

**Summary of 2010 Humpback whale research along the Osa Peninsula, Costa Rica**  
Oceanic Society Research Expeditions, Exploritas and Cascadia Research Collective

Expedition Dates:

Week one (26-31 January)

Week two (1-7 February)

By

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## **INTRODUCTION**

From 26 January to 7 February 2010, research was conducted focused on humpback whales based in Drakes Bay Costa Rica. This research was part of an ongoing effort by Cascadia Research as part of a program conducted in collaboration with the Oceanic Society and with participants from Exploritas. Daily surveys were conducted of the waters based from Drakes Bay with search effort extending north to Isla Ballena and Uvita, and south to the mouth of Golfo Dulce (Figures 1 and 2).

## **METHODS**

Over the two weeks of survey effort (26 January to 7 February 2010) there was a total of eight days with two boats in operation, and opportunistic survey effort on two additional days coincidental with the tour boats carrying passengers to and from Corcovado National Park. Survey effort generally began about an hour after sunrise to take advantage of the early portion of the day that generally had less wind than the afternoons. While on the boats the volunteer 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 sizes of animals encountered, recording data, using the GPS to read the vessels positioning, using project cameras for photo and species id, and using the hydrophone to detect whale song or dolphin vocalizations. Over the first week the participants were able to assist with recording whale song and using the directional hydrophone to find whales. Towards the end of each survey week the participants compared images of the flukes obtained in the field to the existing Central America humpback catalog, and were able to discover the identity of the whales encountered this year.

All proposed survey area was covered with effort concentrated along the coast immediately north and south of Drakes Bay, and in the “core area” (between Drakes Bay and Isla Del Caño). Surveys extended north to Marino Ballena (Costa Rica’s first national marine park created in 1989), south to the mouth of Golfo Dulce, and into deeper waters offshore of Corcovado as well as west of Isla Del Caño.

Three different vessels were used for these surveys, *Paraiso III*, *Paraiso IV* and *Raphael*. Over the first week the starter assembly was replaced on one of the boats, and by the time the second group got on the water all boats were in good working order. All vessels had life jackets available, ample room for passengers and dry items, as well provided a stable platform for the research. We had four primary boat drivers with Tico, Raphael and Edwin, and Daniel filled on a Corcovado tour days. Both groups were highly appreciative of the boat drivers, especially for their knowledge of the area, their care in driving around whales and for getting everyone in and out of the boats for swim breaks. Both vessels had fully functional directional hydrophones and recording devices. Communication on the water relied on cell phones and handheld radios and worked most of the time.

## RESEARCH RESULTS

### Humpback whales

#### *Week one*

Over the four survey days of two vessel effort there was a total of 1,240 km (669 nautical miles) covered over 64 hours (Table 1, Figure 1). In total there were there were 28 marine mammal sightings with 27 humpbacks whales encountered. The humpback whale encounter rate for this week of effort was 0.42 whales/ search hour. We obtained identification photos of nine adult whales and a partial fluke photo of the small calf. An initial comparison was made to the Central America humpback catalog, and four whales were identified out of the nine adults. The remaining ID photos were taken through the the North Pacific humpback whale catalog by interns at Cascadia and one additional match was found.

#### *Week two*

Over the four survey days of two vessel effort there was a total of 1,119 km (604 nm) covered over 61 hours (Table 2, Figure 2). In total there were 29 marine mammal sightings with 29 humpback whales encountered. The humpback whale encounter rate for this week of effort was 0.47 whales/ hour, however more animals were likely in the area and not sighted since we had two whales that we heard using the hydrophone, but never found. We obtained fluke ID photos of six adult humpback whales and a partial fluke photo of the small calf. ID photos were compared to the Central America humpback catalog, and three of the six adults were found in the catalog, including the mother of the small calf and one of her various escorts. The remaining ID photos were taken through the the North Pacific humpback whale catalog by interns at Cascadia and two additional matches were made. A high rate of returning whales is expected off Drakes Bay, since much of our winter research has been focussed in these waters, and we have seen a high return rate in the past.

