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PART 6

**CONSERVATION BIOLOGY**

## **The Impact of the fur seal industry on the distribution and abundance of Cape fur seals *Arctocephalus pusillus pusillus* on the Eastern Cape coast of South Africa**

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### **ABSTRACT**

The present paper provides a review of the former distribution and abundance of Cape fur seals, *Arctocephalus pusillus pusillus*, off the Eastern Cape coast of South Africa based on available historical records. It identifies the distribution of Eastern Cape seals before commercial sealing began; documents sealing activities off the Eastern Cape coast during the 19th and 20th centuries, and discusses current population trends in relation to past exploitation regimes. The importance of the Eastern Cape population is discussed in relation to the total population. Cape fur seals were valued primarily for their fine quality furs. Other products included oil from the blubber; leather from skins of old seals; and vitamin A from the liver. Exploitation by Europeans began near the Cape of Good Hope in 1610. By the end of the 19th century more than 20 colonies had been extirpated. On the Eastern Cape coast, Cape fur seals inhabited six islands in Algoa Bay (Stag, Seal, Black Rocks, St. Croix, Jahleel and Brenton) and two sites in Plettenberg Bay (Seal Point on the Robberg Peninsula and Beacon Island). Soon after British settlement of Algoa Bay in 1820, the St. Croix and Bird Islands were leased to individuals by the governor of the Cape Colony (Lord Charles Sommerset) at an annual rental, for fishing and sealing purposes. More than 18 000 seals were killed by commercial sealers in Algoa Bay between 1822 and 1825; > 2 935 between 1831 and 1850; c. 3 516 between 1851 and 1876; > 1763 in 1907 and 1908; and > 500 between 1943 and 1949. Harvest figures for Plettenberg Bay are unknown. Available evidence suggests that seals had been extirpated from St. Croix, Jahleel and Brenton Islands in the late 1850s; Seal Point between 1857 and 1890; Stag Island in the mid/late 1800s; Seal Island in the early 1900s; and Beacon Island in the late 1800s/early 1900s. Black Rocks was the only colony on the Eastern Cape coast to survive commercial sealing operations. Access to Black Rocks is difficult and for that reason sealing activities were irregular. Sealing operations on Black Rocks were terminated in 1949. At present, Black Rocks supports c. 700 seals. In the last 12 years (1986–1997) the population has decreased by 82%. By destroying seal herds through commercial harvesting, and confining the population to Black Rocks, the population is unable to build up its numbers sufficiently to stimulate colonisation on neighbouring islands. Limited space for breeding seals on Black Rocks, and the influence of storms (gale force winds and high swells) restricts the number of pups that can be reared successfully. It is unlikely that the Black Rocks population can increase quickly enough to flow onto Seal and Stag Island, without being depleted by storms. The effect of man on the Seal, Stag and Black Rocks population is therefore a permanent one. Approximately 23 000 Cape fur seals may have occupied the Bird Island group before European exploitation. The current population for the Eastern Cape coast is considerably less than its historical size.

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## INTRODUCTION

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Fur-seal harvesting is one of the oldest 'fisheries' in South Africa. The first known commercial sealers were the Dutch who killed *c.* 45 000 Cape fur seals near the Cape of Good Hope in 1610 (Hart, 1957; Shaughnessy, 1984). Soon after European settlement of the Cape in 1652, most of the seals in and around Table Bay were destroyed (Rand, 1950, 1972; Shaughnessy, 1984). In the late 18th and early 19th centuries operations intensified when British and American sealers began to exploit west coast seal herds (Morrell, 1832; Allen, 1899; Rand, 1950, 1972; Best & Shaughnessy, 1979; Shaughnessy, 1984). By the turn of the 20th century, Cape fur seals were almost exterminated (Anonymous, 1907). At least 23 seal colonies had been destroyed; population size of the Colonial Islands (islands of the former Cape Colony) was reduced to *c.* 20 000 (Anonymous, 1907; Shaughnessy, 1984).

The first legal protection was afforded to Cape fur seals in 1893 (ARGGI, 1894). Numbers have increased greatly since the 1940s; a response of a species recovering from over-exploitation (David, 1995). Today, 1.5 to 2 million Cape fur seals breed at 25 colonies distributed from Black Rocks (Algoa Bay) on the south-east coast of South Africa, to Cape Cross (Namibia) (Butterworth & Wickens, 1990). In 1990, seal harvesting in South Africa was suspended indefinitely, pending further research. The last harvests took place in 1989 (Wickens *et al.*, 1991). Harvesting continues in Namibia.

Knowledge of past exploitation regimes can be useful when analysing the current distribution and abundance patterns of animal populations. Currently, detailed information on the commercial exploitation of Cape fur seals is only available for seven colonies off southern Africa: Hollams Bird, Long, Albatross, Sinclair and Elephant Islands on the west coast; Seal Island in False Bay and Seal Island in Mossel Bay on the south coast (Shaughnessy, 1982, 1984). The extent of sealing operations on the Eastern Cape coast and its impact on the population is not known (Ross, 1971; Rand, 1972; Shaughnessy, 1982).

The present paper provides a review of the former distribution and abundance of Cape fur seals off the Eastern Cape coast of South Africa based on available historical records. It identifies the distribution of Eastern Cape seals before commercial sealing began; documents sealing activities off the Eastern Cape coast during the 19th and 20th centuries, and discusses current population trends in relation to past exploitation regimes. The importance of the Eastern Cape population is discussed in relation to the total population.

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## MATERIALS AND METHODS

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### Historical records

Historical information on the distribution of Eastern Cape seals was obtained from reports compiled by

ships' captains, shipwrecked sailors and sealers, i.e., early sighting data. Historical information concerning sealing operations, island lease, protective legislation and skin exports, was obtained from *Records of the Cape Colony* (1812–1831); *The Cape of Good Hope Blue Books* (1821–1884); *The Cape of Good Hope Almanacs* (1830–1886); *The Eastern Province Herald* (1845–1909); *Annual Reports for the Government Guano Island* (1857–1951); The Bird Island Lighthouse Logbook from 1881 to 1967 (unpubl.); *The Cape of Good Hope Statistical Registers of the British Colonial Office* (1886–1909); *Official Year Book of the Union of South Africa and of Basutoland, Bechuanaland Protectorate, and Swaziland* (1910–1953); and The Daily Diaries of Mr. D. B. Price, formerly Chief Inspector, Government Guano Islands Division, 1938 to 1972 (unpubl.). Skin export records were used as a minimum estimate of harvesting. Total harvest figures are not known, i.e., some skins were unsuitable for export; a small percentage of skins were sold locally.

### Estimate of seal numbers on the Bird Islands, Algoa Bay, before commercial exploitation began

The Birds Islands of Algoa Bay comprise Bird, Seal, Stag and Black Rocks. The number of Cape fur seal pups that occupied the Bird Island group before commercial sealing began was estimated following methods described by Crawford and Best (1990). Mean pup density was assumed to be *c.* 0.53 pups/m<sup>2</sup>, based on mean pup counts calculated from six well established seal colonies off South Africa for which surface areas were available (Crawford & Best, 1990). Assumed pup density was multiplied by surface area measurements of the Bird Islands taken from Rand (1963, 1972). The estimated number of pups derived from this calculation was then multiplied by five to obtain an estimate of the total population (Wickens & Shelton, 1992). Original colony area included the whole above-water area, minus areas in which seals were not likely to occur, i.e., probable seabird nesting sites on Seal and Stag Island.

### Pup mortality in relation to storms at Black Rocks, Algoa Bay

For this study, a weather station was established on Bird Island *c.* 1 km east of Black Rocks seal colony. Weather (including wind speed and direction) and estimated swell height were recorded three times daily (0800 hrs, 1400 hrs, 1800 hrs) by two observers. Wind speed and direction were measured using a pressure plate anemometre. Environmental observations were recorded over four pupping seasons (i.e., November and December) from 9 December 1992 to 31 January 1996. Observations continued until the end of January because during the first 1–2 months of life, seal pups are subject to considerable risk of being washed from the rocks

during storms. Cape fur seal pups cannot swim proficiently until they are several months of age.

Observations of the number of pups that stranded (dead or alive) on the mainland between Port Elizabeth and Port Alfred, and on neighbouring Bird Island, were recorded during two pupping seasons from 9 December 1992 to 31 January, 1993; and 1 November 1993 to 31 January 1994. The relationship between the frequency of storms and the number of stranded pups was examined. In the present study, a storm is defined by peak wind speeds greater than 30 knots (1 knot = 1.852 km/hr).

## RESULTS

### Sealing operations

Cape fur seals were valued primarily for their fine quality furs (Fig. 10(a).1). Other products included blubber oil; meat; leather from the skins of old seals; and vitamin A from the liver (Green, 1955; Shaughnessy, 1981; David, 1995). Frozen carcasses have been sold to Japanese crab fishermen as bait; dried carcasses have been used for poultry feed, and genitalia have been dried and sold in powdered form to the Far East as an aphrodisiac (Green, 1955; David, 1995).

Early sealers hunted animals opportunistically; they invaded rookeries throughout the year and slaughtered animals irrespective of sex and age class. Bulls were shot with a small-calibre rifle, whereas pups were killed by a blow to the head with a heavy club. By killing pregnant females and disturbing herds during the breeding season, many herds were destroyed. It was not until the establishment of formal legal authority over sealing (1893) that harvest

was conducted in a more enlightened fashion, i.e., kills were mostly restricted to pups and bulls (Shaughnessy, 1982).

Winter harvest (June–September/October) was directed at first-moult animals aged between 6.5 and 10.5 months (Shaughnessy, 1982). At this stage of development, the black natal coat has been replaced with a high quality pelt that is greyish-brown dorsally with pale throat and darker belly. The underfur has reached its greatest length and the hide is free from scars (King, 1983). A small number of sub-adult and adult seals were included in the Winter harvests (Shaughnessy, 1982).

