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National Report on Large Whale Entanglements Confirmed in the United States in 2022



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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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Front cover: An entangled humpback whale and her calf swim in the breeding/calving grounds of Hawai'i. Credit: Van Aswegen, University of Hawai'i at Mānoa (Permit No. 21476-01).

Back cover: Underwater view of a hooked knife above attached to long carbon-fiber pole used to safely cut large whales free. Credit: NOAA (NOAA Permit No. 18786).



A responder throws a specialized grapple to retrieve trailing entangling gear from a distance, which is safer for both responders and the whale. Credit: Ed Lyman (NOAA Permit No. 18786).

Introduction

In 2022, there were **67** confirmed newly entangled large whales documented along the coasts of the United States. Sixty-five cases involved live animals, and two cases involved animals that were dead (floating) when initially reported. All 67 whales were independently confirmed as entangled by members of the [United States Large Whale Entanglement Response Network](#) (Network) through photographic or video documentation, reports from multiple and/or experienced members of the on-water community, or through field responses by authorized responders. The confirmed entanglement cases for 2022 (n=67) represent unique individual whales and do not represent multiple reports of the same individual. Any subsequent reports of individual whales reported during 2022 have been combined into a single record for the purposes of this summary to provide clarity on the number of entangled individuals. However, NOAA Fisheries tracks subsequent reports of previously reported entangled whales to understand the nature of the entanglement, monitor associated injuries, and assess the animal's health status. For example, a previously confirmed entanglement case, documented in 2021, was sighted again in 2022 and confirmed as still entangled. As this case is a resight from a previous year, it is not included in the total of confirmed entangled large whales for 2022.

Beyond the 67 confirmed cases, 36 additional cases were reported by members of the public. However, 12 of those entanglements could not be confirmed with the information received, and the whales were not resighted by Network members. The other 24 reported cases were confirmed as not entangled. These 36 additional reports were tracked but are not included in the overall total for 2022. Therefore, this summary report represents a conservative estimate of the number of large whale entanglements in U.S. waters as it only accounts for confirmed entanglement cases. Given that many large whale species travel long distances between their feeding and breeding grounds, and across international boundaries and oceans, some of these entanglements may have originated in waters outside of the United States.



Using a specialized knife at the end of a long pole, authorized responders cut lines that entangled a subadult humpback whale near the coast of Maui, Hawai'i. Credit: Jason Moore (NOAA Permit No. 18786).

Importantly, confirmed entanglements underestimate the true number of entangled whales, as many entangled whales go undetected (e.g., are not observed while entangled and die at sea). Moreover, the number of entanglements in any given year, and the relative increases and decreases observed and confirmed by the Network, may not be representative of true increases and decreases in entanglements, given that the number of confirmed reported entanglements is not a precise estimator of actual entanglements.¹ NOAA Fisheries' goal during each response is to document, collect, and identify entangling gear and marine debris, and understand the impact of these entanglements on the whales in order to better understand the threats and work with fishermen and coastal communities to reduce future entanglements and their broad-based impacts. However, definitive identification of the entangling material is not always possible, and quantifying risks is challenging.

Entangled large whales face a number of life-threatening consequences from the entanglement. Line or net often interferes with swimming, feeding, breathing, and/or other vital functions. Severe entanglements can cause serious injuries and significant pain and suffering, and can ultimately lead to amputations of flippers or flukes, and death. Response operations to remove entangling gear are mounted by the Network for humane and welfare reasons. Response activities also collect and document important information to identify how whales become entangled, and which gear and marine debris pose observable risks to the animals. Ultimately, response operations can have a significant positive impact on the conservation of these species. All large whales are covered under the Marine Mammal Protection Act (MMPA) of 1972, and several species or populations are listed as threatened or endangered under the Endangered Species Act (ESA) of 1973. Although the majority of responses in 2022 involved species and/or populations in the United States that are not considered threatened or endangered under the ESA, each response attempt by the Network provides an important opportunity for responders to improve their skills. They also allow responders to apply lessons learned from those cases to respond more effectively and safely to threatened and endangered species (e.g., North Atlantic right whales, *Eubalaena glacialis*), cases in which the rescue of each individual can be vital for the survival of their species.

¹ Pace III, R.M., Williams, R., Kraus, S.D., Knowlton, A.R. and Pettis, H.M., 2021. Cryptic mortality of North Atlantic right whales. *Conservation Science and Practice*, 3(2), p. 346.

Comparing Confirmed Entanglements in 2022 to Past Years

Confirmed Large Whale Entanglements by Region, 2007–2022

The number of confirmed large whale entanglement cases nationwide in 2022 ($n=67$) is slightly lower than the average annual number of confirmed entanglements over the previous 15 years from 2007–2021 ($n=72.1 \pm 21.1$; average \pm one standard deviation). However, two NOAA Fisheries regions experienced an increase in the number of confirmed large whale entanglements in 2022 when compared to 2021 (the West Coast and Pacific Islands), while three regions documented fewer confirmed large whale entanglements in 2022 (Alaska, Northeast and Mid-Atlantic, and Southeast Atlantic; Figure 1).

