

Right Whale Research News

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The 2017 Mortalities and Entanglements

It has been a very hard year for this population of right whales, and a challenging time for those of us who have dedicated our lives to understanding and protecting them. Since the beginning of the year, 16 different dead whales have been discovered. This is almost five times the annual average (3.5 deaths per year for 2010-2016). Twelve of the carcasses were found in the Gulf of St. Lawrence during a year with unusually high survey effort. Without that effort, how many of these deaths would have been missed?

At the end of May, it was looking like an average year in terms of documented mortalities. There had been just one death—**Catalog #4694**, who had been hit and killed by a vessel in Cape Cod Bay in April. Then, in June, just as we were preparing to launch our field effort in the Gulf of St. Lawrence, the bad news from that region started rolling in. It began with the death of **#3746** on June 6 (see page 2 for further details about each whale). Then, in a six-day period from June 18 to June 23, five more carcasses were discovered. They were two females just reaching sexual maturity—**Starboard (#3603)** and **Contrail (#3512)**—and three older males—**Panama (#3190)**, **Glacier (#1402)**, and **#1207**. The Canadian government—along with local stranding responders, veterinarians, and numerous volunteers—scrambled to muster a response, and five of the seven were towed to shore and necropsied. But that wasn't even close to the end. In July, two more floating carcasses were detected: an unidentified male on July 5 and a male named **Peanut (#2140)** on July 19. Both were towed to shore and necropsied. Then, in the latter part of July, four more extremely decomposed carcasses were found washed up on the inaccessible western shores of Newfoundland. Their conditions were too poor to identify by physical features, but genetics samples have since shown that one of them was **Contrail**, whose carcass had not been retrieved when discovered in June; the other three were new carcasses. One of the three was a juvenile female **#4111**—the offspring of **Piper (#2320)**, who died in the Gulf of St. Lawrence just two years earlier. In addition to these mortalities, two carcasses were discovered in U.S. waters in August: a small unidentified



Starboard (Catalog #3603), an 11-year-old female, was one of the victims of the Unusual Mortality Event in the Gulf of St. Lawrence. She was found lethally entangled in two different sets of snow crab gear. She was named for her severed right fluke. Photo: Peter Duley/NOAA/NEFSC.

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Entanglements

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male on Martha's Vineyard on August 6 and **Couplet (#2123)**—a reproductive female on Georges Bank on August 9. Just as we thought that the chaos might be simmering down, on September 15, the 12th Gulf of St. Lawrence carcass, a young female, **#4504**, was found entangled and towed to shore for a necropsy. She and her mother had been seen together in the Gulf in 2015. And on October 23, the 16th death was recorded when a decomposed carcass was discovered on Nashawena Island, Massachusetts. We hope it is the last one.

At the time of this article, we are still awaiting the full reports from all the necropsies. Preliminary results indicate that two whales died of entanglements in ropes going to snow crab gear and

four showed evidence of blunt force trauma (vessel strike). NOAA Fisheries in the United States has officially declared this an Unusual Mortality Event (UME). Under the Marine Mammal Protection Act, a UME is defined as “a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response.” The UME website (nmfs.noaa.gov/pr/health/mmume/events.html) goes on to say that “understanding and investigating marine mammal UMEs is important because they can serve as indicators of ocean health, giving insight into larger environmental issues which may also have implications for human health and welfare.”

In addition to the deaths, there have been seven entanglements of live whales so far this year—two in the winter/spring and five this summer. **Ruffian (#3530)**,

a 13-year-old male, was seen entangled in crab gear in January off the southeastern U.S. and disentangled (See *Update on Entanglements...in RWRN May 2017*). In April, **#4146**, a 6-year-old female, was seen entangled in Cape Cod Bay. The five summer entanglements were all discovered in the Gulf of St. Lawrence. These included: 1) an uncataloged whale entangled on July 5 and disentangled by Joe Howlett and team with help from DFO; 2) **Ergo (#1317)**, a 33-year-old male, on July 8 and seen 17 days later off Anticosti Island free of gear; 3) **#4123**, a 6-year-old male, on July 10, disentangled by Joe Howlett and team with help from DFO; 4) **Mayport (#4094)**, a 7-year-old female, on July 19, who has not been seen since; 5) **#3245**, a 15-year-old male, on August 28 and not seen since. When we add in the two whales that died from entanglements in

