

## SHORT NOTES

### DOUBLE BREEDING SEASON IN PIED SHAGS ON STEWART ISLAND, FROM RECORDS BY ROY TRAILL

The Pied Shag (*Phalacrocorax varius varius* Gmelin, 1789) has a discontinuous distribution within New Zealand (Bull *et al.* 1978) and there has been some uncertainty about its breeding seasons in different parts of its range. According to Stonehouse (1968): "Laying seasons vary; in the South Island most eggs are laid throughout July and September, but in the North Island birds lay throughout the year with peaks of breeding activity in spring and autumn." There is equal intensity of egg-laying in spring and autumn at Lake Pupuke (Falla *et al.* 1966). The Australian subspecies *P. v. perthi* has a similar double breeding season in marine environments (Serventy *et al.* 1971). Continuous nesting has been recorded in the South Island from Marlborough Sounds (Soper 1972) and records suggest a similar trend on Stewart Island.

Roy Traill, who has lived on Stewart Island for most of his 86 years, kindly permitted me to inspect his more recent bird diaries in order to calculate annual nesting periods for shags. This account is based on his visits between 1970 and 1977 to a Pied Shag colony at Little Kaipipi (46°54'S 168°04'E), a small bay in Paterson Inlet. Descriptions of Pied Shag nesting behaviour in this area were given by Guthrie-Smith (1914) and Gillham (1965). This species nests at Little

TABLE 1 — Numbers of occupied Pied Shag nests at Little Kaipipi. Observations by Roy Traill.

Year	J	F	M	A	M	J	J	A	S	O	N	D
1970	-	2	-	5	+	-	2	+	5	5	-	4
1971	-	7	6	-	4	3	-	-	12	+	-	0
1972	-	0	3	-	-	-	2	+	-	-	-	-
1973	0	2	3	4	-	6	+	5	7	5	-	-
1974	0	3	4	-	5	7	5	+	6	5	+	-
1975	-	-	3	7	-	7	6	10	10	+	+	-
1976	+	5	6	+	-	5	5	+	-	+	2	-
1977	+	6	6	-	-	-	-	-	-	-	13	-

+ nests occupied but no count made.

- colony not visited.

**Notes:**

September 1971: nests with all stages from egg to large chick.

May and November 1974: all nests with large chicks.

Kaipipi in several Southern Ratas (*Metrosideros umbellata*) on branches which overhang the water. Nests are re-used from year to year and the number occupied per month is shown in Table 1. Roy Traill's records from other Pied Shag colonies in Paterson Inlet are relatively infrequent but show similar trends.

The Little Kaipipi colony was occupied almost continuously during the eight years recorded except for either December, January or February of some years (range 0-7 nests for these months). Nests were re-occupied during January/February in 1973 and 1974 and February/March in 1972. Numbers of occupied nests were fairly constant from March to July (range 3-7) and maximum annual numbers occurred from August to November (range 5-13). Roy Traill suggested that these birds have two annual egg-laying periods: summer and winter. These two periods overlap in winter but not always in summer. Pied Shags in Paterson Inlet therefore have breeding cycles similar to those recorded in the North Island, except that more nests are occupied in spring than in autumn. Without banding, it cannot be known if the same birds breed more than once in a year.

The other three shag species common on Stewart Island have extended but apparently not continuous breeding seasons. The Little Shag (*P. melanoleucos brevirostris*), which often nests in association with the Pied Shag, lays eggs in mid-winter, with most young fledged by September (Guthrie-Smith, 1914). Roy Traill has seen chicks as late as December but Richdale's report from Stewart Island (*in* Oliver, 1955) of eggs in January and chicks in May appears exceptional. The breeding season for the Stewart Island Shag (*Leucocarbo carunculatus chalconotus*) is not fully documented but probably extends from August to February in Foveaux Strait (Guthrie-Smith, 1914; Oliver, 1955; Watt, 1975). Nesting of the Blue Shag (*Stictocarbo punctatus stadii*) coincides with that of the Little Shag. Roy Traill has recorded mating plumage in June and July; eggs in July and August; chicks usually fledged by October, but occasionally as late as December. This contrasts with Oliver's record for eggs from November to January, but the latter dates from a period when Blue Shags were relatively rare (Stead, 1948) and did not nest in or near Paterson Inlet.

#### LITERATURE CITED

- BULL, P. C.; GAZE, P. D.; ROBERTSON, C. J. R. 1978. Bird distribution in New Zealand. A provisional atlas 1969-1976. 254 pp. Ornithological Society of New Zealand.
- FALLA, R. A.; SIBSON, R. B.; TURBOTT, E. G. 1966. A field guide to the birds of New Zealand. 254 pp. Collins.
- GILLHAM, M. E. 1965. A naturalist in New Zealand, 285 pp. A. H. & A. W. Reed.
- GUTHRIE-SMITH, H. 1914. Mutton birds and other birds. 207 pp. Whitcombe & Tombs.
- OLIVER, W. R. B. 1955. New Zealand birds. (2nd ed.). 661 pp. A. H. & A. W. Reed.
- OSN2 1970. Annotated checklist of the birds of New Zealand. Ornithological Society of N.Z. 96 pp. A. H. & A. W. Reed.
- SERVENTY, D. L.; SERVENTY, V.; WARHAM, J. 1971. The handbook of Australian sea-birds. 254 pp. A. H. & A. W. Reed.
- SOPER, M. F. 1972. New Zealand birds. 216 pp. Whitcombe & Tombs.
- STEAD, E. F. 1948. Blue Shag of Stewart Island. NZ Bird Notes 3: 79-80.
- STONEHOUSE, B. 1968. Birds of the New Zealand shore. 122 pp. A. H. & A. W. Reed.
- WATT, J. P. C. 1975. Notes on Where Island and other roosting and breeding stations of the Stewart Island Shag (*Leucocarbo carunculatus chalconotus*). Notornis 22: 265-272.

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