Zoological Studies **50**(3): 327-337 (2011)

Zoological Studies

Distribution and Status of the Guiana Dolphin *Sotalia guianensis* (Cetacea, Delphinidae) Population in Babitonga Bay, Southern Brazil

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(Accepted December 7, 2010)

Marta J. Cremer, Fernando A.S. Hardt, Antonio J. Tonello Jr, and Paulo Cesar Simões-Lopes (2011) Distribution and status of the Guiana dolphin *Sotalia guianensis* (Cetacea, Delphinidae) population in Babitonga Bay, southern Brazil. *Zoological Studies* **50**(3): 327-337. The Guiana dolphin *Sotalia guianensis* is one of the most endangered small cetaceans in the southern Atlantic Ocean. The population abundance and density of this species were estimated in Babitonga Bay in 2000-2003. Sampling was random and stratified, and a line transect method with distance sampling was applied in an area of 160 km^2. The total length of transects covered was 1251.9 km, with 163 groups of dolphins recorded. Group sizes varied 2-30 (mean, 5.3; SD, 5.6) individuals. Some areas were preferred by the population, and area 3 was considered the core area of *S. guianensis* in Babitonga Bay. The abundance was estimated to be 245 (95% confidence interval (CI): 142-422) individuals between Dec. 2000 and Nov. 2001, 186 (95% CI: 93-374) individuals between Apr. 2002 and Feb. 2003, and 179 (95% CI: 93-344) individuals between Mar. and Dec. 2003, and the densities were estimated at 1.6 (95% CI: 1-2.7), 1.2 (95% CI: 0.6-2.4), and 1.3 (95% CI: 0.5-3.4) individuals/km^2, respectively. The highest density was recorded in the central area of the bay. http://zoolstud.sinica.edu.tw/Journals/50.3/327.pdf

Key words: Abundance, Density, Group size, *Sotalia guianensis*, Southern Brazil.

Population size is a fundamental parameter for establishing management and conservation strategies for wild fauna (Whitehead et al. 2000). In the last decade, efforts increased to assess marine mammal populations and in particular to acquire estimates of abundances. This investment is the result of growing concerns about the status of potentially endangered populations (Hammond 1986, Gillespie et al. 2005, Scheidat et al. 2008, Barlow et al. 2006, Bradford et al. 2008, Cremer and Simões-Lopes 2008, Andriolo et al. 2010).

The Guiana dolphin *Sotalia guianensis* (Monteiro-Filho et al. 2002, Cunha et al. 2005) is restricted to the Atlantic Ocean of South America and parts of Central America (Silva and Best 1996), with a continuous distribution from Nicaragua (Carr and Bonde 2000) to Santa Catarina State, Brazil (Simões-Lopes 1988). The species has a coastal distribution and is constantly exposed to impacts from human activities, such as accidental captures in fishing nets, pollution, noise, disturbances, and depletion of fish stocks (Silva and Best 1996, Wedekin et al. 2005, Cremer 2007). The International Union for the Conservation of Nature classifies the species as "data deficient" (Reeves et al. 2008), while in Brazil it is considered "near-threatened" (Machado et al. 2005).

While a number of ecological studies focused on the distribution, behavior, and residence levels of the species (Geise 1991, Geise et al. 1999, Daura-Jorge et al. 2007, Rossi-Santos et al. 2007, Wedekin et al. 2007, Flach et al.

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2008a), abundance estimates continue to be scarce. Assessments of population abundances and densities were conducted in Nicaragua (Edwards and Schnell 2001) and in 2 localities in southeastern Brazil: Guanabara Bay (Pizzorno 1999) and Sepetiba Bay (Flach et al. 2008b). In addition, information on densities is available for the Paranaguá estuary and Guaratuba Bay of southern Brazil (Filla 2004).

Resident populations seem to be common for this species and were confirmed in many areas throughout its range (Flores 1999, Pizzorno 1999, Santos et al. 2001, Rossi-Santos et al. 2007), including the Babitonga Bay population (Hardt 2005). Resident populations with well-defined home ranges in bays and inlets may potentially be more threatened due to their limited distributions. Therefore, habitat destruction is a serious threat, particularly for inshore cetacean species (Whitehead et al. 2000).

Santa Catarina State, Brazil, is the southern limit for the distribution of the species. In this region, only 2 populations are known, and the species seems to be highly associated with protected bays: the Norte Bay population at the southern limit and the Babitonga Bay population. These habitats are located near the largest cities in Santa Catarina (Florianópolis and Joinville, respectively) and are strongly threatened by economic activities, like shipping, industrial development, and tourism (Wedekin et al. 2005, Cremer 2007). The objectives of the present work were to analyze the distribution and estimate the density and abundance of the *S. guianensis* population in Babitonga Bay to generate support for long-term monitoring of this population and to allow comparisons with other populations along the coast.

