

Ecosystem Survey of *Delphinus* Species



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ADDITIONAL PRD INFORMATION:

<http://swfsc.noaa.gov/prd.aspx>

ADDITIONAL CRUISE INFORMATION:

<http://swfsc.noaa.gov/prd-delphinus.aspx>

29 November 2009

Weekly Report No. 10: 22-28 November 2009

Jim Carretta, Cruise Leader

If you have never seen the equine sport of ‘cutting’, let me explain. A team of three cowboys on horseback, wearing big hats, approach a group of cattle and attempt to isolate (“cut”) one particular animal from the group, keep it separated from the herd, and then do this two more times. This is a timed event, with blue ribbons and bragging rights to the fastest team. It takes good horses, coordination, and a bit of luck to get three cows separated from the herd in the least amount of time. What does this have to do with whales and dolphins? Late afternoon on Nov. 23rd, we witnessed the marine mammal version of ‘cutting’, when we came upon a group of killer whales intent on cutting a single common dolphin from a large school. The killer whales’ goal was not to win a blue ribbon, but to obtain dinner. The killer whales did succeed in cutting a common dolphin from the school and more than one of us in the science party saw the dolphin get broadsided by a killer whale. The dolphin appeared to escape this initial contact and bounded away from the killer whales, completely separated from its own kind, with the killer whales in hot pursuit. We don’t know the final outcome of this encounter, as the sun was setting. See our photography summary for additional information on the sighting history of some of the individuals we encountered. Bizarre sighting of the week was a barely-alive neonate fin whale that we found south of Santa Rosa Island.

More information about individual projects, including summaries of data collected follow. Additional information about the project and past weekly reports can be found on our cruise website: <http://swfsc.noaa.gov/prd-delphinus.aspx>.





Female transient killer whale in pursuit of common dolphins, 23 November 2009. This female was one of several whales that isolated a single common dolphin just prior to sunset. Dolphins can be seen fleeing on either side of the killer whale. Notice how pointed the dorsal fin is on this ecotype. Compare it with the more rounded dorsal fin of the offshore ecotype in the next figure.



Adult female and calf 'offshore' ecotype killer whales seen on Thanksgiving Day. This large group of whales was scattered over at least a few miles. Over a two-hour period, one subgroup was seen 'escorting' a young fin whale, often within a few meters of the whale, without demonstrating any aggressive behavior toward the fin whale. The fin whale never showed any behavioral signs that it considered these killer whales a threat.



Photography Report – James Cotton, Suzanne Yin, Corey Sheredy and Sophie Webb

One of the main reasons for photographing dolphins and whales is because we can often use the images to identify individual animals. This technique, called photo-identification, allows us to remotely 'capture' and recognize a 'marked' individual. The animal may have a unique pattern of black and white on its flukes, as for humpback whales, or nicks out of the dorsal fin for many species of dolphins. These markings can be as individual as a human fingerprint. Through long-term studies using these images, researchers can determine association patterns, movements, and even get an idea about the age of the animal.

This week, we had 3 sightings of killer whales (for a total of four so far for leg 3. It's a bit unusual to see killer whales so frequently). Killer whales can be identified by the shape of the dorsal fin, nicks and notches in the fin and the shape and size of the saddle patch (the white patch behind the dorsal fin) along with using other markings such as scratches and scars.

Researchers currently recognize three eco-types of killer whales in the north Pacific: resident (fish-eating), transient (mammal-eating) and offshore (probably fish-eating). Behavioral, acoustic, genetic and physical differences separate the three types. Offshore killer whales are the least studied as they are rarely seen and photographed. Since 1993, they have only been seen about 50 times in California waters. We've seen them 3 times in 8 days!

Collaboration is a cornerstone of fieldwork. Having the *McArthur II* as our base of operations allows us to travel farther afield and for longer periods than many of our colleagues. We share our images with researchers studying humpbacks, killer whales, blue and fin whales. This week, our killer whale images were sent to Alisa Schulman-Janiger, Director of the California Killer

Whale Project, ACS/LA Gray Whale Census and Behavior Project. After looking at our images, Alisa determined that we had two sightings of the offshore type and one transient group.

