

BAJA BLUE WHALE RESEARCH 2011

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

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INTRODUCTION

Blue whales occur widely in the world's ocean and became a target of commercial whalers in what is termed the modern era of whaling. Largest populations occurred in the southern Hemisphere and the Antarctic blue whale was the most heavily hit by commercial whaling with close to 300,000 killed primarily in the first half of the 20th century. From a world-wide abundance of over 300,000 their numbers are estimated at close to 10,000 now, more than 40 years after the supposed end of commercial whaling in 1966. One of the healthier populations of blue whales documented post-whaling is in the eastern North Pacific. There are thought to be at least a half dozen if not a dozen or more distinct populations of blue whales around the world (based in part on different song types as well as genetics). In the North Pacific, at least two populations exist based on these song types. The eastern North Pacific population we have been studying ranges at least from Central America to the south to the Gulf of Alaska in the north.

Cascadia Research has been studying eastern North Pacific blue whales since 1986 using photographic identification. Our catalog now contains over 2,000 individuals with distinct markings. Resightings of these identified whales have provided confirmation of movements of the blue whales off the US West Coast down to the Costa Rica Dome and up to Alaska. Our estimates of abundance based on mark-recapture calculations based on resightings of these photo-identified whales, have yielded an estimate of just over 2,000 for this eastern North Pacific population. While these initial estimates were higher than expected our data from the early 1990s to late 2009 have shown only a slight indication of an upward trends. Some other estimates of abundance from line-transect density estimates for the US West Coast have actually shown a decrease in numbers from the 1990s to the last 10 years. We think this discrepancy reflects that blue whales were dispersed more widely especially to the north in the last 10 years and that is why the density dropped even though the total population did not necessarily decrease.

Extensive research has been conducted on blue whales in a few key areas. This has included off the US West Coast (especially off southern California) in the summer and fall and also in the Sea of Cortez, Mexico in winter and spring. There have also been cruises to the Costa Rica Dome area both by Southwest Fisheries Science Center and two cruises Cascadia has participated in. While we know that the west coast of Baja is an important area for blue whales, relatively little work has been conducted there focused on blue whales.

The west coast of Baja was known as an important area for blue whales even in whaling days. One area where whaling was conducted in the early 1900s was based from a processor in Magdalena Bay off southwest side of Baja. Additionally, periodic surveys along the west coast of Baja have found high concentrations of blue whales. Satellite tags deployed on blue whales by Oregon State University have revealed the west coast of Baja as an important area in almost any time of year but especially winter and spring (Bailey et al. 2009). It is suspected blue whales are using these waters as a feeding areas.

OBJECTIVES AND RATIONALE

The project has several objectives:

1. Examine the distribution of blue whales and other cetaceans using the coastal waters along the north west portion of Baja in late winter/spring
2. Use photographic identification to examine the interchange of these animals with other areas that have blue whales have been documented in the eastern North Pacific
3. Examine the behavior of animals to determine whether they are feeding and if possible what they are feeding on in this region.
4. Determine to what degree this is an area used by mothers and calves and document the photo-ID of some of these mothers and calves.

METHODS

Surveys

Boat surveys were conducted from MV *Horizon* is a 85-ft. long-range motor vessel. Observations were conducted both from the bridge of the vessel as well as a platform above the bridge. Searching was conducted with naked eye supplemented by 7x50 binoculars. Date was recorded on datasheets with position/effort entries at least every 30 minutes that summarize the time, latitude, and longitude (from a hand-held GPS), sea state, cloud cover, wind speed, sea condition, water and air temperature, and swell height. When a whale is sighted, we broke-off the survey to gather data on the group of whales. We recorded the group size, behaviors, and movement of whales. Smaller 14-foot inflatable boats were deployed on one day where conditions allowed.

Photographic Identification

Photographic identification of individual animals was conducted wherever possible. A number of different species of whales can be reliably identified using different methods. This included 1) underside of the flukes of humpback whales, 2) pigmentation patterns on the right and left side near the dorsal fin for blue whales, 3) dorsal fin shape and nicks and body markings for fin whales, 4) and dorsal fin and saddle patches of pilot whales.

Study area

The week-long cruise covered coastal waters from San Diego, California down to near Isla Cedros in central Baja, Mexico and back. Some areas were transited at night or were impaired by fog or poor weather conditions. In general the primary area searched was waters from 100 m deep out to just past the shelf edge.

