



Marine Strandings Network

2016 Annual Summary Report

Marine Strandings in Cornwall and the Isles of Scilly

Report by
 Cornwall Wildlife Trust
 Marine Strandings Network

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Photo 1: Female sperm whale, Perran Sands, 10.07.2016, photo by Niki Clear

I. Executive Summary

Data on marine organisms that stranded on the shores of Cornwall in 2016 were collected by the Cornwall Wildlife Trust Marine Strandings Network (CWT MSN). All species were recorded in the database. However, when possible, the majority of cetaceans, seals, basking sharks and turtles were examined and recorded in detail by trained volunteers of the Network.

A total of 205 cetaceans were recorded in 2016. Short-beaked common dolphins (*Delphinus delphis*) represented the majority of strandings (55%, n=113), followed by Harbour porpoises (*Phocoena phocoena*) (29%, n=61). Of particular stranding interest in 2016 was both a female sperm whale which stranded and was post mortemed on Perran Sands, north Cornwall, in July 2016, and the one bottlenose dolphin which stranded on the Isles of Scilly and was recorded on the 30th November 2016. Sadly, due to the inaccessible location of the bottlenose, a PM was not possible nor were samples taken. Another whale stranded further north at Compass Point near Bude on the 13th July 2016 in an unrelated incident. This was a female juvenile minke whale, and an in-situ PM performed by James Barnett, assisted by MSN and BDMLR volunteers.

In total, evidence of bycatch was identified in 14% (n= 28) of all stranded cetaceans (n=205) in 2016. CWT MSN volunteers retrieved 31 cetaceans for post-mortem examination. Bycatch was found to be the cause of death in 23% of the post mortemed animals (n=7). Of those not sent for post-mortem (n=174), but examined by MSN volunteers *in-situ* using the Bycatch Evidence Evaluation Protocol (BEEP), 12% (n=21) showed features consistent with bycatch. These features are based on recognised net entanglement marks such as fin edge cuts/slices, encircling net marks and severed appendages. Several other animals showed signs of previous bycatch such as healed fin edge wounds; however these animals were not included in this total if there was no other evidence of entanglement observed. The remaining 153 animals were considered inconsistent with bycatch as; cause of death was inconclusive based on the data available, carcasses were unsuitable for examination due to decomposition, or the cause of death was attributable to other factors such as disease.

159 dead grey seals (*Halichoerus grypus*) were recorded by the CWT MSN in 2016, of which 33% (n=52) were categorised as pups measuring less than 120cm. Figure 8 shows the gender of these seal strandings, with 13% male seals (n=20), 6% female (n=10) and 81% of unknown gender (n=129) due to either limited or no supporting photos, or that the animal is too decomposed and/or with genital scavenging. The majority of grey seal strandings were in January and February and then between September to December which coincides with the peak breeding and weaning seasons. Thanks to collaborative work with Cornwall Seal Group Research Trust (CSGRT), four stranded seals (3%) were identified from their photo-ID catalogues. Of particular interest in 2016 was a seal S/2016/155 which is considered a landmark case that illustrated that scavenging should not be disregarded as a cause of lesions that otherwise may be mistakenly identified as grey seal predation.

Nine grey seals were retrieved for post-mortem examination in 2016. Of these post-mortems, there were two cases of infectious disease, two cases of trauma, one cause of death was from starvation and hypothermia and two cases of bycatch which were animals retrieved from fishing nets. These two cases highlighted the subtlety of the external pathology of seal bycatch compared to that seen in cetaceans, making careful observation and meticulous photography using SEEP protocols critically important.

The Marine Strandings Network collects records of all species of stranded marine life in Cornwall including birds, sharks and turtles. During 2016, only one turtle was reported with species unknown due to decomposition. Data on cetaceans, seals and turtles were shared with the UK Cetacean Strandings Investigation Programme (CSIP) database and in the case of turtles, also submitted to the Database of Marine Turtle Records for the United Kingdom & Eire.

2. Introduction

Records of stranded marine organisms have been collected in Cornwall and the Isles of Scilly for many years, the earliest record being logged from 1354. To date, the Cornwall Wildlife Trust Marine Strandings Network (CWT MSN) database holds over 6,450 records, comprising data relating to stranded cetaceans (whales, dolphins and porpoises), seals, turtles, birds, cephalopods, fish (including sharks), seeds, hydrozoa, molluscs, echinoderms and crustaceans.

The records are shared with a number of other partner organisations including the Natural History Museum (NHM) which has collated records of all stranded cetaceans in the UK since 1913. In 1990, the NHM began working in collaboration with the Institute of Zoology (IoZ) to research the mortality, biology and ecology of cetacean populations around the British Isles, under contract to Defra (Department for Environment Food and Rural Affairs). This project, now known as the UK Cetacean Strandings Investigation Programme (CSIP), is currently under the management of the Institute of Zoology and contributes to the UK's programme of research on the North Sea and its response to ASCOBANS (the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas).

The CWT MSN operates under the CSIP license (granted by Natural England) for the possession and transportation of cetacean carcasses. Over the last 23 years, in response to the increasing number of stranded cetaceans in Cornwall, more detailed data has been collected by the team in Cornwall. Building on over a decade of work by volunteer Strandings Coordinator Stella Turk MBE and other dedicated researchers, a more formal network of volunteer recorders was established by Cornwall Wildlife Trust in 2003, led by MSN Coordinators Jan and Jeff Loveridge, to provide a comprehensive reporting and recording system for strandings, in particular of marine mammals. Procedures for reporting and recording stranded marine animals were introduced, together with training for volunteers in investigating carcasses. In 2012, the management of the Marine Strandings Network was passed to the Living Seas Team of the Cornwall Wildlife Trust, with data management provided by the Environmental Records Centre for Cornwall and Isle of Scilly (ERCCIS).

The Marine Strandings Network now consists of a team of over 150 trained volunteers throughout Cornwall and the Isles of Scilly who record all reported strandings of organic organisms from over 360 miles of coastline. All MSN volunteers are given detailed training to ensure accurate and consistent data collection, and are continually supported by the CWT. Detailed reports and photographs are obtained where possible, as well as some tissue samples for analysis by various partner organisations. Analysis of the data collected by the CWT MSN and partners is ongoing.

The CWT MSN has a 24-hour Strandings Hotline telephone number, (0345 201 2626), for the reporting of stranded marine animals. The Hotline number operates year-round and is staffed by a rota of dedicated volunteer Hotline Coordinators. Carcasses reported to CWT MSN are either examined in-situ by trained volunteers, or via post-mortem by a veterinary pathologist affiliated to the University of Exeter (UofE) Cornwall Campus under the aegis of the Defra-funded Cetacean Strandings Investigation Programme (CSIP).

3. Recordings

3.1 Cetaceans

A total of 205 cetacean strandings were recorded in Cornwall during 2016. This figure is regarded as being above average of the normal parameters of year to year fluctuations for cetacean strandings. Short-beaked common dolphins (*Delphinus delphis*) represented the majority of strandings (55%, n=113), followed by Harbour porpoises (*Phocoena phocoena*) (29%, n=61). Due to decomposition, 24 stranded cetaceans could not be identified to species level. Of particular stranding interest in 2016 was both a female sperm whale which stranded and was post mortemed on Perran Sands north Cornwall in July 2016, and the one bottlenose dolphin, which stranded on the Isles of Scilly and was recorded on the 30th November 2016. Sadly, due to the inaccessible location, a post mortem of the bottlenose was not possible nor were samples taken.

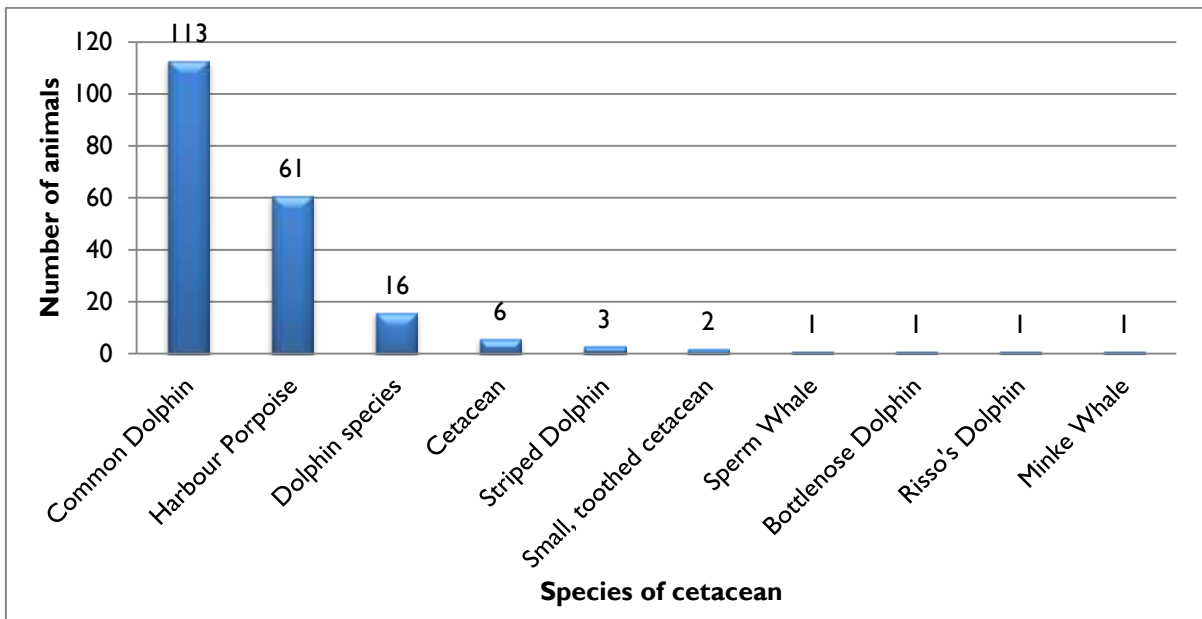


Figure 1: Number of cetacean strandings by species in 2016

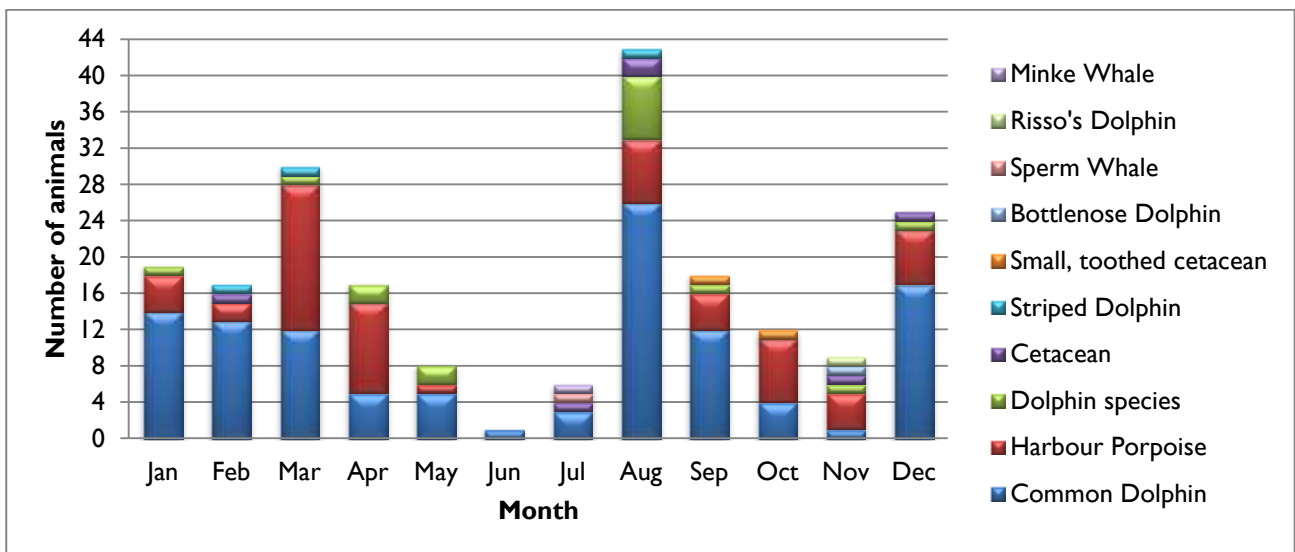


Figure 2: Cetacean strandings by species/month (2016)

