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INTERNATIONAL WHALING COMMISSION

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INTRODUCTION

The Southern Right Whale *Eubalaena australis* is distributed between 20°S and 60°S (Payne, 1986). Whales migrate each year from their sub-antarctic summer feeding grounds to the coasts of continents and islands, mainly to mate and calve (Whitehead *et al.* 1986, Payne *et al.* 1990, Best 2000, Rowntree *et al.* 2001). Commercial whaling during eighteenth and nineteenth century caused a drastic decrease in the number of whales and the species was carried almost to extinction (IWC 2001). In the last decades several stocks of whales off Argentina-Brazil, South Africa and Australia have shown signs of recovery (Bannister 2001, Best *et al.* 2001, Cooke *et al.* 2001). The estimated population size in 1997 was 7,571 animals with the mentioned stocks growing at a rate of 7-8% annually (IWC, 2001).

The stock inhabiting northern patagonian gulfs near Peninsula Valdes (Argentina) has shown a sustained growth since 1999 (Crespo *et al*. 2014). However, Crespo *et al*. 2015 noted a decline in the rate of population increase for this area during the last years and propose that these changes would be related to a density-dependent process in which the preferred areas located into the Peninsula Valdes system (including Golfo Nuevo and Golfo San José) appears to be near their carrying capacity and are "exporting" individuals to other areas. The growing presence of transient whales, including solitary animals, mating groups and mother with calves, observed during the last two decades in the northern San Matías Gulf –SMG- (González *et al*. 1992, Crespo *et*

al. 2008, Svendsen 2013) could be the consequence of this process. Presence of whales in the neighborhood of San Antonio Bay (northern SMG) during winter and early spring season has become so common that an experimental program of whale-watching tourism has been started in 2012. This program, designed according the current legal framework and enforced by the Environment and Sustainable Development Secretary of the Río Negro Province, authorized to four small tourism companies to develop whale watching in the San Antonio Bay Marine Protected Area and commended to scientist of the Comahue National University to monitor the activity and the assess its environmental impact.

The objective of this paper is to present information on the current status of Southern Right Whale in SMG and preliminary results regarding the distribution, abundance and social structure, as well as a characterization of the emerging activity of whale-watching tourism. Results are compared with data gathered in previous (2007-2008) studies and discussed and integrated with historical data for SMG and available information for Peninsula Valdes area.

MATERIALS AND METHODS

Aerial surveys

Coastal flights were performed comprising 354 km of SMG coast from Puerto Lobos (42° 00´S/ 65° 04´W) to the mouth of the Río Negro (41° 02´S / 62° 47´W) (Fig. 1). Surveys were performed with a Cessna 182 aircraft flying on a linear transect at a 500-700 meters off the coastal line, at a height of 500 ft (152 m) and 90 knots (170 km/h). The crew was composed by two observers, one on each side of the plane and a third person recording the following data: position (lat, long) of the whales, sighting angle respect the vertical on the line transect, number of animals and type of group (mothers with calves -MC-, one adult female with a calf; solitary individuals -SI-, adult or subadult males or females and breeding groups -BG-, usually composed by one adult female and n-1 males).

