Soundings

AMERICAN CETACEAN SOCIETY
MONTEREY BAY CHAPTER

American Cetacean Society – Monterey Bay Chapter
P.O. Box HE, Pacific Grove, CA 93950

JANUARY 2022

VIRTUAL MONTHLY MEETING
THURSDAY, JANUARY 27 AT 7:00 PM
PRESENTER: DR. ROBIN BAIRD
TITLE: SCIENCE AND MANAGEMENT OF ENDANGERED AND NON-ENDANGERED CETACEANS: CASE STUDIES OF HAWAIIAN ODONTOCETES

Robin Baird first began working with marine mammals in 1985. He obtained his Ph.D. in Biology from Simon Fraser University in 1994, focusing on foraging behavior of mammal-eating killer whales, and was a Post-doctoral Fellow at Dalhousie University in Halifax, Canada from 1996 to 1999, studying northern bottlenose whales and continuing work with killer whales.

For many years his research focused on marine mammals in British Columbia and Washington, but since graduate school he has also participated in odontocete studies in New Zealand, Japan, Mexico, North Carolina, Iceland, and Italy. Although he lives in Olympia, Washington, since 1999 his primary focus has been a multi-species, multi-question study of Hawaiian odontocetes.

Dr. Baird has authored or co-authored more than 140 peer-reviewed publications, two books (Killer Whales of the World published in 2002 and The Lives of Hawai'i's Dolphins and Whales, Natural History and Conservation, published in 2016 by the University of Hawai'i Press) and a number of book chapters. Since 2003 he has worked as a Research Biologist with Cascadia Research Collective, and is also an Affiliate Faculty at the Hawai'i Institute of Marine Biology, Hawai'i Pacific University, and Oregon State University, as well as an Editor of Endangered Species Research, and has been a member of the Committee of Scientific Advisors on Marine Mammals of the U.S. Marine Mammal Commission since 2011.

Next month: Our next meeting will be on Thursday, February 24 at 7 PM. Please save the date and join us! More information is available on our website, www.acsmb.org.

INSIDE THIS ISSUE

CALENDAR

Jan. 25: Seymour Science Center online webinar: Phytoplankton: Why These Tiny "Plants" are a Big Deal. Speakers: Ralph Kudela, Ph.D, UC Santa Cruz; Allison Cusick, Ph.D, UC San Diego; Steve Mandel, Executive Director, OceansMicro. 6:00 - 7:15 PM.

Jan. 25: ACS San Francisco Monthly Speaker Series: Cotton Rockwood: "Whale Conservation on the US West Coast: Decreasing the Risk of Deadly Ship Strikes." Virtual presentation from 7:00 - 8:30 PM.

Feb. 23-25: 49th Annual Meeting of the Pacific Seabird Group. Virtual event - registration is open!

Mar. 19-20: 12th Annual Whalefest Monterey. More information about speakers and activities will be forthcoming.

Mar. 21-25: V International Symposium on Killer Whales. Tarifa, Strait of Gibraltar, Cadiz, Andalusia, Spain.

May 23-26: 72nd Tuna Conference: "Technological Advances in Large Pelagic Fisheries Science: Applications, Benefits, and Challenges." Meeting location: UCLA's Lake Arrowhead Conference Center.

Aug 1-5: 24th Biennial Conference on the Biology of Marine Mammals in Palm Beach, FL. This conference will be the first fully hybrid, live-virtual conference of the Society of Marine Mammalogy.

Fall 2022 (dates TBA): 10th California Islands Symposium at the Ventura Beach Marriott in Ventura, CA.

BOOK RECOMMENDATIONS

Flights of Fancy: Defying Gravity by Design and Evolution, by Richard Dawkins, with illustrations by Jana Lenzova. 2021 Apollo.

The Sound of the Sea: Seashells and the Fate of the Oceans, by Cynthia Barnett. 2021 W.W. Norton.

The Brilliant Abyss: Exploring the Majestic Hidden Life of the Derp Ocean, and the Looming Threat That Imperils It, by Helen Scales. 2021 Atlantic Monthly Press.