Among the highlights of the image matching:

1) From our transient killer whale sighting this week: One adult female first seen in Monterey Bay in 1982. Also seen in Glacier Bay, Alaska (1989), Washington (1985) and last year in the Santa Barbara Channel (this whale is older than some members of our science party!)

2) Offshore sighting: An adult male first photographed off Point Conception, California in February 1993.

P.S. Update: the male killer whale, prominently displayed on page 1 of last week's weekly was identified by Alisa as an offshore type killer whale. First seen in 1993 in Southeast Alaska, this whale has previously been seen only a handful of times in California.



Northern right whale dolphins, harbingers of winter in southern California waters, are among the most bizarre and beautiful cetaceans in the world.

Thanks Alisa, for all your hard work. It is very much appreciated!

Seabird Report – Michael Force & Sophie Webb

The winter winds sweeping the flying bridge this week chilled us to the bone. Okay. It isn't winter. And maybe it wasn't that cold, but some mornings it sure felt like winter. Regardless, the seabird assemblage had a winter feel with our first Black-legged Kittiwake, a high latitude pelagic gull heading south for the winter from a nesting colony somewhere in coastal Alaska. Furthermore, our weekly species total (29) took a hit this week as the diversity changed little from day to day. Our lowest daily average of 15 species was reached for the third time this cruise. Northern Fulmar, Western and California Gulls, Brown Pelican, Pomarine Jaeger and Cassin's Auklet were seen almost daily, while a scattering of loons, cormorants, and alcids added some variety. A lost and very timid Western Meadowlark



spent a night on board providing a splash of yellow as it scurried for cover or flew off at the slightest movement. Less common species seen this week include Leach's and Ashy Storm-Petrels and a couple of Red-billed Tropicbirds.

Large diverse feeding flocks of Western and California Gulls mixed with other seabirds gorging on small fish, probably anchovies, were loci of activity. The rarest of the regularly occurring shearwaters we can expect to find, the Flesh-footed Shearwater, was often in these flocks, along with other shearwaters such as Pink-footed, Buller's, Black-vented and the winter-visiting Short-tailed Shearwater. A lone South Polar Skua was often present and Pomarine and Parasitic Jaegers always were. These "feeding frenzies" can contain upwards of 19 species of seabirds of multiple age classes, presenting an enumeration challenge as birds swirl and plunge for food.



Northern Fulmar.

Oceanographic and Mid-trophic Project Report – Candice Hall, Justin Garver, Corey Sheredy, Amanda Bowman, Jim Carretta and SST Lacey O'Neal

Two unusual events occurred this week, prompting us to dub this 'The *Dosidicus* Week'! The first took place on Wednesday night during our UCTD Yo-Yo cast session. During the 5th UCTD deployment, we noticed that the line was spooling out unusually. It appeared to us on the surface that a number of times during that deployment the probe appeared to stop sinking altogether! We brusquely brought the probe back to the surface to see if there was anything noticeable that could have caused the odd behaviour. Once the probe was within sight however, the reason was abundantly clear. Following

directly behind the probe were about 8 large *Dosidicus*! We pulled the UCTD out of the water and checked for any damage or noticeable marks, and sure enough, there was squid slime all over the probe and the tail. At that point we cancelled the UCTD Yo-Yo station and our squid jiggers took over. Unfortunately we only managed to hook 2 large Humboldt Squid, leading to numerous 'helpful' suggestions on where to attach hooks to our precious UCTD probe. . .



Bow-riding squid.

The following day sealed the weekly, if not the cruise, sighting for us in the Ecosystem team. While on an Orca sighting we noticed what we thought was an unusual looking red fish. As we sailed closer we realized that we were witnessing a first for us, a large Humboldt swimming at the surface during daylight hours. The squid turned towards the ship and did what can only be described as an attempt at bow riding. It is very rare to see these squid at the surface during the day and was quite interesting to witness. Luckily some great photographs were taken, which proves the sight was not just Channel Fever as the cruise slips into its final week.

