NOAA FISHERIES

National Report on Large Whale Entanglements Confirmed in the United States in 2018

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National Marine Fisheries Service
Office of Protected Resources
Marine Mammal and Sea Turtle Conservation Division
Marine Mammal Health and Stranding Response Program

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Cover photo (background): Large whale entanglement responders in Alaska train in Auke Bay near Juneau. Photo: NOAA/David Gann

Cover photo (circle): An entanglement around a humpack whale's tail. Entanglements involving the tail can prevent the whale from easily moving, increase drag which requires more energy, and severe entanglements may lead to drowning (photo taken under permit 18786-03). Photo: Center for Coastal Studies/Scott Landry

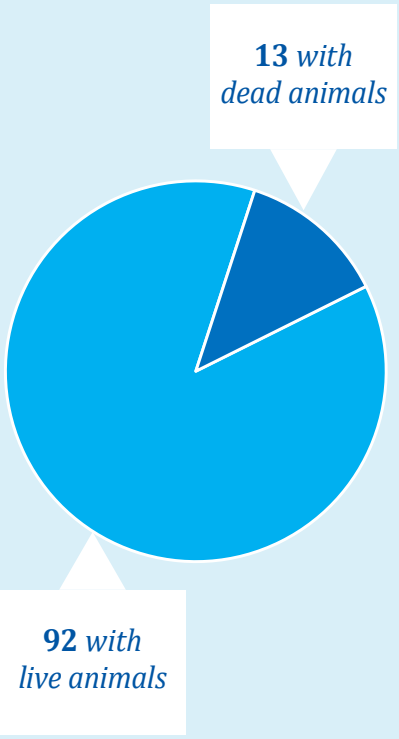
Executive Summary

In 2018, 105 confirmed entangled large whales were documented along the coasts of the United States, with 92 cases involving live animals and 13 cases involving animals that were dead when initially reported. All 105 whales were independently confirmed as entangled by members of the U.S. Large Whale Entanglement Response Network, either through photographic or video documentation or through field responses. The number of confirmed cases for 2018 (n=105) does not include multiple reports of any individual entangled whale. NOAA Fisheries tracks subsequent reports of previously reported entangled whales to better understand the nature of the entanglement, associated injuries, and the animal's health status. The subsequent reports have been combined into a single record for the purposes of this summary to provide clarity on the number of entangled individuals. Thirteen additional cases were reported, but those entanglements could not be confirmed with the information received and the whales were not relocated by network members; thus, those reports were tracked but are not included in the overall total. This summary report therefore represents a conservative estimate of the number of large whale entanglements confirmed in U.S. waters.

Entangled large whales are always considered to be in distress and may be facing a life-threatening situation. Entanglements often interfere with swimming, feeding, breathing, or other vital functions. Severe entanglements can cause great pain and suffering, and lead to amputations or the death of whales. Rescue operations to remove entangling gear are mounted by the U.S. Large Whale Entanglement Response Network for humane and welfare reasons to provide relief to individually entangled animals. Response activities also collect important documentation information to identify how whales become entangled, and which gear poses risks to the animals. Ultimately, rescue operations can have a significant positive impact on the conservation of these charismatic species, since several species of large whales are listed as threatened or endangered, and the rescue of each individual can be vital for the survival of their species. Although the majority of rescues in 2018 involved species and populations in the United States that are no longer considered threatened or endangered each rescue attempt by the Large Whale Entanglement Response Network provides an important opportunity for responders to hone their skills and provide increased humane care when responding to threatened and endangered species.

U.S. Large Whale Entanglements, 2018

105 *total entanglements*



Origin Determination

Some of these entanglements may have originated in waters outside the United States, given that large whales travel long distances between their feeding and breeding grounds, across international boundaries and oceans. NOAA Fisheries tries to collect and identify entangling gear during each response in order to work with fishing communities to reduce future entanglements. However, definitive identification is not always possible.

An entanglement through a humpback whale's mouth. Entanglements that involve the mouth may prevent the whale from successfully feeding, and ultimately lead to death from starvation (photo taken under permit 18786-01). Photo: NOAA Fisheries/Bryant Anderson

Comparing Confirmed Entanglements in 2018 to Past Years

Historical Trends

The number of confirmed entanglement cases nationwide in 2018 (n=103) is much higher than the average ± one standard deviation annual number of confirmed entanglements over the previous 11 years from 2007 to 2017 (n=70.8 ± 21.8).

Confirmed Large Whale Entanglements by Region, 2007-2018

Nearly every region of the United States experienced an increase in the number of confirmed large whale entanglements in 2018 when compared to 2017, with the exception of the Southeast Atlantic region, which documented a consistently low number of confirmed entanglement reports over the past 4 years (Figure 1).

Additionally, some regions experienced near-record numbers of confirmed entanglements in 2018, with the West Coast region and the Northeast and Mid-Atlantic region documenting the second and third highest total number of entanglements during the past 12 years, respectively (Figure 1).