2017 Mortalities



- April 13, 2017** – **Catalog #4694**, female, age 1, the 2016 calf of **#4094 (Mayport)**
- June 6, 2017** – **Catalog #3746**, male, age 10, son of **#2746**
- June 18, 2017** – **Catalog #3190 (Panama)**, male, age >17 (first seen in 2000 at unknown age), sired **#4160**
- June 19, 2017** – **Catalog #1402 (Glacier)**, male, age 33, son of **#1157 (Moon)** and **#1052**
- June 21, 2017** – **Catalog #3603 (Starboard)**, female, age 11, daughter of **#1503 (Trilogy)** and **#1712**
- June 22, 2017** – **Catalog #3512 (Contrail)**, female, age 12, daughter of **#1012 (Pediddle)**
- June 23, 2017** – **Catalog #1207**, male, age >37 (first seen in 1980 at unknown age), father of **#3545** and **#3893**
- July 5, 2017** – Unidentified male
- July 19, 2017** – **Catalog #2140 (Peanut)**, male, age 26, son of **#1240 (Baldy)** and **#1150 (Gemini)**, father of **#3466**
- July 21, 2017** – Unidentified male, Church Point, Newfoundland
- July 27, 2017** – Unidentified male, Cape Ray, Newfoundland
- July 30, 2017** – **Catalog #4111**, female, age 6, daughter of **#1911 (Mystique)** and **#1156 (Misstip)**
- August 6, 2017** – Unidentified male, Martha's Vineyard, MA
- August 9, 2017** – **Catalog #2123 (Couplet)**, female, age 26, daughter of **#1123 (Sonnet)** and **#1144 (Dingle)**. **Couplet** had given birth to five calves, her most recent in 2014
- September 15, 2017** – **Catalog #4504**, female, age 2, the 2015 calf of **#1604**
- October 23, 2017** – Unidentified right whale, sex undetermined due to advanced decomposition

All the right whale carcasses found at sea were floating belly up, providing no view of the callosities on the top of the head—the main identifying feature for right whales. It is a noteworthy feat that, despite this, the Aquarium team was able to identify eight of the 10 floating carcasses using a combination of the whale's sex, belly color, and small scars on the chin, flippers, underside of the peduncle (tail stock), and tail. This success rate is due to two things: the skills of very experienced matchers who will search for all available clues to help find a match, and our extremely detailed database of images and the custom-designed DIGITS software that we use to manage and search the database. The degree of detail in this database is only made possible by the dedication and collaboration of hundreds of individuals and organizations along the entire Eastern Seaboard who submit images to the catalog.

