Marine Strandings Network

Cornwall Wildlife Trust

Protecting Cornwall's wildlife and wild places

2015 Annual Summary Report

Marine Strandings in Cornwall and the Isles of Scilly

Report by
Cornwall Wildlife Trust
Marine Strandings Network

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Cornwall Wildlife Trust

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1.0 Executive Summary

Data on marine organisms that stranded on the shores of Cornwall in 2015 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 96 cetaceans were recorded in 2015. Harbour porpoises (*Phocoena phocoena*) represented the majority of strandings (44%, n=42), followed by Short-beaked common dolphins (*Delphinus delphis*) (35%, n=36). Of particular interest were four Risso's dolphins (*Grampus griseus*) which is noteworthy due to these being a relatively uncommon species in Cornish waters.

In total, evidence of bycatch was identified in 18% (n= 17) of all stranded cetaceans (n=96) in 2015. CWT MSN volunteers retrieved 22 cetaceans for post-mortem examination. Bycatch was found to be the cause of death in 36% of the animals (n=8). Of those not sent for post-mortem (n=74), but examined by MSN volunteers *in-situ* using the Bycatch Evidence Evaluation Protocol (BEEP), 12% (n=9) 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 65 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.

125 dead grey seals (*Halichoerus grypus*) were recorded by the Network in 2015: This is the highest ever annual number of recorded seal strandings, of which 30% (n=38) were categorised as pups measuring less than 120cm. 25% were male (n=32), 15% were female (n=19) and 60% were of unknown gender (n=74). The majority of grey seal strandings were in January and then between November and December which coincides with the peak breeding and weaning season. The unusually high number of seal strandings recorded in January 2015, (n=24), is thought to be due to storm systems hitting the Cornish coast, coinciding with the end of the pupping season.

Thanks to collaborative work with Cornwall Seal Group Research Trust (CSGRT), three stranded seals (4%) were identified from their photo-ID catalogue. Ten grey seals were retrieved for post-mortem examination in 2015. Of these post-mortems, there were four cases of infectious disease, two cases of bycatch, three cases of trauma, and significantly, one case of a rifle shot wound was found on the Isles of Scilly.

2015 saw a much lower annual count of dead birds reported compared with the previous two years, with only 55 birds recorded from 39 individual reports. Apart from extreme circumstances, such as the PIB pollution incident in 2014, stranded birds continue to be vastly under recorded.

The Marine Strandings Network collects records of all species of stranded marine life in Cornwall. During 2015, three turtles were reported; one Leatherback, one Kemps Ridley and one Loggerhead. Several jellyfish, hydrozoa, crustaceans, blue mussel, cuttlefish and a European squid were also reported to the MSN hotline during the year.

Data were captured in the Marine Strandings Network database. 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.

2.0 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 6,200 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 120 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).

Photo 1: Common Dolphin, Church Cove Gunwalloe, 04.07.2015, C-2015-052, photo by Mick Dawton

3.0 Recordings

3.1 Cetaceans

A total of 96 cetacean strandings were recorded in Cornwall during 2015. This figure is regarded as being within the normal parameters of year to year fluctuations for cetacean strandings. Of particular interest were four Risso's dolphins (*Grampus griseus*) which is noteworthy due these being a relatively uncommon species to strand in Cornish waters. Due to decomposition,10 stranded cetaceans could not be identified to species level.

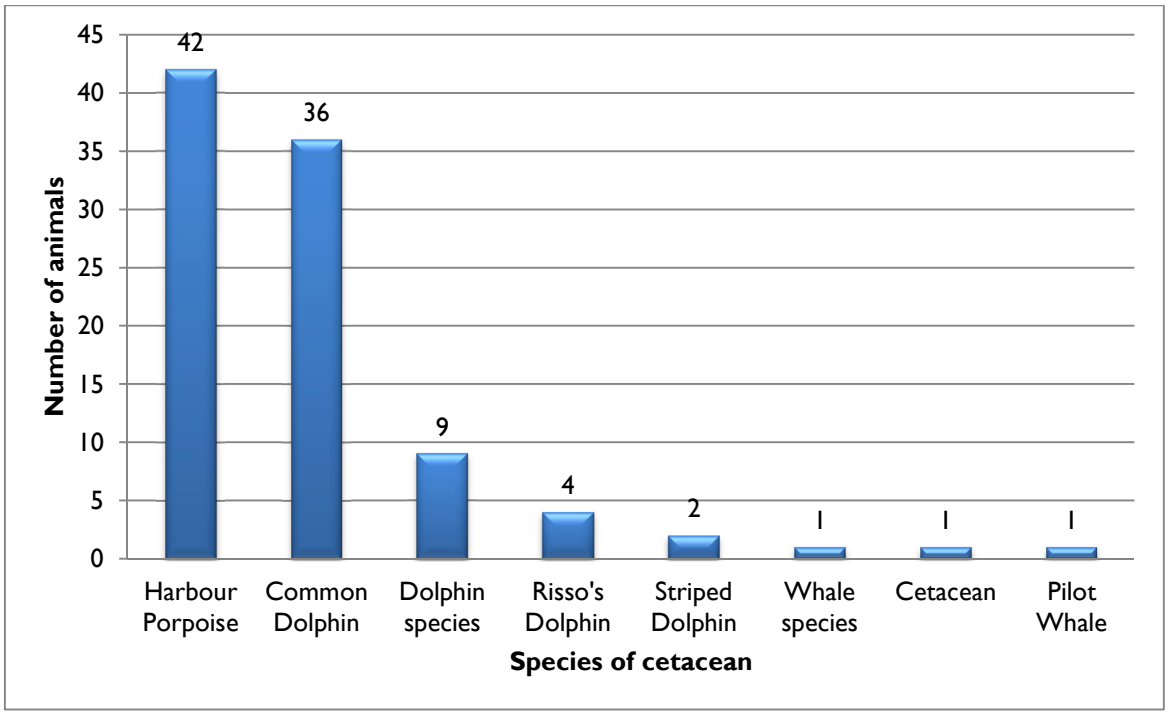

Figure 1: Number of cetacean strandings by species in 2015

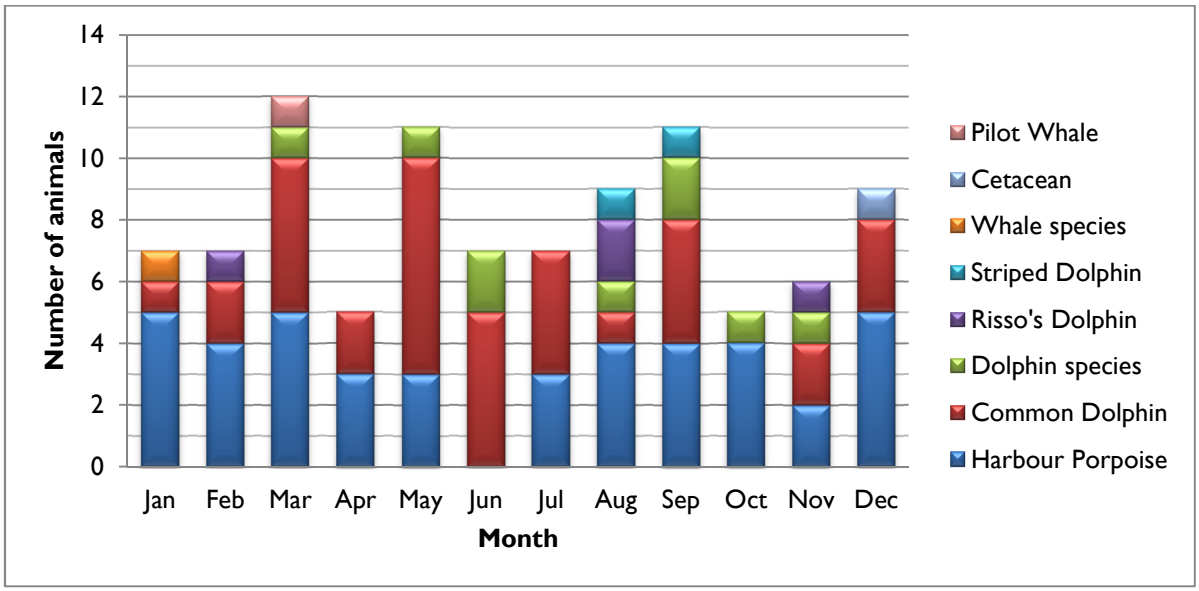

Figure 1: Cetacean strandings by species/month (2015)

