Progress report [June 2007]:

BLUE WHALES IN CHILE:
THE GIANTS OF MARINE CONSERVATION

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Introduction

This section presents fieldwork related to blue whale research undertaken during 2007 in southern Chile by the NGO Blue Whale Centre and Universidad Austral de Chile, through an ongoing research program established in 2000 (Hucke-Gaete *et al*. 2003). This is also a report of the field season's activities with the community.

Scientific Research

Study area

Our main study area corresponds to western Chiloe Island, the Gulf of Corcovado and Chonos Archipelago (41º - 44ºS). From 2004 onwards we have concentrated efforts in the Gulf of Corcovado, operating from the small village of Melinka, located on Ascencion Island (43°53'S; 73°44'W). This region receives direct influence from the Pacific Ocean and the Cape Horn Current from the West. It is bounded by the Guaitecas and Chonos Archipelagos on the South, while a number of fjords lead off the nearby Moraleda Channel to the East (continental Chile) where it is fed by glacial ice-melt and mixed-regime river run-off (Hucke-Gaete 2004).

Land-based observations

Land-based observations were performed from a vantage observational point located 77 m above sea level. Two four-hour periods of observation per day were undertaken, weather permitting, by two experienced observers using Nikon 7x50 and Celestron 11x50 binoculars. On certain occasions a Leika T110 digital theodolite (precision ± 6'' and 30x) was used to track groups but this information is subject of another study and is not presented here. Data such as date, time, weather conditions, cue, distance, species, group size and behaviour were recorded on specially designed forms and each group was considered independent when not resighted within 30 minutes. After this period, a new sighting was searched and followed, and possible duplicates were annotated as such when slight chances of following a previous group appeared plausible (Montecinos & Hucke-Gaete 2007).

The 2007 field season was developed between 25 January and 7 April completing a total of 173 hours of land-based observations in 37 effective days [weather-wise]. A total of 205 groups comprised by 326 animals were observed throughout the field season (Table 1). Number of groups sighted per day ranged between 1 and 19 (mean=7; CI 95%=2), including 1 to 37 animals (mean=11; CI 95%=4). The mean group size was 2 (range=1-8) and sighting distances ranged between 4 and <20 nautical miles (nm) with a mean of 13 nm. Throughout the field season blue whale sightings varied considerably in number (Fig. 3), on occasions irrespective of effort. This is consistent with that reported by Hucke-Gaete (2004) and Hucke-Gaete & Mate (2005) in terms of blue whale frequent movements between local feeding areas within the study area [monitored through satellite transmitters]. There is an apparent diminishing trend in sightings as the field season progresses; however, this is not supported by sighting rates (Fig. 4) or by information collected in previous years. There is a somewhat noticeable trend in sighting rates during different periods of the day, being the morning the most productive in terms of numbers sighted, decreasing as day progresses (Fig. 5) (Montecinos & Hucke-Gaete 2007).

Boat based observations

Despite the numerous mechanic problems we had with the vessels' outboard (Suzuki 115 hp) and additional outboards we brought in to solve the problem (without much success), we were able to complete a total of 21 boat based surveys through the aid of land-based observers guiding the research vessel (*R/V Musculus*). Number and distribution of sightings made from the sea are still under review and will be reported on a later date. This issue only highlights the need for obtaining better equipment and count with replacement

options, which we did not have available at the time.

Since 2000 onwards, results from our project have increased blue whale records in Chile *ca*. three-fold (157 sightings including 429 animals and 28 mother-calf pairs) out of the 48 reported sightings pre-2000 (Cummings & Thompson 1971; Aguayo 1974; Gallardo 1983; Aguayo *et al*. 1998; Findlay *et al*. 1998; Hucke-Gaete 1998). Only during 2006 field season, a total of 57 sightings were made, including 113 animals and 10 mother-calf pairs. We were able to again confirm the importance of the area as a feeding ground not only for blue whales but also by humpback whales (Fig. 6).

