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Monitoring of birds and pinnipeds on King George Island (South Shetland Islands) in 1989/1990¹

ABSTRACT: In 1989/90, in the region of SSSI 8 situated on King George Island 21 bird species were observed, 12 species were breeding. Dominants were 3 *Pygoscelis* species (19229 pairs). Five species of pinnipeds were noticed. *Mirounga leonina* was most abundant in January (623 individuals), *Arctocephalus gazella* — in February and March (890 individuals), *Hydrurga leptonyx* — in October (39 individuals). The abundance of *Leptonychotes weddelli* was low and rather stable. As a result of mild winter during the study period such birds as *Sterna vittata* and *Pygoscelis adeliae* stayed near their breeding places. The scarcity of *Lobodon carcinophagus* was probably also a result of this mild winter.

Key words: Antarctica, birds, pinnipeds, monitoring.

Introduction

This work is a continuation of the studies on the abundance and phenology of birds and pinnipeds occurring in the SSSI 8 area. Changes in the abundance of these animals in this region were investigated since 1977: birds were studied by Trielpiece and Volkman 1979, Jabłoński 1984a, 1984b, 1986, 1987, Wasilewski 1986, Trielpiece et al. 1987, W.Z. Trielpiece, S.G. Trielpiece and Volkman 1987, 1990 and Sierakowski 1991, and pinnipeds by Myrcha and Teliga 1980, Presler 1980, Woyciechowski 1980, Krzemiński 1981, Jabłoński, Krzemiński and Zdzitowiecki 1987, and Sierakowski 1991.

Such long lasting monitoring studies are of great importance because of quick changes in many species populations, after ceasing their industrial exploitation and undertaking the exploitation of other animal resources in Antarctica, representing the same or neighbouring trophic levels. An example of

¹ This work was done as a part of CPBP 03.03. Project during XIII PAS Expedition to "H. Arctowski" Station in the years 1988–1990 supervised by dr Henryk Gurgul.

the change in the trophic chain was a considerable decrease of the abundance of whales, due to overfishing, what, in turn, resulted in the increase of resources of krill (Starck and Rakusa-Suszczewski 1982), that is also the basic food source for many birds and pinnipeds.

The aim of this study was the investigation of population trends in birds and pinnipeds on King George Island and an attempt to determine factors influencing the abundance fluctuations. The present report contains data from 25 January 1989 to 28 February 1990.

Study area and methods

The surface of SSSI 8, located in the Admiralty Bay region, is about 13 km². The study covered the whole area, and additionally the part of the coast, situated near "H. Arctowski" Polish Polar Station. The segment of the coast

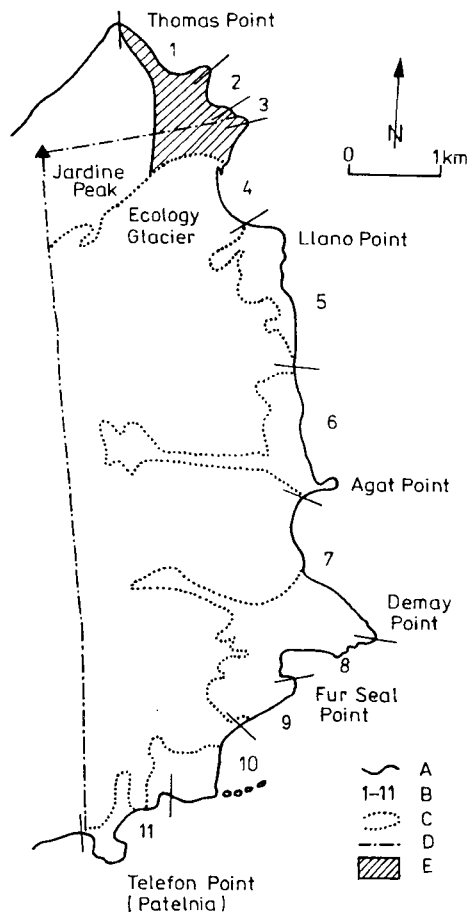


Fig. 1. Study area, division of the coast into sections and the situation of the census plot
 A — coastal line, B — number of successive section, C — borderline of the permanent land ice-cover, D — limits of SSSI 8, E — census plot.

from Thomas Point to Telefon Point (Patelnia) (about 15 km long) was checked; it was divided into 11 smaller sections (Fig. 1). More detailed description of the study area was presented by Sierakowski (1991).

Birds

To determine the changes in bird abundance in non-breeding period (III—X), between Thomas Point and the Ecology Glacier the census plot of an area of about 1 km² was chosen (Fig. 1). A total of 72 countings were carried out, along with pinnipedian countings (2–3 hours for the penetration of the area). In the case of *Chionis alba* individuals ringed with colour rings were checked.