Summer harvest (late October to early December) was generally directed at adult males, commonly referred to as wigs (Shaughnessy, 1982). Wigs were targeted primarily for their blubber oil (train). Their battle scarred hides were of little commercial interest. In the early months of Summer, wigs are in prime breeding condition; oil yield is high and they are easily approached by the sealers (Rand, 1952).

### Seal islands of the Eastern Cape coast

#### *The seal islands of Algoa Bay*

There are two island groups within Algoa Bay; the Bird Island group (Bird, Seal and Stag Islands; Black Rocks), and the St. Croix Island group (St. Croix Island; Jahleel and Brenton islets) (Fig. 10(a).2; Table 10(a).1; Appendix 10(a).1a–d). With the possible exception of Bird Island, these islands were once home to numerous seals. At present, Cape fur seals are restricted to one breeding colony; Black Rocks in the Bird Island group.



Fig. 10(a).1 Cape fur seals killed by government sealers for their fine quality furs (photograph compliments of the Government Guano Islands).

Soon after 'knock-down', skins were removed from the carcasses to prevent the fur slipping from the hide through overheating. Furs were then washed thoroughly; spread over a beaming board and excess blubber removed; washed and salted; piled on top of each other and cured for 6–10 days; re-salted and packed into brine soaked casks for export (Jackson, 1925; Cross, 1928).

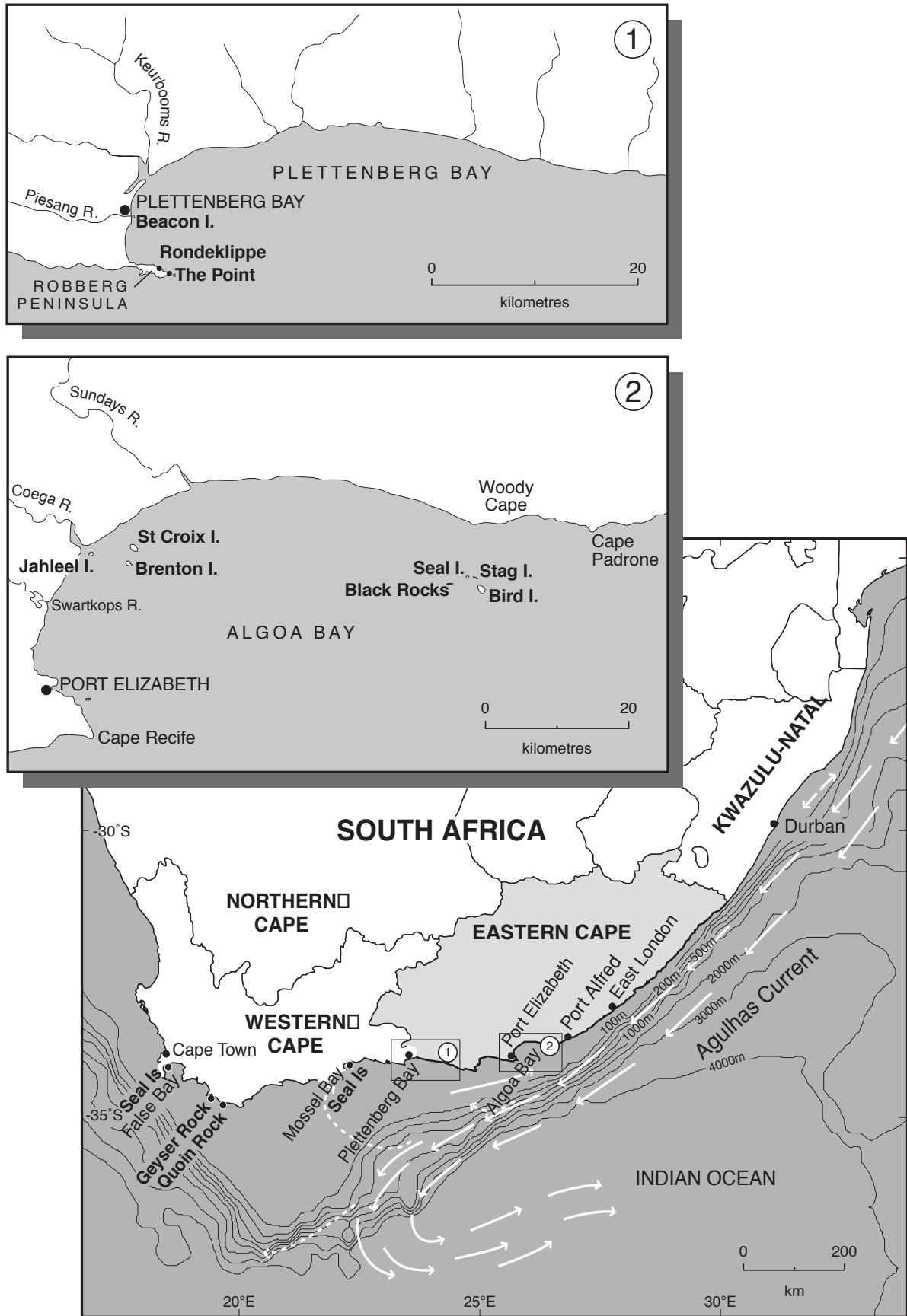


Fig. 10(a).2 The distribution of Cape fur seals along the Eastern Cape coast of southern Africa.

Before exploitation by Europeans, Cape fur seals inhabited six islands in Algoa Bay (Stag, Seal, Black Rocks, St. Croix, Jahleel and Brenton) and two sites in Plettenberg Bay (Seal Point on the Robberg Peninsula, and Beacon Island).

Table 10(a).1 Cape fur seal colonies on the Eastern Cape coast of South Africa indicating locality and present population status

Seal colony	Locality	Cape fur seals
<b>ALGOA BAY</b>		
<b>Bird Island Group</b>		
Bird Island	33° 50.67'S, 26° 17.34'E	unknown <sup>a</sup>
Stag Island	33° 50.00'S, 26° 17.00'E	extirpated
Seal Island	33° 50.00'S, 26° 17.00'E	extirpated
Black Rocks	33° 50.25'S, 26° 15.87'E	breeding colony (c. 710 seals in 1997)
<b>St. Croix Island Group</b>		
St. Croix Island	33° 47.93'S, 25° 46.25'E	extirpated
Jahleel Islet	33° 49.08'S, 25° 45.90'E	extirpated
Brenton Islet	33° 48.33'S, 25° 42.30'E	extirpated
<b>PLETTENBERG BAY</b>		
Beacon Island	34° 03.62'S, 23° 22.83'E	extirpated
Robberg Peninsula		
(a) Cape Seal	(a) 34° 06.45'S, 23° 24.76'E	(a) extirpated
(b) Rondeklippe	(b) 34° 06.07'S, 23° 23.96'E	(b) non-breeding colony (48–67 seals in 1996; highly variable)

<sup>a</sup> Available data (e.g., survivors of the shipwrecked *Doddington* in 1755) suggest that seals were not present on Bird Island historically (Webb, 1763; Temple, 1900–1902).

[Note: there is a breeding colony at Mossel Bay (Seal Island) just beyond the western boundary of the Eastern Cape coast].

The following extracts provide evidence that Cape fur seals inhabited Seal, Stag, Black Rocks, St. Croix, Jahleel and Brenton Islands historically:

In 1575, the king of Portugal (King Sebastian) selected Manuel da Mesquita da Perestrello to conduct a detailed survey of the Cape coast. January 1576, Perestrello anchored in Algoa Bay and named it *Baia des Lobos* (=Bay of wolves [seals]) (Raven-Hart, 1967). Perestrello chose the name because of the great number of seals that he found there.

On July 17, 1755, the ill-fated vessel *Doddington* was shipwrecked off Bird Island. Records of the ordeal, kept by the First Mate Evans Jones (Temple, 1900–1902) and Third Mate W. Webb (Webb, 1763), indicate that seals inhabited Seal and Stag Islands, and were occasionally found on Bird Island.

Captain P. Hornby, of the his majesty's ship *Stag*, charted the Bird Islands in March 1814. In a letter to his superior (Vice Admiral Tyler), Hornby noted: "*the islands abound with seals, which may be killed with ease*" (RCC, Oct 1812–Apr 1814). An account of this voyage was published by Temple (1900) which confirmed that seals were present on Seal and Stag Island, and Black Rocks: "*Bird Island is the easternmost of them and is of round form and about a quarter of a mile in extent...myriads of birds, particularly gannets and penguins, covered the isle. The next about half a mile in length, called Seal Island, and the third called Stag Island, with Black Rocks that extend from it to the westward were all covered by seals*".

In 1820, Admiral Fairfax Moresby observed numerous seals on St. Croix, Jahleel and Brenton Islands: "*These islands are inhabited by immense numbers of seals, which at times literally cover their surface*" (Moresby, 1972).

### *The seal islands of Plettenberg Bay*

The writings of early travellers to Plettenberg Bay indicate that seals once inhabited the point of the Robberg Peninsula (i.e., Cape Seal), and Beacon Island. At present, Cape fur seals are restricted to one non-breeding colony, Rondeklippe, on the eastern side of the Robberg Peninsula between Grasnek and Witsand (Fig. 10(a).2; Table 10(a).1).

The following extracts provide evidence that Cape fur seals inhabited the Robberg Peninsula and Beacon Island historically:

In 1488, Duarte Pachecko Pereira accompanied Portuguese navigator, Bartholomeu de Novaes, on part of his homeward voyage from the Eastern Cape coast of Africa to Portugal. During this voyage, they sailed into a bay which they named *Bahia das Alagoas* (=the Bay of the Lagoons [Plettenberg Bay]) (Storrar, 1978). Pereira noted that there was a small islet (Beacon Island) in *Bahia das Alagoas* where many seals and seabirds lived (Storrar, 1981).

