), Environment Agency, and Natural Resources Wales latest report on Salmon Stocks and Fisheries in England and Wales, that states byelaws were introduced and remain in place due to concerns in relation to salmon stock status and sustainability,

see:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1093963/SalmonReport-2021-assessment.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1093963/SalmonReport-2021-assessment.pdf)

Environment Agency: Salmon and Sea Trout Protection Byelaws can be found here:

<https://consult.environment-agency.gov.uk/fisheries/proposed-national-salmon-byelaws/results/statementtosupportsstpb2018.pdf>

During this time, Cornwall has also seen an increase in year-round water-use; with this comes an increased number of disturbance incidents. Cornwall Marine and Coastal Code Group (CMCCG) reported that wildlife disturbance incidents more than tripled in the six years prior to 2021. For more information, see: <https://www.cornwallwildlifetrust.org.uk/news/marine-disturbance-cornwall-triples-six-years> PIP sightings of bottlenose dolphins to 2018 were at their lowest during the summer months, coinciding with the peak of the tourist season in Cornwall. This may suggest the dolphins preferred to migrate to areas with less human activity during this time.

In 2013 a bottlenose dolphin calf was killed when the pod of bottlenose dolphins was pursued over the course of several hours by up to 25 boats in the Camel Estuary area. This led to the creation of the CMCCG.

Another factor to consider when looking at the different types of human activity within the two areas: Cornwall and the southwest, and southeast England around to Kent, is the contrasting audible frequency ranges of the vessel traffic associated with each. Commercial vessel traffic more commonly seen along the southeast coast of England are thought to produce underwater noise primarily at low frequencies. Whereas the underwater sound created by the smaller vessels and recreational boats found along the coast of Cornwall tend to be higher frequencies. Evidence and lessons from worldwide studies into the effects of underwater noise on cetaceans and other marine animals need to be applied here to aid their conservation. For more information on sound frequencies in the sea, visit:

<https://dosits.org/animals/effects-of-sound/anthropogenic-sources/commercial-vessel-traffic/>

Coastal security measures put in place for 2021's G7 Summit held in Cornwall were monitored by land-based volunteer surveyors of the Police Rural Affairs Marine Mammal Advisory Group set up by CMCCG, SRT, and BDMLR to ensure mitigation was in place for marine mammal safety throughout G7 activity. During the Red Arrows flyby event, bottlenose dolphins were observed by the surveyors. The dolphins swam the length of the security vessel restraint system, past a large number of vessels, whilst the Red Arrows performed above to G7's gathered crowds. Once the bottlenose dolphins had done so, they left the area, not to return. More information on this can be found on SRT website:

<https://www.cornwallsealgroup.co.uk/2021/06/g7-operation-marine-mammal/>

Bottlenose dolphins are an intelligent, long-lived species. Studies on dolphin behaviour have confirmed complex capacity for long-term memory; individuals are able to remember each other's signature clicks and whistles after periods of separation exceeding 20 years. It could be that several factors and events have combined, such as declining food sources, the harassment incident and overall increased disturbance alongside environmental changes, which the dolphins now link with the north coast of Cornwall; and as a result, they have chosen to spend most of their time elsewhere. Research on decades-long social memory in bottlenose dolphins, by Jason N. Bruck can be found here:

<https://royalsocietypublishing.org/doi/10.1098/rspb.2013.1726>

The research and monitoring of the south coast inshore population of bottlenose dolphins, including investigating their distributional movements continues as part of the South Coast Bottlenose Dolphin Consortium. For more information please see: <https://www.cornwallwildlifetrust.org.uk/what-we-doour-conservation-work-at-sea/southwest-bottlenose-dolphin-project>

Worldwide sightings of social solitary dolphins appear to be becoming more common; and the habituation that ensues when a dolphin chooses to interact primarily with people and watercraft over other dolphins carries high risks. In October 2020, The Cetacean Strandings Investigation Programme (CSIP) carried out a post-mortem examination (PME) on the body of a bottlenose dolphin recovered from Portland Port,

Dorset. Unfortunately, this individual was killed by ship strike, and was confirmed by photo ID to be 'Splashy', the lone bottlenose dolphin observed by PIP surveyors in October 2017.