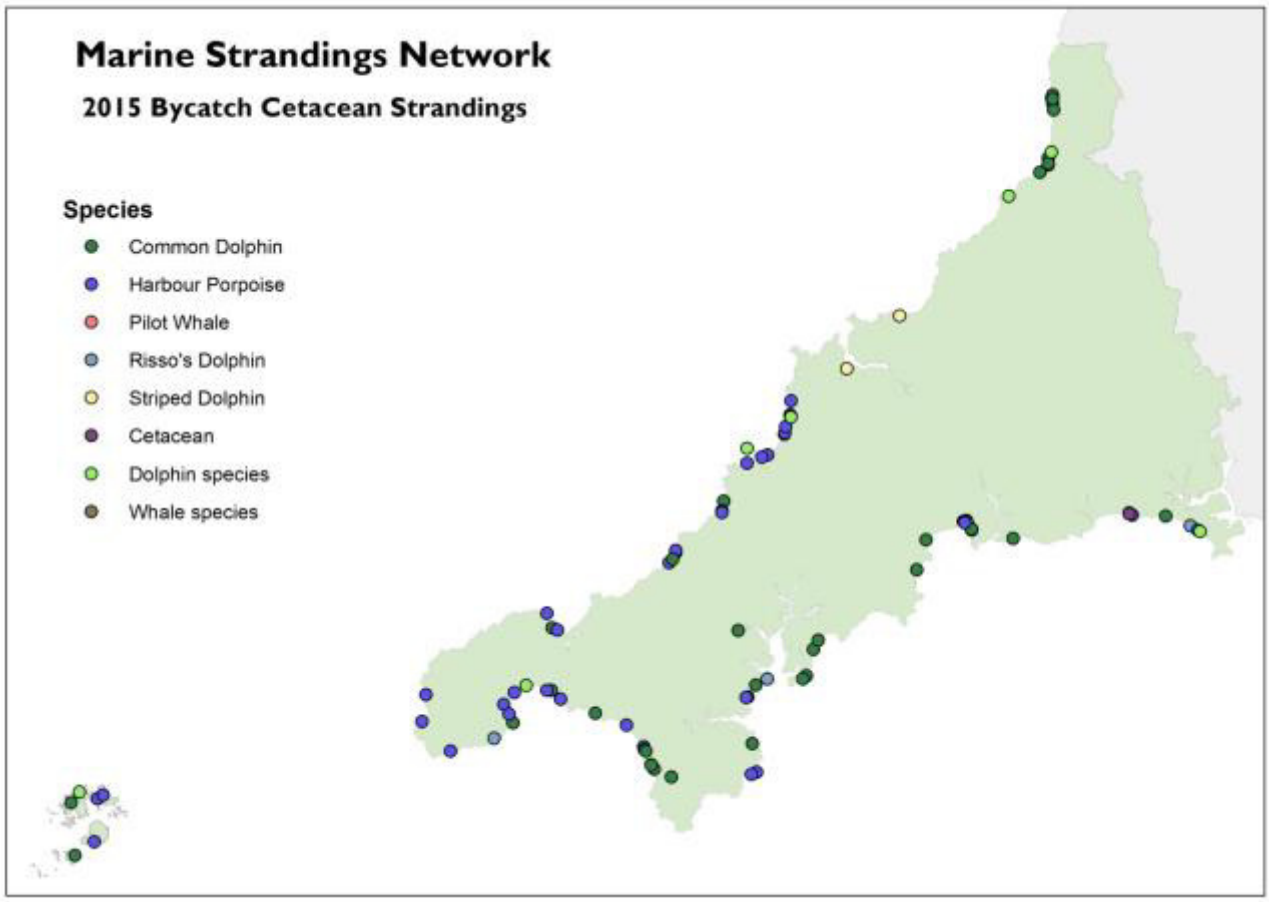

Figure 3: Locations of cetacean strandings in 2015 (n=96)

Figure 3 shows the locations of all cetacean strandings in 2015. There appears to be a hotspot for cetacean strandings within Mounts Bay on the beaches near Penzance and Newlyn, as well as St Austell Bay and Whitsands Bay.

In total 96 cetaceans were reported to and examined by CWT MSN in 2015, which is up 14% from the total in 2014 (n=88), (see Figure 4). In comparison with the previous year's data (Figure 5), there was a comparatively low number of cetacean strandings recorded during the winter months, and a higher than average number recorded during May, July, August and September (Figure 5).

Photo 2: Risso's dolphin on Tregantle Beach, 26.02.2015, C-2015-014, photo by Claire Wallerstein

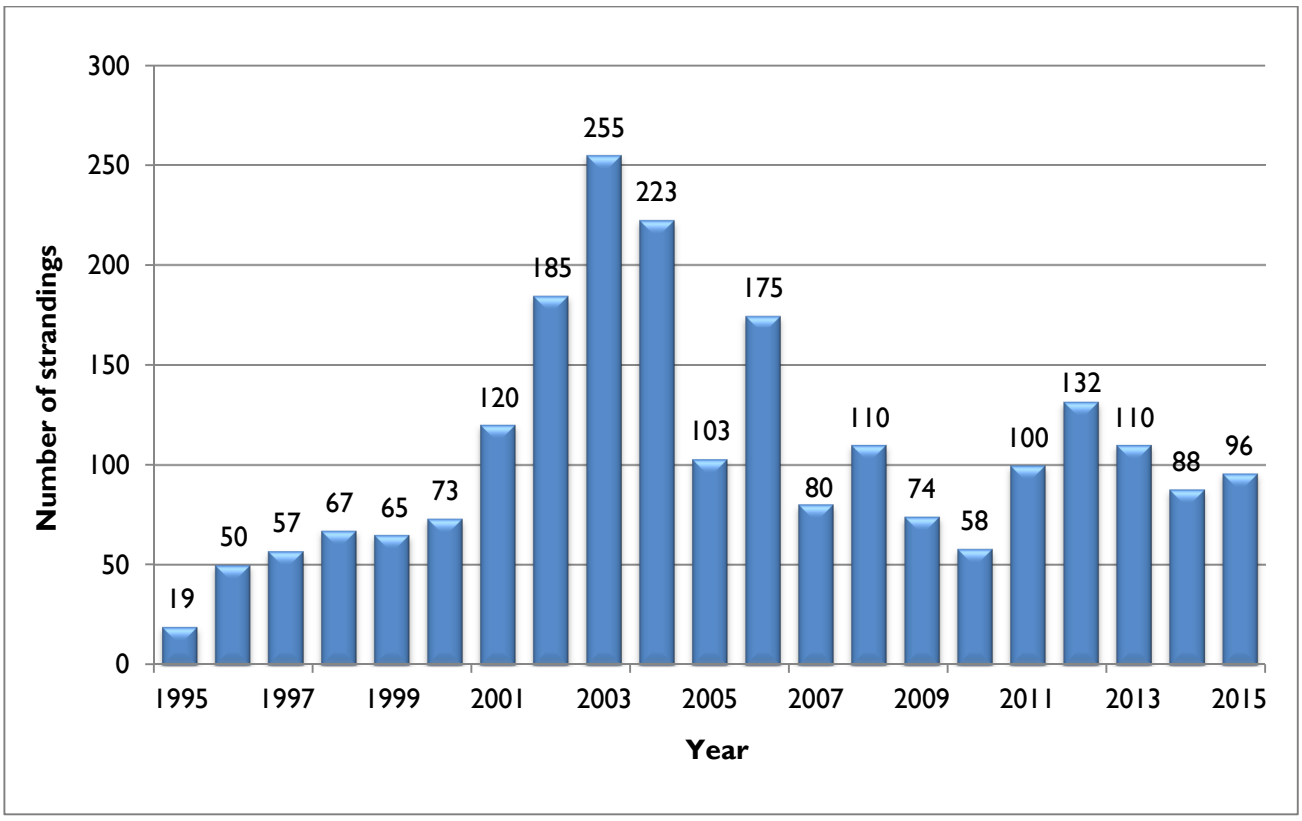

Figure 4: Comparison of cetacean strandings by year (1995 to 2015)

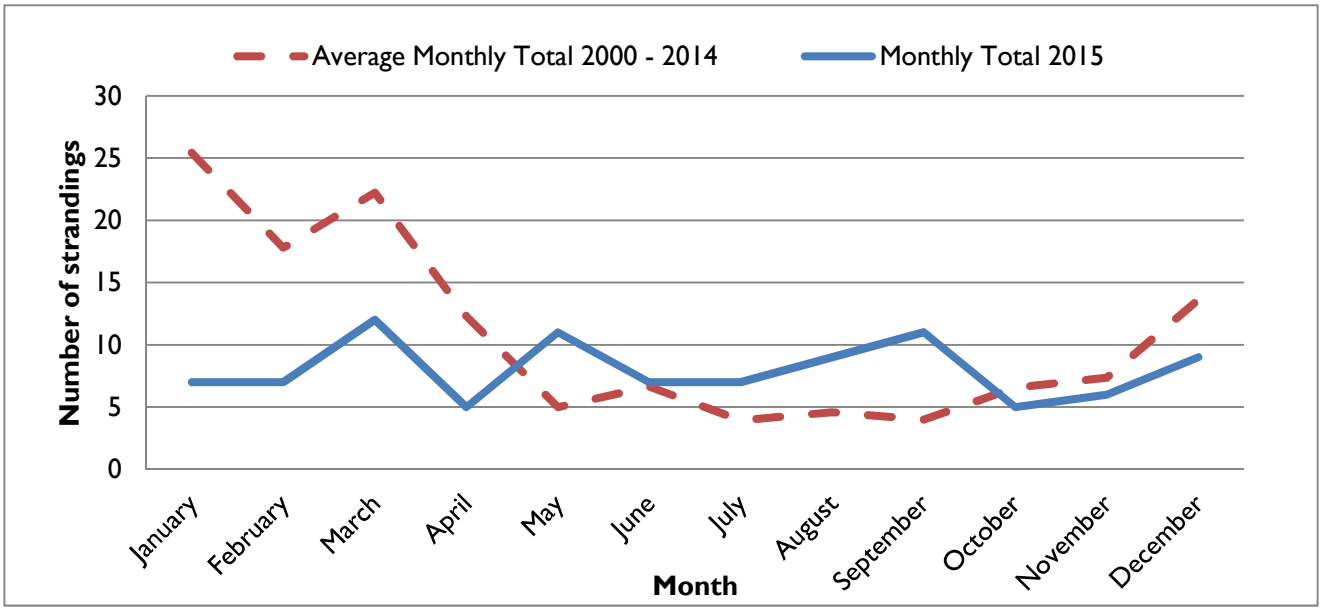

Figure 5: Seasonality of cetacean strandings for 2015, in comparison to average seasonality between 2000 and 2014

3.1.1 Cetacean post-mortem examinations

Of the 96 cetacean carcasses that stranded during 2015, 22 (23%) 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.