Natural markings data

A total of 1,308 digital photographs were obtained from different animals during 2007 and are still to be analyzed and incorporated to the photo-id catalogue during the following months (Fig. 7). The total number of photos obtained during the previous four field seasons reaches 5,672 photos and includes at least 80 individually identified blue whales.

Biopsies collected

Biopsy sampling was undertaken by using a simple crossbow equipped with standard modified arrows. To date we have obtained 26 biopsies (4 in 2004, 12 in 2005, 4 in 2006 and 6 in 2007) from individual blue whales. Skin samples will be analyzed using genetic markers for individual identification (complementing the photo-id database), sex determination, maternally directed fidelity to the area, movements, and association patterns, together with contributing to the understanding of blue whale population structure and stock identity.

Community Work

Introduction

We have been concentrating additional efforts on community base work, in particular in Melinka. This fishing village is one the most inaccessible community in Chile, as well as one of the poorest. The community wants to be engaged in the process of building an MPA and we have been working with the representatives and the community in general to give all the necessary information and now to plan strategies to aboard the topic. This includes the conformation of a round table with representatives of different sectors in the area, where the community will consider how the MPA can fit in their plans and how to develop a strategy plan to do that. We are also focusing on the same issue in another scale in the whole of Chiloé Island, where we are conforming several of these round tables with different sectors of the society (fishermen, indigenous communities, tourism, among others) to finally conform a multi-sectorial group.

The 2007 community season took place between January 21 and March 23, both in Melinka and also in the community of Repollal and included actions that addressed the needs expressed by different community organizations and those identified by Blue Whale Center's community development unit. Work was conducted in close coordination with local stakeholders, in the following areas:

1. Socio-political efforts
2. Education efforts
3. Community outreach

Socio-political efforts

Goals
Carry out work and dissemination meetings regarding the proposal of establishing a Multiple-Use Marine and Coastal Protected Area (MCPA). Discussing joint work proposal; establishing alliances and agreeing on a shared agenda approach.

Identifying local leaders
Conversations and meetings were held in several opportunities and with various local grassroots and political stakeholders with the aim of overcoming the weak community participation which is a characteristic of rural communities in general, particularly in Melinka. Group meetings held were attended by at least 150 people. We highlight the attendance of the following organizations and leaders:

- Melinka Harbor Master's Office: Mr. Juan Carlos Geraldo (Harbor Master, Chilean Navy).
- Melinka Federation of Artisanal Fishermen: Ms. Verónica Bravo (administrative officer) and Mr. José Rain y Antonio Antecao.
- Melinka's Union: Mr. Daniel Canuillan (secretary), Juan Carlos Vargas (President).
- Canales del Sur Union: Mr. Domingo Puinao (President).
- Municipal Council: Mr. Marcos Silva and Mr. Juan Carlos Barría.
- Fishing Committee of the Municipality of Guaitecas: Mr. Gastón Alvarado.
- Country Service Program: Mr. Ignacio Pastrani.

Meetings requested formally by BWC and by the organization were as follows:

Thursday, February 1: Meeting requested by BWC and the Fishing Committee of the Municipality of Melinka. Place: Melinka's clinic. Attendance: 18 people.

Sunday, February 11: Open community meeting requested by the Melinka Federation of Artisanal Fishermen and the Country Service Program. Place: Municipal Event Hall. Attendance: 15 people.

Friday, February 23: Open community meeting requested by BWC under the frame of the "Scientific Whale Watching Visit at the Guaitecas Archipelago". In this opportunity, a Navy ship arrived in Melinka carrying regional and national authorities. The meeting, in which the MCPA for Chiloé and Corcovado was presented and discussed, and was attended by approximately 80 people.

Education efforts

Melinka

Workshops were held during the entire season, on three-hour sessions twice a week. Additional workshops were conducted occasionally. All the community was invited to participate through the local radio and street posters.

Goals:

Promoting awareness in children regarding the role of people (children, adults, and authorities) in environmental protection and about the impact of waste in urban and rural environments and in particular over the marine ecosystem; Teaching children basic concepts of waste management, recycling and reusing; Developing simple waste management techniques.