MATERIALS AND METHODS

Study area

Babitonga Bay is located on the coast of Santa Catarina State, southern Brazil (26°02'-26°28'S, 48°28'-48°50'W), and comprises an area of 160 km^2 (Fig. 1). The bay is connected to the Atlantic Ocean through a single channel that extends for 1.7 km. The maximum depth in the bay is 28 m in the main channel, with a mean depth of 6 m. Large tidal flats are present, and the margins of the bay are lined by mangroves, rocks, and sandy-muddy beaches. The region is under intense anthropogenic pressures caused by urban occupation of the surrounding areas and by the use of the harbor area, which has generated problems with water pollution and destruction of the margins (Cremer 2006, Oliveira et al. 2006).

Sampling design

A boat-based line transect method and distance sampling were used to obtain abundance and density estimates of *Sotalia guianensis* (Buckland et al. 1993, Thomas et al. 2002). Monthly samplings were performed in 2 periods: Dec. 2000-Nov. 2001 (period 1) and Apr. 2002-Feb. 2003 (period 2). From Mar. to Dec. 2003 (period 3), sampling was seasonal. The seasons were considered to be spring (Oct.-Dec.), summer (Jan.-Mar.), autumn (Apr.-June), and winter (July-Sept.).

Transects covered the entire study area. Nautical charts were digitized into a geographic information system (GIS) database using Mapinfo Professional 4.1®, in which transects and geographic locations were plotted. Transects were projected transverse to the coastline whenever possible. However, the presence of islands and tidal flats in some locations required transects to be drawn parallel to the coastline or following channels. In total, 46 transects were established, which were ~400 m apart when parallel (Fig. 1). Transects were distributed in 5 main areas of different sizes. We stratified the sampling based on previous knowledge of the heterogeneous distribution of the population in the area (Cremer 2000). The lower channel in area 1 was not surveyed because the animals were never seen there during 4 yr of a “group-sampling” effort (Cremer 2000) and because it is a shallow area. For each sampling interval (month or season), transects covered in each area were randomly selected except for area 4, where only 1 transect was available. If selected, adjacent transects were not surveyed because our previous experience observing this species showed that animals could be detected at a distance of at least 400 m (the distance between transects), and overlapping or double sampling on adjacent transects can occur. Each transect was considered a replicate.

Data collection

The 1st 2 mo of standardized sampling were used as a training period, and the data collected during that time were not used in the analyses.

In this period, observers were trained to estimate the radial distance by eye using buoys and boats and to compare them to the distance measured by the pilot using a global-positioning system (GPS). This period comprised the months of Oct. and Nov. 2000, when 41 transects were completed, 143.3 km was covered, and 10 groups were recorded. During the entire study period, the same crew of 4 trained observers was maintained.

During the sampling period, 2 vessels, 5.5 m long equipped with 40- and 60-horsepower outboard engines, were used. Each sampling was conducted with 2 observers positioned at the bow of the vessel; each observer was responsible for scanning at an angle of 90° from the bow, and the pilot was responsible for recording notes. The observers were at an eye-height 2.3 m above the water level. Daily efforts varied depending on the environmental conditions, and samplings were always carried out under sea conditions of