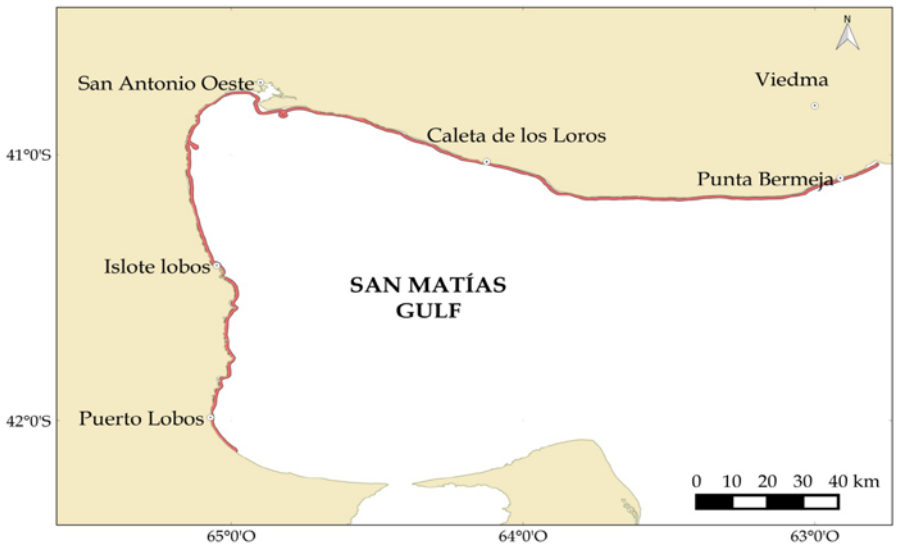

Figure 1. Transect covered during aerial surveys

On board surveys (tourism vessels)

On board surveys were carried out in August, September and October 2014 using tourism vessels during whale watching trips. Surveys were performed in the area authorized for whale watching activity and included the main channel of access to the San Antonio Bay (SAB) and the adjacent area (Fig. 2).

On each trip, all whales observed in the area were counted and data about their position (lat, long), group type and, when present, the number of seagulls *Larus dominicanus* and their behavior respect the whales, were recorded. The social groups categories used in these surveys were the same that for aerial surveys, but with the addition of a fourth category: non-social active group (Non-SAG), composed by adults or sub-adults whales not showing breeding behavior (Best *et al*. 2003).

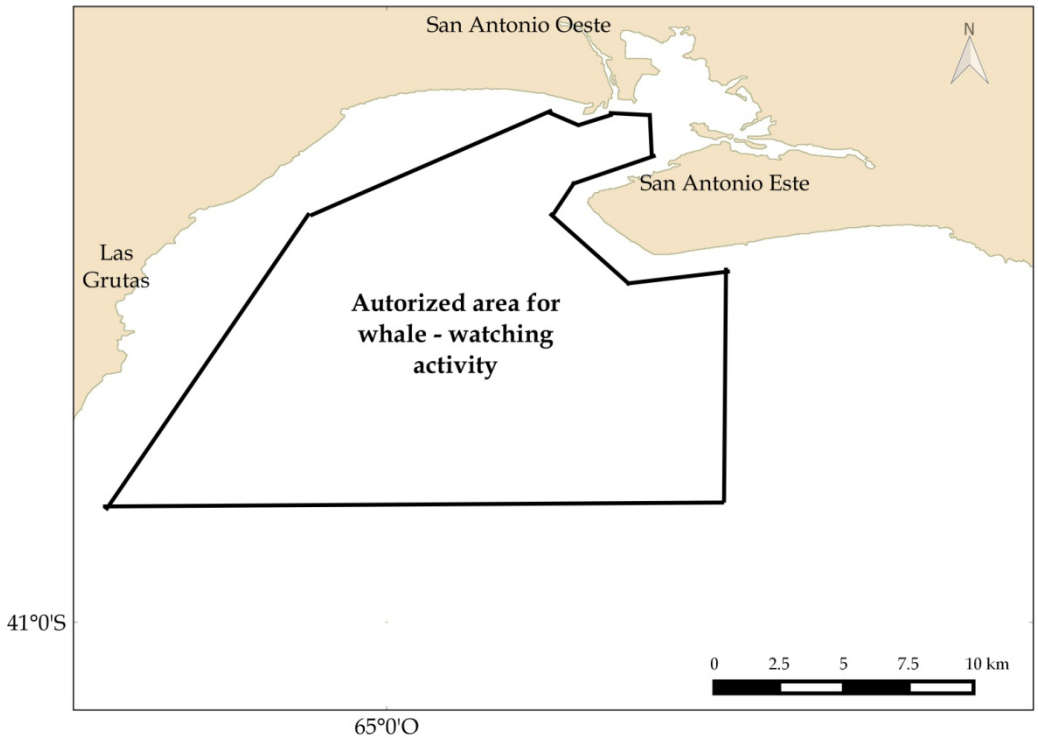

Figure 2. Map showing the authorized area for whale watching activity

RESULTS

Social structure, abundance and spatial distribution

Aerial surveys planned during the study were conducted in August, October and November 2014. Other aerial surveys performed previously were carried out in August and October 2007 and October 2008. Whales were present in the study area from August to October and a difference was found between the number of whales and the social group composition (Fig. 3). The abundance of whales fluctuated between years and months. Both in 2007 and 2014 the

