

Soundings



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

March 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**

DATE: THURSDAY, MARCH 31, 2011

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

**Speaker: Dan Linehan, Writer, Photographer and World
Traveler**

Title: "Plastic Pollution and Solutions"

In the 1967 movie "The Graduate" there is an exchange between Mr. McGuire (Walter Brooke) and Benjamin (Dustin Hoffman) which was eerily predictive about our future: "I want to say one word to you. Just one word...Plastics...."

The inference was that it was a key to the future but like many views into the future the positive, profitable aspects were anticipated without consideration of the potential negative effects or responsible implementation.

Today, nearly a half a century later, the use of plastics has rapidly outpaced our ability to properly dispose of what are mostly one-time-use plastics such as water bottles, straws, and lighters. Plastics take hundreds of years to break apart and much, much longer to completely degrade. Off the California coast lurks the Great Pacific Garbage Patch, a mass of plastic debris twice the size of Texas. The seawater and marine life exposed to plastic pollution truly have no boundaries. Yet, there are many simple solutions that everyone can participate in to help stem the tide of this plastic pollution epidemic.

Our speaker, Dan Linehan, has worked under a NOAA Grant to investigate and report on the issue of plastic pollution. He has shared the fruits of his research with the Monterey Bay National Marine Sanctuary, other conservation oriented groups and has written articles which appeared in various publications including our own Monterey Coast Weekly.

Please come to our March Chapter Meeting to learn more about plastics and how they affect the environment, wildlife, and all of us.

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-Bob Mannix, Co-chair Programs

CALENDAR

April 9: Monterey Bay National Marine Sanctuary Symposium 2011. Ripple Effects: The Far Reaching Impacts of Local Ocean Research. CSUMB 9am-5pm

April 12-15: 31st Annual Symposium on Sea Turtle Biology and Conservation San Diego, CA. Symposium will be held at The Town and Country Resident Hotel and Convention Center.

April 17: Earth Day Whale Festival 2011. Celebrating Cetaceans and Community, Leo Carillo State Park 10am-4pm Cost is \$12.00

May 16-19: 62nd Tuna Conference. Lake Arrowhead, CA For Info Call 858-546-7100

ACS National Humpback Whale Fundraiser
May 21st (Sat.) 8am-4pm: Trip will take place on the Condor Express, Santa Barbara, CA. Cost for ACS members is \$88.00. This trip has the potential to observe a multitude of marine mammal species. For More Info Contact Cheryl McCormick at 310-548-6279

MLML Summer Marine Mammal Courses:

1-Techniques and Theories of Animal Training Bio 348. July (11-17) Tuition \$585.00

2-Working with Marine Mammals: Bio 347 (July 25-31). Tuition \$585.00

For more info about course details please contact Jenifer Zeligs, Ph.D Director of SLEWTHS at 831-771-4191 or go to slewths.mlml.calstate.edu

Nov 27-Dec 2: 19th Biennial Conference on the Biology of Marine Mammals. Tampa, Florida. More info will be forthcoming.

BOOK
RECOMMENDATIONS

Among Giants, A Life with Whales. Writing and Photography by Flip Nicklin.

Available through Whale Trust Hawaii 808-572-5701 or go to www.whaletrust.org

Human Impacts on Seals, Sea Lions, and Sea Otters. Integrating Archaeology and Ecology in the Northeast Pacific. 2011 UC Press. Written and Edited by Todd J. Brese and Torben C. Rick

Ornithological Monograph: Storm Petrels of the Eastern Pacific Ocean. 2011 UC Press By David Ainley and Larry B. Spears

FISH-EATING (RESIDENT) KILLER WHALES SIGHTED IN MONTEREY BAY ON FEB. 10, 2011

By Nancy Black, Marine Biologist and Owner of Monterey Bay Whale Watch.