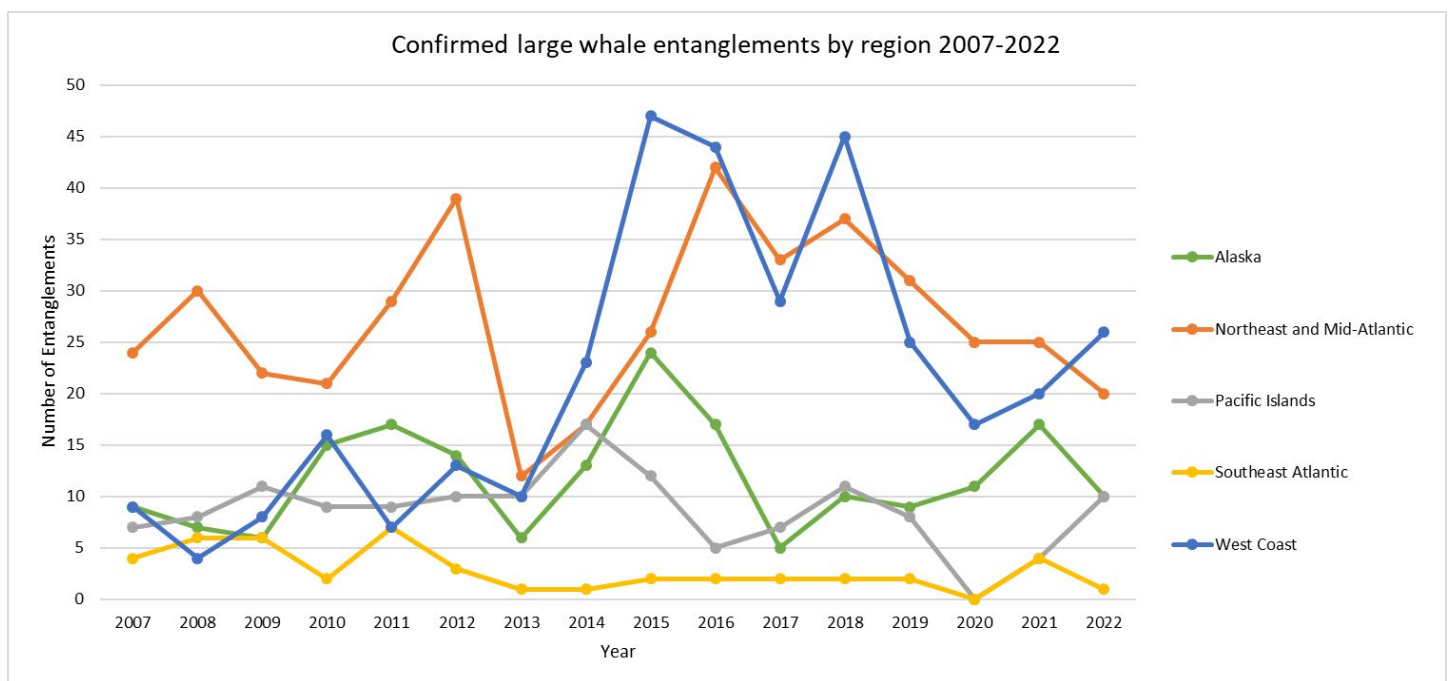


Figure 1. Confirmed large whale entanglements by region from 2007–2022.



An entangled humpback whale breaches in the breeding/calving grounds of Hawai'i. Credit: Stephanie Stack (NOAA Permit No. 18786).

Entanglements by Whale Species

In 2022, four species of large whales were newly documented with entanglements in U.S. waters²: humpback whales (*Megaptera novaeangliae*), gray whales (*Eschrichtius robustus*), minke whales (*Balaenoptera acutorostrata*), and fin whales (*Balaenoptera physalus*). For two of the 67 confirmed large whale entanglement cases, the entanglement was confirmed but the whale could not be identified to species, and therefore those two cases have been classified as “unidentified.”

Table 1. Number of confirmed entanglements in 2022 compared to the 15-year average number of entanglements for each large whale species.³

Species	2022	2007–2021 Average
Blue Whale	0	0.5 ± 1.0
Bowhead Whale	0	0.1 ± 0.3
Bryde's Whale	0	0.1 ± 0.2
Fin Whale	1	2.0 ± 1.6
Gray Whale	10	7.0 ± 3.8
Humpback Whale	49	49.8 ± 18.9
Minke Whale	5	5.7 ± 1.5
North Atlantic Right Whale	0	4.3 ± 2.2
Sei Whale	0	0.3 ± 0.5
Sperm Whale	0	0.5 ± 0.9
Unidentified Whale	2	1.9 ± 1.5

² A fifth species, the North Atlantic right whale (*Eubalaena glacialis*) did not have any newly documented entanglements in U.S. waters in 2022. However, members of the National Large Whale Entanglement Response Network continued to respond to entangled North Atlantic right whales documented as entangled in previous years, as seen in Snow Cone's Story (page 13). Many North Atlantic right whales entangled in previous years were likely still carrying those entanglements in 2022. Entanglement in fishing gear remains one of the primary causes of the ongoing [North Atlantic right whale Unusual Mortality Event](#).

³ Large whale species not listed in the table have never been documented with a confirmed entanglement in U.S. waters.