Main activities

"LITTER PICK-UP" (Fig. 8). Activity conducted jointly with the Harbor Master's Office in the Estero Álvarez area located in one of the main residential areas of Melinka. The activity took place during one hour and children were able to see and pick up a great amount of waste in the coastal border. The debris collected was used for subsequent workshops.

GUIDED VISIT TO THE OPEN LANDFILL. Guided visit to witness direct impacts on marine ecosystems and community health. Ways to revert this trend through sustainable management were also discussed.

WORKSHOPS: Recycling and reusing activities (building a drum kit with waste; reusing tetra pack cartons to make flowerpots, among others); role playing to identify problems; contests and creative skills to reuse waste; writing letters to authorities.

Repollal

Workshops were conducted at school facilities throughout the season, in three to four sessions, twice a week. The community of Repollal is located 20 km away from Melinka. Tide rises at certain times of the day, cuts off the only access road leaving the town isolated. Currently, a new road is being built.

In previous assessments, local stakeholders –particularly the school community– stated their need to be included in the training programs carried out in Melinka. Therefore, the workshop described below was designed to address such demand and based on the conviction that is was extremely relevant to include such an unspoiled area and a population directly and regularly involved with marine ecosystems in the program.

The invitation was open to the entire community and made through the radio. Additionally, information was delivered door-to-door in the different neighborhoods of this community. Fifteen children attended and the contents were as follows:

Goals:

- Strengthen an interest on scientific research and thinking through the observation, analysis and documentation of natural and cultural elements in the environment.
- Developing an innovative learning experience that links scientific and local knowledge about natural and cultural assets of the Guaitecas archipelago.

Contents:

Scientific exploration of the coastline. Physical environment and biological diversity;

Socio-cultural archaeology and anthropology: the sea and human beings, adaptation strategies to a specific environment;

Ecology and ecosystems: organization levels –food chain, competition, predator, prey, balance;
Navigations and watching marine animals;

Building a large dry aquarium representing the contents of the workshops by means of simple art techniques.

The workshop finalized on 3 March at the school premises, with the attendance of the children's parents. A video was shown including pictures and contents from the workshop and diplomas were presented to workshop participants. The dry aquarium built by the children was formally presented to the school.

Outreach

Outreach efforts were aimed at recreational activities and included the participation of BWC members in community activities. Activities conducted were very important to generate local trust and position the BWC within the community. Since Melinka is one of the communities with the largest isolation rate in the country, there is little cultural outreach and residents often express such a need. An Outdoors Movie and Documentary Cycle using the multimedia projector purchased through Rufford Foundation's grant, was carried out in several parts of the community. Based on this activity, a group of 10 Melinkan youngsters spontaneously and actively collaborated in the arrangement of each showing developing certain ownership of the activity. This led to a permanent discussion about the role of youth in community development.

During the season and under the celebration of the Melinkan Week, several activities and sports competitions were organized. BWC was invited in several opportunities and, as time permitted it, we participated actively.

A serious problem within the community is the overpopulation of dogs. An additional activity was the participation of the BWC in reactivating, jointly with the managers of the Fishermen Federation, the social municipal committee and the Country Service Program, a campaign for the sterilization and responsible ownership of dogs. Health baths were carried out for about 80 dogs and currently, a sterilization campaign is being arranged to take place during May. Dogs are a big issue in the community and represent one of the main interests of the people to solve this problem.

Scientific blue whale watching activity carried out on February 22, 23 and 24 at the Gulf of Corcovado.

The Chilean Navy, jointly with the Blue Whale Center (BWC), WWF Chile and the Austral University, carried out an open scientific blue whale watching activity on February 23, at the Gulf of Corcovado.

This activity called upon different representatives of National and International NGOs, national media and BWC staff, to board the Chilean navy ship *Engineer George Slight Marshall* on February 22. The ship sailed from Puerto Montt to the future MPA from the North-East and arrived in Melinka on Friday 23.

