

The breeding birds of Hennequin Point: an ice-free area of Admiralty Bay (Antarctic Specially Managed Area), King George Island, Antarctica

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Recebido em: 13/04/2007. Aceito em: 12/07/2008.

RESUMO: Aves reprodutoras de Hennequin Point: uma área livre de gelo da Baía do Almirantado (Área Antártica Especialmente Gerenciada), Ilha Rei George, Antarctica. Estudamos a comunidade de aves de Hennequin Point, Ilha Rei George, Península Antártica na estação reprodutiva de 2004/2005 e apresentamos uma comparação de nossos dados com dados de Jablonski obtidos em 1978/1979 (Jablonski 1986). Registramos oito espécies que se reproduzem na área de estudo, incluindo: Petrel-do-cabo (*Daption capense*), Alma-de-mestre (*Oceanites oceanicus*), Painho (*Fregetta tropica*), Skua-polar-do-sul (*Catharacta maccormicki*), Skua-sub-antártica (*C. lonnbergi*), Skua-chilena (*C. chilensis*), Gaivotão (*Larus dominicanus*) e Trinta-réis-antártico (*Sterna vittata*). Duas destas espécies apresentaram taxa de crescimento anual positiva: Skua-polar-do-sul (10.33%) e Gaivotão (6.22%); outras três espécies apresentaram taxa negativa: Alma-de-mestre (-1.29%), Skua-sub-antártica (-6.00%) e Trinta-réis-antártico (-2.13%). A abundância total não diferiu significativamente entre os anos analisados ($U = 28.500$; $p = 0.29$), mas observamos alterações qualitativas, por espécie, na abundância e na composição da comunidade de aves em Ponta Hennequin quando comparamos os dados apresentados por Jablonski (1986) e o presente estudo. Estes dados indicam que estudos realizados em intervalos regulares de tempo podem ajudar a entender flutuações populacionais em aves e indicar variáveis ambientais associadas a estas flutuações.

PALAVRAS-CHAVE: aves marinhas, flutuações populacionais, Península Antártica.

ABSTRACT: We surveyed the breeding bird community of Hennequin Point, King George Island, Antarctic Peninsula, in the 2004/2005 breeding season and here we provide a comparison of our data with Jablonski's data collected in the summer of 1978/79 (Jablonski 1986). We recorded eight species breeding in the study area, including: the Cape Petrel (*Daption capense*), the Wilson's Storm-petrel (*Oceanites oceanicus*), the Black-bellied Storm-petrel (*Fregetta tropica*), the South Polar Skua (*Catharacta maccormicki*), the Subantarctic Skua (*C. lonnbergi*), the Chilean Skua (*C. chilensis*), the Kelp Gull (*Larus dominicanus*) and the Antarctic Tern (*Sterna vittata*). Two species showed positive average annual growth: the South Polar Skua (10.33%) and the Kelp Gull (6.22%); three others showed negative average annual growth: the Wilson's Storm-petrel (-1.29%), the Subantarctic Skua (-6.00%) and the Antarctic Tern (-2.13%). The total species abundance did not differ significantly between the analyzed years ($U = 28.500$; $p = 0.29$), but we could observe qualitative alterations in the abundance per species and composition of bird community in Hennequin Point when we compared the data presented by Jablonski (1986) and the data from this study. These data can serve as a basis for studies with regular time intervals to understand the bird population fluctuations and the environmental variables associated to them.

KEY-WORDS: seabirds, populational fluctuations, Antarctic Peninsula.

Southern Atlantic seabird populations began greatly fluctuating around 1980 (Croxall *et al.* 1981, 1984, Jouventin and Wemersbirch 1990, Woehler 1993, Woehler and Croxall 1997) accentuating the need of constant monitoring for management and protection of the living resources of this region (Woehler and Croxall 1997, Favero *et al.* 2000). With the exception of data for penguins, which have been widely studied, data on the breeding distribution and population fluctuations of Antarctic seabirds is very deficient (Croxall *et al.* 1995, Soave *et al.*

2000, Olivier and Wotherspoon 2006). The knowledge and the monitoring of these populations give a general view about the current situation of the species and the communities.