Humpback whale⁴ (n=49 in 5 Regions)

In 2022, the number of confirmed entanglements of humpback whales was near the 15-year national average, and every region experienced at least one confirmed entangled humpback whale (Table 1). In the Pacific, 33 humpback whales were confirmed entangled, which was higher than the 15-year average for this ocean basin (31.2 ± 15.1). In the Atlantic, entanglements involving this species were lower than the 15-year average for this ocean basin (18.6 ± 6.6), with 16 confirmed entanglements in 2022. Humpback whales are the most frequently reported entangled large whale species, representing over 69 percent of all confirmed entanglements since 2007. Humpback whales are found throughout the world's oceans and several populations have rebounded in recent years. The frequency of entanglements seen in this species could be due to many factors, such as the increasing number of whales, a high degree of overlap in distribution of whales and fishing effort, increased reporting effort and educational outreach, or a combination of these or additional factors. The requirements of the MMPA apply to all humpback whales that occur in U.S. waters, and the ESA provides additional protections for some populations listed as endangered or threatened. In U.S. waters, humpback whales in the western north Atlantic and Hawai'i are no longer listed under the ESA, while some populations in the eastern north Pacific are listed. An [Unusual Mortality Event \(UME\) for humpback whales began in the North Atlantic in 2016](#) and is still ongoing. Several of the whales that are included in the UME were determined or suspected to have died from entanglements, including one in 2022.

Gray whale (n=10 in 2 Regions)

The number of confirmed gray whale entanglements in 2022 in U.S. waters was higher than the 15-year average for gray whales (Table 1). In the United States, gray whales only occur in the Pacific Ocean. All confirmed entanglements in 2022 were first reported in the West Coast and Alaska regions. Most gray whales migrate between summer foraging grounds off the coast of Alaska and winter breeding grounds in Mexico, passing through 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 off the coast of northern California, Oregon, and Washington during the summer. There are two populations of gray whales, and both are covered under the MMPA. The eastern North Pacific population that is found along the U.S. West Coast and Alaska was delisted from the ESA in 1994, so they are not considered a threatened or endangered species. However, the western North Pacific population, typically found along the coast of Russia and Asia, is listed as endangered under the ESA, and some individuals from that population have been documented in the eastern North Pacific. An UME was [declared for gray whales in 2019](#) and is ongoing. Several of the whales that are included in the UME were determined or suspected to have died from entanglements, including one in 2022.

⁴ Whale illustrations not to scale.



Minke whale (n=5 in 1 Region)

The number of confirmed minke whale entanglements in 2022 in U.S. waters was similar to the 15-year average (Table 1). Although minke whales are present in both the Atlantic and Pacific Oceans, the initial locations of confirmed entanglements in 2022 were all in the Northeast and Mid-Atlantic. Minke whales are covered under the MMPA but are not listed under the ESA. An UME for [minke whales began along the U.S. Atlantic Coast in 2017](#) and is ongoing. Preliminary findings for several of the whales included in the UME have shown evidence of entanglements. In 2022, one minke whale mortality is suspected to have been caused by an entanglement, but it has not been confirmed as cause of death.



Fin whale (n=1 in 1 Region)

The number of fin whale entanglements in 2022 in U.S. waters was the same as the number of entanglements in 2021, and slightly below the 15-year average (Table 1). Fin whales are present in both the Atlantic and Pacific Oceans, and the single confirmed fin whale entanglement was observed in the West Coast region, off California. Fin whales are protected under the MMPA and are also listed under the ESA.



Responders from the Center for Coastal Studies work to free a juvenile entangled humpback whale. Credit: Center for Coastal Studies (NOAA Permit No. 18786).

Reported Locations of Confirmed Entangled Whales

In 2022, large whale entanglements were first reported and confirmed off the coast of 11 states. Over 85 percent of all confirmed live whale entanglements reports were observed off the coast of four states: 34.3 percent off the coast of California (n=23), 20.9 percent off the coast of Massachusetts (n=14), 14.9 percent off the coast of Alaska (n=10), and 14.9 percent off the coast of Hawai'i (n=10). The initial reports of confirmed entanglements off the coast of Massachusetts were concentrated along Cape Cod and Cape Cod Bay (Figure 2). In Alaska, most initial reports of confirmed cases were reported in Southeast Alaska. Many confirmed cases off the coast of California were first observed in Monterey Bay. Lastly, half of the cases reported off the coast of Hawai'i occurred near Maui and within Hawaiian Islands Humpback Whale National Marine Sanctuary waters where there is a great deal of response effort.

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

These data also show how ocean users (e.g., whale watchers, scientific researchers) in particular geographic areas may help whales coast-wide, as the high number of observed and confirmed entanglement cases from these spots can be used to identify impacts from a much larger area as the entangling gear is identified and matched to a different geographic region.