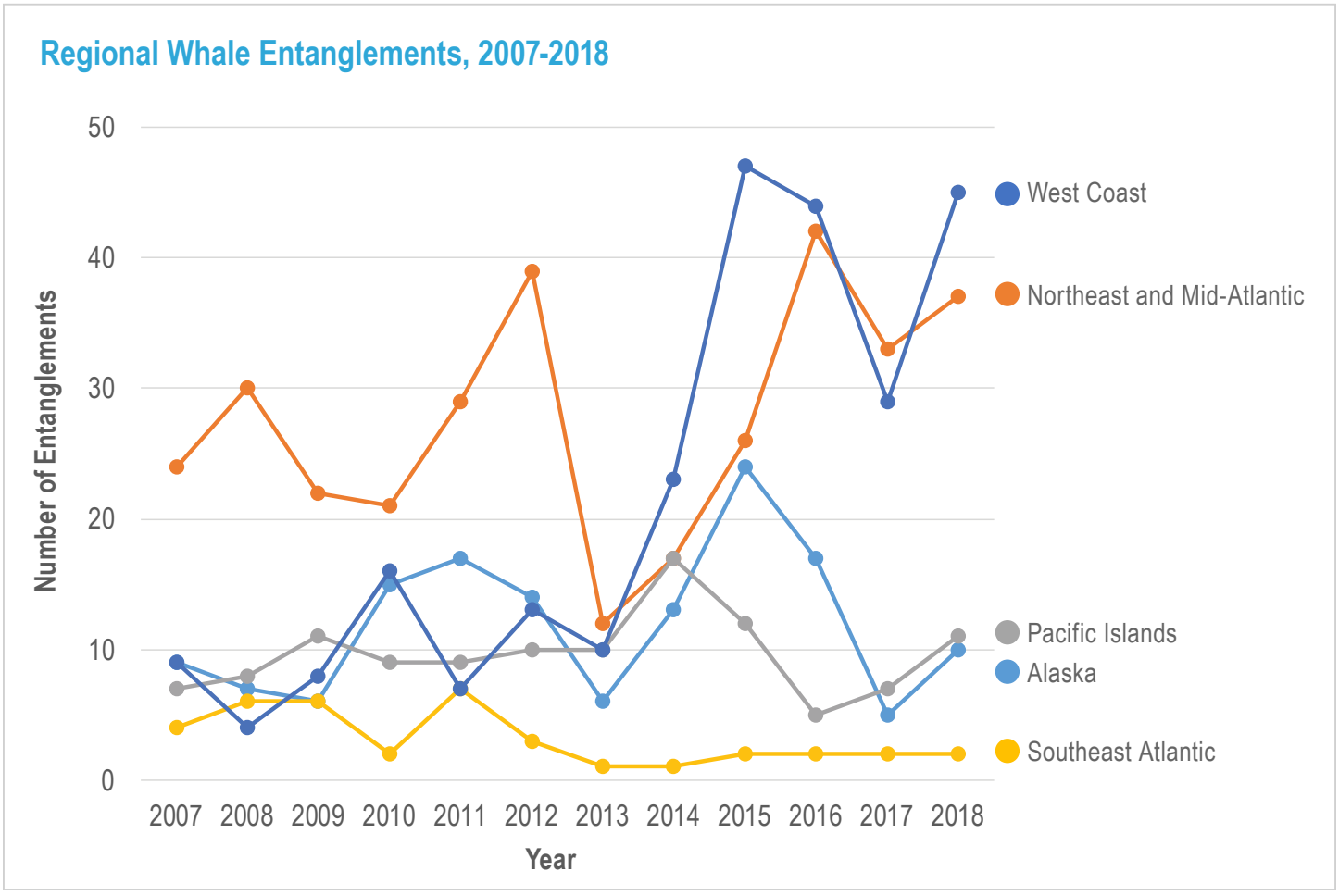


Figure 1. **Confirmed large whale entanglements from 2007–2018. In 2018, most regions had an increase in confirmed entanglements, with only one region (Southeast Atlantic) experiencing the same number of entanglements.**

Entanglements by Whale Species

The most frequently entangled large whale species in 2018 were humpback whales (*Megaptera novaeangliae*), followed by gray whales (*Eschrichtius robustus*), minke whales (*Balaenoptera acutorostrata*), and North Atlantic right whales (*Eubalaena glacialis*). This was similar to the most frequently entangled species in 2017.

Additionally, in 2018 a Bryde's whale (*Balaenoptera brydei*) was confirmed as entangled in the Pacific Islands Region—the first live confirmed entanglement of this species in U.S. territorial waters. In two of the 90 confirmed live whale entanglement cases, although the entanglement was confirmed, the whale could not be identified to species, and therefore is considered "unidentified."

