March 2017

2016 West Coast Entanglement Summary

NOAA FISHERIES
WEST COAST REGION

Overview of Entanglement Data

In 2016, 71 separate cases of entangled whales were reported off the coasts of Washington, Oregon, and California, as well as in neighboring countries with gear from U.S. fisheries. This is the highest annual total for the West Coast of the United States since NOAA Fisheries started keeping records in 1982. We confirmed 48 of the 71 cases via the documentation submitted, follow-up sightings, and entanglement response information provided to NOAA Fisheries' West Coast Marine Mammal Stranding Network. Unconfirmed reports are received from a variety of sources with varying levels of credible information; however, the report cannot be verified as confirmed based on the nature of the report (e.g., photo or video documentation may not exist). Numerous additional reports identified as resightings of entangled whales previously reported were also received. The increase in entanglement reports likely reflects a variety of factors, including changes in whale abundance and distribution, shifting patterns in human activities like fishing, and increased public reporting. Humpback whales continue to be the predominant species reported as entangled, with 54 separate entanglement cases reported and 42 cases confirmed in 2016. This year there were four entangled blue whales cases reported on the West Coast, three of which were confirmed with photographs.

Entanglements were reported throughout the year, but the highest number of cases was reported in August- with 15 documented cases. Of the 71 reported whale entanglement cases in 2016 summarized in Tables 1 and 2, 66 were reported off California, one off Washington, one off Oregon, two off Baja (Mexico), and one off British Columbia (Canada) (Figure 1). However, the location where entangled whales are observed and reported does not necessarily reflect where and when the entanglement originated (e.g., the two entanglements in Mexico and one in Canada included here were associated with California Dungeness crab gear). Animals can remain entangled in gear for long periods of time and still be capable of traveling great distances. While entanglements with fishing gear from California are known to occur, higher reporting rates in California may also reflect factors such as a higher level of human activity (e.g., recreation and whale watching). In addition, whales frequently visit preferred sites during migrations and there may be a greater likelihood of an entangled whale being seen and reported off the coast of California even when the entanglement may have originated somewhere else.

Humpback whale breaching shows line entanglement through mouth, around left pectoral flipper, with trailing towards tail. Photographed under MMHSRP Permit #18786

2016 West Coast Whale Entanglement Summary

Comparing Entanglement Reporting in 2015 and 2016

Tables 1 and 2 compare entanglements in 2015 and 2016. Entanglement reports were received in every month in both years. Significant entanglement reporting occurred in April through June of 2016 coinciding with the unusually late and irregular opening of the California Dungeness crab fishery in 2016. This unusual crab fishing season likely influenced the distribution and concentration of gear during this time period relative to past seasons.

It should be noted that the data reported in Tables 1 and 2 do not account for reports determined to be resightings of entangled whales previously reported, known to be a fairly common occurrence, especially during the summer and fall months.

Table 1. 2016 U.S. West Coast whale entanglement reporting activity by year, in comparison to 2015. Unk = Unidentified whale species

Humpback Whales		Gray Whales		Blue Whales		Killer Whales		Fin Whales		Unidentified (Unk)	
2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
54	**35**	**3**	**12**	**4**	**1**	**1**	**1**	**0**	**2**	**9**	**11**

Table 2. 2016 U.S. West Coast whale entanglement reporting activity by month, in comparison to 2015. Unk = Unidentified whale species

Month	2016 Humpbacks	2016 Other whales	2016 Total	2015 Humpbacks	2015 Other whales	2015 Total
January	1	0	**1**	2	0	**2**
February	2	1 gray	**3**	2	2 gray, 1 fin	**5**
March	1	0	**1**	1	4 gray, 1 Unk	**6**
April	6	2 gray, 1 killer, 1 Unk	**10**	0	1 killer	**1**
May	8	5 Unk	**13**	4	1 gray, 3 Unk	**8**
June	10	1 blue	**11**	5	0	**5**
July	1	1 blue	**2**	5	1 gray	**6**
August	12	2 blue, 1 Unk	**15**	2	1 gray, 2 Unk	**5**
September	3	2 Unk	**5**	6	2 gray, 1 blue, 2 Unk	**11**
October	6	0	**6**	6	1 fin	**7**
November	1	0	**1**	2	3 Unk	**5**
December	3	0	**3**	0	1 gray	**1**
Total	**54**	**17**	**71**	**35**	**27**	**62**