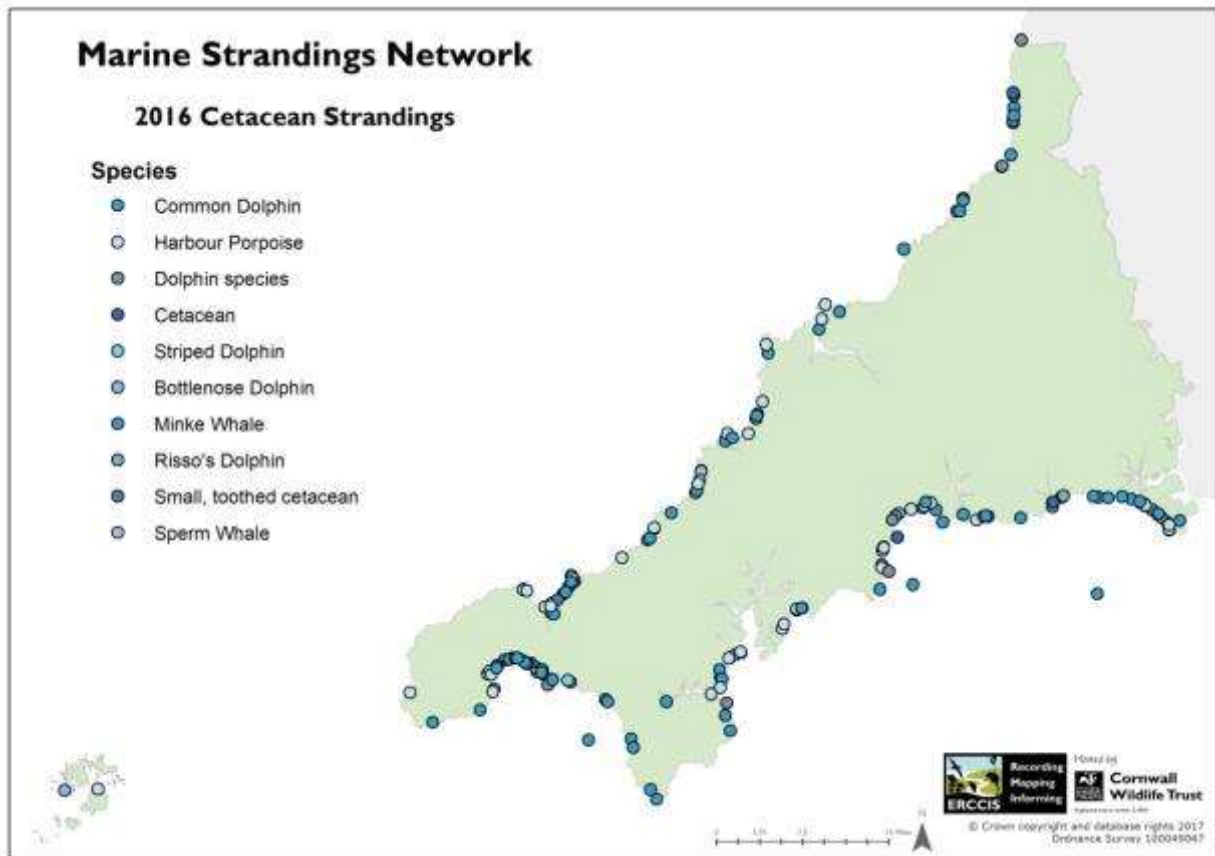


Figure 3: Locations of cetacean strandings in 2016 (n=96)

Figure 3 shows the locations of all cetacean strandings in 2016. There appears to be a hotspot for cetacean strandings within Mounts Bay on the beaches near Penzance and Newlyn, St Ives Bay, as well as St Austell Bay and Whitsands Bay.

In total 205 cetaceans were reported to and examined by CWT MSN in 2016, which is more than double (103% increase) the total in 2015 (n=101), and was the third highest annual total since stranding recording began in Cornwall (see Figure 4). In comparison with the previous year's data (Figure 5), there was a significant peak in the number of cetacean strandings recorded during August.



Photo 2: Common Dolphin, Polkirk Beach, 19.03.2016, C/2016/049, photo by Rob Wells

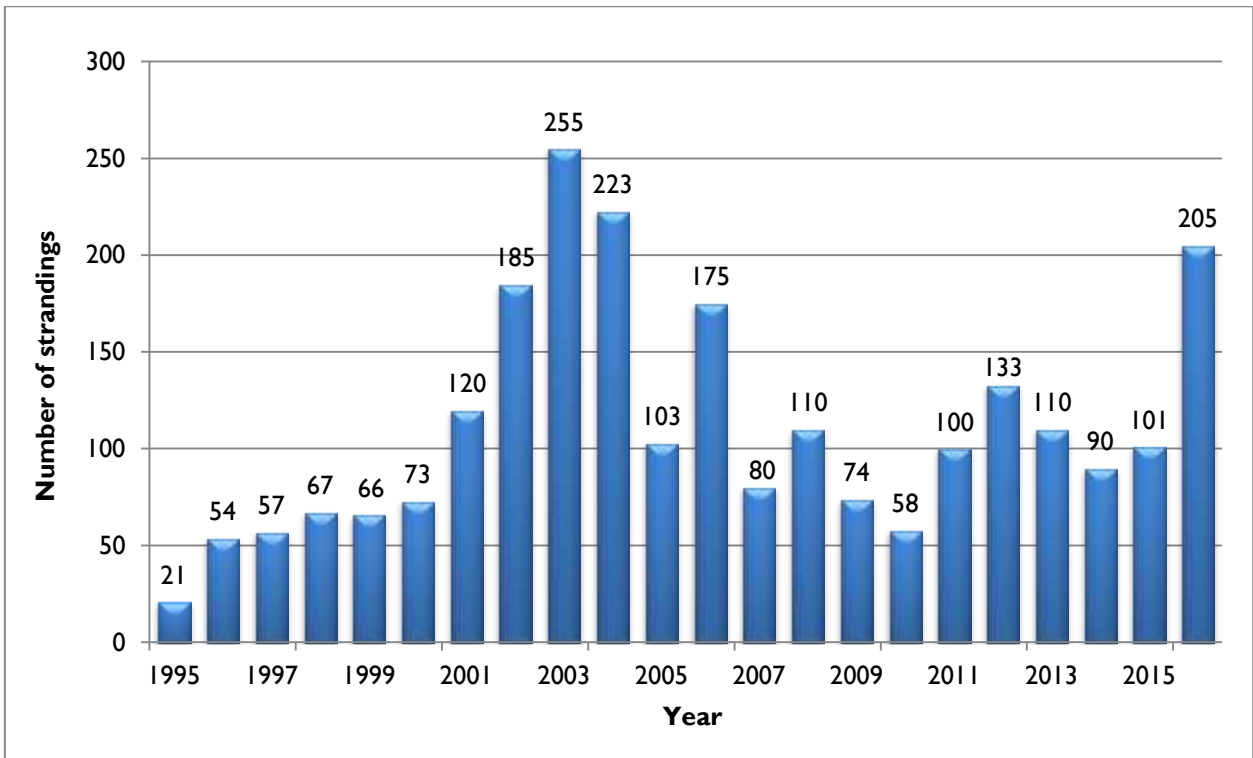


Figure 4: Comparison of cetacean strandings by year (1995 to 2016)

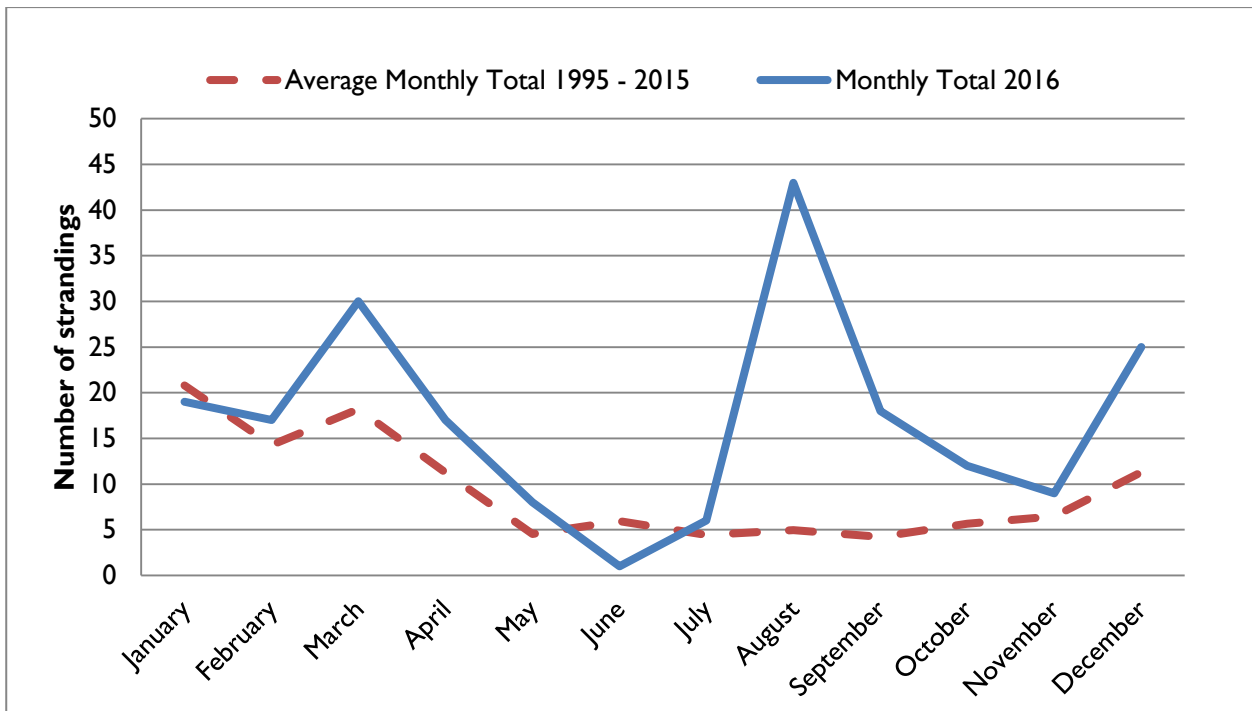


Figure 5: Seasonality of cetacean strandings for 2016, in comparison to average seasonality between 2000 and 2015

3.1.1 Cetacean post-mortem examinations

Of the 205 cetacean carcasses that stranded during 2016, 31 (15%) were suitable and accessible for retrieval by the CWT MSN team for post-mortem examination (Figure 6) under licence and on behalf of the Defra-funded Cetacean Strandings Investigation Programme (CSIP). Necropsies were mainly performed by James Barnett, the veterinary pathologist affiliated to the University of Exeter, Tremough campus, on behalf of CSIP and assisted by trained MSN volunteers.