#### *Overall humpback whale observations and fate of the small calf*

We identified thirteen individual humpback whales this season, eight whales matched the historical catalog (Table 3). We observed all behaviors that indicate that this area continues to be used by humpback whales primarily as a breeding and calving area. Competitive groups were encountered over both weeks, and at least two cow/calf pairs were encountered as well as escorts and singing whales. At least four whales were heard singing over the first week of research and two in the second week. Additionally, there was a behavior that we had not seen before in this

area and we were unsure how to categorize. The escort of the small calf and female seemed to be showing aggressive behavior targeted at the calf. Although aggressive behavior is common between escorts, and occasionally a calf will get separated or jostled by escorts in pursuit of a female, we had not seen a male direct its approaches at a calf before. Over both survey weeks the large male escort with the white scar on the trailing edge of his dorsal fin was seen swimming towards the small calf in a seemingly aggressive manner. The male's approach toward the calf was interrupted by the female who surfaced between the two whales. These approaches on the calf coupled with its apparently weakened state, led to much speculation as to the escorts' intentions and the calf's chances.

Unfortunately, we now believe that the small calf that was observed by both groups likely died shortly after our trips based on the sighting of the mom without the calf on our last day on the water and the report of a small calf washing up dead on the rocks near La Llorana (see Figure 3) around the 7<sup>th</sup> of February (the exact date is still not clear and the animal was in a difficult to access location). We still hope to be able to confirm the identity of this calf if we can obtain some photographs to compare to ones that we took over this season. The small calf/mother/Escort trio were first observed by John's boat on 30 January mid channel between the mainland and the south side of Isla Del Caño. On 31 January the three whales were seen again about 8 km (4.3 nm) north of the first sighting. During the second encounter with the calf, John and his group noted that the calf was "swimming very slowly and at an unusual orientation .... calf often by mom's head". Similar observations were made during the second week when the small calf was seen 2, 3 and 4 February close to the mainland between San Josecito and Drakes Bay. Observers noted that the calf was resting on its mother's rostrum often and that it had a large white patch on its rostrum, also the tubercles were white tipped. We last saw/photographed the small calf on February 5<sup>th</sup> in the presence of its mother and three escorts. On 6 February we sighted and photographed the mother whale 41 km (22 nm) north of Drakes Bay at Isla Ballena where both Frank and Annie's boats followed a group of five whales as they traveled north. Over the three hours of observing the large group the small calf was not seen or photographed, it seems very likely that it was not in the group of fast traveling whales.

The calf's death is a sad conclusion to this whale's story, however, if we are able to confirm that this is the same calf, we at least know whether it survived. There will also be a possibility of resighting the mother (and if not dead, the calf) in our research this season off California. The fact that so much of these whales' lives are spent out of our view is one of the most challenging aspects of whale research. For every glimpse of their lives we are handed more questions that we can only answer with patient observation. In this most recent event, with the report of the dead calf at Playa Llorona we may have enough of these whale's histories to be able to ask or at least speculate about interactions between escorts, females and their calves. Did we witness the male attempting to injure the calf so that the female could mate again? Was the calf already sick/dying before the harassment by the escort? Infanticide has not been documented among humpback whales as it has with land (lions, chacma baboons, eastern gray squirrels etc) and marine (bottlenose (Patterson et al 1998) and tucuxi dolphins) mammals. However, calves have been observed to be separated from mothers when multiple escorts are following a female, and this likely leads to added stress on the calf until its mother reappears. Last summer Frank Garita, working with the southern hemisphere whales off Drakes Bay, photographed an escort tail-slapping a calf. Could this be an indication of an imbalance of available females to males in these

waters or some other population stress? Maybe this is normal for a population on the recovery? We don't know.

### Odontocetes and Other encounters

Spotted dolphins were encountered in all survey areas, with a total of twelve groups encountered in the first week and nineteen the second week. Only three groups of bottlenose dolphins were encountered over the two weeks of survey. Photographs were taken of dolphins that approached the survey vessel for documentation of individuals, injuries, prey species and behavior. Healed injuries were observed on the lateral sides of a few individual bottlenose dolphins and there were some injuries (see Appendix) on the dorsal fins of a few of the spotted dolphins. One photograph of feeding spotted dolphin captured the prey fish species flying through the air. Odontocete diversity was lower in the Drakes Bay area than past years, species that are generally expected like false killer whales were not sighted or even reported over the survey period (last sighting in Drakes Bay October 2009). Olive ridley turtles were spotted most survey days, but numbers were much lower than last year. Yellow bellied sea snakes were not seen last year, but were seen every few days this year.