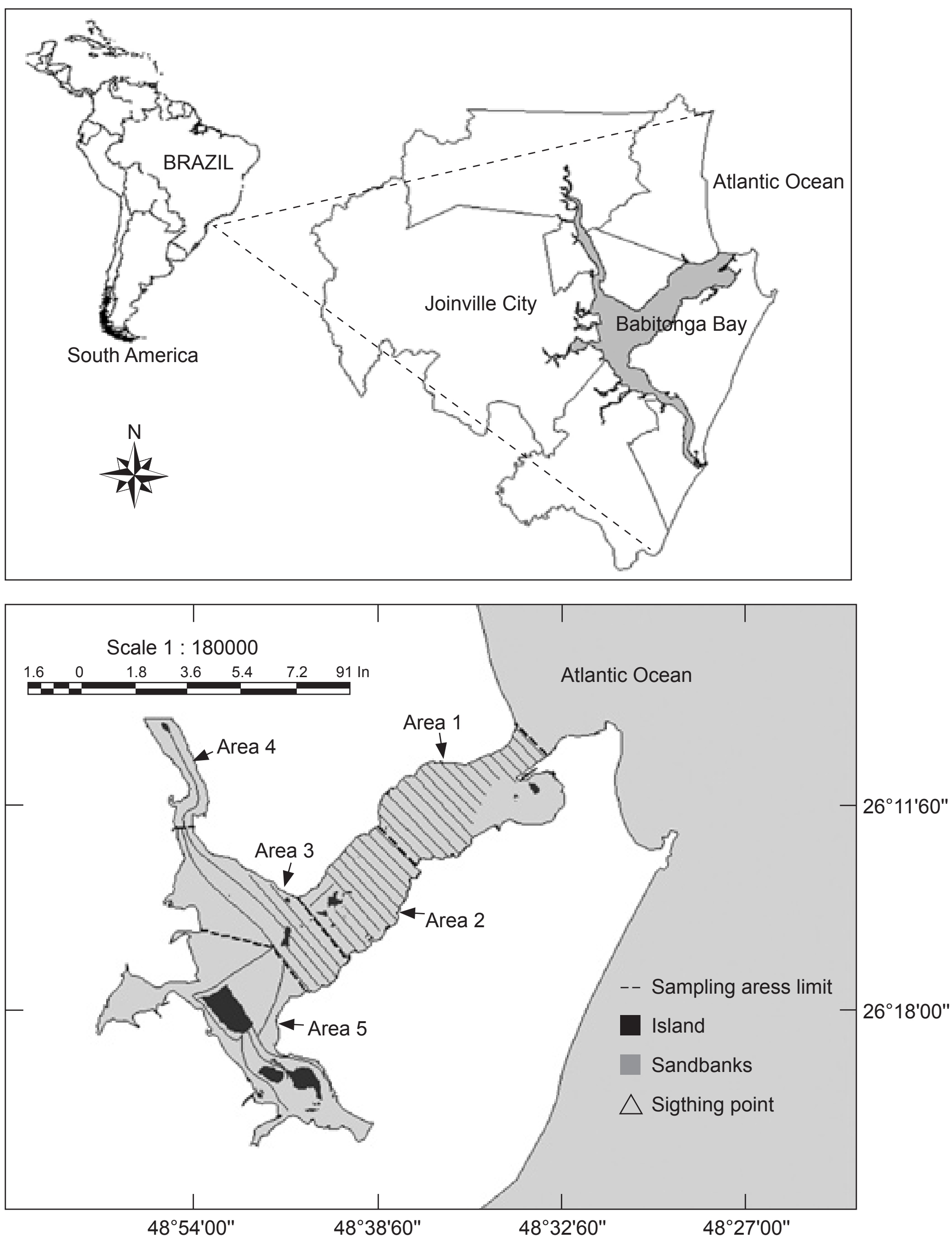

Fig. 1. Location of the study area: Babitonga Bay, southern Brazil (26°02'-26°28'S, 48°28'-48°50'W) and transects projected for distance sampling of the *Sotalia guianensis* population for abundance and density estimates.

Beaufort force 0 or 1. For this reason, samplings were conducted mainly in the morning, when sea conditions were generally better. If the sea conditions deteriorated before completing a transect, sampling was interrupted, and the data were discarded. The cruising speed was maintained at 10-15 km/h, which was monitored using a GPS unit. The boat speed during sampling was faster than the dolphins' maximum speed in the area (7.2 km/h) (Cremer 2000). The sighting angle of the dolphins in relation to the bow was measured using a large protractor positioned at the bow of the boat. The survey was conducted in passing mode as recommended by Buckland et al. (1993); as a consequence, the position registered at each sighting was the boat's position. The radial distance (between the boat and the group) was visually estimated with the naked eye. Systematically (on each sampling day), observers used the GPS to train distance estimations using buoys and small boats as targets. In addition, the time, geographical position (using the GPS), and group size were recorded. Age-class differentiation was not considered due to the difficulty in determining the classes at a distance, which could have resulted in underestimating the number of calves.

