

Soundings



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

AUGUST 2009

**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

Date: Thursday, August 27, 2009

Time: 7:30 PM. **PLEASE JOIN US AT 7:00 FOR REFRESHMENTS**

Speaker: Daniela Maldini, Ph.D., CEO and Chief Scientist for OKEANIS:
Research and Conservation for a Sustainable Ocean.

Subject: Coastal Dolphin Project

What a lucky day it is to see *DOLPHIN* swimming in the ocean! Whether you are on the beach seeing dolphin swimming just beyond the surf line or on a boat watching them “bow ride” dolphin always seem to conjure up pleasurable feelings of delightful enthusiasm. But if you look closer, you will find that some of these beautiful and graceful cetaceans, including the California coastal bottlenose dolphin (*Tursiops truncatus*) have serious challenges with which to contend.

The California coastal bottlenose dolphin are truly coastal, living their lives within 1 km of the coast. This group is generally considered distinct with a total of about 450 to 500 individuals and about 200 of these spend a lot of time in the Monterey Bay National Marine Sanctuary (“MBNMS”).

Living so close to the shore, California bottlenose dolphin can be affected by coastal contaminations. For example, dead strandings of this dolphin species have had alarmingly high concentrations of PCBs and DDT. However, such strandings are not that common. To make significant findings, research needs to be done on living dolphin in their natural habitat. Such research could also be helpful to others, including the human population.

Recent findings reveal that, among other things, the California bottlenose population is suffering a high rate of skin disease which could be related to near shore contamination. This is also an area of concern for our speaker. Daniela has been studying this dolphin species for nearly 10 years and so is very familiar with them. In addition to contributing to a catalog for identification of individual members of this group of dolphins she is involved in the investigation of near shore contamination in the MBNMS and its effects on the California bottlenose dolphin. Please join us for a revealing and informative presentation about this on going cetacean research in the Sanctuary.

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CALENDAR

Sat. August 15th 8 am-4: ACS National Blue Whale Watch , Aboard the Condor Express in Santa Barbara, CA. For info please call trip chair at 310-548-7821.

Thu Aug 27th: Monthly ACSMB meeting with Daniela Maldini, PhD, who will discuss her work with bottlenose dolphins in Monterey Bay. Hopkins Marine Station, 7pm refreshments, 7:30pm talk.

Sat Sept 12th 9am-1:30pm: Blue Whale Fundraiser for ACS Monterey Bay Chapter. Join cetacean experts with Monterey Bay Whale Watch for a half day of whale watching in one of the most productive marine ecosystems in the world, in search of the largest animal that has ever existed. We will also be on the lookout for humpback whales, killer whales, dolphins, leatherback sea turtles and other marine life. Cost is \$45 for members, \$55 for non-members. Send checks to ACSMB, PO Box HE, Pacific Grove, CA, 93950 or contact Tony Lorenz at 831-901-7259.

Sat Sept 12th Noon-5: MBARI's Open House. Open house will feature science and technology exhibits, research presentations, children's activities, ocean science career info and much more.

Saturday, September 19th : 25th Annual California Coastal Cleanup Day. See You at the Beach

Sept. 24-27: Monterey Bay Birding Festival "Bridging the Americas". Watsonville Civic Plaza, Watsonville, CA

September 26th, and October 3rd, Oceanic Society Cordell Bank Wildlife Adventure. Departs from Bodega Bay aboard the 'New Sea Angler'. Cost-\$150.00. Contact Oceanic Society for more info-1-415-474-3385

Oct 10th and 11th: Mammology 18th Biennial Conference on the Biology of Marine Mammals in Quebec City, QC, Canada. 2 Day Workshop. For more info go to www.marinemammalogy.com

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Nov 6-8, Sitka Whale Festival
Sitka, Alaska. 2009 keynote speaker will be Richard Ellis, one of the world's great marine artist and a prolific author of all things marine

Nov 7, 2009-Feb 28, 2010: Darwin: Evolution/ Revolution. San Diego Museum of Natural History.

Feb 17-20, 2010: Pacific Seabird Group 37th Annual Meeting. Long Beach, CA

February 26-28, 2010 Whale Trust 2010 Ritz Carlton, Kapalua, Maui, Hawaii
More info about speakers will be forthcoming

Sept 7-11, 2010: 1st World Seabird Conference
Hosted by: Pacific Seabird Group Victoria Conference Center Victoria, B.C.