2016 West Coast Whale Entanglement Summary

Sources of Entanglement

Of the 48 confirmed entanglement cases, 29 were identified as associated with specific fisheries or gear type. This includes gear identifiable to both state and federally managed fisheries occurring off the coasts of Washington, Oregon, and California (Table 3). In 2016, there was an increase in the number of reported whale entanglements identified as associated with the Dungeness crab commercial trap fishery compared to 2015 and previous years. There are multiple fisheries on the West Coast known to have been involved with entanglements in recent years, and the number of entanglements identified to individual fishery type has varied from year to year. NOAA Fisheries is increasingly able to identify a number of details associated with entanglements events including gear type, location, timing, etc., as the documentation of entanglements continues to improve. NOAA Fisheries is working closely with the fishing industry and fishery managers to increase knowledge of fixed gear fisheries and promote improved marking of gear to make it easier to identify the specific sources of entanglements.

Table 3. Identified sources of entanglements on the West Coast in 2015 and 2016

Fishery type	Number of reports for 2016	Number of reports for 2015
Dungeness crab commercial trap fishery	22 (1 killer, 2 blue, 19 humpback)	11 (9 humpback, 1 killer, 1 gray)
Gillnet fisheries	2 (humpback)	5 (3 humpback, 2 gray)
Spot prawn trap fishery	3 (humpback)	0
Sablefish trap fishery	2 (humpback)	0
Dungeness crab recreational trap fishery	0	1 (humpback)
Spiny lobster fishery	0	1 (humpback)

Outcomes of Entanglements Reported in 2016

Disentangled: There were five well-documented cases where entangled whales were fully released, and two other cases where gear was described as removed but it was unknown if a full release occurred.

Partial Disentanglement: There were two cases where some, but not all, of the gear was removed from the whale.

Self-release: There were three cases where the whale was observed to escape from the gear on its own or was later observed to be free of the gear.

Unknown Outcome: There were fifty-nine cases where the outcome is unknown although none of the entangled whales were originally reported as dead or later observed to have died.

Response team in inflatable boat approaches entangled whale in an attempt to cut lines and fully remove entangling gear. Photographed under MMHSRP Permit #18786

2016 West Coast Whale Entanglement Summary

Geographic location of entanglements reported in 2016

- Reports originated from throughout the U.S. West Coast but were concentrated in central and southern California
- 73% (n=52) of reports originated from central California (Marin, Monterey, San Francisco, San Mateo, San Luis Obispo, and Sonoma counties)
- 42% (n=30) of reports were made from Monterey County
- 18% (n=13) of reports originated from southern California (Santa Barbara, Los Angeles, Orange, and San Diego counties)