## CONCLUSIONS

We are thankful to the Exploritas and Oceanic Society participants who worked with us this year. Data and photos collected during these trips become part of Cascadia's long term database and id catalogs. We may also use photos taken on these trips for education and scientific presentations. Over that entire two week period we covered 2,359 kms (1,273 nm) of trackline and had 57 sightings of marine mammals. We noted that water temperatures were higher than past years, and species diversity was lower than usual, with only three species encountered, however, the number of humpback whales encountered was double from last year. There were more competitive groups seen in this area than past, as well as more singing whales heard. And finally, we had two cow/calf pairs, the small calf and mother were seen both weeks, and the medium size calf and mother were seen the second week. The most recent reports from Drakes Bay and the Quepos is that the number of humpback whales has continued to be high, and even increased since our trip two weeks ago. A few additional photos of whales taken in the last week have made their way up to our office, and we look forward to seeing which whales are still using the area.

## PARTICIPANTS

### Expedition Dates 26-31 January

**Group leaders:** John Calambokidis and Frank Garita

**Oceanic Society Participants:** Roger Coit, William Gamble, Kathleen Luczynski, Beth can Opdorp, Carlen Pinskey, Alima Sherman, Arnold and Jeffrey Silverman, Kathryn and Martin Urberg

**Primary boat drivers:** Arnolando Samudio Quintero (Tico), Edwin, Rafael

### Expedition Dates 1-7 February

**Group leaders:** Annie Douglas and Frank Garita

**Oceanic Society Participants:** Anne Douglas, Joanna Hollis, Diana Lynch, Ruth Merchant, Coral Pitkin, Holly Rogers, Louise Scott

**Primary boat drivers:** Edwin, Rafael

Table 1. Summary of vessel effort for cetaceans out of Drakes 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
1/27/2010	Rafael	7:25	13:34	6:09	3	5		Survey south along coast and out to Isla Cano. Pair and comp grp.
1/27/2010	JAC	7:04	15:35	8:31	5	5	Spotted dolphins	Survey north to Marino Ballena. Competative group. Singer
1/28/2010	Frank	7:21	14:24	7:03	3		Spotted dolphins	Survey south along coast past La Chancha rock.
1/28/2010	Tico	7:58	16:26	8:28	2	1	Olive ridley	Survey south along coast past La Chancha rock. Singer.
1/29/2010	JAC	7:30	15:52	8:22	2	1	Spotted dolphins	Survey north to Isla Ballena. Singer.
1/29/2010	Rafael	7:43	16:42	8:59	3	1	Unid dolphin	Survey around Island and north to Isla Violin. Singer
1/30/2010	Rafa			0:00	3	5	Spotted dolphins	Corcovado NP day, whales encountered enroute
1/31/2010	Tico	7:14	16:06	8:52	3	6	Spotted dolphins	Survey offshore of Isla Cano. Small calf swam near/under boat
1/31/2010	Paraiso	7:21	14:57	7:36	4	3	Spotted dolphins	Survey south and around Isla Cano. Cow/calf/Escort.
				64:00:00	28	27		



Figure 1. Map of survey effort for 27-31 January (red – JAC boat, white- FDG boat) with all humpback whale encounters for the same time period.  $\Delta$ =competitive group,  $\odot$  = small calf/cow pair,  $\square$  = pair,  $\bullet$ = singer.