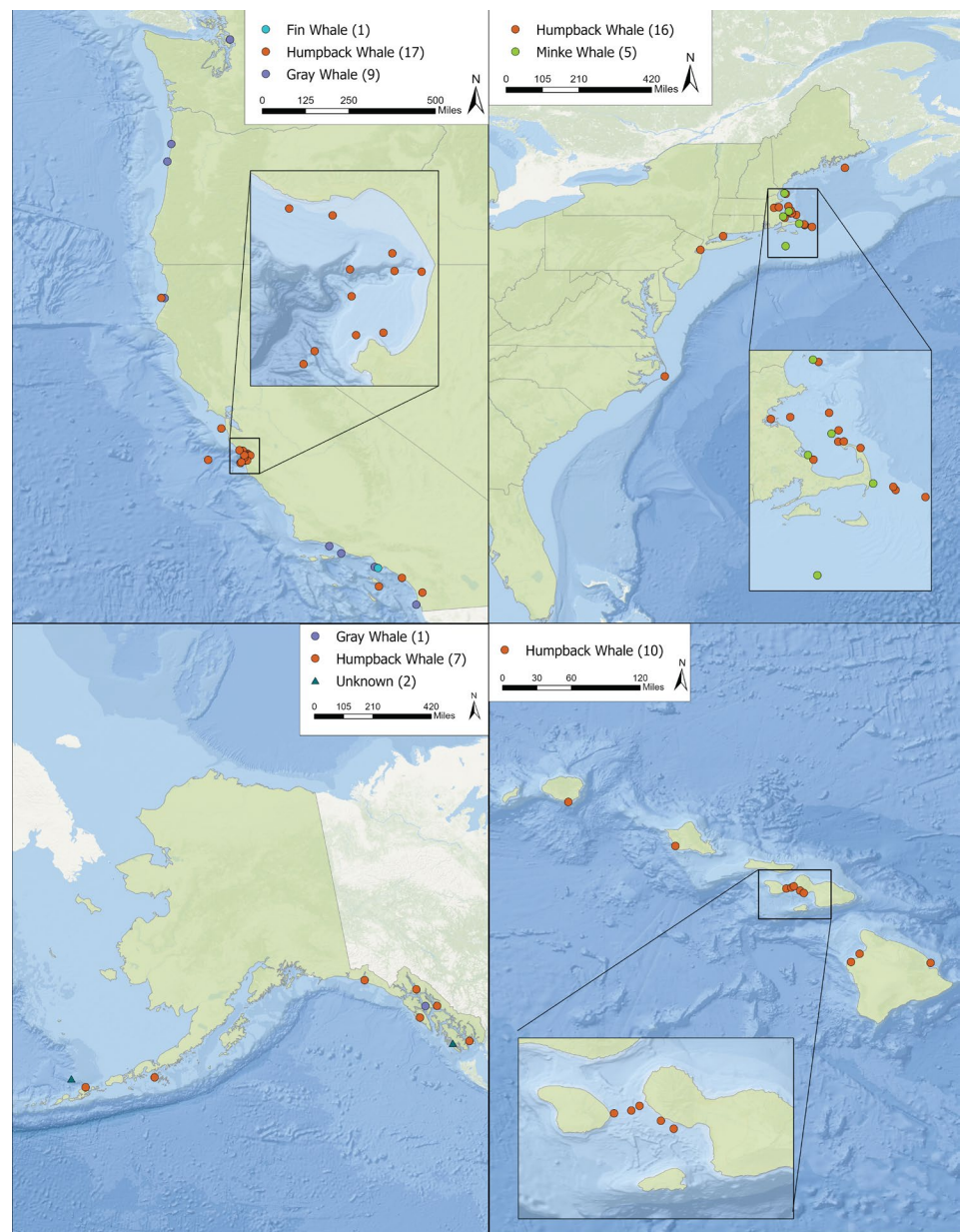


Figure 2. The locations of all confirmed live and dead large whale entanglements in U.S. waters in 2022. Note that whales may be observed and reported either close to or far from where the entanglement occurred, as they have been known to travel great distances while entangled. No large whale entanglements were confirmed in the U.S. Caribbean or Pacific Island Territories in 2022.

Sources of Entanglements

NOAA Fisheries continues to investigate sources of entanglements. By identifying the source of entangling fishing gear, NOAA Fisheries can work with fishermen and coastal communities to identify geographic areas, times of year, types of fisheries, and gear configurations that have resulted in whale entanglements. These data can help NOAA Fisheries better understand the threat in order to consider modifications and mitigations to reduce the risk of future entanglements and the impacts of entanglements on whales and fishermen alike. Forty percent (n=27) of confirmed cases in 2022 involved commercial or recreational fishing gear (e.g., buoys with identifiable marks, traps, nets, and monofilament line). The remaining cases in 2022 (n=40) involved line that could not be directly attributed to a fishery or other source (i.e., no clear evidence of traps, nets, buoys without identification, or other gear with a known source). Although various marine industries introduce gear into the ocean (e.g., ropes, lines, nets, chains, and cables), one of the most common sources of line is commercial or recreational fishing. Therefore, it is likely some of the cases involving only line that could not be identified to a specific source were related to fishing activities.