(Monterey, CA. February 10, 2011)
Members of the endangered group of Resident Killer Whales were spotted by Monterey Bay Whale Watch, headed into Monterey Bay along the deep submarine canyon. The group consisted of "L Pod" a family group of 40 individuals, part of the population of Southern Residents consisting of J, K and L pods. These whales spend most of the year off the San Juan Islands in Washington State feeding on salmon in the inland waterways. These whales have been recently listed as endangered as their population has decreased most likely due to a reduction in their primary food source, Chinook salmon. Today's afternoon group of whale watchers were absolutely thrilled as our boat searched north along the canyon edge for gray whales, most common at this time, but instead our naturalist, Lori Beraha, spotted a distant splash, nearly 2 miles in the distance. It turned out our captain, Richard Ternullo, had navigated the boat right towards the Resident Killer whales, which were

seen the day before off San Francisco. Our friend and colleague, MJ Schramm who works for the Gulf of the Farallones National Marine Sanctuary, called us after she received a report about the whales off San Francisco and sent a photo, which confirmed they were the Southern Residents. We were hoping they might be headed our way and luckily were correct! Several passengers said it was a trip of a lifetime for them and they never imagined they would see so many killer whales! Nancy Black, marine biologist with Monterey Bay Whale Watch first sighted and identified the Residents in Monterey Bay during the winter of 2000 and these whales have been sighted at least once in Monterey Bay each winter since then. Nancy has been researching three different populations or types of Killer Whales in Monterey Bay for nearly 25 years. These three types of killer whales include: 1) "mammal hunters" or "Transients" that are found in small matrilineal (adult female with offspring) groups, feed only on marine mammals from seals to whales and are frequently sighted in Monterey Bay with a larger range along the west coast; 2) "fish hunters" or "Residents", specifically the endangered Southern Residents (J, K, and L pods) that feed only on fish and venture in outer waters as far south as Monterey Bay during winter, and occur in larger family groups up to 90 whales; and the least known 3) "Offshore Type", found in large dispersed groups (50+), composed of one population that ranges along the entire west coast, and feeds on fish, sharks, and squid. Ken Balcomb, director of the Center for Whale Research in Friday Harbor, Washington, a location where the Southern Residents occur nearly daily during summer months, has been a guest of Monterey Bay Whale Watch over the last several days in his hopes of spotting the Residents in Monterey Bay. Although Ken is known as the "father" of killer whales as he has



studied them longer than anyone and has followed this particular group of whales since 1976, resulting in the longest study of any whale population in the world, he has never seen them off our coast in winter. His house even sits in a prime location on the coast of Friday Harbor to spot the whales as they travel back and forth during summer feeding on salmon. When Ken first started his study, salmon were very abundant but have since drastically decreased in numbers, causing strong concern for the survival of the killer whales depending on them. Since Nancy first sighted these whales in 2000 in Monterey Bay and they were not seen previously, it appears that the whales expanded their range into new waters in search of their primary prey. Ken said after getting off our boat today, "Thanks Lori - for first spotting them, and, thanks L Pod for being perfectly on schedule. Wow! This is the first time I have seen the Southern Residents in California but I hope not the last. We must collect prey and fecal samples in the future encounters." Ken has tried for several years to sight these particular whales in the winter, as he needs to learn more about their winter feeding habits. Since these whales are endangered, it is of critical importance to study them year-round to determine if they are successfully finding prey, what type of prey they are catching and if that prey population is abundant enough to support the whale population. What is clear now is that Chinook Salmon numbers are drastically low everywhere along the west coast due to habitat destruction and water diversion and if the whales are to recover then strong measures need to be implemented to protect the salmon. Monterey Bay Whale Watch strongly supports researchers such as Ken and provides information to many researchers from information gathered on our whale watching trips to help in the effort to learn more about various populations of endangered whales.

Check the "Sightings" section on www.montereybaywhalewatch.com for daily

updates, as we will continue to monitor these whales and post our sightings.

WHY LEATHERBACK TURTLES LINGER IN SOUTH PACIFIC GYRE, AND WHY IT MATTERS TO STANFORD RESEARCHERS AND THE TURTLES

By Louis Bergeron

Leatherbacks. They are the Olympians of the turtle world – swimming farther, diving deeper and venturing into colder waters than any other marine turtle species. But for all their toughness, they have still suffered a 90 percent drop in their population in the eastern Pacific Ocean over the last 20-plus years, largely at the hands of humanity.