In July/August 1630, a Portuguese ship *San Gonzales* was shipwrecked off Plettenberg Bay (formerly *Bahia Formosa* = the Bay Beautiful). Records of the ordeal indicate that seals were abundant on Beacon Island. Soon after the ship was destroyed, the survivors (c. 100) began to construct two small vessels. Numerous seals were killed on Beacon Island in the construction of these vessels, i.e., for tar they used benzoin mixed with incense and seal oil (Raven-Hart, 1967; Storrar, 1977, 1978).

In March 1816, reverend Latrobe referred to a colony of seals on Beacon Island opposite the mouth of the Piesang River, Plettenberg Bay (Ross, 1971).

In August 1833, Captain Harker, the Government Resident of Plettenberg Bay, estimated that there were 3 000 seals on the Robberg Peninsula. However, in that same year, businessman George Rex, noted: "As for the seal fishery, in one season from September to March 146 seals were taken at Robberg, all males...Harker said he had seen 3 000 on Robberg...but other people have never seen more at a time than 200 to 300. He proposed killing no more than 1 500 in a season, leaving the remaining 1 500 to breed, but having hitherto caught none but males, it would seem that it is not their breeding place"(Metelerkamp, 1955).

### Nineteenth century sealing: Algoa Bay

Soon after British settlement of Algoa Bay in 1820 (Chase, 1967, 1969), the St. Croix and Bird Islands were leased to individuals by the governor of the Cape Colony (Lord Charles Sommerset) at an annual rental, for fishing and sealing purposes (RCC, Apr–Jun 1825, Feb–Jun 1826, Dec 1827–Apr 1831;

CGHBB, 1831; ARGGI, 1886). In 1822, more than 17 000 seals were killed on the Bird Islands (Table 10(a).2). Large numbers of seals were also taken from the St. Croix Islands (Settlers, 1823; RCC, Jun–Aug 1825; Moresby, 1972). Estimated population size before European exploitation would have exceeded 20 000 (present study).

The first shipment of seal skins, from Port Elizabeth (Algoa Bay) direct to London, was reported in 1831 (Chase, 1967). In 1833, regulations were introduced to ban foreign vessels (non-British) from sealing (and whaling) in the Cape settlement over which her British majesty had sovereignty (ALMANAC, 1833, 1837, 1842). Seal skins and blubber oil were required to be declared as British takings in order to be admitted to England (ALMANAC, 1835, 1851). Seal skins were exported regularly from Port Elizabeth until 1876, with a minimum of 2 935 skins exported between 1831 and 1850; and c. 3 516 between 1851 and 1876 (Table 10(a).3, 10(a).4). The average number of seal skins exported during this period was c. 150 per year. A maximum of 681 skins was exported in 1835.

Eyes witness accounts of seals on the Bird Islands indicate that seals remained on Black Rocks throughout the 1800s, but were greatly reduced on both Seal and Stag Islands (CGHBB, 1853–1859; Graham's Town Journal, 12 June, 1834; Pinchin, 1871; EPH, 27 September, 1878). There is evidence to suggest that Seal and Stag Islands were possibly devoid of seals during the late 1850s, 1860s and 1870s (CGHBB, 1859; Pinchin, 1871). The Stag Island population was presumably extirpated in the mid to late 1800s. During the early 1900s, Stag island was used for deblubbering, preservation of pelts and oil-extraction (UGGI files; Rand, 1972).

Table 10(a).2 Minimum number of Cape fur seals killed on the islands of Algoa Bay (Eastern Cape coast of South Africa) between 1822 and 1825

Date	Island	Name of sealer	No. seals killed <sup>a</sup>	Source
Jan 1822 to Jan 1825	St. Croix Islands	Deal Party (Charles Gurney and his team from Deal England)	NR	1
1822	Bird Islands	James Saunders King (former British naval officer)	c. 3 000	2
27 June 1822 to 27 June 1825	Bird Islands	Frederick Korsten (former Dutch naval officer)	14 000 <sup>b</sup>	3, 4
12 Dec 1823 to 9 Jan 1824	St. Croix Islands & Bird Islands	Master John Alexander (unlicensed sealer)	1 232	4

NR, not recorded.

<sup>a</sup> Minimum number of seals killed.

<sup>b</sup> 14 000 seals were killed on the Bird Islands by Korsten in a single season.

1. Settlers (1823); 2. RCC (Oct 1824–Feb 1825); 3. Chase (1969); 4. RCC ( Jun–Aug 1825).

Table 10(a).3 Annual rental of the Algoa Bay islands and the minimum number of Cape fur seal skins exported from Port Elizabeth between 1830 and 1850. Percentage of total exports from the Cape Colony is given in brackets (see Appendix 10(a).2).

Year	No. of skins exported from Port Elizabeth <sup>a</sup> (% of total exports)	Annual rent		Source
		Bird Islands	St. Croix Islands	
1831	93 (1%)	–	–	CGHBB (1832) ALMANAC (1833)
1832	–	–	–	ALMANAC (1834)
1833	–	–	–	CGHBB (1833)
1834	417 (9%)	–	–	CGHBB (1834)
1835	681 (15%)	20	187	CGHBB (1835)
1836	345 (6%)	20	187	CGHBB (1836)
1837	105 (2%)	20	187	CGHBB (1837) ALMANAC (1839)
1838	44 (2%)	20	187	ALMANAC (1840)
1839	–	20	187	CGHBB (1839)
1840	111 (100%)	20	31	CGHBB (1840)
1841 <sup>b</sup>	348 or 121	33 (J. Norton)	31	ALMANAC (1843) CGHBB (1841)
1842	348 (100%)	33 (J. Norton)	31	CGHBB (1842)
1843	159 (16%)	33 (J. Norton)	31	CGHBB (1843) ALMANAC (1845)
1844	94 (5%)	33 (J. O. Smith)	31	CGHBB (1844) ALMANAC (1846)
1845	166	33 (govt/Smith)	31	ALMANAC (1847) CGHBB (1845)
1846	0	33 (govt/Smith)	31	CGHBB (1846)
1847	139 (11%)	0 (govt/Smith)	31	ALMANAC (1849)
1848	0	0 (govt/Smith)	–	ALMANAC (1850)
1849	112 (18%)	0 (govt/Smith)	–	ALMANAC (1852)
1850	0	0 (govt/Smith)	–	ALMANAC (1853)
<b>Total</b>	<b>2 935</b>			

<sup>a</sup> Seals exported from Port Elizabeth were taken from the Bird Islands and the St. Croix Islands.

<sup>b</sup> Conflicting records of the number of seal skins exported (minimum value for 1841 was used to calculate the total number of skins exported).

Apart from the indiscriminate sealing operations, human activity in the area contributed to the decline in seal numbers. From the 1840s to the mid 1980s, Bird Island was managed for the production of seabird guano (Cape of Good Hope Government Gazette, 10 May 1844; Graham's Town Journal, 25 April 1844, 22 May 1845; ARGGI, 1886; Ross *et al.*, 1988). The presence of guano workers; noise created from scraping and loading guano; and the presence of small guano boats in the area, altered seal behaviour and habitat use...“since vessels have taken guano from the Bird Islands, the seals have left” (CGHBB, 1859).

Records suggest that seals were extirpated from the St. Croix Islands by the late 1850s; the last record of seals being killed on St. Croix was in 1858 (CGHBB, 1831–1859). During the 1860s, a whale fishery was presumably established at the St. Croix Islands (EPH, 19 August 1864); therefore, if any seals had survive, they would have been removed when the station was

established. From at least 1871 to 1893, the islands were used by the government as a quarantine station, and leased under certain stipulations for fishing purposes and seabird egg collection (ADLCC, 1886–1897). In 1895, St. Croix Island was used solely as a lookout station during the whaling season (May to December); whaling boats could be stored there during the Winter months (ADLCC, 1886–1897).

### Nineteenth century sealing: Plettenberg Bay

There are no official records of commercial sealing in Plettenberg Bay until 1840 (CGHBB, 1840); however, it is likely that the boats from the early whale fisheries were used to kill seals along the east coast during the late 1700s and early 1800s. The Southern Whale Fishery was established in Plettenberg Bay in 1795/6, soon after British settlement of the Bay (see Chase, 1967; Storrar, 1978).



Table 10(a).4 Number of casks of seal skins exported from Port Elizabeth (Eastern Cape coast of South Africa) between 1851 and 1900

Vessel	Date sailed	No. casks of skins	Estimated no. skins <sup>a</sup>	Source <sup>b</sup>
<i>Phoenix</i>	1851	8	600	5 July 1851 (EPH)
<i>Victory</i>	11 Feb 1853	2	150	15 Feb 1853 (EPH)
<i>Ariel</i>	1854	2	150	4 April 1854 (EPH)
<i>Hero of the Nile</i>	12 June 1857	2	150	16 June 1857 (EPH)
<i>Leonidas</i>	25 June 1859	2	150	28 June 1859 (EPH)
<i>Maravi</i>	3 Aug 1859	3	225	5 Aug 1859 (EPH)
<i>Monsoon</i>	8 May 1860	3	225	8 May 1860 (EPH)
<i>Woodbine</i>	14 Sep 1860	–	138	14 Sep 1860 (EPH)
<i>Meg Merrilies</i>	27 July 1861	8	600	30 July 1861 (EPH)
<i>Reullura</i>	9 Aug 1862	3	225	12 Aug 1862 (EPH)
<i>Ariel</i>	27 Feb 1863	3	225	3 Mar 1863 (EPH)
<i>Veritas</i>	20 Aug 1863	1	75	21 Aug 1863 (EPH)
<i>Noor Jehoa</i>	1864	2	150	26 Aug 1864 (EPH)
<i>Arthur Pardew</i>	14 May 1866	1	75	15 May 1866 (EPH)
<i>Roman</i>	11 May 1867	1	75	14 May 1867 (EPH)
<i>Norseman</i>	29 Feb 1868	1	75	8 March 1868 (EPH)
<i>Good Hope</i>	24 Oct 1868	(1 bale of skins)	?	27 Oct 1868 (EPH)
<i>Saxson</i>	15 March 1869	1	75	16 Mar 1869 (EPH)
<i>Trudel</i>	3 July 1871	1 cask (and 14 bundles of skins)	>75	4 July 1871 (EPH)
<i>Celt</i>	28 Aug 1872	–	3	30 Aug 1872 (EPH)
<i>Syria</i>	21 Dec 1873	(1 bundle of skins)	?	28 Dec 1873 (EPH)
<i>European</i>	29 Feb 1876	1	75	3 Mar 1876 (EPH)
<b>Total</b>		<b>45</b>	<b>&gt; 3 516</b>	

<sup>a</sup> See Appendix 10(a).3 for calculations used to determine the estimated number of seal skins per cask.