In the SSSI 8 region the localization and abundance of breeding populations of 10 bird species were determined. In November the localization of bird colonies was controlled 3 times. From December to January the whole coast segment was checked 5 times and smaller sections were checked 10 times (mainly from Jardine Peak to Ecology Glacier). The abundance of birds was determined by single counting (*Pygoscelis* spp., *Larus dominicanus*, *Catharacta* spp., *Daption capensis*, *Phalacrocorax atriceps* — December, *Sterna vittata* — November, *Macronectes giganteus* — December/January). Depending on the different density of pairs and on the difficulties in finding the nests different counting methods were applied:

1) the localization of single nests or nests in loose colonies (*Larus dominicanus*, *Chionis alba*, *Catharacta* spp., *Daption capensis*, *Macronectes giganteus*);

2) the counting of nesting penguins in December (*Pygoscelis adeliae* and *P. papua* — at the beginning of this month, *P. antarctica* — at the end of this month). For big colonies (over 500 nests) an estimation method was used. It was based on visual estimation of the surfaces occupied by 10, 50, 100 and 200 pairs, each subsequent evaluation was based on the former one. The surface occupied by 200 pairs was the basic unit for counting;

3) the number of breeding *Sterna vittata* pairs was evaluated by counting of adult birds, flying in spring over the nests and dividing the result by 2.

Pinnipedians

Pinnipedians were counted with different frequency along two sections of the coast. The controls of the longer section (15 km), were performed in the average time span of 20 days. Animals were counted and, when possible, the sex was determined. Similar observations were carried out along the shorter coast section from Thomas Point to Ecology Glacier (Sec. I—IV, about 3 km long; Fig. 1), but here the countings were much more frequent — about every 2 days. During the pack ice presence pinnipedians were registered in the Bay with the help of 20 × 50 field-glass.

Water conditions during the study and the ice cover in the bay

Regular meteorological observations were carried out at "H. Arctowski" Station (Krzywiński and Zapała, unpubl. data); thermic conditions and wind velocity in the study area were determined. Air temperature was relatively high in 1989 and the winter was mild (Fig. 2). During the large part of May–October period the temperature oscillated near 0°C. Admiralty Bay was not frozen and only during a week in the first decade of September

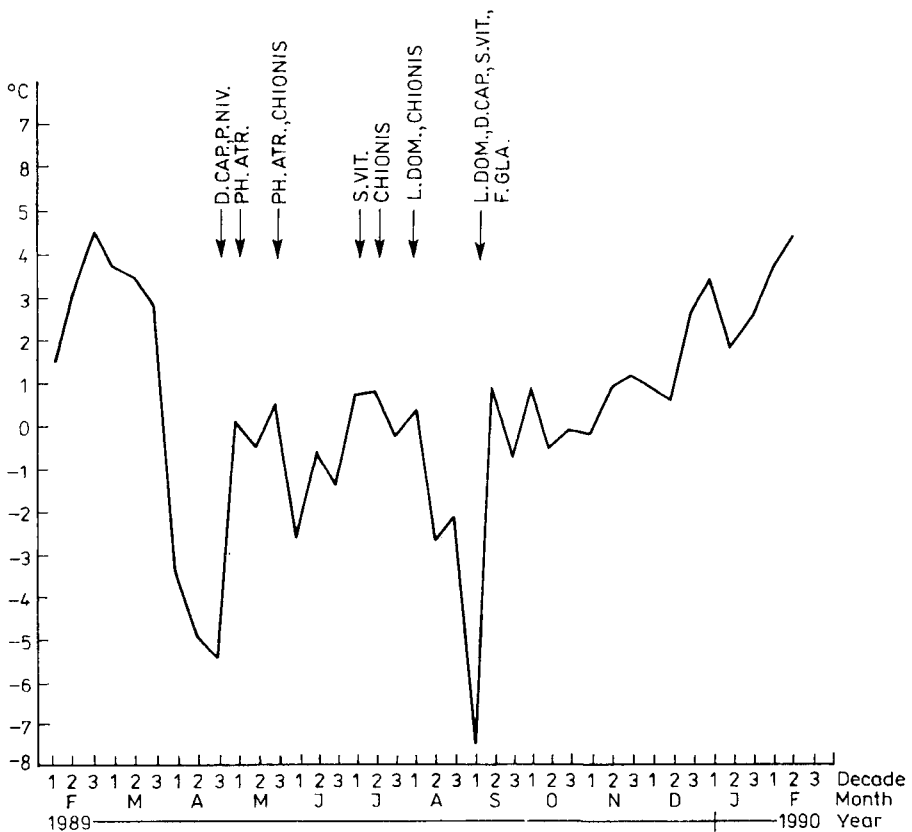


Fig. 2. Average air temperature in decades in the "H. Arctowski" Station region in the investigated period. Arrows indicate the terms of major appearances of bird species from April to September

its surface was covered by dense pack-ice. In other months, only small amounts of the brash ice were noticed, which was concentrated mainly in Ezcurra and Mackellar Inlets, especially in October. On the other hand, the year of the study happened to be windy, with the average day-and-night wind velocity reaching 19.2 m/s, and there were 47 days with the mean wind velocity over 10 m/s.

