

Soundings



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

NOVEMBER 2011

**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**

**COMBINED NOV/DEC MEETING DATE:
THURSDAY, DECEMBER 1, 2011**

TIME: 7:30 PM.

PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

Speaker: Robert "Bobby" Boessenecker, M.S., Earth Sciences

**Title: "Marine Mammal Paleontology of the Purisima
Formation in Central California"**

Marine Mammals are an important and interesting component of California coastal marine habitats and their fossil records demonstrate they have been for many, many years. The Purisima Formation is a "local" geological formation that is noted for marine fossils including marine mammal fossils.

Our speaker has done field work in the Purisima Formation on several expeditions. Bobby's presentation will provide an overview of marine mammal paleontology in Santa Cruz in general focusing on the cetaceans rather than the pinnipeds and sea cows. He will also discuss the preservation processes associated with the death and decay of cetaceans and the eventual incorporation of their skeletons into the rock record. His presentation promises interesting photographs along with interesting observations about cetaceans from the past.

Please join us for a journey into the past to learn about recent marine mammal ancestry, in particular the ancestry of cetaceans, who lived along the older California coast.

Bob Mannix, ACS MB, Programs Committee Chair

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CALENDAR

Nov. 15 at 7 pm Friends of Moss Landing Marine Laboratories. The Essential Naturalist: an evening with Dr. Michael Graham. Seminar Room at MLML
RSVP AT831 771-4464

Nov. 16, 7pm-8:45pm: Pacific Sea Turtles and the Great Leatherback Migration
Sonoma, CA. Sonoma Veterans Memorial Building. For more info go to SeaTurtleRestoration.org

Nov 18, 12pm-1pm : HMS Science Seminars: Jarrett Byrnes, UCSB: Causes and Consequences of Changes to Food Web Structure in California's Giant Kelp Forest

Dec 2, 12pm-1pm : HMS Science Seminars: David Post, Yale University: The Long and Short of Food Chain Length

Nov. 17 , 7 pm: Lecture: Why Did the Turtle Cross the Pacific? Leatherback Turtles in the California Current. By Dr. Scott Benson. Pacific Grove Museum of Natural History (pgmuseum.org)

Nov. 20th 1pm : Science Sundays Lecture: Trouble in Paradise: the Struggle for Survival by the Endangered Hawaiian Monk Seal. Lecture to be given by Dr. Terrie Williams. Seymour Center
(seymourcenter.ucsc.edu/calendar.html)

Nov 27-Dec 2: 19th Biennial Conference on the Biology of Marine Mammals. Tampa, FL
Conference Theme: Cumulative effects of threats to marine mammals: Challenges to animals, scientists, and managers. On Saturday and Sunday prior to the conference there will be 29 workshops running all day covering many diverse conservation topics. For more info visit The Society for Marine Mammalogy website

Dec. 1st 7pm: Lecture: From Sardines to Anchovies and Back in 50 years. By Francisco Chavez MBARI (mbari.org). **Gift items made by artisans in Puerto Penasco, Mexico, will be available for purchase to benefit Viva Vaquita.**

Dec. 10th 7pm: Lecture: Following Elephant Seals by Daniel Costa PGMNH (pgmuseum.org)

January 21, 9am to 10pm: WHALEFEST MONTEREY "Whale Watching Capital of the World" at Old Fisherman's Wharf, #1 Old Fisherman's Wharf, Monterey, California

Feb. 7-10 2012: 38th Meeting of the Pacific Seabird Group. Makaha, Hawaii
For more info go info@pacificseabirdgroup.org

BOOK RECOMMENDATIONS

The Left Coast: California On The Edge
Photos By Alex L. Fradkin + Text By Philip L. Fradkin University of California Press, 2011

The Essential Naturalist: Timeless Readings in Natural History By Michael Graham (MLML)
2011 University of Chicago Press

Sex, Drugs and Sea Slime: The Oceans Oddest Creatures And Why They Matter. By Ellen Prager 2011 University of Chicago Press