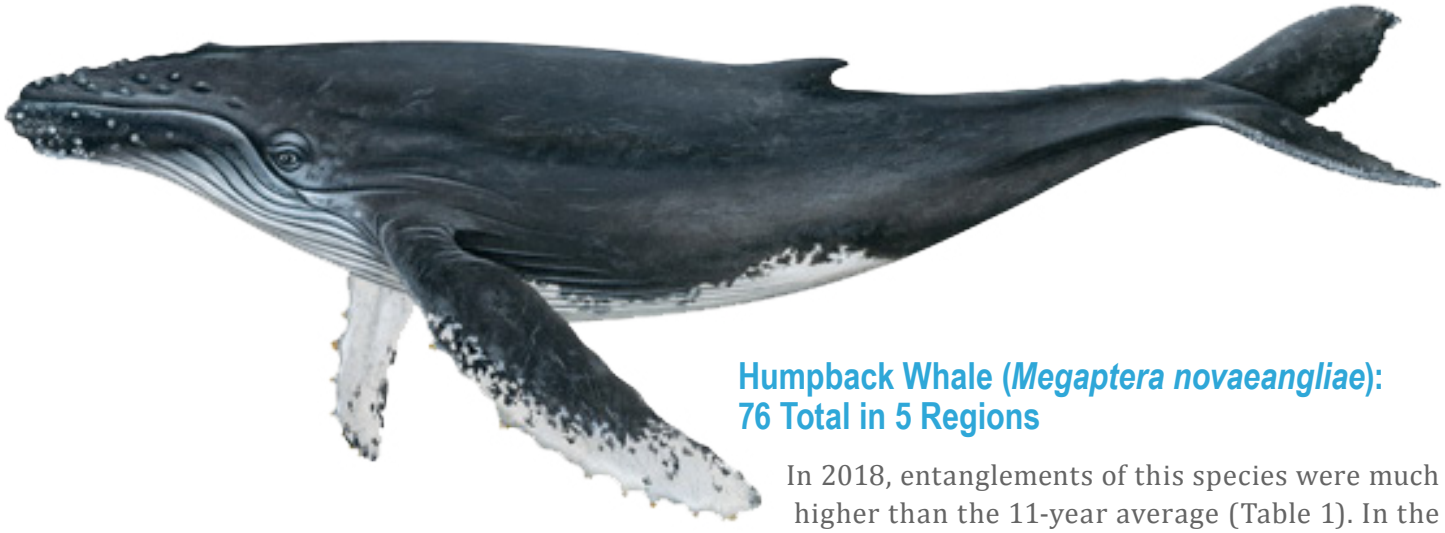


Table 1. Number of confirmed entanglements in 2017 and 2018 with the 11-year average number of entanglements for each large whale species.

Species	Entanglements (Confirmed)		11-Year Average
	2017	2018	
Blue Whale	3	0	2.3 ± 0.9
Bowhead Whale	0	0	1 ± 0.4
Bryde's Whale	0	1	0 ± 0
Fin Whale	1	1	2.9 ± 1.5
Gray Whale	11	11	6.3 ± 4.2
Humpback Whale	49	76	47.6 ± 19.5
Minke Whale	7	7	5.0 ± 1.5
North Atlantic Right Whale	2	4	4.6 ± 2.6
Sei Whale	1	1	0.3 ± 0.5
Sperm Whale	0	0	0.4 ± 0.9
Unidentified Whale	2	2	2.1 ± 1.8

Humpback Whale (*Megaptera novaeangliae*): 76 Total in 5 Regions

In 2018, entanglements of this species were much higher than the 11-year average (Table 1). In the Pacific, 51 humpback whales were confirmed entangled, which is higher than the 11-year average for this ocean basin (30.5 ± 16.1). Similarly, entanglements involving this species were also higher than the average in the Atlantic (19.9 ± 7.05), with 27 confirmed entanglements in 2018. As humpback whales are the most frequently reported entangled large whale species, representing 68.9 percent of all confirmed entanglements since 2007, the increase in total large whale entanglements confirmed in 2018 is mostly due to the considerable increase in humpback whale entanglements. Humpback whales are found in all the world's oceans and several populations have rebounded in recent years, so the increasing entanglements seen in this species could be due to any number of factors such as the increasing number of whales, increasing amounts of fishing gear deployed in U.S. waters, increasing overlap in distribution of whales and fishing effort, a combination of these factors, or none of these factors.

Gray Whale (*Eschrichtius robustus*): 11 Total in 1 Region

The number of gray whale entanglements in 2018 in U.S. waters was equal to 2017, but much higher than the 11-year average for gray whales (Table 1). In the United States, gray whales only occur in the Pacific Ocean, and all confirmed entanglements occurred along the West Coast. Most gray whales migrate between their summer foraging grounds in Alaska and their winter breeding grounds in Mexico, passing by Washington, Oregon, and California on each trip (however, a few gray whales have been reported in the Arctic and Gulf of Alaska in winter, and some remain in waters of Northern California, Washington, and Oregon during the summer). The increase in entangled gray whales in recent years suggests the animals may be overlapping with fishing efforts more than usual during their annual migrations.

Minke Whale (*Balaenoptera acutorostrata*): 7 Total in 1 Region

The number of minke whale entanglements in 2018 in U.S. waters was equal to 2017, but is higher than the 11-year average (Table 1). Although minke whales are present in both the Atlantic and Pacific Oceans, all confirmed entanglements in 2018 occurred in the Northeast United States. Six of the seven confirmed minke whale entanglements occurred along the coast of New England, in the Gulf of Maine, or along Cape Cod. Three of the whales in New England waters were found only after they had died. Additionally, a dead entangled minke whale was also found stranded on Tangier Island, in the middle of the Chesapeake Bay.

North Atlantic Right Whale (*Eubalaena glacialis*): 4 Total in 1 Region

North Atlantic right whale entanglements in U.S. waters in 2018 increased compared to 2017, but were near the 11-year average (Table 1), All confirmed entanglements in 2018 occurred in the Northeast. Of these four confirmed entanglements, one was found dead, two are presumed still entangled, and one was fully disentangled (self-release). The one animal that received an entanglement response, but was not successfully disentangled, was a female that was first documented entangled in 2014. This was the first time that the Large Whale Entanglement Response network resighted the whale after the initial report in 2014. Although the U.S. confirmed right whale entanglements were near average, the overall entanglement of this species remains of grave concern.[1] NOAA Fisheries has an open Unusual Mortality Event (UME) investigation for this species, based on a high number of dead whales discovered in Canadian and U.S. waters in 2017 and 2018, several of which were determined to have died from entanglements. North Atlantic right whales migrated from cold water feeding grounds to warm water breeding grounds (historically along the U.S. East Coast between New England and Canada and Georgia and northern Florida. This migration is physically demanding and, even if an entanglement is not life threatening, the stress and drag created by entangling gear may delay or prevent females from successfully giving birth.[2] Given the critically endangered status of North Atlantic right whales—recent population estimates indicate only about 409 individuals remain—and declining trend of the species, any entanglement is a major threat to their recovery.[3]

1 Sharp, Sarah M., et al. "Gross and histopathologic diagnoses from North Atlantic right whale Eubalaena glacialis mortalities between 2003 and 2018." Diseases of Aquatic Organisms 135.1 (2019): 1-31.

2 van der Hoop, Julie, Peter Corkeron, and Michael Moore. "Entanglement is a costly life-history stage in large whales." Ecology and Evolution 7.1 (2017): 92-106.