Splashy's fate is sadly not a unique story. 'Danny', a bottlenose dolphin that frequented the coast of Dorset was also killed in December 2020; and 'Nick', another dolphin that delighted visitors to Cornwall with his interactions, was killed by propeller strike in Ireland in September 2021. More information can be found on BDMLR website: <https://bdmlr.org.uk/social-solitary-dolphin-killed-by-boat-in-ireland>

### Common dolphin

It is interesting to note that observed group sizes of common dolphin appear to vary by season. Average observed pod sizes have been smallest in the summer months. Could this be an indication that dolphins are mitigating their own disturbance at a time when recreational human activity at sea is at its highest? Or are they unable to group into larger numbers until they are freer to do so in winter and spring when there is less human activity? However, this could also be a reflection of their varying hunting strategies associated with the abundance of different food sources throughout the year.

Most sightings of common dolphins occurred in the areas between ██████████ and ██████████, ██████████ and ██████████, both within the Bristol Channel Approaches SAC but outside of MCZ's, and in the ██████████ area, an area currently without any formal marine conservation protection (**Figure 14.1**).

It is encouraging to see that there have been a range of ages recorded within common dolphin pods from a population health perspective.

Common dolphins were seen in larger numbers during PIP surveys in 2022 both in terms of frequency of sightings and average pod size. This may be due to current healthy small pelagic fish stocks that the common dolphins feed on, such as sardines, a warmer water species who find themselves at the northern end of their natural range in the Celtic Sea. CEFAS conduct annual acoustic (PELTIC) surveys of pelagic fish stocks, which the International Council for the Exploration of the Sea (ICES) interpret and advise on for fishing opportunities, catch and effort. In recent years, sardine stocks have been shown to fluctuate. In 2022 the estimated stock of sardines in the southern Celtic Sea and English Channel increased by 20%, based on the average taken from the two previous years. More information can be found in the ICES data library: [https://ices-library.figshare.com/articles/report/Sardine\\_Sardina\\_pilchardus\\_in\\_Subarea\\_7\\_southern\\_Celtic\\_Seas\\_and\\_the\\_English\\_Channel\\_/19772449](https://ices-library.figshare.com/articles/report/Sardine_Sardina_pilchardus_in_Subarea_7_southern_Celtic_Seas_and_the_English_Channel_/19772449)

However, while an absence of bottlenose dolphins on the north Cornish coast since 2018 is an observation of note, particularly as it is backed up by CWT Seaquest Southwest's decreased sighting reports, an increase in sightings of common dolphins during PIP surveys in one year is difficult to draw accurate conclusion from without continued monitoring of this species.

### Harbour porpoise

Spatially, most sightings of harbour porpoise occurred in the ██████████ area, from ██████████ and stretching up to past ██████████ within the Bristol Channel Approaches Special Area of Conservation, where harbour porpoise are an Annex II protected feature. However, several sightings have occurred in the ██████████ area, which is currently an area without any formal marine conservation designation for protection (**Figure 14.1**).

Temporally there appears to be variation in the intra-annual use harbour porpoise make of the marine habitat along this stretch of coast. Numbers of harbour porpoises were greatest during the autumn and winter months, between September and February, with far fewer sightings in the spring and summer seasons, and this pattern has persisted across a number of years.

Larger pods of 8-14 harbour porpoise were observed only in the years 2012-2016. Typical sightings of harbour porpoise have since consisted of 1-3 individuals.

Little has been observed in terms of harbour porpoise behaviour. Being one of the smallest marine mammals they can be subject to predation, which may explain their particularly shy and elusive behaviour.