SPONSORED BY UCMP AND THE NATIONAL CENTER FOR SCIENCE EDUCATION. THINK EVOLUTION: A SUMMER INSTITUTE FOR SCIENCE EDUCATORS

Calling all middle and high school science teachers! Put on your evolution eyeglasses and your nature of science thinking cap and join us for a fun-filled four days of evolutionary explorations with biologists and educators from the University of California. The Think Evolution Summer Institute will combine lectures by prominent biologists with sessions focused on hands-on activities for the middle and high school classroom. Hear about the most recent developments in evolution and have an opportunity to explore how to integrate these topics into your curriculum. Follow up with biologists and participating educators at the Evo-Picnic to be held the following February

Tuesday through Friday, August 11-14, 2009
UC Museum of Paleontology, Valley Life Sciences Building, UC Berkeley. 9:00 am to 3:00 pm
\$75.00 for four days (college credit available for additional cost); includes lots of free resources distributed to participating teachers plus morning and afternoon snacks.

www.starrsites.com/acsmf/

WHY NOAA IS BANNING KRILL HARVEST OFF THE WEST COAST

By Moises Velasquez-Manoff

On Monday, the National Oceanic and Atmospheric Administration (NOAA) prohibited krill harvesting off the US West Coast. The ban goes into effect Aug. 12.

Krill are tiny shrimp-like creatures. They eat algae and, occasionally, other little critters. Ultimately, we all rely on photosynthetic organisms for our daily bread – they're the only organisms able to use the sun's energy to directly create carbohydrates.

In the marine realm, it's krill that play the important role of converting plant matter into flesh. Anything that's not a vegetarian – and that includes whales, seals, and many, many fish – relies on krill, or similar shrimp-like creatures (like copepods), to convert plant matter into animal protein and fat.

Salmon eat them, that's how they get their characteristic orange-ish color. So does the blue whale. That tells you something about the little shrimp's abundance. There are enough to support the largest animal ever to have existed.

Indeed, judged by sheer biomass – the combined weight of all living individuals – Antarctic krill are the single most successful animal on the planet. And they support large, both literally and figuratively, quantities of life. If you were to put all the world's marine mammals on a scale, you'd find half that mass came from the krill-rich waters surrounding Antarctica. That includes one-fifth of the world's whales. All that is because of krill.

Greenpeace says of krill: It is currently the largest fishery in the Southern Ocean (Everson 2000). The market for krill is expected to grow in line with increasing demand globally for aquaculture feed (Nicol & Foster 2003). Previous difficulties related to rapid spoiling of the catch and high levels of fluoride leaching from the shells into the meat have largely been overcome by improved and more rapid on-board processing techniques. Some facilities exist aboard vessels to manufacture bio-diesel from

krill. The decline in sea ice in the south-western Atlantic has enabled the krill fishery to operate year round (Smetacek & Nicol 2005). This and the improved processing methods have effectively removed the last constraints that were limiting growth of this fishery. In addition, the development of new products is taking place, including the production of krill oil rich in omega-3 fatty acids as a human dietary supplement.

There are no krill fisheries yet in the 200-mile wide exclusive economic zone off the US West Coast. But, as Greenpeace points out, demand for krill is on the rise. Usually, harvested krill are ground and squeezed into meal or oil that goes to feed livestock or fish. But some foresee a fish food shortage.

There's already talk that rising fishmeal prices will spark a krill war in the Southern Ocean. And a 2002 report by the UN's Food and Agriculture Program used the term "fish meal trap" to refer to that moment when supply of the limited resource (fish meal) would no longer meet demand — a peak fish moment.

A later FAO report says: Even with stable (neither increasing nor decreasing) supplies of raw fish for fishmeal production, it is also argued that the growing demand for fishmeal will continue to drive the price of fishmeal and fish oil upwards. Upon reaching a certain price level, the use of fishmeal and fish oil may no longer be financially viable.

It goes without saying that environmentalists would rather avoid that scenario. By the time market prices respond to a scarcity in fish and/or krill meal, who knows how many marine animals will have starved to death. So more than anything, the NOAA krill ban may be a proactive step toward protecting the California food web – especially large, slow-breeding animals such as whales that already suffer from low numbers.

And that's how many are hailing it: Mother Jones says, "Today's rule is a rare instance of foresight in fisheries management, designed to preserve the foundation of a healthy

marine foodweb in the California Current ecosystem, including its five National Marine Sanctuaries.”

Oceana’s Ben Enticknap tells the AP: “It’s proactive and precautionary taking action now before there is a crisis, rather than waiting for a big problem to occur and then having to deal with it.”