3 NMFS 2018. "US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2018" U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NE-258.

Responders in Hawaii with gear removed from an entangled whale. Photo: NOAA/Cheryl King

Location of Confirmed Entanglement Reports

Geographic Trends

In 2018, large whale entanglements were reported and confirmed in the waters of eleven states and one U.S. territory. More than half of all confirmed entanglement reports occurred in two states; 28.8 percent in California waters (n=30) and 26.9 percent in Massachusetts waters (n=28).

Atlantic Coast

- **Massachusetts:** The entanglement reports off the coast of Massachusetts were concentrated along Cape Cod and in Cape Cod Bay, and approximately half were humpback whales (n=13) (Figure 2).
- **Other states:** Entanglements in the Atlantic were also reported in Florida, Virginia, New York, New Hampshire, and Maine (n=11) (Figure 2).

Pacific Coast

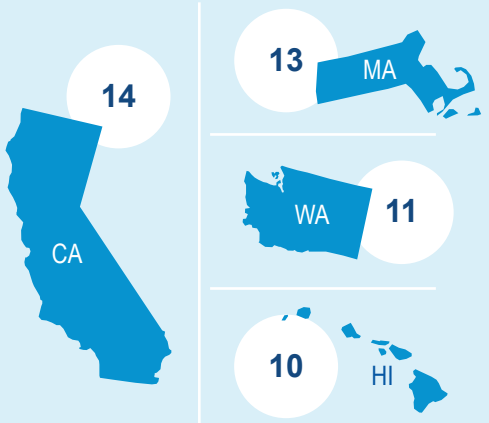
- **California:** In California, a large number of entangled whales, primarily humpbacks, were observed in central California, specifically Monterey Bay and San Francisco Bay (n=14).
- **Washington and San Juan Islands:** Another area along the West Coast with a high number of confirmed entanglement reports was the outer coast of Washington and the Straits of Juan de Fuca (n=11).

Pacific Islands

The Pacific Islands Region also confirmed a high number of entanglement cases in 2018.

- **Hawaii:** The majority of entanglements were humpback whales in Hawaii (n=10).
- **Guam:** An entangled Bryde's whale was observed in the territorial waters of Guam in 2018—the first time this species has been documented alive and entangled in U.S. jurisdiction. The location of this confirmed report in a remote part of the Pacific Ocean highlights how entangled large whales can encounter or carry gear far from highly populated coastal areas.

Top States by Number of Entanglements



Origin Determination

The location where an entangled whale is reported may be close to where the entanglement occurred, or it may be far removed from the origin of the entanglement in both time and space. Whales have been documented to carry the entangling gear thousands of kilometers and for many months, and even years.

For example, several confirmed entanglement cases in Hawaii included fishing gear that was set in Alaska or British Columbia, Canada. In these cases, the whales became entangled while feeding off the coast of North America in the summer, and traveled with the entanglements to their winter breeding grounds in Hawaii. These cases highlight how large whale entanglements are an issue in many areas of the country, crossing national boundaries, and the importance of the National Network, as the data from these cases help NOAA Fisheries work with stakeholders across regions and even trans-nationally to reduce the frequency of these events.