The mission was joined on Friday 23 by the Ambassador of New Zealand, Mr. Nigel Fyfe and by the Chief Staff of the Second Naval Zone, Captain Fernando Contreras Acuña, who flew in a helicopter from Puerto to Melinka to attend the activity. The Ambassador met with the community of Melinka and talked about the benefits arising from a Multiuse Marine Protected Area in New Zealand and about the advantages he envisaged from developing a marine protected area in the area.

On Friday evening, the mission and 75 community members (children, seniors, teachers, etc) set off to navigate for a little more than three hours to watch blue whales. The activity with the navy was unsuccessful in the search of whales due to prevailing weather conditions. However, the activity was successful by itself as it was a unique opportunity for community members to board a navy ship and get a chance to appreciate their area from a different perspective. The activity also helped to better position the protected area efforts within the navy, an important stakeholder both at the local and national level.

Conclusions

The socio-political effort had considerable outcomes in terms of discussing the implications of a MMPA in Chiloé and Corcovado, which is reflected in the permanent interest and participation of the main leaders of the organizations summoned. Additionally, we now have a well-defined map of stakeholders and leaders which was a need to continue putting forward BWC's community work strategy.

Workshops with children have also generated specific outcomes in terms of contributions to the community; positive assessments have also been made in terms of contents learned for children. At the same time, by working with children we have been able to reach their families (adults) with a clear message regarding environmental stewardship. For BWC, it is extremely important to have finalized a second season of systematic educational efforts with a positive community assessment. Based on such results, we can now replicate the workshops and experiences in other areas nearby the area of influence and consolidate our Education strategy.

The daily and systematic contact with the community, especially with grassroots leaders, lays the foundations for a relationship of trust. This is a key issue to plan and implement local development strategies for the community of Melinka through relevant joint actions with local stakeholders. This last issue is very important considering this community's geographical situation. Additionally, now the BWC has community allies that give sustainability to the efforts it carries out in the area.

Acknowledgements

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Table & Figures

Table 1: Detail of land-based blue whale sightings performed at the Gulf of Corcovado during the 2007 austral summer.

	Date (dd/mm/yy)	Groups (nº)	Individuals (nº)	Effort (h)
February	2/13/2007	3	4	5.2
	2/15/2007	9	12	6.4
	2/16/2007	19	23	6.6
	2/17/2007	17	37	3.5
	2/18/2007	0	0	0.3
	2/19/2007	4	5	0.3
	2/20/2007	3	7	5.8
	2/22/2007	3	4	2.5
	2/23/2007	0	0	1.5
	2/24/2007	0	0	1.7
	2/25/2007	19	33	6.0
	2/26/2007	10	12	4.0
	2/27/2007	18	23	7.0
	TOTAL	**102**	**160**	**50.8**
March	3/2/2007	6	9	7.4
	3/3/2007	17	33	7.3
	3/4/2007	0	0	2.1
	3/7/2007	10	27	2.2
	3/8/2007	6	7	3.3
	3/12/2007	0	0	4.0
	3/15/2007	9	13	5.6
	3/16/2007	0	0	6.8
	3/17/2007	2	4	2.5
	3/19/2007	1	1	2.5
	3/20/2007	0	0	3.3
	3/21/2007	2	3	5.7
	3/22/2007	9	14	3.7
	3/23/2007	1	1	2.0
	3/26/2007	0	0	6.9
	3/27/2007	0	0	5.7
	3/28/2007	1	1	7.0
	3/29/2007	2	3	5.7
	3/30/2007	3	4	8.0
	3/31/2007	6	9	8.0
	TOTAL	**78**	**133**	**99.7**
April	4/1/2007	7	10	5.0
	4/2/2007	2	4	1.6
	4/3/2007	4	5	6.9
	4/4/2007	12	14	7.0
	TOTAL	**25**	**33**	**20.5**
	GRAND TOTAL	**205**	**326**	**173**