The West Coast has seen firsthand what happens when krill stocks collapse. In 2003, rockfish populations off California tanked, reports the AP. Then, in 2005, sea birds and other marine life began showing signs of starvation. Scientists eventually blamed a plummeting krill population.

It wasn’t from overfishing, though: 2004-’05 was an El Nino year, a periodic warming of the eastern Pacific. That’s when warm surface waters halt the upwelling of cooler, nutrient-rich waters from the deep. Primary productivity slows, and so does everything that depends on it

BONE BED TELLS OF LIFE ALONG CALIFORNIA’S ANCIENT COASTLINE

By Robert Sanders, BERKELEY — In the famed Sharktooth Hill Bone Bed near Bakersfield, Calif., shark teeth as big as a hand and weighing a pound each, intermixed with copious bones from extinct seals and whales, seem to tell of a 15-million-year-old killing ground.

Yet, new research by a team of paleontologists from the University of California, Berkeley, the University of British Columbia in Vancouver, Canada, and the University of Utah paints a less catastrophic picture. Instead of a sudden die-off, the researchers say that the bone bed is a 700,000-year record of normal life and death, kept free of sediment by unusual climatic conditions between 15 million and 16 million

years ago.

Shark tooth Teeth such as this from the extinct 40-foot-long shark *Carcharocles megalodon* are common in the Sharktooth



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Hill Bone Bed because, like modern sharks, these extinct sharks also shed teeth throughout their lives.

The team's interpretation of the fossils and the geology to establish the origins of the bone bed, the richest and most extensive marine deposit of bones in the world, are presented in the June 2009 issue of the journal *Geology*.

The mix of shark bones and teeth, turtle shells three times the size of today's leatherbacks, and ancient whale, seal, dolphin and fish skeletons, comprise a unique six-to-20-inch-thick layer of fossil bones, 10 miles of it exposed, that covers nearly 50 square miles just outside and northeast of Bakersfield.

Since the bed's discovery in the 1850s, paleontologists have battled over an obvious question: How did the bones get there? Was this a killing ground for megalodon, a 40-foot version of today's great white shark? Was it a long-term breeding area for seals and other marine mammals, like Mexico's Scammon's lagoon is for the California gray whale? Did a widespread catastrophe, like a red tide or volcanic eruption, lead to a massive die-off?

The new and extensive study of the fossils and the geology of Sharktooth Hill tells a less dramatic story, but an important one, for understanding the origin of rich fossil accumulations, said Nicholas Pyenson, a former UC Berkeley graduate student who is now a post-doctoral fellow at the University of British Columbia.

"If you look at the geology of this fossil bed, it's not intuitive how it formed," Pyenson said. "We really put together all lines of evidence, with the fossil evidence being a big part of it, to obtain a snapshot of that period of time."

Pyenson and his colleagues, totaling five UC Berkeley Ph.D.s and UC Berkeley integrative biology professor Jere Lipps, hope that the study will draw renewed attention to the bone bed, which Lipps said needs protection even though a small portion of it was added to the National Natural Landmark registry in 1976.

One 12-foot-long fossil seal skeleton that Lipps helped excavate during the 50 years he has visited the bone bed was mounted and displayed for decades at the Natural History Museum of Los Angeles County (NHM), which houses thousands of fossils excavated from the Sharktooth Hill deposits during expeditions in the 1960s and 1980s. Other collections are in the California Academy of Sciences, San Diego Natural History Museum, Buena Vista Museum of Natural History in Bakersfield, and UC Berkeley's Museum of Paleontology (UCMP), where students over the years have made studies of the bone bed's extinct sea turtles, sharks, marine mammals and seabirds. Lipps is a faculty curator in the UCMP.

The paper's other coauthors - all of whom obtained their Ph.D.s from UC Berkeley - are Randall B. Irmis, now an assistant professor of geology and geophysics at the University of Utah, and Lawrence G. Barnes, Edward D. Mitchell Jr. and Samuel A. McLeod of NHM's Department of Vertebrate Paleontology.

When the bone bed formed between 15,900,000 and 15,200,000 years ago, the climate was warming, sea level was at a peak, California's Central Valley was an inland sea dubbed the Temblor Sea and the emerging Sierra Nevada was shoreline. By closely studying the geology of the Sharktooth Hill area, the paleontologists determined that it was part of an underwater shelf in a large embayment, directly opposite a wide opening to the sea.

Pyenson and Irmis examined some 3,000 fossilized bone and teeth specimens in the collections of many museums, including the NHM and UCMP, and they and Lipps also cut out a meter-square section of the bone bed, complete with the rock layers above and below, and transported it to UC Berkeley for study.