highest number of whales was observed in August. BG were more frequent in August compared with other months being virtually absent in October except for 2008. Regarding the social structure the SI were the most frequent, while MC pairs were present from August to October and BG were mostly seen in August (Fig. 3). The difference observed between years must be carefully considered due to the preliminary character of data.

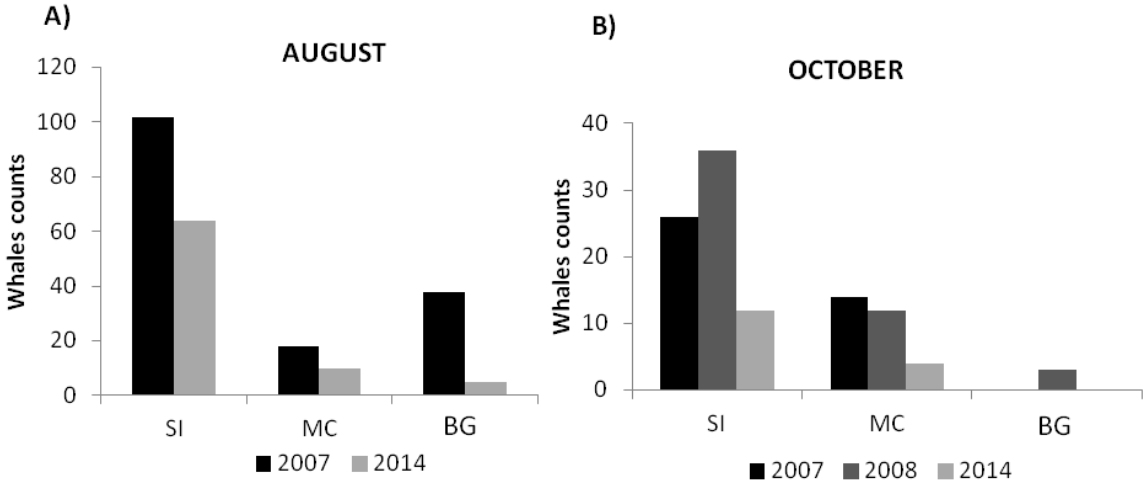

Figure 3. Number of whale´s counts in aerial surveys conducted in the SMG in relation to their group composition, month and year (see the text for references).

Spatial distribution also showed high monthly and inter-annual variability. During August 2007 SI and BG were mainly found in the southwestern area while in August 2014 they were concentrated on the northern coast. During October SI were distributed without a defined pattern along the gulf, whereas MC pairs were mainly observed over the northern coast. Regarding these data and other reports by whale watching operators and fisherman, it appears that since 2012 there was an increase in the number of whales in the north are of SMG.

Whale watching operations

Whale watching in SMG was authorized since 2012 according the provincial law N°4,066 and under an experimental framework involving initially two and, after the second year, four small companies operating simultaneously with only one vessel each. Vessels are less than 10 m length, carrying a maximum of ten passengers. The whale-watching season is authorized to start early on August and finish late October each year.

The annual number of tourists since 2012 ranged between 1041 and 2150 (data provided by the coast guard service -Prefectura Naval Argentina- and tourism companies). During 2014 season tourists were 1% international and 99 % from Argentina.

