

Soundings



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, January 29, 2015
Time: 7:30 PM**

PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

**Speaker: Victoria Vásquez, Graduate Student,
Pacific Shark Research Center, Moss Landing Marine Labs**

Topic: “The great white fear: How 500 shark species have been reduced to one”



Vicky Vásquez, a graduate student at Moss Landing Marine Labs’ Pacific Shark Research Center, will be our speaker for the first program of 2015. Vicky, who is researching soup fin sharks in San Francisco Bay for her master’s degree, will talk about conservationists and scientists concentrating on great white sharks instead of all sharks.

“At shark events people are absolutely talking about great whites,” she said. “When other species of sharks are mentioned, interest drops.”

Vicky is a native of San Diego. She worked as a youth marine educator for seven years before starting her graduate studies. At the Ocean Discovery Institute in San Diego she taught young students, some who had never been to the beaches near their homes, how to snorkel and see ocean resources up close. She also served as translator between English speaking staff and Spanish speaking students. After that she worked with the Marine Science Institute in San Francisco as a program manager.

Vicky has also volunteered with a number of ocean conservation organizations in the Bay Area and last year became deputy director of a new organization named Ocean Research Foundation.

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

Next month: On February 26, Dr. Geoff Shester, California Campaign Director of Oceana, will talk to us about the cetacean bycatch in sword fishing.

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© Daniel Bianchetta
Gray Whale spyhopping on Dec. 29, 2014. (Credit: Daniel Bianchetta).

CALENDAR

Jan. 24-25: From 10:00 AM – 5:00 PM on Saturday and Sunday, the Monterey Old Fisherman's Wharf Association will hold the 5th annual Whalefest Monterey, at and around Old Fisherman's Wharf. This popular family friendly event is designed to educate and inspire the public about many of the outstanding marine organizations

ACS Monterey Bay Gray Whale Fundraiser

Sunday Jan. 25th from 8:00-10:00 AM

Join local gray whale experts aboard the 100' *Greatland* as we embark into the gray whale migratory corridor during the peak of the gray whale's southbound migration. Monterey Bay is one of the best places along the west coast to observe the annual southbound migration of the Pacific Gray Whale with some trips producing in excess of 50 gray whales just a few miles from the Monterey harbor.

This trip is an annual fundraiser and all proceeds go to support grants for cetacean research. In addition to observing gray whales we may also encounter several different species of dolphins and numerous species of winter birds.

The trip will depart from Princess Whale Watching in Monterey, California. Cost is \$40.00 and can be booked online at montereywhalewatching.com or by calling 831-372-2203.

For more information please call Tony Lorenz at 831-901-7259.

that are involved in the Monterey Bay area and the Monterey Bay National Marine Sanctuary, and will include world-renowned scientists, marine science documentaries, opportunities to whale watch and much more. More information is available at www.montereywharf.com.

Jan. 30-31: Southern California Marine Mammal Workshop in Newport Beach, CA. For more information please go to socialmarinemammals.org.

Feb. 18-21: Pacific Seabird Group 42nd Annual Meeting: A Future for Seabirds. The meeting will take place in San Jose, CA. For more information please go to pacificseabirdgroup.org.

Feb. 27-Mar. 1: 12th Annual San Francisco International Ocean Film Festival at the Cowell Theatre, Fort Mason Center, San Francisco. For more information please go to oceanfilmfest.org.

BOOK RECOMMENDATION

E. robustus: The Biology and Human History of Gray Whales, by James Sumich. 2014 Whale Cove Marine Education Corvallis, Oregon.

James has studied gray whales from British Columbia to Baja California for over 40 years. His new book is written for not just the scientific community but also for the enthusiastic gray whale watcher. It covers gray whale evolution, Pre-history, Anatomy, Migrations, Life History and of course whale watching in Baja Lagoons and along the west coast. A great addition to any naturalist library, Jim's book can be ordered by going to www.thegraywhalebook.com

IBERIAN ORCAS, INCREASINGLY TRAPPED

Nov. 26, 2014 — Thanks to the more than 11,200 sightings of cetaceans over the course of ten years, Spanish and Portuguese researchers have been able to identify, in detail, the presence of orcas in the Gulf of Cadiz, the Strait of Gibraltar and the Alboran Sea. According to the models that have been generated, the occurrence of these cetaceans is linked to the distribution of their main prey (red tuna) and their presence in Spanish, Portuguese and Moroccan waters is thus more limited than previously thought.