Now, new data from a 5-year-long project tagging and tracking the turtles are providing insights into their behavior, explaining why they congregate for months in what appeared to be one of the most nutrient-poor regions in the oceans, the South Pacific Gyre, and also helping researchers predict their movements on the high seas.

This new view of the lives of leatherbacks could offer a way to keep the turtles out of harm's way and give their numbers a chance to rebound.

"By taking the data we've gathered on their movements and integrating it with data on the surrounding oceanographic conditions, we've been able to identify what kind of habitats the leatherbacks prefer. This information is helping us develop models to predict where they might go and when they might show up there," said Stanford biologist George Shillinger, lead author of a paper to be published in *Marine Ecology Progress Series* and available online.

Until now, researchers didn't know why the leatherbacks that nest at Playa Grande in Costa Rica headed for the gyre and lingered for months. Satellite surface data suggested that this area spanning the Pacific Ocean between South America and New Zealand, from the low to mid-latitudes, appeared to be a virtual desert in the ocean, largely devoid of nutrients.

However, the presence of substantial tuna and swordfish fisheries within the region

suggested there must be ample forage of some sort available.

Because only limited data exist concerning the diversity, abundance and distribution of the leatherback's favorite prey – gelatinous zooplankton, such as jellyfish – within the South Pacific Gyre, no one knew whether the turtles had food down there or not.

Following the food supply

"Nobody is really out chasing jellyfish down," Shillinger said. "They are poorly studied organisms and there is very little data on them in the region of the gyre."

But the data that came back from the tagged turtles suggest there may be plenty of jellyfish on which to feast.

"We saw a distinct reduction in the swimming speed of the turtles as they entered the South Pacific Gyre," Shillinger said. "They were making more turns, diving more frequently and diving deeper. All those things suggest feeding behavior."

Another piece of evidence was the timing of the turtles' dives. Like many marine organisms, jellyfish appear to engage in daily vertical migrations, moving into shallower depths at night and returning to somewhat deeper depths during the day.

The turtles' dives mirrored those movements, with their nighttime dives averaging about 38 meters deep, while average daytime dives were around 65 meters.

"The deepest dives we had in the data set were in the daytime, including the longest one, which was over 900 meters," Shillinger said. "That dive was also one of the longest leatherback dives ever reported. It was about 84 minutes." The cause for these superlative dives remains a mystery, although seeking prey and avoiding predators are likely motivations.

"Understanding what sort of areas leatherbacks are likely to favor is a critical first step in protecting them in the open ocean," he said.

From 2004 to 2007, Shillinger and his colleagues tagged 46 female leatherbacks on the beach in Costa Rica with satellite tags that broadcast information on location, depth and

water temperature for an average of 245 days, with one tag transmitting for 562 days. "Altogether, it added up to 13,038 days of turtle tracking," Shillinger said.

One of the biggest hazards leatherbacks face on the high seas is longline fishing, a widely used approach for capturing commercially valuable species such as tuna and swordfish. The turtles also face fishing pressure from gill nets and longlines as they swim through coastal waters on their way out to the open ocean.

The problem, Shillinger said, is that areas that attract commercially desirable species also tend to be attractive to leatherbacks and other non-targeted species, known as by-catch.

"We are really going to have to link our research on turtles with a better understanding of where and how fishing is being done, things like how many hooks and nets are in the water and for how long," he said. "We also need to know more about the by-catch – which non-targeted species are being caught and in what numbers."

Having all that data would help Shillinger and his colleagues pinpoint the areas where fishing activity is most likely to coincide with turtle activity and determine what mitigation measures would be most effective.

Temporary closure of certain areas – breeding zones, migration routes and rich foraging habitats – when turtles are most likely to be concentrated there is one possible measure.

"We are not talking about closing the whole ocean. When the turtles have moved through, they can go back to fishing, in a lot of cases," Shillinger said.

Modification of fishing techniques, such as deploying hooks at the depths that are least likely to be occupied by turtles, could also help.

Shillinger emphasized that the timing of the turtles' presence, or the exact locations they inhabit, may well vary somewhat from year to year as ocean conditions vary, so mitigation

measures will have to adapt to changing conditions.