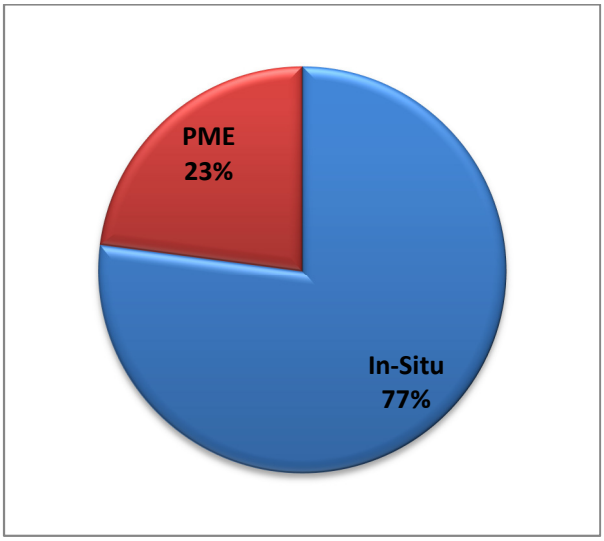

Figure 6: Percentage of stranded cetaceans retrieved for post-mortem examination (n=22) and in-situ assessment by MSN volunteers (n=74)

Photo 3: Harbour Porpoise, Porthcurno, taken for PM 10.04.2015, C-2015-026, photo by Jess Hirons

Gross post-mortem examination findings are summarised in Table 1. 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 8 of the 22 (36%) cetaceans. The findings of these examinations are published with kind permission of CSIP.

Date	Cornwall ID	Species	Location	Cause of Death
08/03/2015	C/2015/018	Harbour porpoise	St Ives	gastric parasitism (heavy)
10/04/2015	C/2015/026	Harbour porpoise	Porthcurno	physical trauma, bycatch
30/04/2015	C/2015/031	Short-beaked common dolphin	Praa Sands	physical trauma, bycatch
02/05/2015	C/2015/032	Short-beaked common dolphin	Pentewan Sands	physical trauma, bycatch
06/05/2015	C/2015/035	Short-beaked common dolphin	Portwrinkle beach	physical trauma, bycatch
09/05/2015	C/2015/038	Harbour porpoise	Whitsands Bay	starvation/hypothermia (neonate)
21/05/2015	C/2015/040	Short-beaked common dolphin	Mawgan Porth	starvation/hypothermia
12/07/2015	C/2015/053	Harbour porpoise	Mawgan Porth	physical trauma, acute (neonate)
18/07/2015	C/2015/055	Short-beaked common dolphin	Devoran Creek, Perranarworthal	gastric parasitism, heavy
01/08/2015	C/2015/059	Striped dolphin	Little Petherick Creek	gastric parasitism, heavy
03/08/2015	C/2015/058	Risso's dolphin	Lamorna Harbour	not established (possible physical trauma)
17/08/2015	C/2015/063	Harbour porpoise	Gunwalloe, Lizard peninsula	physical trauma, by-catch
22/08/2015	C/2015/065	Harbour porpoise	Porthleven	physical trauma, by-catch
30/08/2015	C/2015/066	Short-beaked common dolphin	St. Ives	gastric perforation (fundic), acute peritonitis
09/09/2015	C/2015/068	Short-beaked common dolphin	Maenporth	gastric inversion
27/09/2015	C/2015/075	Short-beaked common dolphin	Swanpool beach, Falmouth	pulmonary abscesses, extensive
11/10/2015	C/2015/076	Harbour porpoise	Penzance	physical trauma, bycatch
21/11/2015	C/2015/085	Short-beaked common dolphin	Porthtowan	physical trauma, acute; live stranding
06/12/2015	C/2015/090	Harbour porpoise	Maenporth	parasitism, heavy (multiple sites); aged
08/12/2015	C/2015/091	Harbour porpoise	Polkerris Beach	parasitism, pulmonary (heavy)
15/12/2015	C/2015/093	Harbour porpoise	Par	physical trauma, bycatch

Table 1: Cetacean post-mortem reports (2015) – gross post-mortem findings (source: CSIP)

Photo 4: Risso's Dolphin, Lamorna Cove, 03.08.2015, C-2015-058, photo by Mick Dawton

3.1.2 Bycatch Evaluation Evidence Protocol (BEEP)

The Cornwall Wildlife Trust Marine Strandings Network (CWT MSN) 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 under its Bycatch Evaluation Evidence Protocol (BEEP). Other causes of injury, such as damage caused to the carcass by rocks during stranding, are discounted.

74 cetaceans were examined and recorded in situ by CWT volunteers and staff using BEEP. Of these, 12% (n=9) 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 the BEEP report if there was no other evidence of new entanglement observed.

The other 65 animals examined in-situ showed no features consistent with bycatch. The cause of death of these animals was therefore inconclusive based on the data available, either due to carcasses being unsuitable for examination due to decomposition, or that the cause of death was attributable to other factors such as disease. For the full BEEP report, please see Appendix 1.

Common Dolphin C/2015/052 (SW2015/519)	Church Cove, Gunwalloe SW661204	04/07/2015	Encircling monofilament net marks to dorsal fin and head between crease and blowhole. Monofilament net marks follow around dorsal fin and traverse across the LHS body to the side of the pectoral fin joining net marks from the head. Broken and misaligned teeth to lower RHS jaw. Skin edge slice to RHS fluke.
  			
Harbour Porpoise C/2015/008 (SW2015/487)	Watergate Bay, Newquay SW840649	03/02/2015	Encircling net mark to melon. Possible clean cut to tailstock. Possible encircling monofilament net marks to dorsal fin. 50mm slice to LHS of belly. Lip cut to LHS & RHS lower jaw. Blood in the eyeball LHS.
  			

Figure 7: Two examples of in-situ bycatch analysis (see Appendix 2 for full list)

3.2 Grey seals

125 dead grey seals (*Halichoerus grypus*) were recorded by the CWT MSN in 2015, of which 30% (n=38) were categorised as pups measuring less than 120cm. Figure 8 shows the gender of these seal strandings, with 25% seals were male (n=31), with 15% female (n=18) and 60% of unknown gender (n=74).

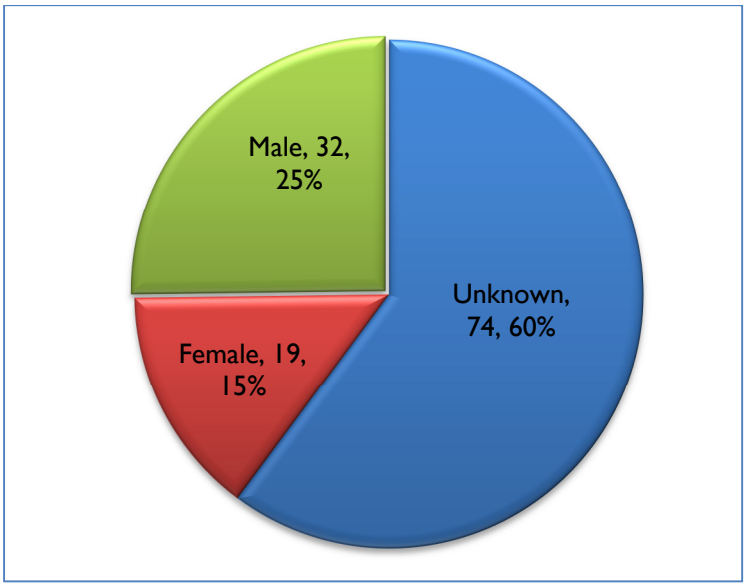

Figure 8: Grey Seal strandings gender classes (2015)

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 seal strandings during the winter months.