<sup>b</sup> EPH, Eastern Province Herald.

[Note: there were no records of seal skin exports in the EPH after 29 February 1876].

Available records indicate that seals were occasionally killed on Robberg between 1840 and 1843, but the quantity and value are unknown (CGHBB, 1840–1843). In 1852, Robberg was leased at £5 per annum for sealing purposes; seals were killed annually between 1852 and 1857 (CGHBB, 1852–1857). There are no official records of sealing on Robberg after 1857 (CGHBB, 1858–1884; Rand, 1972).

Although it is not known when the Robberg rookery ceased to exist, it is likely that the seals were extirpated from the rookery between 1857 and 1890 (CGHBB, 1840–1857; Ross, 1971).

The Beacon Island colony survived until at least 1881. The diary of John Fisher Sewell, harbour master of Plettenberg Bay from 1875 to 1897, confirms that seals inhabited Beacon Island in the early 1880s. Sewell notes that a small seal hunt was organised on Beacon Island in 1881 (Storrar, 1981). If any seals survived until 1912, they would have been removed when a large shore whaling station was built in that year (see Kelly-Paterson, 1971; Storrar, 1978, 1981).

## The Fish Protection Act of 1893

By the late 1800s, the seal population had been greatly reduced (Shaughnessy, 1984). Under the current system, the colonial government had no restriction upon the season, sex or numbers killed (ARGGI, 1894). If current sealing practices continued, “seals would become extinct in these waters” (as above). Thus, from 1890, the government resumed concessions for the Colonial Islands, and the first legal protection was afforded to seals in 1893 (Proclamation Number 499 of Act 15) (ARGGI, 1894). C. H. Jackson, government agent in charge of the seal and guano islands, was ordered to conserve the seals (ARGGI, 1898). From 1895 to 1909, an array of proclamations concerning sealing was introduced in an attempt to manage successfully the industry (Shaughnessy, 1984).

## Twentieth century sealing: Algoa Bay

After 1893, sealing operations on the guano islands were dominated by the government; however, a limited amount of private sealing was permitted until at least 1937 (ARGGI, 1938).

Table 10(a).5 Number of Cape fur seals killed on the islands of Algoa Bay (Eastern Cape coast of South Africa) between 1900 and 1949

Date	Island	Name of sealer	No. seals killed	Source
July and Oct 1907	Bird Islands	NR	902 skins	1, 2
10 Sep to 17 Oct 1907	Bird Islands	Private sealing party (Robert Overstone)	> 75 skins <sup>a</sup>	1
1908	Black Rocks	NR	786 skins	2
5 May 1908	Bird Islands	Private sealing party (cutter <i>Vicking</i> )	NR	1
6 Nov 1911	Black Rocks	Private sealing party (Robert Bowden)	NR <sup>b</sup>	1
Aug and Sept 1920	Black Rocks	Private sealing party	NR	3
April 1943	Black Rocks	Government sealers	6 drums of oil	4
March 1945	Black Rocks	Government sealers	9 skins (wigs)	4
1946–1949	Black Rocks	Government sealers	546 skins (wigs)	2
<b>Total</b>			<b>&gt; 2 318</b>	

NR, not recorded.

<sup>a</sup> 2 October 1907, Overstone borrowed 400 lbs of salt from the Bird Island lighthouse keeper to preserve his catch, i.e., enough salt for c. 75 skins (Mike Meyer, pers. comm.).

<sup>b</sup> 6 November 1911, the UGGI informed Oskar Larson (headman of Bird Island) that private sealer, Robert Bowden, of the cutter *Bob*, was granted a permit to seal at Black Rocks.

1. UGGI files; 2. Rand (1972); 3. BILHLB; 4. Price, D. B. (1938–1972).

Although Algoa Bay seals were hunted during the 1900s, there are no available skin export records for this period. Catch figures indicate that a minimum of 1 763 seals were killed in 1907 and 1908; and more than 500 were taken between 1943 and 1949 (Table 10(a).5).

Eyes witness accounts of seals on the Bird Islands indicate that: (i) the Stag Island population did not recover during the 1900s; (ii) a small number of seals were possibly breeding on Seal Island until at least 1909 (UGGI files; EPH, November, 1909); (iii) seals remained on Black Rocks throughout the 1900s (UGGI files; Anonymous, 1917; Fitzsimons, 1920).

In a description of the natural history of Algoa Bay, Fitzsimons (1920) reported that a large herd of seals occupied Black Rocks. Fitzsimons did not mention seals inhabiting Seal or Stag Islands, indicating that the latter colonies had been destroyed.

Although seals remained on Black Rocks throughout the 1900s, numbers were greatly reduced by the sealers. For example, in January 1912 there were only c. 200 adults seals and some pups on Black Rocks (UGGI files). In August 1942, the headman of Bird Island (H. Groenewald) noted... “with regards to the killing of seals - it is very unsatisfactory...there are only a few seals...it does not seem that seal killing will be thriving here” (UGGI files). Despite the small number of seals on Black Rocks, government sealers killed more than 500 seals during the 1940s (Table 10(a).5). All sealing operations on Black Rocks were terminated in 1949 (Rand, 1972).

Black Rocks was the only colony on the Eastern Cape coast to survive commercial sealing operations. Access to Black Rocks is difficult and for that reason sealing activities were irregular.

Table 10(a).6 Estimated pup production of Cape fur seals on the Bird Islands (Algoa Bay) before exploitation by Europeans

Colony	Approximate surface area (m <sup>2</sup> ) <sup>a</sup>	Pup production
Seal Island	6 479	2 268
Stag Island	1 129	395
Black Rocks <sup>b</sup>	8 360	2 926
<b>Total</b>		<b>5 586</b>

<sup>a</sup> Approximate surface areas taken from Rand (1963, 1972).  
<sup>b</sup> This calculation refers to the main breeding rock only, i.e., the largest rocky outcrop.  
 [Note: pup production was estimated following methods described by Crawford & Best, 1990].

Table 10(a).7 Population estimates for Black Rocks seal colony (Algoa Bay) based on counts of Cape fur seal pups taken from aerial photographs. All counts are for December of that year

Year	Seal pup count	Total population <sup>a</sup>	Source
1974	904	4 520	1
1976	86	430	1
1979	442	2 210	2
1982	561	2 805	2
1986	808	4 040	2
1988	800	4 000	2
1992	463	2 315	3
1996	296	1 480	3
1997	142	710	3

<sup>a</sup> Total pup count multiplied by a factor of 5 (Wickens & Shelton, 1992).  
 [Note: see Shaughnessy (1987a) for problems associated with population estimates inferred from aerial photographs].  
 1. Shaughnessy (1987a); 2. Wickens & Butterworth (1990); 3. SFRI, unpubl. data.

### Estimate of seal numbers on the Bird Islands, Algoa Bay, before commercial exploitation began

An estimated 23 000 Cape fur seals may have occupied the Bird Islands before exploitation began. When the total surface area of each island (Rand, 1963, 1972) is multiplied by 0.53 (Crawford & Best, 1990), pup production is c. 5 589 (Table 10(a).6). The total seal population is therefore  $5\,589 \times 5 = 28\,000$  seals. This estimate will be considerably less when we account for those areas in which seals were not likely to occur (e.g., probable seabird nesting sites on Stag or Seal Island). For example, in the 1750s, a minimum of 500 breeding

pairs of jackass penguins, *Spheniscus demersus*, occupied Seal Island, and c. 50 breeding pairs occupied Stag Island (Ross, 1978). Assuming that seals occupied the main rock at Black Rocks; 60–70% of Seal Island; and 50% of Stag Island, pup production is c. 4 598. The total population for the Bird Islands is therefore c. 23 000 seals. Early harvest figures support this estimate, i.e., a minimum of 17 000 seals were killed on the Bird Islands in 1822.

Only the main rock (largest rocky outcrop) at Black Rocks was included in the above calculation because it is the only one capable of supporting pups during storms with large ocean swells. Furthermore, Bird Island was excluded from the above calculation because there is no current evidence to suggest that seals have ever inhabited this island (see Temple, 1900–1902; Webb, 1763).

### Current population status of Black Rocks

Available population estimates of the Black Rocks seal colony are presented in Table 10(a).7. These estimates have been inferred from aerial counts of black pups. For a number of physical reasons, aerial estimates of seal populations are negatively biased (Shaughnessy, 1987a, b).

All sealing operations on Black Rocks were terminated in 1949. By 1974, c. 4 500 seals inhabited Black Rocks. The population then declined to a low of c. 430 in 1976, and then recovered to a high of c. 4 000 in a ten year period (Table 10(a).7).

During the last 12 years (1986 to 1997), the population has decreased by 82%. Causes for the population fluctuations are complex. Key factors influencing this decline include: (1) impact of storms on pup survival, i.e., storm driven waves associated with *El Niño*; unusually large waves; (2) absence of seals from neighbouring Seal and Stag Islands, i.e., lack of surplus seals to repopulate Black Rocks when numbers decline after storms; and (3) interactions with commercial fisheries, i.e., by-catch and deliberate shooting of seals by fisherman (Stewardson, unpubl. data). At present, Black Rocks supports c. 700 seals (SFRI, unpubl. data for December 1997). The population is viable, yet vulnerable to change.