RESULTS

Despite varying weather conditions, from 3 to 35 cetacean sightings were made on every survey day. In total there were 106 sightings of 1,162 animals representing 13 species of cetaceans (Tables 1 and 2). These likely included a number of repeat sightings of the same individual but this will not be known until the completing of photographic identification processing.

Table 1. Summary of sightings of cetaceans from all platforms during the cruise.

Common Name	27 Mar	28 Mar	29 Mar	30 Mar	31 Mar	1 Apr	2 Apr	Total Sight
Blue Whale	1	3	1	1		4		10
Fin Whale			2	6	1	19	1	29
Gray Whale	14		1				3	18
Humpback Whale						9	2	11
Bryde's Whale			1	1				2
Minke Whale						1	1	2
UnID Large Cetacean	1	1	1			1		4
Common Dolphin, Delp Sp			1	1		1	1	4
Long-beaked Common Dolphin	3	2	1					6
Short-beaked Common Dolphin							1	1
Bottlenose Dolphin							2	2
Northern Right Whale Dolphin						1		1
Pacific White-sided Dolphin	1		4	4				9
Pilot whale			1			1		2
Risso's Dolphin			1				2	3
UnID Small Cetacean							2	2
Total	20	6	14	13	3	35	15	106

Blue whales were sighted on all but two survey days but in fairly low numbers, in total there were 10 sightings of 11 blue whales during the trip. Three species of whales, fin whales, gray whales, and humpback whales were all seen in larger numbers than the blue whales. While a major concentration of blue whales was not found on the trip, their frequent presence and the sightings of concentrations of feeding fin and humpback whales suggest they may have been present but not found. In particular, the area around Punta Baja searched on 1 April where blue whales were seen along with larger concentrations of fin and humpback whales, could only partially be searched due to a fog bank that closed in on the area by late morning.

The large number of sightings of other species was unexpected and included several unexpected insights:

1. Large numbers of feeding humpback areas in the Punta Baja area and waters farther north was not expected. Humpback whales are known to use several areas of Mexico as winter breeding areas including southern Baja California. Their feeding areas in the eastern

North Pacific are known to extend down to southern California but we did not expect to encounter concentrations of feeding humpback whales off northern Baja. Photographic identification will help reveal if these are animals known to feed later in the season off the US West Coast.

2. The presence of concentrations of substantial numbers of feeding fin whales in coastal waters of northern Baja this time of year is valuable especially since many aspects of fin whale movements and population structure remain unresolved.
3. The multiple sightings of short-finned pilot whales along with the photographic identifications will be important since this species was known to be common off southern California until the early 1980s and then largely disappeared. Only two sightings of pilot whales was seen in the 2001, 2005, and 2009 surveys conducted by SWFSC off the US West Coast.
4. The sightings of northern right whale dolphins associated with one of the pilot whale groups was unexpected because this appears to be at the limit of their southern ranges. The NMFS stock assessment for this species reports that they probably venture into northern Baja in winter months and our data helps confirm this. Their presence does not appear to be common since the long term crew on the *Horizon* had not recalled ever having seen this species before.

In addition to the visual sightings, recordings were obtained at several areas. Probably most valuable was the recordings obtained while surrounded by a group of Pacific white sided dolphins. There have been two click types reported in this species off southern California that may represent different types so additional data on the type of clicks deselected assigned to specific groups is valuable.

Table 2. Summary of number of individuals sighted from all platforms during cruise.

Common Name	27 Mar	28 Mar	29 Mar	30 Mar	31 Mar	1 Apr	2 Apr	Total #
Blue Whale	1	3	1	1		5		11
Fin Whale			3	11	1	26	1	42
Gray Whale	21		1				7	29
Humpback Whale						20	3	23
Bryde's Whale			2	1				3
Minke Whale						1	1	2
UnID Large Cetacean	1	1	1			1		4
Common Dolphin, Delp Sp			15	7		150	100	272
Long-beaked Common Dolphin	53	3	2					58
Short-beaked Common Dolphin							400	400
Bottlenose Dolphin							100	100
Northern Right Whale Dolphin						12		12
Pacific White-sided Dolphin	3		13	96				112
Pilot whale			12		30			42
Risso's Dolphin			5				25	30
UnID Small Cetacean							22	22
Total	79	7	55	116	43	203	659	1162