Results

Birds

In the years 1989 and 1990 in the study area 21 bird species were noted, among them 12 were breeding ones. Information on their phenology and, in the case of breeding species, also the general abundance of the breeding population is presented below (NB — non-breeding species, BM — breeding species with seasonal migration, BS — stationary breeding species; A — date of arrival to breeding places, D — date of departure, TN — total number of the breeding pairs).

1. Adelie penguin, *Pygoscelis adeliae* — (BM), A — 14.09., D — 7.03. In winter few individuals were observed, mainly in June (1 individual from 6 to 8.06) and also in July and at the beginning of August (max. 11 individuals on 24.07); TN — 13965.

2. Antarctic penguin (Chinstrap penguin), *Pygoscelis antarctica* — (BM), A — 14.10., Fur Seal Point (near "H. Arctowski" Station — 22.10), D — 11.04., TN — 2907.

3. Gentoo penguin, *Pygoscelis papua* — (BS). With short, several days lasting breaks, observed in the study area all over the year. In 23–24.08. birds staying for night were counted in section 5 — 2460 individuals, in sections 2 and 3 — 125 individuals, TN — 2357.

4. King penguin, *Aptenodytes patagonica* — (NB). Near Thomas Point on 11.01.1990 one individual was observed by A. Barcikowski. His description of the height of the bird and the shape and colour of the yellow patch behind the eye inclined us to decide that it was *A. patagonica*.

5. Macaroni penguin, *Eudyptes chrysolophus* — (NB). Observed in January and February 1990 from section 2 to section 4, 1 juv. — 1.01., 1 ad. — 5.01., 1 juv. — 17.01., 1 juv. — 1.02., and in section 5 (several observations of 1–3 individuals — W. and S. Trivelpiece — pers. comm.).

6. Southern giant petrel, *Macronectes giganteus* — (BS). The winter population of this species in the SSSI 8 area consisted of about 70 individuals, which stayed on the land mainly near their breeding places (sections 4 and 5), TN — 121.

7. Cape pigeon, *Daption capensis* — (BS). After the breeding period it occurred more abundantly on the whole investigated section of the coast in the middle of April. In the study area from mid April to the end of September the number of individuals observed depended on weather conditions. The negative correlation was observed between the mean number of individuals per one counting in given month (y) and the mean air temperature for this month (x): $r = -0.876$, regression equation describing this relationship: $y = -1.64x + 5.55$, $n = 6$, $p = 0.022$. The maximum of 83 individuals was observed on 3.09. (Fig. 3). TN — about 70.

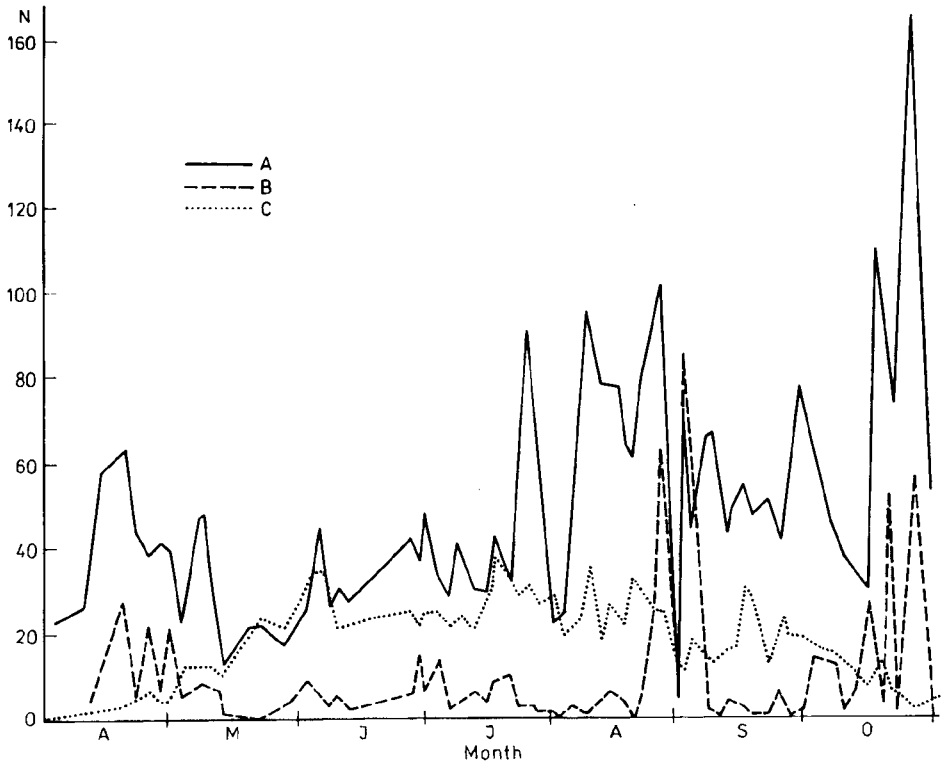


Fig. 3. Changes in the abundance of *Larus dominicanus* (A), *Daption capensis* (B) and *Chionis alba* (C) in the census plot from April to October

