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Experts suspect record-setting gray whale struck multiple times in San Francisco Bay; cause of death for second gray whale still unknown

Both necropsy responses led by The Marine Mammal Center and the California Academy of Sciences were to individual whales sighted earlier this year in San Francisco Bay by the Center's researchers

(SAUSALITO, Calif. – May 11, 2023) – Scientists at The Marine Mammal Center, the world's largest marine mammal hospital, and their partners at the California Academy of Sciences and the National Park Service, determined probable vessel strike and malnutrition to be the cause of death for a gray whale that was sighted for at least 75 days in San Francisco Bay, a record for the species.

The cause of death for a second gray whale was undetermined after both animals washed ashore in Point Reyes National Seashore last weekend. By investigating deaths like this, the Center can identify and respond to rapidly changing environmental trends as well as human impacts on marine mammal populations.

"To respond to two known gray whales on consecutive days, including one that our team has been actively monitoring for months in San Francisco Bay, is challenging and concerning to say the least," says Dr. Pádraig Duignan, Director of Pathology at The Marine Mammal Center. "As sentinels for ocean health, gray whales face several human-caused threats including vessel strikes. This critical observation and pathology data can help build a stronger case about the current challenges this species faces and solutions to address them."

In a necropsy, or animal autopsy, conducted Tuesday, May 9, by a combined team of 11 scientists on North Beach in Point Reyes National Seashore, experts identified the whale as a 39-foot adult male in emaciated body condition based on previous live observation surveys in San Francisco Bay by the Center's Cetacean Field Research Team. This was further confirmed during the necropsy on Tuesday.

The whale was first sighted in the Bay on February 9 in good body condition and again actively feeding in late March. The Center's research experts later noted a new slowly healing scar along the middle of the animal's back that occurred sometime in that same month. Further resights by the Center documented an increasingly debilitated whale with increased numbers of sea lice on the skin and associated with the scar by the time of its last resight on April 24.

During the necropsy, scientists discovered multiple rib and spinal fractures with evidence of attempted healing that were located beneath the external scar. In addition, the team noted fractures to the skull

with recent hemorrhage and muscle damage particularly in the muscles connecting the head to the body. This would be equivalent to a severe whiplash injury in a motor vehicle collision.

Due to these factors, the team hypothesizes that the whale was struck twice in separate instances. One strike likely occurred to its back while the animal was in the Bay, causing the whale to slowly decline. The strike to the whale's head was a much more acute event that occurred immediately before the animal died. This strike is the most likely cause of its death due to the extent and severity of damage to the top of the skull, proximity to the brain and wrenching of the animal's neck by the impact.

In the other necropsy investigation, conducted Monday, May 8, on the northern end of Agate Beach, a team of 17 scientists identified the whale as a 37-foot adult male in excellent body condition based on the fat stores, an abundant blubber layer and robust amounts of muscle. The stomach of this whale was filled with material that included plant fibers and invertebrates that may have been scooped from the bottom of the Bay. This data point supports the Center's ongoing field observations that gray whales are feeding while inside San Francisco Bay.

Due to the positioning of the whale, the necropsy team was able to examine all of the ribs and the entire spinal column on the left side. Although the team found no signs of initial fracture or trauma, experts concluded that the whale died suddenly based on the factors described and hope to return to the whale later to determine whether human interaction can be ruled out. This whale was previously sighted alive in San Francisco Bay on May 1 and May 2 by the Center's researchers.

Experts were first notified of the dead whale on the north end of Agate Beach on May 6 and a small team from the California Academy of Sciences responded on May 7 to take initial measurements and samples prior to the necropsy investigation. The whale at North Beach was initially sighted floating a mile off Point Reyes National Seashore by National Park Service staff on May 6 before also washing ashore May 7.

It's unknown whether the whales died inside Bay waters and were taken out by the tide or ventured outside the Bay and later died.

Elevated numbers of dead gray whales washing ashore in poor body condition since early 2019 across the species' entire migratory range caused the National Oceanic and Atmospheric Administration (NOAA) to declare an Unusual Mortality Event (UME) that is ongoing.

According to NOAA, the number of gray whales migrating along the West Coast has dropped 38 percent during the UME to an estimated 16,650 whales since the last population assessment in 2015/2016, when whale numbers peaked at an estimated 26,960 whales.

Malnutrition, entanglement and trauma from vessel strikes are the most common causes of death in whales identified by the Center's research team in recent years. The Center's team participates as an investigator on NOAA's gray whale UME working group, which assesses those factors as well as the impacts from harmful algal blooms, infectious disease, natural predation, and other human interactions.

It is critical for boaters and people on the water to keep a safe distance from whales and report sightings to the Center's website. All marine mammals are federally protected, and the public should not approach any whale, alive or dead.

Scientists from The Marine Mammal Center and the California Academy of Sciences were able to collect a series of samples for ongoing research projects from both whales. Typically, the California Academy of Sciences archives various parts of each specimen (baleen, pelvic bones, blubber, muscle, etc.) in their scientific research collection thus making them available to scientists from around the world.

For more information about the Center's pathology work with dead whales, visit our website.

2023 whale response information:

4 gray whales
Necropsies: 3 suspected/probable vessel strikes, 1 undetermined

- March 25, 2023: subadult male gray whale, Bolinas Beach, Bolinas; cause of death: suspected vessel strike
- April 7, 2023: juvenile male gray whale, San Leandro Marina; cause of death: suspected vessel strike
- May 8, 2023: adult male gray whale, Point Reyes National Seashore (north Agate Beach); cause of death: undetermined
- May 9, 2023: adult male gray whale, Point Reyes National Seashore (North Beach); cause of death: probable vessel strike and malnutrition

ABOUT THE MARINE MAMMAL CENTER:
The Marine Mammal Center is a global leader in marine mammal health, science and conservation, and is the largest marine mammal hospital in the world. As a leading contributor to the global body of research and knowledge about marine mammal medicine and ocean health, the Center generates research findings and scientific outputs at volumes comparable to top academic institutions and prides itself on gathering and providing open research data that is free to access, reuse, repurpose and redistribute. The Center's teaching hospital and training programs operate globally with headquarters in Sausalito, CA. The Center has rescued more than 24,000 marine mammals from 600 miles of authorized rescue area along the California coastline and the Big Island of Hawai'i. The Center's mission is to advance global ocean conservation through marine mammal rescue and rehabilitation, scientific research, and education.

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