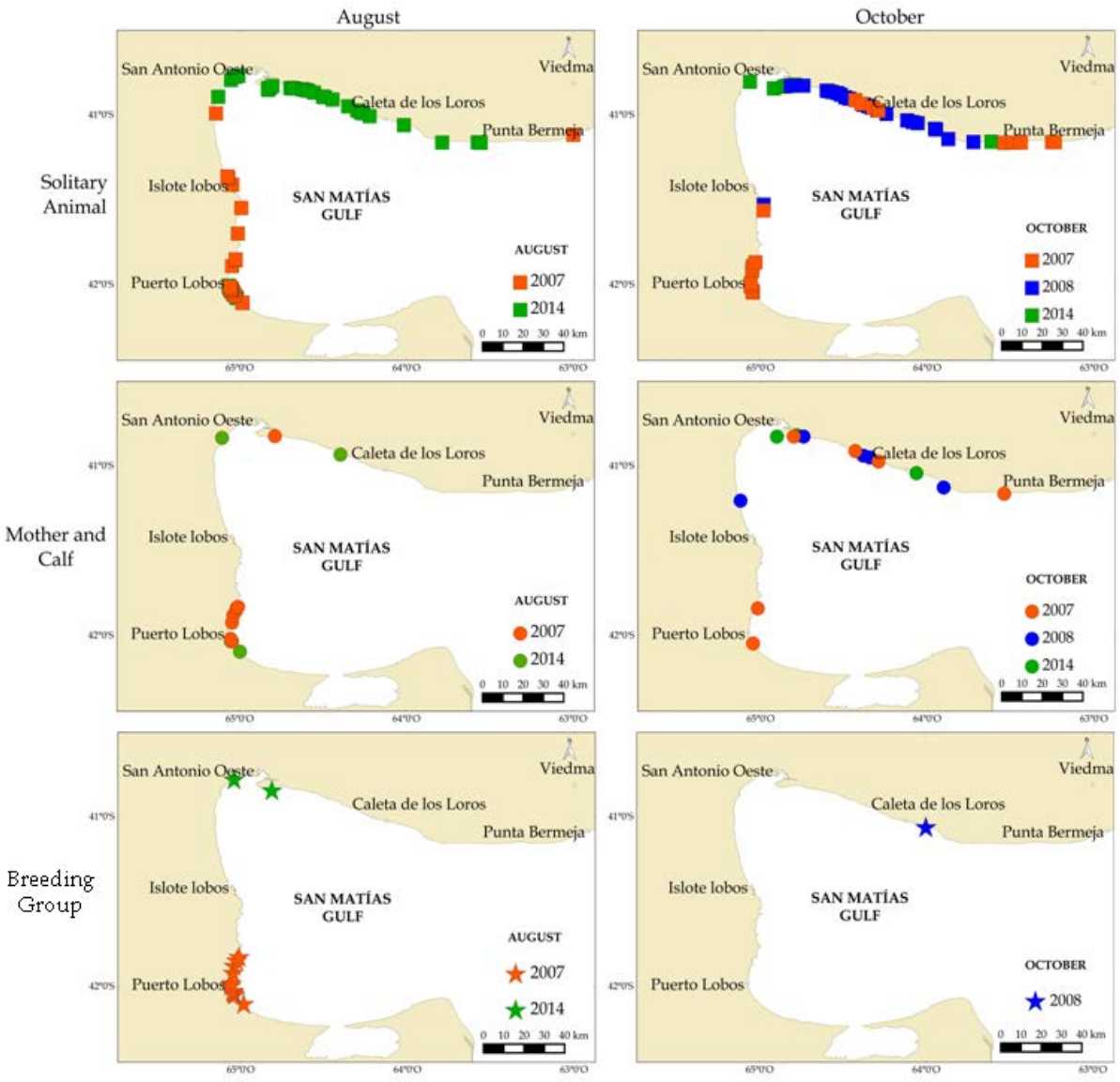

Figure 4. Spatial distribution of different social groups depending on the month and year obtained from aerial surveys

A total of 145 whale watching trips were carried out during 2014 and 98 (68%) were monitored on board by scientific observers (effort = 176.8 hours). The surveyed trips were made within the authorized area, into the San Antonio Bay Marine Protected Area and the mean duration of each trip was 1:48 hours. A total of 339 sightings (comprising a total of 611 whales arranged in different social groups) were recorded from tourism vessels. The distribution of groups in the whale watching area is shown in Figure 5.