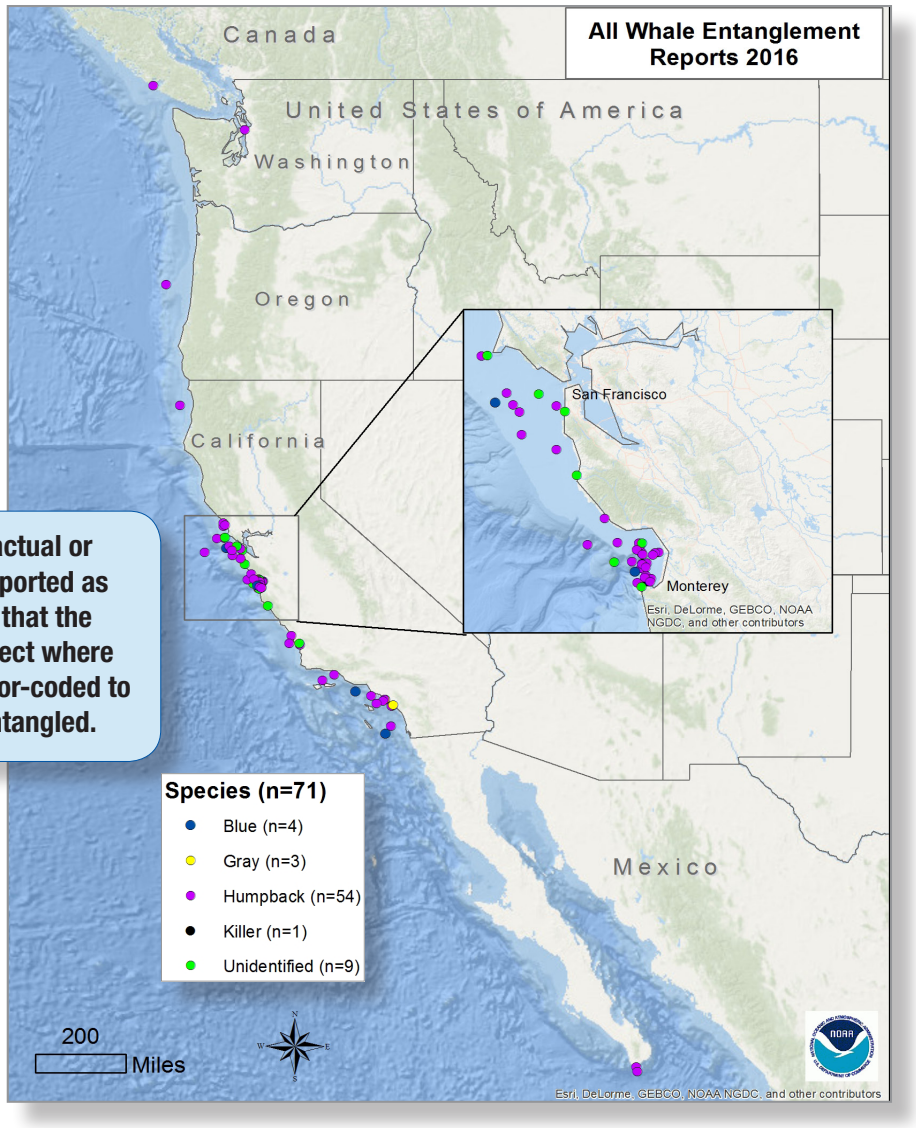

Figure 1. Colored dots on the map show actual or estimated locations where whales were reported as entangled in 2016. It is important to note that the entanglement report locations may not reflect where the entanglement occurred. The dots are color-coded to show the species of whale reported as entangled.

Underwater photo, taken with a camera on a pole, used by rescue team to document entanglement wrapped line and buoy around humpback caudal peduncle (tail stock). Photographed under MMHSRP Permit #18786

2016 West Coast Whale Entanglement Summary

2016 Developments of Interest

- There were several cases where U.S. commercial fishing gear was observed and/or removed from humpback whales in Canada and Mexico. In these instances, communication and cooperation between individuals involved in entanglement response in different countries was essential in helping determine the origins of the fishing gear. These cases highlight the international scope of the entanglement issue, emphasize the value of comprehensive documentation of entanglement events, and strengthen relationships across international borders.
- In 2016 there were numerous cases where entangled whales were resighted multiple times, including some whales showing signs of significant health deterioration over time. Some entangled whales were resighted gear-free and showed signs of healing from injuries. These cases illustrate how an entanglement event can evolve over time, and highlight the need to enhance our understanding of the outcomes of entanglements to better assess the consequences of entanglements to whale populations.

Humpback whale breaches showing blue gillnet entangled around head. Photographed under MMHSRP Permit #18786

Addressing the Current Problem

- The California Dungeness Crab Fishing Gear Working Group initially convened in the fall of 2015 to address the recent increase in entanglements and discuss potential solutions to the problem. An updated Best Practices Guide was produced in the fall of 2016 by the working group. One significant recommendation included minimizing the length of line between the main buoy and trailer buoys reducing the potential for entanglements.
- California Department of Fish and Wildlife issued a letter informing all California Dungeness crab fishermen of an increased concentration of entangled whale reports in the central California region in the spring of 2016. The letter included several recommendations for actions that could reduce the risk of further entanglements with whales at that time.
- Funding to promote research activities related to reducing future whale entanglement risk on the U.S. west coast was provided to multiple groups through NOAA Fisheries Bycatch Reduction Engineering Program (BREP) in 2017. This funding will support research to improve understanding of current gear and fishing practices as well as potential gear modifications. BREP funding will also support a workshop in 2017 designed to bring together a diverse group to identify the most promising ideas for innovation to address the entanglement issue across the U.S. west coast.

Efforts to Conserve Whales & Reduce Entanglements

Whale Conservation Efforts

Over the last several decades, marine mammal populations have been increasing off the West Coast as a result of federal and state protections. In the case of some large whales, like the humpback and gray whale, population recovery has led to re-evaluating the protected status of these species under the Endangered Species Act. The Eastern Pacific population of gray whales was removed from the Endangered Species List in 1994, and some populations of humpback whales off the West Coast are being considered for changes in their listing status.