'No one is out to kill turtles'

"No one is out to kill turtles," Shillinger said. "We are looking for solutions that are less adversarial with fishermen and more productive for turtle conservation."

The information collected from turtles in the South Pacific Gyre is already helping Shillinger and his colleagues refine their modeling of the turtles' movements.

Overall, Shillinger said, the leatherbacks showed an affinity for areas with cooler sea surface temperatures and stronger upwellings of deep, cool, nutrient-rich water, which drives in an increased abundance of life, including prey.

Another striking piece of data involved some synchronized swimming on the part of the turtles, Shillinger said. When the turtles hit about 35 to 37 degrees latitude south of the equator, they would stop swimming south and fan out along a belt to the east and west.

"They would be strung out hundreds of miles apart along this boundary and then, in concert, swing northward, all at about the same time," Shillinger said. "They might be responding to some sort of cue that we're not aware of, we just don't

know. At this point, it is a mystery."

Although the temperature of the sea surface water decreases closer to the south pole, the leatherbacks can readily tolerate the colder water, so the researchers speculate that changes in the distribution of gelatinous zooplankton may have influenced the turtles not to go farther south. Or the turtles might just prefer to avoid the cooler waters, as it takes less energy to stay warm. The southern thermal bound occurred where the sea surface water temperature was about 14 to 15 degrees Celsius (57 to 59 degrees Fahrenheit).

"This information will help us refine our predictions regarding what sort of conditions attract leatherbacks, which is a challenge in the continually changing, highly dynamic conditions in the ocean," Shillinger said.



"Our hope is that these findings will further humanity's efforts to develop workable solutions for reducing our impacts and insuring the survival of this unique, enigmatic and critically endangered species."

Other Stanford-affiliated coauthors of the paper are Alan Swithenbank and Michael Castelton, both staff research technicians in the Block Lab at Hopkins Marine Station, and Barbara Block, professor of biology and a senior fellow at Stanford's Woods Institute for the Environment.

Shillinger is director of Marine Spatial Planning at the Center for Ocean Solutions, a partnership of Stanford University (through its Woods Institute for the Environment and Hopkins Marine Station), the Monterey Bay Aquarium and the Monterey Bay Aquarium Research Institute (MBARI). The Center for Ocean Solutions focuses on finding practical and enduring solutions to the greatest challenges facing the ocean.

At the time this research was conducted, Shillinger was a PhD candidate working at Stanford's Hopkins Marine Station in Barbara Block's laboratory.

Funding for this research was provided by the Tagging of Pacific Predators program of the Census of Marine Life, the Office of Naval Research, the UNESCO World Heritage Program, the Alfred P. Sloan Foundation, the Gordon and Betty Moore Foundation, the Packard Foundation, the Lenfest Ocean Program, the Cinco Hermanos Fund, Earthwatch Institute and NASA.

POPULATION STRUCTURE AND HABITAT USE OF FIN WHALES ALONG THE U.S. WEST COAST

BACKGROUND- Cascadia has collected opportunistic sighting data and photographs from fin whales along the U.S. west coast for as long as we have been studying other species in the region. Like closely related blue and humpback whales, fin whales were severely depleted by whaling throughout their range and remain on the Endangered Species list. However, unlike blues

and humpbacks, fin whales tend to range far from shore, do not appear to follow predictable migratory patterns, and individual whales are not as uniquely marked. Thus the techniques that have allowed us to monitor the recovery of other whale species in the region have not been employed with fins until recently. The need to better understand the population structure, dynamics, and habitat use of west coast fin whales has been underscored recently by their prevalence in vessel collisions throughout the region and their regular occurrence on naval training ranges.

In 2006, our marine mammal studies at SCORE (Southern California Offshore Range) brought consistent and focused effort to an offshore region where fin whales are sighted regularly, occasionally in large aggregations, and provided many more opportunities to collect sighting data, photographs, and biopsy samples from whales in this population. In 2008, we also began using the LIMPET tag, a small, medium-duration satellite transmitter, to track the movements of individuals within this population over periods of weeks and months. Analyses of these growing datasets are currently underway, with genetic studies being led by researchers at the Southwest Fisheries Science Center in La Jolla, CA.