U.S. Locations of Confirmed Whale Entanglements, 2018

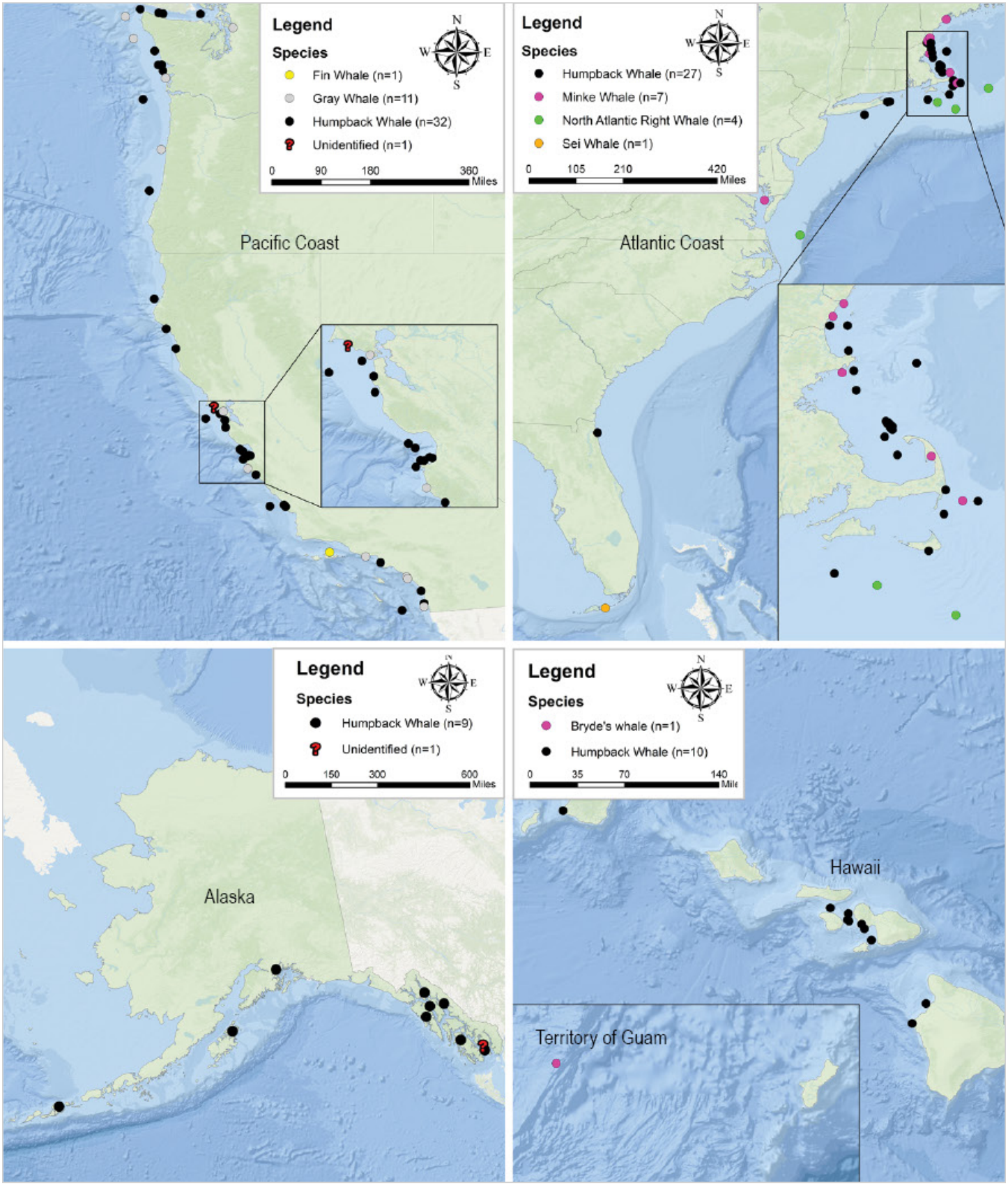


Figure 2. **The locations of all confirmed large whale entanglements in U.S. waters in 2018. Note that whales may be reported either near or far from where the entanglement occurred, as they have been known to travel great distances while entangled.**

Sources of Entanglements

Investigating Gear Origin

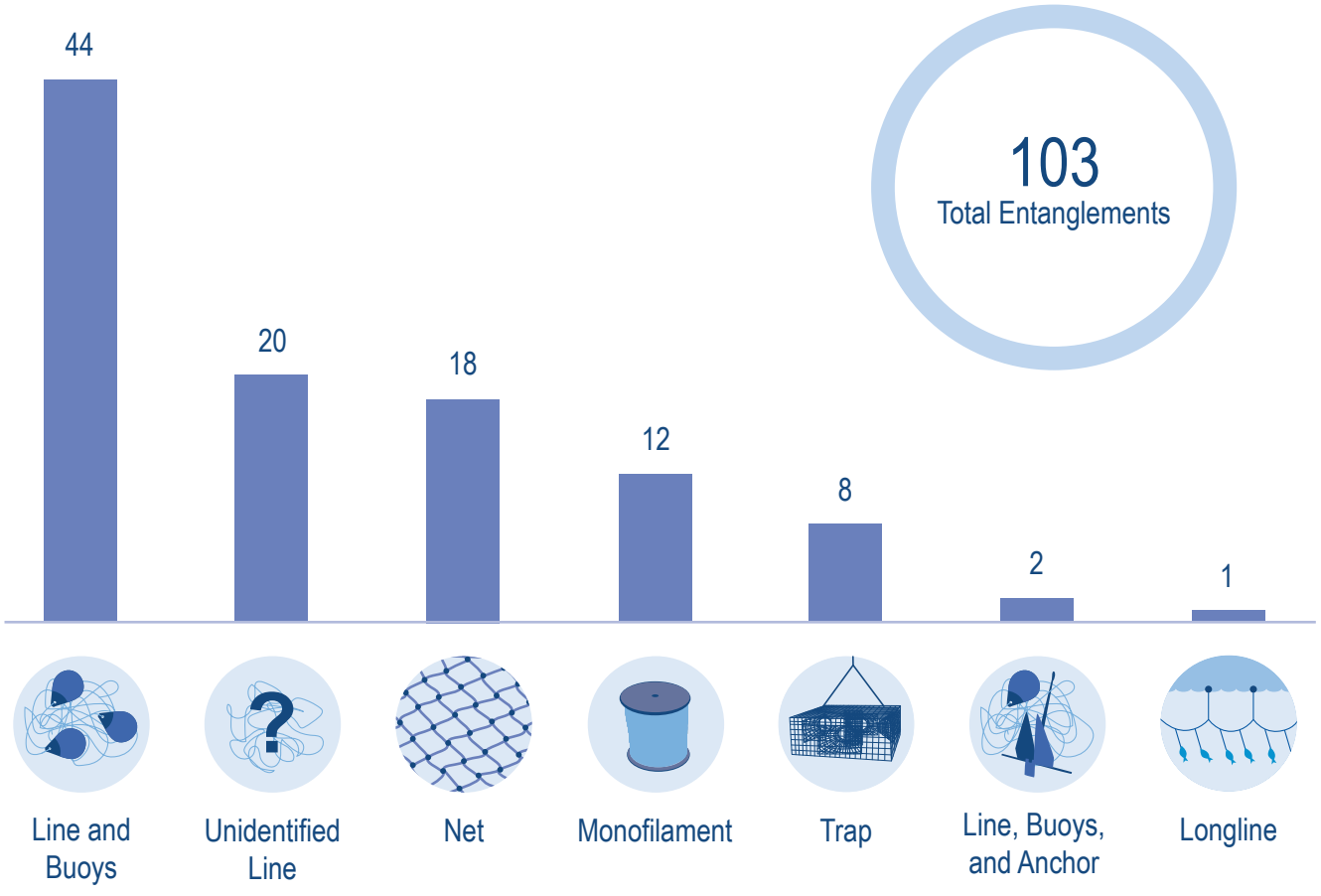
Fishery-Specific Gear

Over 80% of confirmed cases in 2018 involved gear used in fishing (line and buoys, traps, nets, and monofilament line), and 54.4% of all confirmed entanglements could be directly attributed to a specific fishery. In recent years, NOAA Fisheries has been working to better investigate the sources of entanglements. By identifying the source of entangling gear, NOAA Fisheries can work with fishermen to identify areas, fisheries, and gear configurations that are more likely to result in whale entanglements, and thereby better understand the threat in order to mitigate the risk and its impacts.