In 2011, the Spanish Ministry of the Environment considered the small population of orcas (*Orcinus orca*) that inhabits the waters in the south of Spain to be 'vulnerable', and included it in the Spanish Catalogue of Endangered Species. Its addition was justified: the orcas that live in this area belong to a reduced group of individuals that each year swims between the Strait of Gibraltar and the Gulf of Cadiz in search of tuna.



Killer whales' distribution is limited to the Gulf of Cadiz in spring and the Strait of Gibraltar in summer. (Credit: CIRCE).

Despite efforts to demarcate the spatial distribution of this group of cetaceans, until now little was known about their movements during spring and summer in the Alboran Sea, the Strait of Gibraltar and the Gulf of Cadiz. The new study, published in the 'Journal of the Marine Biological Association of the United Kingdom', allows their location each year to be identified with greater precision.

"We have created two generalised models: the presence model (sightings of orcas) and the pseudo-absence model (sightings of other cetaceans), with the information gathered from the 11,276 sightings between 2002 and 2012," Ruth Esteban, the main author of the study and a researcher for Conservation, Information and Research on Cetaceans (CIRCE), said.

The scientists created a model using data from spring, when red tuna (orcas' main prey) enter into the Mediterranean Sea, and another model with data from summer, when red tuna leave for the Atlantic Ocean.

The results show that the presence of orcas is closely linked to the distribution of the tuna during their migration through the studied area. "This limits their distribution to the Gulf of Cadiz in spring and the Strait of Gibraltar in summer," notes Esteban.

Furthermore, "any reduction in the abundance of tuna could endanger this population of orcas," the researcher adds. She considers it important to demarcate an exclusive marine area where human activity, such as whale watching, military exercises or recreational fishing, does not interrupt their predation techniques.

A very limited habitat

According to the predictions of the model generated using 278 orca sightings and 7,206 of other cetaceans, it has been forecast that in summer there

will be a large number of orcas in the most westerly part of the centre of the Strait of Gibraltar.

The 44 sightings of orcas from research vessels, whale watching companies and opportunist observations and the 3,746 sightings of other cetaceans have shown that the orcas remain in two specific areas in spring: in the most easterly area of the Gulf of Cadiz -in shallow waters around Spain and Morocco-, and in southern Portugal, in particular close to Faro.

In the Alboran Sea, only four orca sightings have been registered in ten years. Scientists have therefore not been able to identify any important habitat area with the models used in the other areas.

During autumn and winter, orcas have barely been observed in the most regularly populated areas. "It is possible that this group of marine mammals travels in waters close to the migration route of the tuna," the researchers have concluded.

<http://www.sciencedaily.com/releases/2014/11/141126111120.htm>

STUDY ON WORLD'S BIGGEST ANIMAL FINDS MORE THAN ONE POPULATION IN THE SOUTHEASTERN PACIFIC

Dec. 18, 2014 — Scientists from WCS (Wildlife Conservation Society), the Universidad Austral de Chile, the Blue Whale Center, the American Museum of Natural History (AMNH), NOAA, and other organizations are examining molecular clues to answer a big question: how many types of blue whales exist in the waters of the southeastern Pacific?

The answer seems to be two distinct populations, according to a genetic study comparing the blue whales off the southern coast of Chile with those swimming in the waters of Antarctica and other nearby regions. One of the populations could be made up of pygmy-type blue whales, a subspecies slightly smaller than the Antarctic blue whale. The findings could help wildlife managers devise more effective conservation plans for this endangered species.

The study appears in the online edition of the journal *Molecular Ecology*.