Outreach and Education Report – Siri Hakala

You can check out our wiki at the following website: <http://www.sbsd.k12.ca.us/groups/noaa/>.
Username: noaaproject
Password: read

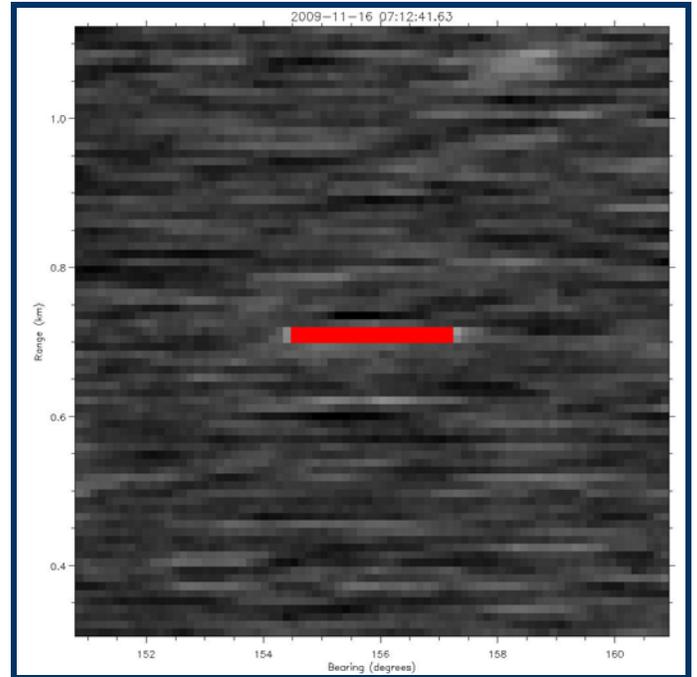
Radar Tracking of Marine Mammals – Adam Knudson and Jodie Morgan

This week has been an eventful one for the radar team as we have our first whale detection. We continue to collect data at a rapid pace, with about 1.5 TB collected so far. The data collected this week should prove very interesting as there were several days with multiple

