

OBSERVATIONS OF BREEDING REDLEGGED CORMORANTS *PHALACROCORAX GAIMARDI*
IN THE NORTH OF CHILE

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Three cormorant species inhabit the northern coast of Chile (Araya & Millie 1986). Of these species, the Redlegged Cormorant *Phalacrocorax gaimardi* is the least known (Siegel-Causey 1987, Glade 1988). Its populations are decreasing, probably because fishermen collect their eggs (Schlatter 1984, Collar *et al.* 1992). This species is found along the whole continental Chilean coast, from Arica to Tierra del Fuego. Its breeding season is from October to January (Goodall *et al.* 1957), whereas in tropical regions, farther north, the species can be found breeding throughout the year (Murphy 1936, Harrison 1985).

This paper investigates the breeding cycle and factors that influence the breeding success of the Redlegged Cormorant in the north of Chile.

From September 1990 up to the beginning of August 1991, we followed the activity of 20 Redlegged Cormorants at a small breeding colony located on a rocky cliff at 10 m a.s.l., eight kilometres south of Caleta Chungungo (29° 24'S, 71° 30'W) in the province of La Higuera, in the IV Region of Chile (Fig. 1).

The colony was visited monthly to record breeding activity of the adults, numbers of chicks and fledglings, in nests, in roosts and at sea in the vicinity of the colony. Each nest was identified according to its appearance and was mapped. The

observations were made from a point opposite the breeding colony with the help of 8x30 binoculars and with the naked eye. Photographic records were also made.

The timing of laying was established by extrapolation of known hatching or approximate fledging dates where these were recorded. The hatching period was estimated according to the chick size and comparison with the size of those chicks of known hatching date, as well as in relation to the last date when eggs were observed in that nest.

Although adults were observed throughout the year in the vicinity of the breeding colony, it was not until mid September that we observed adult pairs at nest sites. Out of 10 pairs recorded, eight were seen nest-building between October and the beginning of January, whereas one pair only completed its nest by the beginning of February. One pair that occupied the same site all the time did not build a nest. Courtship and mating took place in the vicinity of the nest.

Nests mainly consisted of fronds of the seaweed *Lessonia nigrescens* collected from the intertidal zone or from the sea bottom in the vicinity of the breeding colony, and also of guano deposited by the adults themselves. In two cases, nesting material