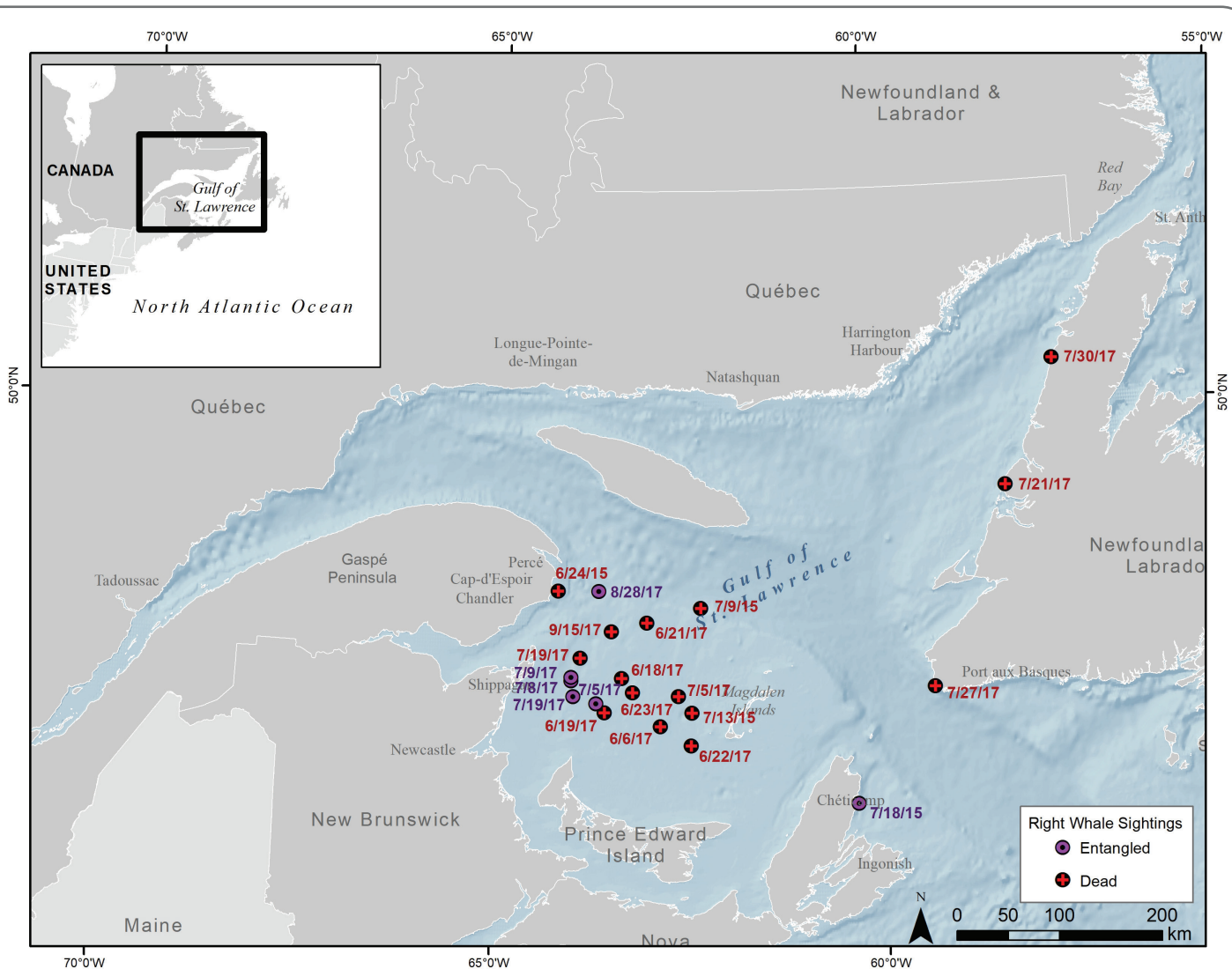
the Gulf, the total comes to nine. We believe that most of these whales had been recently entangled—some within hours. We often don't know where right whales become entangled, making it harder to determine which fisheries were involved. In this case, we know that most, if not all, were entangled in Canadian snow crab gear. As with the carcasses, we wonder how many of these summer entanglements would have been detected without the exceptional level of survey effort in the area this summer.

As this newsletter goes to print, we have lost at least six females and nine males, and we don't know the fate of three of the entangled whales. Sixteen whales are 3.5% of the population, which was recently estimated at 458 animals (See *How Many Right Whales Are There?*). Unfortunately, a recent study suggests that the majority of right whale carcasses are

never seen, so 16 is the minimum number of deaths that occurred this year. This level of loss is not sustainable—especially with the low calf counts in recent years (just five born this year). The loss of six females is particularly upsetting. A female can give birth to at least 10 calves in her lifetime, so this represents the loss of the potential for 60 calves. If even half of those calves were female and had gone on to produce 10 calves themselves, then it becomes the loss of 360 whales. We all eagerly await the findings from the necropsies and the UME investigation, but we already know that at least seven of the deaths were from vessel strikes and entanglements. In the Gulf of St. Lawrence, the Minister of Fisheries closed one of the snow crab fishery areas, restricted or delayed other fisheries (such as rock and toad crab), mandated ships of 20 meters or more in the area to

slow down to 10 knots, and authorized DFO aerial surveys to continue efforts to monitor right whale presence in the area. The big question is what will happen next year? If right whales again show up in the Gulf of St. Lawrence in large numbers will similar protective measures be enacted? We hope that this UME will galvanize both the U.S. and Canadian governments to not only react to the crisis, but to double-down on their efforts to prevent these threats in the future. We encourage you to reach out to NOAA Fisheries and DFO to show your interest in seeing meaningful actions taken to protect right whales throughout their range.