Table 2. Summary of vessel effort for cetaceans out of Drakes Bay, Costa Rica. 2-6 February 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
2/2/2010	<i>Paraiso 4</i>	7:22	13:20	5:58	0	0	Olive Ridley	Travel north to Isla Ballena- Humpback whale song heard
2/2/2010	<i>Raphael</i>	7:15	15:04	7:49	5	5	Spotted dolphin	Survey to Mirencó mother + calf w/ escort. Isla Cano spotted dolphins + cow/calf pair breaching
2/3/2010	<i>Paraiso 4</i>	7:18	15:54	8:36	7	3	Bottlenose dolphin, spotted dolphins	Survey south to Chancha, return offshore in mid-deep water depth, cow, calf and escort
2/3/2010	<i>Raphael</i>	7:23	14:56	7:33	3	2	Spotted dolphin	Surveyed around Isla Cano and south. Found cow + med size calf inside of Chancha rock
2/4/2010	<i>Paraiso 3</i>	6:49	16:39	9:50	6	2	Bottlenose dolphin, spotted dolphins	Survey south to Golfo Dulce- singer. Cow + small calf seen enroute- no escort.
2/4/2010	<i>Paraiso 4</i>	7:10	13:41	6:31	5	2	Spotted dolphin	Survey along coast and lunch stop at San Josecito. Cow + small calf - no escort.
2/5/2010					1	5		Corcovado day and San Josecito snorkle
2/6/2010	<i>Paraiso 4</i>	7:17	15:44	8:27	2	5	Spotted dolphin	Survey between Isla Cano and coast to Isla Ballena-5 whales
2/6/2010	<i>Raphael</i>	7:24	13:33	6:09		5		Survey south past La Llorona then up to Isla Ballena- 5 whales
				60:53:00	29	29		