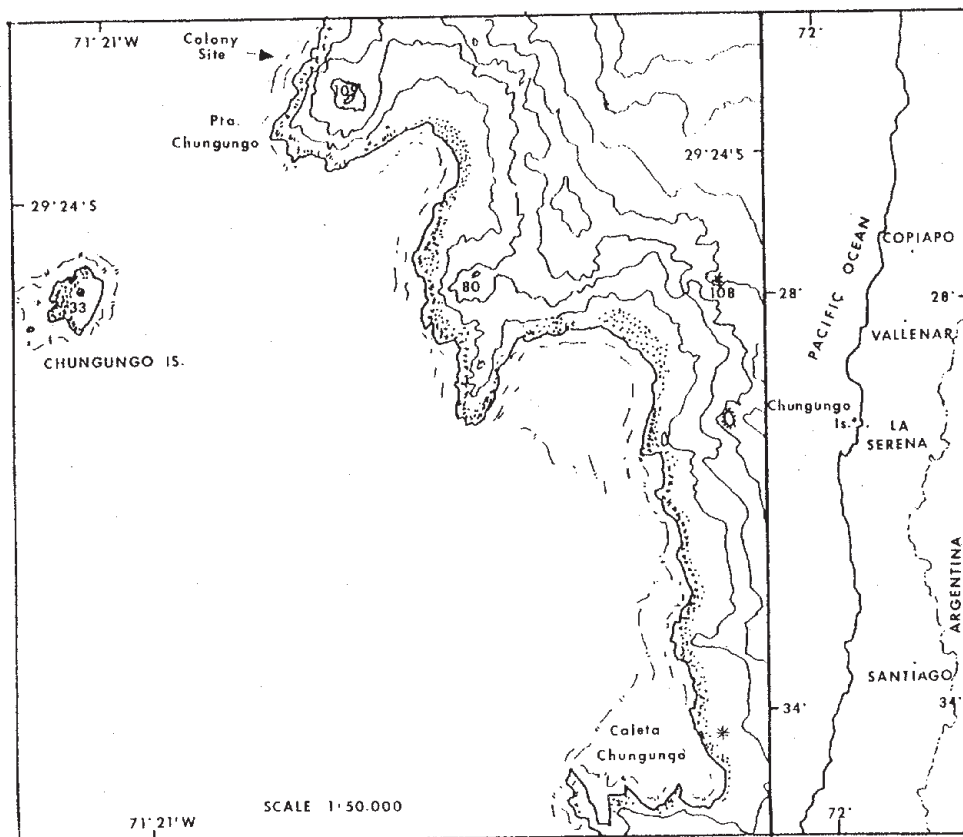


Figure 1

Study site near Caleta Chungungo, Chile

used included black plastic material left behind by tourists and fishermen.

The nine nests were built along one kilometre of shoreline, with a maximum distance of 300 m and a minimum of two metres between nests. Nests were located between five to eight m a.s.l. Three nests were situated on the south-facing cliffs, exposed to the southerly winds predominant in this region, two on the eastern and four on the northwest exposures.

Egg-laying occurred in December and January, but in the nest that was finished at the beginning of February eggs were laid in March. The clutch

size ($n=9$) was always three eggs, characteristic of this species (Goodall *et al.* 1957).

Although we could not establish the duration of the hatching period with precision, it was estimated to be between 25 and 35 days. Most eggs hatched during the second half of January. Nestlings were first observed leaving their nests between the end of March and the beginning of April.

Four nests were destroyed before hatching by rough seas. Three of these were located at the southern exposed site and one at the eastern exposure. The remaining five nests produced 10

fledglings; giving an overall breeding success of 37% (10/27). The juveniles displayed black gular pouches and their general plumage patterns were class B, i.e. juvenile individuals that have a pale throat, blackish-grey crown, pale underparts and dark grey upperparts, as may be expected for this region according to descriptions by Rasmussen (1988).

The Redlegged Cormorant, which generally nests in small colonies or as isolated pairs (Murphy 1936, Siegel-Causey 1987), breeds year-round in the northern part of its distribution area (Murphy 1936, Goodall *et al.* 1957). As for the majority of bird species, the breeding season of this species in the temperate zone is seasonal.

Compared with the two other species of cormorant that breed along the northern coast of Chile, the breeding season of the Redlegged Cormorant is intermediate in duration between the long (July to March) season of the Neotropical Cormorant *P. olivaceus* (Vilina & Gonzalez 1991) and the summer-breeding season of the Guanay Cormorant *P. bougainvillii* (Araya & Todd 1987).

The nest of the Redlegged Cormorant resembles more the nests of the Bank Cormorant *P. neglectus* (Cooper 1986) than the those built by the sympatric Neotropical Cormorant, which builds its nests with sticks from bushes in rocky cliffs or on big cacti (Y. A. Vilina pers. obs.)

The courtship followed the patterns described for the species by Siegel-Causey (1987), but we did not observe creches as described by Rasmussen (1988) for Punta Guapacho colony in the south of Chile.

Exposure to wind seems to be the environmental factor with the strongest influence on breeding success, because all the nests exposed to the prevailing winds were lost as a consequence of rough seas. A similar phenomenon has been observed for Whitebreasted *P. carbo lucidus* and African *P. africanus* Cormorants, where

seasonally strong winds were described as the main regulating effect of reproductive cycles by causing breakdown of nests. (Marshall & Roberts 1959). Another factor causing loss of nests could be the lack of experience of some breeding pairs. We did not observe human disturbance or predation, as described for this species in other regions of Chile (Schlatter 1984).

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