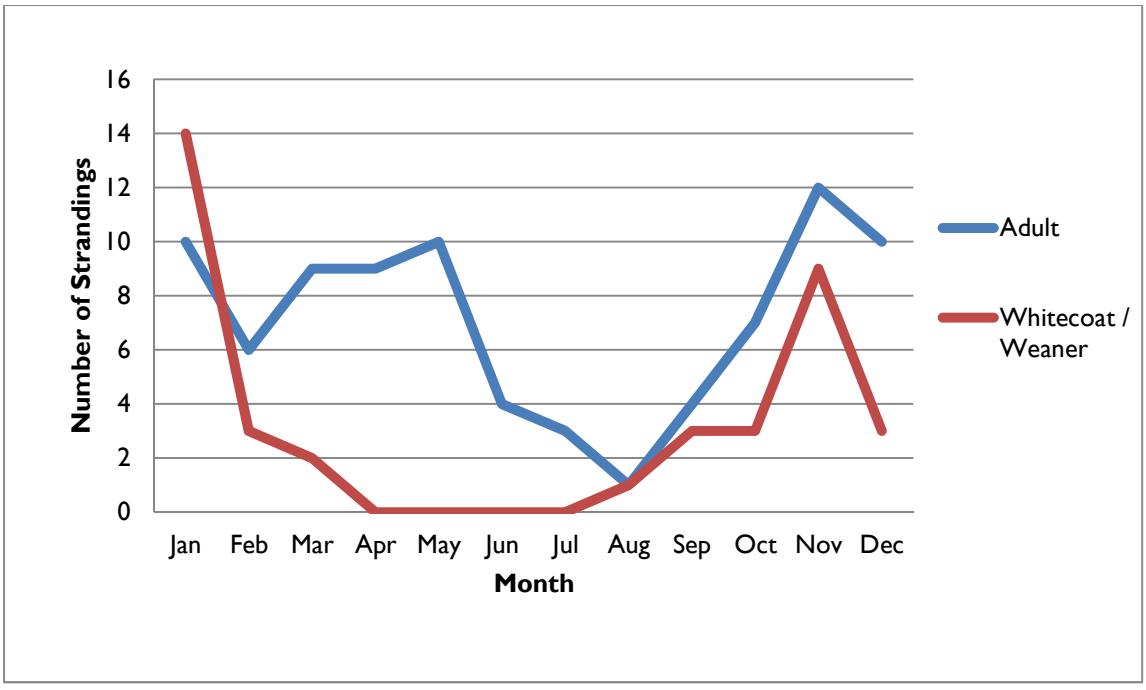

Figure 9: Juvenile and adult grey seal strandings per calendar month in 2015 (n=125)

The majority of grey seal strandings were in January, and then between November and December which coincides with the peak breeding and weaning season. The unusually high number of seal strandings recorded in January 2015, (n=24), is thought to be due to storm systems hitting the Cornish coast, coinciding with the end of the pupping season (Figure 10).

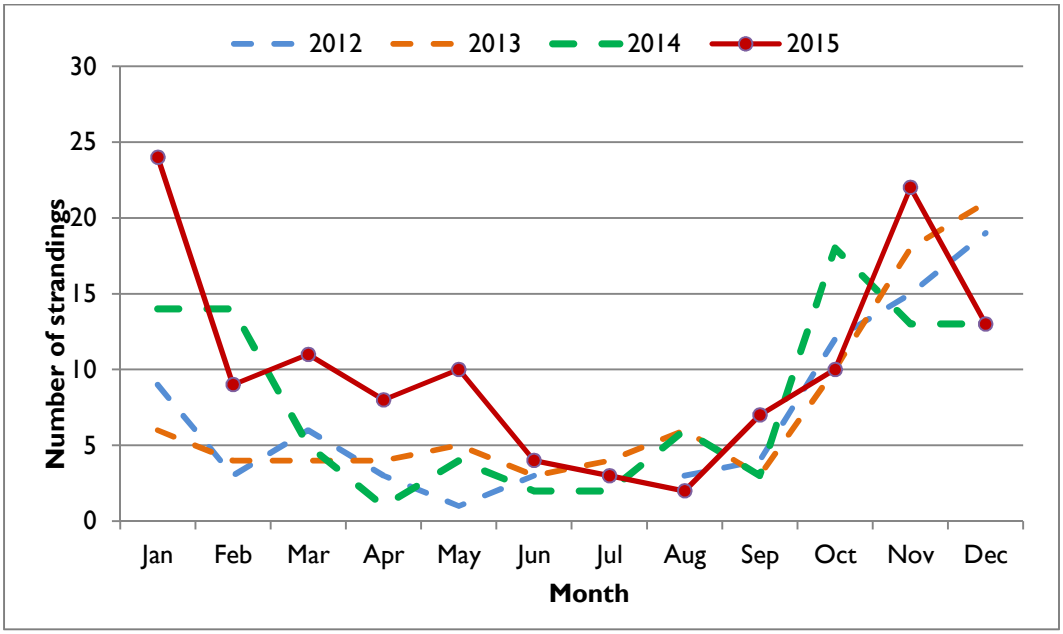

Figure 10: Grey seal strandings per calendar month in 2015 (n=125) compared to the monthly totals for 2011 – 2014

Grey seal strandings have been recorded in detail on the CWT MSN database since 2000. 2015 saw the highest number of grey seal strandings recorded since that time, with 125 reported to MSN (Figure 11). The increasing trend in grey seal strandings is thought to be due to increased awareness and effort in reporting these animals to CWT MSN. However, we continue to monitor this trend closely.

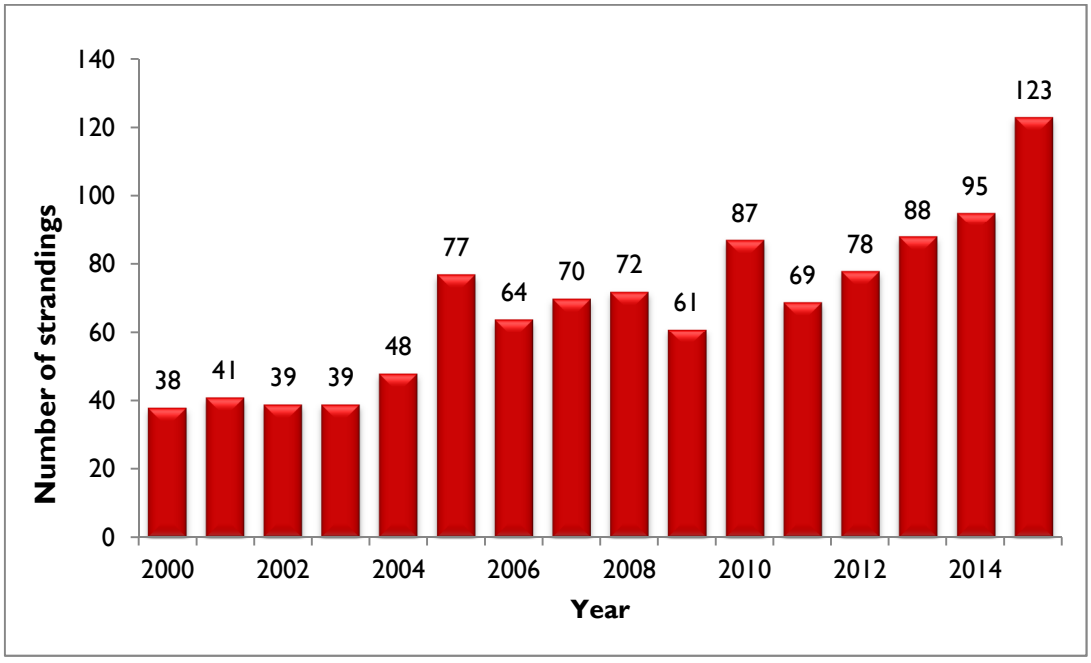

Figure 11: Comparison of grey seal strandings by year (2000 – 2015)

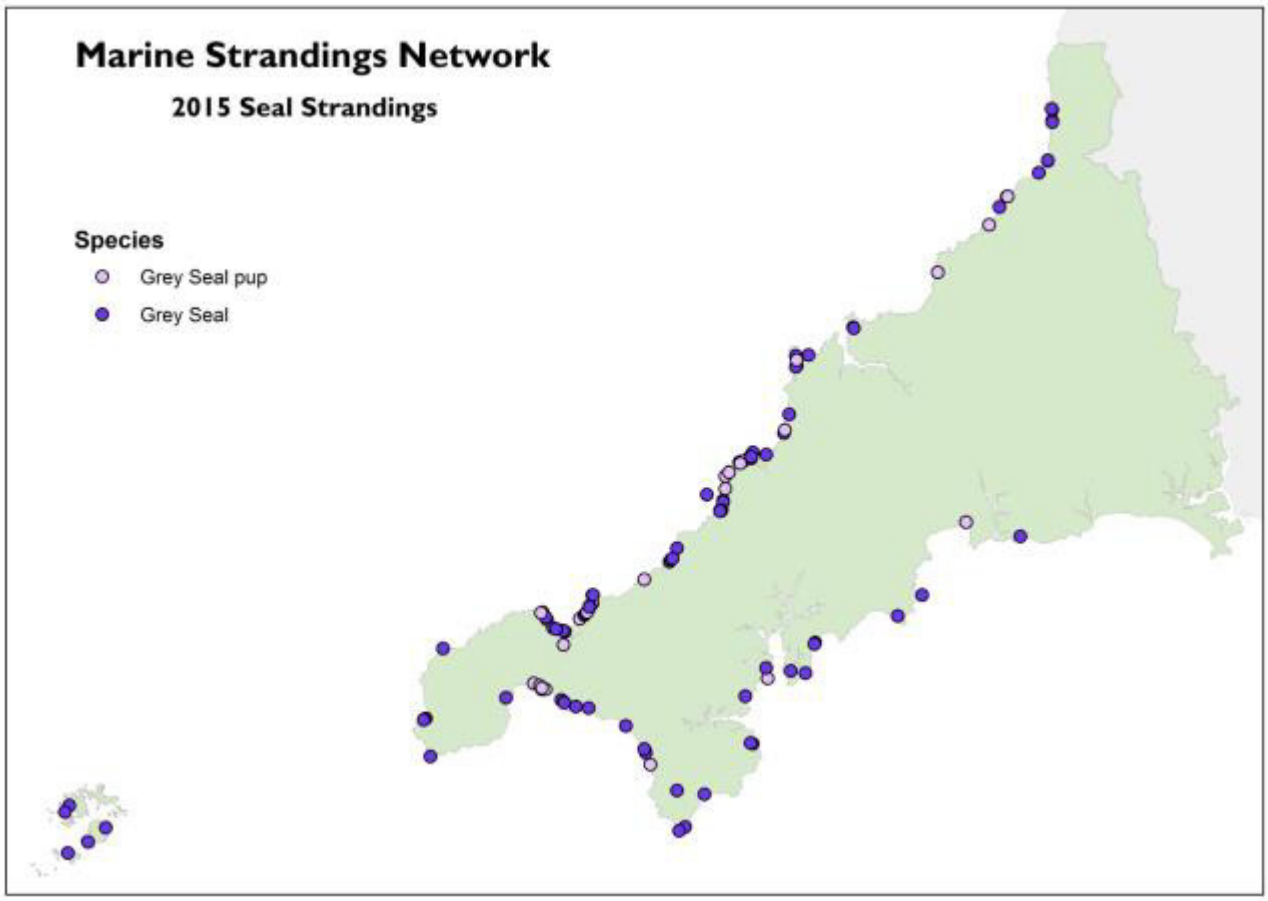

Figure 12: Locations of grey seal mortalities (2015) (n=123)

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.