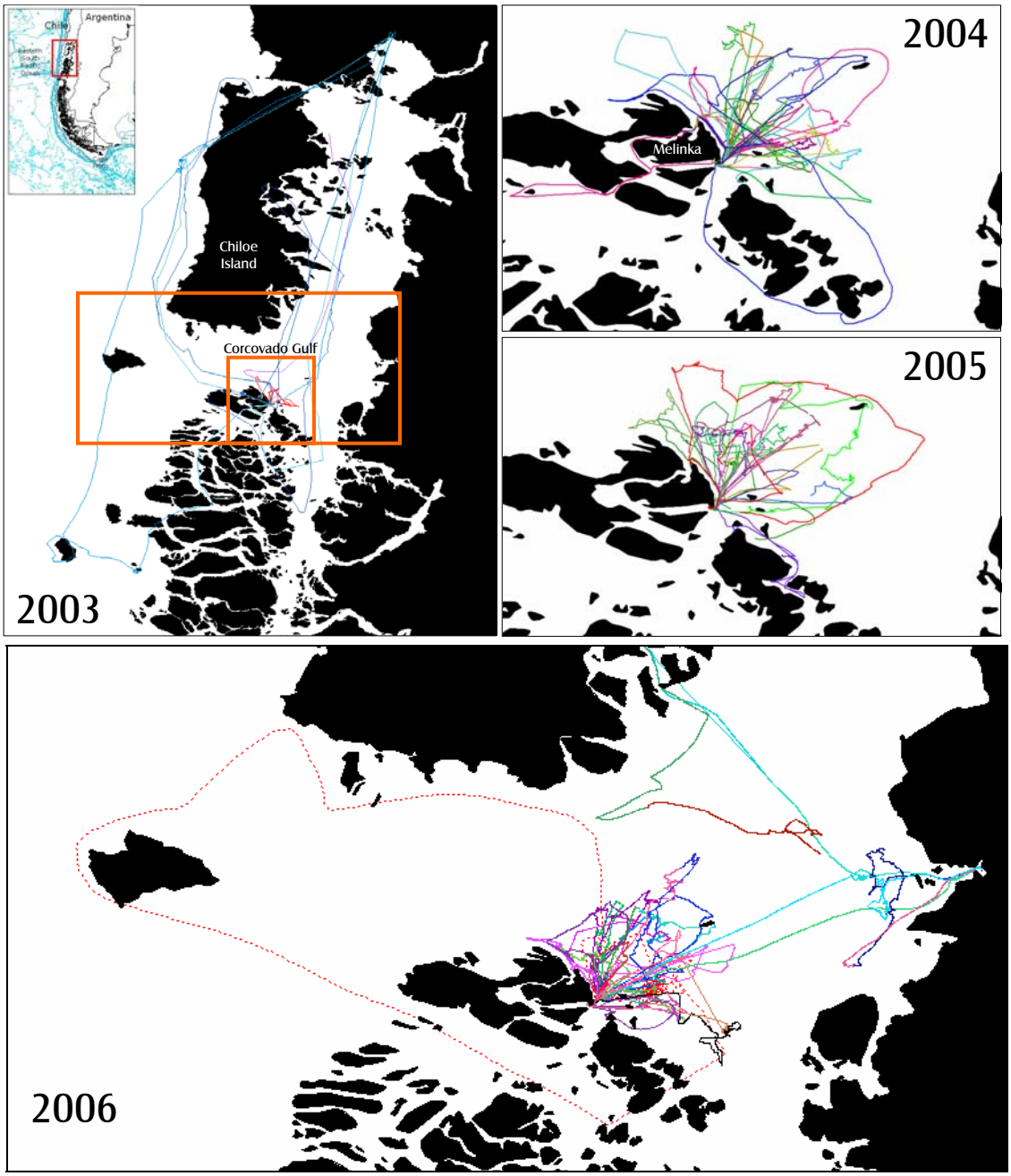

Figure 1: Dedicated aerial and boat based surveys undertaken in southern Chile between 2003 and 2006 searching for blue whales.