### Pup mortality in relation to storms at Black Rocks, Algoa Bay

In polygynous breeding pinnipeds, such as the Cape fur seal, pups are surrounded by sexual and agonistic activity from birth; bulls intent on mating or fighting often kill or injure pups, and females may bite pups which are not their own (Rand, 1967; Wartzok, 1991). When pups are not suckling, they tend to move from the most active areas of the rookery and lie in crevices or congregate in open spaces (Rand, 1967). Where space is a limiting factor, pups may be forced to less sheltered areas where they may be washed from the rocks.

Being washed out to sea is a significant cause of pup mortality in a number of pinniped species at certain rookeries, e.g., gray seals, *Halichoerus grypus* (Baker, 1984; Anderson *et al.*, 1979; Wartzok, 1991) and northern elephant seals, *Mirounga angustirostris* (Le Boeuf & Briggs, 1977). Strong currents and swells may carry pups long distances from their mothers, and the noise of the wind and surf may interfere with the ability of mothers to hear pup vocalisations (Boness *et al.*, 1992; Renouf, 1984; Perry & Renouf, 1988). Unlike some species which are strong swimmers soon after birth (e.g., Bearded seals, *Erignathus barbatus*) (Burns, 1981), a young Cape fur seal is particularly vulnerable on some islands (Rand, 1967). Although Cape fur seal pups may be introduced to the water when only a few hours old, they acquire swimming abilities slowly, gaining proficiency only after some months of 'training' in the rock pools (Rand, 1967).

Space for breeding seals on Black Rocks is a limiting factor. As the number of seals increase, crowded conditions on the main breeding rock are likely to reduce the number of pups that can be successfully reared. Crowded conditions are likely to result in increased mortality. For example, when numbers are high, individuals are forced to less sheltered areas. If storms come early in the pupping season, pups inhabiting less sheltered areas are more likely to be washed from the rocks. Although low lying areas are more prone to surging swells, large swells may also break over the main breeding rock which rises to 6 metres above mean sea level (Fig. 10(a).3). The largest outcrop is the only one capable of supporting pups during heavy seas. When very large swells sweep the colony (e.g., December 1976) all pups, irrespective of their location, may be washed from the rocks.

Before commercial sealing began, seals were plentiful on Seal and Stag Islands. When population

density was high, some seals would have been forced to inhabit other sites, e.g., Black Rocks. Neighbouring islands would have played a significant role in maintaining seal numbers on Black Rocks. However, over harvesting greatly reduced seal numbers and changed distribution patterns. Seals now inhabit a single island, Black Rocks. Black Rocks may have been a 'refuge' from commercial sealers, but provides little protection against storms. When storm induced pup mortality is high on Black Rocks, there is no recruitment from neighbouring islands (i.e., extirpated), thus recovery is a gradual process. The intensity and frequency of storms during the pupping season is a key factor influencing population fluctuations at Black Rocks. By destroying seal herds through commercial harvesting, and confining the population to Black Rocks, the population is unable to build up its numbers sufficiently to stimulate colonisation on neighbouring islands.

Weather data collected from the Bird Island weather station (Table 10(a).8, 10(a).9) indicates that wind waves (waves produced by local prevailing wind), and swell waves (wind-generated waves which have moved away from their source area, independent of the prevailing wind) can have a negative influence on seal pup survival. Of the 28 strandings recorded during the 1992–1993 and 1993–1994 pupping season, 75% were associated with wind speeds 20 to 30 knots or greater, and swell height  $\geq 1.5$  metres (Table 10(a).10). Considering that many of the pups washed from the rocks would have drowned or have been eaten by sharks, and a percentage of those that made it ashore may have been missed by observers or scavenged, overall pup mortality would have been much higher.

Unusually large swell waves ( $\geq 4$  metres) during the pupping season were not recorded in the present study; however, swell  $\geq 4$  metres was responsible for mass strandings (i.e., 50–300 pups) in December



Fig. 10(a).3 South-westerly swell breaks over the Black Rocks seal colony (Algoa Bay). When wind waves and/or swell waves flood nursing habitat, pup mortality can be substantial.

1974, December 1976, January 1986; and possibly in December 1977 and December 1987 (Stewardson, 1999; Appendix 10(a).4). Three of these mass strandings occurred during warm phase El Niño years, i.e., 1976, 1986 and 1987 (see Mariner, 1998). Storm driven waves associated with El Niño have resulted in dramatic pup losses elsewhere (e.g., LeBoeuf & Condit, 1983; Ono *et al.*, 1987).

### The importance of the Eastern Cape population in relation to the total population

The majority of Cape fur seals occur on the west coast, in nutrient rich waters of the Beunguela Current. The remainder of the population (less than 10%) inhabit the south and south-east coasts, between False Bay and Algoa Bay at six colonies (David, 1995). Three of these colonies (Geyser Rocks, Quoin Rock and Seal Island-False Bay) occur in the west of the Agulhas/Atlantic mixing area and three (Seal Island-Mossel Bay; Rondeklippe-Plettenberg Bay; Black Rock-Algoa Bay) in the east, inshore of the

warm Agulhas Current (Rand, 1967; Shannon, 1989). The distribution of the population is associated with the productivity of these three coastal zones. Compared with the west coast, the Eastern Cape coast population is a marginal one.

It is unlikely that the south coast and south-east coast seal populations will increase greatly because the seal islands are small in size (limited space for breeding seals) and the waters are warm (reduced productivity compared with the west coast). As global warming increases and sea levels rise, suitable habitat (small rocky islands) will be reduced. Seals will be forced to find mainland breeding colonies. However, as human activities intensify, factors such as human presence, noise, and physical habitat alteration, limit the number of potential sites.

A more immediate threat to the seal population off the southern coast is interaction with the commercial fishing industry. As the number of trawlers increase, the potential of seals being caught incidentally in fishing gear and killed is also increased (Stewardson, unpubl. data). Furthermore, seals and the industry compete for commercially

Table 10(a).8 The number of recording periods during which strong winds ( $\geq 28$  knots) were noted at the Bird Islands (Algoa Bay). Observations were made thrice daily (0800 hrs, 1400 hrs and 1800 hrs) during four pupping seasons, from 1 November to 31 January, 1992 to 1996.

Pupping season (Nov, Dec & Jan)	No. of recording periods with local winds $\geq 28$ knots			
	NW-NE	ENE-ESE	SE-SW	WSW-WNW
1992/1993 <sup>a</sup>	0	2	2	1
1993/1994	0	2	3	2
1994/1995	0	1	1	2
1995/1996	0	3	0	0
<b>Total</b>	<b>0</b>	<b>8</b>	<b>6</b>	<b>5</b>

<sup>a</sup> For the purpose of this study, the 1992/1993 season commenced 9 December 1992, when the weather station was established. [Note: one recording period is 0800 hrs or 1400 hrs or 1800 hrs].

Table 10(a).9 Swell height and wind direction recorded thrice daily (0800 hrs, 1400 hrs and 1800 hrs) at the Bird Islands (Algoa Bay) during four pupping seasons, from 1 November to 31 January, 1992 to 1996

Pupping season (Nov, Dec & Jan)	Swell height (metres)				Wind direction (%) <sup>a</sup>			
	$\leq 1$	1.5-2	2.5-3	3.5-5	N	E	S	W
1992/1993 <sup>b</sup>	104	51	5	0	4	27	49	17
1993/1994	259	17	0	0	5	41	25	28
1994/1995	98	130	39	9	4	34	29	33
1995/1996	68	111	81	16	5	38	22	34

<sup>a</sup> Wind direction was not recorded for 5 periods during the 1992/1993 season, 1 period during the 1994/1995 season and 1 period during the 1995/1996 season.

<sup>b</sup> For the purpose of this study, the 1992/1993 season commenced 9 December 1992, when the weather station was established. [Note: one recording period is 0800 hrs or 1400 hrs or 1800 hrs].

Table 10(a).10 Relationship between the number of stranded seal pups from Black Rocks (Algoa Bay), wind force and swell height. Environmental observations were made thrice daily (0800 hrs, 1400 hrs and 1800 hrs) at the Bird Islands (Algoa Bay) during two pupping seasons, 9 December 1992 to 31 January 1993, and 1 November 1993 to 31 January 1994.

Wind speed (knots)	Swell height (metres)			
	0.5	1.5	2	3
17	2	0	0	0
18	1	0	0	0
19	0	0	1	0
20	1	0	0	0
24	0	2	0	0
25	2	0	0	0
31	0	2	6	11
<b>Total</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>11</b>

[Note: one recording period is 0800 hrs or 1400 hrs or 1800 hrs. Stranded seal pups were observed between Port Elizabeth and Port Alfred, and on neighbouring Bird Island. These pups had been washed from Black Rocks (Algoa Bay)].

important fish, notably hake, *Merluccius* spp., anchovy, *Engraulis capensis*, pilchard, *Sardinops sagax*, and horse mackerel, *Trachurus trachurus capensis*. Overfishing may reduce the amount of food available to seals and/or change feeding patterns (e.g., Reijnders *et al.*, 1993). In recent years, there have been renewed calls from the fishing lobby for a forced reduction of the Cape fur seal population.

## CONCLUSION

This is the first detailed study documenting the fur seal industry off the Eastern Cape coast of South Africa. Before commercial exploitation by Europeans began in 1610, Cape fur seals inhabited six islands in Algoa Bay (Seal, Stag, Black Rocks, St. Croix, Jahleel and Brenton) and two sites in Plettenberg Bay (Seal Point on the Robberg Peninsula and Beacon Island). By the early 1900s, all Eastern Cape colonies were extirpated, with the exception of Black Rocks. Currently, Black Rocks is comprised of c. 700 seals. Numbers have decreased by 82% in the last 12 years. We suggest that by destroying seal herds, and confining the population to Black Rocks, the population is unable to build up its numbers sufficiently to stimulate colonisation on neighbouring islands. Limited space for breeding seals and the influence of storms restricts the number of pups that can be reared successfully. The effect of man on the Seal, Stag and Black Rocks population is therefore a permanent one. Other anthropogenic factors, including incidental by-catch and deliberate killing of seals by fisherman, also contribute to population decline in this region (Stewardson, unpubl. data). It is unlikely that the seal populations along the southern coast will increase greatly because the seal islands are

small in size, and the waters are less productive compared with the west coast. Approximately 23 000 Cape fur seals may have occupied the Bird Islands before exploitation began. The current population size for the Eastern Cape coast is considerably less than its historical size.