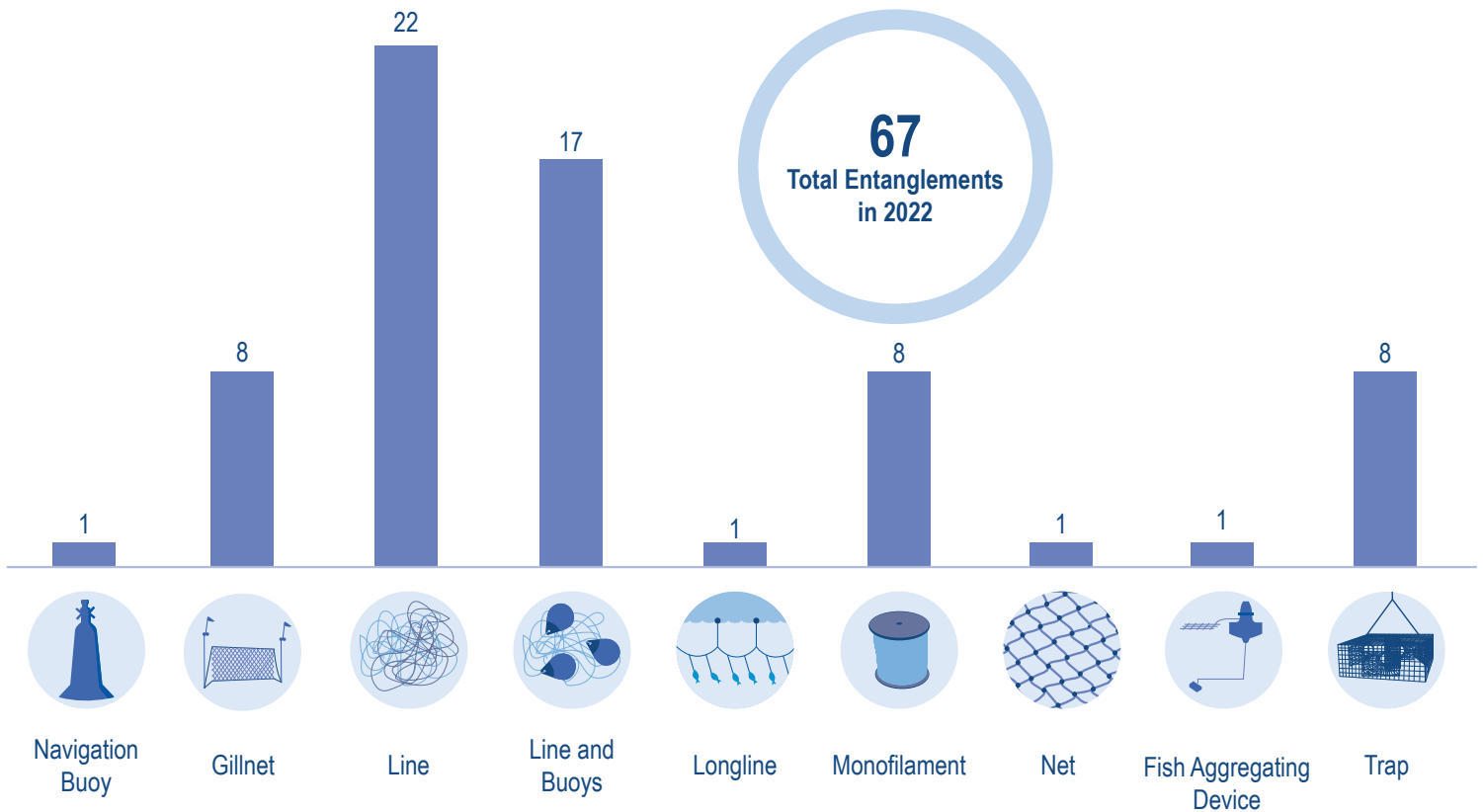


Figure 3. The number of different entanglements by type.

The National Large Whale Entanglement Response Network

NOAA Fisheries coordinates the [National Entanglement Response Network](#), which is composed of five regional networks (Figure 4): Greater Atlantic Region (Maine to Virginia), Southeast Region (North Carolina to Texas and the Caribbean), West Coast Region (Washington to California), Alaska Region (Alaska), and Pacific Islands Region (Hawai'i, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands). Network members represent individuals involved with a wide range of non-profit, academic, industry, and government organizations, with significant experience gained from trainings and responses. All large whale entanglement response operations on ESA-listed species are conducted under the authority of the MMPA/ESA Scientific Research and Enhancement Permit issued to NOAA Fisheries' [Marine Mammal Health and Stranding Response Program](#). The trained professional expert responders who are authorized to closely approach entangled whales are listed as Co-Investigators under the permit.

Table 3. Number of authorized Level 3, 4, and 5 entanglement responders in 2022.

Location	Level 3	Level 4	Level 5
Atlantic Coast	30	7	8
Pacific Coast	42	13	1
Total	72	20	9

In general, Level 1 and 2 responders are fishermen, boaters, and other ocean users who are trained to recognize entangled whales, assess a situation, and collect priority information to document the case. There are several training opportunities to familiarize ocean users with assessing and reporting entangled large whales, including a web-based course that has been developed in a partnership between NOAA and The Nature Conservancy. However, completion of this course alone does not provide authorization for close-approach or disentanglement activities. Level 3, 4, and 5 responders are experienced ocean users—typically biologists, whale watch captains, and Stranding Network members—who are authorized under the MMHSRP permit to conduct entanglement response activities after submitting documentation of their training and experience. Nationwide, in 2022 there were 101 authorized Level 3, 4, or 5 responders, and they were widely distributed geographically (Figure 4). Large whales are the largest animals on Earth, and disentangling them is inherently dangerous. NOAA supports the Network by providing tools, training, protocols, funding, and oversight across the country to ensure that these activities are conducted in a manner that emphasizes and prioritizes human and animal safety. NOAA also conducts and encourages outreach to the public to raise the profile of this nationwide program in an effort to increase safe reporting of entanglements.

Responder Levels

Large whale entanglement responders are authorized by NOAA Fisheries, and are categorized into five levels, based on training and expertise:

Level 1: First responders are trained to spot and report entangled large whales, and may be asked to assist in entanglement response activities by tracking and documenting entangled whales from a distance.

Level 2: Responders are trained to better assess and document entangled large whales, and may be asked to assist in entanglement response activities by tracking and documenting entangled whales from a distance.

Level 3: Authorized responders closely approach entangled whales for visual health assessments, and may attach tracking devices (tags) to entangling material so entangled whales can be followed remotely and quickly located.

Level 4: Authorized responders use tools to cut and remove 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: Authorized responder duties are similar to Level 4, except that responders may remove entangling gear from all species of whales, and have additional training and experience in responding to North Atlantic right whales.