### **Risso's dolphin**

Usually only found in deep offshore waters where their key prey are squid, Risso's dolphins, one of the largest dolphin species are a less frequent visitor to the north Cornish coast. Little can be deduced regarding their population numbers, habitat use or migrational and life cycle patterns from the infrequent sightings collated through PIP surveys.

Both sightings of Risso's dolphins during PIP surveys have taken place within the Bristol Channel Approaches SAC; and each one has been on the edge of either the Padstow Bay and Surrounds, or the Hartland Point to Tintagel MCZs (**Figure 14.1**).

### **Sunfish**

Sunfish have a clear temporal distribution in the waters on the north Cornish coast. PIP surveyors have only seen sunfish in summer and autumn months. They appear to have an even spatial distribution along our coastline when the sea temperature is at its warmest and a variety of food sources become abundant.

The majority of sunfish observed on PIP surveys are estimated to be between 50-60cm in their diameter, which, considering the species can grow up to 3.3m in length, could indicate that they may have different patterns of migration at different life stages as well as following a seasonal migration pattern.

Sightings of sunfish on PIP surveys neither appear to have increased nor decreased over the survey years.

### **Barrel jellyfish**

Barrel jellyfish are a much less mobile species than others such as cetacean species or sunfish; they respond to the environment around them and can be prone to drifting to where tides, swell, currents and wind may take them. This said, barrel jellyfish are thought to live in deeper water during winter months, moving towards the coast to breed in shallower water during the spring, which our data also reflects.

Barrel jellyfish have not been recorded on a PIP survey since 2019. It would be recommended to continue to monitor and record barrel jellyfish sightings on PIP surveys going forwards to assess whether this trend continues over a longer period of time.

### **Atlantic bluefin tuna**

Atlantic bluefin tuna were once common in UK waters before their absence spanning more than half a century due to the pressures of over fishing. However, their numbers have appeared to increase in the UK since 2014 according to research funded by Defra and led by CEFAS and the University of Exeter, for more information, see <https://academic.oup.com/icesjms/article/78/5/1672/6231587>. An increase in Atlantic bluefin tuna numbers in UK waters is likely to show an extension in the range of this highly migratory species, perhaps more to do with climate change, or changes to food sources, than an improvement in health of stocks across the Atlantic.

Atlantic bluefin tuna have been recorded only once by PIP surveyors on the north coast of Cornwall. This sighting would not be enough to support an increase in Atlantic bluefun tuna without further evidence.

### **Jellyfish (not including barrel)**

The typical lifecycle of a jellyfish results in adult medusae being present during summer months. This is a pattern recorded by PIP surveyors that has persisted over several years. Jellyfish are a food source for other species, some of which may migrate to the UK during the summer months to feed.

### **Portuguese man o' war**

Portuguese man o' war are free floating colonial hydrozoans usually found in the open ocean; the floating component of the colony features a crested structure that acts as a sail. They are propelled by winds as well as ocean currents; therefore, we find them close to our shores during periods of westerly winds or after storms. We have only observed Portuguese man o' war on PIP surveys since 2017, potentially indicating an increase in the wind conditions that drive their distribution closer to our shores.

### **Unknown cetacean (sighting confirmed, identity unconfirmed)**

Unknown cetacean sightings have been recorded on occasions when a definite sighting has occurred, but the species has been unable to be confirmed, usually because the sighting has been too brief for a positive ID. These sightings could range several species, from harbour porpoise, dolphin species, or whales such as Minke.

More than half of all unknown cetacean sightings were recorded during winter PIP surveys when sea conditions can frequently be rougher than at other times of the year.