Humpback whale. Photo: Robert Pitman, NOAA

Protecting Whales from Entanglements

NOAA Fisheries is engaged in a number of activities to minimize whale entanglements. We are:

1. Actively raising awareness about the importance of the quality of information needed in an entanglement report;
2. Working to expand the capability of permitted organizations to respond to entanglement reports;
3. Collaborating with the California Department of Fish and Wildlife, commercial and recreational crab fishermen, and non-governmental organizations, to evaluate ways to minimize entanglements in the California fishery, including development of a "Best Practices Guide" for fishermen that can be used coast-wide;
4. Working with states of California, Oregon, and Washington, as well as stakeholders to establish priorities for future evaluation of entanglement risk in particular fisheries and fishing gear;
5. Providing scientific expertise on all known or suspected sources of entanglements, exploring when, where, and how entanglements are occurring, and evaluating the available information on entanglements to determine the impacts on humpback whale populations; and
6. Working to better understand how environmental conditions influence the vulnerability of whales to entanglements.

Management Considerations

Each year, the distribution of whales off the West Coast could shift based on a variety of biological and environmental conditions. Whales typically undertake regular migrations between feeding and breeding areas. Environmental conditions will also vary and will influence the distribution of prey species for these animals (krill and small fishes). This may bring the whales into areas that may or may not be used by fisheries, and could lead to greater or fewer chances of entanglements. The annual abundance and distribution of whales informs management efforts, and NOAA Fisheries considers all of this information, along with data collected on entangled animals, in its effort to protect whales from entanglements.

How do I learn more about whale entanglements?

Disentanglement Network: www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/disentanglement_network.html

Whale & Fisheries Interactions: www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/fisheries_interactions.html

Fixed Gear Guide: www.westcoast.fisheries.noaa.gov/publications/protected_species/marine_mammals/fixed_gear_guide_final_12.14.11.pdf

Best Practices Guide: http://www.opc.ca.gov/webmaster/_media_library/2016/08/Best_Practices_Guide_Final.pdf

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How to Report an Entangled Whale

The public plays an important role in saving distressed whales, like those that become entangled. Prompt reporting and monitoring of the animal are the best ways to help.

You can report large whales in distress to either:

The 24/7 reporting hotline: 1-877-SOS-WHALe (767-9425)

or

The United States Coast Guard on VHF CH-16

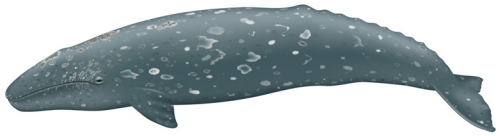
Entangled whales are unpredictable and potentially dangerous. Please keep a safe distance and do not approach the animal. You can continue to monitor the animal's condition and document the encounter while waiting for a response team to arrive.

What to include in your Report

Download reporting form

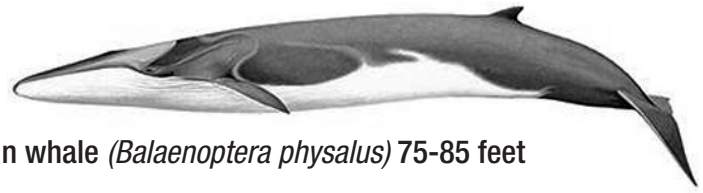
1. **Location of the animal;**
2. **A detailed description of the color and gauge of rope;**
3. **Location of gear on the whale;**
4. **Color and size of buoys;**
5. **Direction of the whale's movement, including whether it is solitary or with a group;**
6. **Behavior of the whale, including whether it is surfacing or diving, and the length of dive times;**
7. **Species of whale; and**
8. **Size and condition of the whale.**

Documentation in the form of photos and videos of the entangled whale can provide valuable information to the responders and resource managers. The information from each whale entanglement contributes to our larger knowledge-base and can be a valuable tool in helping to prevent future entanglements.

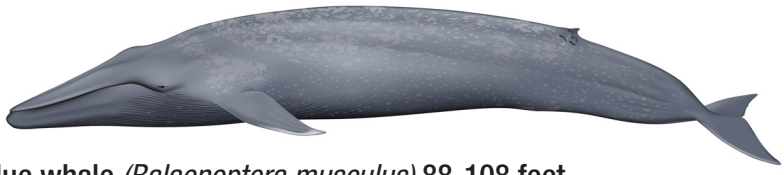


Gray Whale *(Eschrichtius robustus)* 39-46 feet

Humpback whale *(Megaptera Novaeangliae)* 40-60 feet



Fin whale *(Balaenoptera physalus)* 75-85 feet



Blue whale *(Balaenoptera musculus)* 88-108 feet

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