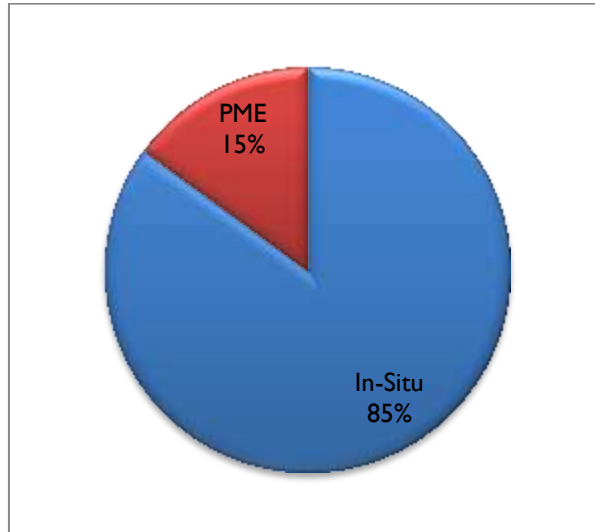


Figure 6: Percentage of stranded cetaceans retrieved for post-mortem examination (n=31) and in-situ assessment by MSN volunteers (n=176)

Gross post-mortem examination findings are summarised in Table I. Please note these may be amended subject to verification and the results from any tests (histology, bacteriology, etc.) that are pending. Post mortem examinations concluded that bycatch was the cause of death for 7 (23%) of the cetaceans. Of interest, the cause of death of 16% (n=5) of the animals examined was bottlenose dolphin attack, one of which was witnessed by public near Penzance in January 2016 with the carcass stranding soon after the event. The findings of these examinations are published with kind permission of CSIP.



Photo 3: Common dolphin on Perranuthnoe beach, 25.03.2016, C/2016/053, taken for post mortem. Photo by Syd Trudgeon

Date	Cornwall ID	Species (common)	Location	Cause of Death
07/01/2016	C/2016/004	Short-beaked common dolphin	Sandymouth, Bude	Physical trauma, by-catch
22/01/2016	C/2016/006	Short-beaked common dolphin	Long Rock	Physical trauma, by-catch
23/01/2016	C/2016/008	Short-beaked common dolphin	Poldhu Cove	Asphyxiation (fish in nasal cavity)
25/01/2016	C/2016/010	Short-beaked common dolphin	Lamorna Cove	Physical trauma, by-catch
27/01/2016	C/2016/012	Short-beaked common dolphin	Polkerris	Infectious disease
28/01/2016	C/2016/015	Harbour porpoise	Longrock	Physical trauma, bottlenose dolphin attack
03/02/2016	C/2016/022	Short-beaked common dolphin	Polruan	Still pending histopathology – possible hepatopathy
06/02/2016	C/2016/023	Short-beaked common dolphin	Porthleven	Not established (marked autolysis limited investigation)
10/02/2016	C/2016/031	Short-beaked common dolphin	St Agnes	Infectious disease
21/02/2016	C/2016/034	Short-beaked common dolphin	Northcott, Bude	Starvation/hypothermia
03/03/2016	C/2016/038	Harbour porpoise	Porthmeor beach	Physical trauma, bottlenose dolphin attack
06/03/2016	C/2016/039	Striped dolphin	Phillack Beach	Physical trauma, bottlenose dolphin attack
06/03/2016	C/2016/041	Short-beaked common dolphin	Fistral beach	Starvation/hypothermia
14/03/2016	C/2016/046	Harbour porpoise	St Ives	Infectious disease
25/03/2016	C/2016/053	Short-beaked common dolphin	Perranuthnoe	Not established (suspect infectious disease)
26/03/2016	C/2016/054	Short-beaked common dolphin	Tolcarne beach	Physical trauma, by-catch
30/03/2016	C/2016/064	Short-beaked common dolphin	Perranuthnose	Physical trauma, by-catch
30/03/2016	C/2016/065	Harbour porpoise	Gwithian	Physical trauma, acute
06/04/2016	C/2016/062	Harbour porpoise	Mawgan Porth	Physical trauma, by-catch
22/04/2016	C/2016/081	Harbour porpoise	Tavis Vor, Mousehole	Starvation/hypothermia
06/05/2016	C/2016/088	Short-beaked common dolphin	Pentewan	Physical trauma, by-catch
10/07/2016	C/2016/095	Sperm whale	Perranporth Beach	Live stranding (pending histopathology)
13/07/2016	C/2016/097	Minke whale	Compass Point, Bude	Live stranding
28/07/2016	C/2016/098	Short-beaked common dolphin	Fistral beach	Physical trauma, bottlenose dolphin attack
31/07/2016	C/2016/099	Short-beaked common dolphin	Lundy Bay, Polzeath	Infectious disease
11/08/2016	C/2016/115	Short-beaked common dolphin	Newquay	gastric impaction (fish bones)
13/08/2016	C/2016/119	Short-beaked common dolphin	Hayle Harbour	gastric impaction (fish bones)
16/08/2016	C/2016/127	Short-beaked common dolphin	Mawgan Creek, Helford River	Infectious disease
02/09/2016	C/2016/143	Short-beaked common dolphin	Kingsand	Infectious disease
09/10/2016	C/2016/165	Harbour porpoise	off Newlyn	physical trauma, bottlenose dolphin attack
22/11/2016	C/2016/179	Harbour porpoise	Marazion	Infectious disease

Table 1: Cetacean post-mortem reports (2016) – gross post-mortem findings (source: CSIP)



Photo 4: Minke Whale, Compass Point near Bude, 13.07.2016, C/2016/097, post mortemed in-situ by veterinary pathologist James Barnett



Photo 5: Common Dolphin, Maenporth Beach Falmouth, 23.08.2016, C/2016/133 photo by Emma Theobald

3.1.2 Bycatch Evaluation Evidence Protocol (BEEP)

The Cornwall Wildlife Trust Marine Strandings Network (CWT MSN) has been collecting valuable data on stranded marine life around Cornwall for over 20 years, and holds over 6,450 records. The Network is an invaluable tool to monitor the impact of bycatch on cetacean species within the region. To that end, cetacean species reported to CWT MSN undergo rigorous examinations to identify and record signature features identified as being caused during a bycatch event.

Of the 205 strandings in 2016, 31 (15%) were retrieved under licence by the team for post-mortem examination at University of Exeter, Tremough on behalf of the Defra-funded Cetacean Strandings Investigation Programme (CSIP). The examination concluded that 7 of the 31 (23%) cetaceans were very suspicious of bycatch; the findings of these examinations are published with the kind permission of the CSIP (below, please see Appendix 1 where animals that were subject to necropsy are highlighted in blue).

The remaining 174 cetaceans were examined and recorded in situ by the MSN volunteers and staff. Of these, 12% (n=21) showed features consistent with bycatch. These features are based on recognised net entanglement marks such as fin edge cuts/slices, encircling net marks and severed appendages. Several other animals showed signs of previous bycatch such as healed fin edge wounds; however these animals were excluded from this report if there was no other evidence of entanglement observed. The remaining 153 animals were considered inconsistent with bycatch, cause of death was inconclusive based on the data available, the cause of death could not be determined through external examination, carcasses were unsuitable for examination due to decomposition or the cause of death was attributable to other factors such as other forms of trauma. Therefore, evidence of bycatch was identified in 14% (n=28) of all stranded cetaceans (n=205) in 2016 through analysis of external marks and post mortem examination, each of these are described below.

For the full BEEP report, please see Appendix 1.



Dolphin Species C/2016/049	Polkirk Beach, Mevagissey SX016443	19/03/2016	Monofilament encircling marks to tail stock. Multiple monofilament encircling marks behind blowhole. Monofilament marks to right and left side trailing edge pectoral fin. Possible broken lower jaw - not tested in the field.
			

Figure 7: An example of in-situ bycatch analysis (see Appendix 1 for full list)

3.2 Grey seals

159 dead grey seals (*Halichoerus grypus*) were recorded by the CWT MSN in 2016, of which 33% (n=52) were categorised as pups measuring less than 120cm. Figure 8 shows the gender of these seal strandings, with 13% male seal (n=20), 6% female (n=10) and 81% of unknown gender (n=129) due to either limited or no supporting photos, or that the animal is too decomposed and/or with genital scavenging. MSN will work with our existing and new volunteers to improve seal gender data collection through training.

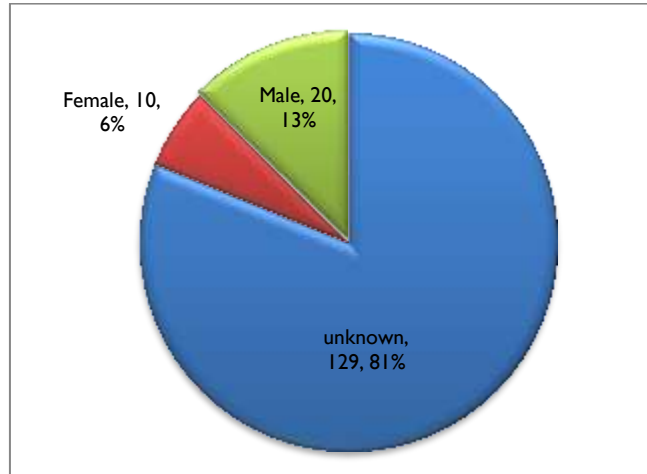


Figure 8: Grey Seal strandings gender classes (2016)

Figure 9 shows the proportion of white coat and weaner seal pup strandings compared to adult strandings during the year, and shows the clear peaks in pup/calf seal strandings from September to February, coinciding with the pupping season and period during which weaned pups are teaching themselves to feed. We can also see a clear December/January adult mortality peak post pupping season and a February peak in juvenile mortality which may also be related to post weaning pups. In future reports, with improved gender data collection, we will pull out both male and female adult stranding numbers to see if we can identify a peak in female adult strandings post pupping season.

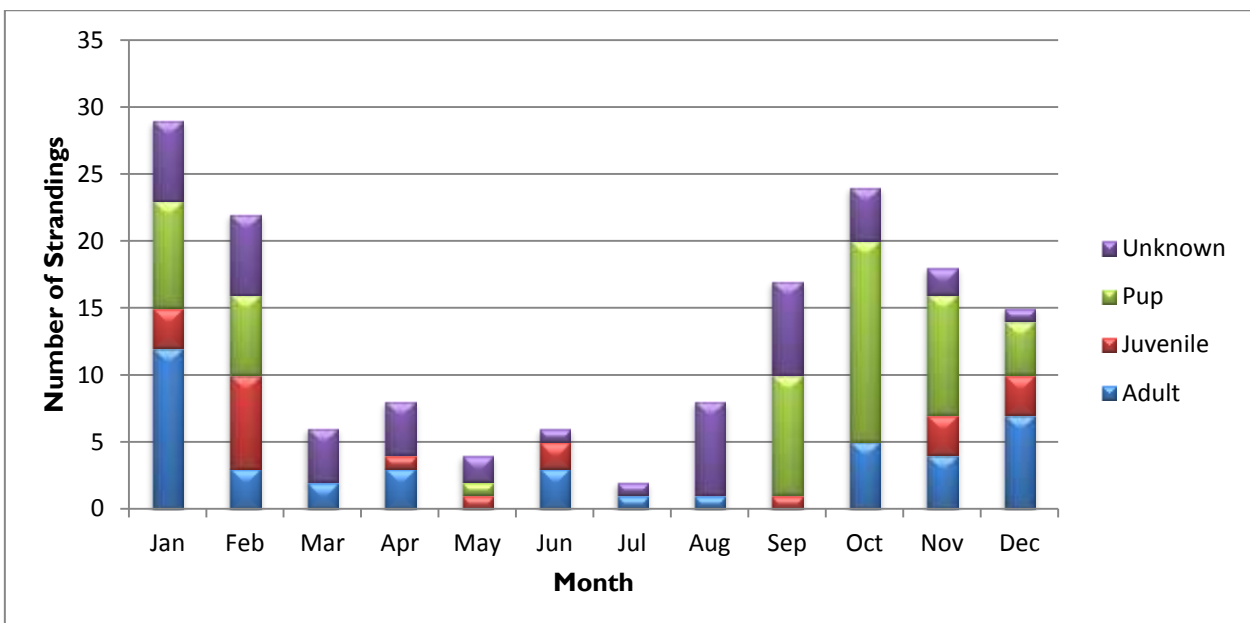


Figure 9: Juvenile and adult grey seal strandings per calendar month in 2016 (n=159)

Seal strandings followed a similar annual pattern as in previous years, with the majority in January, and then in October which coincides with the peak breeding and weaning season. Once again we have an unusually high number of seal strandings recorded in January and February 2016, but interestingly we have another higher than average peak in September and October.