We present detailed information on population abundances and densities of the breeding birds at the Hennequin Point, Admiralty Bay, inside Antarctic Specially Managed Area (ASMA) in the breeding season of 2004/2005. We also provide a comparison of the population abundances recorded in this period with a previ-

ous published study carried out during the summer of 1978/79 (Jablonski 1986).

METHODS

Study area: Hennequin Point (62°07'16"S, 58°23'42"W) is in the east entrance of Martel and Mackellar Inlets; the east of Admiralty Bay, King George Island, South Shetland Islands, Antarctic Peninsula (Figure 1). It has 4.700 meters of coast and 2.36 km² of area, representing 12% of the ice-free area of Admiralty Bay (Rakusa-Suszczewski 1993).

Sampling: The first author (E.S.C.) visited the area during the breeding season of 2004/2005, from 04 December 2004 to 09 February 2005. During this time she counted all breeding pairs of seabirds and recorded their individual nest location (only for *Catharacta* spp.) or breeding areas [Cape Petrel (*Daption capense*), Wilson's Storm-petrel (*Oceanites oceanicus*), Black-bellied Storm-petrel (*Fregatta tropica*), Kelp Gull (*Larus dominicanus*) and Antarctic Tern (*Sterna vittata*)] using a GPS. For Wilson's and Black-bellied Storm-petrels, species that breed in holes or crevices, reported numbers are therefore estimates based on personal impressions: environmental characteristics, individuals flying in the proximity and remains of birds eaten by skuas (Quintana *et al.* 2000).

We recorded the abundance (number of pairs) and calculated the variation in density and in abundance and the average annual growth rate for Wilson's Storm-petrel, South Polar Skua (*Catharacta maccormicki*), Subantarctic Skua (*C. lonnbergi*), Kelp Gull and Antarctic Tern. We calculated the average annual growth rate (Yáñez *et al.* 1984, Quintana *et al.* 2000) using the following formula: $i = \{[(BP_{pr}/BP_{ps})^{1/n}] \times 100\} - 100$ (BP_{pr}, number of breeding

pairs at present; BP_{ps}, number of breeding pairs at past; n, years that passed). We calculated this rate using the population numbers found in the present study and the data collected by Jablonski (1986) in 1978/79. We used Mann-Whitney test to detect differences in the abundances between years.

RESULTS

We recorded eight flying bird species breeding in Hennequin Point: Cape Petrel, Wilson's Storm-petrel, Black-bellied Storm-petrel, South Polar Skua, Subantarctic Skua, Chilean Skua (*C. chilensis*), Kelp Gull and Antarctic Tern. We also recorded other four species (*Phalacrocorax bransfieldensis* – Imperial Shag, *Pygoscelis papua* – Gentoo Penguin, *P. adeliae* – Adélie Penguin and *P. antarctica* – Chinstrap Penguin) only as occasional visitors. Numbers of breeding pairs and comparisons with a previous study in the same area (Jablonski 1986) are provided in Table 1. The abundance of total species did not differ significantly between the years ($U = 28.500$; $p = 0.29$). The detailed area of breeding of the species is shown in Figure 2.

Daption capense – Cape Petrel

We found only five nests of Cape Petrel at Hennequin Point in one breeding area (Figure 2). Jablonski (1986) did not record this species in this area 26 years before our study. According to Novatti (1978), *D. capense* nesting on rocky cliffs or on level rocky ground no further than a kilometer from the sea. We recorded their nests in two rocks separated by five meters and almost two meters from the sea. Fluctuation in the population abundance of this species was not recorded for the study area.

