

2011 Humpback whale and Odontocete species survey along the Osa Peninsula, Costa Rica

Summary of research conducted by Cascadia Research as a part of an Oceanic Society Research Expedition with volunteers from Road Scholar

Expedition Dates:

21-28 January 2011

By

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INTRODUCTION

From December to April Costa Rica's coastal Pacific waters are recognized as calving and breeding areas for north pacific humpback whales (Calambokidis *et al.* 1996, 1998, Steiger *et al.* 1991, Rasmussen *et al.* 1995, Acevedo and Smultea 1995). In an effort to monitor the number of humpback whales using these waters and obtain photos of individuals, 1-2 week long small boat surveys have been conducted out of Drake Bay from 1996 to 2011 in late January and early February. This paper summarizes the effort and sightings of marine mammals from 22 to 30 January 2011 out of Drake Bay Costa Rica. This research was part of an ongoing effort by Cascadia Research as part of a program conducted in collaboration with Oceanic Society and Road Scholar (formerly Elderhostel) participants. Surveys were conducted on five days, with two boats in operation on all but one day to maximize survey coverage around Isla Cano, along the Osa Peninsula and north towards Uvita (Figure 1).

METHODS

Over the survey week (21-28 January 2011) there were a total of three days with two boats in operation and one weather day with only partial effort. An additional half day survey was conducted 30 January by A. Douglas in attempt to make up for some of the survey effort lost on the weather day. Survey effort generally began an hour after sunrise each day with both crews assembling and loading boats at 07:00 hours. Once on the water Road Scholar participants assisted with all duties of the research effort. Duties included scanning for whales, dolphins, turtles, bird flocks and drift logs, identifying species and estimating group size of animals encountered, recording data, reading the latitude and longitude off of a handheld Garmin 76

GPS, using project cameras for photo and species id, and using a hydrophone to detect whale song or dolphin vocalizations. Towards the end of the survey week some participants compared images of the flukes obtained over the preceding week to the existing Central America humpback whale catalog, and discovered two whales that matched the catalog! Following the survey the photos were processed and compared to the entire humpback catalog by interns at Cascadia Research.

Due to weather delays and reported whale densities the survey vessels spent more time in the “core study area” (between Drake Bay and Isla Cano) than most other years. Surveys extended north to Marino Ballena (Costa Rica’s first national marine park created in 1989), south as far as Rio Sirena, and into deeper waters offshore. Proposed tracklines were modified during the day in response to weather and reported sightings from other vessels.

The two primary research vessels *Paraiso III* and *Paraiso IV* are about 22 feet long and equipped with 80 and 40 hp Yamaha outboard engines. Both vessels had life jackets, ample room for passengers and dry items and proved to be stable platforms for approaching whales and dolphins. Both vessels were equipped with ladders for exiting the water after swim breaks, and with the help of our drivers everyone was able to safely get out and in of the vessel. There were two primary boat drivers from Drake Bay, Rafael and Edwin, with Memo filling in on a single day and Olivier Flores Marillo from Agujitas driving on the final day. Our group was highly appreciative of the boat driver’s skill at entering river mouths at low tide, their knowledge of the area, their care in driving around animals and for their enthusiasm even on the day of heavy rain. Both vessels had hydrophones and recorders which were used to locate whales and record humpback whale song. Communication between survey vessels on the water and with Drake Bay relied on cell phones.

RESEARCH RESULTS

Humpback whales

Over the survey period (23-30 January) there was a total of 960 km surveyed (518 nautical miles) over 58 hours (Table 1, Figure 1). In total there were 30 marine mammal encounters, with thirteen humpback whale sightings of 30 individuals. The humpback whale encounter rate for this period of effort was 5.1 whales per 10 hours searched. The break down of group types encountered were six mother/calf pairs, three mother/calf/escort groups, three singeltons and one competitive group (Figure 2). We obtained identification photos of one mother whale, ten adult whales and partial flukes from two calves. An initial comparison was made to the North Pacific humpback whale catalog for these whales and six matches were found (see appendix I for histories of whales that are in the historical catalog). There were nine encounters with mother calf pairs, after comparing photographs of dorsal fins (when flukes were unavailable), we found at least five different mother and calf pairs were encountered over the survey period. Mother whales and calves were found primarily in shallow water along the coast, with a single mother

calf pair encountered near Isla Cano and two mother calf pairs mid channel between the mainland and Isla Cano.

In addition to the humpback whales that were photographed by the research team at Drake Bay, there were an additional five fluke photos that were obtained by Ronald Monge Arias and Fred Barrentesa, operating north of Drake Bay over the same time period. These photos have been added to the collection of humpback whale flukes that were matched the catalog and three matches were made to the historical catalog.