Reaching nearly 100 feet in length, the blue whale is thought to be the largest animal that ever existed, even larger than the biggest known dinosaurs. Blue whales were nearly hunted to extinction by commercial whaling fleets in the 20th Century before the species was granted international protection in 1966.

Although whaling records dating back to the 1960s indicate that both Antarctic and pygmy-type

blue whales utilized Chilean waters, it wasn't until 2004--when a blue whale feeding and nursing ground was discovered in the protected bays of southern Chile--that scientists began to question whether multiple populations of blue whales currently utilized the southeastern Pacific. A previous study had even recognized the existence of an as-of-yet unnamed subspecies of blue whale based on size differences in animals in the southeastern Pacific. At the time, however, it was unknown how closely related the whales on this Chilean feeding ground were to those in other areas, and thus what this discovery might mean in terms of the recovery of the animals in the Southern Hemisphere.

"The most effective way to protect the region's blue whales depends on a better understanding of how blue whales in the waters of Chile interact with other populations of the same species, as well as knowing which areas are used for activities such as feeding and breeding to facilitate future designation of MPA network," said Dr. Juan Pablo Torres-Florez, researcher for the Universidad Austral de Chile and lead author of the study.

"Molecular methods give us the means for uncovering the hidden relationships of blue whales in southeastern Pacific, as well as finding regions of importance to the species," said Dr. Howard Rosenbaum, one of the senior authors of the paper and Director of WCS's Ocean Giants Program.

In order to investigate the genetic identity of blue whales in the coastal waters of southern Chile with

respect to blue whales in other areas, the research team sequenced the DNA of 60 animals using skin samples collected from living animals with non-lethal biopsy darts fired from crossbows between 2003 and 2009. The analysis enabled the team to identify 52 individuals based on specific regions of both nuclear and mitochondrial DNA.

The samples from these whales were then compared with existing datasets from whales in the eastern tropical Pacific (where southern Chile blue whales are thought to breed), northern coastal Chile, and Antarctica. The research team found that blue whales in southern Chile are similar in genetic makeup to whales in the eastern tropical Pacific and northern Chile. Whales in Antarctica were deemed to be more distantly related, indicating the region may have two distinct populations or types of blue whales, an important consideration for any plan to protect a wide-ranging marine mammal species in coastal and international waters.

"Our study gives us crucial insights into the population structure of blue whales in the waters of Chile and will serve as an important stepping stone for further research," added Rosenbaum. "The long-term goal of such work would be a network of marine protected areas designed to save the world's largest animal."

The first stepping stone was already been achieved earlier this year with the declaration of Tic Toc Marine Protected Area in the Gulf of Corcovado, Chile. "It's been 10 years since we made the initial discovery of this magnificent blue whale feeding ground with the aid of the WCS and other institutions," said Dr. Rodrigo Hucke-Gaete, principal investigator and professor at Universidad Austral de Chile, as well as president of the Blue Whale Center. He added that "building the puzzle through the aid of scientific evidence has been exciting and has taken time, but is providing robust information to aid in the recovery of this wonderful and still endangered species."

<http://www.sciencedaily.com/releases/2014/12/141218154552.htm>

ANCIENT NEW ZEALAND 'DAWN WHALE' IDENTIFIED

Nov. 18, 2014 — University of Otago palaeontologists are rewriting the history of New Zealand's ancient whales by describing a previously unknown genus of fossil baleen whales and two species within it.

Otago Department of Geology PhD student Robert Boessenecker and his supervisor Professor

www.acsmb.org



A blue whale swimming through the waters of coastal southern Chile, the location of a feeding and nursing ground for the species. Using genetic information, scientists from the Wildlife Conservation Society, the Universidad Austral de Chile, the Blue Whale Center, the American Museum of Natural History (AMNH), and NOAA are working to determine how many types of blue whale exist in the waters of the southeastern Pacific. (Credit: Rodrigo Hucke-Gaete (CBA/UACH))

Ewan Fordyce have named the new genus *Tohoraata*, which translates as 'Dawn Whale' in Māori.