Photo 5: Grey seal adult, Praa Sands, 24.10.2015, S-2015-094, photo by Mick Dawton

Thanks to collaborative work with Cornwall Seal Group Research Trust (CSGRT), three stranded seals (4%) were identified from their photo-ID catalogue, Spade, Septimus, and Key Chain, plus one tagged by the RSPCA West Hatch in Somerset (photo 6). Examination of the CWT MSN seal stranding data recorded in-situ confirmed two animals to have clear and confirmed signs consistent of entaglement, with one example shown in photo 7 below.

Photo 6: Grey seal adult stranded on Polzeath, tagged by RSPCA West Hatch, 01.12.2015, S/2015/113, photo by Arthur Boyt

Photo 7: Grey seal adult showing signs of entanglement, 02.04.2015, S/2015/047, photo by Malcom McKenzie

3.2.1 Seal post-mortem examinations

10 seals were retrieved for post-mortem examination in 2015. Post-mortem examination was carried out by veterinary pathologist James Barnett at University of Exeter Cornwall Campus. There were four cases of infectious disease, two cases of bycatch, three cases of trauma, and significantly one cause of death was from rifle shot which was found on the Isles of Scilly.

Date	Cornwall ID	National ID	Location	Cause of Death
13/01/2015	S/2015/017	SS2015/23	Portreath beach	Infectious disease
15/01/2015	S/2015/018	SS2015/24	Church Cove, Gunwalloe	Infectious disease
26/01/2015	S/2015/020	SS2015/41	Perranporth beach	Infectious disease
21/02/2015	S/2015/033	SS2015/62	Tolcarne beach, Newquay	Trauma
29/03/2015	S/2015/045	SS2015/85	Treyarnon Bay, Padstow	Infectious disease
28/05/2015	S/2015/061	SS2015/155	Fistral beach, Newquay	Bycatch
24/10/2015	S/2015/094	SS2015/246	Praa Sands, Helston	Trauma with secondary infection
01/11/2015	S/2015/096	PM by IOS Heike Dorne	Pelistry beach, St Mary's IOS	Rifle shot
06/11/2015	S/2015/090	SS2015/265	Marazion beach, Penzance	Bycatch
07/11/2015	S/2015/091	SS2016/408	Top Tieb beach, Marazion	Trauma with secondary infection

Table 2: Seal post-mortem examinations, gross findings

Photo 8: Grey seal adult, Praa Sands, 24.10.2015, S-2015-094, photo by James Barnett

3.3 Birds

2015 saw a low number of stranded seabirds, with only 55 animals recorded, consisting of 11 different species (see Table 3). This is a dramatic reduction in seabirds strandings compared with the previous year, when 1,930 birds were reported most of which were attributed to the impact of severe winter storms across the UK in early 2014.

Species	Number of Reports	Estimate number of animals
Gannet	18	32
Guillemot	7	8
Cormorant/Shag	3	4
Puffin	2	2
Cormorant	2	2
Shag	2	2
Razorbill	1	1
Black-headed gull	1	1
Manx Shearwater	1	1
Bird species	1	1
Great black-backed gull	1	1
Grand Total	**39**	**55**

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

Bird strandings have always been under-reported in Cornwall. 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 stranded birds, they continue to be under-reported.

Month	2010	2011	2012	2013	2014	2015
January	0	0	342	0	81	6
February	0	2	0	12	1657	0
March	1	0	0	4	166	10
April	1	0	0	2350	3	11
May	11	0	0	52	7	2
June	0	2	0	52	3	7
July	0	1	2	7	1	6
August	1	0	0	6	3	2
September	10	0	0	3	0	1
October	0	0	0	6	8	1
November	1	1	2	2	1	5
December	1	1	1	20	0	4
Total	**26**	**7**	**347**	**2514**	**1930**	**55**

Table 4: Total numbers of sea birds reported to MSN between 2010 and 2015
(CWT MSN NOTE: The numbers of birds are either exact counts or conservative estimates.)

3.4 Sharks

There were 2 reports of stranded basking sharks in Cornwall in 2015. These were reported to University of Exeter Cornwall Campus for samples to be collected. Other species of shark reported to MSN include three tope sharks and two nursehounds.

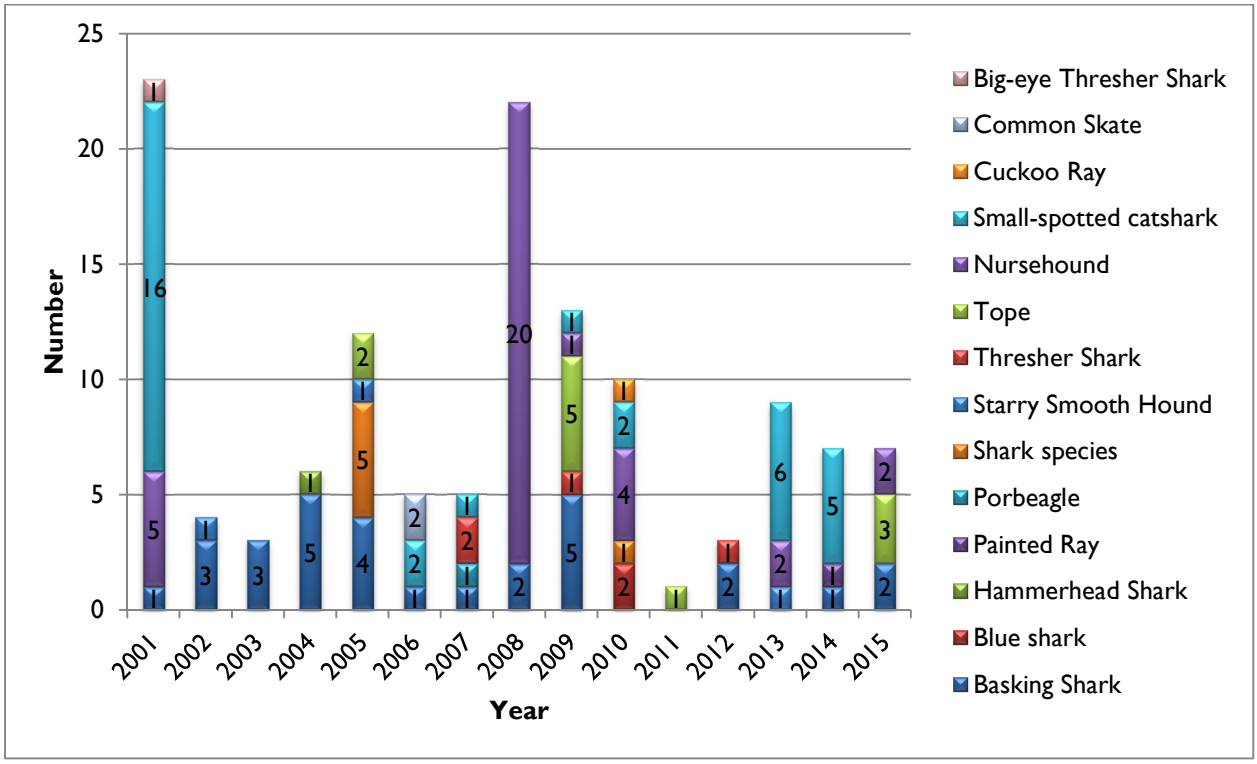

Figure 13: Shark strandings 2000 – 2015

Photo 9: Tope Shark, Porth Beach Newquay, 19.03.2015, DBID11811, photo by Mike Boyse

3.5 Marine turtles

In 2015 there were three reports of turtles stranding on Cornwall beaches; one leatherback turtle, one Kemp's Ridley and one loggerhead. In all cases the remains were severely decomposed, therefore it was impossible to determine cause of death.