Acoustic recordings were made when a single humpback whales was determined to be very close to the vessel by the volume and intensity of song heard through the hydrophone. Both boats made recordings of single whales on 23 January 2011 while waiting for the whales to surface. Frank's boat was able to make a one hour recording near Drake Bay and Annie's boat recorded a whale for five minutes near Marino Ballena.

Odontocetes and Other encounters

There were 18 sightings of 150 dolphins during the survey week with the average group size being 9.37. Spotted dolphins were the most commonly encountered (15 sightings), there were single sightings of rough-toothed dolphin, bottlenose dolphin and an unidentified dolphin. The dolphin encounters were localized in the area between Drake Bay, Isla Cano and San Pedrillo (Figure 3), however, our overall coverage was decreased from past years, and we received reports of high concentrations of dolphins in offshore waters. The high proportion of spotted dolphin sightings was expected, this species is generally encountered all along Central America. Rough-toothed dolphins are considered relatively uncommon throughout their tropical range (Leatherwood and Reeves 1983), and they are rarely documented by our surveys out of Drake Bay; the last documented encounter at Drake Bay was 26 January 2006. Both research boats got a chance to observe the rough-toothed dolphins which were aerially active, as well as tail slapping, and diving in synchrony (Figure 4). Bottlenose dolphins are generally encountered every year in low numbers, this year they were encountered along the southern side of Isla Cano. Olive ridley turtles were sighted most days on the water, but there were no sightings of yellow bellied sea snakes. False killer whales were not sighted during our survey, however they were sighted and photographed off Uvita and Drake Bay in December 2010.

CONCLUSIONS

Although we did not have the luxury of a two week field project at Drake Bay this year our timing seem to coincide with a greater number of humpback whale mother and calf pairs than have been observed in the past three years. The presence of singing males, mother and calf pairs as well as a single competitive group of humpback whales shows that this area continues to be an important calving and breeding area. Of the six whales that matched to the historical north

pacific humpback whale catalog, all had been encountered off Central America previously (Table 2, Appendix). The whale with the longest history was first sighted off California in 1989. We also documented a higher diversity in dolphin species than we encountered last year, with three different species observed.

Over the entire study area there was a remarkably high number of fish schools at the surface often accompanied by flocks of brown boobies and cruising frigate birds. We noted that sea surface temperatures on our trackline were lower than past years, however part of that difference could be due to the unseasonably heavy rains that increased the flow of fresh water into the coastal waters. The greater numbers of fish in the water did not translate to greater numbers of dolphins throughout the study area, but there was a high concentration of animals in the core study area as well as a relatively high diversity in encountered species.

We are thankful to the Road Scholar participants who not only made our research possible this year, but also made our time at Drake Bay so much fun! Data and photos collected over the survey period become part of Cascadia Research's long term database and photo id catalogs. Photos taken by participants of operations on the research boat, marine mammals and birds may be used in educational and scientific presentations over the years to come.

PARTICIPANTS

Expedition Dates 21-28 January

Group leaders: Annie Douglas and Frank Garita

Road Scholar participants: Claire Breihan, Jane Ford, Nancy Glenz, Al Hermann, Imogene (Jean) Kleinschmit, June and Richard Swartz, and O. R. Schmidt

Primary boat drivers: Edwin, Rafael, Memo

Corcovado guide: Manuel

Contributing photographers: Ronald Monge Arias, Fred Barrantes, Julia Erickson



Figure 1. Map of study area and tracklines from both research boats 23-30 January (red - A. Douglas boat, white - F. Garita's boat)

Table 1. Summary of vessel effort for cetaceans out of Drake Bay, Costa Rica. 26-31 January 2010 by Oceanic Society and Cascadia Research.