Dolphin Diaries: My 25 years with Spotted Dolphins in the Bahamas. By Dr. Denise L. Herzing

Enjoy LOCAL WHALES with companies that have supported ACS Monterey Bay:

**MONTEREY WHALE WATCHING
MONTEREY BAY WHALE WATCH**

PACIFIC LOGGERHEAD SEA TURTLES DECLARED ENDANGERED

Rare Sea Turtles Protected Worldwide; Five Populations Now Listed as Endangered

WASHINGTON— The Obama administration today designated the North Pacific loggerhead sea turtle as endangered under the Endangered Species Act. Populations of this rare turtle, which spends much of its time off Mexico and Southern California, have declined by at least 80 percent over the last decade. Although loggerhead sea turtles have been listed as threatened since 1978, today's rule recognizes that some populations are nearing extinction from fisheries bycatch, climate change, and marine pollution, including oil spills.

"Pacific loggerheads need increased

protections immediately to reverse their decline toward extinction," says Dr. Chris Pincetich, marine biologist with the Sea Turtle Restoration Project of the Turtle Island Restoration Network (TIRN). "Deadly high-seas longline fisheries, illegal poaching and the radioactive debris offshore of loggerhead nesting beaches in Japan all jeopardize these endangered sea turtles."

"Loggerhead populations worldwide require additional protections if they are to survive this century," said Catherine Kilduff, attorney at the Center for Biological Diversity. "This listing is a wake up call that a host of threats like oil spills, channel dredging and commercial trawling, longline, and gill net fisheries continue to kill turtles faster than they can reproduce." Today's decision by the National Marine Fisheries Service is in response to two 2007 legal petitions by the Center for Biological Diversity, Turtle Island Restoration

Network, and Oceana for additional protections for the North Pacific and Northwest Atlantic loggerheads.

The rule separates loggerheads into nine populations, and five are now considered endangered. The government did not list as endangered Northwest Atlantic loggerhead sea turtles despite the fact that Florida beaches, which host the largest nesting population of loggerheads in the Northwest Atlantic, have seen an almost 40 percent decline in nesting since 1998 before small rebounds in recent years. "The failure to recognize Northwest Atlantic loggerheads are

endangered ignores the massive impacts of the BP oil spill and increasing threats from shrimp trawl fisheries on this imperiled population," said Pincetich. "NMFS ignored thousands of coastal residents who cherish these imperiled sea turtles and wanted more protections for them." Now that Pacific loggerheads



are endangered, significant threats such as longline and gill-net fisheries will be subject to increased scrutiny and may need restrictions to decrease their deadly impacts. North Pacific loggerhead sea turtles nest in Japan, but spend most of their life along the coast of Mexico and Southern California. Swordfish fishing boats from Hawaii regularly hook and drown loggerhead sea turtles on millions of longline hooks. While critical habitat is not currently designated for loggerheads, this rule triggers its identification, an important step toward achieving improved protections for key nesting beaches and migratory and feeding habitat in the ocean. Species with protected critical habitat are twice as likely to recover as those without.

Turtle Island Restoration Network is an international marine conservation organization headquartered in California whose 55,000 members and online activists work to protect sea

turtles and marine biodiversity in the United States and around the world. For more information, visit www.SeaTurtles.org.

The Center for Biological Diversity is a national, nonprofit conservation organization with more than 320,000 members and online activists dedicated to the protection of endangered species and wild places. www.biologicaldiversity.org.

ANTARCTIC KILLER WHALES MAY SEEK SPA-LIKE RELIEF IN THE TROPICS

ScienceDaily (Oct. 26, 2011) — NOAA researchers offer a novel explanation for why a type of Antarctic killer whale performs a rapid migration to warmer tropical waters. Scientists believe that warmer waters help the whales regenerate skin faster, after spending months coated with algae in colder waters.