Locked In Time: Animal Behavior Unlocked in 50 Extraordinary Fossils, by Dean R. Lomax. 2021 Columbia University Press.

How Rapid Warming Affects Some Killer Whale Populations off the Antarctic Peninsula

by Jim Palardy and Kathrynlynn Theuerkauf

October 29, 2021 — Killer whales (Orcinus orca) are demonstrating different responses to the changing conditions in the Southern Ocean, a pair of new studies found. Killer whales that rely on large expanses of sea ice to feed may be struggling to find enough food as climate change drives a decrease in annual ice cover, while those that feed primarily in open water appear to be less affected.

The findings, published in the journals Marine Mammal Science and Marine Ecology Progress Series, come from a long-term study in which scientists collected and analyzed thousands of photos of these apex predators to provide the first estimates of abundance, size, and body condition.

The data gives insight into how killer whale populations are faring in light of a rapidly warming environment and consequential shifts in prey abundance, and how the whales themselves as top predators may be influencing the broader ecosystem. This information could help support marine conservation decision-making in the area.

"The marine ecosystem of the Antarctic Peninsula is rapidly changing due to unprecedented warming, resulting in impacts on a number of species as they lose important habitat for breeding and foraging," said Holly Fearnbach, marine mammal research director at SeaLife Response, Rehabilitation, and Research and an author on both papers.

A look at population trends

Three forms, or ecotypes, of killer whales occur in the waters off the Antarctic Peninsula: Types A, B1, and B2. Each ecotype is genetically and physically distinct, with characteristic feeding habits. Type A killer whales have the typical black-and-white pigmentation of most killer whales around the world. They prefer open-water habitat and primarily feed on elephant seals and minke whales.

Both Type B1 and B2 killer whales have distinctive pigmentation with very large white eyepatches, largely gray bodies, and a darker patch, or "cape," on their backs. The larger Type B1 killer whales prefer to hunt Weddell seals on pack ice, while Type B2 killer whales, which are smaller and depend less on ice cover, feed on penguins, Weddell seals, and likely fish or squid.

To get a first-ever look at the population trends of Type B killer whales in the area, scientists collected thousands of images of these mammals during austral summers between 2008-09 and 2018-19 from a variety of research platforms. Researchers used the photos to identify individual whales by their

distinctive and long-lasting natural markings and track them across the study period.

The resulting decade-long dataset revealed that Type B1 killer whales had a smaller population size of roughly 100 individuals, with abundance declining at a rate of close to 5% per year because of reduced survival or possibly movement south to find ice in other regions. Type B2 killer whales had a much larger—and stable—population size of about 740 individuals. Previous research found that Type A killer whales had high survival and increased in abundance by about 25% over the same period to a recent high of around 150 whales.

"We found that both Types B2 and A killer whales, the two ecotypes that prefer open-water habitats, have fared well over the past decade in terms of abundance, which may be a response to locally plentiful prey and access to more ice-free foraging areas. However, the ice-dependent Type B1 killer whales appear to be struggling with the loss of sea ice, which is the habitat for their primary prey—Weddell seals," Fearnbach explained.

Documenting health trends

Researchers used a drone to collect aerial images to assess the size and body condition of all three types of whales between 2016 and 2019. As large top predators that require a high caloric intake, trends in physical health are more sensitive indicators of prey availability and the health of the broader ecosystem and may serve as an early warning system of impending population changes.

The study found that Types A and B1 whales were relatively large, with the longest males being Type As and averaging 7.8 meters (about 26 feet), and the longest females being Type B1s and averaging 6.9 meters (about 23 feet). In contrast, Type B2s were diminutive in size, measuring over 1 meter shorter on average for both sexes. Type B2 whales were also found to be significantly leaner, even when accounting for their shorter length, and there were several whales measured to be in anomalously poor condition.