Non-Specific Gear

The remaining cases (20%) involved line that could not be attributed to a fishery (i.e., no clear evidence of traps, nets, or other gear associated with fishing). Although various marine industries introduce gear into the ocean (e.g., ropes, lines, nets, chains, and cables), one of the most common sources is commercial or recreational fishing. Therefore, it is likely some of the cases involving only line were incidental to fishing activities.

Number of Cases by Entanglement Type



Entanglement responders from several organizations work to free an entangled humpback whale in Half Moon Bay, CA on October 14, 2018. Photo: Sealife Response, Rehab, and Research/Joe Flowers

The National Large Whale Entanglement Response Network

Network Participants

NOAA Fisheries coordinates the National Large Whale Entanglement Response Network, which is composed of five regional networks: Greater Atlantic (Maine to Virginia), Southeast (North Carolina to Texas), West Coast (Washington to California), Alaska, and Pacific Islands. Network members represent a wide range of non-profit, academic, industry, and government organizations, with significant experience gained in trainings and responses.

Permits and Authorization

All large whale entanglement response operations on ESA-listed species are conducted under the authority of the MMPA/ESA Scientific Research and Enhancement Permit (No. 18786-03) issued to the Marine Mammal Health and Stranding Response Program, and the trained professional expert responders who are authorized to closely approach whales (Level 3, 4, and 5) are listed as Co-Investigators under the permit.

Overview of Responder Levels

Level 1 and 2 Responders

In general, Level 1 and 2 responders are fishers, boaters, and other members of the public who are trained to spot entangled whales and assess the situation. More than 1,000 individuals have completed the basic training to date.

A web-based course to familiarize ocean users with assessing and reporting entangled large whales has also been developed in a partnership between NOAA and The Nature Conservancy, although completion of this course alone does not provide a qualification as a network member.

Level 3, 4, and 5 Responders (Experienced and Expert)

Responders at Level 3, 4, and 5 are experienced ocean users—frequently biologists, whale watch captains, and stranding network members—who are authorized under the MMPA/ESA permit to conduct entanglement response activities after submitting documentation of their training and experience. Nationwide, 94 people are authorized as Level 3, 4, and 5 responders, and they are located across a wide geographic range (Figure 3).

Responders in Hawaii with gear removed from an entangled whale. Photo: NOAA/Ed Lyman

Responder Levels

Responders are categorized into five levels, based on training and expertise:

Level 1 and 2 *responders are trained to assess entangled large whales, and may be asked to assist in entanglement response activities by tracking and documenting the entangled whale from a distance.*

Level 3 *responders closely approach entangled whales for visual health assessments, and may attach tracking devices (tags) to the entangling gear so that the whale can be followed and quickly located.*

Level 4 *responders use tools to cut and remove the entangling gear. Level 4 responders can perform these activities on all whale species except North Atlantic right whales, as disentangling this species is particularly dangerous.*

Level 5 *responder duties are similar to Level 4, but they may remove entangling gear from all species of whales, including North Atlantic right whales.*

U.S. Locations of Network Responders (Level 3, 4, and 5)