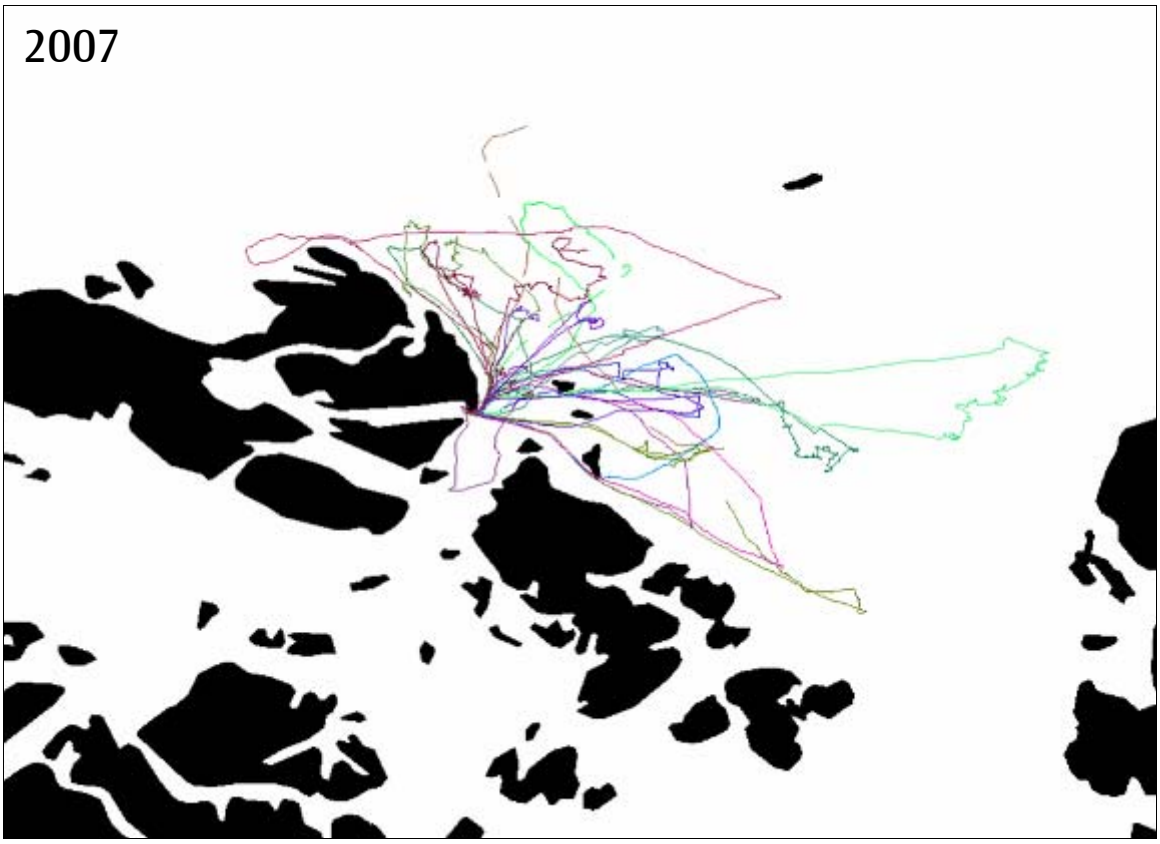

Figure 2: Dedicated boat and aerial surveys developed during January and April 2007 in the Corcovado Gulf, southern Chile.