"This relatively poor condition of Type B2s, along with their relatively high abundance, may indicate that the population of this ecotype is close to reaching carrying capacity, or the maximum number of individuals that the marine ecosystem around Antarctic Peninsula is able to support," said John Durban, a researcher with Southall Environmental Associates and a lead author of the health study. "It may well be that the warming waters and declining sea ice are reducing this carrying capacity, and the poor body condition we are seeing may be a warning of impending population declines. Similarly, the relatively robust body condition of Type B1s adds some support that their declining abundance may be due to movement south to find their ice seal prey, where sea ice still regularly occurs."

A pod of killer whales swims in the coastal waters of Antarctica. In two long-term studies, researchers collected and analyzed thousands of photos to study population trends and body condition of killer whales off the Antarctic Peninsula to understand how these top predators are responding to a decrease in sea ice and other changing conditions.Credit: Robert McGillivray / Shutterstock.

The data in these studies offers decision-makers at the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the multilateral management body charged with conservation of the Southern Ocean, a more holistic view of the ecosystem as they consider proposals to create a marine protected area around the Antarctic Peninsula and implement an ecosystem-based management system for the regional krill fishery.

"We will continue to monitor changes in whale health in this changing environment in future years, to build on our research over the past decade, and to use whales as sentinels to better understand the changes in the ecosystem on which these top predators depend," Fearnbach said.

https://www.pewtrusts.org/en/research-and-analysis/articles/2021/10/29/how-rapid-warming-affects-some-killer-whale-populations-off-the-antarctic-peninsula

New Rules to Protect Endangered Right Whales Fall Short

by Katharine Deuel

November 17, 2021 — North Atlantic right whales are among the world's most endangered species, threatened by ropes used in commercial lobster and crab fishing gear and strikes from vessels. In recent years, right whale numbers have dropped sharply, from nearly 500 in 2010 to just 336 at the end of 2020, the lowest number in nearly two decades. Among those are only an estimated 70 breeding females.

At the end of August, the National Oceanic and Atmospheric Administration's Fisheries Service (NOAA Fisheries) announced the first new regulations in seven years to reduce deaths and serious injuries to right whales caused by entanglement in New

England's lobster and crab trap/pot fisheries. On Sept. 17, these regulations published in the Federal Register, starting the clock for some measures to be in effect on the water in 30 days, with the rest starting to take effect in late spring 2022.

The final regulations are better than the draft regulations NOAA Fisheries released for public comment earlier this year but still won't provide the protection right whales need.

Measures fall short of what's needed

The regulations are composed of a requirement in some areas to use weaker rope that will break more easily; a requirement that fishermen attach more traps to each rope, intended to reduce entanglement risk; and seasonal closures to traditional trap or pot fishing.

Specifically, the measures would prohibit commercial lobster and crab fishing with ropes in:

- a 5,500-square-mile area south of Nantucket and Martha's Vineyard from February to April.
- a 967-square-mile area in the Gulf of Maine from October to January.
- a 487-square-mile strip from Plymouth, Massachusetts, to the boundary with New Hampshire's state waters from February to April.

Area closures are among the most effective ways to reduce right whale entanglement in fishing gear. And these seasonal closures affect only traditional roped fishing while still allowing fishing with ropeless gear under controlled conditions. This detail, which was not included in the proposed rule, will likely accelerate the research and development of ropeless fishing solutions.

However, the regulations miss the mark on a critical point: the duration of the closures. For instance, the area south of Nantucket and Martha's Vineyard, where a significant amount of trap/pot gear with heavy ropes can be found, is slated to close only between February and April despite evidence that right whales feed in this area year-round. In most months of 2021, sightings of right whales in this area have compelled NOAA Fisheries to alert vessels to slow their speeds. The Pew Charitable Trusts' proposal was for closures off New England that would reflect the latest science, which the regulations fail to do.

The regulations require that, in some areas, fishermen use rope that is weak enough to break if a whale becomes entangled. But the rope configurations NOAA plans to implement are not proved to reduce risk to whales—and aren't supported by the scientists who studied rope strength—so it's unclear if this measure will be effective. And while the regulations to require more traps per trawl may reduce the overall number of ropes in the water, science suggests that benefit may be offset by the more-severe injuries that could result from the thicker and heavier gear needed for trawls with multiple traps.