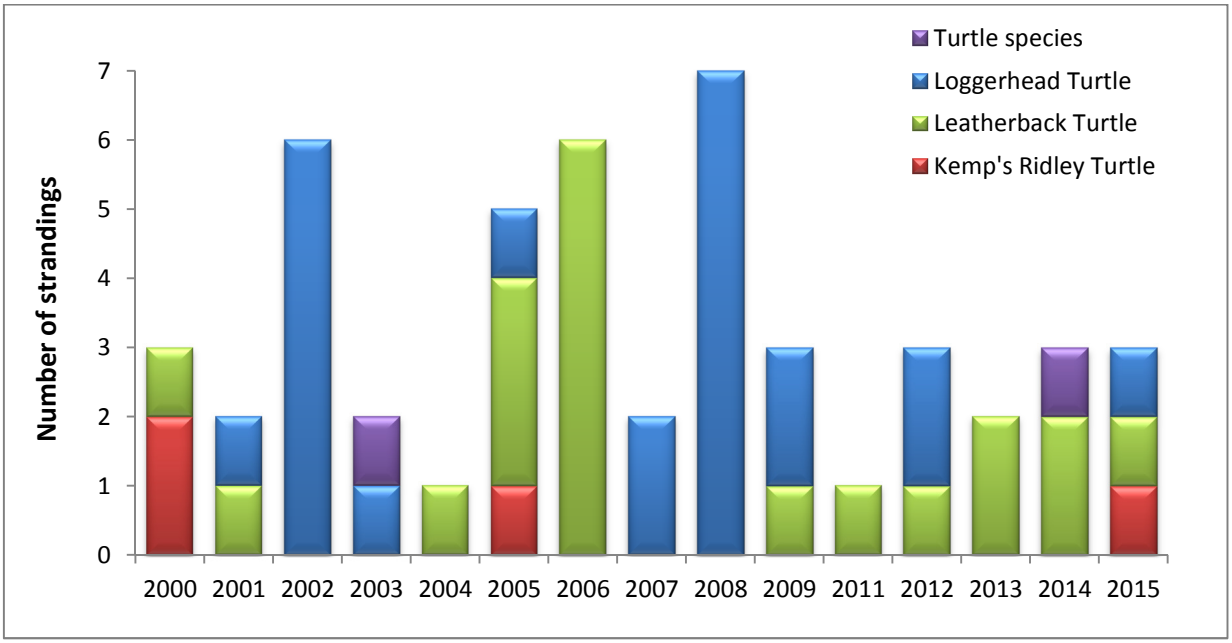

Figure 14: Marine turtle strandings 2000 – 2015

Photo 10: Kemp's Ridley turtle, Priest's Cove Cape Cornwall, 06.12.2015, T-2015-002, photo by Paul Semmens

3.6 Other strandings

62 other animals, comprising of 17 different species, were recorded to MSN In 2015. This included 6 different jellyfish species, and 2 species of hydrozoa. There were large numbers of barrel jellyfish sightings this year and this was also seen in the number of strandings reported, with 21 individuals reported to CWT MSN (compared to 30 in 2014 and 0 in 2013). However, it is acknowledged that these figures vastly underestimate the true number of jellyfish strandings as these are generally under-reported.

Species	Grand Total
Barrel Jellyfish	21
Blue Jellyfish	1
By-the-Wind Sailor	5
Columbus Crab	1
Common Cuttlefish	2
Common Goose-barnacle	4
Compass Jellyfish	2
Conger Eel	3
Crystal Jellyfish	1
Edible Crab	1
Grey Triggerfish	9
Mauve Stinger	7
Moon Jellyfish	1
Pink Sea Fan	1
Portuguese Man-of-War	1
Spiny Starfish	1
Stocky cerith	1
Total	**62**

Table 5: Other stranded species reported to CWT MSN in 2015

Photo 11: By-The-Wind Sailor, Watergate Bay, 27.11.2015, DBID12024, photo by Tracey Williams

4.0 Events

4.1 New volunteer training

A total of 16 new volunteers were trained at Bude, North Cornwall in September 2015.

Photo 12: New volunteers trained in Bude at annual CWT MSN Training Day September 2015, photo by Abby Crosby

Photo 13: Carrying a dead common dolphin above high tide line so it can be recorded, Portwrinkle Beach Whitsands Bay, 06.05.2015, C-2015-035, photo by Claire Wallerstein

4.2 MSN Forum 2015

In October 2015, 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 2015 the focus of the forum was pollution. Among the presentations were topics including; 'PCBs in European top predators' by Paul Jepson, Institute for Zoology; 'The trends in a range of legacy and emerging chemical pollutants in UK marine mammals' by Robin Law, Centre for Environment, Fisheries and Aquaculture Science; 'The investigation into the 2011 pilot whale mass stranding in Durness, NE Scotland' by Rob Deaville, Institute for Zoology and 'The extent and impact of ghost fishing gear on Cornish grey seals' by Sue Sayer, Cornwall Seal Group.

Photo 14: Delegates at the 2015 annual MSN Forum, photo by CWT MSN

5.0 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, Dee Medlicott, Kate Atack, Abbie Brook, Anthea Hawtrey-Collier, Mike Lord.
- Anthea Hawtrey-Collier for all her work on collating, assessing, checking and entering records into the database.
- Frugi Ltd, for their financial support to CWT Living Seas programme.
- University of Exeter, Cornwall campus for collaboration on post mortem examinations
- James Barnett, veterinary pathologist and advisor to the MSN.
- 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.
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Appendix 1:

APPENDIX 1:

Cornwall Wildlife Trust Marine Strandings Network
BYCATCH REPORT 2015

1.0 Introduction

The Cornwall Wildlife Trust Marine Strandings Network (CWT MSN) 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 under its Bycatch Evaluation Evidence Protocol (BEEP). Other causes of injury, such as damage caused to the carcass by rocks during stranding, are discounted in BEEP assessments.

Figure 1 and 2 are of the BEEP guide, which illustrates the photos volunteers are to take for BEEP analysis. Photos are taken using digital cameras and in high resolution to enable analysis by trained MSN staff. All animals determined as showing features of bycatch are verified both by at least two trained members of MSN, and by James Barnett, Veterinary Pathologist at University of Exeter Cornwall Campus.

Bycatch Evidence Evaluation Project (BEEP)

This guide illustrates the photos to take for the BEEP. At this stage of the project, we are recording *all* marks regardless of their cause, to test the method. Please **take all the photos listed** using a digital camera, regardless of whether marks are present or not. Wear disposable gloves and **wash all sand and debris off the animal before you take any pictures to reveal important clues**. Continue to do this throughout the examination, taking care not to wash off any netting.

Please use this sheet in conjunction with the latest **CWT MSN Cetacean Recording form** which is available on the web site at www.cwtstrandings.org. Thank you.

Cornwall Marine Strandings Network

View of animal at stranding site to show location, beach type, rocks etc. which may cause scratches.

Full side view, right, to help confirm species and determine carcass condition (level of decomposition).

Full side view, left, to help confirm species and show level of decomposition, which may be different from the right side.

Head from above to show any/all marks, especially encircling marks or indentations round head or beak.

Head, right side to show any/all marks

Head, left side to show any/all marks.

Blowhole to show any froth and whether open or closed.

Teeth (upper and lower jaw) to show broken/dislodged teeth and any cuts/net marks; broken jaw. Take care with sharp teeth.

Baleen plates to help confirm species.

Dorsal fin, both sides, to show any fin-edge cuts, slices or encircling marks.

Tail from above and below to show any fin-edge cuts, slices or encircling marks.

Pectoral fins, especially the edges, to show fin-edge cuts/slices, encircling marks, or abrasions.

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Figure 1: *Page one of the BEEP illustrative guide for MSN volutneers*

Rope or net on any part of animal, plus close-ups of knots. Measure 1 horizontal, and 1 vertical, side of mesh to determine type of fishery.

Possible net marks/indentations anywhere on body. **Photograph following the complete arc of encircling marks from all angles.**

Close-ups of any holes, including scavenged holes, **plus wider views** to show where they are on the body.

Amputated appendages: wide views and body part views to show which limbs are affected.

Amputated stump, close-up, to show clean or ragged edges; help determine type of implement used; or rule out deliberate amputation.

Deep cuts, puncture wounds, to help determine cause.

Fresh rake (tooth) marks. Include a ruler at right angles to the marks to help determine the species of the aggressor.

Both eyes (or eye sockets): blood in the eyeball or coming from the eye, together with other features, may be an indicator of bycatch.

Genital area and underbelly, to confirm sex and show any marks.

'Skyline' view, (from the head looking towards to tail), to show nutritional state as a possible indicator of disease.

'Tattoo' marks, pox marks etc., which may help to show disease.

Other relevant photos: any other stranded animals (seals, birds, other cetaceans), net nearby, fishing boasts close-by etc.

Thank you for your help with this important research project.

When we have sufficient records and photos, we will statistically analyse them so that we can eliminate any marks which are not reliable indicators of bycatch. We will then go to the next stage of the Project, which is to produce the final version of the method for diagnosing bycatch features in the absence of a *post-mortem* examination.

Please email your records and digital photos **as soon as possible** (full size, do not reduce, so that we can zoom in to look closely at the marks) to: records@cwtstrandings.org or post to:

Jan Loveridge, CWT Marine Strandings Network, Higher Trewardreva, Trewardreva, Falmouth TR11 5QB.

If you would like a laminated copy of this sheet, please contact us.

Figure 2: *Page two of the BEEP illustrative guide for MSN volutneers*

2.0 Results

In 2015, a total of 96 dead stranded cetaceans were recorded by the CWT MSN. Of these, 22 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 8 of the 22 (36%) cetaceans were very suspicious of bycatch; the findings of these examinations are published below in Section 3.0 of this report and with the kind permission of the CSIP (*animals that were subject to necropsy are highlighted in blue in Section 3 below*).

