

**SURVIVAL OF AFRICAN PENGUINS  
*SPHENISCUS DEMERSUS* AT DYER ISLAND,  
SOUTHERN CAPE, SOUTH AFRICA**

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**Abstract.**—Breeding African Penguins (*Spheniscus demersus*) have increased at Dyer Island on the south coast of South Africa. Penguins banded as fledglings had a minimum annual survival rate of 69.1%, those banded as juveniles, 71.4%, and those banded as adults, 68.6%. High fledgling survival appears to be the cause of the population increase at Dyer Island.

**SOBREVIVENCIA DE PINGÜINOS (*SPHENISCUS DEMERSUS*) EN LA  
ISLA DYER, AFRICA**

**Sinopsis.**—La población de pingüinos (*Spheniscus demersus*) en la Isla Dyer, Africa, ha incrementado en número. Se anillaron pingüinos a diferentes edades. Aquellos por dejar el nido, tuvieron una tasa de sobrevivencia anual de 69.1%, los juveniles de 71.4% y los anillados como adultos de 68.6%. El incremento poblacional en la Isla Dyer parece estar relacionado al alto grado de sobrevivencia de los pichones.

The total African Penguin (*Spheniscus demersus*) population has decreased in historic times, but breeding birds have increased locally at Dyer Island (33°25'S, 19°08'E; Shelton et al. 1984), on the south coast of South Africa. We present minimal survival figures for African Penguins from Dyer Island, based on recoveries and resightings of fledglings, juveniles, and adults ringed during October/November 1978 and recaptured through 1985.

During October/November 1978, FitzPatrick Institute staff ringed 512 fledglings and 27 juveniles and rebanded 86 adult African Penguins at Dyer Island. The adults, of unknown age when first ringed, were first banded in 1971, following rehabilitation after oiling. The adults were thus at least 7 yrs old when rebanded.

We recaptured banded penguins during subsequent visits to the island, mainly in 1982-1985. These visits totalled 1-3 wks/yr during February, June/July, and November. Recoveries and retraps of penguins from other areas and islands were supplied by the South African Bird Ringing Unit (SAFRING). The limited amount of retrapping on the island, and the inability to retrap the same individuals each year (Table 1) preclude any presentation of accurate survival figures for the population, and these data must be considered as minima only.

To calculate survival, we used a general formula for penguins (Croxall 1981):

TABLE 1. Numbers of banded fledgling, juvenile, and adult African Penguins seen for the first time, and seen in a previous year, for each year after 1978, at Dyer Island.

Age class and number banded in 1978	Recaptures															
	1979		1980		1981		1982		1983		1984		1985		1979-1985	
	1st	>1	1st	>1	1st	>1	1st	>1	1st	>1	1st	>1	1st	>1	Totals	
Fledglings ( <i>n</i> = 512)	5		5	17	1	25	4	8	12	5	6	65				
Juveniles ( <i>n</i> = 27)	2		1	3	3	3	1	1	1	1	1	6				
Adults ( <i>n</i> = 86)	12		6	20	4	36	9	10	13	6	9	97				
Overall	19		12	37	8	64	22	29	36	22	26	168				

$$\phi = \left( \frac{n_x}{n_1} \right)^{1/x}$$

where:  $\phi$  = survival coefficient

$n_1$  = number banded in first year

$n_x$  = number retrapped x years later

The number of recaptured fledglings and adults from 1982–1985, and the number of juveniles from 1983–1985, were used in the analysis of annual survival (Table 1). Only one individual was recaptured in every year between 1981 and 1985, and in 1985, 40% of all penguins recaptured had never previously been recaptured.

Penguins banded as fledglings had an estimated minimal survival rate of 69.1%/yr, based on a 32% survival of first-year birds from St. Croix Island (Randall 1983); and 12.7% of all fledglings have been recaptured alive, compared to 4.7% at Marcus Island (La Cock et al. 1987). The minimum annual survival of birds banded as adults was 68.6% and of birds banded as juveniles, 71.4%. Thirty percent of adults have been recaptured, and 22.2% of juveniles.

Although our estimate of adult survival is a minimum, it is similar to survival (61%: La Cock et al. 1987) obtained from a long-term African Penguin study colony at Marcus Island (33°25'S, 17°58'E), southwestern Cape, South Africa, where the penguin population has been decreasing (Shelton et al. 1984). It is, however, lower than rates for five of six penguin species examined by Croxall (1981).

There is no evidence of movements of African Penguins to Dyer Island from the west coast of South Africa (Randall et al. 1987), and adult survival is similar in both areas, so higher fledgling survival, rather than immigration, appears to be the cause of the population increase at Dyer Island.

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