"The whales are traveling so quickly, and in such a consistent track, that it is unlikely they are foraging for food or giving birth," said John Durban, lead author from NOAA's Southwest Fisheries Science Center in La Jolla, California. "We believe these movements are likely undertaken to help the whales regenerate skin tissue in a warmer environment with less heat loss."

As evidence, the researchers point to the yellowish coating on Antarctic killer whales caused by a thick accumulation of diatoms or algae on the outer skin of the animals. The coloring is noticeably absent when they return from warmer waters indicating the upper epidermis of the skin has been shed.

One tagged Antarctic killer whale monitored by satellite traveled over 5,000 miles to visit the warm waters off southern Brazil before returning immediately to Antarctica just 42 days later. This was the first long distance migration ever reported for killer whales.

The coloring is noticeably absent when they return from warmer waters indicating the upper layer of skin has been shed. The scientists tagged 12 Type B killer whales (seal-feeding specialists) near the Antarctic Peninsula and tracked 5 that revealed consistent movement to sub-tropical waters. The whales tended to slow in

the warmest waters although there was no obvious interruption in swim speed or direction to indicate calving or prolonged feeding.

"They went to the edge of the tropics at high speed, turned around and came straight back to Antarctica, at the onset of winter," said Robert Pitman, co-author of the study. "The standard feeding or breeding migration does not seem to apply here."

Researchers believe there are at least three different types of killer whales in Antarctica and have labeled them Types A, B and C.



Pod of killer whales. (Credit: © pr2is / Fotolia)

BLUEFIN TUNA TRADE EXCEEDED LEGAL QUOTAS BY 141 PERCENT, STUDY SAYS

A new analysis commissioned by the Pew Environment Group has found that the amount of eastern Atlantic bluefin tuna traded on the global market last year exceeded the official fisheries quota by 141 percent. According to the report, that gap was significantly wider than in 2008 — when the amount of bluefin tuna caught and traded exceeded quotas by 30 percent — and suggests fundamental flaws in existing mechanisms to manage fisheries of the endangered fish. Three years ago, the International Commission for the Conservation of Atlantic Tunas adopted stricter enforcement and trade regulations on tuna caught in the

Mediterranean Sea and the eastern Atlantic, including lower catch limits and a paper-based documentation system. However, the total amount of Atlantic bluefin tuna traded between 2009 and 2010 exceeded 70,600 metric tons, more than twice the legal quota of 35,306 for the two years. Saying the existing paper-based system is "rife with fraud and misinformation," Lee Crockett of the Pew Environment Group called for an electronic documentation system by 2014, saying it would provide better information that could be shared more easily and cross-checked immediately.

NEW, HIGHER ESTIMATES OF ENDANGERED HUMPBACK WHALES IN THE NORTH PACIFIC

ScienceDaily (Oct. 18, 2011) — Scientists have increased the estimate on the number of humpback whales in the North Pacific Ocean in a paper published in the journal *Marine Mammal Science*. The increase follows a refined statistical analysis of data compiled in 2008 from the largest whale survey ever undertaken to assess humpback whale populations throughout the North Pacific.

The number of North Pacific Humpback Whales in the 2008 study known as the Structure of Populations, Levels of Abundance and Status of Humpbacks, or SPLASH, was estimated at just under 20,000 based on a preliminary look at the data. This new research indicates the population



A humpback whale calf breaching off Hawaii. (Credit: HIHWNMS NOAA Fisheries Permit #782-1438)

to be over 21,000 and possibly even higher -- a significant improvement to the scant 1400 humpback whales estimated in the North Pacific Ocean at the end of commercial whaling in 1966.

"These improved numbers are encouraging, especially after we have reduced most of the biases inherent in any statistical model," said Jay Barlow, NOAA's Fisheries Service marine mammal biologist at the Southwest Fisheries Science Center in La Jolla, Calif. "We feel the numbers may even be larger since there have been across-the-board increases in known population areas and unknown areas have probably seen the same increases."