Below the bone bed, they found several feet of mudstone interlaced with shrimp burrows, typical of ocean floor sediment several hundred to several thousand feet below the surface. The

bone bed itself averaged 200 bones per square meter, most of them larger bones, with almost no sediment. Most were disarticulated, as if the animal carcasses had decayed and their bones had been scattered by currents.

"The bones look a bit rotten," Lipps said, "as if they lay on the seafloor for a long time and were abraded by water with sand in it." Many bones had manganese nodules and growths, which form on bones that sit for long periods in sea water before being covered by sediment.

Toward the top of the bone bed, some articulated skeletons of seals and whales were found, while in the layer above the bone bed, most skeletons were articulated and encased in sediment.

The team's conclusion is that the climatic conditions were such that currents carried sediment around the bone beds for 100,000 to 700,000 years, during which time bones remained exposed on the ocean floor and accumulated in a big and shifting pile.

Given the rarity of bones marked by shark bites, plus the occurrence of terrestrial animals such as tapirs and horses that must have washed out to sea, predation by sharks like *Carcharocles megalodon* seems unlikely to have been the major source of the bone bed, the authors wrote. Because of few young or juvenile specimens, the team also discounted the hypothesis that this was a breeding ground for early seals such as *Allodesmus*. The absence of volcanic ash makes a volcanic catastrophe unlikely, while the presence of land mammal fossils makes red tide an unlikely cause.

"These animals were dying over the whole area, but no sediment deposition was going on, possibly related to rising sea levels that snuffed out silt and sand deposition or restricted it to the very near-shore environment," Pyenson said. "Once sea level started going down, then more sediment began to erode from near shore."

Pyenson noted that, while bone beds around the world occur in diverse land and



A reconstructed skeleton of the extinct seal Allodesmus from the Sharktooth Hill Bone Bed, now on display at the San Diego Natural History Museum.

marine environments, the team's analysis of the Sharktooth Hill Bone Bed could have implications for other fossil-rich marine deposits.

The work was funded by UCMP and UC Berkeley's Department of Integrative Biology, as well as by grants from the Geological Society of America and the American Museum of Natural History, and graduate fellowships from the National Science Foundation.

FISHING PUTS A THIRD OF ALL OCEANIC SHARK SPECIES AT RISK OF EXTINCTION

The first International Union for the Conservation of Nature (IUCN) red list of oceanic sharks names 64 species as endangered. Sharks are vulnerable because they take decades to mature and produce few young.

Over-fishing threatens to drive a third of the world's open-ocean shark species to extinction, say conservationists. Hammerheads, giant devil rays and porbeagle sharks are among 64 species on the first ever red list for oceanic sharks produced by the International Union for Conservation of Nature (IUCN).

Sharks are vulnerable because they can take decades to mature and they produce few young. The scalloped hammerhead shark, which has declined by 99% over the past 30 years in some parts of the world, is particularly vulnerable and has been given globally endangered status on the red list, which means it is nearing extinction. In the Gulf of Mexico, the oceanic whitetip shark has declined by a similar amount.

Scientists estimate that shark populations in the north-west Atlantic Ocean have declined by an average of 50% since the early 1970s.

Announcing the red list of open-ocean or "pelagic" sharks and rays today, scientists called on governments to set limits for catching the animals on the high seas and to enforce strict bans on "finning" – the practice of catching sharks, cutting off their fins and throwing the bodies back in the water.

"Despite mounting threats, sharks remain virtually unprotected on the high seas," said

Sonja Fordham, deputy chair of the shark specialist group at the IUCN and policy director for the Shark Alliance. "The vulnerability and lengthy migrations of most open-ocean sharks call for coordinated, international conservation plans. Our report documents serious over-fishing of these species in national and international waters, and demonstrates a clear need for immediate action on a global scale."

Pelagic sharks are usually caught on the high seas in tuna or swordfish fisheries. In 2007, 21 shark-fishing nations reported catching more than 10,000 tonnes of shark. The top five – Indonesia, India, Taiwan, Spain and Mexico – accounted for 42%.

At one time, sharks were considered worthless bycatch, but they are increasingly being fished on purpose to serve emerging markets for their meat and fins, which are used in soups and can fetch more than £100 per kilogram. In places such as China, shark-fin soup could once only be afforded by the elite, but the growing numbers of middle-class people in the country has driven up demand.

To satisfy the growing market, some fishermen have taken to finning sharks. There are bans on this practice in operation around the world, but Fordham said the coverage is patchy and, in any case, enforcing the bans is difficult due to a lack of policing on the high seas.

