

Soundings



APRIL 2015

American Cetacean Society – Monterey Bay Chapter
PO Box H E, Pacific Grove, CA 93950

**MONTHLY MEETING AT HOPKINS MARINE STATION,
LECTURE HALL BOAT WORKS BUILDING
(ACROSS FROM THE AMERICAN TIN CANNERY OUTLET STORES)
MEETING IS OPEN TO THE PUBLIC**

MEETING DATE:

Thursday, April 30, 2015

Time: 7:30 PM

PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

**Speaker: Alisa Schulman-Janiger
Director, ACS/LA Gray Whale Census and Behavior Project**

Topic: Gray Whale Census and Behavior Project



We should be in for up-to-the-minute news of gray whales this month as Alisa Schulman-Janiger tells us about the annual census by the Los Angeles Chapter of the American Cetacean Society. She has been director of the census project for 31 years, training and coordinating volunteers who sit high above the Pacific in Palos Verdes and watch gray whales swimming past on their annual migration between Alaska and Mexico.

In addition to observing the migration, Alisa is coming to Monterey after a week with the whales in Baja.

The Southern California observers see only a portion of the gray whales as most of them migrate through the Channel Islands. By the beginning of April this year they had counted 1,898 gray whales going south, including a remarkable 50 calves apparently born on the way. And they had seen 1,432 on the way back north, including 16 calves.

Alisa is a marine biologist (degree from CSU Long Beach) who taught in San Pedro High's Marine Science Magnet School for 21 years. In addition to her expertise with gray whales, she has studied humpbacks, orca and porpoises with the National Marine Mammal Lab in Alaska, and founded the California Killer Whale Project.

Please join us for refreshments before the program begins. More information is available on our website, www.acsmb.org.

Next month: We'll meet at Hopkins on May 28 (the last Thursday of the month).

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Migrating gray whale breaches off of Palos Verdes.

CALENDAR

Apr. 11-12: Moss Landing Marine Laboratories Open House. This year's open house activities will include seminars, touch tanks, SLEWTHS demo, a dune walk, fish printing R/V *Pt. Sur* tours, a puppet show and much more. 9 am -5 pm both days. For more info please go to mlml.calstate.edu.

Apr. 17: Hopkins Marine Station Marine Science Seminar. The Betty and Gordon Moore Center for Science: Emerging Opportunities for Conservation in the Pacific 12 PM – 1 PM.

Apr. 19: Science Sunday at the Seymour Marine Discovery Center in Santa Cruz. The Secret Lives of Snowies: Ecology and Conservation of the Snowy Plover. Presentation by Kris Neuman, M.S., Waterbird Ecologist at Point Blue Conservation Science. 1 PM – 2 PM.

Apr. 22: MBARI Seminar by Ted Cranford, San Diego State University: Virtual Model of a Baleen Whale: Constructing Mysticete Audiograms. 11 AM – 12 PM at MBARI's Pacific Forum in Moss Landing.

Apr. 25: Monterey Bay National Marine Sanctuary Currents Symposium: We Want You! The Rise of Citizen Science. California State University Monterey Bay.

Hopkins Marine Station Marine Science Seminars: Fridays from 12 PM – 1 PM at Boatworks Hall.

May 1: MBARI Advances in Deep Sea Biology: Exploring Monterey Canyon. Presentation by Bruce Robison.

May 15: Fishermen Selectivity: The Science of How to Engage the Best Fisheries for Bycatch Solutions. Presentation by Kiki Jenkins of the University of Washington.

May 29: What's Ahead? A Look at a Few Big Issues for a Sustainable Ocean Future. Presentation by Denny Takahashi of the Moore Foundation.

American Cetacean Society
Monterey Bay Chapter

Annual Blue Whale Fundraiser Saturday, June 27, 2015

This annual search for the world's largest animal will also be on the lookout for humpback whales, killer whales, dolphins, porpoises, pinnipeds and various early summer marine seabirds.

Cost: \$55

Time: 9:00 am - 2:00 pm

Boat: *Sea Wolf 2* or *Black Fin*

Location: 84 Fisherman's Wharf, Monterey, CA

More info will be available in forthcoming newsletters. For reservations call Monterey Bay Whale Watch at 831-375-4658.

All proceeds benefit ACS Monterey Bay.