—Philip Hamilton



A plot of all 15 dead and six live entangled right whales documented in the Gulf of St. Lawrence from 2015 to 2017.

Note that all but three records are from 2017. Map: Brooke Hodge/Anderson Cabot Center for Ocean Life/NEAq.

Spring in Cape Cod Bay

Before all the tragic events of this past summer, we were feeling very hopeful given how many whales were seen feeding in Cape Cod Bay. Although photo analysis is still ongoing, we expect that the total number of individual whales seen there between January and May will be close to the 2011 record of 283. On April 14, the Center for Coastal Studies (CCS) aerial survey team photographed an astonishing 197 right whales, the most ever seen by its team on a single day in the bay!

All three mother-calf pairs seen in the Southeast this year were sighted in Cape Cod Bay. **Pediddle (Catalog #1012)** and calf were the first reported on April 3, followed by **Tripelago (#2614)** and **#1711** and their calves on April 9 and 14, respectively.

We had some great news when two additional mother-calf pairs were seen in Massachusetts waters. The mothers, **#1412** and **#1515**, are rarely sighted, and we know very little about them.

Catalog #1412 was first photographed in October 1984 with a calf on Jeffreys Ledge (about 26 miles off the coast of New Hampshire). Eleven years passed before her next sighting in 1995 between Iceland and Greenland. Then, in 1997, she was again seen on Jeffreys Ledge in October with a calf. In 2003, she was videotaped from a whale watch boat off Iceland and on April 12, 2017—14 years after her last sighting—she was photographed in Great South Channel (east of Cape Cod) by CCS with her third documented calf. Interestingly, she has never been seen in the calving grounds off the Southeast U.S.

Catalog #1515 was first sighted in 1985 in Massachusetts Bay with a calf. Since then, she has had six more calves that we know of, including this year's. She has been seen a bit more often than **#1412**, but still infrequently, having only been sighted in nine of the last 32 years, most recently in 2009. She and her seventh calf were photographed by the NOAA Fisheries aerial survey team on April 30, 2017, in Great South Channel.

As mentioned in our last newsletter, our team also worked in Cape Cod Bay this spring. In March, we collaborated with scientists from Woods Hole Oceanographic Institution and NOAA on the sailing vessel *Rosita* as they flew a small drone over right whales to obtain images for photogrammetry (to measure growth and body condition) and collect respiratory blow for microbiome analysis. (See [Right Whales Have Arrived... in RWRN May 2017](#) and [Unmanned Aerial Systems... in RWRN May 2016](#)). The effort was a success with at least 35 individual whales photographed and 25 blow samples collected.

In April, we joined NOAA on the R/V *Selkie* with a goal of obtaining skin biopsy samples from previously unsampled individuals for genetic studies. This effort is challenging as it requires quickly recognizing the individual that needs to be sampled and keeping track of it among all the other nearby right whales as the darter prepares the biopsy equipment—harder than it sounds when there are 30 skimfeeding right whales in the area! Of the five biopsy samples we collected, one was especially exciting.

On April 20, we were thrilled to find the mysterious **#1412** skimfeeding in Cape Cod Bay with her calf in tow. We were able to obtain a sample from her and now eagerly await the genetics report to see if the results shed any light on the life story of this elusive whale.