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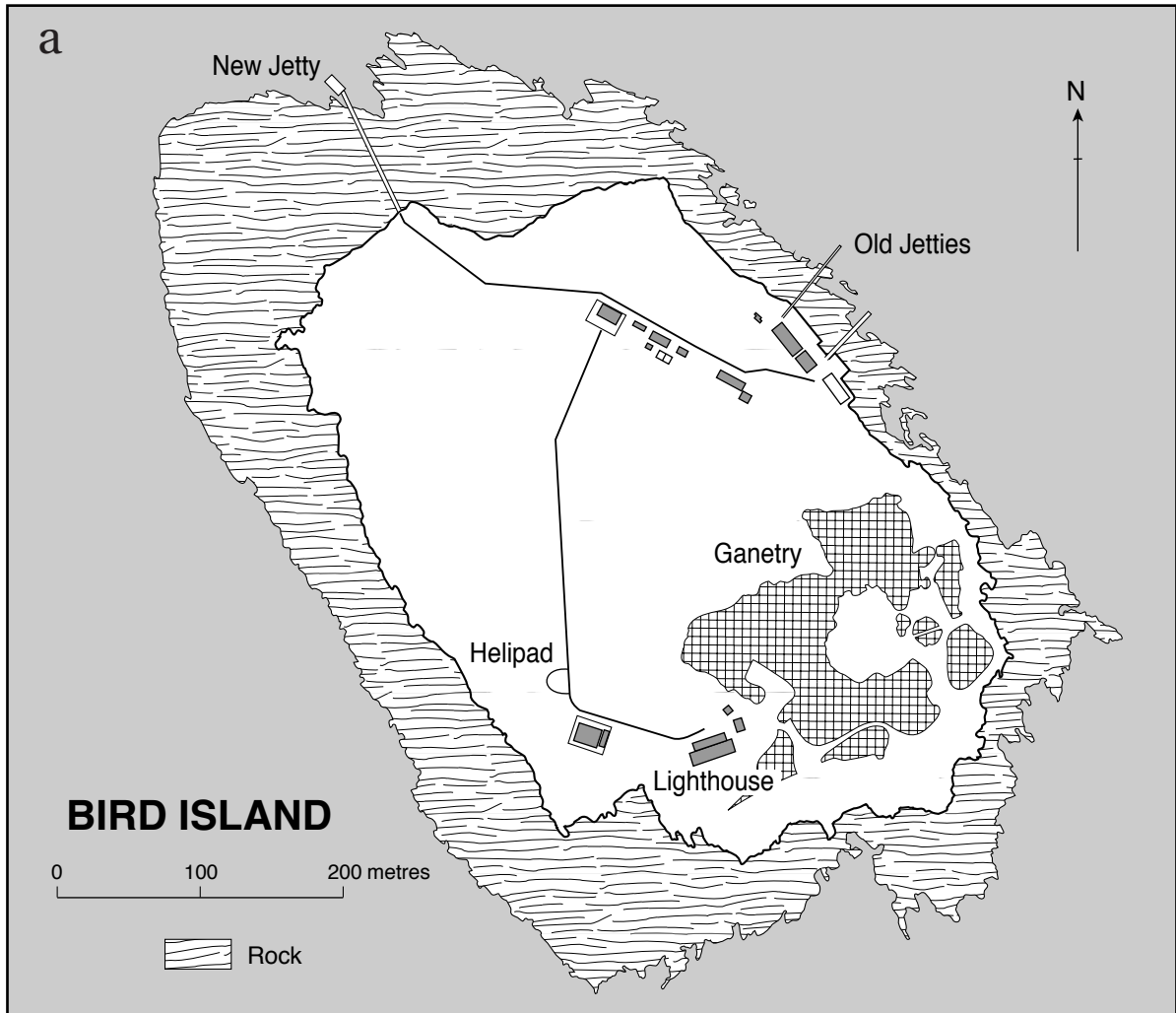
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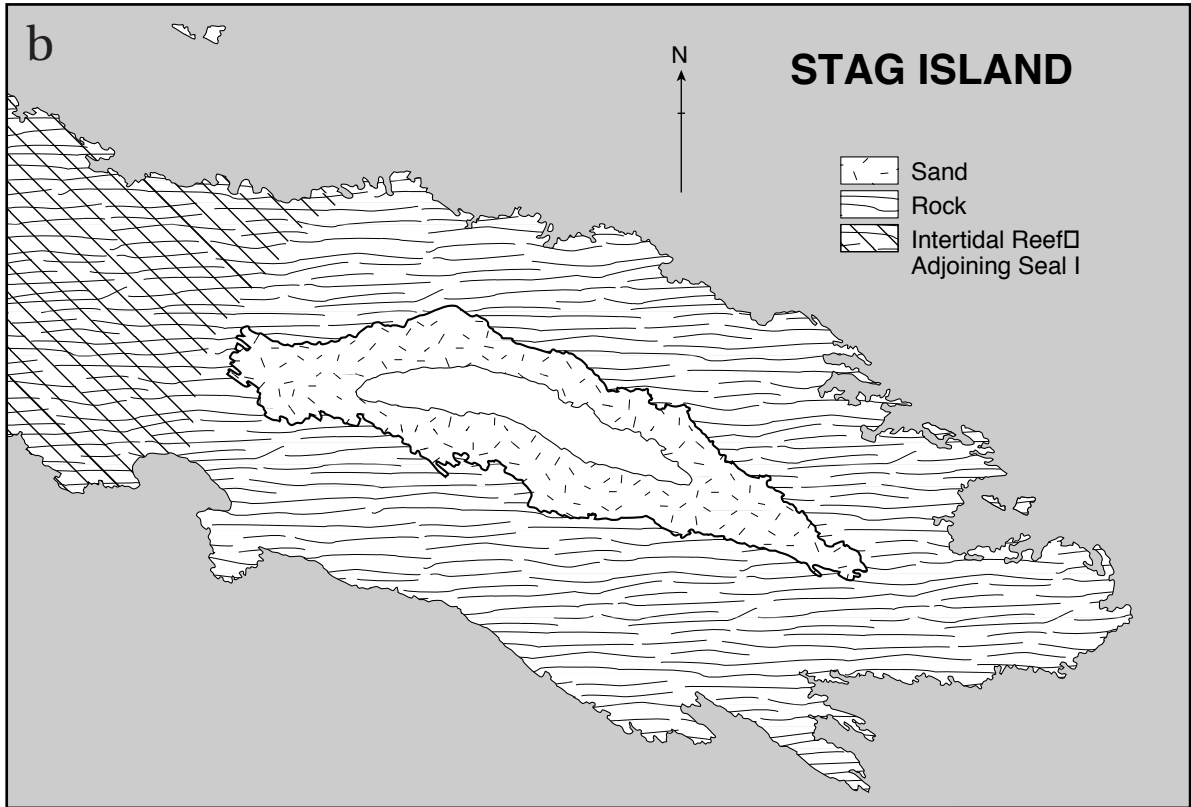
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1910–1921. 7/8, p. 700, 701.  
1910–1922. 7/10, p. 714, 715.  
1910–1924. 7/12, p. 613, 614.  
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1926–1927. 7/15, p. 626, 627.  
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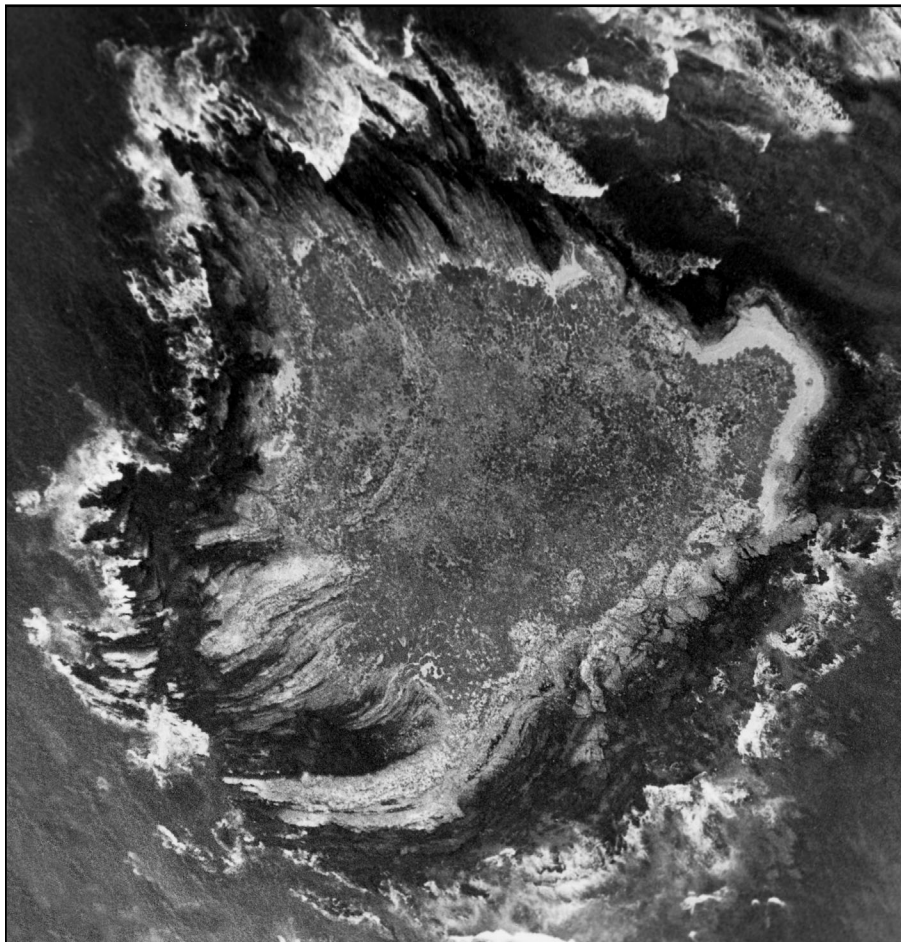
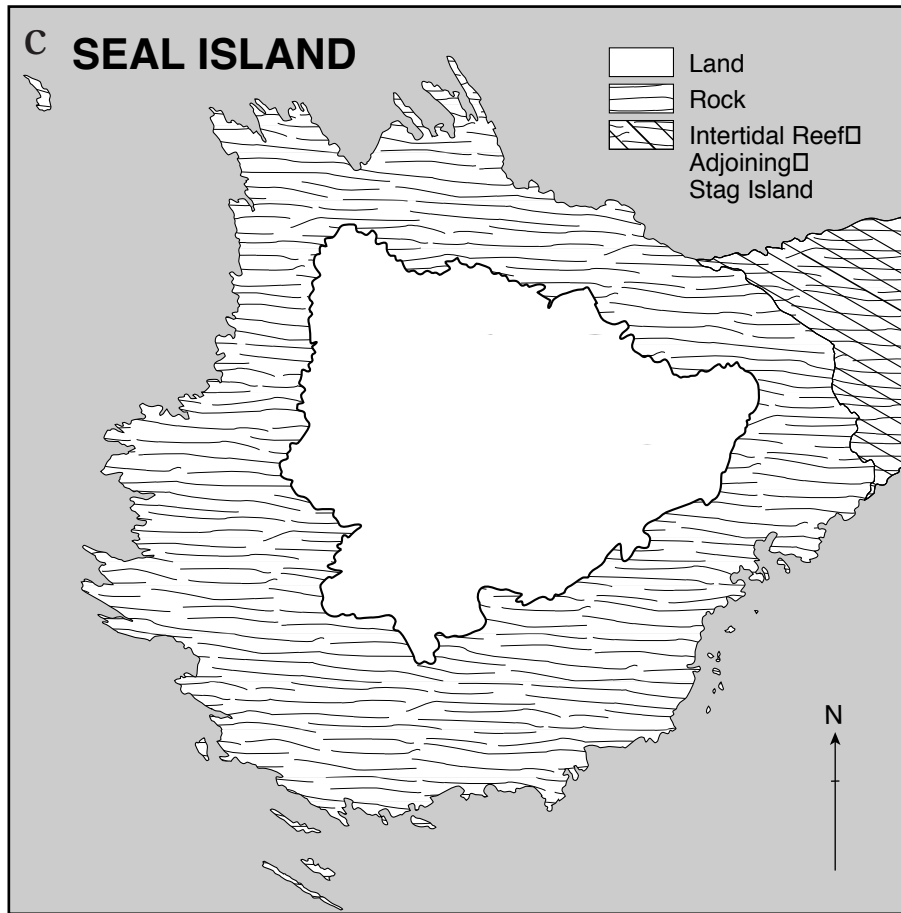
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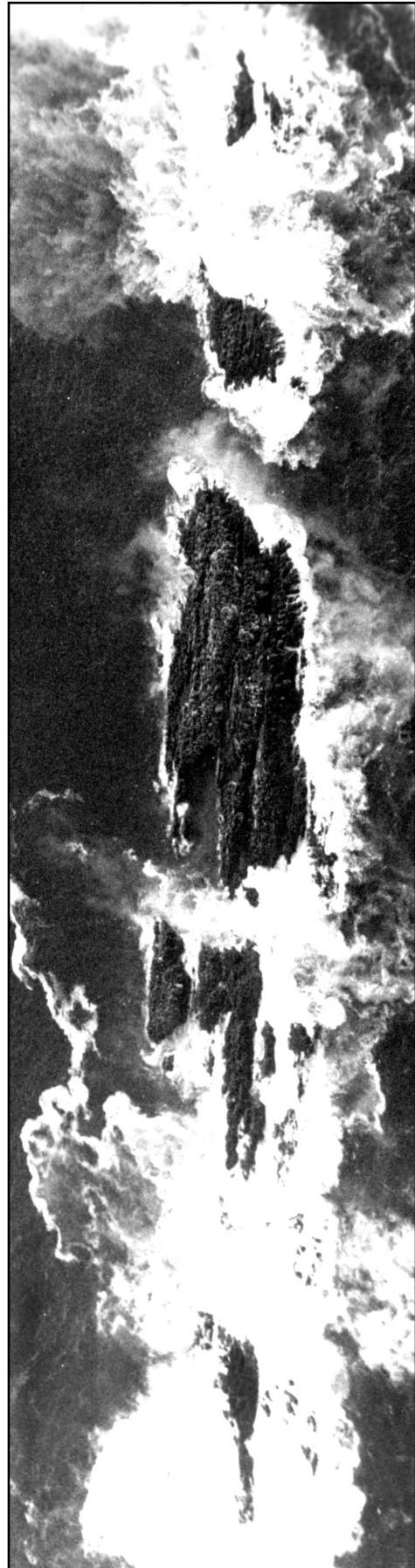
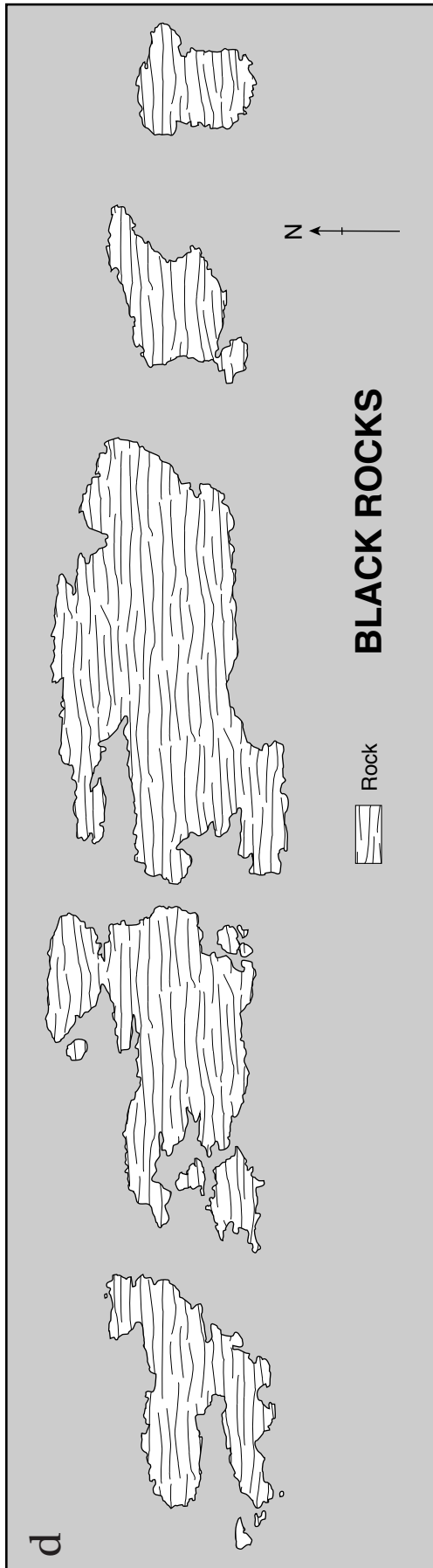
Appendix 10(a).1 *The Bird Island group (Algoa Bay): a. Bird Island, b. Stag Island, c. Seal Island and d. Black Rocks. Aerial photographs taken in April 1994 by C.L. Stewardson.*