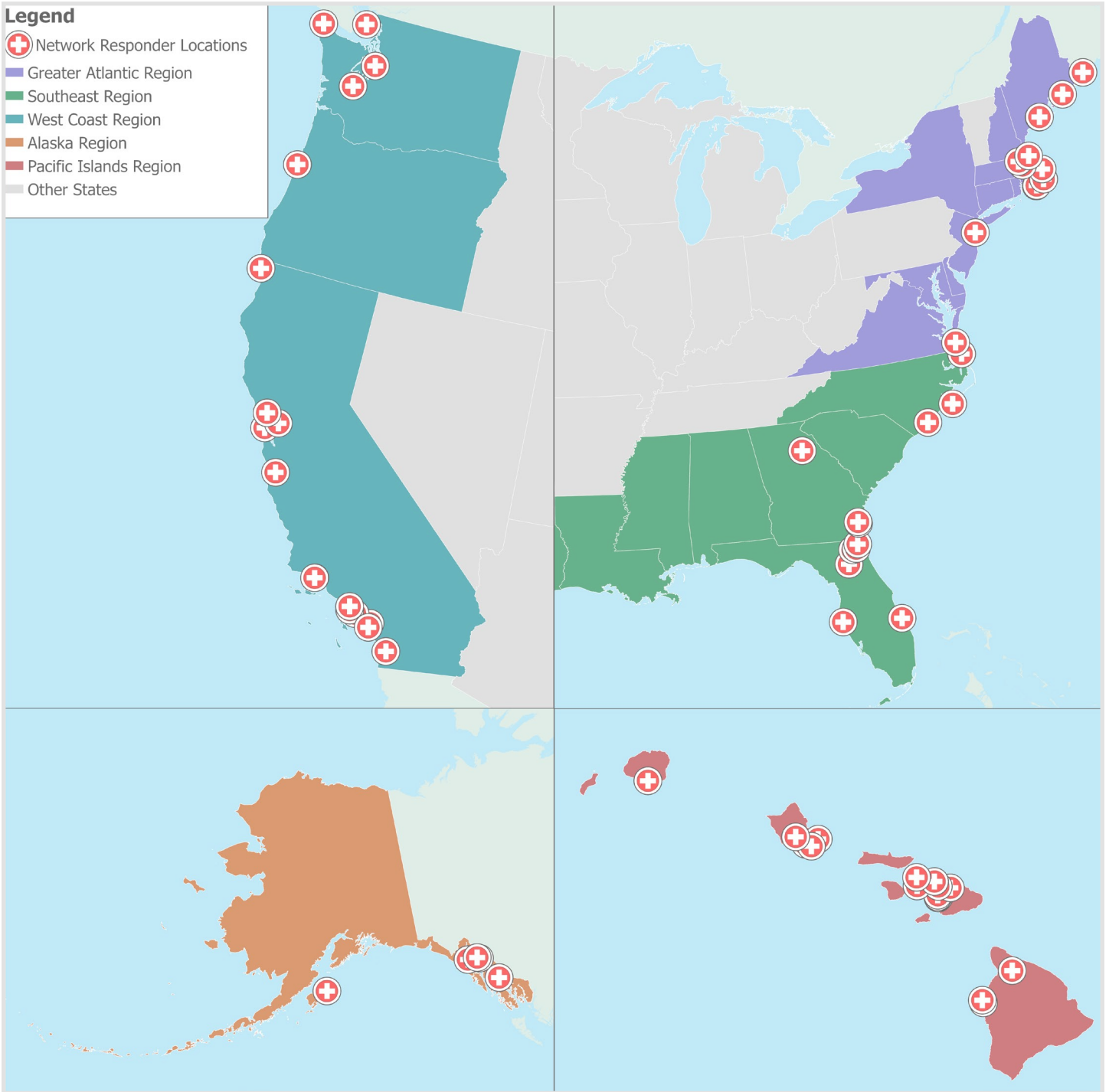


Figure 4. The locations of all Level 3, 4, and 5 responders in the Large Whale Entanglement Response Network in 2022. Note that multiple responders may be based at the same location.

Rescue Operations to Disentangle Large Whales

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 serious injuries, and can eventually lead to a painful death.⁵ Response operations are conducted not only for humane and welfare reasons to provide relief to individually entangled animals, but also to provide an important opportunity to collect information that may reduce the risk of future entanglements, which ultimately aids in the conservation and management of the species. This is particularly important for species that are listed as threatened or endangered under the ESA because each individual contributes to population recovery.

In 2022, the Network mounted responses to a minimum of 28 whales that resulted in the full or partial disentanglement of 14 individual animals (Figure 5). This includes Network responses to a previously confirmed entanglement case from 2021, a North Atlantic right whale named “Snow Cone” (Catalog #3560; see page 13). Four of the 28 whales that received at least one Network response shed all or part of their gear prior to Network intervention. Three other whales that did not receive a Network response were later documented to have shed the entangling gear on their own. The Network mobilized a response for an additional 14 live whales reported to regional entanglement hotlines, but were unsuccessful in locating those animals. For the remaining cases, the Network was unable to mount a response due to the animal’s remote location (e.g., the whale was too far offshore to mount an effective response) or the unsafe conditions (i.e., reports were received late in the day or during bad weather).