Data analyses

Data were analyzed using the program Distance 5.0 Release 2 (Thomas et al. 2006). Outliers were excluded from the analysis to improve the fit of the detection function (Buckland et al. 2001). Estimated radial distances and measured angles of the sightings were used to calculate the perpendicular distance between groups and the trackline using trigonometric relationships. Perpendicular distance data were truncated at 350, 400, and 450 m, respectively, in periods 1, 2, and 3. Thus, we excluded 5.2%, 6.1%, and 2.8% of all observations in each respective period. The detection probability was estimated using a conventional distance sampling approach (Buckland et al. 2001 2004), and the detection function model was selected according to the minimum Akaike information criterion (AIC) (Akaike 1973). Two key functions were tested (half-normal and hazard-rate) without adjustment and with cosine adjustment. The probability of detection along the trackline was assumed to be equal to 1 ($\hat{g}(0) = 1$) during the entire study period, and our ability to achieve this level of detection (Thomas et al. 2002) was considered acceptable, taking into consideration 2 factors that occurred during transect surveys: 1) the reduced speed of the vessel (≤ 15 km/h), and 2) ideal sea conditions (Beaufort scale of ≤ 2). These 2 factors, coupled with the mean immersion time of the species (30 s; see details in Cremer 2000) helped ensure the detection of dolphins along the track-line. Furthermore, the small size of the boat did not hinder the detection of individuals close to the bow. Abundance and density analyses were conducted on data pooled over all areas, and density analyses were conducted for each area separately when the sample size was sufficient.

The distribution of the dolphin population was analyzed by comparing the number of individuals registered in each area using a Chi-squared test (at a 5% significance level). Differences in group sizes between sampling periods were tested using the Kruskal-Wallis test (at a 5% significance level).

RESULTS

During the 3-yr study period, data were collected on 92 d covering 1251.9 km (Table 1). In total, 871 individuals belonging to 163 groups of

Table 1. Field effort applied in line transect surveys carried out during the 3-yr study to determine population estimates of *Sotalia guianensis* in Babitonga Bay, southern Brazil, and the number of Guiana dolphin groups per area in each period. Dc, distance covered; period 1, Dec. 2000-Nov. 2001; period 2, Apr. 2002-Feb. 2003; period 3, Mar.-Dec. 2003

Period	Days	Dc (km)	Number of groups recorded per area					
			Area 1	Area 2	Area 3	Area 4	Area 5	Total
1	42	563.1	7	15	43	0	12	77
2	35	391	3	11	30	0	5	49
3	15	297.8	1	10	22	0	2	35

Guiana dolphins were recorded, including repeated sightings.

Distribution

The population showed a non-random distribution in the bay for the 3 sampling periods (period 1: χ^2 = 37.81, p < 0.05; period 2: χ^2 = 37.12, p < 0.05; period 3: χ^2 = 17.88, p < 0.05). In general, Guiana dolphins were concentrated in area 3 (Fig. 2), and no individuals were recorded in area 4. In period 1 (Dec. 2000-Nov. 2001), dolphins were more widely dispersed, and they were more concentrated in area 3 in period 3.

Group size

Group sizes varied from 2 to 30 individuals (mean, 5.3; standard deviation (S.D.), 5.6; n = 139 groups), and 14.7% of the sightings were of solitary individuals (n = 24). Group sizes significantly varied between sampling periods (Kruskal-Wallis: H = 6.107; *d.f.* = 2; p = 0.0472). The largest groups were sighted in period 2 (Apr. 2002-Feb. 2003; mean, 6.5; S.D., 6.4; n = 49) and the smallest in period 3 (Mar.-Dec. 2003; mean, 3.9; S.D., 4.1; n = 35).

Density and abundance estimates

After data truncation, 73, 46, and 34 sightings were used for the analyses in periods 1-3, respectively. Sightings were grouped at equal intervals of 50 m, varying 6-8 sightings, to fit the detection function. Estimates of density and abundance were obtained for each sampling period by considering the total area of the study. The half-normal model with no parameter adjustment provided the best result among the models examined (Fig. 3).

In period 1, estimates of the population density and abundance were the highest. The population was estimated to be 245 individuals (confidence interval (CI), 142-422; α = 0.05) (percent coefficient of variation (%CV), 27.88), while the density was 1.6 individuals ind./km^2 (CI, 0.9-2.7) (%CV, 26.63). The mean abundances in the 3 sampling periods corresponded to an estimated population of 203 individuals (Table 2).

The highest density of individuals during the 3 periods was always observed in area 3 (3.71, 2.46, and 3.05 ind./km^2, respectively). In areas 2 and 5, the analyses were performed only for periods 1 and 2, corresponding respectively to 0.92 and 1.36 ind./km^2 for area 2, and 2 and 0.8 ind./km^2 for area 5. The low sighting rates in areas 1, 2, and 5 produced elevated CVs, and in some instances, the analyses could not be completed.