PHOTO-IDENTIFICATION- The first results of photo-identification studies of west coast fin whales are available in a technical report to the NOAA-NMFS Southwest Region from January 2011. Cascadia's fin whale catalog now contains several hundred individuals, some with sighting histories spanning 15 years, and we have documented movements of at least one well-known fin whale, CRC-BP-3 (pictured below), between Southern California and the offshore waters of Washington state. The first photographs of this whale were contributed to us by Cornell University during a collaborative project off the coast of Southern California in 1995. We next photographed the whale at SCORE in 2006. The whale was sighted inshore near Los Angeles, CA on four separate days in 2009, where we satellite tagged it. Most recently the whale was sighted in May 2010 off Westport, WA- with the two small

scars where the tag was attached less than 6 months previously barely visible at the base of the dorsal fin. This whale has demonstrated that while challenging, photo-identification studies of fin whales are both feasible and productive, and compliment the results of other types of data collection (i.e. satellite telemetry and genetics).

SATELLITE TAGGING: As of February 2011, we have deployed 25 LIMPET tags on fin whales along the U.S. west coast. Preliminary results of some of these deployments are summarized in a technical report for the NMFS Southwest Fisheries Science Center. Detailed analyses of movement patterns, habitat use, and occurrence in areas of elevated risk are currently underway with these datasets.

FLEX MATCH: PHOTOGRAPHIC IDENTIFICATION MATCH OF A WESTERN GRAY WHALE TO CASCADIA'S CATALOG OF EASTERN NORTH PACIFIC GRAY WHALES

A photographic identification match was recently discovered by Cascadia biologists comparing identification photographs of the satellite tagged Western Gray Whale (named Flex) to Cascadia's catalog of identified gray whales from the eastern North Pacific. Western Gray Whales are considered one of the most endangered whale populations in the world numbering just over 100. Additional information on Western Gray Whales and results of this match and some of the background information on this animal including the satellite tag results are available at:

<http://www.iucn.org/wgwap/?7015/Western-gray-whale-makes-unexpected-journey>

http://cmsdata.iucn.org/downloads/movements_of_western_gray_whales_from_the_okhotsk_sea_to_the_eastern_north_pacific.pdf

This whale, a 14-year old male nicknamed "Flex" by researchers, was first photo-identified on the Sakhalin feeding ground as a calf in 1997 and has subsequently been observed in multiple years off Sakhalin during the summer feeding

season. As part of a broader effort to understand this whale's movements, photo-identification images of him collected by the Russia-U.S. joint research program on western gray whales were sent to Cascadia Research Collective (CRC) for comparison to a catalog of over 1000 eastern gray whales identified by CRC and its collaborators working in U.S. and Canadian waters from California to Alaska. This catalog focuses on several hundred gray whales (termed the "Pacific Coast Feeding Group") that feed during summer and fall in coastal waters between northern California and the Gulf of Alaska but also includes a small number of gray whales identified in the spring during their northward migration to the Bering and Chukchi Seas.

The photo comparison of Flex resulted in a confirmed match between Sakhalin Island and Vancouver Island. He was sighted April 2008 in the Barkley Sound area off the west side of Vancouver Island (photos by W. Szaniszlo) and then during the summer of 2008 off Sakhalin Island. This photographic match, in combination with the telemetry data, provides the first evidence that links the Sakhalin feeding ground of western gray whales to locations in the eastern North Pacific.

This whale was satellite tagged on 4 October 2010 by a team of scientists from Russia and the United States off the east coast of Sakhalin Island, Russia to document it's movement to an anticipated unknown breeding area in the western North Pacific. The information from satellite tags and photographic identification is providing new information on the movements and migrations of this population to the eastern North Pacific. Genetic and other data still suggests that some of the Western Gray Whales are also migrating to an unknown breeding area in the western North Pacific.

Contact: John Calambokidis, Cascadia Research, calambokidis@cascadiaresearch.org, Phone 360-943-7325 ext 104

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