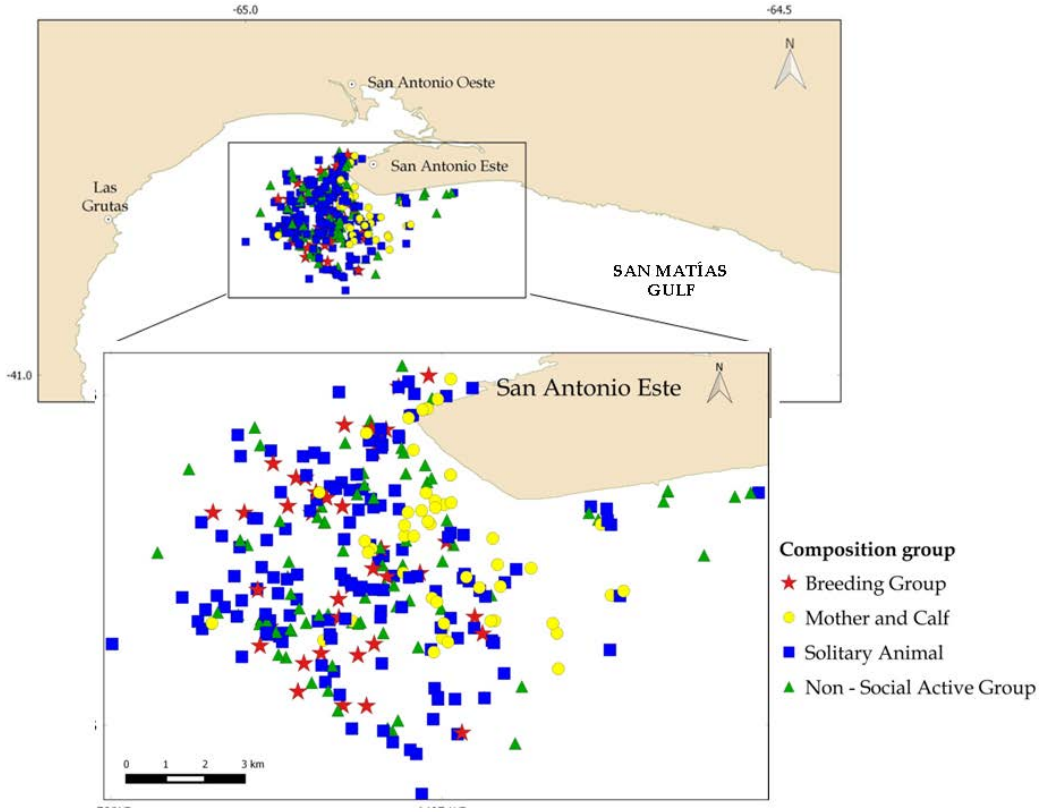

Figure 5. Distribution of different groups of whales recorded in the ship-based survey on the commercial vessels in 2014 season.

The 45% of these encounters were with SI, followed by Non-SAG (26%), MC pairs (17%) and BG (12%) (Fig. 6).

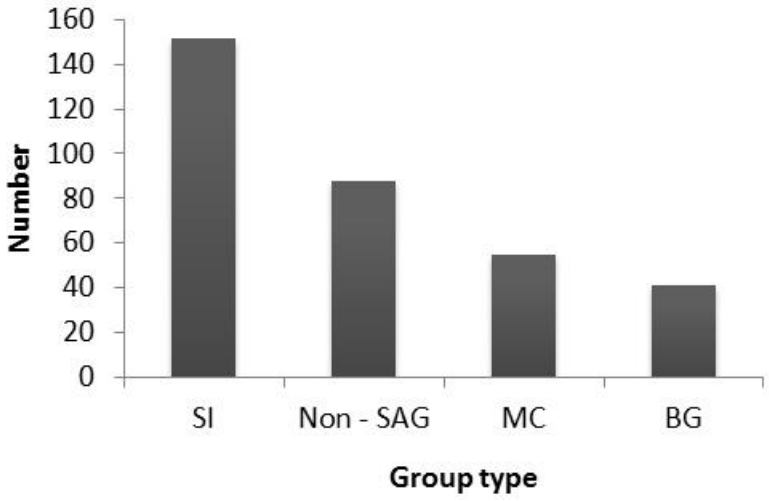

Figure 6. Frequency of each type of group recorded during whale-watching activities (references in the text)

From the 339 encounters, 105 of them were monitored for the impact assessment study. Eighty two percent of the sightings lasted less than 20 minutes (Fig. 7), with a maximum of 64 minutes.