8. Snow petrel, *Pagodroma nivea* — (NB). Observed from 20.09. to 21.10. The abundance of this species was rather strongly correlated with the abundance of *D. capensis* ($r=0.623$, $p < 0.001$), although was considerably lower (Fig. 4). In the census plot, on 3.09., 22 individuals of this species were observed.

9. Antarctic petrel, *Thalassoica antarctica* — (NB). Only once over the Bransfield Strait, between Fur Seal Point and Patelnia one individual was observed on 23.02.1990.

10. Antarctic fulmar, *Fulmarus glacialisoides* (NB). This species was observed 5 times over the waters of the bay near SSSI 8 (29.04 — 1 individual, 13.09. — 9 individuals, 14.09. — 1 individual, 3.10. — 3 individuals, 5.02 — 1 individual). On 24.01.1990 one dead specimen was found on the shore near Sphinx Hill (section 6).

11. Blue petrel, *Halobaena caerulea* — (NB). On 3.09.1989 one bird was observed in section 4 in the flock of *D. capensis*.

12. Wilson's storm petrel, *Oceanites oceanicus* — (BM), A — 7.09., D — 1.06.

13. Black-bellied storm petrel, *Fregatta tropica* — (BM), A — 9.09, D — no data.

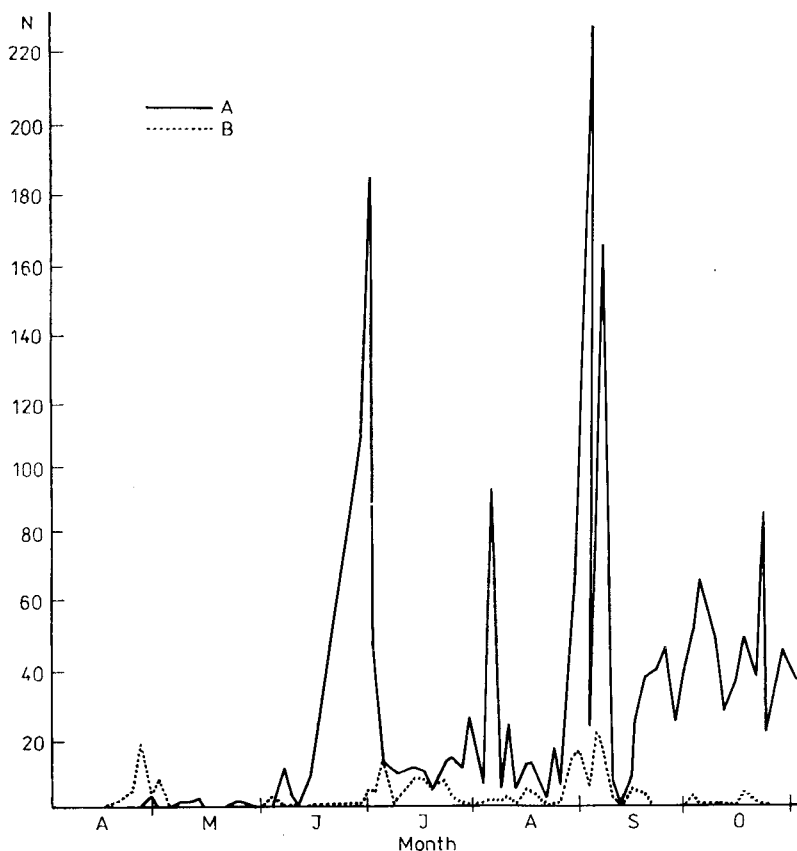


Fig. 4. Changes in the abundance of *Sterna vittata* (A) and *Pagodroma nivea* (B) in the census plot from April to October

14. Black-browed albatross, *Diomedea melanophris* — (NB). It was noticed only twice in February: 12.02.1989 — 1 individual, 8.02.1990 — 1 individual.

15. Black-necked swan, *Cygnus melanocoryphus* — (NB). In 1989, this species was observed a dozen or so times in January and February on the waters of the Bay and ponds near "H. Arctowski" Station; there were usually single individuals but once 3 individuals at a time (6.02).

