

EARLY BREEDING OF IMPERIAL CORMORANTS *PHALACROCORAX ATRICEPS*

AT PRINCE EDWARD ISLAND

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Received 12 October 1984, accepted 12 January 1985

INTRODUCTION

The Imperial Cormorant *Phalacrocorax atriceps* is largely sedentary, occurring between 38 and 65S from South America and the Antarctic Peninsula eastwards on many Subantarctic islands to Macquarie Island (Watson *et al.* 1971). Breeding is reported as being seasonal, with eggs being laid between October and January (Murphy 1936, Rand 1956, Derenne *et al.* 1976, Devillers & Terschuren 1978, Williams & Burger 1979). Eggs laid towards the end of this period are mostly replacement clutches (Williams & Burger 1979). This paper reports early breeding among a small proportion of the Imperial Cormorant population at Prince Edward Island (46 38S, 38 00E).

METHODS

We visited Prince Edward Island from 31 August to 6 September 1984. During this period we counted the numbers of pairs of Imperial Cormorants holding sites at colonies and observed contents of occupied nests at the two largest colonies. Colony sizes are approximate since some birds had not started nest building.

RESULTS

Five colonies were found (Fig. 1) between the east cape of "Albatross Valley" in the northeastern portion of the island and the south end of McNish Bay. Only a single bird was seen at the western end of the island, although roosts have been seen near Kent Crater and on Ross Rocks in May 1983 and March 1984 respectively (J. Cooper pers. comm.). No evidence of breeding was found at Kent Crater and Ross Rocks in September 1984. The total breeding population was estimated at 120 pairs (Table 1), which is considerably higher than the previous estimate of 65 pairs (Williams *et al.* 1979).

Breeding activity had, for the most part, only recently commenced and birds were involved in courtship displays and nest building. This is similar to the position at neighbouring Marion Island (46 54S, 37 45E) at the beginning of September (Williams & Burger 1979, pers. obs.). At the Boggel-McAll Kop colony on 4 September 1984, however, there were two nests with large chicks (one in one nest and two in the other) with feathered bodies and downy heads and necks, one nest with two medium-sized downy chicks, one nest with two smaller downy chicks and one nest with a clutch of three eggs. The Cave Bay colony contained a bird

TABLE 1

COLONIES OF IMPERIAL CORMORANTS AT PRINCE EDWARD ISLAND

Location	No. breeding pairs*	Site description
East cape of "Albatross Valley"	10	Sheer cliffs
Boggel - McAll Kop	30	Low cliff top
South point of Cave Bay	40	Low cliff top
1 km east of South Cape	20	Sheer cliffs
1 km north of South Cape	20	Boulder beach
Total number of breeding pairs	120	

* estimates from counts of pairs occupying nest sites, 3-5 September 1984.