The SPLASH research was a three-year project begun in 2004 involving NOAA scientists and hundreds of other researchers from the United States, Japan, Russia, Mexico, Canada, the Philippines, Costa Rica, Panama, Nicaragua and Guatemala and was the first systematic survey ever attempted to determine the humpback whales' overall population, structure, and genetic makeup in the North Pacific.

Researchers were able to quantify the number of humpback whales by photographing and cataloguing over 18,000 pictures of the animals' tail, or fluke because the pigmentation patterns on the fluke act like a fingerprint and are unique to each animal. Scientists determined population numbers by comparing photographs taken in northern feeding grounds (around the Pacific Rim from California to Kamchatka) compared with matches of the same animals in the warm tropical waters of southern breeding areas as far as 3000 miles away.

"This latest revision to the study provides an accurate estimate for humpback whales in an entire ocean that could not have been possible without researchers working together to pool data," said John Calambokidis, senior research biologist and co-founder of Cascadia Research. "While populations of some other whale species remain very low this shows that humpback whales are among those that have recovered strongly from whaling."

METABOLIC MYSTERIES: RESEARCHERS EXPLORE CONNECTION BETWEEN HEART RATE AND ENERGY EXPENDITURE

Scientists believe the precipitous decline of Western Alaska's sea lion populations is driven by changes in the availability of their prey. However, relatively little is known about how much food they need to remain healthy, or how much energy they expend in day-to-day activities like swimming and foraging.

Two new Consortium studies led by Beth Young evaluated the relationship between feeding, activity, heart rate, and energy expenditure. While scientists cannot directly measure the energy a wild sea lion expends, previous studies have established an equation that predicts oxygen consumption (a proxy for energy expenditure) based on heart rate, which is easily measured.

However, the previous equation was calibrated with animals that were resting on land and not feeding. Young and colleagues investigated whether this equation could apply to animals swimming at sea and searching for food. "An exercise treadmill is a good analogy for how energy expenditure can be estimated from heart rate," Young says. "The treadmill's heart rate monitor predicts the number of calories we burn when running or walking, according to a specific equation for that type of exercise. But it does not consider your digestive state, and it is not accurate for other types of exercise. Our study attempted to calibrate a similar equation for sea lions when they are diving or feeding, and not just while they are resting on dry land."

Land and sea

Young and colleagues examined three potential influences on the relationship between heart rate and oxygen consumption: environment (land vs. water), feeding (fed vs. fasted), and diving (single vs. consecutive). In the first of two studies, published in the *Journal for Comparative Physiology*, they measured heart rate and respiration in captive Steller sea lions on dry land, in water, and in open water. The sea lions had either been recently fed or had fasted overnight.

"Environment made a big difference," Young notes. "The relationship between heart rate and oxygen consumption was completely different on land than in water, which suggests that a separate equation is needed to estimate energy spent in swimming animals."

This is probably because marine mammals have an automatic dive response in water that is absent on land, Young says, which lowers the heart rate and shunts blood away from the extremities.

"The dive response in marine mammals is part voluntary and part involuntary, and it varies with the depth and duration of the dive," says Young. "Even submergence in shallow water can cause a mild involuntary dive response. We see the same thing in humans — our heart rate drops when we submerge our faces in cold water, even for a few seconds."

Young and colleagues had expected that feeding would also influence the relationship between heart rate and oxygen consumption in both environments, but found that feeding only had an effect if the sea lion was in water. On land, the equation held true whether the animal was fed or fasted. The size of the meal also had an effect on the heart rate relationship in water, but not on land.

Dives and debts

In a related study published in the *Journal of Experimental Biology*, Young and colleagues measured heart rate and respiration in active Steller sea lions after single dives and successive dives, or dive bouts. Unlike previous diving studies with captive animals, these dives were made in an open water environment and simulated natural underwater foraging, including feeding at realistic depths (up to 40m) and diving for realistic lengths of time (2-8 min).