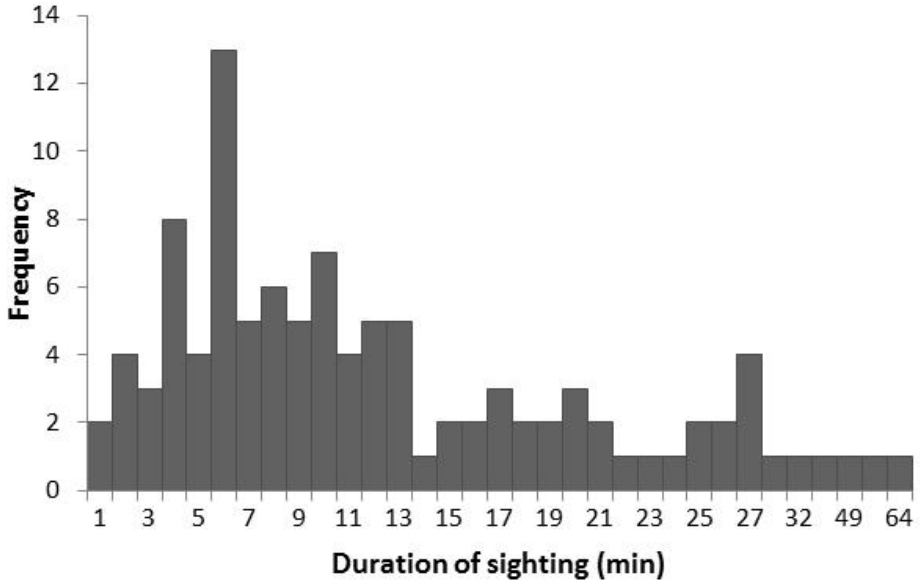

Figure 7. Frequency of duration of sightings.

Group composition changed as the whale watching season progressed (Fig. 8). MC, Non-SAG and SI were present throughout the season, unlike BG that only occurred in August and September. BG presented its maximum abundance in the middle August and decreases late in September. SI and Non-SAG were dominant throughout the season decreasing towards the end of it and MC increased in numbers towards the end of the season.

