

## SHORT NOTE

### A census of Spotted Shags (*Stictocarbo punctatus punctatus*) breeding on Banks Peninsula in 1960

During October - November 1960, a census was carried out of breeding pairs of the Spotted Shag (*Stictocarbo punctatus punctatus*) on Banks Peninsula. Although the maps were completed shortly afterwards, an account of the census was not written up owing to pressure of other work. We hope that publishing this account will enable a comparative census to be carried out. A full study of the breeding biology of this species based on two seasons' work (1970 and 1971) at Sumner (= Whitewash) Head was published subsequently by Fenwick and Browne (1975); such a study would have greatly assisted us in working out our census methods, but reference to Fenwick and Browne's paper has now enabled us to check our procedures especially as regards breeding biology and stages in the breeding cycle in the area.

The Spotted Shag is an inshore-foraging shag, with main breeding centres in the Auckland area (Hauraki Gulf and west coast), the Marlborough Sounds, Banks Peninsula and Otago Peninsula; breeding sites are on cliff ledges or in sea-caves (Stead 1932, Turbott 1956, Fenwick & Browne 1975). A second subspecies, the Blue Shag (*Stictocarbo punctatus steadi*), is found from Stewart Island along the west coast of the South Island north to the Steeples (Kinsky 1970).

Banks Peninsula and the Sumner Head area consist of volcanic rocks providing (apart from embayments) almost continuous coastal cliffs often over 100m in height. The cliffs are generally precipitous and have numerous comparatively shallow ledges which are often overhung; similar ledges also occur in many sea-caves. Many Spotted Shag breeding sites occupy ledges deep enough to accommodate only a single row of nests, although in some cases ledges and slopes of greater depth are occupied. However, none of the ledges and slopes were deep enough to cause difficulty in counting the pairs from a boat just offshore.

The Banks Peninsula colonies were counted in three sections as follows: 26 October, Little Port Cooper - Le Bons Bay Lighthouse; 27 October, Dan Rogers Caves - East Head; 28 October, Jacobs Ladder - Birdlings Flat. On 26 November the colonies of the Sumner Head area were counted.

Previous observations by E.G.T. and by Mr. D. G. Helps, of Port Levy, indicated that the breeding season throughout Banks Peninsula colonies was fairly closely synchronised i.e. if the count could be made in mid- or late October (laying mid-September onwards; incubation period 28-31 days) the adults would be on nests containing eggs or young chicks. Mr. Helps checked the Beacon Rock colony on 24 October, a few days before our first day of counts, and found that all nests contained eggs. (He also visited the same colony on 11 November when nearly all the nests contained newly-hatched chicks.) At Sumner Head Fenwick and Browne (1975) found that Spotted Shags started laying in mid-September in both 1970 and 1971.