"The overarching problem for sharks is that, for a variety of reasons, they've been considered low priority and they're traditionally low value compared with something like the tuna," said Fordham. "Also public image feeds into that – I don't know if there are people clamouring for their conservation."

Most species of pelagic shark take many years to mature and have relatively few young when they do reproduce. The IUCN's report highlights a study by scientists in Canada which showed that the population of porbeagle sharks, classified as vulnerable in the red list, has been so affected by fishing that it will take at least 100 years to recover. Yet the government still allows the animal to be fished in its waters.

The global dusky shark population, also classed as vulnerable by the IUCN, could take up to 400 years to recover because the animals are not sexually mature until around 20 years of age and usually raise only one offspring at a time.

Fordham said that because many of the sharks on the red list are at the top of the food chain, their extinction could also cause major local ecological problems. "We know that most of these species are top predators and we know that removing the top predators usually has negative consequences to the system as a whole."

In 2007, Julia Baum of the Scripps Institution of Oceanography in California, who is also a member of IUCN shark specialist group, published a study showing how a major decline in the numbers of predatory sharks in the north Atlantic after 2000 had allowed populations of cownose rays, which are their prey, to explode. The rays in turn decimated the populations of bay scallop off North Carolina. "There was a fishery for bay scallops in North Carolina that lasted over a century uninterrupted and it was closed down in 2004 because of cownose rays," she said last year.

Conserving threatened shark species might not be difficult. Last year, Peter Klimley of the University of California, Davis, found that scalloped hammerhead sharks migrate along fixed "superhighways" in the oceans, speeding between a series of "stepping stone" sites near coastal islands ranging from Mexico to Ecuador. Focusing marine reserves around these hotspots might be a cost-effective way to conserve the species.

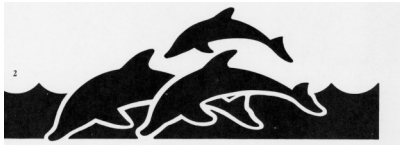
The IUCN sharks red list is published a few days before Spain is due to host an international meeting of the managers of tuna fisheries, where many of the sharks are caught. Scientists are also meeting in Denmark this week to produce advice for authorities on how to manage populations of Atlantic porbeagle sharks. "The completion of this global assessment of pelagic sharks and rays will provide an important baseline for monitoring the status of these keystone species in our oceans," said Roger

McManus, vice-president for marine programmes at Conservation International.

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

Date	#	Type of Animal(s)
7/29 p.m.	26	Humpback Whales
	700	Risso's Dolphins
	200	Northern Right Whale Dolphins
7/29 a.m.	48	Humpback Whales
	30	Risso's Dolphins
	5	Dall's Porpoise
7/28 p.m.	25	Humpback Whales
	700	Risso's Dolphins
	500	Northern Right Whale Dolphins
7/28 a.m.	30	Humpback Whales
	2000	Risso's Dolphins
	800	Northern Right Whale Dolphins
7/27	5	Humpback Whales
	10	Pacific White-sided Dolphins
	15	Risso's Dolphins
	20	Northern Right Whale Dolphins
7/26 p.m.	1	Humpback Whale
	120	Long-beaked Common Dolphins
7/26 a.m.	2	Humpback Whales
	175	Long-beaked Common Dolphins
7/25 p.m.	8	Humpback Whales
	300	Pacific White-sided Dolphins
	80	Northern Right Whale Dolphins
7/25 a.m.	22	Humpback Whales
	75	Pacific White-sided Dolphins
	200	Risso's Dolphins
	1000	Northern Right Whale Dolphins
7/24 p.m.	2	Humpback Whales
	60	Pacific White-sided Dolphins
	150	Risso's Dolphins
	120	Northern Right Whale Dolphins
7/24 a.m.	3	Humpback Whales
	2	Minke Whales
	400	Risso's Dolphins
	150	Northern Right Whale Dolphins
	2	Dall's Porpoise
7/23 p.m.	1	Humpback Whale
	1	Blue Whale
7/23 a.m.	1	Humpback Whale
	40	Pacific White-sided Dolphins
	120	Risso's Dolphins
	150	Northern Right Whale Dolphins
7/22	1	Humpback Whale
	35	Pacific White-sided Dolphins
	700	Risso's Dolphins
	600	Northern Right Whale Dolphins
7/21	4	Humpback Whales
	180	Pacific White-sided Dolphins
	350	Risso's Dolphins

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