16. Blue-eyed shag, *Phalacrocorax atriceps* — (BS) (breeding in the Admiralty Bay outside the study area on Shag Island near Vaureal Point). It appeared in the study area regularly all over the year. The biggest flock was observed on 6.06. near section 2 — 155 individuals. The breeding colony localized on Shag Island consisted of 96 nests.

17. Greater sheathbill, *Chionis alba* — (BS). After the breeding period the increase in their abundance and gathering of the flocks near the station took place in the middle of April. The abundance of winter flocks varied from 11 to 38 individuals; on the basis of colour rings with which the birds were ringed

during earlier investigations, it was found that there were 81 individuals at least on the sampling area till the end of October. During the last days of October the abundance of the species rapidly dropped and the breeding population was formed (Fig. 3); TN — 7.

18. Southern black-backed gull, *Larus dominicanus* (BS). The winter flocks of this species near the Station consisted of up to 103 individuals (29.08) (Fig. 3); TN — 47.

19. Antarctic tern, *Sterna vittata* — (BM). Except of the short breaks it was observed all over the year. Only the periods of severe frost caused the birds flying away, e.g. in April (Fig. 4). On the study area two mini-invasions happened: 30.06 — 185 individuals, 3.09 — 230 individuals; TN — 143.

20. 21. South polar skua and brown skua, *Catharacta* spp. — (BM). Both species: *C. lonnbergi* and *C. maccormicki* were counted together because of the difficulties in identification and of the formation of the mixed pairs. A — 15.10., D — 26.04.; TN — 57.

A clear majority of breeding pairs of birds was observed in the northern part of the investigated region (over 80% in sections 1–5, Tab. I).

Table I

The distribution of breeding pairs of birds in different coast sections

Species	Section number						
	1–4	5	6	7–8	9	10	11
<i>P. adeliae</i>	8045	5920	—	—	—	—	—
<i>P. papua</i>	136	2221	—	—	—	—	—
<i>P. antarctica</i>	18	81	—	210	1035	—	1563
<i>Catharacta</i> sp.	31	12	1	2	4	4	3
<i>L. dominicanus</i>	16	9	2	10	1	6	3
<i>S. vittata</i>	6	9	25	40	22	8	33
<i>Ch. alba</i>	2	3	—	1	—	1	1(?)
<i>D. capensis</i>	—	1(?)	—	55	—	15–16	—
<i>M. giganteus</i>	17	104	—	—	—	—	—

It was mainly due to Adelie penguin colony localization; these birds were nesting only near Thomas Point and Llano Point. On the contrary, the number of pairs in the colonies of the Antarctic penguin increased southwards, reaching the highest value in the Patelnia region. *Macronectes giganteus* and *Chionis alba* and *Catharacta* spp. that show a strong trophic relation with penguin colonies, nested the most abundantly in sections 1–5. *Daption capensis* needed the presence of high, nearshore rocky cliffs localized mainly near Demay Point and in Section 10. The smallest differences in the number of breeding pairs between particular sections were characteristic for *Sterna vittata* and *Larus dominicanus*.

Wintering, that means regular presence from May to August was observed for 6 species from those breeding in the study area (*Chionis alba*, *Larus dominicanus*, *Daption capensis*, *Pygoscelis papua*, *Macronectes giganteus* and

Phalacrocorax atriceps). Longer breaks in the occurrence in winter were observed for *Sterna vittata* and *Pygoscelis adeliae*. In the group of 8 non-breeding species only *Pagodroma nivea* was regularly wintering. More abundant appearances of *Daption capensis*, *Pagodroma nivea* and *Fulmarus glacialis* from April to September were connected with longer periods with low air temperatures (Fig. 2).

Pinnipeds

During the study period 5 species were observed: antarctic fur seal, *Arctocephalus gazella*, southern elephant seal, *Mirounga leonina*, Weddell's seal, *Leptonychotes weddelli*, leopard seal, *Hydrurga leptonyx* and crabeater seal, *Lobodon carcinophagus*. In Fig. 2 and in Tab. II the changes of the abundance of these in shorter and longer part of the coast are presented.

Table II

Changes in the abundance of pinnipeds throughout a year along the Admiralty Bay coast from Thomas Point to Patelnia

ES — *M. leonina*, FS — *A. gazella*, WS — *L. weddelli*, CS — *L. carcinophagus*, LS — *H. leptonyx*;
Number of young animals in brackets.