The two whales, which lived between 27-25 million years ago, were preserved in a rock formation near Duntroon in North Otago. At that time the continent of Zealandia was largely or completely under water and the whales were deposited on a continental shelf that was perhaps between 50 to 100 metres deep.

The new genus that the fossils represent belongs to the toothless filter-feeding family *Eomysticetidae*, and it is the first time members of this family have been identified in the Southern Hemisphere.

They named the younger of the two fossil whales, which may be a descendent of the elder, as *Tohoraata raekohao*. *Raekohao* means 'holes in the forehead'.

Mr Boessenecker says this whale lived between 26-25 million years ago and vaguely resembles a minke whale but was more slender and serpent-like. Its skull, which contains a number of holes near its eye sockets for arteries, was probably about two metres in length and the whole animal would have been eight metres long.

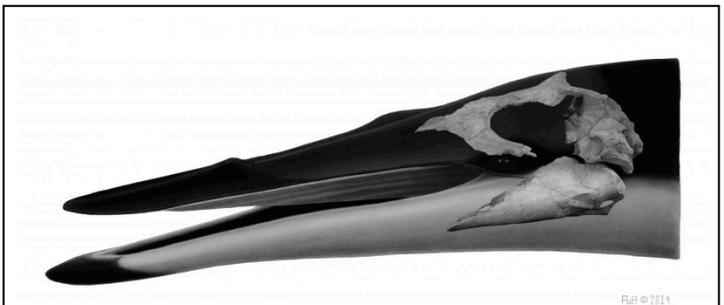
"This new species differs from modern baleen whales in having a smaller braincase and a skull that is generally much more primitive, with substantially larger attachments for jaw muscles. The lower jaw retains a very large cavity indicating that its hearing capabilities were similar to archaic whales."

The researchers also determined that the older fossil whale from the site, which was collected in 1949 and named in 1956, had been misidentified as belonging to the genus *Mauicetus*, a more advanced type of whale called a "cetothere." They have now changed its name from *Mauicetus waitakiensis* to *Tohoraata waitakiensis*.

Mr Boessenecker says this particular fossil had been poorly understood for more than 50 years and only with this study was it proven not to be from its originally attributed genus. The two whales have now become the first eomysticetids to be reported outside of South Carolina, USA, and Japan.

"Researchers contend with confusing or surprising fossils in museum collections all the time. Often, the best way to solve these mysteries is to go out and dig up another one, which is what Professor Fordyce and his colleagues did in 1993 when they collected the partial skull of *Tohoraata raekohao*."

Eomysticetids occupy an important position in the evolutionary tree of cetaceans: they are the earliest toothless baleen-bearing cetaceans, and in many characteristics are intermediate between toothed baleen whales and modern baleen whales, he says.



University of Otago researchers have described a new genus of ancient baleen whales that they have named *Tohoraata* (a Māori term which can be translated as Dawn Whale). The genus belongs to the toothless filter-feeding family *Eomysticetidae*, and it is the first time members of this family have been identified in the Southern Hemisphere. They named the younger of the two fossil whales, which may be a descendent of the elder, as *Tohoraata raekohao* (pictured). *Raekohao* means 'holes in the forehead'. Researcher Robert Boessenecker says this whale lived between 26-25 million years ago and vaguely resembles a minke whale but was more slender and serpent-like. Its skull, which contains a number of holes near its eye sockets for arteries, was probably about two metres in length and the whole animal would have been eight metres long. (Credit: Copyright Robert Boessenecker).

"They are the first baleen whales to have been completely toothless, and are therefore the earliest known cetaceans to have wholly relied upon filter feeding."

<http://www.sciencedaily.com/releases/2014/11/141118182456.htm>

INTER-ANNUAL AND SEASONAL TRENDS IN CETACEAN DISTRIBUTION, DENSITY AND ABUNDANCE OFF SOUTHERN CALIFORNIA

By Campbell, G.S, et al.