### **Strandings**

Other than seals and birds, no dead marine species have been observed during PIP surveys. Information on dead strandings can be sourced from Cornwall Wildlife Trust Marine Strandings Network (CWTMSN): [strandings@cornwallwildlifetrust.org.uk](mailto:strandings@cornwallwildlifetrust.org.uk); and live strandings data is held by BDMLR: [info@bdmlr.org.uk](mailto:info@bdmlr.org.uk). Please note, live animals in need of assistance should be called in to the BDMLR Rescue Hotline: 01825 765546; and dead strandings should be reported to CWTMSN Hotline: 0345 201 2626.

### **Anthropogenic impacts**

Disturbance of cetaceans has been witnessed during PIP surveys. Greater public awareness on the impacts of disturbance to marine wildlife needs to be raised. The CMCCG promote best practice with an aim to minimise effects of human activity on marine and coastal wildlife. The Wildlife Safe (WiSe) Scheme is an accreditation that people can gain when they take part in a course on how to act safely around marine wildlife. Greater awareness and an increased uptake of water-users and operators to WiSe courses may decrease future incidents of marine wildlife disturbance. SRT's Sue Sayer MBE and Dan Jarvis (also BDMLR) are WiSe trainers.

As part of our work, SRT routinely record seal entanglement. Cornwall has the highest rate of entanglement for any of the phocid seal species anywhere in the world. In 2014 we developed a specific protocol to systematically survey for abandoned, lost, or otherwise discarded fishing gear on the PIP surveys to gather data over a three-year period.

We recorded the amount of lost fishing gear, the size, type, where it was, how marine wildlife was interacting with it and its possible risk rating. Where possible, ghost fishing gear was removed from the sea along the survey transect.

Information on bycatch and cetacean entanglement can be sourced from CWT: <https://www.cornwallwildlifetrust.org.uk/contactus> and UK CSIP: <https://ukstrandings.org/>.

SRT use a variety of techniques during PIP surveys, such as filming with an underwater GoPro camera. These methods allow us a unique opportunity to record 'other' species behaviours and observe their body condition, and health that would otherwise not be visible. For example, the wound on the upper part of the peduncle on one of the common dolphins observed on a PIP survey in 2022. This wound is not encircling, nor consistent with those gained by entanglement, but may be a sign of interaction with other human activity.



## Conclusions

SRT have gathered more than 10 years of 'other' species data (in addition to seals) from these systematic PIP boat surveys; the three repeated transects have been surveyed around four times per year (12 boat surveys a year) since 2011. Despite the challenges of forecast conditions and costs, surveying by boat offers a valuable insight from a sea-based perspective, allowing access to a larger dataset than that would be attainable by surveying by land. Surveying by boat enables locations not accessible from land to be surveyed.

PIP surveys contribute unique long-term data about the habitat used by marine life across the coastal transects on the north coast of Cornwall, as well as information about numbers and behaviours of species across a range of environmental conditions and throughout the meteorological seasons. Some of the seasonal patterns identified for species in this report have been surprisingly consistent.

Additional data that SRT has gathered on human activity, lost fishing gear, marine microplastics (in collaboration with local marine conservation groups within the Cornwall Marine Microplastic Researchers), and plankton levels (data shared with The Secchi Disk Foundation) contributes hugely to an understanding of how this stretch of coastal habitat supports marine life and the key anthropogenic impacts they face. It is hoped that this long-term data set will enable confident trend assessments to be made in the future over a range of natural and anthropogenic parameters.

Surveyed areas cover sites within the Bristol Channel Approaches SAC, and the Newquay and the Gannel, Padstow Bay and Surrounds, and Hartland Point to Tintagel MCZs. These sites have been consistently used by 'other species' during PIP surveys, have become known for their high biodiversity and have been designated as MPAs since PIP surveys began, to protect specific wildlife features and the important habitats they depend on. Cetaceans have frequently been sighted in the St Ives Bay area, an area currently without any formal marine protection. PIP surveyors have also witnessed disturbance of cetaceans within this area.