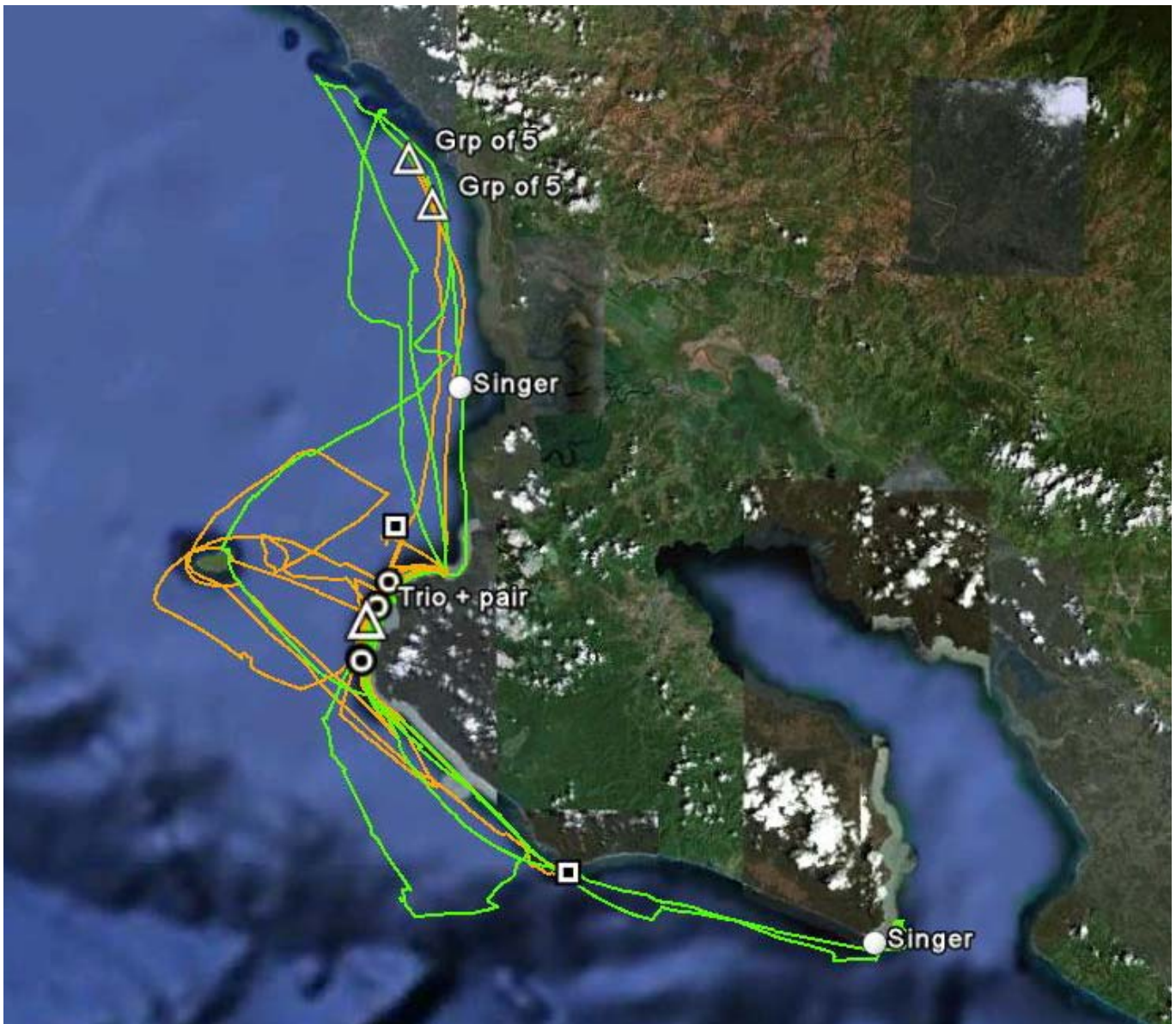


Figure 2. Map of survey effort (green ABD boat, yellow FDG boat) for 1-6 February with all humpback whale encounters for the same time period.  $\triangle$  = competitive group,  $\odot$  = small calf/cow pair,  $\square$  = med size calf/cow,  $\circ$  = singer.



Figure 3. Map of sightings of small calf 26 January-5 February 2010. A dead small calf was discovered on the rocks near La Llorona, approximate date 7 February 2010. Photos of dead calf have not been compared to whales sighted over the two survey weeks.

Table 3. Sighting histories of humpback whales identified off Southern Costa Rica 27 Jan-6 Feb 2010.

ID	Date seen 2010	Behav. role	Prev. Years Cent. America	Prev. Years California
9042	6-Feb	Esc, comp	2001, 2005	1988, 1995, 1997, 2000
10411	27-Jan	Esc, quartet	2002	1990-1996, 1998, 2001, 2006
10534	30-31 Jan, 2-3 Feb	Esc of Cow w/ sm calf	2005	1991, 1992, 1995, 1998, 1999, 2002-2004
10547	30-31 Jan, 2-6 Feb	Cow of sm calf	2001*, 2005*, 2003*	1991, 1993, 1997, 1998, 2001
Sm calf	20-31 Jan, 2-5 Feb	Calf of 10547	-	
10629	5-Feb	Esc, comp grp	-	1992, 1993, 1995, 1998, 2002-2005, 2008
10657	6-Feb	Adult Female	2004	1992, 1995, 1996, 1998, 2003, 2007
11141	30-Jan	Single	2000, 2005	1997, 1999, 2001, 2002, 2007
11883	27-Jan	Esc 2, comp grp	-	2004, 2007
Med size calf	2-3 Feb	Med size calf	-	No Id
Cow w/ Med calf	2-3 Feb	Cow w/ Med calf	unk	No Id

\*with calf

## REFERENCES

Patterson, I. A. P., R. J. Reid, B. Wilson, K. Grellier, H. M. Ross, and P. M. Thompson. 1998. Evidence for infanticide in bottlenose dolphins: An explanation for violent interactions with harbour porpoises? *Proceedings of the Royal Society of London, Biological Sciences* 265 1167-1170.

APPENDIX Humpback whale Identification photographs, Example of Healed Injury on a Bottlenose Dolphin, And Sighting Histories of identified whales