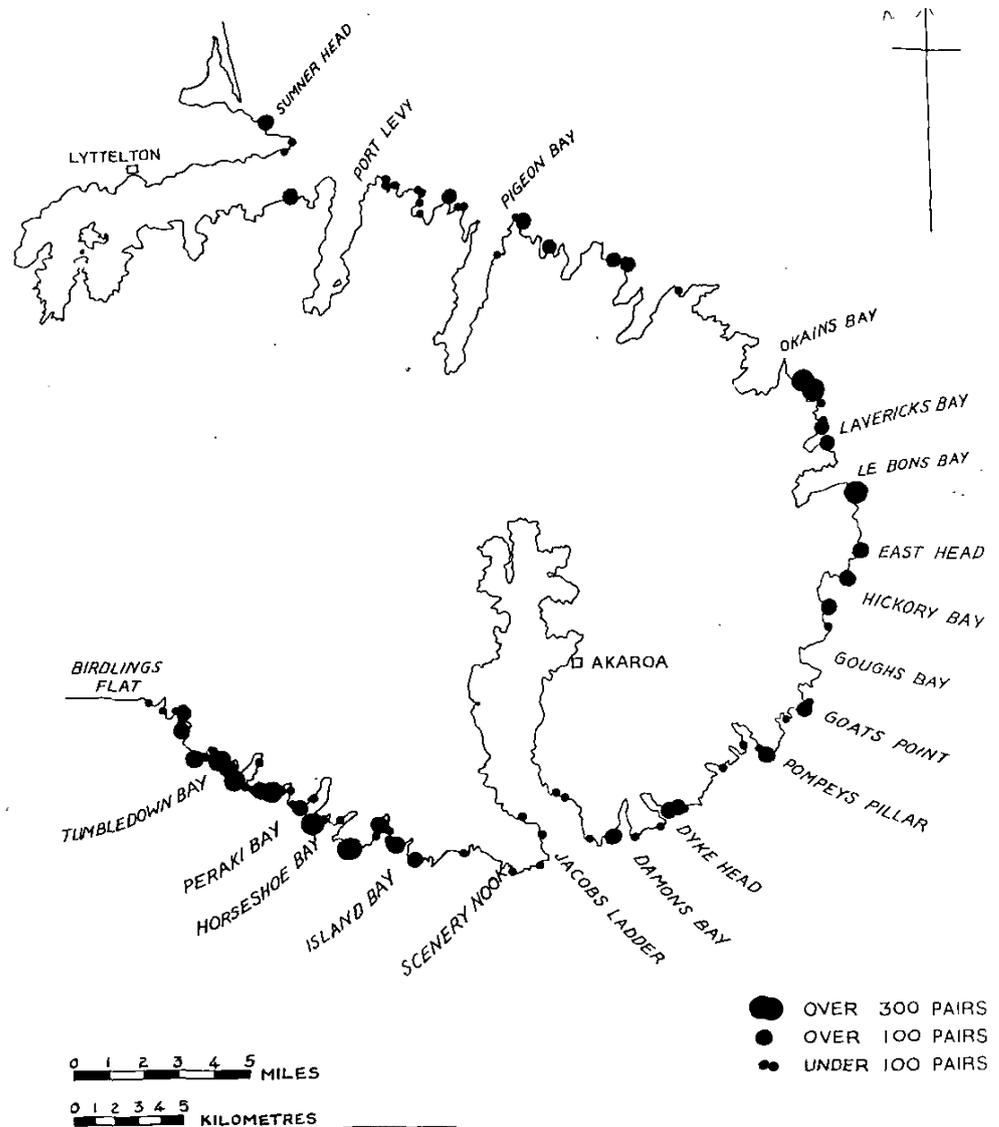


FIGURE 1 – Location and comparative size of breeding colonies of Spotted Shags in the Banks Peninsula area.

At all the Banks Peninsula sites counted sitting adults could be clearly seen, indicating that the birds were incubating or possibly sitting on recently hatched chicks; laying throughout would thus have been mainly in late September. Chicks perhaps two weeks old, i.e. eggs laid in mid-September, were seen at only two nests during the October counts.

Although chicks were present at most nests during the count of the Sumner Head area, the chicks were still in or close to the nests so that an accurate count of the number of nests (breeding pairs) could be made.

Of much importance in our choice of the best time for making the counts was the sequence of plumage stages in this species. Breeding plumage is assumed by both sexes in late winter or early spring, the first stage being an elaborate pre-nuptial plumage characterised by a double crest and numerous white decorative plumes on head and neck; in addition, a prominent broad white stripe extends down the side of the face and neck