DISCUSSION

Distance sampling feasibility

The line transect method using distance sampling carried out on a small boat showed good applicability for obtaining population estimates of *S. guianensis* in estuarine environments, as previously described by Flach et al. (2008b). Line transects with distance sampling has at least 3 important assumptions: (1) all objects in the trackline are detected, or $\hat{g}(0) = 1$; (2) objects do not respond to the observer, so that they are detected at their initial location; and (3) distances and angles are accurately measured (Buckland et al. 2001). We judged that these assumptions were satisfactorily met considering the difficulties of conducting these studies on marine mammals. To address the 1st assumption, we used the same experienced observers during each survey and collected data only under good sea conditions. The low boat speed (≤ 15 km/h), the dolphins' dive time (a mean of 30 s; Cremer 2000), and the visibility provided by the good sea conditions combined for a high probability of detecting all of the dolphins along the trackline.

There were no indications that dolphins approached or avoided the boat during the low-speed survey. Additionally, the bay has intense boat traffic, and it is probable that this population is habituated to the noise (Cremer et al. 2009). In Sepetiba Bay, Flach et al. (2008b) concluded that dolphins were habituated to boat traffic. The behavior of bow riding that is characteristic of some species of delphinids was not observed in *S. guianensis*. Therefore, we believe that the 2nd assumption was satisfactorily met.

The 3rd assumption may be the hardest to meet in studies of marine mammals. Accurate distance measurements on the water are difficult to obtain, and all methods normally applied have some level of bias (Williams et al. 2007). Some methods have been used to improve the estimates, such as binoculars marked with reticules. However, distance estimations with that method require a horizon, and that is not possible in habitats like bays. For our study, we considered

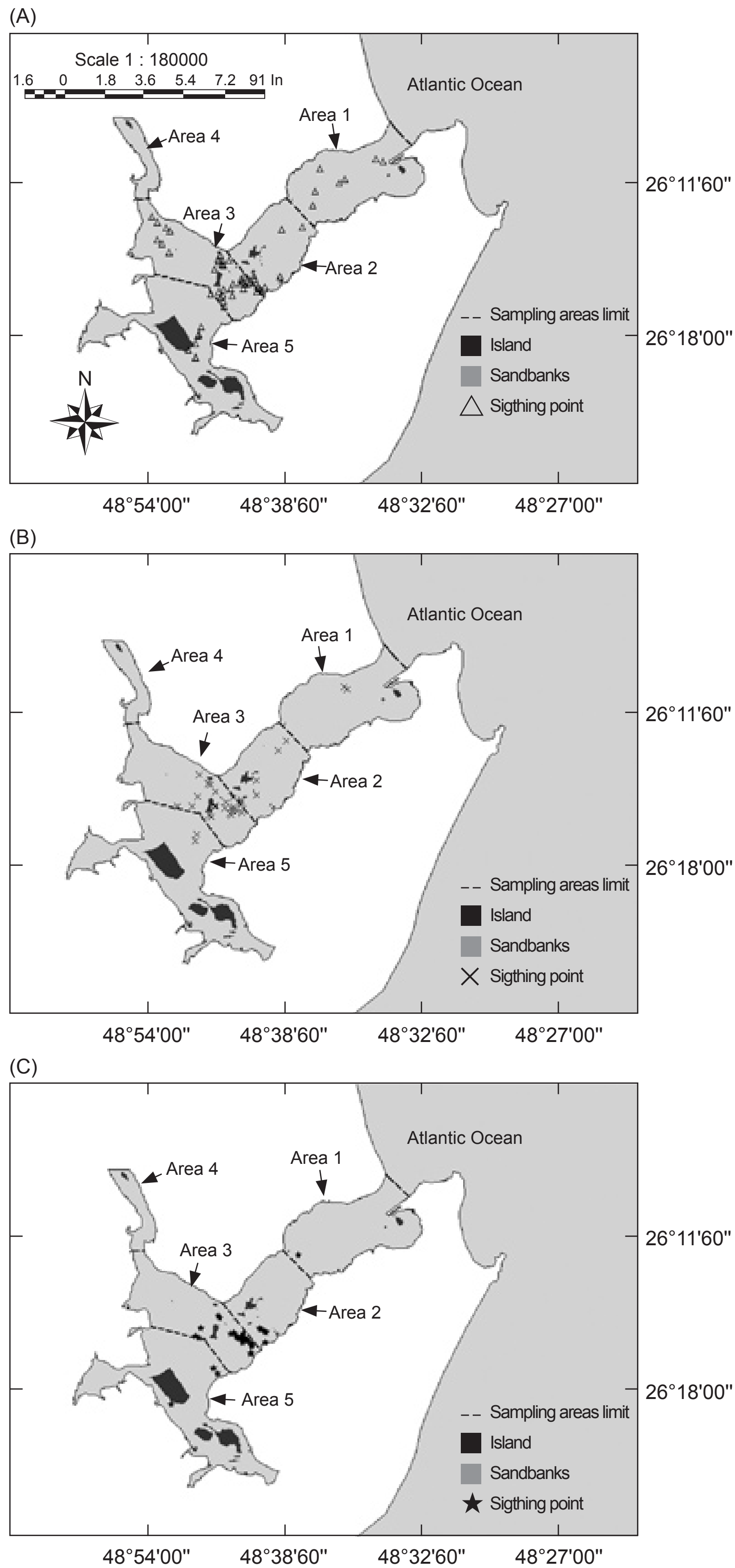

Fig. 2. Locations of *Sotalia guianensis* groups in Babitonga Bay during the line transect surveys. (A) Locations of groups sighted in periods 1, (B) 2, and (C) 3.