The remaining 74 cetaceans were examined and recorded in situ by CWT volunteers and staff using BEEP. Of these, 12% (n=9) showed features consistent with bycatch. The findings of these examinations are published below in Section 3.0 of this report (*animals that were subject to in-situ examination are highlighted in white in Section 3 below*). These bycatch 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 the BEEP report if there was no other evidence of new entanglement observed.

The other 65 animals examined in-situ showed no features consistent with bycatch. The cause of death of these animals was therefore inconclusive based on the data available, either due to carcasses being unsuitable for examination due to decomposition, or that the cause of death was attributable to other factors such as disease.

To conclude, evidence of bycatch was identified in 18% (n=17) of all stranded cetaceans (n=96) in 2015 through analysis of external marks and post mortem examination (Table 1), each of these are described in Section 3.0 of this report.

Species	Total No. Examined	No. with Bycatch Features in situ and PM	% Examined with Bycatch Features
Common dolphin	36	**8**	22%
Harbour porpoise	42	**9**	21%
Dolphin species	9	0	0
Bottlenose dolphin	0	0	0
Striped dolphin	2	0	0
Pilot whale	1	0	0
Whale species	1	0	0
Risso's dolphin	4	0	0
Cetacean	1	0	0
Total	**96**	**17**	**18%**

Table 1: Summary of the proportion of stranded cetacean species examined by MSN in 2015 through post mortem and in-situ examination

Figure 3 displays the percentage of examined cetaceans found to have evidence of bycatch over the previous five years. Cetaceans studied in-situ displaying evidence of bycatch has remained stable in 2015 compared with 2014 at 12%. Post mortemed cetaceans whose death is likely to be caused by bycatch has dramatically increased from 7% in 2014 to 36% in 2015, however this increase is likely due to the post mortem laboratory being closed for the final three month of 2014 therefor impacting on the number of carcasses examined.

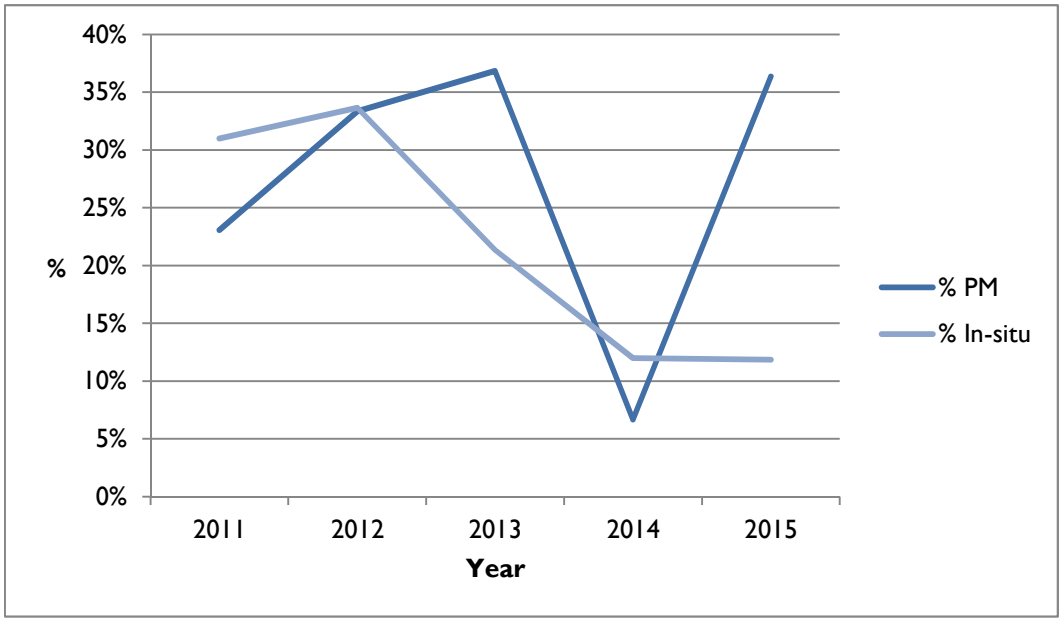


Figure 3: *Percentage per year* of stranded cetaceans which exhibited features of bycatch, assessed by post mortem examination or in-situ assessment, over the last five years.

Figure 4 shows the number of cetaceans with evidence of bycatch both by post mortem and in-situ per month in 2015. There was a peak of cetaceans with evidence of bycatch in May 2015, with four animals recorded.

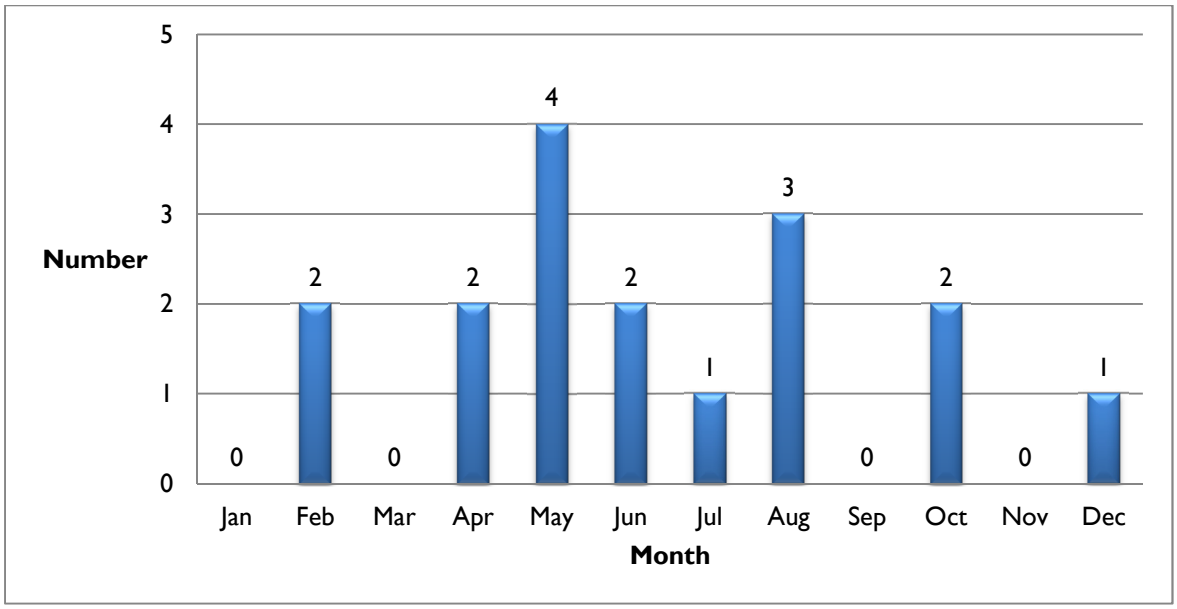


Figure 4: *The number of stranded cetaceans which exhibit feautures of bycatch, assessd by either post mortem examination or in-situ assessment, by month during 2015*

Stranded cetaceans with evidence of bycatch, determined both by post mortem and in-situ examinations, are distributed around both the north coasts and south coasts of Cornwall, however there is a clear hot spot within Mounts Bay (Figure 5).