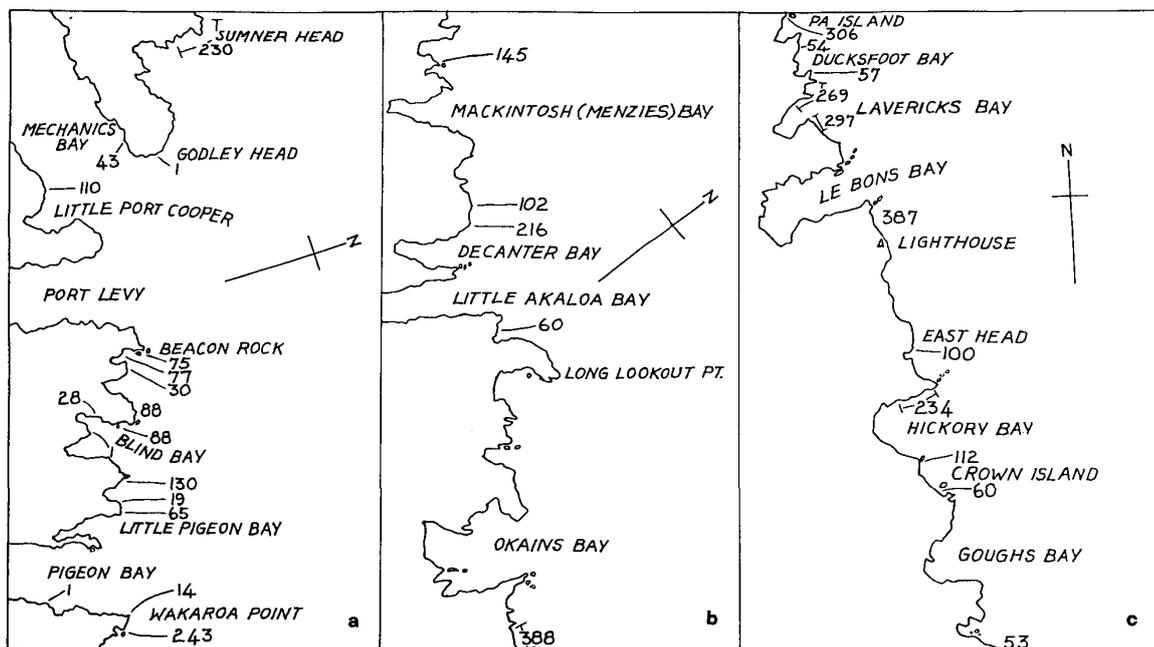


FIGURE 2 - Location of colonies and counts of breeding pairs of Spotted Shags in the Banks Peninsula area: northwest to east. The scale is given on Fig. 3.