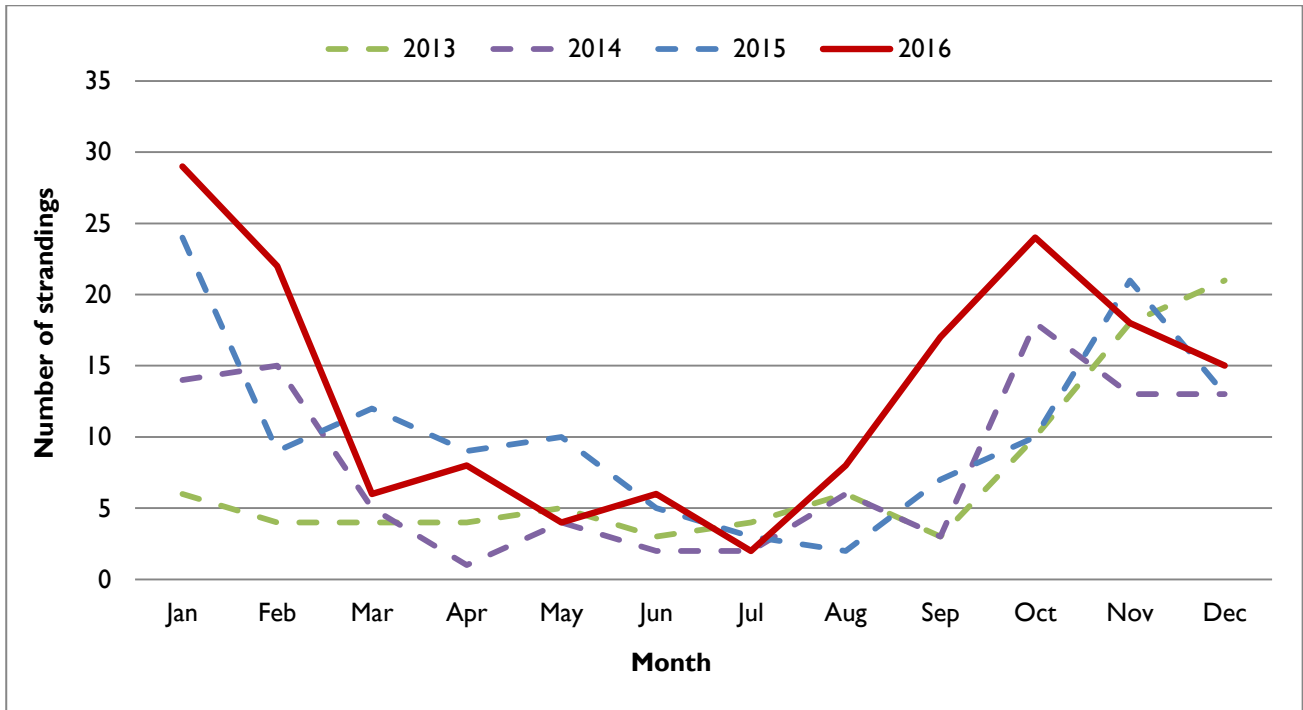


Figure 10: Grey seal strandings per calendar month in 2016 (n=159) compared to the monthly totals for 2013 – 2015

Grey seal strandings have been recorded in detail on the CWT MSN database since 2000. 2016 saw the highest number of grey seal strandings recorded since that time, with 159 reported to MSN (Figure 11) which continues the annual increase in reported seal strandings. This increasing trend in grey seal strandings may be due to increased awareness and effort in reporting these animals to CWT MSN. Whilst seal strandings between March and July were in line with previous years, more were recorded in January/February and August to October than in the preceding three years. It is thought by partners Cornwall Seal Group Research Trust that the mortality rate for Atlantic grey seals in Cornwall is high (particularly associated with the pupping and post weaning seasons) and that this data may reflect an interesting event that deserves further investigation. MSN will continue to work closely with CSGRT and monitor this trend closely by improving data collection (using SEEP) and partnership working.

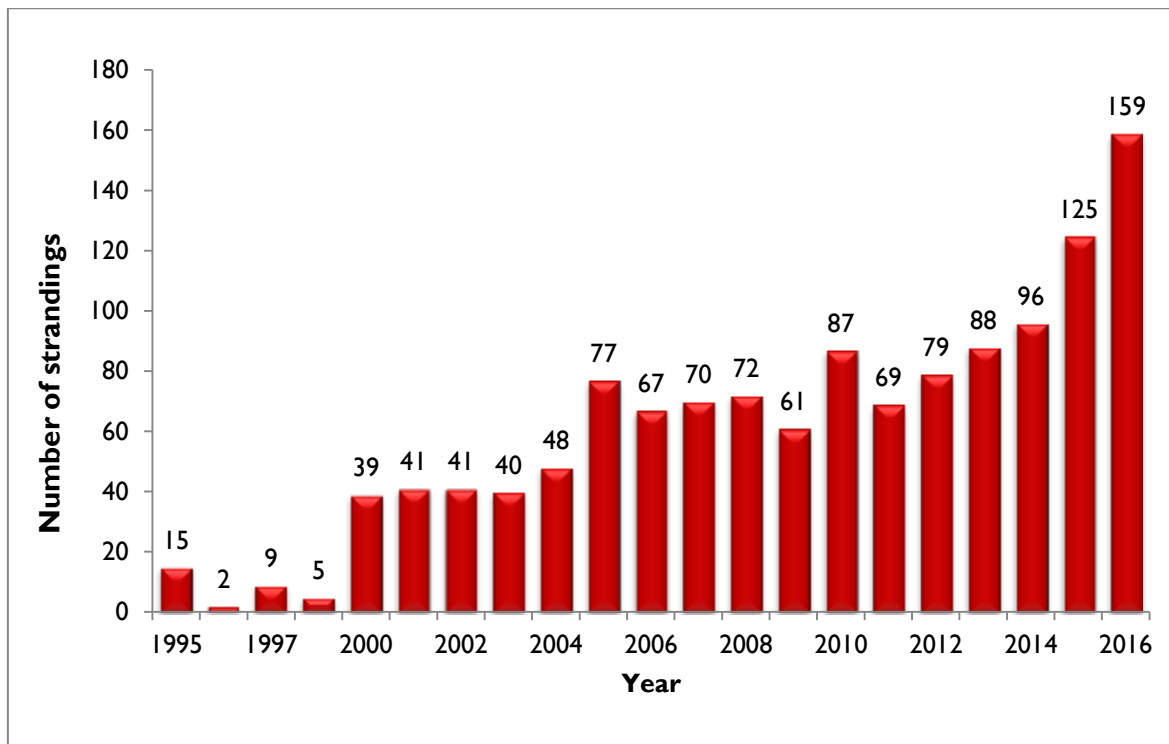


Figure 11: Comparison of grey seal strandings by year (1995 – 2016)

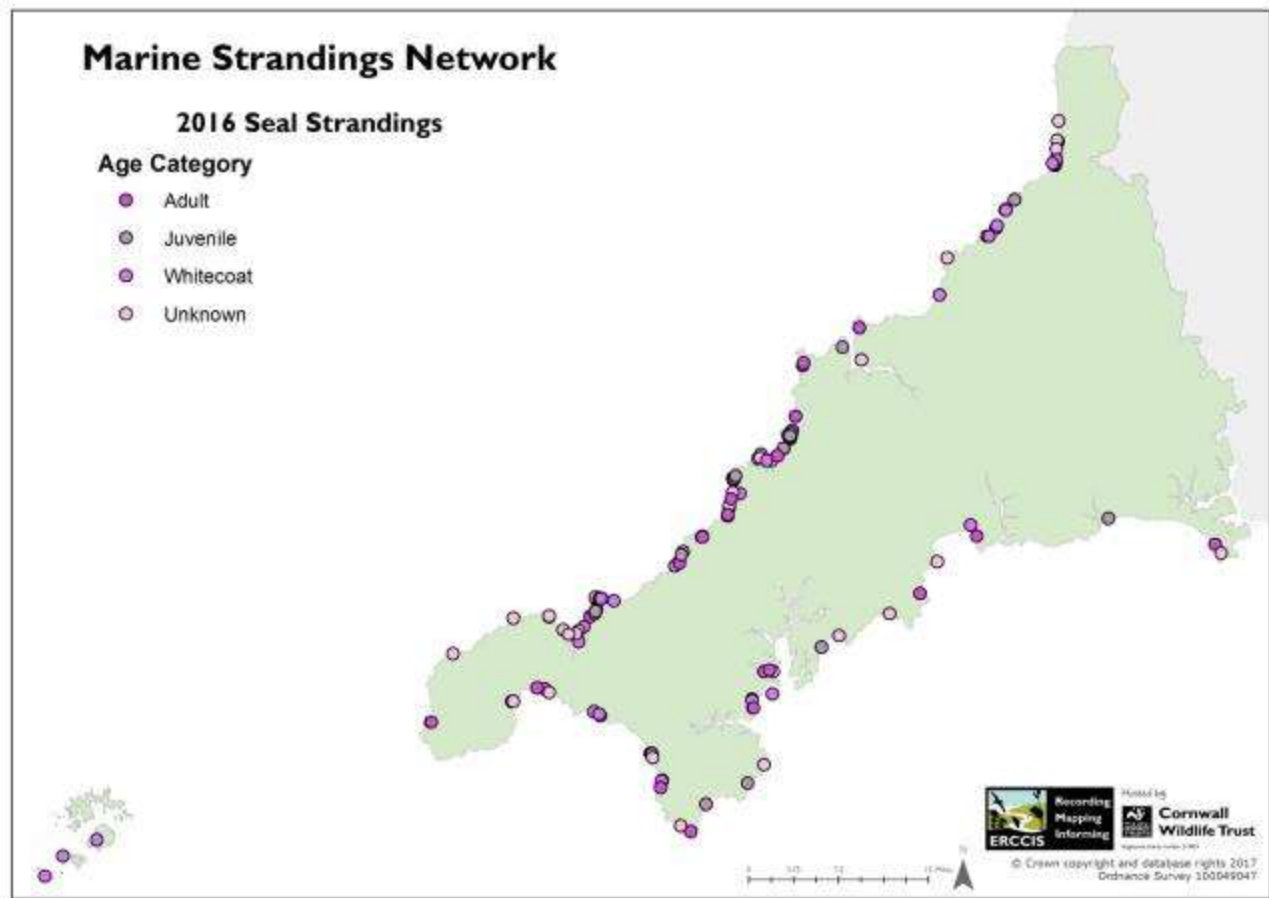


Figure 12: Locations of grey seal mortalities (2016) (n=159)

The locations of grey seal strandings are shown in Figure 12. The majority of strandings occurred on the north coast, as is usually seen each year. A clear hotspot is St Ives bay, which is likely to be related to the important seal sites in the locality visited by many seals as they move around the Celtic Sea.