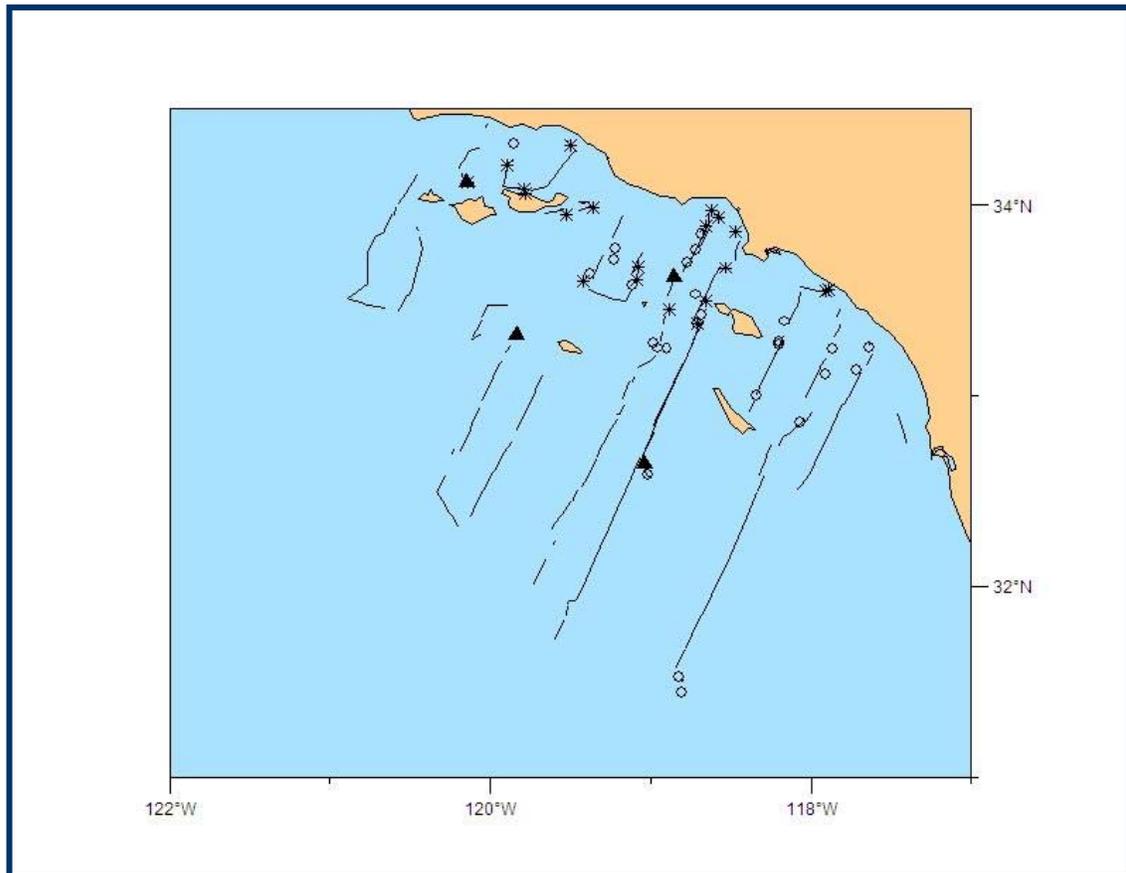


whale sightings covering a number of species. We have also had some success in improving our detection and tracking algorithms. Since the detector we use is very sensitive, it detects not only whales but also many other sources such as waves, birds, and interference from other radars. All of these detections are then fed into a tracker which attempts to identify detections that move like whales while throwing the rest out.

As we improve our understanding of the nature of the collected radar images, we further refine our detector and tracker algorithms. Through this iterative process and the comparison with the sighting records of the marine mammal observers, we were able to make our first positive whale detection of a passing humpback whale. As we collect more data and find more whales we will be able to use what we learn to fine-tune both the detector and the tracker leading to more and better whale detections.



Radar detection of humpback whale



Transect effort 12-28 November. ▲ = Killer whales; ○ = Short-beaked common dolphin; * = Long-beaked common dolphin.

Line-transect Survey Report: Juan Carlos Salinas, Jim Cotton, Rich Pagen, Richard Rowlett, Ernesto Vázquez & Suzanne Yin

Summary of Marine Mammal Effort

Date	Time	Position		On Effort Survey Miles (nm)	Average Beaufort
112209	1307	N33:33.31	W119:23.33	35.4	3.4
	1639	N33:44.78	W119:02.96		
112309	1509	N34:17.57	W120:04.52	41.8	2.0
	1631	N34:09.40	W120:10.60		
112409	1304	N33:41.49	W120:46.10	80.2	3.5
	1640	N34:09.22	W120:27.39		
112509	0645	N33:06.01	W119:40.53	78.2	3.0
	1640	N32:55.82	W120:04.30		
112609	0836	N33:13.64	W119:54.25	35.7	2.3
	1348	N33:20.19	W120:05.65		
112709	0651	N32:34.00	W118:59.82	55.8	4.8
	1548	N33:29.55	W118:40.57		
112809	No effort due to high wind and swell				

Summary of Marine Mammal Sightings

Species	Number of groups
<i>Delphinus</i> sp.	5
<i>Delphinus capensis</i>	9
<i>Delphinus delphis</i>	8
<i>Grampus griseus</i>	4
<i>Lagenorhynchus obliquidens</i>	3
<i>Lissodelphis borealis</i>	12
<i>Orcinus orca</i>	3
<i>Phocoenoides dalli</i>	1
<i>Physeter macrocephalus</i>	2
<i>Ziphius cavirostris</i>	1
<i>Balaenoptera</i> sp.	10
<i>Balaenoptera physalus</i>	15
<i>Balaenoptera musculus</i>	1
Unid. small delphinid	5
Total	79