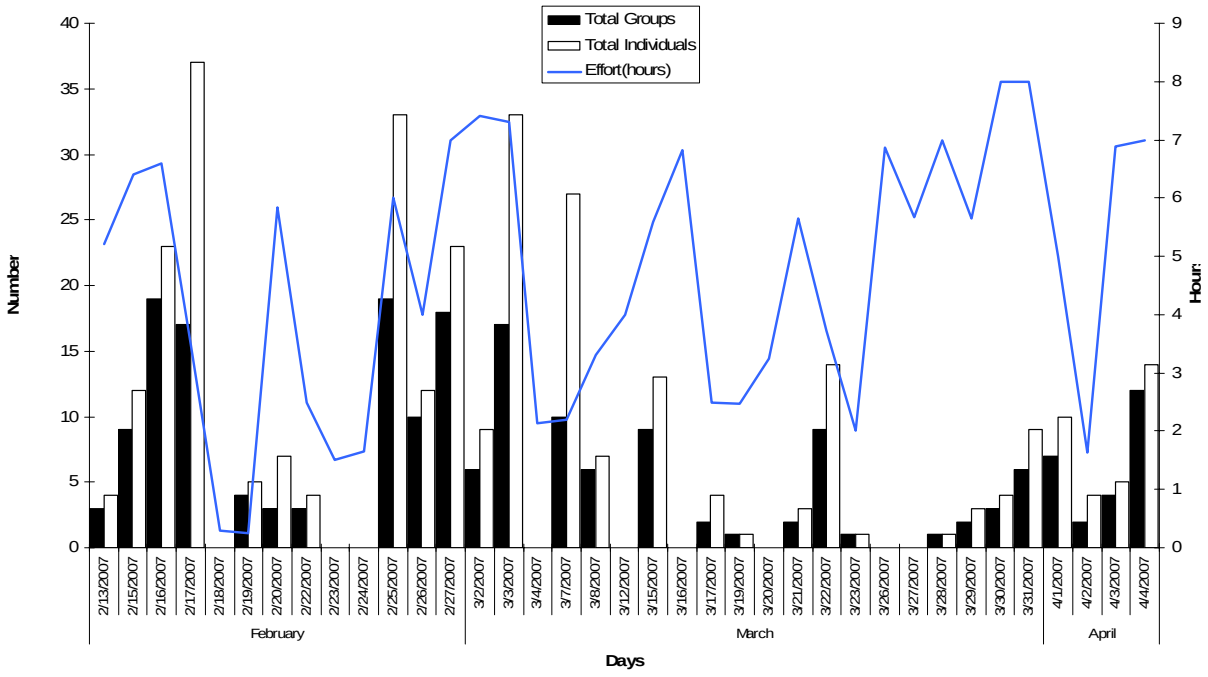

Figure 3: Blue whale groups and individuals sighted from land between February and April 2007 during days where observation effort (hours) was undertaken in the Corcovado Gulf, southern Chile.