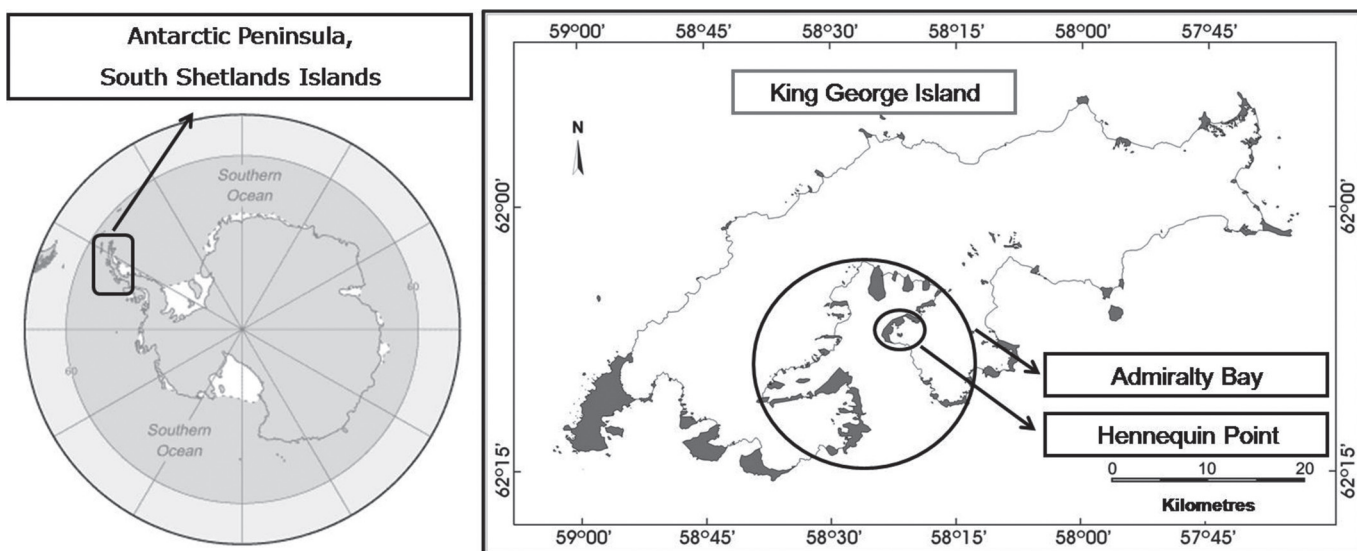


FIGURE 1: Location of Hennequin Point, King George Island, South Shetland, Antarctic Peninsula.

***Oceanites oceanicus* – Wilson’s and *Fregetta tropica* – Black-bellied Storm-petrels**

We estimated a total of 50 pairs of Wilson’s Storm Petrel breeds in five breeding areas (Figure 2). The population was underestimated due to their nocturnal activity habits and the difficulty in counting cavity-nesting species. We estimated ten breeding pairs of Black-bellied Storm Petrel for the whole area. Jablonski (1986) estimated 70 pairs of Wilson’s Storm-petrel and he did not give information on the Black-bellied Storm-petrel. The average annual growth rate for Wilson’s Storm-petrel was negative: -1.29%.

***Catharacta maccormicki* – South Polar Skua, *C. lonnbergi* – Subantarctic Skua, *C. chilensis* – Chilean Skua and mixed pairs**

We recorded 126 pairs of skuas at the sampled area. About 92% were South Polar Skuas and only two pairs of the Subantarctic Skua were found (Figure 2). We identified one individual, very similar to a Chilean Skua, breeding with a South Polar Skua (Table 1, Figure 2). We recorded four mixed pairs of South Polar and Subantarctic Skuas and three mixed pairs of South Polar and hybrid skuas breeding in this area.

Jablonski (1986) recorded only 19 breeding pairs of skuas of which nine pairs were of South Polar Skuas and 10 pairs were of Subantarctic Skuas. He did not record either mixed or hybrid pairs. The average annual growth rate for South Polar Skuas was positive (10.33%), while for the Subantarctic Skua it was negative (-6.00%).