Date	Vessel	Start time	End time	Total search hrs	Tot # sight	# of Ind humpbacks	Other species enc.	Notes on effort
1/23/2011	<i>Paraiso 3</i>	7:17	15:25	8:08	5	4	Spotted dolphin	Isla Cano and south to La Llorona. 2 singers and 1 Mc pair. Acoust. Recording
1/23/2011	<i>Paraiso 4</i>	7:11	14:46	7:35	1	1	B.boobies, Frigate birds	North to Isla Ballena and found 1 singer and 1 adult whale. Acoust. Recording
1/24/2011	<i>Paraiso 3</i>	7:01	15:24	8:23	3	5	Rough-toothed dolphin	Around Island and mid channel. 1 McE and 1 Mc pair
1/24/2011	<i>Paraiso 4</i>	7:08	15:26	8:18	7	5	Spotted and Rough-toothed dolphin	south along coast past La Chancha, 1McE and one Mc pair
1/25/2011	<i>Paraiso 3</i>	7:16	08:30	1:14	1		Spotted dolphins	Corcovado day, opportunistic sighting effort
1/26/2011	<i>Sea Rod</i>	8:22	10:36	2:14	0	0		Heavy Rain, return to Drake Bay early
1/26/2011	<i>Paraiso 4</i>	8:17	8:33	0:16	0	0		Heavy Rain, return to Drake Bay early
1/26/2011	<i>Paraiso 4</i>	13:42	16:40	2:58	0	0		Survey south to San Pedrillo, heard one whale
1/27/2011	<i>Paraiso 3</i>	6:59	13:03	6:04	2	4	Manta ray, dead turtle	Survey between Isla Cano and mainland. 2 Mc pairs north of Isla
1/27/2011	<i>Paraiso 4</i>	7:04	14:12	7:08	5	0	Spotted and Bottlenose dolphin	Survey south to Sirena and offshore around island
1/30/2011	<i>LaGata</i>	7:14	13:04	5:50	7	11	Spotted dolphin	Survey south to La Llorona and around Isla Cano. 1 Mc, 1 Comp grp, 1 McE
				58:08	31	30		

Key: McE= humpback mother and calf with escort; Mc = mother and calf pair; Comp grp = competitive group



Figure 2. Humpback whale sightings 23-30 January 2011. Δ = Comp grp, \square = Single whale, \circ = mother calf pair.



Figure 3. Dolphin encounters from 23-30 January 2011. □ = Spotted dolphins, ○ = Bottlenose dolphin, □ = Rough-toothed dolphin



Figure 4. Rough-toothed dolphin. 24 January 2011. Drake Bay. Photo by F. Garita

Table 2. Sighting histories of six humpback whales identified off Southern Costa Rica 22-30 January 2011 which matched our catalog. An additional five adults and two partial calf IDs have not matched to our catalog.

ID	Date seen 2011	Behav. role	Prev. Years Cent. America	Prev. Years California
10306	22 Jan	Adult	1999, 2008	1989, 1992, 1993, 1995, 1996, 1998, 1999, 2002, 2003, 2009
10411	30 Jan	Adult, comp grp	2002	1990, 1991, 1992, 1993, 1994, 1995, 1996, 1998, 2001, 2006
10725	30 Jan	Adult, comp grp	2002	1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2003, 2004, 2006
10983	24 Jan	Escort	2006	1995, 1996, 2000, 2004, 2005, 2006, 2009
10993	27 Jan	Mother	1998	None
12409	25 Jan	Adult	2008	None

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APPENDIX Humpback whale Identification photographs

And Selected histories



Whale # 10306, Adult. Encountered 22 January 2011. Photo by F. Barrantes



Whale # 10725, Adult in comp grp. Encountered 30 January 2011. Photo by A. Douglas



Whale # 10411, Adult in comp grp. Encountered 30 January 2011. Photo by J. Erickson



Whale # 10983, Escort. Encountered 24 January 2011. Photo by F. Garita



Whale # 10993, mother with calf. Encountered 27 January 2011.
Photo by F. Garita



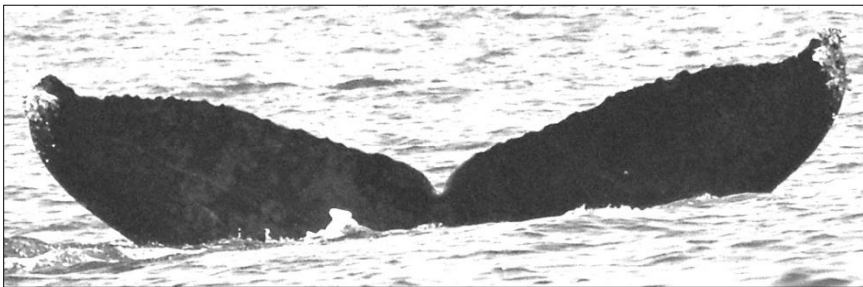
No match to catalog, Mn4, adult in comp grp. Whale sighted 30 January.
Photo by A. Douglas