We demonstrated that heart rate can predict oxygen consumption in individual dives, and that neither depth nor dive duration changed that relationship," says Young. "But a different equation is needed for dive bouts. We found the relationship only held true over complete dive cycles that included the surface interval following the dive bout."

A diving animal incurs an oxygen debt

during the dives that is paid back at the surface, Young explains. In a single dive, the oxygen debt likely is not large enough to change the relationship between heart rate and oxygen consumption, but over multiple dives the animal accumulates a greater oxygen debt, which does influence that relationship.

In the wild

Ultimately, Young believes her research provides researchers with valuable insights to help assess metabolic rates of wild Steller sea lions.

"By temporarily attaching a heart rate data logger on a wild sea lion, one could predict metabolic rate from its heart rate — with the right equations," she says. "This is particularly important in identifying how much energy nutritionally stressed animals expend, because it enables us to estimate how much food they need to eat to remain healthy. It also helps fisheries managers assess how much fish is required by wild sea lion populations, versus how much is available."

Heart rate can predict metabolism, Young concludes, but it cannot be done using a single predictive equation. The relationship between heart rate and energy expenditure differs according to whether the sea lion is on land or in water, whether it has a full or empty stomach, and whether it is diving to depth or swimming along the surface. Thus, separate equations are needed to distinguish among environmental, digestive and diving states. Young recommends modifying the current equations that are based on fasting animals to account for the more realistic activities that sea lions undertake in the wild.

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

Date	#	Type of Animal(s)
11/2 a.m.	11	Killer Whales
	30	Risso's Dolphins
(Sightings for Oct. 31 and Nov. 1 to be posted later.)		
10/30 p.m.	1	Humpback Whale
	5	Risso's Dolphins
	5	Harbor Porpoise
10/30 a.m.	1	Humpback Whale
	10	Harbor Porpoise

10/29 p.m.	1	Humpback Whale
10/29 a.m.	1	Humpback Whal
		Killer Whales (predation on elephant seal)
	300	Risso's Dolphins
10/28 p.m.	1	Humpback Whale
	125	Risso's Dolphins
	2	Bat Rays
10/28 a.m.	1000	Long-beaked Common dolphins
	35	Risso's Dolphins
10/26 a.m.	9	Killer Whales
	1	Thresher Shark
10/25 a.m.	4	Humpback Whales
	250	Risso's Dolphins
10/24 p.m.	3	Humpback Whales
10/24 a.m.	4	Humpback Whales
	200	Risso's Dolphins (with newborns)
10/23 p.m.	1	Humpback Whale
	75	Pacific White-sided Dolphins
	500	Risso's Dolphins
10/23 a.m.	5	Humpback Whales
	300	Long-beaked Common dolphins
10/22 p.m.	50	Pacific White-sided Dolphins
	1000	Risso's Dolphins
	100	Northern Right Whale Dolphins
10/22 a.m.	1000	Risso's Dolphins
	100	Northern Right Whale Dolphins
10/21 a.m.	1	Humpback Whales
	600	Risso's Dolphins
	10	Northern Right Whale Dolphins
10/20 a.m.	4	Humpback Whales (feeding)
	1600	Long-beaked Common dolphins (with lots of calves)
	200	Risso's Dolphins
10/19 a.m.	250	Risso's Dolphins
	1	Mola Mola
10/18 p.m.	40	Risso's Dolphins
		Mola Molas
	2	Sharks
10/18 a.m.	100	Risso's Dolphins
	40	Harbor Porpoise
10/17 p.m.	2	Humpback Whales
10/17 a.m.	2	Humpback Whales
	150	Risso's Dolphins
	1	Leatherback Sea Turtle
10/16 p.m.	4	Humpback Whales
	100	Risso's Dolphins
	10	Harbor Porpoise
10/16 a.m.	4	Humpback Whales
	300	Risso's Dolphins
	20	Harbor Porpoise
10/15 p.m.	3	Humpback Whales
	75	Risso's Dolphins
	30	Bottlenose Dolphins
	25	Harbor Porpoise

Skipped dates indicate no trip

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