***Larus dominicanus* – Kelp Gull**

We recorded 24 nests in two breeding areas (Figure 2). Jablonski (1986) recorded only five pairs in one breeding area. The average annual growth rate showed that this species is increasing in population size (Table 1). The trend of an increasing population for this species in Admiralty Bay also was recorded by Sander *et al.* (2006). According to these authors the increase in the abundance of this species in Admiralty Bay was about 37.14%. The abundance of this species had increased in some areas of the Bay while other areas had been abandoned (Sander *et al.* 2006).

***Sterna vittata* – Antarctic Tern**

We recorded two nests of this species at one breeding area near the beach, while Jablonski (1986) found seven pairs breeding there. This may indicate a decreasing population size for this species (Table 1). Sander *et al.* 2005 recorded evidences that the population of this species decreased 84.6% in abundance in the Admiralty Bay.

Table 1: Abundance (AB), density (Km²) (DE), variation in abundance (V) and average annual growth rate (i) on the breeding pairs of birds in the Hennequin Point, Admiralty Bay, King George Island, Antarctica. (*Catharacta maccormicki* presents pure, hybrid and mixed pairs, and *C. lonnbergi* occurs in pure and mixed pairs.)

Species/Breeding Station	1978/1979		2004/2005		V (%)	i (%)
	AB	DE	AB	DE		
<i>Daption capense</i>	0	0.00	5	2.12		
<i>Oceanites oceanicus</i>	70	29.66	50	21.19	-28	-1.29
<i>Fregetta tropica</i>	0	0.00	10	4.24		
<i>Catharacta maccormicki</i>	9	3.81	116	49.15	1188	10.33
<i>C. lonnbergi</i>	10	4.24	2	0.85	-80	-6.00
<i>C. chilensis</i> + <i>C. maccormicki</i>	0	0.00	1	0.42		
<i>C. maccormicki</i> + Hybrid	0	0.00	3	1.27		
<i>C. maccormicki</i> + <i>C. lonnbergi</i>	0	0.00	4	1.69		
<i>Larus dominicanus</i>	5	2.12	24	10.17	380	6.22
<i>Sterna vittata</i>	7	2.97	4	1.69	-43	-2.13

DISCUSSION

Of eight flying bird species found breeding in Hennequin Point, five were previously recorded by Jablonski (1986). In the present study we found three new species breeding in the area: Cape Petrel, Black-bellied Storm-petrel and Chilean Skua.

The Cape Petrel, according to Novatti (1978), builds its nests on somewhat vertical rocky walls of different heights close to the sea. We observed the nests on two offshore rocks and they were less than five meters from each other, near the sea.

One individual of Chilean Skua was breeding in a mixed pair with South Polar Skua. The first work that cited hybridization between those species was Reinhardt *et al.* (1997) at Potter Peninsula, King George Island, near Admiralty Bay. According these authors, the individuals similar to Chilean Skuas were hybrids between South Polar Skuas and Chilean Skuas, because they showed a pattern of mitochondrial DNA typical of South Polar Skua. It is necessary to confirm our record using a DNA test.

Only two species recorded by Jablonski (1986), the South Polar Skua and the Kelp Gull, increased in population (Table 1), but the increase did not differ significantly (U = 12.00; p = 0.39). Both are predatory, commensal and opportunistic species that feed on other bird species (Watson 1975). According to Sander *et al.* (2006) the population of Kelp Gulls has remained unchanged in Admiralty Bay since the summer of 1978/79; but at Hennequin Point its average annual growth rate indicates an increase of the 6.22% per year.

Three other species appear to have decreased in abundance and density: Wilson’s Storm-petrel, Subant-

arctic Skua and Antarctic Tern (Table 1). Other studies have shown a similar change for this last species indicating a decrease in their abundance and density (Croxall 1987, Peter *et al.* 1991, ANON. 1993, Coria *et al.* 1996). For the Antarctic Tern, according Woehler and Croxal (1997), the recorded data on the reproductive population of this species can be confused, mainly because the nests are difficult to identify; almost always being camouflaged in the land. To evaluate alteration of the population of this species, detailed and continuous studies are necessary to evaluate if the population really was reduced or only the nests' position in adjacent territories had changed.