As the data generated from PIP surveys has grown over the years, patterns of 'other' species activity have started to emerge, for example those potentially linked to climate change or human activity. Photo identifications from early PIP surveys when others were not identifying individual bottlenose dolphins made a valuable contribution to our understanding of how these creatures from the north Cornwall coastal transect have moved to other linked habitats. Observed pod sizes of harbour porpoise have decreased; and sightings of Portuguese man o' war have increased.

A key outcome of these PIP surveys has been providing marine group members, marine students from local colleges/universities, and the public access to Cornwall's north coastal habitat. This raises their appreciation of this environment, their awareness of the issues faced by our marine life and enhances their motivation, inspiring them to be ambassadors for and to take action to protect and conserve these amazing wildlife spectacles around our shores. These citizen science volunteers are also contributing to long term monitoring which would otherwise not be possible due to limited resources.

SRT will continue to monitor 'other' species on PIP surveys, subject to survey funding, using a range of techniques. Continued monitoring of 'other' species throughout the seasons alongside other factors such as weather/sea conditions and human activity will help to explain the variation in numbers over the long term.

## Recommendations

This report highlights emerging changes in habitat use for different species and would recommend the following:

- Continued quarterly surveying of all three PIP transects using current proven survey protocols, with both marine wildlife experts and citizen scientist volunteer surveyors: including continued recording of all 'other' species on surveys using a range of survey techniques, such as underwater filming, and keeping photo ID records of bottlenose dolphins. Ideally SRT would be funded the boat charter costs, and coordination and report writing fees that it costs the charity each year to undertake these surveys, considering the long-term value they add to multiple statutory agency evidence bases. These surveys provide excellent value for money considering the huge 'in kind' voluntary contributions made by up to 12 surveyors for around 7.5 hours per survey, every survey representing a minimum of 90 hours of volunteer effort. There has been a substantial financial and time commitment made by SRT and their volunteer teams to this ongoing research project since 2011, without which this valuable data set (plus additional datasets on seals, seabirds, lost fishing gear, and others) collected during these PIP surveys would not exist.
- Further research into marine species behaviour and how this links with environmental and anthropogenic factors. For example, by collecting data using an F-pod (a fully automated passive monitoring device which detects and records the acoustic activity of porpoises and dolphins within the vicinity of the device) array across this transect area.
- Funding for a greater public awareness raising campaign: including the impacts of marine wildlife disturbance; engaging and encouraging water-users to be 'wildlife safe' by participating in a WiSe course; reporting wildlife sightings to the relevant organisations, and disturbance incidents or wildlife related crime to either the police, CMCCG or Operation Seabird as required.
- Licensing and compulsory WiSe training, accreditation and enforcement for harbour staff and commercial tripper vessels operating out of the relatively small number of harbours on the north Cornish coast, including St Ives, Newquay, and Padstow for a decreased impact on this vital marine life habitat.
- Designation of a new Marine Protected Area (MPA) that covers the St Ives Bay area. St Ives Bay currently has no formal marine conservation protection, yet regular sightings of mobile cetacean species: bottlenose dolphins, common dolphins, and harbour porpoise, have been recorded here on PIP surveys over a number of years. In addition to this, CWT Seaquest Southwest hold data on whale species such as minke and humpback that have also been observed here. The presence of these marine creatures in the St Ives Bay area at higher occurrence and density than in the surrounding sea area may suggest that there is an ecological significance to the St Ives Bay area that is worthy of MPA status.
- Increased protection of all marine species within existing MPAs by applying a whole site approach as opposed to feature-based management to match the public perception of what MPAs are for.
- Continued conservation efforts for Atlantic bluefin tuna in the hope that more will be observed in future surveys. Atlantic bluefin tuna numbers in the UK have only recently started to increase following their near extinction in Atlantic waters. Any fishing practice targeting this vulnerable species is likely to put stocks of Atlantic bluefin tuna once again under considerable stress, setting back previous conservation effort.
- A repeat study of a further 10 years of PIP survey data: 2023 – 2032 to continue to assess trends, and potentially confirming or disproving the current conclusions drawn from data obtained 2011-2022 about increasing and decreasing observational trends of specific marine species.