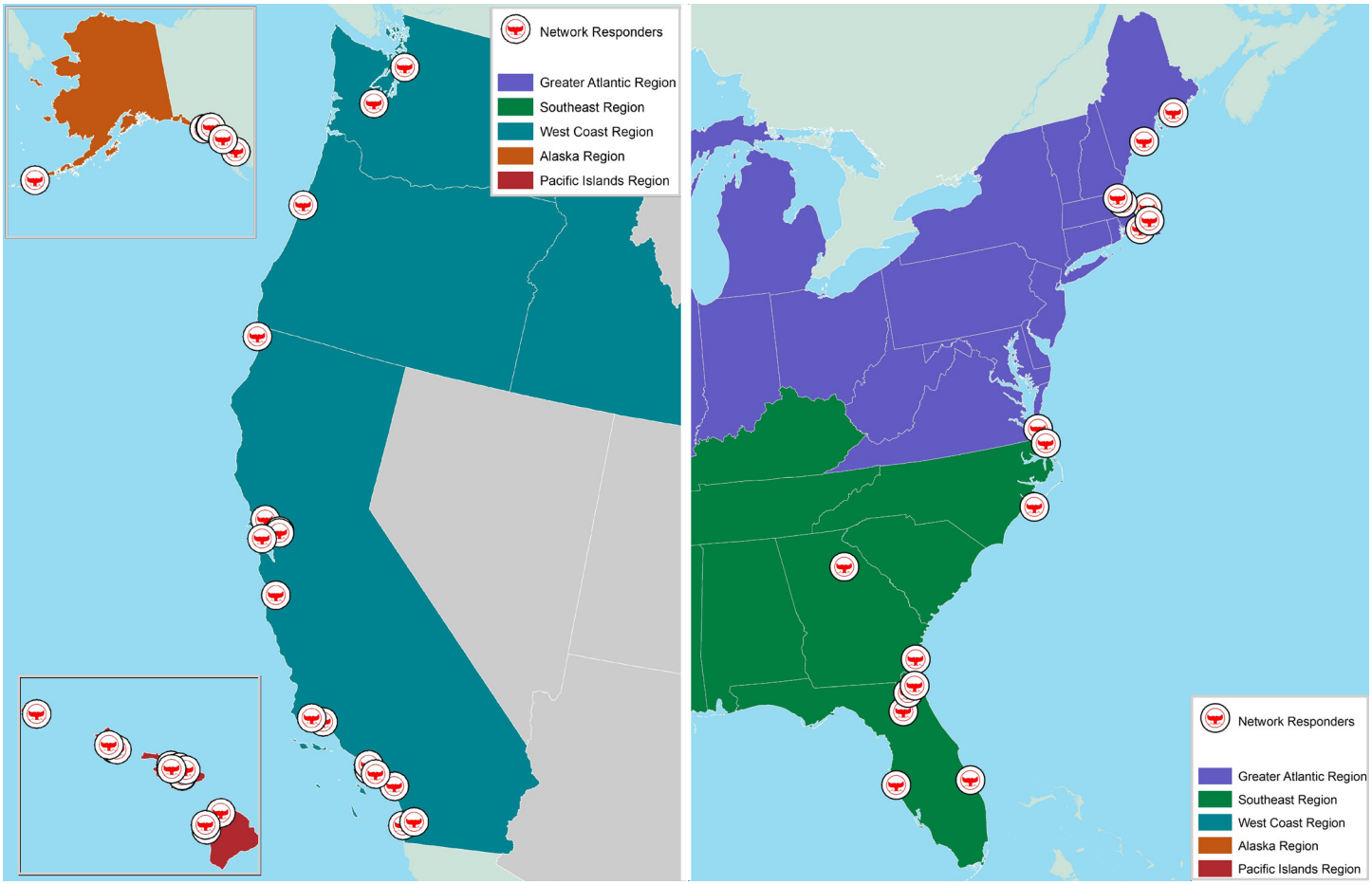


Figure 3. The locations of all Level 3, 4, and 5 responders in the Large Whale Entanglement Response Network. Note that multiple responders may be based at the same location.

Table 2. Number of permitted Level 3, 4, and 5 entanglement responders.

Location	Level 3	Level 4	Level 5
Atlantic Coast	31	4	6
Pacific Coast	43	9	1
Total	74	14	7

Nationwide, 94 people are authorized as Level 3, 4, and 5 responders, and they are located across a wide geographic range (Figure 3).

NOAA Support for the Network

Large whales are the largest animals on Earth, and disentangling them is inherently dangerous. NOAA supports the Network by providing tools, training, and funding across the country to ensure that these activities are conducted in a manner that emphasizes human and animal safety.

In 2018, NOAA conducted more than 37 training sessions with numerous participants, many of whom were current network members who were strengthening and increasing their skills. Several of these trainings were specifically provided to more than 150 commercial fishermen and the public to help increase the capacity of the network by ensuring new Level 1 and 2 responders are ready and available to assist as needed.

Rescue Operations to Disentangle Large Whales

Responders in Hawaii with gear removed from an entangled whale. Photo: NOAA/Ed Lyman

Assisting Whales in Distress

Entangled large whales are always considered to be in distress and may be facing a life-threatening situation, as entanglements can interfere with swimming, feeding, breathing, or other vital functions. Severe entanglements cause suffering, and eventually lead to a painful death.[1] Rescue operations are mounted first and foremost for humane and welfare reasons to provide relief to individually entangled animals.

Supporting Conservation of Threatened and Endangered Species

Each rescue attempt by the Large Whale Entanglement Response Network provides an important opportunity for the members to provide humane care to animals in distress and collect important information for conservation and management for the species. This is particularly true for species that are listed as threatened or endangered species because each individual helps the population to recover. Although the majority of rescues in 2018 involved species with populations in the United States that are no longer considered threatened or endangered (e.g., humpback whales in the Atlantic and Hawaii stocks, eastern North Pacific gray whales, and minke whales)—the experience and lessons learned by the Large Whale Entanglement Response Network members from responding to those cases helped hone skills and expertise so that future responses to critically endangered species like North Atlantic right whales and blue whales can be conducted as skillfully as possible. Therefore, disentangling all large whale species can ultimately have a positive impact on the conservation of threatened and endangered species.

1 Moore, Michael J., and Julie M. Van der Hoop. "The painful side of trap and fixed net fisheries: chronic entanglement of large whales." Journal of Marine Biology 2012 (2012).

Rescue Operation Outcomes, 2018

- **Network Response (40%):** In 2018, the Large Whale Entanglement Response Network was able to mount a minimum of 58 responses to 37 of the 90 confirmed cases, which resulted in the full or partial disentanglement of 16 animals. Unfortunately, one of the whales that was disentangled had severe injuries resulting from the entanglement, and was found dead a few days after the response.
- **No Response (34%):** The Network was not able to mount a response in the remaining 53 cases due to the location of the report (i.e., the whale may be too far offshore to mount an effective response) or due to the conditions (i.e., reports made late in the day or during bad weather).
- **Self-Release (15%):** Separately, 14 whales were documented to have shed the entangling gear on their own. The Network mobilized a response for an additional 21 live whales reported to the hotlines, but were unsuccessful in locating those animals and the outcome of those cases is not known; they may have remained entangled, died, or shed their gear.
- **Public Response (11%):** Ten cases involved members of the public attempting to disentangle large whales.[2] Not all of these attempts were successful, and needlessly put members of the public in danger. Even for trained responders, disentangling large whales is dangerous. In 2017, a trained and very experienced responder died during a rescue operation. Public interventions are also not as effective as a response from properly trained and equipped network members. In one case in 2018, untrained and ill-equipped members of the public attempted to remove entangling gear from a humpback whale that was anchored in place, and only after they were unsuccessful and the whale had drowned did they report the case to the Large Whale Entanglement Response Network. Additionally, Network members are properly trained on the types of data that should be collected from entangled whales. These data are often not recorded properly by members of the public, which may hamper efforts to effectively address this threat to large whales.