Date	ES	FS	WS	CS	LS
2.02.1989	543	107	7	—	—
13.02.1989	344	150	11	—	—
24.02.1989	174	222	20	—	—
4.03.1989	97	416	24	—	—
16.03.1989	57	458	20	—	—
29.03.1989	103	333	19	—	—
5.04.1989	187	403	10	—	—
21.04.1989	108	47	6	—	—
23.05.1989	29	28	5	—	—
13—14.07.1989*	1	52	28	—	1
26—27.07.1989	47	392	21	1	1
23—24.08.1989*	3	101	11	2	1
19—20.09.1989*	10	216	23(2)	1	—
13—14.10.1989	184(61)	108	9(2)	—	17
9—10.11.1989	146(127)	4	22(3)	—	—
25—26.11.1989	391(78)	—	24(1)	—	—
5—6.12.1989	258(66)	—	16	—	—
26—27.12.1989	519(25)	—	15	—	—
5—6.01.1990	623(11)	2	17	—	—
25—26.01.1990	455	188	12	—	—
22—23.02.1990	201	890	9	—	—

* — only the section from Thomas Point to Demay Point.

Moulting sea elephants were the most abundant in the first part of January, and later their abundance decreased rather quickly; from the end of May till the end of September they were scarce. They appeared again in higher numbers at the end of September, occupying the breeding places. Fully formed harems were

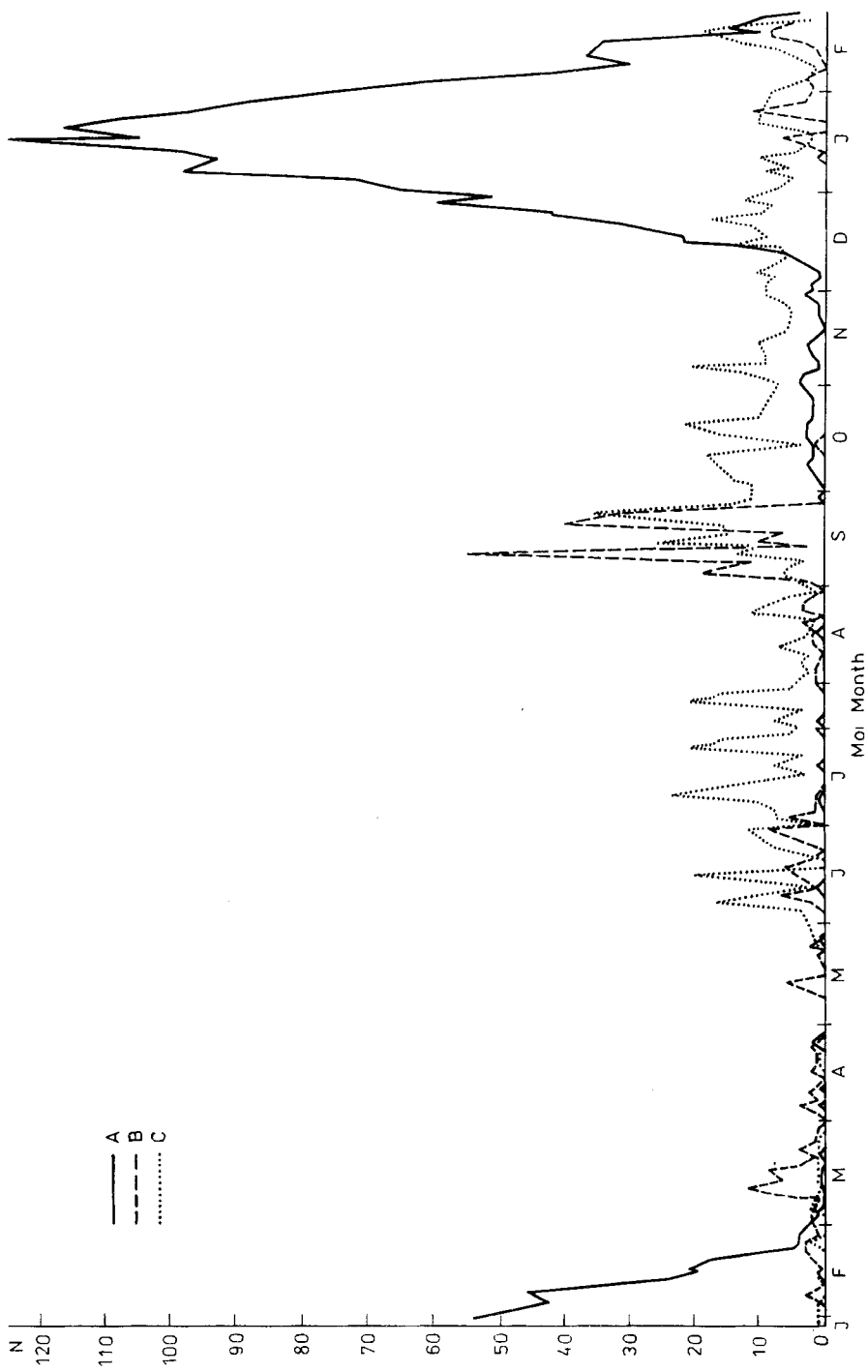


Fig. 5. Changes in the abundance of *Mirounga leonina* (A), *Arctocephalus gazella* (B) and *Leptonychotes weddelli* (C) in the census plot throughout a year

noted in the middle of October; the largest included 75 females (Patelnia). Maximally 355 adult males and 127 young individuals along the whole coast were observed.