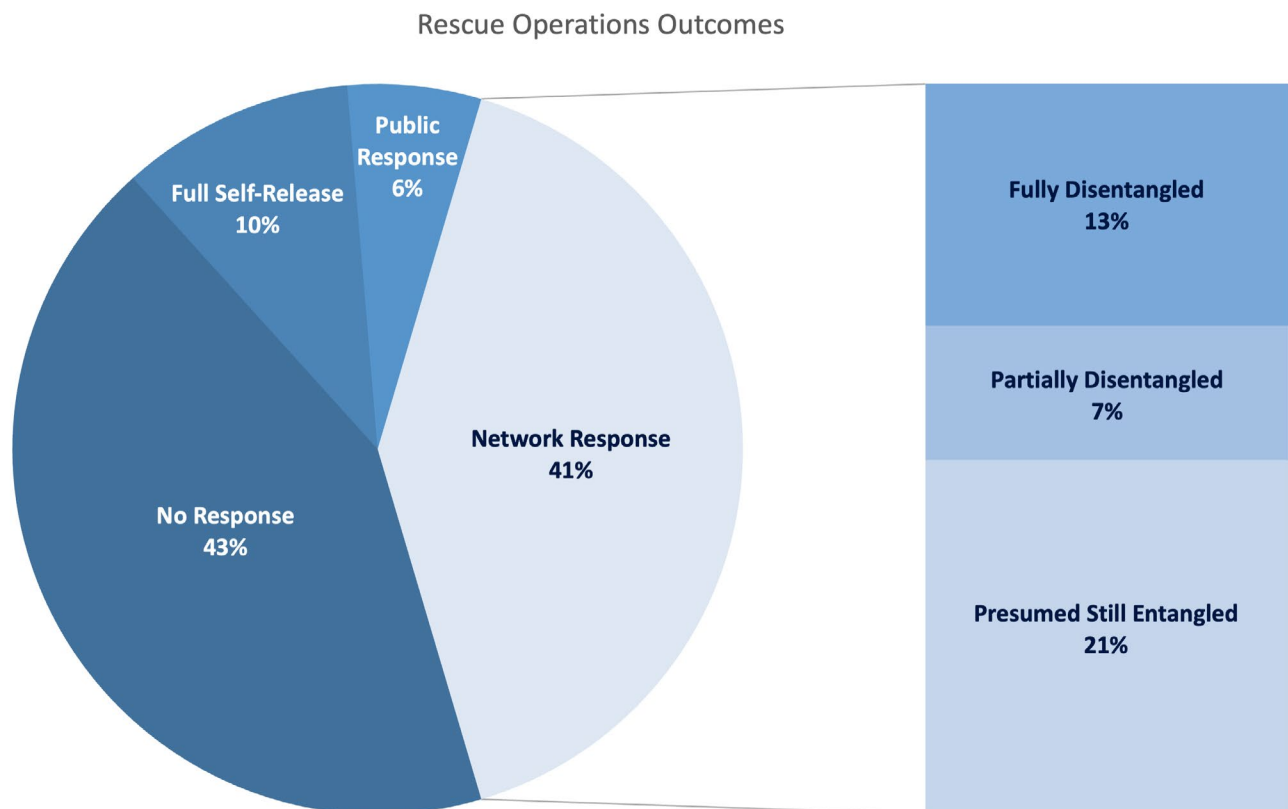


Figure 5. The known outcomes of all live, free-swimming entangled large whales confirmed in 2022. One case that involved partial disentanglement was Snow Cone, the North Atlantic right whale, first documented as entangled in 2021 and also partially disentangled in 2021.

⁵ Moore, M.J. and Van der Hoop, J.M., 2012. The painful side of trap and fixed net fisheries: chronic entanglement of large whales. *Journal of Marine Biology*.



A team of trained responders use hooked knives attached to long carbon-fiber poles to safely cut large whales free. Credit: Marc Lammers (NOAA Permit No. 18786).

Four cases involved unauthorized members of the public attempting to disentangle large whales.⁶ While likely well-intentioned, these responses needlessly put members of the public and the whale at risk of serious injury or death. Responses by untrained members of the public typically do not free the animal from the lethal part of the entanglement (i.e., only some gear is removed) and reduce the chances of experienced Network responses. Cutting off trailing gear and buoys, which is typically what the public is able to do, makes it harder to relocate and disentangle the animal. Additionally, experienced disentanglement teams prioritize the order in which specific cuts should be made to increase the likelihood of all gear being removed.

Finally, 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 address the threat of entanglement to large whales. Therefore, NOAA Fisheries and our partners urge the public to contact their [regional entanglement hotlines](#) to alert trained and equipped members of the Network if they encounter an entangled whale instead of taking matters into their own hands. This is for the safety of the public as well as the whales, as attempting to remove an entanglement from a whale can be very dangerous for untrained members of the public who do not have the right equipment and expertise; for more information, please visit: <https://www.fisheries.noaa.gov/feature-story/let-qualified-experts-respond-entangled-whales>.