Photo 6: Moulded grey seal pup, Fishing Cove Gunwalloe, 17.12.2016, S/2016/148, photo by Malcolm McKenzie

Thanks to collaborative work with Cornwall Seal Group Research Trust (CSGRT), four stranded seals (3%) were identified from their photo-ID catalogue, Elephant S/2016/051, Flipper Patch S/2016/060, Appletree S/2016/159, and Flax S/2016/151 (photo 6) which was flipper tagged from the RSPCA. Flipper Patch and Flax were both only young adult males with no obvious cause of death. Appletree had unusual stomach contents including ingested monofilament – an infrequently reported finding. Elephant’s skull was retrieved and sanitised for educational purposes. Summary reports for each of these seals can be obtained direct from Cornwall Seal Group Research Trust, www.cornwallsealgroup.co.uk.

Of particular interest in 2016 was a seal S/2016/155 (photo 7) which was reported to MSN on the 26th December 2016 on Holywell Beach in north Cornwall in poor body condition. The animal then re-reported on the same beach on the 4th January 2017, 9 days later, with considerable scavenging thought by some to be consistent with grey seal predation. On examination by CSGRT, the seal was definitively identified as the same animal which had stranded in December, resulting in it being a landmark case that illustrated that scavenging should not be disregarded as a cause of lesions that otherwise may be mistakenly identified as grey seal predation. For full seal S/2016/155 photo ID report, please contact CSGRT www.cornwallsealgroup.co.uk.



Photo 7: Adult male grey seal Flax S/2016/151, stranded on Watergate Bay 24.12.2016, Newquay, and identified by CSGRT from its fur patterns. Photo by Liz Bimsey



Photo 8: Juvenile grey seal on Holywell Bay S/2016/155, above 26th December 2016 and below 4th January 2017. Photos by Mike Boyse and Mark MacKenzie. For full photo ID report please contact CSGRT www.cornwallsealgroup.co.uk

3.2.1 Seal post-mortem examinations

9 seals were retrieved for post-mortem examination in 2016. Post-mortem examination was carried out by veterinary pathologist James Barnett at University of Exeter Cornwall Campus. There were two cases of infectious disease, two cases of bycatch, two cases of trauma, and one cause of death was from starvation and hypothermia (Table 2). Of the two cases of bycatch, these were both animals caught in nets near Falmouth and with permission brought in for examination, providing our veterinary pathologist with invaluable information on both internal and external pathology of seal bycaught animals. These two cases also highlighted the subtlety of the external pathology of seal bycatch compared to that seen in cetaceans, making careful observation and meticulous photography using SEEP protocols critically important.

Date	Cornwall ID	National ID	Location	COD category
18/01/2016	S/2016/007	SX/S02/16	Maenporth, Falmouth	Infectious disease
21/01/2016	S/2016/011	SS2016/32	Praa Sands, Helston	Peritonitis from perforated ulcer
28/01/2016	S/2016/023	SS2016/48.2	Falmouth	Physical trauma - bycatch
28/01/2016	S/2016/024	SS2016/48.1	Falmouth	Physical trauma - bycatch
27/02/2016	S/2016/052	SS2016/2100	Poltesco beach, Lizard	Physical trauma - acute
06/09/2016	S/2016/087	SS2016/270	Crackington Haven	Not established - transport stress?
16/09/2016	S/2016/084	SS2016/277	St Agnes	Physical trauma - acute
14/12/2016	S/2016/159	SS2016/478	Mawnan Smith	Not established - suspect infectious disease
17/12/2016	S/2016/148	SS2016/479	Gunwalloe	Starvation/hypothermia

Table 2: Seal post-mortem examinations, gross findings 2016



Photo 9a: Grey seal bycaught in nets 28.01.2016, S/2016/024, photo by MSN



Photo 9b: Grey seal bycaught in nets 28.01.2016, S/2016/024, photo by MSN

3.2.2 Seal Evidence Evaluation Protocol (SEEP)

Cornwall Wildlife Trust produced a new Seal Evidence Evaluation Protocol (SEEP) in 2016 to illustrate the photos MSN callout volunteers should take when attending a dead seal stranding which was launched at the 2016 MSN Forum. This useful document will guide our trained volunteers to collect the information required to enable us to develop further our understanding and analysis of the marks and injuries observed on dead stranded seals and their potential causes. In doing so, we hope to build and improve our photo database for seals within the MSN catalogue in future years, allowing us to further seal strandings research in Cornwall.

Please find our SEEP guidelines in Appendix 2.



Photo 10: Seal pup, Widemouth beach near Bude, 17.10.2016 S/2016/107, photo by Rachel Spencer

3.3 Birds

2016 saw a relatively high number of stranded seabirds, with 1097 animals recorded, consisting of 15 known different species and four unknown species (see Table 3). This is substantially higher than 2015 (n=55) and a result of a significant stormy weather period in February 2016 where huge numbers of gannets were reported dead and struggling off Porthcurno, Lands End (Table 4).

Species	Number of reports	Est. number of animals
Gannet	18	1026+
Bird species	11	11+
Gull species agg.	2	11
Guillemot	2	11
Cormorant	6	6
Puffin	4	6
Auk	4	5
Razorbill	4	4
Herring Gull	3	3
Black Throated Diver	2	2
Black-headed gull	2	2
Lesser black-backed gull	2	2
Shag	2	2
Chough	1	1
Cormorant/Shag	1	1
Fulmar	1	1
Kittiwake	1	1
Manx Shearwater	1	1
Oystercatcher	1	1
TOTAL	68	1097

Table 3: Total numbers of each sea bird species reported to CWT MSN in 2016

Ad hoc bird strandings have always been under-reported in Cornwall unless significant events occur, such as the PIB spill in 2013, the extreme storms in 2014 and now the storm event in 2016. Table 4 shows the huge increase of birds reported to the CWT MSN in 2013, especially in April during the PIB pollution incident. However, despite the awareness raised during this incident and the need to report and record birds strandings continue to be under-reported.

An important development in 2016 was the use of the MSN hotline to record stranded key bird species within the Falmouth to St Austell pSPA; the black-throated diver, great northern diver, and the Slavonian Grebe (see Appendix 3). The information gathered about these species is shared with both Natural England and Cornwall Inshore Fisheries and Conservation Authority (IFCA) in support of the designation and management of this Marine Protected Area (MPA).

Month	2010	2011	2012	2013	2014	2015	2016
January	0	0	342	0	81	6	22
February	0	2	0	12	1,657	0	1,014
March	1	0	0	4	166	10	4
April	1	0	0	2,350	3	11	3
May	11	0	0	52	7	2	4
June	0	2	0	52	3	7	10
July	0	1	2	7	1	6	21
August	1	0	0	6	3	2	2
September	10	0	0	3	0	1	3
October	0	0	0	6	8	1	8
November	1	1	2	2	1	5	0
December	1	1	1	20	0	4	6
Total	26	7	347	2514	1930	55	1097

Table 4: Total numbers of sea birds reported to MSN between 2010 and 2016
(CWT MSN NOTE: The numbers of birds are either exact counts or conservative estimates.)



Photo 11: Black throated diver, Cawsand beach, 14.12.2016, photo by Claire Wallerstein

3.4 Sharks

There were 17 reports of stranded sharks in Cornwall in 2016, including notable a basking shark and porbeagle which stranded on the 24th September 2016 on Porthpean Beach near St Austell (see photo 9). The porbeagle was sampled at the University of Exeter, Tremough campus.

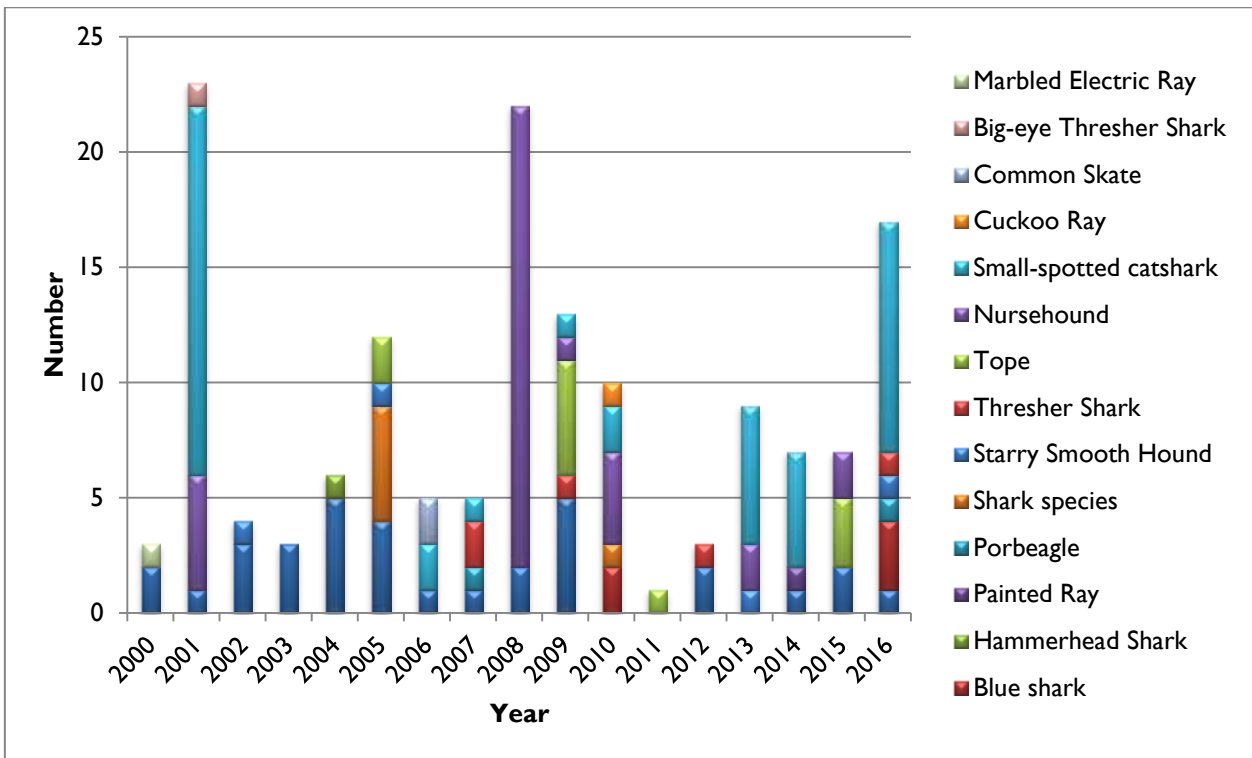


Figure 13: Shark strandings 2000 – 2016



Photo 12: Porbeagle Shark, Porthpean St Austell, 24.09.2016, photo by Annabelle Lowe



Photo 13: Small-spotted catshark, Daymer Bay near Rock, 15.12.2016, photo by Julie Dyer

3.5 Marine turtles

In 2016 there was only one report of a turtle stranding on Cornwall beaches, which sadly was severely decomposed and therefore impossible to determine species or cause of death.