Final rule improves upon proposal—but is still insufficient

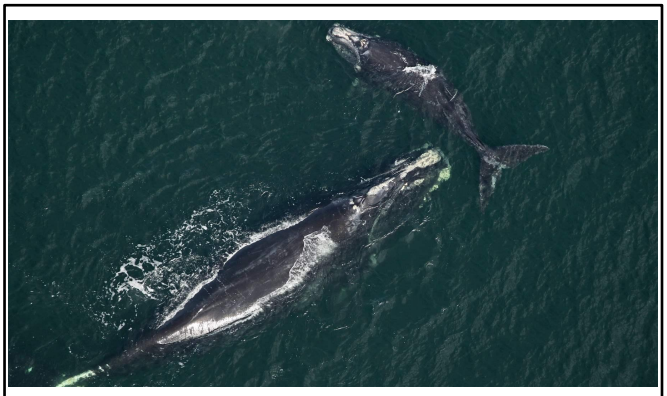
NOAA Fisheries predicts the new rules will reduce the risk of right whale deaths and serious injuries from entanglement by 69% in U.S. waters in the first year, and 87% by 2030. But the right whale population cannot afford to wait for such a gradual risk reduction —and the Marine Mammal Protection Act requires NOAA Fisheries to reduce risk by 95% within six months of implementation of the rule.

NOAA Fisheries estimates that the cost of implementing the new regulations, including for fishermen choosing to transition to ropeless gear, is $9 million to $20 million over 10 years—a very manageable amount given that the New England lobster fishery has brought in about $600 million in each of the past five years. In other words, the cost of implementing the regulations would be 1.5% to 3.3% of lobster fishery revenue in any given year. NOAA Fisheries estimates that the closures would require just 27 vessels to move outside the area south of Cape Cod during the restricted months, and that only 52 would need to move outside the closed zone off of Maine, where more than 4,000 licensed lobstermen mostly fish in state waters.

Three ways NOAA Fisheries could still help right whales

The new regulations recognize the importance of fishermen transitioning to ropeless fishing gear—technology that would dramatically reduce the number of vertical lines in the water. But this transition needs a major boost to scale up from the tiny fraction of fishermen currently testing ropeless gear to being a viable option for anyone seeking to fish in closed areas. Pew strongly encourages Congress to appropriate funds to speed this transition, and NOAA to provide assistance, training, and support.

Second, as Pew and partners reiterated in a Nov. 9 letter to the Secretary of Commerce, Pew still stands behind its request for emergency action to protect right whales by closing the highest-risk areas to fishing with ropes when right whales are likely to be



Right whales, like this mom and her calf, born in 2021, face a high risk of entanglement in lobster fishing gear off New England once they travel there from calving grounds off Georgia and Florida. Credit: Florida Fish and Wildlife Conservation Commission.

present. The Secretary of Commerce could order this at any time—similar to how she implements voluntary vessel speed restrictions when whales are present—and change or remove it just as easily; it's a flexible tool that can be responsive to science and can be clearly communicated to fishermen, much as Canada has done. There, government agencies use real-time visual and acoustic monitoring to inform decisions on whether to reopen areas to fishing or extend closures, and has implemented updated regulations in each of the past four years.

Such dynamic management is urgently needed. The right whale population is in a perilous state and simply will not survive if it takes the agency seven years to issue new regulations in response to a crisis. To effectively protect right whales, NOAA must continually evaluate the science and take decisive action that can help North Atlantic right whales recover quickly. A nimble, science-based system is possible—Canada is already doing it—and is even more needed now because scientists know right whales are shifting where they live, feed, and breed in response to climate change.

Pew remains committed to helping policymakers find solutions that allow right whales and lobster fishing to thrive far into the future.

https://www.pewtrusts.org/en/research-and-analysis/articles/2021/11/17/new-rules-to-protect-endangered-right-whales-fall-short

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Whales Are More Important Ecosystems Engineers than Previously Thought

Nov. 3, 2021 — From 1910 to 1970, humans killed an estimated 1.5 million baleen whales in the frigid water encircling Antarctica. They were hunted for their blubber, baleen -- the filtering fringe they have in place of teeth -- and meat. One might assume that from the perspective of krill -- the tiny shrimp-like creatures the whales feast on -- this would be a boon. But new research published Nov. 4 in Nature from a collaboration led by Stanford University's Goldbogen Lab suggests the opposite: that the decline of baleen whales in the Southern Ocean has led to a decline of krill.