## Signposts for useful references and resources

SRT website:

<https://www.cornwallsealgroup.co.uk/>

Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS):

[www.ercis.org.uk](http://www.ercis.org.uk)

The Southern Bottlenose Dolphin Consortium project:

<https://www.cornwallwildlifetrust.org.uk/what-we-doour-conservation-workat-sea/southwest-bottlenose-dolphin-project>

Seaquest Southwest Annual Report:

[https://www.cornwallwildlifetrust.org.uk/sites/default/files/2022-07/Seaquest%20Report%202021.%20FINALx\\_0.pdf](https://www.cornwallwildlifetrust.org.uk/sites/default/files/2022-07/Seaquest%20Report%202021.%20FINALx_0.pdf)

Marine Connection: Lone rangers: A report on solitary dolphins and whales including recommendations for their protection:

<http://marineconnection.org/wp-content/uploads/2019/07/Lone-Rangers-Second-Edition-2019.pdf>

Westcountry Rivers Trust: £2.2 million project to restore freshwater fish habitats in Cornish rivers:

<https://wrt.org.uk/2-2-million-project-to-restore-freshwater-fish-habitats-in-cornish-rivers/>

CEFAS, Environment Agency, and Natural Resources Wales: Salmon Stocks and Fisheries in England and Wales in 2021:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1093963/SalmonReport-2021-assessment.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1093963/SalmonReport-2021-assessment.pdf)

Environment Agency: Salmon and Sea Trout Protection Byelaws:

<https://consult.environment-agency.gov.uk/fisheries/proposed-national-salmon-byelaws/results/statementtosupportsstpb2018.pdf>

G7 Op Marine Mammal, SRT:

<https://www.cornwallsealgroup.co.uk/2021/06/g7-operation-marine-mammal/>

Cornwall Marine and Coastal Code Group:

<https://cornwallmarinelifecode.org.uk/>

Marine disturbance in Cornwall triples in six years, CWT:

<https://www.cornwallwildlifetrust.org.uk/news/marine-disturbance-cornwall-triples-six-years>

Decades-long social memory in bottlenose dolphins, Jason N. Bruck:

<https://royalsocietypublishing.org/doi/10.1098/rspb.2013.1726>

UK Cetacean Strandings Investigation Programme:

<https://ukstrandings.org/>

Social solitary dolphin killed by boat in Ireland, BDMLR:

<https://bdmlr.org.uk/social-solitary-dolphin-killed-by-boat-in-ireland>

Discovery of sound in the sea: Commercial vessel traffic:

<https://dosits.org/animals/effects-of-sound/anthropogenic-sources/commercial-vessel-traffic/>

ICES advice Sardine southern Celtic Sea and English Channel 2023:

[https://ices-library.figshare.com/articles/report/Sardine\\_Sardina\\_pilchardus\\_in\\_Subarea\\_7\\_southern\\_Celtic\\_Seas\\_and\\_the\\_English\\_Channel\\_/19772449](https://ices-library.figshare.com/articles/report/Sardine_Sardina_pilchardus_in_Subarea_7_southern_Celtic_Seas_and_the_English_Channel_/19772449)

Increased occurrence of Atlantic bluefin tuna in territorial waters of the United Kingdom and Ireland:

<https://academic.oup.com/icesjms/article/78/5/1672/6231587>

BDMLR:

<https://bdmlr.org.uk/>

BDMLR Rescue Hotline:

01825 765546

CWT Marine Strandings Network:

<https://www.cornwallwildlifetrust.org.uk/what-we-do/our-conservation-work/at-sea/marine-strandings-network>

CWT Marine Strandings Network and Disturbance Hotline:

0345 201 2626

The WiSe Scheme:

<https://www.wisescheme.org/>