

## **Abundance estimates of southern right whales (*Eubalaena australis*) in Bahía San Antonio, Patagonia, Argentina**

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Aerial surveys were conducted to estimate the abundance of southern right whales in Bahía San Antonio, a bay located in the north-western region of the San Matías Gulf (40°50'S 64°50'W), Río Negro, Patagonia Argentina. The transect for the realization of aerial surveys was designed using the program DISTANCE 6.0 and consisted out of 14 North-South (up to S 40.9°) parallel transect lines with a 2.5km separation, covering a total surface of 418km<sup>2</sup> (mean coverage probability=0.78). Transect length was chosen according to the safety restrictions of the pilot.

Surveys were conducted in good weather conditions and calm sea state (Beaufort 3 or less) using a high-wing Cessna 152 with a flat window. Due to the small size of the aircraft, only one person could fly besides the pilot; observations were therefore made from one side only. Average speed and height of the aircraft was kept constant over the surveys at 90kn (166km/h) and 700ft (213m) respectively. When a group of southern right whales was sighted, data were taken on location (using a Garmin GPSmap 60csx), time and group size. The downward angle to the group perpendicular to the aircraft's track was then measured using a hand-held clinometer (Suunto PM5/360PC).

Perpendicular distances were calculated by the means of trigonometry using the aircraft's altitude and the declination angle to the sighting. Due to the flat windows of the aircraft a left truncation distance was set at 150m. Perpendicular distances were also right-truncated at 10% of the observations. The uniform cosine model was chosen in the view of the minimum AIC to model the detection function of southern right whales in the study area. The estimates of  $g(0)=(s+t)/(s+d)$  resulted in a correction factor of  $0.392 \pm 0.456$

In total, 7 aerial surveys were conducted in the beginning of August and September 2009, September, October and November 2010, and August, September 2011, resulting in a total flight time effort of 12.4h. In total, 200 whales were seen in 119 whale groups, equally distributed over the entire bay. Group sizes ranged between 1-5 animals with a mean group size of 1.7 animals (SD=0.83). Results show a peak of averagely  $136 \pm 63$  whales in the bay during the month of September, with less than half the amount of whales present in adjacent months. September being the peak month for right whale presence accords to data from other regions in the country.

The aerial surveys resulted in the first estimates of southern right whale abundance in this north Patagonian bay and indicate a marked peak during September. Nevertheless, data obtained over the other months remain scarce. More aerial surveys should be conducted to accurately determine the evolution of southern right whale abundance in the study area.