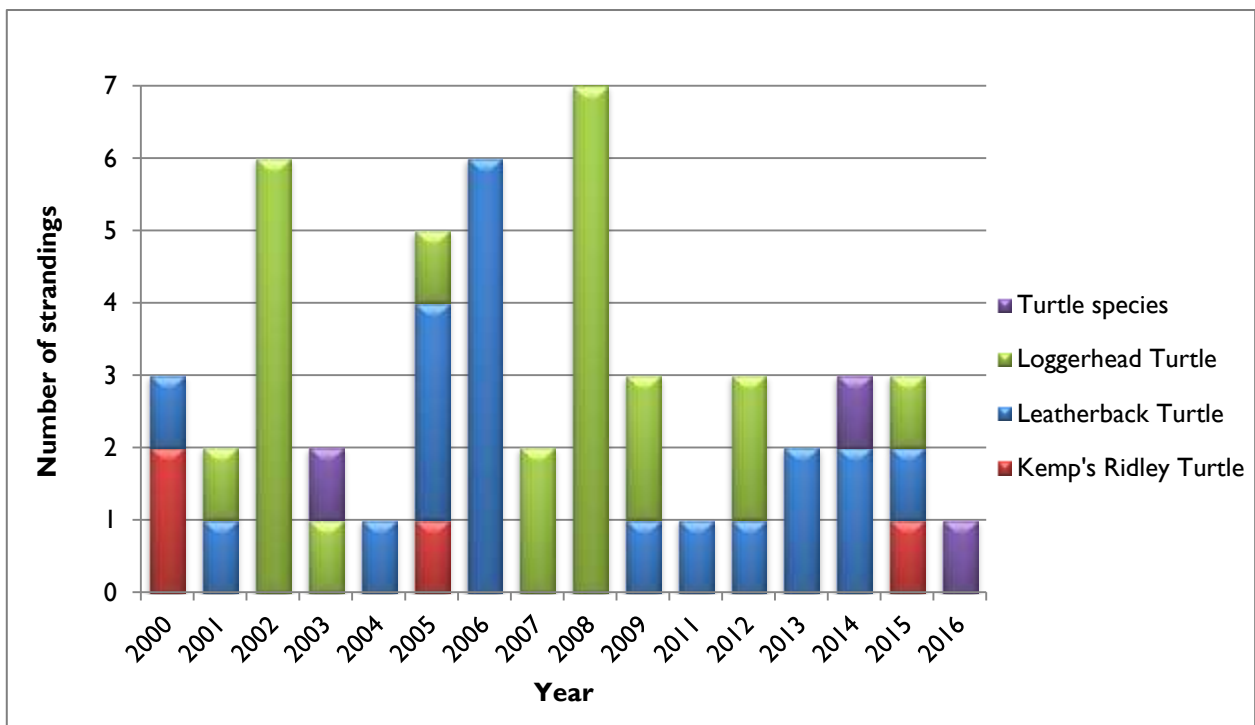


Figure 14: Marine turtle strandings 2000 – 2016

3.6 Other strandings

33 other animals, comprising of 19 different species and one unknown were recorded to MSN In 2016. Of note were a large, fresh Bluefin tuna found on the Gazzle, near Newquay in March 2016, and a North Atlantic marlin which stranded on Porthcurno beach in September 2016. Another rarity was the long snouted seahorse, found on Perranporth Beach in February 2016, which is the first ever seahorse to be reported to the MSN hotline since 1990. Only 3 barrel jellyfish were reported in 2016, which is comparable low compared with 21 in 2015 and 30 in 2014. However, it is acknowledged that these figures vastly underestimate the true number of jellyfish strandings as these are generally under-reported.

Species	Total
Grey Triggerfish	6
Barrel Jellyfish	3
Compass Jellyfish	3
Portuguese Man-of-War	3
Atlantic Herring	2
Moon Jellyfish	2
Ocean Sunfish	2
Atlantic Blue Marlin	1
Blue-Fin Tuna	1
Boar-fish or Zulu	1
Common Starfish	1
Conger Eel	1
Goose-neck Barnacle	1
Horse Mackerel/Scad	1
Long Snouted Seahorse	1
Sand Sifting Starfish	1
Sardine	1
Sea Potato urchin	1
unidentified	1
Total	33

Table 5: Other stranded species reported to CWT MSN in 2016



Photo 14: Long snouted seahorse, Perranporth beach, 11.02.2016, photo by Tracey Williams



Photo 15: Volutneer with blue fin tuna, the Gazzle Newquay, 14.03.2016, photo by Stephen Bowns

4. Events

4.1 New volunteer training

A total of 16 new volunteers were trained at Towan Beach, Newquay, North Cornwall in September 2016.



Photo 16: New volunteers trained in Newquay at annual CWT MSN Training Day September 2016, photo by Abby Crosby



Photo 17: Atlantic blue marlin, Porthcurno beach, 12.09.2016 , photo by Pete Cooper

4.2 MSN Forum 2015

In October 2016, the CWT MSN held its annual Forum, which was attended by volunteers, guests from scientific and educational institutions, NGOs and students. The event was hosted by Truro College. In 2016 the focus of the forum was Ocean Giants. Among the presentations were topics including; the North Sea sperm whale Unusual Mortality Event (UME) by Rob Deaville at the Institute of Zoology, helminth parasites in cetaceans by Eileen Harris at the Natural History Museum, PCBs in global marine apex predators by Paul Jepson at the Institute of Zoology, and post release monitoring of grey seal pups rescued and rehabilitated in Cornwall and the Isles of Scilly by Dan Jarvis at British Divers Marine Life Rescue.

The conference also launched MSN's Seal Evidence and Evaluation Protocol (Appendix 2).



Photo 18: Delegates at the 2016 annual MSN Forum, photo by CWT MSN

5. Acknowledgements

We would like to acknowledge the help and support of the general public in sending in their reports and the following:

- CWT Marine Strandings Network volunteers, who continue to enthusiastically collect vital data and retrieve carcasses, often under difficult and challenging conditions.
- Dedicated Hotline Coordinators (2015): Alison Forward, Joyce Edmonds, Liz Clarke, Abbie Brook, Anthea Hawtrey-Collier, Mike Lord, Rick Payne, Sarah Graham.
- Anthea Hawtrey-Collier for all her work on collating, assessing, checking and entering records into the database.
- University of Exeter, Cornwall campus for collaboration on post mortem examinations
- James Barnett, veterinary pathologist and advisor to the MSN.
- Frugi Ltd, for their financial support to CWT Living Seas programme.
- Nick Davison, Scottish Marine Animal Stranding Scheme for his advice on bacteriology.
- Stella Turk MBE for help, support and inspiration.
- Dr Nick Tregenza, cetacean expert and advisor to Cornwall Wildlife Trust and the MSN.
- Rob Deaville and Dr Paul Jepson, Institute of Zoology and CSIP.
- Kate Hockley from Cornwall Seal Group Research Trust for her help with MSN training days.
- Dave, Lesley and Dan Jarvis and the Marine Mammal Medics, BDMLR, Cornwall.
- Sue Sayer for proof reading and ID and supporters of the Cornwall Seal Group Research Trust.
- Isles of Scilly Wildlife Trust and strandings volunteers.
- Truro College for hosting the annual Marine Strandings Network Forum.
- Cornwall County Council and Cory officers and beach management teams for their assistance.
- Vic and Jane Simpson, Wildlife Veterinary Investigation Centre.
- Rod Penrose and Lin Gander, Marine Environmental Monitoring (Wales).
- Richard Sabin, Brian Smith, Liz Duffell and Molly Clery, Natural History Museum.
- Brendan Godley, Annette Broderick and Matthew Witt, Marine Turtle Research Group.
- Chelonia Limited.
- The National Trust Wardens.
- Bob and Jason at the Watering Hole, Perranporth for assistance with strandings.



APPENDIX I:

Cornwall Wildlife Trust Marine Strandings Network BYCATCH REPORT 2016



Introduction

The Cornwall Wildlife Trust Marine Strandings Network (CWT MSN) has been collecting valuable data on stranded marine life around Cornwall for over 20 years, and holds over 6,450 records. The Network is an invaluable tool to monitor the impact of bycatch on cetacean species within the region. To that end, cetacean species reported to CWT MSN undergo rigorous examinations to identify and record signature features identified as being caused during a bycatch event.

In 2016, a total of 205 dead stranded cetaceans were recorded by the CWT MSN. Of these, 31 (15%) were retrieved under licence by the team for post-mortem examination at University of Exeter, Tremough on behalf of the Defra-funded Cetacean Strandings Investigation Programme (CSIP). The examination concluded that 7 of the 31 (23%) cetaceans were very suspicious of bycatch; the findings of these examinations are published with the kind permission of the CSIP (below, *animals that were subject to necropsy are highlighted in blue*).

The remaining 174 cetaceans were examined and recorded in situ by the MSN volunteers and staff. Of these, 12% (n=21) showed features consistent with bycatch. These features are based on recognised net entanglement marks such as fin edge cuts/slices, encircling net marks and severed appendages. Several other animals showed signs of previous bycatch such as healed fin edge wounds; however these animals were excluded from this report if there was no other evidence of entanglement observed. The remaining 153 animals were considered inconsistent with bycatch, cause of death was inconclusive based on the data available, carcasses were unsuitable for examination due to decomposition or the cause of death was attributable to other factors such as disease. Therefore, evidence of bycatch identified in 14% (n=28) of all stranded cetaceans (n=205) in 2016 through analysis of external marks and post mortem examination, each of these are described below.

Bycatch analysis

All animals which were subject to post mortem examination and in-situ assessments in 2016 have been included in this analysis.

Species	Total No. Examined	No. with Bycatch Features in situ and PM	% Examined with Bycatch Features
Common Dolphin	113	25	22%
Harbour Porpoise	61	1	2%
Dolphin species	16	1	6%
Bottlenose Dolphin	1	0	0
Striped Dolphin	3	1	33%
Sperm Whale	1	0	0
Risso's Dolphin	1	0	0
Minke Whale	1	0	0
Cetacean	6	0	0
Small, toothed cetacean	2	0	0
Total	205	28	14%

Table 1: Summary of the proportion of stranded cetacean species examined by MSN in 2016 through post mortem and in-situ examination