Oct. 24, 2014 — Trends in cetacean density and distribution off southern California were assessed through visual line-transect surveys during thirty-seven California Cooperative Oceanic Fisheries Investigations (CalCOFI) cruises from July 2004 – November 2013. From sightings of the six most commonly encountered cetacean species, seasonal, annual and overall density estimates were calculated. Blue whales (*Balaenoptera musculus*), fin whales (*Balaenoptera physalus*) and humpback whales (*Megaptera novaeangliae*) were the most frequently sighted baleen whales with overall densities of 0.91/1000 km² (CV=0.27), 2.73/1000 km² (CV=0.19), and 1.17/1000 km² (CV=0.21) respectively. Species specific density estimates, stratified by cruise, were analyzed using a generalized additive model to estimate long-term trends and correct for seasonal imbalances. Variances were estimated using a non-

parametric bootstrap with one day of effort as the sampling unit. Blue whales were primarily observed during summer and fall while fin and humpback whales were observed year-round with peaks in density during summer and spring respectively. Short-beaked common dolphins (*Delphinus delphis*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) and Dall's porpoise (*Phocoenoides dalli*) were the most frequently encountered small cetaceans with overall densities of 705.83/1000 km² (CV=0.22), 51.98/1000 km² (CV=0.27), and 21.37/1000 km² (CV=0.19) respectively. Seasonally, short-beaked common dolphins were most abundant in winter whereas Pacific white-sided dolphins and Dall's porpoise were most abundant during spring. There were no significant long-term changes in blue whale, fin whale, humpback whale, short-beaked common dolphin or Dall's porpoise densities while Pacific white-sided dolphins exhibited a significant decrease in density across the ten-year study. The results from this study were fundamentally consistent with earlier studies, but provide greater temporal and seasonal resolution.

<http://dx.doi.org/10.1016/j.dsr2.2014.10.008i>

ANTARCTIC SEALS MAY USE EARTH'S MAGNETIC FIELD TO NAVIGATE WHILE HUNTING

Dec. 22, 2014 — Weddell seals have biological adaptations that allow them to dive deep--as much as of hundreds of meters--while hunting, but also an uncanny ability to find the breathing holes they need on the surface of the ice. Now, researchers supported by the National Science Foundation (NSF) believe they have figured out how they do it--by using the Earth's magnetic field as a natural GPS.

"This animal, we think, may be highly evolved with an ability to navigate using magnetic sense in order to find ice holes some distance apart and get back to them safely," explained Randall Davis of the Department of Marine Biology at Texas A&M University.

If the hypothesis turns out to be true, it would represent the first evidence of such a trait in a marine mammal.

Highlights of the research have been captured on video in underwater images and in interviews by Peter Rejcek and Ralph Maestas of the *Antarctic Sun* newspaper, which is published by the U.S. Antarctic Program (USAP). NSF manages the USAP, which coordinates all U.S. research on the Southernmost continent.

The question of how seals navigate is more than academic. It's about life and death for the animals, which like all mammals, require oxygen to breathe, despite their mostly aquatic environment. Time spent looking for a new place to surface after each dive would not only be inefficient given the energy required to swim and hunt, but failure to locate a hole in the ice means the animal would drown.

"These animals are doing a remarkable amount of exercise all while on breath hold," noted Terrie Williams, a professor of ecology and evolutionary biology at the University of California, Santa Cruz. She is an expert on physiology in the Weddell seal, an animal whose apparent lethargy on the surface of the sea ice belies an amazing athleticism below it.

"The reason a seal wants to be efficient is that they have a limited amount of oxygen onboard," she explained. "The trick is conserving that 'scuba tank' on a dive."

Davis, Williams and another colleague, Lee Fuiman, associate director of the University of Texas' Marine Science Institute in Port Aransas, have been studying the behavior of Weddell's for decades.

The idea that Weddell seals can unerringly follow magnetic lines dates back to the late 1990s when the team first started working together in Antarctica. Fuiman said he was struck by data from the very beginning that showed the seals returning to dive holes with amazing precision.