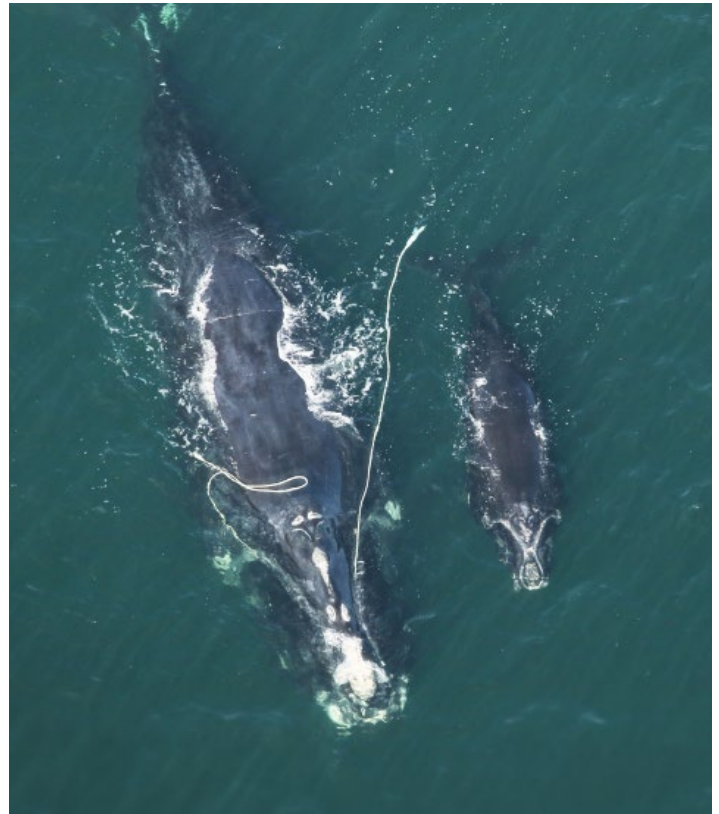
⁶ Section 101(d) of the MMPA allows "Good Samaritans" to assist entangled marine mammals under special conditions. However, since the ESA does not have a comparable provision, the "Good Samaritan Exemption" does not apply to ESA-listed species of large whales. Thus, only responders authorized under MMPA/ESA Permit No. 18786-05 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.

Snow Cone's Story

One North Atlantic right whale (#3560, "Snow Cone") was first confirmed as entangled in the Northeast in 2021, and in 2022, [was confirmed as still entangled](#). While still entangled, she migrated from the Northeast and gave birth to a calf off the southeastern U.S. coast. Snow Cone and her calf were resighted multiple times throughout the 2022 calving season, and several rescue attempts in 2021 and 2022 were made to remove her entangling gear. These rescue attempts enabled responders to better document the entanglement and remove some of the entangling gear. However, Snow Cone is presumed still entangled and, on her last known sighting in October 2022, was documented in poor and declining health and without her calf. Snow Cone's story highlights how entanglement prevention, not response, is the best way to mitigate this threat to large whale populations.

Snow Cone's case is particularly concerning as North Atlantic right whales, a NOAA Fisheries ["Species in the Spotlight,"](#) are one of the world's most endangered large whale species, with fewer than 350 individuals remaining and fewer than 70 breeding females. The loss of any one individual could have negative impacts on an already endangered population where deaths are outpacing births.

Since 2017, North Atlantic right whales have experienced an ongoing UME, and as of the end of 2022, 92 individual right whales (34 confirmed dead, 30 seriously injured, 28 sublethally injured or ill) were included in the UME for the 6-year period (2017–2022). Entanglement in fishing gear and vessel strikes are the leading causes of the UME. NOAA Fisheries and our partners are working to conserve and rebuild the North Atlantic right whale population. The UME continued past 2022; for more information on the current status of the North Atlantic right whale UME, please visit: <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-north-atlantic-right-whale-unusual-mortality-event>



Right whale Catalog #3560 "Snow Cone" and calf sighted off Fernandina Beach, Florida on January 6, 2022. Credit: Florida Fish and Wildlife Conservation Commission (NOAA Permit No. 20556-01).



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

Photo or Video Documentation

Photos or videos from different angles and from a safe and legal distance (note that [regulations apply](#) to certain species and areas) can provide valuable information to entanglement response teams. If you can stand by the animal at a safe distance until responders arrive, it will be the best help for the animal and response team. **Let qualified experts respond!** 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 Network who have been trained and authorized by NOAA Fisheries.

What Members of the Public Can Do

NOAA Fisheries' Marine Mammal Health and Stranding Response Program would like to acknowledge the critical roles first responders and Network partners play in our response to entangled large whales. The Network relies on reports of entangled whales from the public. If you encounter a whale that may be entangled, please contact your local network immediately via the 24/7 regional hotline or contact the United States Coast Guard on VHF CH-16.

Regional Entanglement Hotlines

Region	Phone Number
Maine through Virginia	1-866-755-NOAA 1-866-755-6622
North Carolina through Texas and the Caribbean	1-877-942-5343
California, Oregon, and Washington	1-877-SOS-WHAlE (1-877-767-9425)
Alaska	1-877-925-7773
Hawai'i	1-888-256-9840

Information Needed When Reporting

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

- 1. Location of the animal.**
- 2. A detailed description of the entangling gear or debris.**
- 3. Where the entanglement is located on the animal.**
- 4. The direction and speed the whale is traveling, and whether it is solitary or with other whales.**
- 5. The behavior of the whale.**
- 6. Species of the whale, if known.**
- 7. The approximate size and condition of the whale.**
- 8. Photos and videos, if taken.**



Trained responders from the Center for Coastal Studies work to free an entangled minke whale. One responder looks underwater to see how the whale is entangled and determine how to free it. Credit: Center for Coastal Studies (NOAA Permit No. 18786).

Regional Level 1 Responder Courses

If you are interested in learning more about the Network, our [free web-based Level 1 Responder course](#) is available to the public. This course, which was developed in a partnership between NOAA and The Nature Conservancy, will familiarize you with assessing and reporting entangled large whales. Completion of this course alone does not provide qualification as a Network member.

Additional References

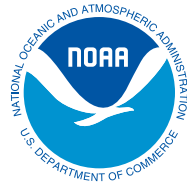
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[Global Entanglement Response Network](#)



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