—Marilyn Marx

Right Whale Fathers

Last year, I sat down with Dr. Tim Frasier of St. Mary's University in Halifax, Nova Scotia, and discussed right whale paternity data. We have no way of behaviorally determining paternity, or fatherhood, in right whales, so we depend upon the geneticists to figure it out for us. If they have a skin sample from both the mother and her calf, they have a chance of inferring who the likely father is if a skin sample from him is also available. Tim determined paternities for a number of males in the mid-2000s and published an [interesting paper](#) as a result. Since that time, graduate student Meagan Moeyart at Trent University in Peterborough, Ontario, analyzed more samples and has boosted the number of known fathers considerably. After Tim and I reviewed the data to ensure that the two analyses followed consistent protocols, we ended up documenting 88 fathers and 176 paternity assignments! Numbers aside, knowing these animals so well, I am always eager to see who fathered whom. The record holder for paternities is **Misstip (Catalog #1156)**, who fathered at least nine calves—his first in 1981 (**#1267**, born in 1982) and his most recent (for which we have data) in 2010 (**#4111** born in 2011). Sadly, genetics just uncovered that **#4111** was one of the mortalities in the Gulf of St. Lawrence this summer (see *The 2017 Mortalities...*). Of all the males with multiple calves assigned to them, only **Misstip** has mated with the same whale more than once. He and **Shenandoah (#1266)** had calves in 1982 (**#1267**) and in 1988 (**#1803**).

The next most productive fathers are **#1037** with six calves, and Sponsorship Whale **Gemini (#1150)** with five. **Gemini** is a bit of a surprise as he has



The mysterious **Catalog #1412**, the fifth mother of the year, skimfeeds in Cape Cod Bay in April. She has only been sighted eight times since 1984. Photo: Marilyn Marx (NEFSC), NOAA Permit #17355-01.

always looked smaller than other adult males and we presumed he would be less likely to be able to compete for mating opportunities. But **Gemini**, along with seven other males, actually sired two calves in the same year.

There is no end to the stories and potential for further research that paternity assignments provide. For example, Tim [used paternity data](#) to show that right whales have a mechanism that can actually increase their genetic diversity—a particularly exciting finding given this population’s level of inbreeding.

To see many of the paternity assignments, and some of the publications that used the data, visit the Trent University website narightwhale.nrdpfc.ca.

—Philip Hamilton

How Many Right Whales Are There?

Each year, the North Atlantic Right Whale Consortium (NARWC) develops a “report card,” which, among other things, gives population estimates for this species. Last year’s report card had a best estimate of 524 photographed right whales—490 of those were cataloged and believed to be alive, and another 34 were recent calves or unknown-age whales, which we were awaiting additional photographs before cataloging them. Recently, Scott Kraus, Vice President of the Anderson Cabot Center for Ocean Life at the New England Aquarium, co-authored [a paper](#) that suggests the population may be considerably smaller than the report card assessment. By using a statistical method to analyze the same data set, the paper’s authors estimate that there are only 458 living cataloged whales. They also discovered that the population started to decline after 2010. The recent Unusual Mortality Event (see *The 2017 Mortalities...*) has not improved that trajectory. We are currently working to develop this year’s report card, which will incorporate new approaches to estimating the population size.

You can see past report cards and look for the newest one on the NARWC website at narwc.org/index.php?mc=3&p=29.

—Philip Hamilton



Joe Howlett with Sponsorship Whale Calvin (#2223) and her calf on Roseway Basin in 2015.
Photo: Marianna Hagbloom.

Captain Joe Howlett

It is with heavy hearts that we write to recognize the passing of Joseph Michael Howlett on July 10, 2017, while rescuing an entangled right whale in the Gulf of St. Lawrence, Canada.

Joe was a husband, father, and grandfather, as well as a vital community member and longtime resident of Campobello Island, New Brunswick. A jack-of-all-trades, Joe worked as a commercial fisherman, house painter, and boat captain. He was an avid golfer, loved to play cribbage, and played a mean harmonica. He was fiercely passionate about the oceans and co-founded the Campobello Whale Rescue Team in 2002. Wanting to give something back to the ocean, Joe spent the last 15 years saving countless whales of various species that were found entangled in fishing gear. Joe’s easy manner, jovial nature, and huge heart, as well as his skills as a fisherman, captain, and whale rescue responder were only surpassed by the enduring friendships he developed with all who spent time with him in his many pursuits and passions.