Jul. 25: ACSMB's Annual BBQ. Tri tip, chicken, salads, beans, bread, and cake! We will have water, soft drinks and coffee; BYOB and silverware. 3 pm – 6 pm at George Washington Park in Pacific Grove. Payment of \$20 per person can be sent to ACSMB at P.O. Box HE, Pacific Grove, CA 93950. Questions call 831-373-4281.

BOOK RECOMMENDATIONS

The Invaders: How Humans and Their Dogs Drove Neanderthals to Extinction, by Pat Shipman. 2015 Harvard University Press

How To Raise A Wild Child: The Art and Science of Falling in Love with Nature, by Scott D. Sampson. 2015 Houghton Mifflin Harcourt.

The Human Shore: Seacoasts in History, by John R. Gillis. 2015 University of Chicago Press

WHALE FOSSIL, 17 MILLION YEARS OLD, PROVIDES FIRST EXACT DATE FOR EAST AFRICA'S PUZZLING UPLIFT

Mar. 17, 2015 — Uplift associated with the Great Rift Valley of East Africa and the environmental changes it produced have puzzled scientists for decades because the timing and starting elevation have been poorly constrained.

Now paleontologists have tapped a fossil from the most precisely dated beaked whale in the world -- and the only stranded whale ever found so far inland on the African continent -- to pinpoint for the first time a date when East Africa's mysterious elevation began.

The 17 million-year-old fossil is from the beaked Ziphiidae whale family. It was discovered 740 kilometers inland at an elevation of 620 meters in modern Kenya's harsh desert region, said vertebrate paleontologist Louis L. Jacobs, Southern Methodist University, Dallas.

At the time the whale was alive, it would have been swimming far inland up a river with a low gradient ranging from 24 to 37 meters over more than 600 to 900 kilometers, said Jacobs, a co-author of the study.

The study, published in the *Proceedings of the National Academy of Sciences*, provides the first constraint on the start of uplift of East African terrain from near sea level.

"The whale was stranded up river at a time when east Africa was at sea level and was covered with forest and jungle," Jacobs said. "As that part of the continent rose up, that caused the climate to become drier and drier. So over millions of years, forest gave way to grasslands. Primates evolved to adapt to grasslands and dry country. And that's when -- in human evolution -- the primates started to walk upright."

Identified as a Turkana ziphiid, the whale would have lived in the open ocean, like its modern beaked cousins. Ziphiids, still one of the ocean's top predators, are the deepest diving air-breathing mammals alive, plunging to nearly 10,000 feet to feed, primarily on squid.

In contrast to most whale fossils, which have been discovered in marine rocks, Kenya's beached whale was found in river deposits, known as fluvial sediments, said Jacobs, a professor in the Roy M. Huffington Department of Earth Sciences of SMU's Dedman College of Humanities and Sciences. The ancient large Anza River flowed in a southeastward direction to the Indian Ocean. The whale, probably

disoriented, swam into the river and could not change its course, continuing well inland.

"You don't usually find whales so far inland," Jacobs said. "Many of the known beaked whale fossils are dredged by fishermen from the bottom of the sea."

Determining ancient land elevation is very difficult, but the whale provides one near sea level.

"It's rare to get a paleo-elevation," Jacobs said, noting only one other in East Africa, determined from a lava flow.



A 17-million-year-old whale fossil stranded far inland in Kenya now sheds light on the timing and starting elevation of East Africa's puzzling tectonic uplift, says paleontologist Louis Jacobs, Southern Methodist University, Dallas, who rediscovered the fossil. (Credit: Southern Methodist University).

Beaked whale fossil surfaced after going missing for more than 30 years

The beaked whale fossil was discovered in 1964 by J.G. Mead in what is now the Turkana region of northwest Kenya.

Mead, an undergraduate student at Yale University at the time, made a career at the Smithsonian Institution, from which he recently retired. Over the years, the Kenya whale fossil went missing in storage. Jacobs, who was at one time head of the Division of Paleontology for the National Museums of Kenya, spent 30 years trying to locate the fossil. His effort paid off in 2011, when he rediscovered it at Harvard University and returned it to the National Museums of Kenya.

The fossil is only a small portion of the whale, which Mead originally estimated was 7 meters long during its life. Mead unearthed the beak portion of the skull, 2.6 feet long and 1.8 feet wide, specifically the maxillae and premaxillae, the bones that form the upper jaw and palate.