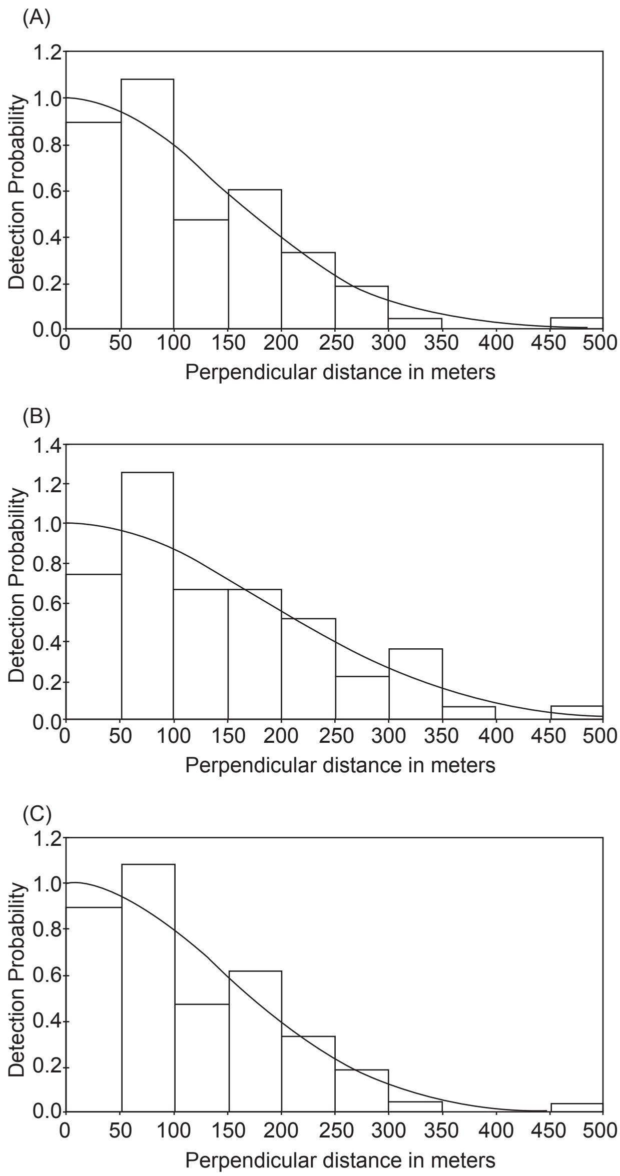

Fig. 3. Frequency distributions of perpendicular distances of sightings of *Sotalia guianensis* groups during line transect surveys in Babitonga Bay. (A) Periods 1, (B) 2, and (C) 3. The curve represents the model that best fit the observed values (Distance 5.0 Release 2 analysis).

that training observers was the most effective way to meet this assumption. We first conducted an experimental survey for 2 mo, and observers were continuously trained at distance estimations along the sampling transects. Angle reading was the 1st measurement to be taken at each sighting, and we considered it precise because we used a large protractor in the bow of the vessel.

The adoption of passing mode was important to avoid biases such as the double counting of groups. The observers' attention to the trackline was not affected by sightings made out of effort as can occur during group approaching. This was possible because the group size was relatively small (a mean group size of 5 individuals) and could be counted with the passing mode, which differs from the case in Sepetiba Bay, for example, where the mean group size was 30 individuals (Flach et al. 2008a).

Group size

The mean group size (5.3 individuals) was smaller than that recorded in past years in Babitonga Bay, when the mean group size was 6.5 individuals (Cremer 2000). Group size in this species fluctuates, ranging 2-29 individuals in the majority of areas in its range (Geise 1991, Edwards and Schnell 2001, Daura-Jorge et al. 2007). Group size can greatly differ along the species distribution, influenced mainly by differences in prey abundance and habitat quality.