For several summers, he worked as a captain on the vessel *Shelagh*, and many of us on the Aquarium’s right whale team sailed with him while studying right whales south of Nova Scotia and in the Gulf of St. Lawrence. There really are no words to properly capture what a tragic loss this is to those of us lucky enough to have worked side-by-side on a boat with him, sometimes for weeks at a time. Sailing with Joe was an absolute delight, and it was impossible not to develop an easy intimacy with this man who wore his heart on his sleeve. He always had a joke, an aphorism (“There’s no ‘I’ in team!”), and a can-do attitude at the ready. The world now knows Joe as a heroic whale rescuer, but to his crew, he was our captain and our buddy. His larger-than-life personality, full of infectious enthusiasm and twinkling mischievousness, is irreplaceable.

We miss you, buddy.

—Aquarium Right Whale Team

Sponsored Whale Update

Cape Cod Bay was very busy this past spring, and most of the sponsorship whales were seen there between February and April; details of those sightings were reported in the May 2017 issue of *RWRN*. The following updates are those recorded since then. Check out the map to see where the whales have been in the last year!

Gemini (Catalog #1150) was seen twice in the Great South Channel this spring by the NOAA Fisheries aerial team. He was seen skimfeeding on April 12 and subsurface feeding on April 30. Our Aquarium team saw him in the Bay of Fundy on July 31. He was travelling in a northerly direction off the coast of Grand Manan Island. **Gemini** was also recently confirmed in a March 23, 2016, sighting in Cape Cod Bay.

Manta (Catalog #1507) was recently confirmed in a sighting from September 5, 2016, in the Bay of Fundy. The Canadian Whale Institute photographed him in a Surface Active Group with **Mogul** (Catalog #3845).

Aphrodite (Catalog #1701) was photographed from a NOAA research vessel as she briefly joined up with **Shackleton** (Catalog #2440) to feed together in Cape Cod Bay on April 9, 2017. She was also seen on May 16, 2017, in Great South Channel (east of Cape Cod) by the NOAA aerial team.

Calvin (Catalog #2223) was photographed skimfeeding in the Great South Channel on April 9, 2017, by the NOAA aerial team. Months later, the team found her in the Gulf of St. Lawrence on July 19, 21, and 26.

Shackleton (Catalog #2440) was seen twice in Cape Cod Bay by NOAA. On April 9, he was seen feeding with **Aphrodite** (see above), and on April 14 he was skimfeeding alone.