The total species abundance did not differ significantly between the analyzed years ($U = 28.500$; $p = 0.29$), but we could observe qualitative alterations in the abundance per species and composition of bird community in Hennequin Point when we compared the data presented by Jablonski (1986) and the present study. These results need to be confirmed with long-term field studies with annual, biennial or tri-annual intervals that provide more detailed information on populational abundances/densities of these birds. This will allow a better evaluation of

the populational fluctuations and their relation to other environmental variables, such as climatic changes, as a way to determine cause and effect for a better comprehension of the system as a whole.

ACKNOWLEDGEMENTS

We thank Davor Vircidibrak and Jason R. Tracker for the English review. The research was supported by the National Council of Scientific and Technological Development (CNPq/UNISINOS 550371/2002-8, coordinator M. Sander), the Secretary of the Inter-ministerial Commission for the Resources of the Sea (SeCIRM) and the Laboratório de Ornitologia e Animais Marinhos da Universidade do Vale do Rio dos Sinos (UNISINOS). This paper uses the partial data of the Master Degree thesis of ESC at UFRJ (2008). The use of this data was authorized by M. Sander, coordinator of the project above mentioned. ESC received a scholarship from Fundação de Amparo a Pesquisa do Estado do Rio de Janeiro (process E-26/100.075/2007) and CNPq/2008; MASA received a CNPq grant (process nº 3027185/03-6) while writing this paper.

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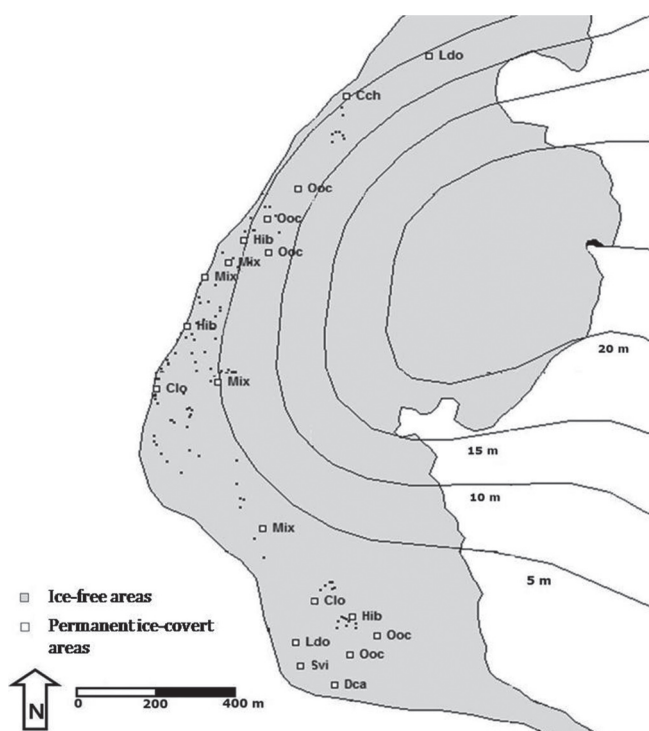


FIGURE 2: Distribution of the bird species breeding in Hennequin Point, King George Island, Antarctica. The white squares indicates the territories of Dca – Cape Petrel (*Daption capense*); Ooc – Wilson's (*Oceanites oceanicus*) and Black-bellied Storm-petrels (*Fregatta tropica*); Ldo – Kelp Gull (*Larus dominicanus*); Svi – Antarctic Tern (*Sterna vittata*); and individual nests of Clo – Sub-antarctica Skua (*Catharacta lonnbergi*); Cch – mixed pair between Chilean Skua (*C. chilensis*) and South Polar Skua (*C. maccormicki*); Hib – mixed pair between South Polar Skua and hybrid individual; Mix – mixed pair between South-Polar Skua and Subantarctic Skua. The black dots indicate the distribution of the individual nests of pure pairs of South Polar Skuas.

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