The researchers reported their findings in "A 17 million-year-old whale constrains onset of uplift and climate change in East Africa" online at the *PNAS* web site.

Modern cases of stranded whales have been recorded in the Thames River in London, swimming up a gradient of 2 meters over 70 kilometers; the Columbia River in Washington state, a gradient of 6 meters over 161 kilometers; the Sacramento River in California, a gradient of 4 meters 133 kilometers; and the Amazon River in Brazil, a gradient of 1 meter over 1,000 kilometers.

<http://www.sciencedaily.com/releases/2015/03/150317112036.htm>

BLUE WHALES 'SWITCH ON' ANTARCTIC SONG

Mar. 11, 2015 — A team of Australian and New Zealand researchers has tracked scores of blue whales off Antarctica, eavesdropping as the world's largest animals began their rumbling song, which can be detected 750 kilometres (465 miles) away.

During the six-week Australia-New Zealand Antarctic Ecosystem Voyage to the Southern Ocean, which returned Wednesday, the Antarctic marine scientists listened for the low moans of the endangered whales, and then tracked them to their feeding grounds.

The scientists were able to identify 58 individual blue whales and record more than 40,000 calls during the voyage, which aimed to help estimate the population size of the endangered animals and their movements.

But at first there was very little of the song, making those onboard anxious about whether they

would be able to study the animals.

"What actually was remarkable this time was that very early on in the voyage there were very few calls and that made us nervous," the Australian Antarctic Division's Mike Double said.

"And then it was like flicking a switch. We didn't change any of our equipment and then suddenly the whales were calling. And then we were getting large numbers of calls and that allowed us to detect them."

Double thinks the animals were in the area all along, just not making any noise.

"All of a sudden it (the song) is really ramped up and we don't really know why that occurs -- it may be linked to the start of the breeding season or it might be associated with foraging," he told AFP after the voyage returned to the New Zealand capital Wellington.

Double said the expedition had been hoping to see a small number of the blue whales and was thrilled when they came across about 80 in a small area after travelling a long way with no sightings.

He said it was possible there were more than 100 in the 100 kilometre by 150 kilometre area, adding that researchers were intrigued as to what had brought the animals there.

They had noted their foodstuff krill was "really tightly aggregated into very dense swarms".

"And we didn't really see that in other areas throughout the voyage," he said.

The voyage was a collaboration between Antarctica New Zealand, the New Zealand National Institute of Water and Atmospheric Research and the Australian Antarctic Division.

"It's not just about finding whales," voyage leader Richard O'Driscoll said of the mission, which also gathered oceanographic and atmospheric data.

"We now have a much greater understanding of the big picture -- the ecosystem -- on which the top predators depend."

<http://news.discovery.com/animals/whales-dolphins/blue-whales-switch-on-antarctic-song-150311.htm>

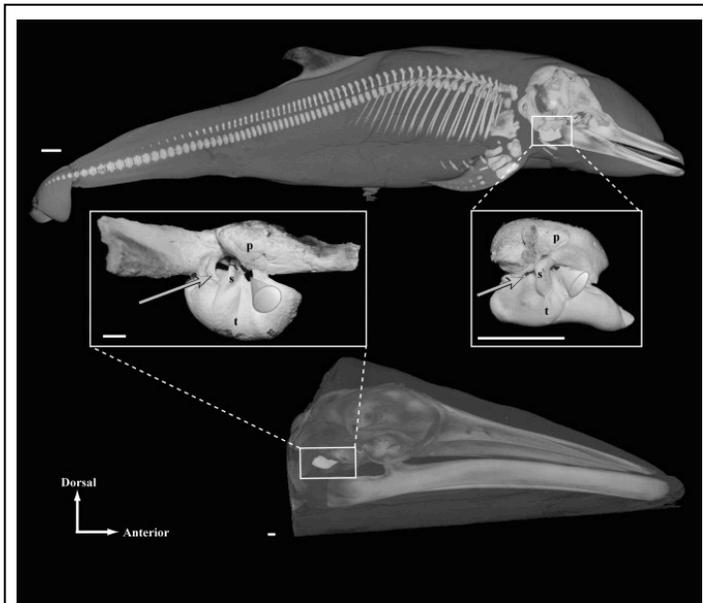
SCIENTISTS RECONSTRUCT EVOLUTIONARY HISTORY OF WHALE HEARING WITH RARE MUSEUM COLLECTION