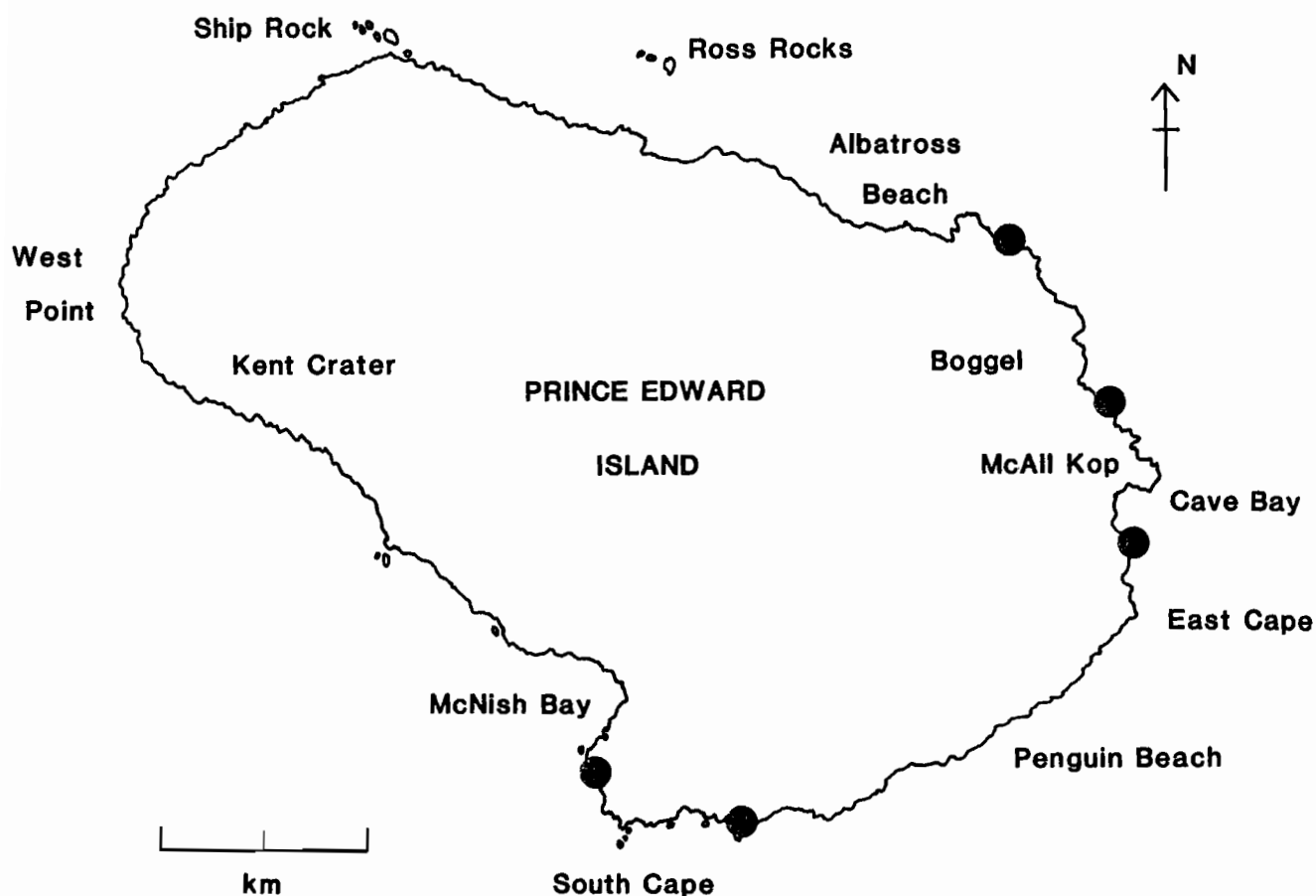


Figure 1

Prince Edward Island showing the locations of the five Imperial Cormorant breeding sites.

incubating a single egg on 5 September 1984.

DISCUSSION

Of the c. 70 pairs of Imperial Cormorants breeding at the two largest colonies at Prince Edward Island, six pairs had already laid by the start of September, and some eggs must have been laid as early as mid-June (extrapolating from chick growth data in Williams & Burger 1979). This is considerably earlier than the earliest recorded laying date for the species, 12 October (Williams & Burger 1979). Even at the northern edge of the breeding range, Mocha Island (38S, 74E) off the west coast of South America, egg laying only commenced in mid-November (Murphy 1936). Assuming an incubation period of 29 days and a chick growth period of 75 to 80 days (Williams & Burger 1979), the chicks from the earliest laid eggs at Prince Edward Island will have left their nests before most of the population lays.

The reason for such early breeding by some Imperial Cormorants at Prince Edward Island is not clear. Early breeding might be favoured should it occur during a relatively calmer time of year since during storms nests are washed away and chicks die of starvation, presumably because the adults cannot forage (Williams & Burger 1979). Climatic data from Marion Island, however, indicate that on average there are more days with gales during the four-month period from June to September than there are from October to January (Schulze 1971). Also, daylength is considerably shorter during the winter months, reducing the number of potential foraging hours. Derenne *et al.* (1976) found predation of eggs and chicks to be the most important cause of breeding failure at the Crozet Islands (46 20S, 51 00E), but it seems unlikely that predation pressure is any greater at Prince Edward Island than it is at nearby Marion Island.

One possible reason for early breeding may be to avoid competition for food during the chicks' growth period. Imperial Cormorants are particularly numerous in the Cave Bay - Boggel area of Prince Edward Island and foraging is restricted to the limited area of shallow coastal waters. Unfortunately, little is known about the feeding ecology of the cormorant or the biology of its prey species. A.J. Williams (*in litt.*) has suggested that the northeastern corner of Prince Edward Island represents a particularly suitable environment for the Imperial Cormorant with north facing breeding sites and protection from the prevailing westerly winds. If this is the case, early breeding by Imperial Cormorants should be looked for at similarly sheltered sites.

Whatever the reason, early breeding attempts by Imperial Cormorants at Prince Edward Island are seemingly successful. Of the four nests with chicks, three had two chicks and at two of these nests the second chick had passed the mean age at death of second chicks reported for both Marion and the Crozet Islands (Derenne *et al.* 1976, Williams & Burger 1979). However, it is impossible to know how many pairs originally attempted to breed in mid-winter, so no estimate of comparative breeding success can be made. It may be that early breeding by Imperial Cormorants represents rare attempts at double brooding. Bank Cormorants *P. neglectus* are known occasionally to raise two

broods in a year (J. Cooper pers. comm.), but double brooding has not been reported from the Imperial Cormorant. More data are required to determine whether early breeding in the Imperial Cormorant at Prince Edward Island represents infrequent double brooding attempts or an alternative breeding strategy maintained at a low level in the population.

ACKNOWLEDGEMENTS

We thank J. Cooper, A.J. Williams and R.P. Wilson for comments on the manuscript. This paper constitutes part of the Percy FitzPatrick Institute of African Ornithology's 25th anniversary commemorations. The financial and logistical support of the South African Department of Transport and the South African Scientific Committee for Antarctic Research, C.S.I.R. is gratefully acknowledged.

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