Distribution and density

The distribution pattern of *S. guianensis* populations within its range is characterized by the preferential use of some areas (Geise 1991, Edwards and Schnell 2001, Filla 2004, Rossi-Santos et al. 2007, Wedekin et al. 2007), as was observed in this study. The distribution of animal populations tends to be patchy for most species,

Table 2. Parameters of the model used to estimate the density and abundance of *Sotalia guianensis* in Babitonga Bay, southern Brazil, with the program Distance 5.0 Release 2. CV, coefficient of variation; CI, confidence interval. Data are presented as the mean ± the standard deviation

Parameter Period	Estimates			% CV			95% CI		
	1	2	3	1	2	3	1	2	3
Encounter rate (groups/km covered)	0.14 ± 0.03	0.12 ± 0.03	0.13 ± 0.05	22.89	29.18	38.85	0.08-0.22	0.06-0.21	0.06-0.28
Group density (groups/km^2)	0.37 ± 0.09	0.26 ± 0.08	0.25 ± 0.07	25.44	33.06	29.89	0.22-0.61	0.13-0.49	0.14-0.46
Individual (ind.) density (ind./km^2)	1.58 ± 0.44	1.2 ± 0.43	1.15 ± 0.39	27.88	36.24	33.9	0.91-2.72	0.59-2.41	0.59-2.21
Abundance	245 ± 68.3	186 ± 67.4	179 ± 60.6	27.88	36.24	33.9	142-422	93-374	93-44

and the availability of resources is generally an important factor affecting this (Begon et al. 1996). Many environmental parameters (e.g., water temperature, depth, and currents) were analyzed in attempts to explain distribution patterns of cetacean populations (Gaskin 1968, Würsig and Würsig 1980, Au and Perryman 1985, Cañadas et al. 2002, Ingram and Rogan 2002). However, the majority of those authors indicated that the environmental parameters directly affected the prey species and consequently dolphin populations (Wells et al. 1980, Selzer and Payne 1988, Hastie et al. 2004). Furthermore, the heterogeneous distribution of Guiana dolphin populations emphasizes the necessity of stratifying the study area to obtain abundance and density estimates for this species.

Area 1 comprises the channel that connects the bay to the ocean, where ships pass into the harbor. Sightings were rare in this area, and the density analysis was impaired because of the small sample size. Cremer (2000) attributed the dolphins' presence in this area to "in and out" movements of the population. The low abundance of prey items for Guiana dolphins in this area could be another factor involved in their low occurrence, as suggested by Cremer (2007). The population shows a high residence level inside the bay (Hardt 2005), but carcasses were recorded on the beaches outside of the bay (Cremer 2007).

Area 2 comprises part of the central region of the bay, including the inlet of São Francisco do Sul Harbor. Until 1999, this area was intensively used by Guiana dolphins for fishing purposes. Nevertheless, the excessive noise produced by harbor expansion construction probably drove the dolphins from this area (Cremer et al. 2009). Sightings recorded during our samplings were always similar to those in area 3, and densities were estimated to be 0.92-1.36 ind./km^2. During this study, dolphins were never seen near the harbor inlet.

Area 3 is the central region of the bay, and consists of many islands, rocks, and tidal flats, and the high number of groups observed there is probably related to its high fish abundance (Cremer 2007). Of all of the sampling periods, the density of dolphins in this region was the highest, varying 2.46-3.71 ind./km^2. This could be considered the core area of *S*. *guianensis* in Babitonga Bay. A preference of Guiana dolphins for specific areas within their home range was also described for other places, such as Sepetiba Bay (Flach et al. 2008a), Guanabara Bay (Azevedo et al. 2007), and Norte Bay (Wedekin et al. 2007).

Area 4 is strongly influenced by a major freshwater source however, and no groups were sighted there. Cremer (2000) observed some groups in this area in 1997, but since then, dolphins have not been seen there. The reasons for the total abandonment of this area are unknown, although dredging activities that are being conducted in this area near the Cubatão River mouth probably have affected the distribution and availability of the dolphins' prey.

Area 5 is very impacted by industrial and domestic discharges from Joinville City and suffers from a continual silting process (Oliveira et al. 2006). The low quality of this habitat could explain the low number of sightings in this area. Densities estimated for the 1st and 2nd periods were 2 and 0.8 ind./km^2, respectively. This reduction could be a response to the silting process that is growing each year as a consequence of the Linguado Channel enclosure (Cremer 2006). Between 1997 and 1999, *S. guianensis* was more common in this area (Cremer 2000), and its abandonment could be a result of habitat degradation and consequent prey reduction.