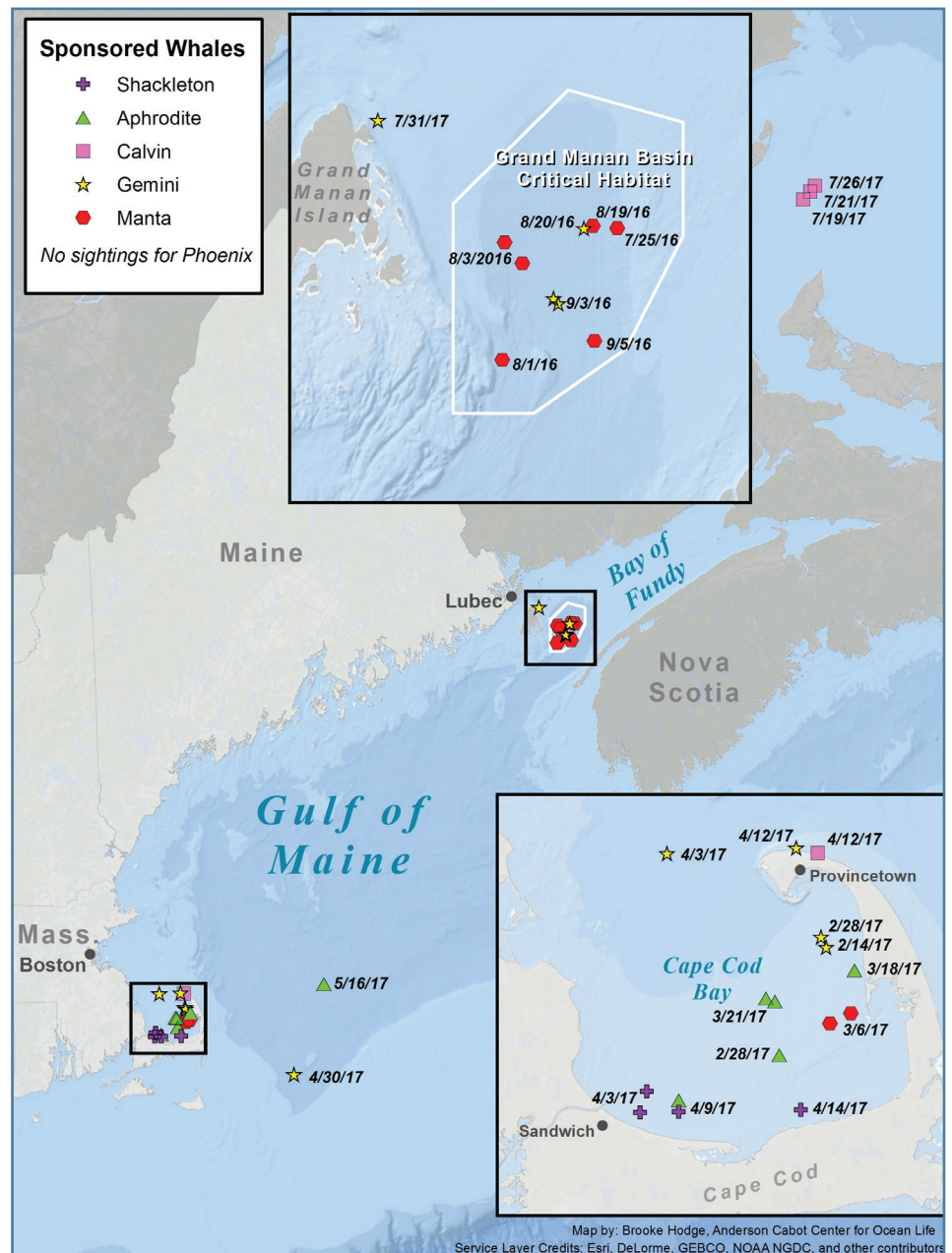
Unfortunately, we do not have any sightings of **Phoenix** (Catalog #1705) to report at this time.

Thank you for your sponsorship and supporting our work!

—Marianna Hagbloom



Aphrodite skimfeeds in Cape Cod Bay in April. Her open mouth and baleen plates are visible under the calm water. Photo: Kelsey Howe (NEFSC), NOAA Permit #17355-01.



Sponsored whale sightings July 2016 through August 2017.

Map: Brooke Hodge/Anderson Cabot Center for Ocean Life/NEAq.

Updates from the Summer Field Season

This summer, as the Bay of Fundy continued to be an unpredictable summer feeding ground and as the death toll in the Gulf of St. Lawrence rose to at least 12 (see *The 2017 Mortalities...*), our research team collaborated with old and new partners to maximize survey efforts in both locations.

In late July, our research team returned to Lubec, Maine, to begin the 37th consecutive field season in the Bay of Fundy. The first week of the season was a busy one, and we documented at least 32 individual right whales, witnessed a Surface Active Group, and collected fecal samples and a biopsy sample. Unfortunately, the activity in the Bay quickly fizzled out after August 2, including noticeably fewer birds and other cetaceans. Our colleagues at the Grand Manan Whale and Seabird Station also found low levels of plankton during their annual tows and witnessed the decline in activity. On August 27, as we were returning to Lubec from a survey of the Bay, we found what would be our last right whale of the season (**Catalog #3820**) off the Eastport, Maine, fuel dock. Right whales rarely come into Head Harbor Passage, so it was a welcome surprise at the end of a long day and an even longer month. Our eight-week field season was cursed with intermittent bouts of terrible weather, so the *Nereid* only logged 13 survey days in total—well below last season for both number of days at sea and number of whales.