This paradoxical result is a sign of just how much the precipitous decline of the large marine mammals has negatively impacted the health and productivity of ocean ecosystems, the researchers say.

"Fifty years after we stopped hunting whales, we're still learning what impact that had. The system is not the same," said Matthew Savoca, a postdoctoral scholar in the Goldbogen lab at Stanford's Hopkins Marine Station and lead author of the paper. "We're looking into ways of using this information to restore ocean ecosystems and bring whales back. And hopefully, that will have benefits for everything from biodiversity conservation to fisheries yield to carbon storage."

The researchers came to their troubling conclusion after asking a very fundamental question: How much do whales eat?

Modernizing whale research

Large whales are inherently difficult to study because they can't be studied in captivity. So, previous estimates of how much whales consume were generally limited to either studies of dead whales or metabolic extrapolations based on much smaller animals.

For this study, the researchers looked at blue, fin, humpback and minke whales -- all whales that feed by gulping a large amount of water and filtering it through their mouths' fringed baleen plates until only their prey remains. They employed several high-tech tagging devices that attach to whales typically for about five to 20 hours, recording their movements, acceleration, sound and, if light allows, video. Drones, operated by the Duke Marine Robotics and Remote Sensing Laboratory, measured the length of individual, tagged whales, which helps the researchers estimate the size of their gulp. In collaboration with the Environmental Research Division at NOAA and the University of California, Santa Cruz, the researchers also ran an underwater device called an echo sounder -- which Savoca likens to "a fancy fish finder" -- which uses sound waves at several different frequencies to measure how much prey is around.

"All of that put together really gives us this amazing view," said Shirel Kahane-Rapport, a graduate student in the Goldbogen lab and co-author of the paper. "From each one, you can learn a lot about whales, but the combination takes the research to another level."

Analysis of the data they captured revealed that whales in the Southern Ocean eat about twice as much krill as previous estimates suggested, and that krill-feeding blue and humpback whales off the coast of California eat two to three times as much as previously thought. Fish feeding humpback whales, however, might eat the previously estimated amount or even less. This range seems to reflect the energy density of the food -- whales need to eat more krill to get the same energy as they would from a smaller amount of fish.

"As large baleen whales get bigger, the anatomical machinery that allows them to eat also gets relatively bigger," said Jeremy Goldbogen, co-director of Hopkins Marine Station and associate professor of biology in the School of Humanities and Sciences, who is senior author of the paper. "They have evolved these systems that allow them to be eating machines. That disproportionately bigger gulp size allows them to take advantage of abundant food, like krill."

The researchers made their estimates of consumption based on their data about prey density, gulp size and lunge frequency, as recorded by the tags.

Going from hours of data to general estimations -- and applying those to whales around the world -- required careful calculations.

"We came up with a very involved process and we try to do our best to retain as much uncertainty as possible along the way," said Max Czapanskiy, a graduate student in the Goldbogen lab and co-author of the paper. "No one else has data like this. It's a huge step forward, but at the same time, it's a hard system to study and there's still a lot of uncertainty."

With these new consumption estimates, the researchers calculated that the early 20th-century abundance of krill in the Southern Ocean had to be about five times what it is now in order to feed the pre-whaling whale population. This implies a complex role for whales in their ecosystems where the decline or recovery of their populations is strongly tied to overall ecosystem productivity and functioning.

"Hopefully work like this can really get people to consider the ecosystem-wide repercussions of human activities because we are still continually affecting their environment," said Kahane-Rapport.