[Note: Accurate ground measurements were not available for Seal and Stag Island or Black Rocks, therefore it was not possible to provide a scale for three of the four maps].







Appendix 10(a).2 The number of Cape fur seal skins exported from South Africa between 1817 and 1950 according to official government registrars

Year	No. seal skins	Value (£)	Source
1817	NR	1 900 (rands)	RCC (1826)
1818	NR	12 250 (rands)	RCC (1826)
1819	NR	3 450 (rands)	RCC (1826)
1820	NR	14 490 (rands)	RCC (1826)
1821	NR	15 920 (rands)	RCC (1826)
1822	22 625	37 700 (rands)	CGHBB (1822); RCC (1826)
1823	16 177	21 274 (rands)	CGHBB (1823); RCC (1826)
1824	6 387	14 920 (rands)	CGHBB (1824); RCC (1826)
1825	13 756	55 440 (rands)	CGHBB (1825); RCC (1826)
1826	2 408	13 146 (rands)	CGHBB (1826); RCC (1826)
1827	13 442	NR	CGHBB (1827)
1828	1 055 (pieces)	NR	CGHBB (1828)
1829 <sup>a</sup>	3 928 (pieces) or 3 744 (skins)	834	CGHBB (1829) ALMANAC (1831)
1830 <sup>a</sup>	5 835 (pieces) or 4 798 (skins)	940	CGHBB (1830); ALMANAC (1832)
1831 <sup>a</sup>	9 186 (pieces) & 93 (bundles) or 9 279 (skins)	1 792	CGHBB (1832); ALMANAC (1833)
1832	3 520 (pieces)	851	ALMANAC (1834)
1833	3 582	NR	CGHBB (1833)
1834	4 947	NR	CGHBB (1834)
1835	4 644	NR	CGHBB (1835)
1836	6 489	NR	CGHBB (1836)
1837	5 384	3 855	CGHBB (1837); ALMANAC (1839)
1838	3 430	1 562	ALMANAC (1840)
1840	111	NR	CGHBB (1840)
1841	588	482	ALMANAC (1843)
1842	348	NR	CGHBB (1842)
1843	1 019	675	CGHBB (1843); ALMANAC (1845)
1844	2 202	735	CGHBB (1844); ALMANAC (1846)
1845 <sup>a</sup>	172 or 166	93	ALMANAC (1847); CGHBB (1845)
1847	1 262	242	ALMANAC (1849)
1848	168	100	ALMANAC (1850)
1849	633	214	ALMANAC (1852)
1850	918	420	ALMANAC (1853)
1852	1 176	350	ALMANAC (1854)
1853	768	129	ALMANAC (1855)
1854	348	88	ALMANAC (1856)
1884	2 834	1 058	CGHSRBCO (1886)
1885	4 331	978	CGHSRBCO (1886)
1886	3 262	963	CGHSRBCO (1886)
1887	4 351	1 052	CGHSRBCO (1887)
1888	3 638	1 749	CGHSRBCO (1888)
1889	4 842	1 727	CGHSRBCO (1889)
1890	6 510	4 140	CGHSRBCO (1890)
1891	4 480	3 183	CGHSRBCO (1891)
1892	2 061	1 420	CGHSRBCO (1892)
1893	2 938	1 607	CGHSRBCO (1893)
1894	1 634	872	CGHSRBCO (1894)
1895	888	754	CGHSRBCO (1895)
1896	386	334	CGHSRBCO (1896)
1897	15	12	CGHSRBCO (1897)
1898	2 292	1 414	CGHSRBCO (1898)
1899	768	1 308	CGHSRBCO (1899)
1900	0	0	CGHSRBCO (1900)
1901	4 436	2 238	CGHSRBCO (1901)
1902	1 067	1 357	CGHSRBCO (1902)