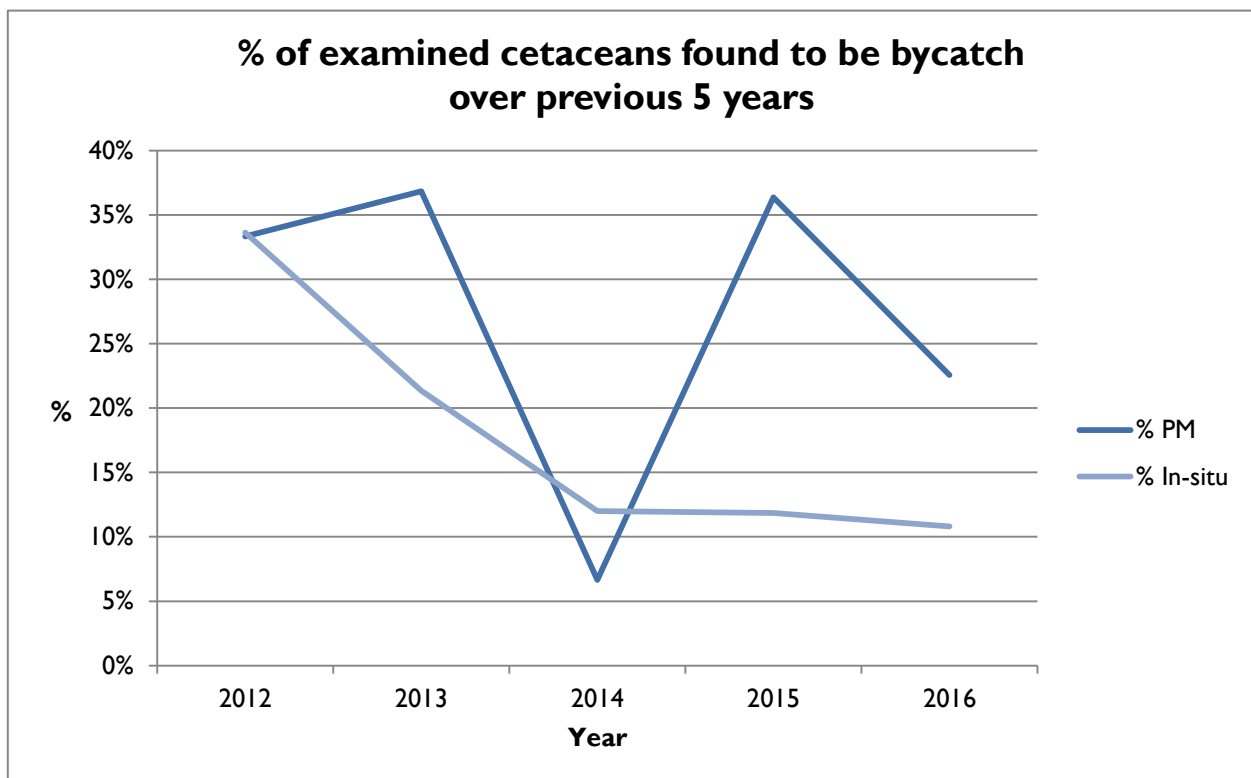


Figure 1: Total number each month of stranded cetaceans which exhibited features of bycatch, assessed by post mortem examination or in-situ assessment, over the last five years.

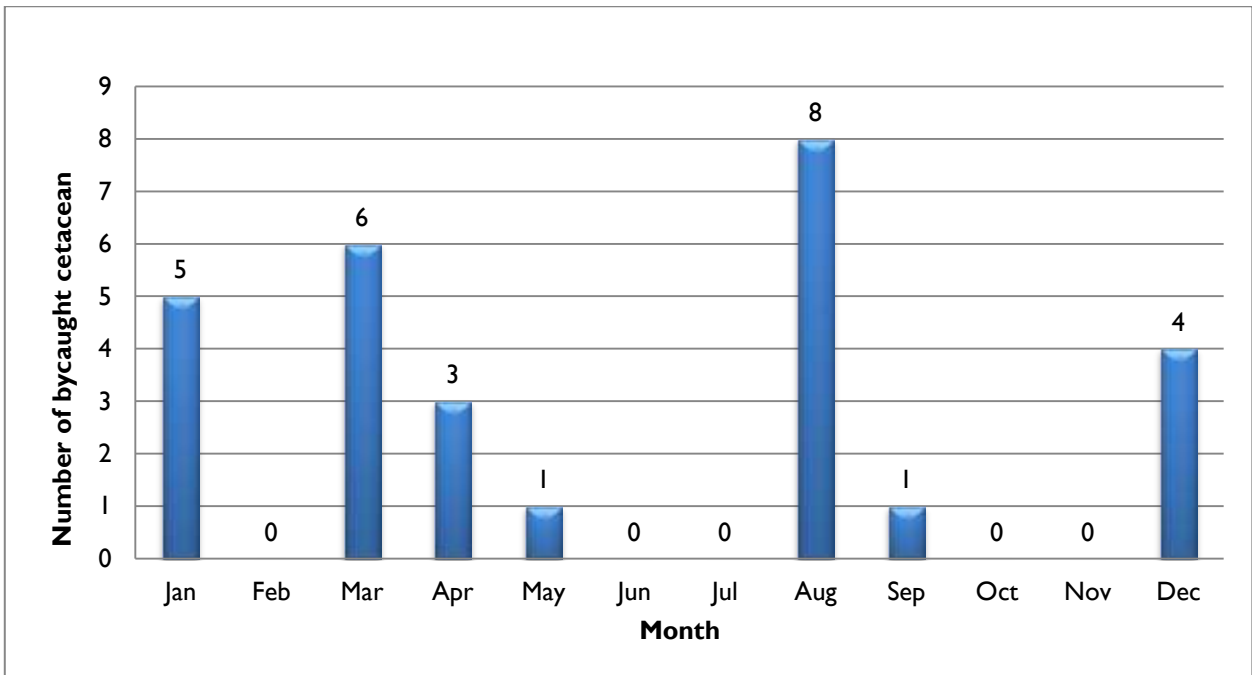


Figure 2: Shows the number of stranded cetaceans which exhibited features of bycatch, assessed by either post mortem examination or in-situ assessment, by month during 2016.

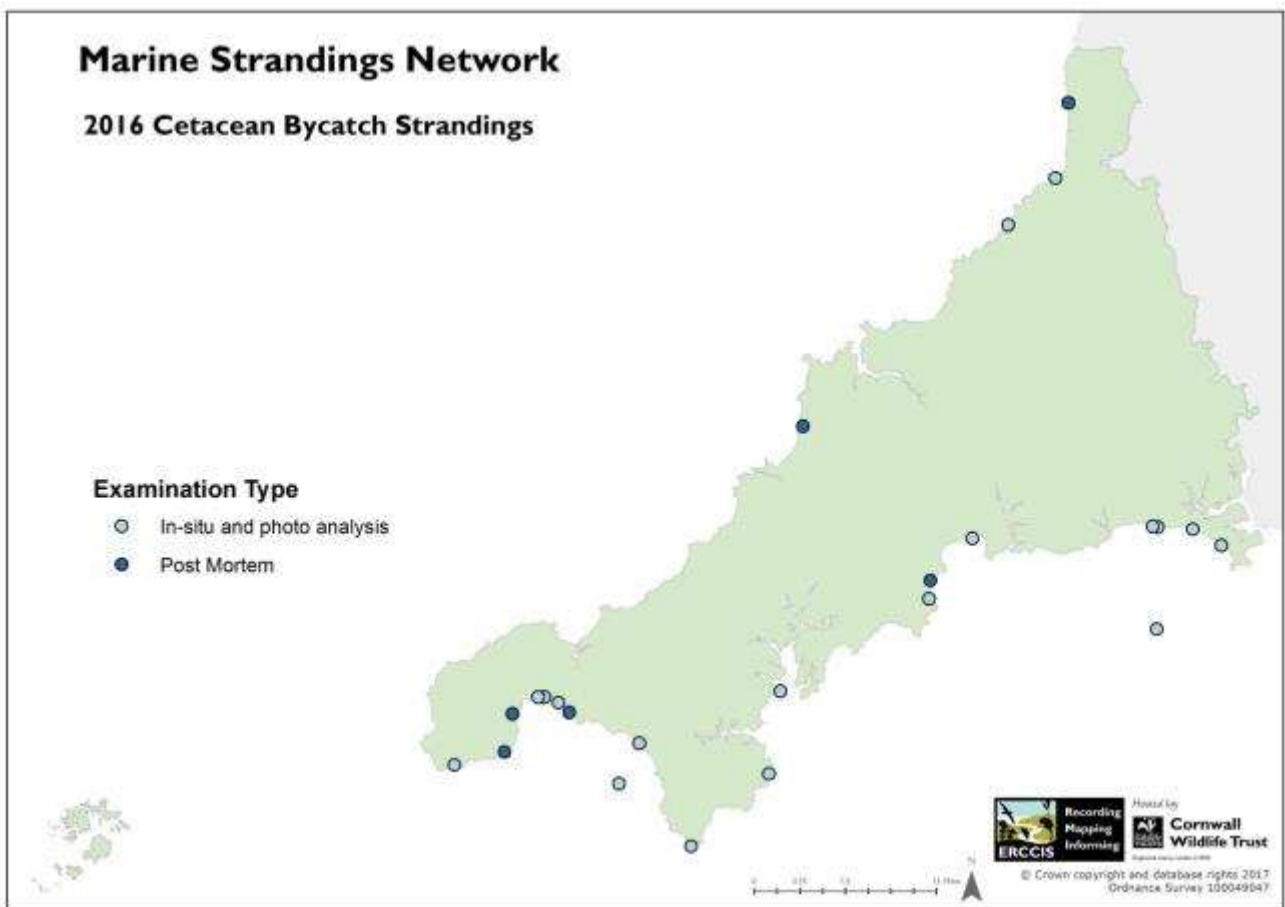






Figure 3: The location of 2016 stranded cetaceans with bycatch features; dark blue indicates animals which were subject to post mortem examination and pale blue indicates those which underwent in-situ assessment.



Summary of all animals which exhibited signs of bycatch in 2016

Blue highlights the cases which went to post mortem. White highlights those cases only studied in-situ.


Reference	Location	Date	Gross post-mortem examination findings/observations
Common Dolphin C/2016/004 (SW2016/5)	Sandy Mount, Bude SS201101	07/01/2016	<i>Two possible causes of the linear encircling wounds present on the mucocutaneous junctions of the mouth were considered. Firstly, that they were created by folding of the skin and gingiva at the time of the impact that fractured the jaw. Secondly, that they were caused by nets and, after further examination of photographs of the wounds, in my opinion this is the most likely explanation. Therefore, coupled with the evidence of recent feeding and despite the lack of further bycatch wounds, it is most likely that the animal was bycaught. Furthermore, the fractures to the mandible and associated soft tissue trauma</i>
		 	
Common Dolphin C/2016/003	Castle Beach, Falmouth SW819320	22/01/2016	Clean cut amputated tail flukes. Semi-encircling monofilament impression behind right eye.
		 	

Common Dolphin C/2016/009	Spit Beach, St Austell SX074523	22/01/2016	Grey rope found tied around tail stock. Broken tip of upper beak with missing skin to the palette plus missing front teeth. Broken tip of lower beak with bone protruding. Notched wound around 2nd visible upper tooth. Small hole under right jaw with associated skin loss - possible gaff hook. 2 linear marks made up of small perpendicular lines in front of leading edge right pectoral fin ventral side towards the chin. Sharp edged y shaped wound down to the tissue on top of the melon with associated skin loss. Deep linear wound between left eye and jaw.
 			

Common Dolphin C/2016/006 (SW2016/38)	Longrock Beach, Penzance SW505312	22/01/2016	<i>This adult female common dolphin was in good body condition and had fed recently. In my opinion, the severed tail stock, linear encircling wounds over the mandible, maxilla, left pectoral fin and dorsal fin and the distinct rope knot mark on the left caudal head were consistent with bycatch as the cause of death.</i>
			

Common Dolphin C/2016/010 (SW2016/40)	Lamorna Cove, Lamorna SW452318	25/01/2016	<i>This adult female common dolphin was in reasonable body condition and had recently fed. The series of linear wounds of 2mm width over the head, coupled with the evidence of recent feeding and the skin, subcutaneous and intramuscular bruising/haemorrhage over the head are suspicious of bycatch in a multifilament net.</i>
			

Dolphin Species C/2016/049	Polkirk Beach, Mevagissey SX016443	19/03/2016	Encircling marks to tail stock. Multiple encircling marks behind blowhole. Monofilament marks to right and left side trailing edge pectoral fin. Possible broken lower jaw - not tested in the field.
			