06 Feb 2010. CRC ID 9042. Adult in group of five whales traveling north near Isla Ballena. Photo by Annie Douglas



06 Feb 2010. CRC ID 10629, escort following female (ID 10547) on 5 and 6 Feb. Photo by Annie Douglas



27 Jan. 2010. CRC ID 10411. Escort in competitive group. Photo by John Calambokidis.



06 Feb 2010. CRC ID 10657. Adult in group of five whales traveling north near Isla Ballena. Photo by Annie Douglas



02 Feb 2010. CRC ID 10534. Escort seen with small calf and female on 30 Jan and 2,3 Feb. Photo by Frank Garita



03 Feb 2010. No CRC ID. Small calf of ID 10547. Photo by Annie Douglas



05 Feb 2010. CRC ID 10547. Female with small calf and Escort (s). Photo by Annie Douglas



30 Jan 2010. CRC ID 11141. Single whale. Photo by John Calambokidis



27 Jan. 2010. CRC ID 11883 an escort in competitive group. Photo by Frank Garita.



28 Jan 2010. Singer. Photo by John Calambokidis



27 Jan. 2010. Unid escort in competitive group. Photo by Frank Garita



27 Jan 2010. Unid. escort in competitive group. Photo by John Calambokidis



27 Jan 2010. Unid adult in competitive group. Photo by John Calambokidis



05 Feb 2010. Unid.escort following female with small calf. Photo by Annie Douglas



3 Feb 2010. Adult bottlenose dolphin with healed injury above eye. Photo by Annie Douglas

### *Humpback whale sighting histories*

The female humpback with a small calf observed on six days is ID **10547**. She was first sighted off Central California 1991, and has been seen in the Gulf of Farallones in 1993, Monterey Bay 1997 and Half Moon Bay in 1998 and 2001. She has not been encountered off of California since 2001, however, sightings of her with a dependent calf have occurred off Southern Costa Rica in 2001, 2005 and 2010, and in 2003 off Nicaragua. In 2010 this whale was sighted numerous days in the company of her small calf which she supported on her rostrum at times.

The escort to the cow and small calf is whale was **ID 10534**. He was first sighted off Southern Central California November 1991, since then he has been sighted in the Santa Barbara Channel in 1992, 1995, 1998, 2002-03, and 2004. Some years he was encountered in multiple places over the summer, with sightings occurring off Monterey Bay (2004) and in the Gulf of Farallones (1998-99). The last historical sighting of this whale occurred off Las Lisas, Guatemala, where he was seen in the company of another whale in March 2005.

The single adult with the severely damaged fluke that was sighted only the first week is whale **ID 11141**. This whale has been seen in Monterey Bay in 1997, 1999 and 2001. In February 2000 and December 2005 this whale was seen off Costa Rica. Despite this whale's injury it is undertaking a round trip migration of at least 8,000 km (4,320 nm)!

On 5 February (Corcovado Day) **ID 10629** was sighted off San Josecito in the company of at least 4 other whales including the mother of the small calf. 10629 was first sighted in the Gulf of Farallones off San Francisco in the fall of 1992, however this year was the first time that he was identified off off Central America. 10629 is known to be a male from a biopsy sample that was taken in Morro Bay California in July 2005. 10629 has been seen off California from the Santa Barbara Channel to the Gulf of Farallones 1992, 1993, 1995, 1998, 2002, 2003, 2004, 2005 and most recently in Port San Luis Southern California August 2008.

Another whale sighted off Central America for the first time this year was **ID 11883**. This escort was encountered and photographed by the participants in Frank's boat on 27 January. This whale has been encountered in the company of a cow and calf pair in the Santa Barbara Channel June 2007, but at the time it was not called an escort

by the observers. It has only been seen once before along the US west coast, and that was in Monterey Bay August 2004. This whale has an all dark fluke with scratches on both halves of the fluke.

**ID 10657** was encountered with four other whales traveling north near Isla Ballena on 6 February. A biopsy sample taken in 2004 revealed that this whale is a female, however despite an extensive history on her starting in 1992 we have not seen her with a calf yet. This year was the second time that 10657 has been sighted near Bahia Drake, in the previous sighting she was observed traveling slowly alone. Off California where she has been seen from Crescent City to the Santa Barbara Channel she has been seen in the company of one to six other whales. Years that she has been seen off California are 1992, 1995, 1996, 1998, 2003, and 2007.

**ID 10411** was encountered on 27 January from John's boat. This whale was an escort in a competitive group of four whales. Besides for single encountered off southern central California in 1991, and Eureka in 2006, this whale has been sighted either in the Gulf of Farallones 1990, 1992, 1993, 1995, 1996 or Monterey Bay 1994, 1998, 2001. In 2002 this whale was photographed near Bahia Drake by Oceanic Society/Cascadia trip on 6 and 7 February, ten days later the whale was photographed in Bahia Honda Panama (about 250 km south of Drakes Bay by water). Whale 10411 has a very distinct fluke with large sections of white trimmed with black on either side of the fluke and likely killer whale rake marks on the left side (parallel scratches).

**ID 9042** was encountered with four other whales traveling north near Isla Ballena on 6 February. From a biopsy sample (2005) and from recording this whale singing in 2001 and 2005 near Bahia Drake we know that 9042 is a male. This is the third year that 9042 has been photographed in Central American waters. He was first encountered in 1988 off Southern-Central California, and has been seen there in 2000 as well. He is repeatedly encountered off Southern California with sightings in the Santa Barbara Channel 1995, 1997 and 2002. Whale 9042 has an all black fluke with a very distinctive ridging pattern on the trailing edge.