Photographs Taken – James Cotton, Suzanne Yin, Corey Sheredy & Sophie Webb

Species	Common Name	No. of Sightings this week	No. of Photos this week	Total No. of Sightings	Total No. of Photos
<i>Stenella attenuata</i> (offshore)	Offshore pantropical spotted dolphin	0	0	10	211
<i>Stenella longirostris orientalis</i>	Eastern spinner dolphin	0	0	5	125
<i>Stenella coeruleoalba</i>	Striped dolphin	0	0	3	39
<i>Steno bredanensis</i>	Rough-toothed dolphin	0	0	1	2
<i>Delphinus capensis</i>	Long-beaked common dolphin	4	862	67	11,945
<i>Delphinus delphis</i>	Short-beaked common dolphin	7	1,464	40	7,721
<i>Delphinus</i> sp.	Unidentified common dolphin	0	0	1	179
<i>Tursiops truncatus</i>	Bottlenose dolphin, black porpoise	0	0	16	954
<i>Grampus griseus</i>	Risso's dolphin	1	2	9	112
<i>Lagenorhynchus obliquidens</i>	Pacific white-sided dolphin	2	28	15	315
<i>Lissodelphis borealis</i>	Northern right whale dolphin	4	133	4	133
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	0	0	8	859
<i>Orcinus orca</i>	Killer whale	3	1,405	4	1,677
<i>Balaenoptera edeni</i>	Bryde's whale	0	0	1	67
<i>Balaenoptera physalus</i>	Fin whale	1	24	3	478
<i>Balaenoptera musculus</i>	Blue whale	0	0	7	1,864
<i>Balaenoptera borealis/edeni</i>	Rorqual identified as a Sei or Bryde's whale	0	0	5	27
Total		22	3,918	199	26,708



Neonate fin whale sighted near the end of a sunny, calm day near the Channel Islands.



Biopsy Samples Collected – Juan Carlos Salinas, Ernesto Vázquez & Rich Pagen

Species	Common Name	Weekly No. of Samples	Weekly No of Takes	Total No. of Samples	Total No. of Takes
<i>Balaenoptera musculus</i>	Blue whale	0	0	4	4
<i>Balaenoptera physalus</i>	Fin whale	0	0	3	3
<i>Delphinus capensis</i>	Long-beaked common dolphin	24	27	641	973
<i>Delphinus delphis</i>	Short-beaked common dolphin	45	60	597	970
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	0	0	2	5
<i>Lagenorhynchus obliquidens</i>	Pacific white-sided dolphin	1	2	19	30
<i>Lissodelphis borealis</i>	Northern right whale dolphin	2	3	3	4
<i>Orcinus orca</i>	Killer whale	3	3	11	12
<i>Stenella attenuata</i>	Pantropical spotted dolphin	0	0	1	1
<i>Stenella coeruleoalba</i>	Striped dolphin	0	0	1	2
<i>Stenella longirostris</i> subsp.	Unidentified spinner dolphin	0	0	2	6
<i>Tursiops truncatus</i>	Bottlenose dolphin	0	0	58	84
Total		75	95	1,342	2,094

Oceanography Samples Collected and Stations Completed – Candice Hall, Justin Garver, Corey Sheredy, Amanda Bowman, Jim Carretta & SST Lacey O’Neal

Date	CTD	Surface Chlorophyll	HAB	UCTD (XBT)	Squid Stations	Bongo Tows	IKMT
11/22/09	2	6	4	3(2)	1	1	1
11/23/09 ^a	1	5	4	2(2)	1	1	1
11/24/09 ^a	1	6	4	5	1	1	1
11/25/09 ^{a,b}	1	6	4	9	1	1	1
11/26/09	2	5	3	3	1	1	1
11/27/09 ^{c,d}	2	5	4	5(1)	0	0	0
11/28/09	2	1	2	0	1	1	1
Week Total	11	34	25	27 (5)	6	6	6
Grand Total	74	380	262	332(83)	62	63	58

^a Too shallow for morning CTD or evening test CTD cast

^b UCTD YoYo cast

^c Squid station, bongo and IKMT cancelled due to rough weather

^d CTD / UCTD / XBT sensor comparison suite