Common Dolphin C/2016/054	Tolcarne Beach, Newlyn SW464290	26/03/2016	<i>This juvenile female common dolphin was in reasonable body condition and had eaten very recently. This, coupled with the clear evidence of net marks on the maxilla and, less clearly on the flukes and dorsal fin, were consistent with bycatch in a monofilament net. Furthermore, some of the marks on the left side of the carcass were possibly caused by multifilament net/rope.</i>
			

Common Dolphin C/2016/056	Whitsand Beach, Whitsand Bay SX404514	27/03/2016	Tail amputated. Monofilament encircling wound around head behind eyes. Multiple crossed encircling marks to tail stock. Large, wide scrape mark above left eye. Right lower jaw broken with associated large scavenged hole, cheek missing.
			

Common Dolphin C/2016/059	Whitsand Bay SX366535	28/03/2016	Monofilament encircling linear marks behind blowhole and around right pectoral fin. Fin slice to trailing edge dorsal fin. Tail missing with multiple rope fibres embedded - orange, blue and green multifilament with associated scavenging. Possible gaff hook wound under right eye, scavenged. Upper and lower jaw broken, upper jaw bone front half missing leaving skin behind. Linear mark diagonally across right tail stock - possible monofilament wound.
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Common Dolphin C/2016/058	Tregonhawke, Whitsand Bay SX404514	28/03/2016	Encircling linear mark in front of left pectoral fin. Fluke missing, yellow twine embedded. Tip dorsal fin missing - straight edged wound.
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Common Dolphin C/2016/064 (SW2016/170)	Perranuthnoe Beach, Penzance SW539292	30/03/2016	<i>This dolphin was in moderate body condition and had fed very recently. The evidence of recent feeding coupled with the linear encircling wounds on the maxilla and, to a lesser extent, mandible, and the fractured tips to both bones are, in my opinion, consistent with bycatch. The haemorrhages and bruising evident in the head/neck region are also potentially consistent with this</i>
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<p>Harbour Porpoise C/2016/072 (SW2016/178)</p>	<p>Sandymouth Beach, Bude SS200101</p>	<p>06/04/2016</p>	<p>The skin tags and encircling linear wounds seen on the fins and flukes were, in my opinion, consistent with bycatch in a monofilament net. The wider linear marks found on the dorsal fin may have been the top rope/cord of the net. A number of the other linear, non-encircling wounds also may have been associated with the animal becoming caught in nets but it is likely that the majority of irregular wounds and scrapes occurred when the animal stranded.</p>
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<p>Common Dolphin C/2016/074</p>	<p>Marazion Beach, Penzance SW506312</p>	<p>06/04/2016</p>	<p>Broken lower jaw, left missing. Skin and flesh missing, bones exposed. 2 linear encircling wounds behind dorsal fin, right round the belly, crossing over on left. Multifilament encircling mark left behind dorsal fin. Possible fin-edge slice to trailing edge dorsal fin.</p>
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<p>Common dolphin C/2016/078</p>	<p>Downderry Beach, Whitsand Bay SX320538</p>	<p>15/04/2016</p>	<p>Monofilament encircling wound behind blowhole. Fluke missing. Sharp 'v' shaped notch in tailstock. Dorsal fin sliced off. Tip of right pectoral fin missing. Possible encircling marks to beak.</p>
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Common dolphin C/2016/088 (sw2016/218)	Pentewan Beach, Mevagissey SX018467	06/05/2016	<i>This adult male was in reasonable body condition. The post mortem examination was confounded by autolysis (it was not possible to examine the animal until 6 days after it was found). However, the linear marks on the mandible and one pectoral and evidence of recent feeding were, in my opinion, consistent with bycatch as the most probable cause of death.</i>
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Common dolphin C/2016/101	Top Teib Harbour, Marazion SW525305	02/08/2016	Left pectoral fin - half missing with scavenging to the wound. Left jaw exposed and broken. Possible monofilament encircling marks across front of the melon. Monofilament encircling mark around left fluke. Right jaw - notches with partial encircling marks.
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Common dolphin C/2016/112	Rusey Beach, Boscastle SX121939	05/08/2016	Tail stock amputated, possible deep encircling marks on remaining tail stock.
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Striped dolphin C/2016/108	Millook Beach, Poundstock SSI84001	06/08/2016	Linear bruise in front of blowhole. Tip of upper beak broken with skin peeled back and partial encircling impression in the end. Monofilament encircling mark to upper beak. Two partial encircling impressions in the tip of the lower beak.
			

Common dolphin C/2016/111	4km off Porthleven, Mounts Bay SW667273	09/08/2016	Tail stock amputated, clean cut.
			

Common dolphin C/2016/114	Southerly point, Lizard SW701114	11/08/2016	3 monofilament encircling impressions to upper beak with slight following impressions to lower beak. Linear impressions in series to underside of tail stock at joint with fluke. Notches to trailing edge of right pectoral fin. Possible encircling impressions to left pectoral fin. Notch with partial encircling mark to base of trailing edge dorsal fin. Fin slice to trailing edge fluke.
			

Common dolphin C/2016/120	Porthleven Sands, Helston SW632251	13/08/2016	Tail stock amputated. Two encircling impressions to upper mandible. Linear monofilament impression behind right eye. Small circular wound to right trailing edge dorsal fin. Notch to base leading edge dorsal fin. Linear 'scuff' wound right below dorsal fin.
			

Common dolphin C/2016/123	Longrock Beach, Marazion SW498312	15/08/2016	Multiple monofilament encircling marks around head behind blowhole, meeting and crossover at thorax. Also behind left pectoral fin. Multifilament rope mark across left torso extending from leading edge left pectoral to leading edge dorsal. Encircling monofilament impressions around tail stock at genitals and anal slit and behind dorsal fin. Skin deep linear wound between pectoral fins ventral side.
			

Common dolphin C/2016/126	Downderry Beach, Whitsand Bay SX313539	16/08/2016	Tail amputated at tail stock with associated scavenging. Two fin slices and two notches to trailing edge dorsal fin. Notch to leading edge dorsal fin. Three notches to left pectoral fin trailing edge.
			

Common dolphin C/2016/149	Porthcurno, Penwith SW387222	08/09/2016	Fluke amputated. Broken back at top of tail stock, vertebrae exposed. Dorsal fin cleanly sliced off. Bottom jaw broken. Broken and missing teeth to bottom mandible. Possible encircling impression to right torso in front of dorsal fin. Possible encircling mark to upper mandible close to melon crease.
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Common dolphin C/2016/185	Godrevy Cove, Lizard SW804210	04/12/2016	Haemorrhage in left eye. Encircling marks to right beak extending under chin. Fin edge slice to trailing edge right pectoral fin. Possible linear impression in front of blowhole. Linear impression right partial encircling in front of dorsal fin. Linear impression right partial encircling around tail stock.
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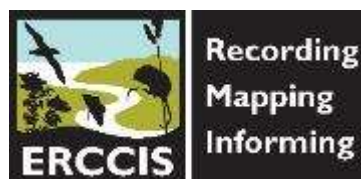


Common dolphin x3 C/2016/196	10 miles off Whitsand Bay SX369512	15/12/2016	Found during trawl, already dead with tails tied together with orange multifilament rope.
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All photos courtesy of the MSN team and James Barnett, veterinary pathologist and affiliate of University of Exeter, Tremough.

A huge thank you in particular to Anthea Hawtrey-Collier, Niki Clear, and James Barnett in the compiling of this report.



APPENDIX 2:



Seal Evidence Evaluation Protocol (SEEP)

This guide illustrates the photos MSN Callout Volunteers should take when attending a dead seal stranding. Please take photos listed with a **digital camera**, set to the **highest image quality** and ensure high quality images are submitted. Ensure to **rinse the carcass** free from sand and debris before taking the photos. As well as usual protocol, please follow the **measure** the size of any marks, cuts, abrasions and wounds. If you attend a fresh seal carcass please **notify the Hotline Coordinator** immediately to start arrangements for PM retrieval.

Make sure to check in with the Strandings Hotline (0345 2012626) when you're off the beach of



View of the animal at site

Show the **animal on location**, including beach type with surrounding rocks which may cause damage.



All sides of the animal

Show **all sides** (left, right above and below) of the entire animal, to help with photo ID and general overview of the condition.



Head and shoulders

Show **all sides** (left, right above and below) to help with photo ID and give an overview of marks and wounds.



Overview of body

Show **all sides** (left, right above and below) to help with photo ID and give an overview of marks and wounds.



Close up of eyes

Show **both eyes** or sockets, including eyebrows, with close up of any associated bulging eyes, wounds or abrasions.



Close up of teeth and mouth

Show **all sides** of the mouth area, including teeth, gums, into the mouth, surrounding muzzle and whisker follicles.



Fore flippers

Show **all sides** (leading, trailing above and below) of each fore flipper, including any wounds, cuts or abrasions.



Rear flippers

Show **all sides** (leading, trailing above and below) of each rear flipper, including any wounds, cuts or abrasions.



Flipper webbing

Show **all sides** (leading, trailing above and below) of webbing for all flippers, including any wounds, cuts or abrasions.



Edges of flipper webbing

Show **close up** of the edges of the webbing for each fore and rear flipper, including any wounds, cuts or abrasions



Genital area

Show **close up** of genital area to confirm gender (example of a male).



Close up of nose and nostrils

Show **close up** of nose, including abrasions, cuts, evidence of froth or parasites.



Close up of skin wounds

Show **close up** of fresh, healing and healed wounds and cuts on the animal.



Cuts and abrasions

Show **overview and close up** of any cuts and abrasion on the head, body or appendages noting their location.



Deep cuts or puncture wounds

Show **close up** of any deep holes or puncture wounds. You can test the depth with a stick and feel for crushed bones. *



Pox marks or lesions

Show **overview and close up** of pox marks which could indicate disease.



Entangling material

Show **overview and close up** of any entangled or embedded material in the animal.



Encircling marks

Show **overview and close up** of any encircling marks around the head, neck, body or appendages.



Broken bones *

Show **overview and close up** of any broken bones, including head and appendages.



De-sleeved skull

Show **overview and close up** of exposed skull, including close up of the wound edges.



Missing head or appendages

Show **overview and close up** of any missing appendages or head, highlighting a clean, ragged or indented edges.



Wound edges

Show **close up** of any missing appendages or head, highlighting a clean, ragged or indented edges.



Damaged or missing flesh

Show **overview and close up** of any missing areas of skin or blubber, including the wound edge and underlying blubber.



Swelling / changes in body shape

Show **overview and close up** of any swelling or changes in the body outline.

* Please take extra care when handling strandings with broken bones as sharp edges could cause you injury

Thank you for your help with this important research

We will be using the information and photographs you collect to further develop our understanding and analysis of marks and injuries observed on dead stranded seals and their possible causes.

Thanks for our partners Cornwall Seal Group Research Trust, Scottish Marine Animal Stranding Scheme and consultant veterinary pathologist James Barnett for their guidance and support

Please submit your photos at full resolution via

- any online file share service (such as Dropbox, Google Drive, OneDrive or WeTransfer)
- email to Strandings@cornwallwildlifetrust.org.uk
- post to **Marine Strandings Network, Cornwall Wildlife Trust, Five Acres, Allet, Truro TR4 9DJ**

Contact the Marine Strandings Network team

www.CWTStrandings.org

/ 0345 201 2626

/ Strandings@CornwallWildlifeTrust.org.uk

Marine Strandings Network

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MSN Hotline: 0345 201 2626



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Also by Cetacean Strandings Investigation Project.

Publication Policy

This report should be accredited to Cornwall Wildlife Trust Marine Strandings Network in all publicity and wherever referred to. Use of these data, by prior agreement with Cornwall Wildlife Trust and the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS), is welcomed. We would be pleased to receive copies of any publications that have used these data.