Using the strip transect method, Edwards and Schnell (2001) found lower densities in core areas in Cayos Miskito Reserve (0.97 ind./km^2) compared to densities of Babitonga Bay core areas (3.71 ind./km^2). Flach et al. (2008b) estimated a density of 2.79 ind/km^2 for Guiana dolphins in Sepetiba Bay, with a slightly higher density at the entrance (2.91 ind./km^2) than in the interior (2.69 ind./km^2) of the bay. In Paranaguá Bay, densities are considered to be particularly high, with a mean of 11.56 ind./km^2, varying 0.48-19.52 ind./km^2 in different sectors of the estuary. Conversely, in Guaratuba Bay, the density was relatively low, at 0.14 ind./km^2 (Filla 2004).

Abundance estimates

Abundance estimates in the present study correspond to a specific population that occurs throughout the year in Babitonga Bay. Studies carried out in the last 8 yr, which include data from photo-identification (Cremer 2000, Hardt 2005), show high residence levels for this population. Although abundance values decreased over the 3 sampling periods, it was not possible to confirm that the population decreased between 2001 and 2003. Natural variability of population parameters, such as the birth rate and mortality, as well as population movements into and out of the bay, may cause fluctuations in abundances depending on the temporal scale. A longer monitoring period is necessary to evaluate fluctuations in population abundances.

Radial distance estimates made by the naked eye have measurement errors that could be biased upwards by as much as 25% (Williams et al. 2007). Marques and Buckland (2004) found that density could be overestimated due to random errors in perpendicular distance measurements. We considered that our density and abundance estimates could have been somewhat overestimated, and future efforts should be made to improve estimates of distances in the field. According to Williams et al. (2007), the use of reticule binoculars does not necessarily result in more-accurate estimates of distance than does the naked eye, and in habitats such as bays, this method is difficult to apply. The same authors also pointed out that the use of fixed cues may provide the wrong correction factor in distance-estimate experiments. Fixed cues provide observers with a longer opportunity to judge range than observers receive from moving animals, and this could lead to a systematic bias. Improving observer training and assessing the error distribution in distance estimations are key to improving estimates of population abundances.

Thus far, abundance estimates for *S. guianensis* are limited to closed habitats, such as bays, estuaries, and rivers. Using mark-recapture methods with photo-identification data, Pizzorno (1999) estimated a population of 69-75 individuals (95%) for Guanabara Bay, which has an area of 328 km^2. The low quality of Guanabara Bay waters could explain this small population compared to the Babitonga Bay population. In the Cayos Miskito Reserve, Edwards and Schnell (2001) estimated a population of 49 individuals. Those authors considered that large estuaries in South America with abundant freshwater resources may support larger numbers of animals than the small and evenly distributed estuaries in Central America. This is the case for Sepetiba Bay, Brazil, were Flach et al. (2008b) estimated 1269 dolphins in an area of 526 km^2.

In Babitonga Bay, the population of *S. guianensis* is sympatric with a franciscana dolphin *Pontoporia blainvillei* population that also occupies the area year-round (Cremer and Simões-Lopes 2005). This population is much smaller than that of *S. guianensis* and was estimated at 50 individuals (IC, 28-89) (Cremer and Simões-Lopes 2008). There are no further cases of direct sympatry reported in the literature where populations of *S. guianensis* are involved. Only apparently isolated events involving interactions with *T. truncatus* have been registered, and Wedekin et al. (2007) considered that the heterogeneous distribution of Guiana dolphins in Norte Bay could be a consequence of bottlenose dolphin occurrence along the coast.

Differences in density within a habitat reflect the patchy distribution of resources, a common trend for the vast majority of populations (Begon et al. 1996). There is strong evidence that areas of concentration of *S. guianensis* in Babitonga Bay are related to a high ichthyofaunal biomass (Cremer 2007). Likewise, such differences may also reflect the effects of anthropogenic impacts caused by overfishing, habitat degradation, noise pollution, contamination, and accidental capture by fishing nets (Cremer 2000). Filla (2004) attributed the low numbers of individuals recorded in Guaratuba Bay to the intense traffic of boats in the entrance channel.

The Guiana dolphin is considered a common species along the Brazilian coast, but this evaluation of its population abundance can be strongly influenced by the high site fidelity characteristic of the species. Only through continuous monitoring of these populations can we make a proper assessment of the distribution of this species in Brazil.

Acknowledgments: We acknowledge the funding provided by the Fundo de Apoio à Pesquisa from Univ. da Região de Joinville, Joinville, Brazil. We thank Angelita Marcucci and Alexandre Herbst for their help with field activities. P.C. Simões-Lopes was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico, Brazil (CNPq/PQ-II) (process 304698/2006-7).

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