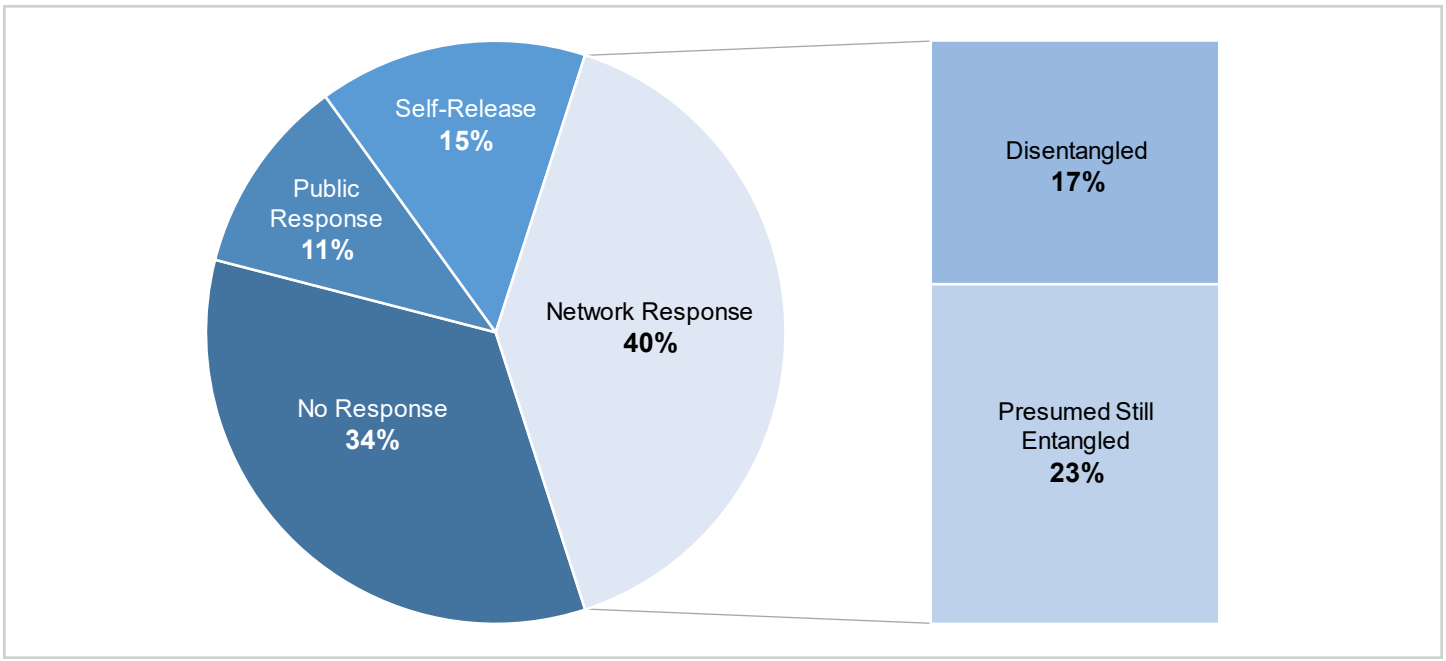


Figure 4. **The outcomes of all live, entangled large whales confirmed in 2018.**

2 Section 101(d) of the MMPA allows "Good Samaritans" to assist entangled marine mammals under special conditions. However, since the ESA does not have a comparable provision, the "Good Samaritan Exemption" does not apply to ESA-listed species of large whales. Thus, only responders authorized under MMPA/ESA Permit No. 18786-03 should attempt rescues of ESA-listed species. Due to human safety concerns including serious injury and death, we further recommend that only professionally trained responders attempt whale disentanglements, even if legal under the MMPA.

What Members of the Public Can Do

Reporting an Entangled Whale

The Large Whale Entanglement Response Network relies on reports of entangled whales from the public. If you encounter a whale that may be entangled, please contact your local network via the 24/7 regional hotline or contact the U.S. Coast Guard on VHF CH-16.

Regional Entanglement Hotlines

Region	Phone Number
Atlantic and Gulf Coasts	1-866-755-6622
California, Oregon, and Washington	1-877-SOS-WHALE (1-877-767-9425)
Alaska	1-877-925-7773
Hawaii	1-888-256-9840

Information Needed When Reporting

When reporting an entangled whale, please include the following information:

- **Whale location:** Location of the animal.
- **Entanglement description:** A detailed description of the entangling gear or debris.
- **Entanglement location:** Where the entanglement is located on the animal.
- **Whale movement and presence of other whales:** The direction the whale is moving, and whether it is solitary or with other whales.
- **Whale behavior:** The behavior of the whale.
- **Whale species:** Species of the whale.
- **Whale size and condition:** The approximate size and condition of the whale.

Only trained and permitted responders should attempt to disentangle or closely approach an entangled large whale.

Photo or Video Documentation

Photos or videos of the whale (from a safe distance of at least 100 yards) can also provide valuable information to entanglement responders.

Only trained and permitted responders should attempt to disentangle or closely approach an entangled large whale. Whales are unpredictable and attempting to remove an entanglement is extremely dangerous. Entanglement response in the United States should only be conducted by members of the Large Whale Entanglement Response Network who have been trained and authorized by NOAA Fisheries.

An entanglement around a humpack whale's tail. Entanglements involving the tail can prevent the whale from easily moving, increase drag which requires more energy, and severe entanglements may lead to drowning (photo taken under permit 18786-03). Photo: Center for Coastal Studies/Scott Landry

Additional References

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- Global Whale Entanglement Response Network

U.S. Secretary of Commerce
Wilbur L. Ross, Jr.

Acting Under Secretary of Commerce
for Oceans and Atmosphere
Dr. Neil Jacobs

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Chris Oliver

May 2020

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