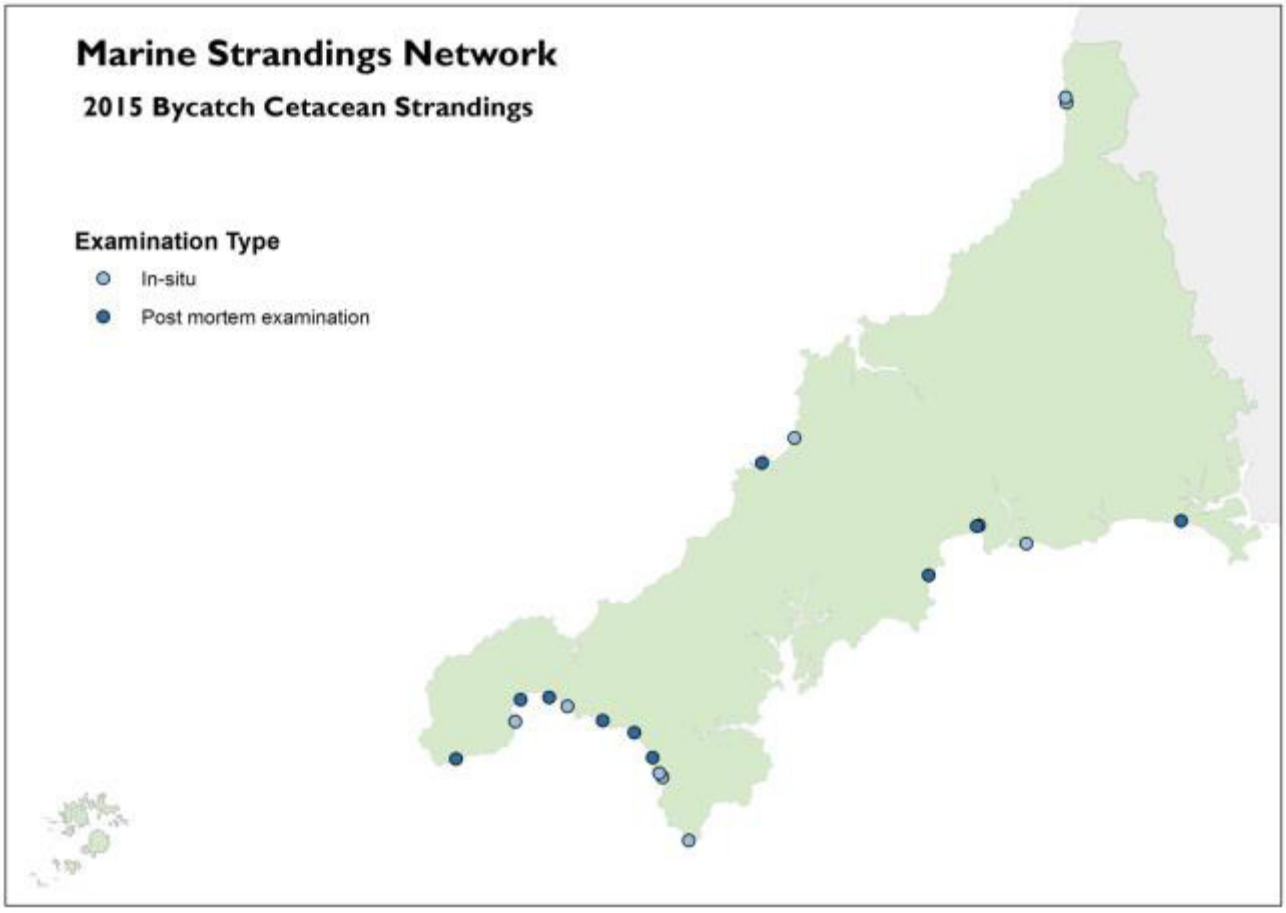
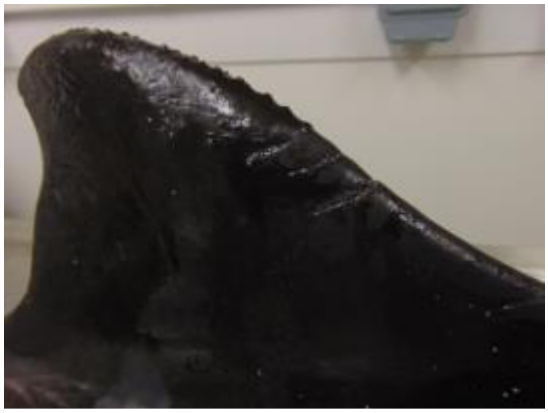
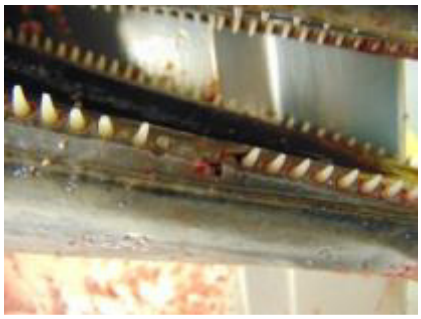


Figure 5: *The location of 2015 stranded cetaceans with bycatch features; dark blue indicates animals which were subject to post mortem examination and light blue indicates those which underwent in-situ assessment.*

3.0 Summary of all animals which exhibited signs of bycatch in 2015

NOTE: The animals in the white boxes were assessed in-situ. Those highlighted in the blue boxes were assessed via post mortem. Those highlighted in the green boxes are animals which underwent both BEEP assessment in-situ and post mortem examination.

Reference	Location	Date	Gross post-mortem examination findings/observations
Harbour Porpoise C/2015/015 (SW2015/486)	Northcott Mouth, Bude SS201094	01/02/2015	Small lip cut to lower RHS jaw. Tips of dorsal fin, LHS pectoral fin and tail flukes absent. Both jaws broken. Two linear marks to RHS upper jaw crossing melon.
			
Harbour Porpoise C/2015/008 (SW2015/487)	Watergate Bay, Newquay SW840649	03/02/2015	Encircling net mark to melon. Possible clean cut to tailstock. Possible encircling monofilament net marks to dorsal fin. 50mm slice to LHS of belly. Lip cut to LHS & RHS lower jaw. Blood in the eyeball LHS.
			

Harbour Porpoise C/2015/026 (SW2015/124)	Porthcurno, SW391223	10/04/2015	*The extensive linear wounds, notches and slices on head, fins and flukes, the persistent froth in the airways and congested lungs were consistent with bycatch.*
			
Common Dolphin C/2015/031 (SW2015/135)	Praa Sands, Helston SW586274	30/04/2015	*The linear wounds over the thorax and dorsal fin were entirely consistent with bycatch with monofilament netting. The distance between the anterior insertion of the dorsal fin and the oblique angle in one of the linear marks over the left thorax was consistent with an inter-knot distance of 25 cm.*
			
Common Dolphin C/2015/032 (SW2015/137)	Pentewan Beach, Mevagissey SX018467	02/05/2015	*This adult male was in fairly good body condition and had eaten very recently, as was clear from the fish in the oesophagus. The large fin slices in both pectorals, several of the other encircling wounds present on the pectoral and dorsal fins and the inflated, congested lungs and persistent froth in the airways were consistent with bycatch. It is quite possible that the broken teeth and the haemorrhaging, clean cut wound in the tail stock also occurred at the time the animal was caught.*
			

Common Dolphin C/2015/033 (SW2015/505)	Par Beach, St Austell SX085533	04/05/2015	Tail amputated, clean cut. Tip of dorsal fin missing, clean cut. Fin edge slices to leading edge of dorsal fin and pectoral fins. Definite rope/net encircling mark around head, over blowhole and posterior to blowhole.
			
Common Dolphin C/2015/034 (SW2015/506)	Lantic Bay, Fowey SX148509	05/05/2015	Multifilament or rope mark to leading edge of dorsal fin and around LHS. Monofilament mark to upper beak. Monofilament mark to RHS pectoral fin close to body.
			

Common Dolphin C/2015/035 (SW2015/142)	Portwrinkle Beach, Whitsands Bay SX353539	06/05/2015	The amputated tail stock was clearly anthropogenic in origin and very suggestive of amputation undertaken to free an animal from nets. In addition, two linear marks running cranially from the point of amputation looked suspiciously like monofilament net marks. The faint linear impressions seen over the thorax were present when the animal was examined on the beach and may be net or rope marks. In summary, the trauma seen was highly suspicious of bycatch.

Common Dolphin C/2015/046 (SW2015/513)	Sandymouth Beach, Bude SS200101	02/06/2015	Possible clean cut posterior to dorsal fin, lower body from dorsal area missing. Beak severely damaged, upper beak detached from carcass.

Common Dolphin C/2015/044 (SW2015/512)	Poldhu Beach, Lizard SW665199	02/06/2015	Possible encircling fin edge slices to LHS pectoral fin. Fin edge slices to trailing edge of dorsal fin and LHS fluke. Broken jaw RHS.
			
Common Dolphin C/2015/052 (SW2015/519)	Church Cove, Gunwalloe SW661204	04/07/2015	*Encircling monofilament net marks to dorsal fin and head between crease and blowhole. Monofilament net marks follow around dorsal fin and traverse across the LHS body to to the side of the pectoral fin joining net marks from the head. Broken and misaligned teeth to lower RHS jaw. Skin edge slice to RHS fluke*
			
Harbour Porpoise C/2015/063 (SW2015/287)	Gunwalloe Cove, Mounts Bay SW652225	17/08/2015	*This juvenile harbour porpoise was in good body condition and had eaten recently. The encircling wounds around the head, pectoral fins, dorsal fin and flukes, the persistent froth in the airways and the congested, oedematous lungs were consistent with bycatch as the cause of death.*
			

Harbour Porpoise C/2015/064 (SW2015/528)	Perran Sands, Perranporth SW539293	20/08/2015	*Possible encircling mark to tip of lower jaw. Fin edge slices and cuts to flukes. Large slice to tailstock.*
			
Harbour Porpoise C/2015/065 (SW2015/303)	Porthleven Harbour, Mounts Bay SW628258	22/08/2015	*The presence of linear encircling wounds on the flukes and right pectoral, the albeit fine fin slices in the trailing edges of the flukes, the persistent froth in the airways and the congested nature of the lungs was strongly suspicious of bycatch. In addition, there were two well circumscribed oval patches of grey skin discolouration on the left thorax of uncertain aetiology but of a regular size and shape suggesting an anthropogenic origin.*
			

Harbour Porpoise C/2015/076 (SW2015/353)	Albert Pier, Penzance SW477302	11/10/2015	*This juvenile/subadult male was in good body condition and had eaten very recently. The encircling marks and wounds around the head, left pectoral, both flukes and dorsal fin, plus the fin slices in the trailing edges of the right pectoral and both flukes were consistent with bycatch. The large deep wounds on both sides of the jaw may be gaff hook injuries.*
 			
Harbour Porpoise C/2015/077 (SW2015/536)	Roskilly Beach, Newlyn SW470273	15/10/2015	Linear cut to upper jaw. Fin edge cuts to RHS pectoral fin. Tips of dorsal fin, LHS pectoral fin and RHS fluke missing.
 			

Harbour Porpoise C/2015/093 (SW2015/424)	Par Beach, Fowey SX082532	15/12/2015	*This post mortem examination was carried out by my colleague, Rob Deaville.* *This juvenile male harbour porpoise was in excellent nutritional condition and had fed recently. The skin tag on one pectoral, linear impressions/incisions on flukes and fins, excised tip of one fluke and evidence of recent feeding were considered to be consistent with bycatch.*
			

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 Hawtry-Collier, Jan Loveridge, and James Barnett in the compiling of this report.

Cornwall Wildlife Trust

Protecting Cornwall's wildlife and wild places

ERCCIS Recording Mapping Informing

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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.