Meanwhile, in the Gulf of St. Lawrence, aerial surveys flown by NOAA Fisheries, Canada's Department of Fisheries and Oceans (DFO), and Transport Canada covered extensive territory throughout the Gulf. More focused areas were covered by vessel surveys conducted by Mingan Island Cetacean Study in the northern Gulf and a joint effort by the Canadian Whale Institute (CWI) and the Aquarium on the western side of the Gulf. Several members of the Aquarium's Right Whale Team joined other researchers from CWI, Dalhousie University, DFO, and NOAA on the 46-foot vessel *Shelagh* to survey an area of the Gulf called the Orpheline Trough for two weeks in both July and August. In addition to the collection of right whale photo-IDs, we made an effort to get a more

complete picture of the habitat by collecting oceanographic information through CTD and plankton tows.

The July *Shelagh* cruise logged a total of five survey days and 51 right whale sightings, and documented high



Catalog #3820 swimming between Campobello Island, New Brunswick, and Eastport, Maine, on August 27.

Photo: Johanna Anderson/Anderson Cabot Center for Ocean Life/NEAq.

numbers of fishing gear (snow crab) and fishing vessel traffic. Our team was repeatedly pulled away from photo-ID work to respond to entangled right whales found by the NOAA aerial survey team. A total of seven right whale entanglements (five alive, two dead) were documented in this habitat this season (see *The 2017 Mortalities...*). It was one of these disentanglement efforts that tragically led to the abrupt end of our cruise (see *Captain Joe Howlett*).

A few weeks later, in early August, the resilient *Shelagh* crew returned to the Gulf of St. Lawrence for the second cruise and found drastically less fishing gear and fewer vessels in the area due to the closure of the snow crab fishery. The August cruise also logged five survey

days, but only documented 33 right whale sightings, most of which were seen on the first day. We witnessed the right whales move out of the Orpheline Trough area (plankton tows confirmed the decline of their main prey), while

other baleen whales moved in (along with different zooplankton, including krill). Aerial surveys later confirmed that the aggregation had shifted further north. Between both the *Shelagh* cruises and the other survey efforts, well over 100 right whales were documented in the Gulf this summer. And because the Canadian government has continued to conduct aerial surveys during autumn that number may rise.

It was an extremely tough season mired in loss, but it was also an informative one that proves the importance of dedicated survey effort and collaboration among research institutions. The Bay of Fundy habitat continues to fluctuate in the timing and duration of use by right whales, and we will monitor these changes and shift our efforts accordingly. The number of right whales seen by multiple platforms in the Gulf of St. Lawrence this season constitutes a considerable portion of the population and is an area that should be studied for many years to come.

—Marianna Hagbloom,
Philip Hamilton, Kelsey Howe



Three whales skimfeeding together in the Bay of Fundy on July 29.

Photo: Kelsey Howe/Anderson Cabot Center for Ocean Life/NEAq.



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To learn more about our Sponsorship program, visit us online. neaq.org/rwsponsorship

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In this newsletter, all photographs of right whales in U.S. waters were taken under NMFS/NOAA permit under the authority of the Marine Mammal Protection Act and the U.S. Endangered Species Act. *Right Whale Research News* is produced and published by the New England Aquarium. We welcome your comments and suggestions.

Read more about a particular aspect of our project at neaq.org.

You may now access past issues of *Right Whale Research News* on our website. Go to neaq.org/rightwhale. The archive goes back to 2005, and all but the two most recent issues of *RWRN* are available. Now when one of the articles in the current issue refers to an earlier piece on the same subject, it's easy to check it out!

Thank you!

We would like to thank all the individuals, organizations, and schools that continue to support our research with annual sponsorships and donations. In these difficult economic times, with federal research budgets shrinking, your support is more critical than ever before, and we truly appreciate your generosity. Sponsorship funds are used by the New England Aquarium Right Whale Program to support activities that directly contribute to the conservation of North Atlantic right whales.