Mobile processing plants

The Southern Ocean is among the most productive ecosystems on Earth, largely due to the abundance of microscopic algae, called phytoplankton. Phytoplankton are a vital food source for krill, small fish and crustaceans -- which are, in turn, consumed by larger animals, including whales, birds and other fish. But whales also help sustain phytoplankton. Through eating krill and then defecating, whales release iron locked within krill back into the water, making that iron available to phytoplankton, which need it to survive.

"Without phytoplankton, you're never going to get all the animals and everything that we care so much about," Czapanskiy said. "When whales were very numerous, they had this incredible role in bolstering the ecosystem."

"Think of these large whales as mobile krill processing plants," Savoca added. "Each fin whale or blue whale is the size of a commercial airliner. So, in the first half of the 20th century, before whaling, there were an additional one million of these 737-sized krill processing plants moving around the Southern Ocean eating, pooping and fertilizing."

The many twists and turns of these findings demonstrate the potential impact of asking simple questions. By trying to pin down how much whales eat, this work has cast doubt upon what people thought whales needed to survive, and how the activities of whales and humans affect ocean ecosystems.

"Just this idea that if you remove large whales, there's actually less productivity and potentially less krill and fish is amazing," said Goldbogen. "It's a reminder that these ecosystems are complex, highly intricate, and we need to do more to fully understand them."

https://www.sciencedaily.com/releases/2021/11/211103140108.htm

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Reducing Vessel Activity Key to Southern Resident Killer Whale Survival

Oct. 28, 2021 — Reducing ship speed and noise levels would increase the probability that endangered West Coast southern resident killer whales will spend more time hunting for Chinook salmon, a new Simon Fraser University study has found.

The research, published in the journal Marine Pollution Bulletin, provides insights to guide conservation efforts and protect the estimated 73 remaining whales in the population.

Research shows that these whales spend between 70 and 84 per cent of their time foraging in the absence of ships and boats to meet their daily energy needs.

"Killer whales rely on echolocation to hunt for Chinook salmon and ship noise interferes with their ability to send out 'clicks' and locate their prey," says study collaborator Ruth Joy, a statistical ecologist and assistant professor in SFU's School of Environmental Science.

Researchers studied the whales' foraging behaviour in Haro Strait during a 2018 voluntary vessel slowdown, as part of a broader effort to reduce human-generated noise disturbance. The strait is a critical summer foraging habitat for the endangered whales.

The ECHO program was led by the Vancouver Fraser Port Authority and followed a successful earlier trial, which saw 55 per cent of vessels voluntarily reduce their speed to 11-knots when transiting through the strait, resulting in an overall noise reduction of 2.5 decibels.

Using a surveying instrument known as 'theodolite tracking' to determine the whales' positions, researchers observed and categorized the group's behaviour as either traveling, resting, socializing or foraging during each five-minute scan.

Researches also recorded the number, type and position of vessels in the area, then combined the data collected on vessels and whales with a sound propagation model, to predict the noise level of the ships and boats that whales were exposed to when they surfaced.

As noise levels increased, the whales were less likely to start foraging and more likely to stop the activity. The researchers suggest reducing vessel speed, lateral displacement within shipping lanes, replacing the noisiest ships in the fleet and rerouting shipping lanes are actions that industry can take to help these marine mammals.

Taking immediate action is more crucial than ever, following recent reports of three pregnant J pod

whales now eating for two and will be raising their young in the years ahead.

"These three pregnant females and members of J-pod cast a ray of much-needed hope on the future of southern resident killer whales," says Joy.

The researchers' work continues as the school's graduate students Kaitlin Baril and Azadeh Gheibi are using the same theodolite tracking methods to study underwater ambient noise and its impact on killer whales in the Canadian waters of Boundary Pass between B.C. and Washington State.