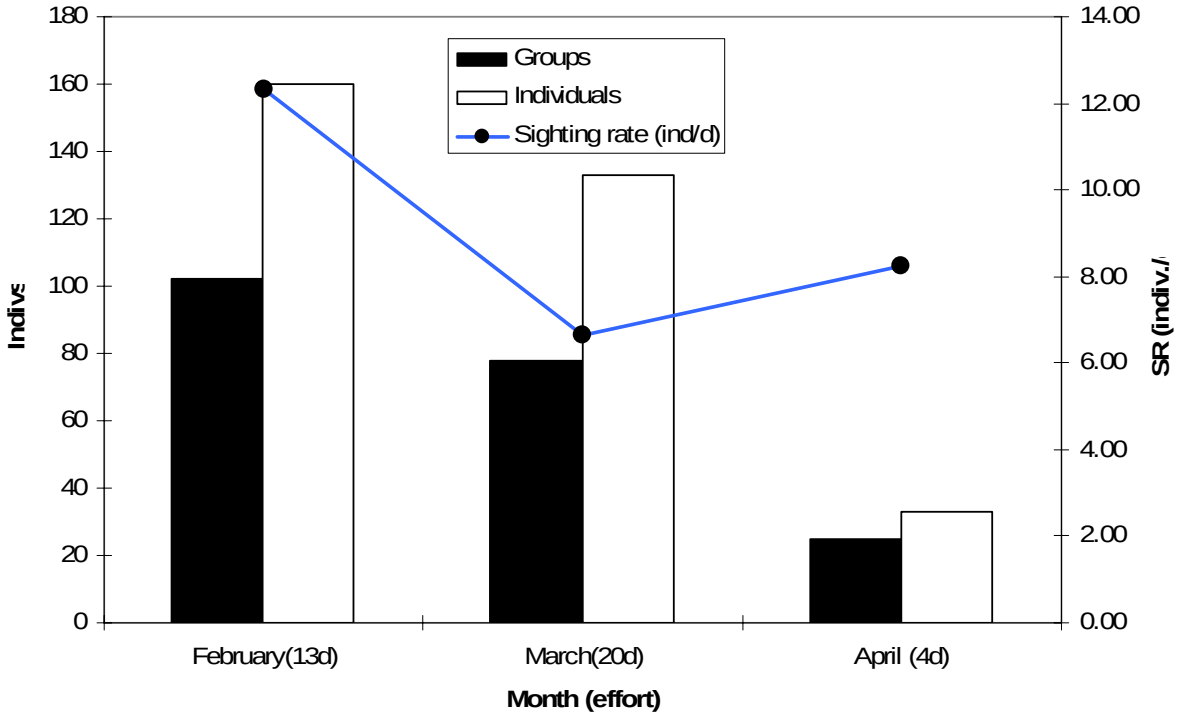

Figure 4: Blue whale groups, individuals and sighting rates (SR, individuals/day) observed between February and April 2007 in the Corcovado Gulf, southern Chile.

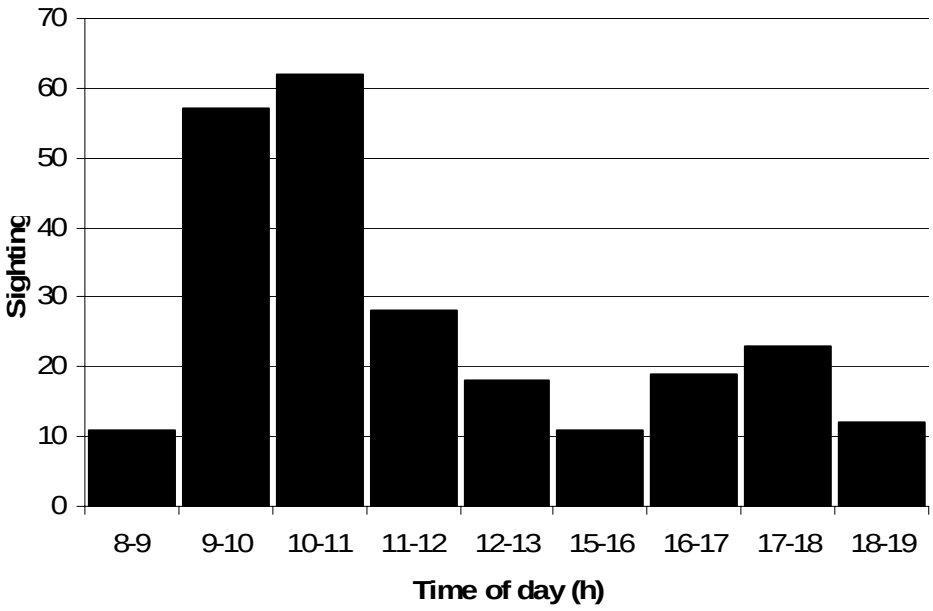

Figure 5: Number of blue whale groups sighted during different periods of the day in the Corcovado Gulf, southern Chile during Feb.-Apr. 2007.

Figure 6: Feeding behaviour of blue (top two panels) and humpback (bottom panel) whales in the vicinity of Melinka during 2007. © F.A. Viddi / CBA 2007.

Figure 7: Examples of photo-identified blue whales during 2007 in the Corcovado Gulf, southern Chile. © R. Hucke-Gaete / CBA 2007.

Figure 8: Examples of the activities conducted with kids in Melinka, in southern Chile.