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Year	No. seal skins	Value (£)	Source
1903	0	0	CGHSRBCO (1903)
1904	4 437	2 217	CGHSRBCO (1904)
1905	0	0	CGHSRBCO (1905)
1906	0	0	CGHSRBCO (1906)
1907	0	0	CGHSRBCO (1907)
1908	0	0	CGHSRBCO (1908)
1911	WR	2 791	OYB (1910–16)
1912	WR	3 535	OYB (1910–16)
1913	WR	5 609	OYB (1910–16)
1914	WR	2 650	OYB (1910–16)
1915	WR	845	OYB (1910–16)
1916	WR	215	OYB (1910–16)
1917	WR	4 279	OYB (1910–17)
1918	WR	4 710	OYB (1910–18)
1919	WR	8 951	OYB (1910–20)
1920	WR	15 933	OYB (1910–20)
1921	WR	12 111	OYB (1910–21)
1922	WR	14 034	OYB (1910–22)
1923	WR	14 507	OYB (1910–24)
1924	WR	17 456	OYB (1910–25)
1925	WR	17 557	OYB (1926–27)
1926	WR	13 174	OYB (1926–27)
1927	WR	11 577	OYB (1927–28)
1928	WR	16 927	OYB (1928–29)
1929	WR	14 035	OYB (1929–30)
1930	0	0	OYB (1930–31)
1931	0	0	OYB (1931–32)
1931	0	0	OYB (1931–32)
1932	0	0	OYB (1932–33)
1933	WR	2 570	OYB (1933–34)
1934	WR	2 845	OYB (1934–35)
1935	WR	20	OYB (1937)
1936	2 689	1 630	OYB (1938)
1937	14 453	8 113	OYB (1938–39)
1938	11 756	NR	OYB (1940)
1939	WR	5 048	OYB (1939)
1940	0	0	OYB (1941)
1945	7 009	25 103	OYB (1948)
	& 4 298	& 63 519	
1946	8 526	31 508	OYB (1948)
	& 5 008	& 81 674	
1947	9 507	37 621	OYB (1948)
	& 6 568	& 107 694	
1948	3 594	20 571	OYB (1948)
	& 3 956	& 65 649	
1949	6 373	NR	OYB (1952–53)
	& 3 372		
1950	10 986	NR	OYB (1952–53)
	& 1 883		

These figures were used to compare the number of seal skins exported for Port Elizabeth to the total number of seal skins exported from the Cape Colony, i.e., % of total exports, Table 10(a).3.

<sup>a</sup> Records give conflicting export figures.

WR, weight recorded, i.e., seal skin exports reported by weight only.

[Note: little information is available from 1855 to 1883, and from 1941 to 1944. Thus, this table must be regarded as the minimum number of seal skins exported].



Appendix 10(a).3 *Estimated number of Cape fur seal skins per cask*

No. of casks	No. of skins	Estimated no. of skins per cask	Date	Source
63	4 925	78	14 August 1823	3
17	1 200	71	1 September 1957	1
20	1 336	67	3 October 1959	1
46	3 411	74	22 October 1963	1
19	1 453	76	13 December 1963	1
37	2 863	77	8 October 1964	1
10	748	75	26 August 1965	1
20	1 258	63	29 October 1965	1
35	2 523	72	25 September 1966	2
16	1 164	73	15 August 1967	1
7	544	78	22 August 1967	1
11	856	78	29 August 1967	1
14	1 166	83	29 August 1967	1
10	687	69	29 August 1967	1
14	1 078	77	9 August 1968	2
16	1 184	74	23 August 1968	1
14	1 077	77	25 August 1968	1
4	329	82	26 August 1968	1
28	2 126	76	22 September 1968	1
28	2 169	77	21 September 1968	1
11	789	71	27 July 1969	1
6	403	67	27 July 1969	1
4	284	71	7 August 1969	1
13	890	68	7 August 1969	1
18	1 264	70	11 August 1969	1
16	1 201	75	15 August 1969	1
26	1 924	74	4 September 1969	1
23	1 431	62	7 September 1969	1
41	3 311	81	1 October 1969	2
15	1 197	80	27 October 1969	2
20	1 444	72	3 August 1970	2
38	2 342	62	30 October 1970	1
40	3 123	78	6 November 1970	1
5	398	80	4 December 1970	2
66	4 651	70	24 October 1971	1
12	920	77	11 October 1972	1
12	940	78	12 October 1972	1
13	1 034	80	16 October 1972	1
15	1 250	83	18 October 1972	1
12	976	81	20 October 1972	1
13	1 029	79	24 October 1972	1
8	656	82	26 October 1972	1
10	775	78	27 October 1972	1
13	924	71	31 October 1972	1
24	1 809	75	13 November 1972	1
13	887	68	16 November 1972	1
<b>Mean ± S.D.</b> <b>(n = 46)</b>		<b>75 ± 5.46</b>		

Estimates were made from available records for which the number of skins and the number of casks were known.  
1. Price (1938–1972); 2. Miles (1966–1971); 3. RCC (June–August 1825) p. 410.

**Appendix 10(a).4 Evidence of mass strandings of Cape fur seal pups attributed to storms<sup>1</sup> at Black Rocks, Algoa Bay**

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**10 January 1912** Headman of Bird Island (O. Larson) to the UGGL... “A lot of pups have been washed ashore (at Bird Island) during strong north-westerlies” (UGGI files).

**31 December 1948** Headman of Bird Island (H. J. Groenwald) to the UGGL... “We had a strong south-westerly wind with a stormy sea. A whole lot of seals climbed out here (Bird Island) and quiet a few have been noticed moving with the stream past here” (UGGI files).

**29 December 1974.** “Hundreds of stranded seals pups were sighted along the Eastern Cape coast between 31 December 1974 and 6 January 1975. Some pups were found more than 60 km from the Black Rocks” (Ross, pers. comm.). Strong south-westerly winds of 63 kts (max. gust) were recorded at the Port Elizabeth weather station on 28 December. Swell height of 4–5 metres (west-south west) and sea height of 3 metres was recorded in the general vicinity (Area: 33–34; 26–27) on 28–29 December. Pup counts conducted on 18 December 1974 establish that there were 904 pups on Black Rocks. Counts in mid March indicate that most of these pups had perished; less than 50 pups remained (Shaughnessy, 1982).

**4 December 1976** “200–300 pups were washed ashore between Woody Cape and East London during strong gales on 4 December. Many of these pups were returned to Black Rocks by SAAF helicopters of the 16 Squadron, Port Elizabeth” (EPH, 8 December 1976, 11 February 1977). Strong south-south westerly winds of 69 kts (max. gust) were recorded at the Port Elizabeth weather station on 4 December. Sea state records are not available for 1–4 December; however, swell height of 9 metres (west-south west) and sea height of 5 metres were recorded in the general vicinity (Area: 33–34; 26–27) on 5 December [A pictorial account of this rescue mission is held at the Cape Archives Repository, Cape Town (Stewardson, 1999)].

**16 December 1977** “Between December 16 and 20, at least 26 stranded (dead and alive) seals pups were found as far as 39 km east of Sundays River mouth. Strong winds were recorded from 13–16 December. On 20 December, SAA helicopters returned 18 live pups to Black Rocks (7 from Port Alfred, 8 from Port Elizabeth and 3 from the air search)” (G. Ross, pers. comm.). Strong south-westerly winds of 51 kts (max. gust) were recorded at the Port Elizabeth weather station on 13 December. Sea state records are not available for this period.

**2–3 January 1986** “Fifty to 60 pups from Black Rocks were washed ashore between Port Alfred and Sundays River Mouth after south-westerly gales” (G. Ross pers. comm.). Strong south westerly winds persisted from 28 December with all days peaking at 25 kts (average) and gusting between 35 and 50 kts on almost every day. Swell height of 4 metres (south-south west) and sea height of 1 metre were recorded in the general vicinity (Area: 33–34; 26–27) on 1 January.

**27 December 1987** “More than 200 pups were washed ashore along the coast between the Sundays River and Port Alfred...the pups had been washed ashore from Black Rocks, near Bird Island, by the strong winds....the 200 stranded pups were put down by vets” (EPH, 5 January 1988). Strong south-westerly winds of 60 kts (max. gust) were recorded at the Port Elizabeth weather station on 27 December. Sea state records are not available for this period.

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<sup>1</sup> Wind information was kindly provided by Garth Samson (Port Elizabeth Weather Bureau, Port Elizabeth, South Africa) and the swell information by Dr Marten Grundlingh (Southern African Data Centre for Oceanography, Stellenbosch, South Africa).