Mar. 11, 2015 — A team of scientists from the Smithsonian's National Museum of Natural History gained new understanding about the evolutionary history of whale hearing thanks to a rare collection of whales at the museum. The researchers used



The blue whale, the largest animal on the planet, is rarely spotted in the Southern Ocean. (Credit: iStockPhoto).

noninvasive biomedical imaging techniques to trace the development of fetal ear bones in 56 specimens from 10 different families of toothed and baleen whales. They observed how ears develop in unborn whales of modern species, and compared these changes with those reflected in the fossilized ears of extinct whales over the course of millions of years. Their findings confirmed that changes in the development of ear bones in the womb paralleled changes observed throughout whale evolution, providing new insight about how whales successfully made the dramatic evolutionary shift from land to sea and adapted to hearing underwater.



Early development and orientation of the acoustic funnel provides insight into the evolution of sound reception pathways in cetaceans. (Credit: Maya Yamato and Nicholas D. Pyenson).

"Whale ears are incredibly complex organs," said Maya Yamato, a Peter Buck postdoctoral fellow in the museum's Department of Vertebrate Zoology and lead author of the study. "Although scientists know that hearing is one of the most important senses that whales use to communicate, navigate and search for food in their underwater world, we are still searching for clues about how their ears actually work. This research provides a window into evolutionary processes that took place millions of years ago and helps explain how whales evolved to hear after they moved from living on land to thriving in today's oceans."

Whales rely on sound to communicate with each other and some species, like humpbacks, are known for their majestic underwater songs. Toothed whales also depend on sounds to navigate and forage. They emit calls and echolocation, a kind of sonar, to

process the echoes from these noises and detect objects in the water. Understanding how whales hear is essential to protecting populations in the future as ocean noise from human activities, including global shipping, seismic surveys and sonar training, continues to rise.

Using innovative imaging methods, the team, which included National Museum of Natural History curator of fossil marine mammals Nicholas Pyenson, also became the first group of scientists to identify and depict in situ the development of a specific area of the ear found exclusively in whales. This structure, known as the "acoustic funnel," is thought to be a critical component to better understanding how baleen and toothed whales hear in their aquatic environments.

Yamato used X-ray computed tomography (CT) to scan images of fetal whales found in the museum's fluid marine mammal collections. These specimens represent 15 different species of modern whales ranging in size from blue whales to harbor porpoises. They were collected in association with commercial whaling operations in the early to mid-20th century and also consist of samples from fisheries by-catch and strandings.

The CT scans of the fetal whales allowed the research team to gain crucial insight into the early developmental stages of whale ears that are extremely fragile and nearly impossible to study via traditional research methods. Yamato and Pyenson observed that during the early stages of whale ear development, there are easily recognizable characteristics found in all mammalian ears. As whale ears continue to mature in the womb, these basic mammalian structures rearrange to form the "acoustic funnel," which may play a critical role in underwater hearing. The position of the acoustic funnel also seems to be significant--some baleen whales have a funnel that faces sideways, while all toothed whales have cones that are oriented towards their snouts. These positions correspond with previously described sound reception pathways in each group. Yamato and Pyenson's nondestructive approach to exploring whale ears could facilitate additional studies on the same specimens and potentially act as a springboard for learning more about the evolution of other senses in whales.

Hearing underwater comes with challenges. Although the terrestrial ancestors of modern whales had ears with similar structures to humans and other land mammals, modern whales no longer have external ears, known as pinnae. Instead, toothed whales (including dolphins and porpoises) channel sound to their ears using specialized "acoustic fats," which are found inside their hollow lower jaws and

lead to the acoustic funnel of the ears. Baleen whales also have fatty tissues leading to the acoustic funnel, but their hearing mechanisms are less understood.

<http://www.sciencedaily.com/releases/2015/03/150311160323.htm>

BAD NEWS ON THE WEST COAST: PACIFIC SARDINES ARE COLLAPSING

By Paul Shively

Mar. 6, 2015 — The population of Pacific sardines, a crucial forage fish for marine life along the U.S. West Coast, has dwindled to the point that it can no longer sustain a commercial fishery, according to a preliminary assessment by scientists advising West Coast fishery managers.

The ongoing collapse is bad news for ocean wildlife, as well as fishermen and others who rely on a healthy ocean.