The study is a collaboration between researchers at SFU, the Oceans Initiative in Seattle, the University of California, and Bielefeld University in Germany.

https://www.sciencedaily.com/releases/2021/10/211028120421.htm

SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see *http://www.montereybaywhalewatch.com/slstcurr.htm*

Date	#	Type of Animal(s)
1/6 10 am	2 20	Gray Whales Risso's Dolphins
1/5 10 am	27 20	Gray Whales Risso's Dolphins
1/4 2:30 pm	7	Gray Whales (migrating south)
1/4 10 am	17 160	Gray Whales Risso's Dolphins
1/3 10 am	35	Gray Whales (breaching)
1/2 2:30 pm	12	Gray Whales
1/2 10 am	29 5	Gray Whales Humpback Whales
1/2 9 am	18 1 12	Gray Whales Humpback Whale Risso's Dolphins (incl. Casper)
1/1 2:30 pm	22 6 150	Gray Whales Pacific White-sided Dolphins Risso's Dolphins
1/1 10 am	21 5 100	Gray Whales Killer Whales (CA140Bs) Risso's Dolphins
12/31 10 am	15 1	Gray Whales Humpback Whale (breaching)
12/31 9 am	15 80 300 6	Gray Whales Pacific White-sided Dolphins Risso's Dolphins Northern Right Whale Dolphins
12/30 10 am	11 6 100	Gray Whales Humpback Whales Pacific White-sided Dolphins
12/28 2:30pm	6	Gray Whales
12/28 9 am	10 3 150	Gray Whales Humpback Whales Risso's Dolphins (incl. Casper)
12/26 2:30pm	1	Humpback Whale
12/26 10 am	4 2	Gray Whales Humpback Whales
12/26 9 am	2 1	Gray Whales Humpback Whale
12/21 10 am	5	Humpback Whales
12/19 10 am	3 100	Humpback Whales (breaching, tail lobbing, pec slapping) Risso's Dolphins (incl. Casper)
12/18 2:30pm	3	Humpback Whales (friendly)
12/18 10 am	5	Humpback Whales (competitive group, friendly behavior)
12/17 10 am	4	Humpback Whales
12/15 10 am	5	Humpback Whales (breaching, mom and calf pair)
12/11 10 am	7 25	Humpback Whales (friendly) Risso's Dolphins
12/10 10 am	2 5 1 5 10 10 20	Humpback Whales Killer Whales (CA140Bs + CA23A2, breaching + predation) Mola Mola (Ocean Sunfish) Buller's Shearwaters Ancient Murrelets Black-footed Albatross Cassin's Auklets
12/9 2:30 pm	7 40 5	Humpback Whalers Risso's Dolphins Dall's Porpoise
12/8 10 am	50 100 50 1500	Common Dolphins Pacific White-sided Dolphins Risso's Dolphins Northern Right Whale Dolphins
12/7 10 am	5 30	Humpback Whales Risso's Dolphins
12/6 10 am	7	Humpback Whales (breaching)
12/5 10 am	7 1	Humpback Whales (breaching) Fur Seal
12/4 10 am	2 200 10	Humpback Whales Risso's Dolphins Dall's Porpoise
12/3 10 am	6 50	Humpback Whales Risso's Dolphins
12/2 2:30 pm	7 40 5	Humpback Whales Risso's Dolphins Dall's Porpoise
12/2 10 am	9	Humpback Whales (breaching, lunge feeding)
12/1 10 am	10	Humpback Whales (breaching, lunge feeding)

Membership Application - American Cetacean Society, Monterey Bay Chapter

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Membership Levels and Annual Dues

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The American Cetacean Society is the world's oldest whale conservation organization, established in 1966. Dedicated to research, conservation and education about whales, dolphins and porpoises and their environment, the American Cetacean Society is volunteer-run and consists of 8 chapters within the national organization. As a 501 (c)(3) non-profit organization, donations are welcome and necessary to continue our work. To donate to the Monterey Bay Chapter of ACS, please visit www.acsmb.org or mail payment to ACS MB, PO Box HE, Pacific Grove, CA 93950. For more information about the American Cetacean Society, please visit www.acsonline.org Thank you!

AMERICAN CETACEAN SOCIETY
MONTEREY BAY CHAPTER

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Strandings / Entanglements / Distress
24-hour toll-free
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Harassment
NOAA Enforcement, Monterey
831-853-1964

Tail-throwing Humpback Whale kelping on December 2, 2021. Credit: Daniel Bianchetta.