Whale # 12409. Encountered 25 January 2011. Photo by Ronald Monge Arias



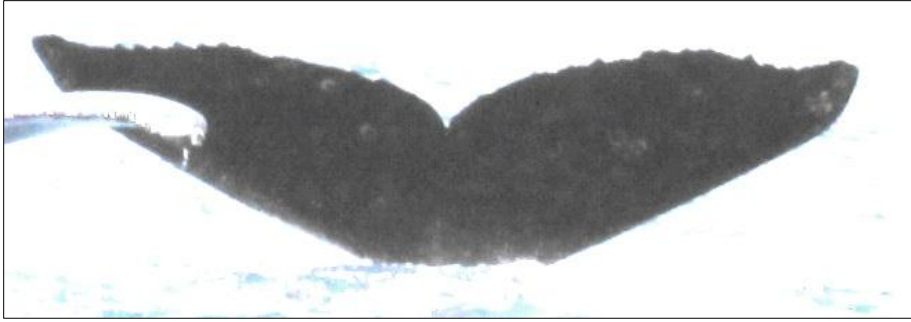
No match to catalog, Mn6, adult in comp grp. Whale sighted 30 January.
Photo by A. Douglas



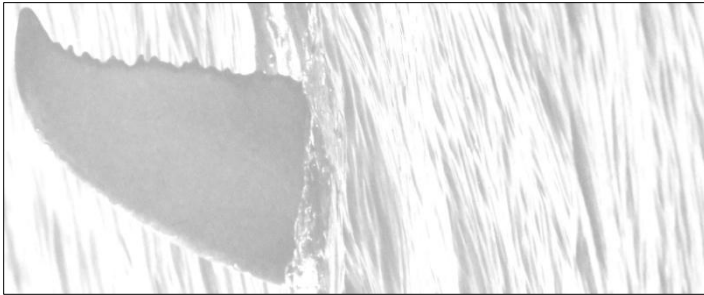
No match to catalog, Mn3. Whale sighted 25 January 2011. Photo by Ronald Monge Arias.



No match to catalog, Mn7, adult in comp grp. Whale sighted 30 January.
Photo by A. Douglas



No match to catalog, Mn9. Whale sighted 30 January. Comp. Grp. Photo by A. Douglas



No match to catalog, Mn1, Calf. Sighted 30 January. Photo by A. Douglas



No match to catalog, Mn5, Calf. Whale sighted 24 January. Mother and calf pair. Photo by A. Douglas

Humpback whale sighting histories

Whale # **10306** was encountered on 22 January off of Drake Bay, the photographer Fred Barrantes kindly shared his photo with us. This whale was first identified off Central California in the Gulf of Farallones September 1989. Since that first encounter this whale has been identified 33 times off Central and Southern California, with the most recent encounter in the Santa Barbara Channel July 2009. In Central America 10306 has been photographed off Northern Costa Rica in 1999, and off Nicaragua by Frank Garita in 2008. During the 2008 encounter 10306 was identified as the escort to a mother and calf pair.

Whale # **10411** was observed on 30 January in a competitive group of six whales traveling towards Isla Cano. 10411 was first encountered November 1990 in the Gulf of Farallones off San Francisco, this is an area that this whale has continued to be resighted over the years. The most recent California sighting occurred off Eureka, California, when this whale was observed paired with another whale feeding. 10411 has been encountered in Central America in 2002, with a few sightings off Drake Bay and another the same year in Bahia Honda Panama.

Whale # **10725** was encountered on 30 January in a competitive group of 6 whales with # 10411 (history above). This whale has been encountered 37 times off Northern Central California with the first sighting in August 1992 and the most recent 2006. Almost all encounters have been in Monterey Bay, where this whale seems to spend its summer. Our sighting of # 10725 was only the second time that this whale has been encountered off Central America, the first time occurred off Northern Costa Rica March 2002 when this whale was observed slow traveling by itself.

Whale # **10983** was encountered on 24 January by Frank's boat between the mainland and Isla Cano. Once the second research boat was called over, both crews observed whale # 10983 escorting a cow with her small calf. The calf surfaced close to a tourist boat on one of the surface series. Whale # 10983 was first identified June 1995 in Monterey Bay. This whale has been encountered 13 times off California with the most recent sighting in the Santa Barbara Channel September 2009. The only previous sighting of this whale off Central America was February 2006 when this whale was recorded singing off northern Costa Rica.

Whale # **10993** and her calf were encountered on 27 January by Frank's boat. The mother and calf were noted to be "milling", and the mother was fluking regularly. # 10993 has never been identified off the US west coast, and the only earlier sighting of her was from February 1998 when John Calambokidis encountered her and another adult whale 32 km west of Uvita.

Whale # 12409 was encountered 25 January by Ronald Monge Arias while he was guiding a whale watch tour off Uvita, north of Drake Bay. Whale # 12409 has never been photographed off the US west coast. The only earlier record of this whale was a sighting off Drake Bay January 2008 by an Oceanic Society/Elder Hostel group.