This is a major cause for concern, but it shouldn't come as a complete surprise. In 2012, two government scientists predicted we would end up in exactly this position, finding a parallel with the last major collapse in the middle of the 20th century. Three years ago, the scientists wrote that "all indicators show that the northern sardine stock off the west coast of North America is declining steeply again and that imminent collapse is likely."

That prediction turned out to be right.

A panel of scientists advising the Pacific Fishery Management Council is reviewing the draft assessment today, March 6, in Vancouver, Washington. In April, the scientists will make a recommendation to the full council, which has already established plans for an automatic cutoff of commercial fishing for sardines when the population's biomass estimate falls below 150,000 metric tons. In recent years, the stock size has fallen steadily, from 1.4 million metric tons in 2007 to 300,000 metric tons in the last official stock assessment in August of 2014.

Now, the new draft assessment projects that the

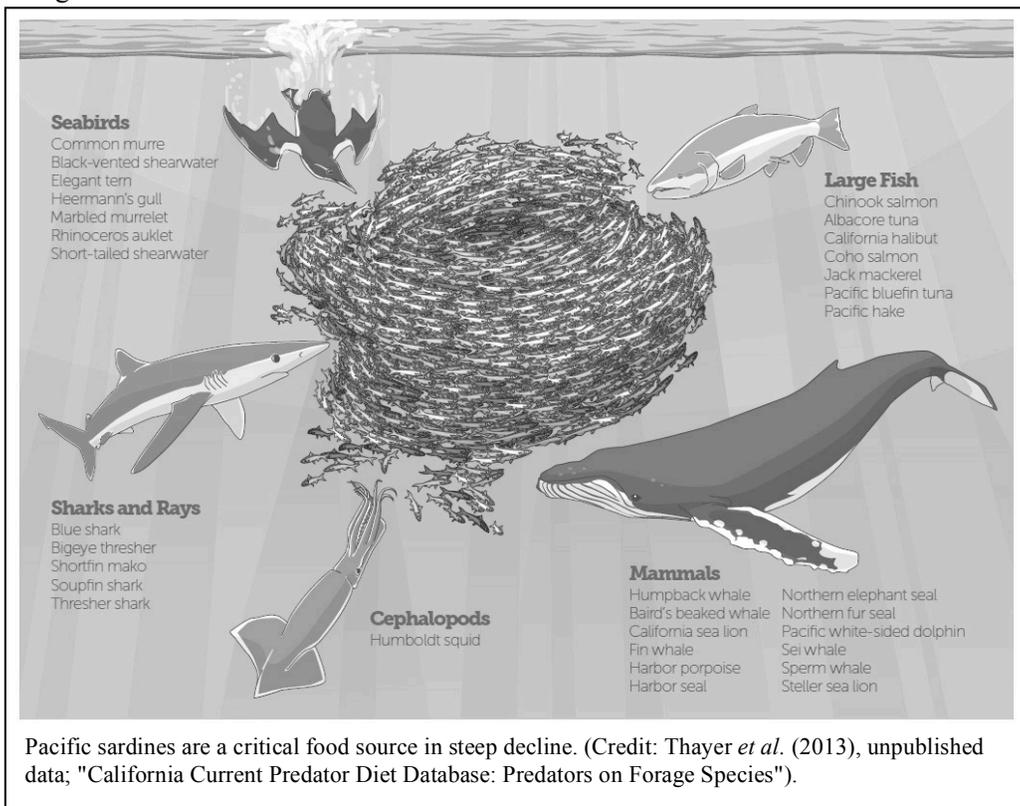
population will be less than 150,000 metric tons as of July 1, the beginning of the new fishing season.

Sardines are small individually, but they are a big deal for the ocean food web. They form large schools known as bait balls that provide an oil-rich source of protein for many species of seabirds, marine mammals, and bigger fish, including salmon and tuna. The estimated size of the West Coast sardine population has fluctuated from several million tons—based on sediment records gathered on the seabed off Southern California—to less than 5,000 tons in the 1960s following the last major collapse.

If the new assessment holds up to scientific review, fishery managers should follow through in April on their harvest guideline protocols and suspend fishing on sardines for the 2015 season. Doing so would give the population a chance to recover as ocean conditions improve.

The sardine fishery has historically been a major source of revenue for California's commercial fishing fleet, dating back to the era chronicled in John Steinbeck's masterpiece *Cannery Row* in 1945. Still, it would not be fair to blame the current collapse on fishing.