In the middle of March a peak of abundance of fur seals was noted. This peak in the shorter section of the coast was less pronounced and the abundance changes in this part of SSSI 8 were not synchronized with the changes of abundance in the southern part. More than 80% individuals of this species were found in sections 8–11. Clear decrease in the abundance of fur seals took place from the end of April till the first days of July. The next abundant appearance was observed in July, and then in the first days of September. In this last case a considerable number of the observed animals stayed on the ice-pack filling the bay during several days. In this period fur seals occurred in places where they were usually rarely observed, for instance on 10.10. near “H. Arctowski” Station there were 55 individuals, and on the ice and on the beaches near Hennequin Point — 320 individuals. At the end of February 1990 a rapid increase in the species abundance up to 890 individuals took place (Tab. II).

Among the observed pinnipedian species the abundance of Weddell's seals was the most stable and low all over the year, usually between 10 and 20 individuals (Fig. 5). Their highest number was noticed during austral winter (July) and from September to November; on the shorter segment maximally 35 individuals (23.09), on the longer — 28 individuals (13–14.07.) were observed. Three deliveries were noticed, the first on 18.09.

In spring and summer in SSSI 8 region there were only single sea leopards; they appeared in higher numbers only in October when 39 individuals near Thomas Point were observed. Small numbers of crabeaters were noted, especially from July to September (Tab. II).

Table III

Comparison of the population abundance for breeding birds in 1988 (Sierakowski 1991) and 1989 (present data) and the estimation of tendencies of changes

Species	Number of breeding pairs		Tendencies of changes in the period 1977–1989
	1988	1989	
<i>P. adeliae</i>	18838	13965	fluctuation and decrease
<i>P. papua</i>	2239	2357	stable
<i>P. antarctica</i>	3353	2907	decrease
<i>M. giganteus</i>	163	121*	increase (?)
<i>Catharacta</i> spp.	38	57	fluctuations
<i>L. dominicanus</i>	52	47	stable
<i>S. vittata</i>	188	143	decrease
<i>Ph. atriceps</i>	83	96	stable
<i>Ch. alba</i>	9	7	decrease
<i>D. capensis</i>	45	70–71	increase

* — nesting pairs were counted in the last phase of eggs incubation and during the hatching.

Table IV

Occurrence of pinnipedians along the investigated coast
In brackets total numbers of individuals observed are given

Species	% of individuals in particular sections										
	1	2	3	4	5	6	7	8	9	10	11
<i>M. leonina</i> (4712)	0.1	4.5	0.3	1.7	2.8	1.4	6.2	12.1	10.0	24.3	36.5
<i>A. gazella</i> (2947)	0.2	1.1	0.2	0.8	1.0	3.4	10.8	13.9	11.6	32.3	28.3
<i>L. weddelli</i> (255)	16.1	6.7	1.6	2.7	5.5	3.9	14.1	10.2	1.6	24.3	13.3
<i>H. leptonyx</i> (19)	89.5	5.3									5.3
<i>L. carcinophagus</i> (3)					+		+				+

A considerable majority of pinnipedians inhabited the southern part of SSSI 8 (sections 8 – 11) (Tab. IV). This was due mainly to the abundant occurrence of *Mirounga leonina* and *Arctocephalus gazella* there. *Hydrurga leptonyx* and *Leptonychotes weddelli* were met relatively often near “H. Arctowski” Station (sections 1 – 2); the first species in autumn, the latter in winter.

Discussion

Sierakowski (1991) presented a summary of the contemporary observation data on the distribution, abundance and phenology of pinnipedians and birds occurring in the region of SSSI 8. This analysis of changes of the above mentioned characteristics concerned the period from 1977 to 1988. The present results of 1989/90 confirmed the majority of trends in changes in the abundance (Tab. III). In some bird species the abundance fluctuations were observed; decrease tendencies were manifested in *Pygoscelis adeliae*, *P. antarctica*, *Sterna vittata* and *Chionis alba* whereas increase tendencies in *Daption capensis* and probably in *Macronektes giganteus*. The abundance of *Catharacta* spp. in 1989 did not differ from that of 1979 (69 pairs) (Jabłoński 1986). In 1988 the number of nesting pairs was 38 (Sierakowski 1991), therefore one can assume that their populations fluctuate insignificantly. The most stable populations in the study area were these of *Larus dominicanus*, *Phalacrocorax atriceps* and *Pygoscelis papua*.