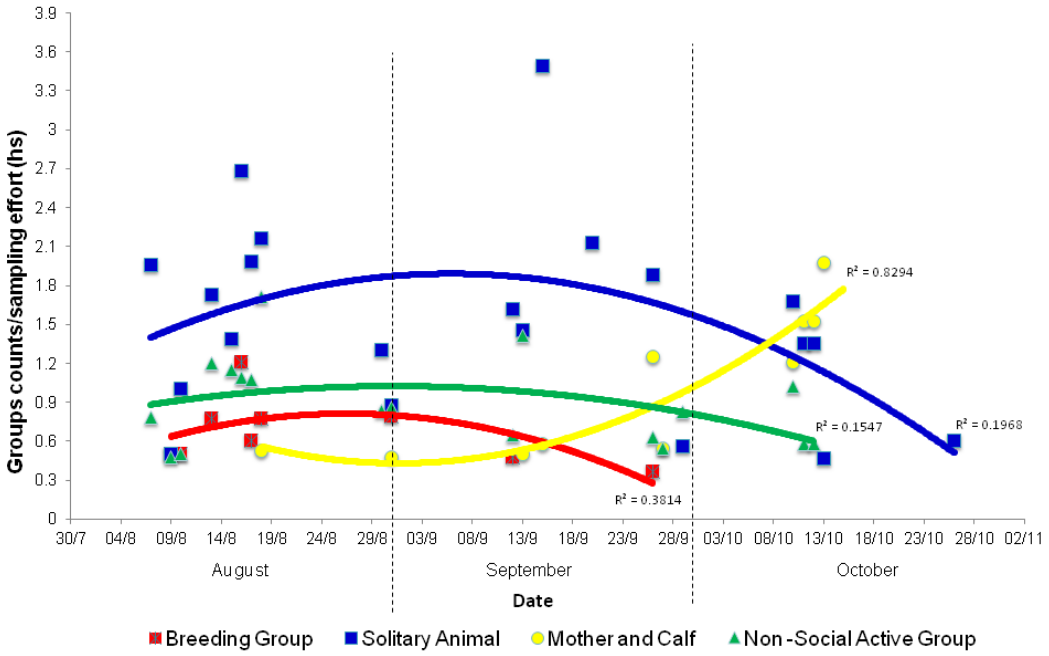

Figure 8. Group count observed throughout the whale watching season referred to the sampling effort (hours).

Presence of seagulls near the whales was only recorded in 3 (2.8%) of the 105 encounters, not showing interaction with them. No seagulls pecking on the backs of whales were observed.

DISCUSSION

Previous studies (coast and boat based) performed during 1987-1992 (González *et al*. 1992) reported the presence of right whales neighboring San Antonio Bay between May and November, with peaks during July 1990 and August 1991. The highest number of whales counted in that period reached 59 individuals throughout an entire month (August 1991). However, no whales were observed along the west coast of SMG during an aerial census carried out during August 12, 1994 (González 1994). In subsequent years, using coastal observations from the neighborhood of Punta Bermeja, a Marine Protected Area located in northern SMG, Intrieri (1997) reported an accumulated (for the 1993-1996 period) number of right whale sightings of 179 individuals (31 MC pairs and 148 SI).

Comparing this information with the results of the present study it is clear that the numbers of whales in SMG has been increasing during the last decade, with a marked seasonality from August to October. During boat and aerial surveys carried out in the last decade the presence of whales was more regular that in the surveys reported for 1987-1996 period, with most of the whales distributed on the northern area of SMG.

Crespo *et al*. (2014) reported a positive population trend for Peninsula Valdes since 1999 to 2013, with an estimated population growth rate of about 7%. They also observed an increase in the density of whales and a higher number of whales distributed in deeper waters. However, Crespo *et al*. (2015) reported a decrease in the growth population rate of the Chubut population probably associated with a density-dependent process. In this sense, they hypothesized that southern right whales stock inhabiting Peninsula Valdes area, including Golfo Nuevo and Golfo San José and the southern area of SMG, are spreading its distribution into (to more deeper waters) and beyond this area (i.e.: northern SMG).

Regarding this information and the results of the present study it is possible to speculate that the most frequent and time-sustained presence of whales in northern SMG could be related to the expansion of the Chubut population. However, if the presence of whales in SMG is actually growing it will be confirmed in the next years, as well as if the whales inhabiting the gulf are the results of immigrant specimens from the Peninsula Valdes area.

Solitary individuals were dominant in SMG coincidently with previous studies for the area (Crespo & Dans 2008, Crespo *et al*. 2014, Svendsen 2013). This result differs with the social composition for Peninsula Valdes area, where the dominant group was mothers with calves (Crespo *et al*. 2014). The presence and abundance of solitary individuals and the different type of groups throughout the whale watching season showed a similar trend to those in

Peninsula Valdes area (Crespo *et al*. 2014) with breeding groups mainly present early in the season, mother-calf pairs presence growing towards the end and other groups and solitary individuals peaking in the middle of season. As in Peninsula Valdes occurs tourism activity in SMG was mainly performed over solitary individuals and non-social active groups.

The results of this study constitute a contribution to the knowledge on the presence and population status of the Southern Right Whale in the SMG area and the first characterization of the whale watching tourism, which is a growing activity in the area. The study is the starting point of a long term data series as a key piece to support management measures and decision making related to the development of tourism and conservation of the resource.

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