We know that sardine populations fluctuate widely with decades-long shifts in ocean conditions. Sardines grow scarce with shifts to cooler water. However, when the population reaches this extreme low level, it is a scientific no-brainer that fishing



should be curtailed so sardines don't continue to decline and perhaps reach the point of no return.

These little fish are a big deal for a vibrant ocean. Fishery managers will be making the right decision by agreeing to strengthen protections for sardines at this critical time.

<http://www.pewtrusts.org/en/about/news-room/news/2015/03/06/bad-news-on-the-west-coast-pacific-sardines-are-collapsing>

SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see www.gowhales.com/sighting.htm

| Date | # | Type of Animal(s) |
|---------|--------------------------|---|
| 3/31 am | 16 50 | Humpback Whales Long-beaked Common Dolphins |
| 3/30 am | 2 400 20 | Humpback Whales (cow & calf) Long-beaked Common Dolphins Risso's Dolphins |
| 3/29 am | 4 7 1 1200 3 | Gray Whales Humpback Whales Minke Whale Long-beaked Common Dolphins Harbor Porpoise |
| 3/28 pm | 2 15 20 | Humpback Whales Long-beaked Common Dolphins Risso's Dolphins |
| 3/28 am | 2 12 350 5 | Gray Whales Humpback Whales Long-beaked Common Dolphins Harbor Porpoise |
| 3/27 am | 2 6 150 | Gray Whale Humpback Whales Risso's Dolphins |
| 3/26 pm | 4 4 80 | Gray Whales Humpback Whales Risso's Dolphins |
| 3/26 am | 5 250 300 | Humpback Whales Long-beaked Common Dolphins Risso's Dolphins |
| 3/25 am | 5 100 | Humpback Whales (lunge feeding) Long-beaked Common Dolphins |
| 3/24 am | 22 300 40 | Humpback Whales Long-beaked Common Dolphins Risso's Dolphins |
| 3/23 pm | 4 11 8 600 | Killer Whales Gray Whales Humpback Whales Common Dolphins |
| 3/23 am | 8 6 2 | Gray Whales Humpback Whales Harbor Porpoise |

| | | |
|-----------------------------------|---------------------------|--|
| 3/22 pm | 21 5 50 | Gray Whales Humpback Whales Long-beaked Common Dolphins |
| 3/22 am | 3 1 150 40 | Gray Whales Humpback Whale Long-beaked Common Dolphins Risso's Dolphins |
| 3/21 pm | 19 3 | Gray Whales Humpback Whales |
| 3/21 am | 7 6 600 500 | Killer Whales Gray Whales Long-beaked Common Dolphins Risso's Dolphins |
| 3/21 early am | 3 7 1000 | Gray Whales Humpback Whales Long-beaked Common Dolphins |
| 3/20 pm | 12 1000 | Humpback Whales Long-beaked Common Dolphins |
| 3/20 am | 5 15 1000 | Gray Whales Humpback Whale Long-beaked Common Dolphins |
| 3/19 pm | 6 400 | Humpback Whales Long-beaked Common Dolphins |
| 3/19 am | 5 1 500 | Humpback Whales Sei Whale Long-beaked Common Dolphins |
| 3/18 pm | 1 8 400 25 | Gray Whale Humpback Whales Long-beaked Common Dolphins Risso's Dolphins |
| 3/15 pm | 6 1200 | Gray Whales Long-beaked Common Dolphins |
| 3/15 am | 13 3 150 10 3 | Gray Whales Humpback Whales Risso's Dolphins Dall's Porpoise Harbor Porpoise |
| 3/14 pm | 10 5 600 | Gray Whales Humpback Whales Long-beaked Common Dolphins |
| 3/14 am <i>Pt. Sur Clipper</i> | 11 9 10 | Gray Whales Humpback Whales Bottlenose Dolphins |
| 3/14 am <i>Sea Wolf II</i> | 4 | Gray Whales (extra friendly, mating for two hours) |
| 3/14 early am | 7 3 50 | Gray Whales Humpback Whales Risso's Dolphins |
| 3/13 pm | 20 4 | Gray Whales Humpback Whales |
| 3/13 am | 15 800 | Gray Whales Risso's Dolphins |
| 3/12 pm | 6 16 300 | Gray Whales Humpback Whales Long-beaked Common Dolphins |
| 3/12 am | 8 11 20 | Gray Whales Humpback Whales Risso's Dolphins |

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