"The animal always found its way back. It's like he knew exactly where the hole was," Fuiman said. "I couldn't figure out how they would do that. How did they know where they were by the time they turned around?"

The behavior from dive profiles is intriguing but not conclusive. So, how to determine whether



A Weddell seal in Antarctica. NSF-funded research indicates they may use the Earth's magnetic field to navigate. (Credit: Peter Rejcek, NSF).

Weddell seals, like homing pigeons, are using magnetic lines to weave their way back home?

For the next three years, the team will work with a handful of Weddell seals. Each animal will be outfitted with a Video and Data Recorder and released into three areas over the course of a couple of weeks in McMurdo Sound, where researchers have precisely mapped the magnetic field.

"There should be changes in behavior when an animal is in a different magnetic field," Fuiman explained.

In other words, comparing the magnetic anomaly maps of McMurdo Sound with dive profiles from the video and data recorder should provide some answers.

"That will give us the amount of data that we need to statistically analyze the information to look for these hypothesized behaviors," Davis said.

Next year, the group will return to Antarctica in August toward the end of the Antarctic winter, when there are still 24 hours of darkness. Davis said it's possible Weddells may be using other strategies for relocating holes in the sea ice with apparent ease. One possible explanation involves the idea of piloting--using under-ice visual features, such as cracks in the ice, to navigate.

However, without light penetrating the ice during winter darkness, the team can eliminate another factor.

"Magnetic sense isn't the only sense that seals use for orientation," Davis said. "What we're trying to do is separate pilotage from navigation."

Another sense that may be in place is hearing. Seals may be receiving acoustic cues on where breathing holes are located from other Weddells. In that case, Davis explained the team is using a directional hydrophone to pinpoint the direction of vocalization.

"Being able to travel reliably between sparsely located breathing holes is absolutely critical for their ability to live under this ice," Davis said. "We're trying to take away as many other potential orientation abilities of this animal and focus on this one aspect, which is the magnetic orientation."

The research was supported by collaborative NSF awards to Davis, Fuiman and Williams.

http://www.nsf.gov/news/news_summ.jsp?cntn_id=133693&org=OLPA&from=news

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)
12/31 pm	13	Gray Whales
	200	Long-beaked Common Dolphins
12/31 am	12	Humpback Whales
	300	Long-beaked Common Dolphins
12/30 pm	6	Gray Whales
12/30 am	8	Humpback Whales
	2	Gray Whales
	300	Long-beaked Common Dolphins
12/30 early am	14	Gray Whales
12/29 pm	8	Gray Whales
12/29 am	18	Gray Whales
	700	Long-beaked Common Dolphins
	1200	Risso's Dolphins
12/29 early am	26	Gray Whales
	1000	Long-beaked Common Dolphins
	800	Risso's Dolphins
12/27 pm	18	Gray Whales
12/27 am	36	Humpback Whales
	2	Gray Whales
	6	Bottlenose Dolphins
12/26 pm	6	Humpback Whales
	1	Gray Whale
12/26 am	7	Gray Whales
	30	Risso's Dolphins
12/24 am	5	Humpback Whales
	2	Gray Whales
	80	Long-beaked Common Dolphins
	100	Risso's Dolphins
12/23 pm	2	Humpback Whales
	2	Gray Whales
12/23 am	15	Gray Whales
	1500	Long-beaked Common Dolphins
	15	Risso's Dolphins
12/22 pm	14	Humpback Whales
	4	Gray Whales
12/22 am	11	Humpback Whales
	2	Gray Whales
	2	Harbor Porpoise
12/21 pm	22	Humpback Whales
	1300	Long-beaked Common Dolphins
12/21 am	6	Humpback Whales
	1400	Long-beaked Common Dolphins
	10	Harbor Porpoise
12/20 am	10	Humpback Whales
	1	Gray Whales
	300	Long-beaked Common Dolphins
	75	Risso's Dolphins
12/19 am	20	Humpback Whales
	75	Long-beaked Common Dolphins
12/18 pm	9	Humpback Whales
	10,000+	Black-vented Shearwaters

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