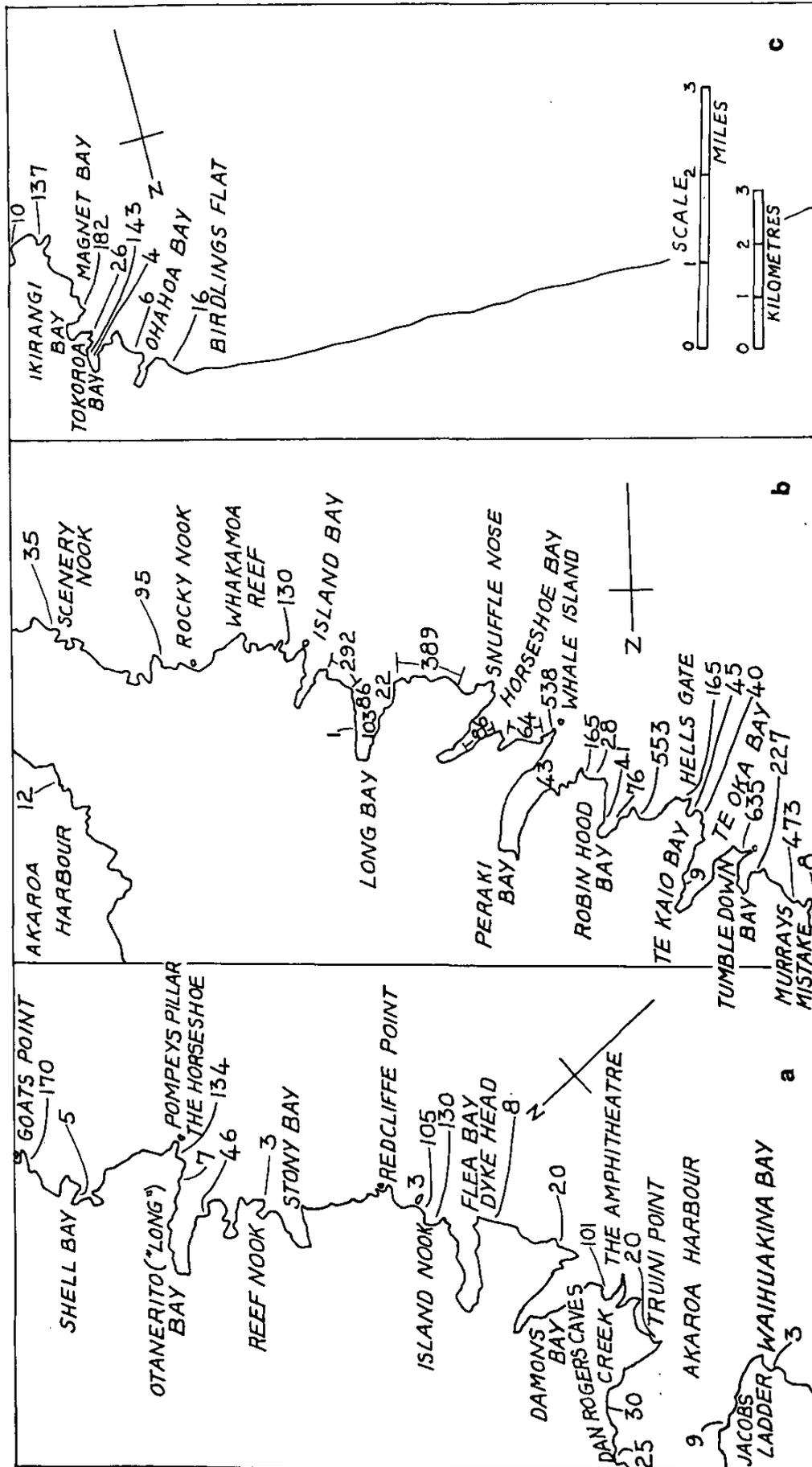


FIGURE 3 - Location of colonies and counts of breeding pairs of Spotted Shags in the Banks Peninsula area: east to southwest.

as far as the shoulders. Before laying the white decorative plumes are shed, but the white head- and neck-stripe remains highly prominent (nuptial plumage). With hatching there is a moult to post-nuptial plumage in which the white stripe on the head and neck is obscured by grey mottling, and the black throat becomes grey or speckled. We found that the white face- and neck-stripe of nuptial plumage could be distinguished readily from offshore.

Incubation is shared by both sexes, and soon after the change-over the relieved bird generally leaves to feed; in comparatively few instances two adults were noted at a nest, and these instances were recorded as a single occupied site. Fenwick and Browne (1975) indicate that male and female share incubation equally, but give no information on length of incubation shifts or period of absence to forage.

Birds not associated with nests were not included in counts, but only a relatively few such birds were seen. Most counts were in the middle portion of the day (approximately 10:00 - 15:00), a time when most non-breeding birds are absent feeding offshore.

The Spotted Shag colonies consisted of discrete groups, presumably located according to the suitability of ledges or slopes (although the distinguishing features of these as compared with adjacent ledges or slopes were often not clearly apparent). The extent of each small or large group could be clearly distinguished, and both observers counted each group, compared results, and recounted if there was a marked difference in our counts.

The total number of Spotted Shag breeding pairs for the area was 9,787. As shown in Figures 1 - 3 there was a marked concentration of colonies, including five large colonies (of over 300 pairs), on the southwest coast between Murray's Mistake-Tumbledown Bay and Island Bay; elsewhere colonies were fairly evenly distributed, with large colonies (over 300 pairs) south of Le Bons Bay and between Okains Bay and Lavericks Bay. As indicated in the maps colonies were in all instances on cliffs exposed to the open sea, and were not present on the cliffs of the deeper bays and harbours.

#### ACKNOWLEDGEMENTS

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