The increase in the abundance in the whole period was observed for *Macronektes giganteus* (Sierakowski 1991), and this tendency was maintained also in the last year of investigations, despite the lower number of breeding pairs noted than a year before. This difference was probably due to the fact that the pairs were counted in the last stage of eggs incubation and at the beginning of hatching, when a part of broods was already destroyed by predators. One can assume that the number of pairs starting breeding was higher.

The results of the observations on wintering birds in the Admiralty Bay region carried out in the years 1988 and 1989 that were so clearly different in their weather conditions (in 1988 very cold winter and freezing of the bay — Sierakowski (1991) — indicate to the substantial importance of this factor in the bird assemblage formation. One can distinguish four groups of species with different reaction to general weather conditions, and especially to the air-temperature changes:

1) regularly wintering, with considerable abundance increases in cold periods until the bay freezes (*Daption capensis*, *Pagodroma nivea*, *Fulmarus glacialisoides*);

2) rather regularly wintering, with abundance increase in warmer periods (*Pygoscelis papua*, *Phalacrocorax atriceps*, *Macronectes giganteus*);

3) rarely wintering and observed more often only during mild winter (*Pygoscelis adeliae*, *Sterna vittata*);

4) staying in winter near Antarctic stations and feeding on remnants; not depending on the stage of the bay freezing (*Larus dominicanus*, *Chionis alba*).

When comparing pinnipedian communities in the SSSI 8 region in different years any significant differences of *Leptonychotes weddelli* and *Mirounga leonina* were noticed (Myrcha and Teliga 1980, Sierakowski 1991), and only in January 1979 the number of moulting sea elephants was higher than in the previous years (Krzemiński 1981). On the other hand the population of *Arctocephalus gazella* showed the abundance increase, which is indicated especially by the data of 1990, when the number of moulting animals considerably exceeded the maximum number found in previous years (781 individuals in 1981 on slightly longer shore segment from Italian Valley to Red Hill — Jabłoński, Krzemiński and Zdzitowiecki 1987). It is worthy of note that in the South Shetland Islands fur seals were totally exterminated in XIX century and even in 60's of XX century in the King George Island this species was not found (Aguayo 1970).

Clear fluctuation in the abundance was observed in the case of *Lobodon carcinophagus*, whose presence strongly depended on the ice cover. In 1980 and in 1988, when Admiralty Bay was frozen over 1500 individuals of this species were recorded (A. Wasilewski — pers. comm., Sierakowski 1991), whereas during mild winters without ice cover (as in 1989) only single individuals were noticed. *Hydrurga leptonyx* was less dependent on this factor, although similarly to the previous species, the majority of individuals used ice pack as a resting place.

Acknowledgments. — Thanks are due to prof. S. Rakusa-Suszczewski for enabling me to take part in the expedition, to prof. J. Pinowski and dr A. Wasilewski for their critical remarks, and to dr H. Gurgul, the leader of XIII Antarctic Expedition for creating a pleasant atmosphere for work. The author is also grateful to his colleagues for their help in the field work, especially to Wojciech Wojtak and Artur Zieliński.

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Streszczenie

W sezonie 1989/90 zbadano rozmieszczenie i liczebność ptaków i płetwonogich w rejonie SSSI nr 8. Stwierdzono 21 gatunków ptaków; 6 spośród nich (*Pygoscelis papua*, *Macronectes giganteus*, *Daption capensis*, *Phalacrocorax atriceps*, *Chionis alba* i *Larus dominicanus*) to formy lęgowe, zimujące na badanym terenie, 7 dalszych (*Pygoscelis adeliae*, *P. antarctica*, *Oceanites oceanicus*, *Fregetta tropica*, *Sterna vittata*, *Catharacta lonnbergi* oraz *C. maccormicki*) to ptaki lęgowe, odbywające sezonowe wędrówki. *Pogodroma nivea* to gatunek niełęgowy, spotykany regularnie zimą, a 7 pozostałych gatunków (*Aptenodytes patagonica*, *Eudyptes chrysolophus*, *Thalassoica antarctica*, *Fulmarus glacialis*, *Halobaena caerulea*, *Diomedea melanophris* i *Cygnus melanocoryphus*) to ptaki niełęgowe, pojawiające się rzadko.

Stwierdzono 5 gatunków płetwonogich: *Mirounga leonina*, *Leptonychotes weddelli*, *Hydrurga leptonyx*, *Lobodon carcinophagus* i *Arctocephalus gazella*. Dwa pierwsze gatunki rozmnażały się na badanym terenie. *M. leonina* najliczniejszy był w styczniu (623 osobników), *A. gazella* w lutym lub w marcu (890 osobników), a *H. leptonyx* w październiku (39 osobników). Najbardziej ustabilizowaną liczebność obserwowano w przypadku *L. weddelli*. Łagodna zima i prawie całkowity brak pokrywy lodowej na Zatoce były przyczyną bardzo nielicznego występowania *L. carcinophagus* (do 10 osobników).