THE DISTRIBUTION AND NUMBERS OF CRESTED GREBE IN NEW ZEALAND 1980

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ABSTRACT

The first national survey of the Southern Crested Grebe *Podiceps cristatus australis* was carried out in the South Island, New Zealand, from 29 November to 14 December 1980. 170 adults were counted and 20+ more estimated on 28 of the 84 lakes covered during the survey. When other recent records are included, this survey indicates that the New Zealand population of adult Crested Grebes is about 240-250. The bulk (c. 55%) of the population was in Canterbury, where most birds were concentrated on two groups of lakes. Total numbers were probably greater than those recorded in 1970 but local declines have occurred. Some breeding data are also presented.

INTRODUCTION

The Crested Grebe *Podiceps cristatus* is a polytypic species with races found in the Palearctic *(cristatus)*, Africa *(infuscatus)* and Australia and New Zealand *(australis)* (Cramp & Simmons 1977).

In New Zealand, the Southern Crested Grebe was formerly distributed on a few large North Island lakes and was widespread throughout most of the South Island but seems to have disappeared as a breeding species from North Island lakes late last century (Westerskov 1972). Kinsky (1970) recorded it as breeding in the South Island only, on lowland lakes west of the main ranges and on alpine and subalpine lakes within and east of the main ranges, as absent from Nelson and Marlborough, and as a rare straggler to the North Island. The only recent North Island records are of a single bird seen on Lake Rotorua in December 1975 and June 1976 (Palliser 1977) and two birds seen on a farm dam at Te Awamutu (Goulding 1981).

Westerskov (1971) recorded the distribution and numbers of Crested Grebes in Canterbury during 1969-70 and provided a well-documented review of their previous status there. In recent years counts of Crested Grebes on the Ashburton Lakes (S. Moore, pers. comm.; C. O'Donnell, pers. comm.; and pers. obs.) and Lakes Alexandrina and McGregor (pers. obs.) showed that numbers there were much higher than those reported by Westerskov. Observations at other lakes in Canterbury were too few to show whether the Canterbury population had increased or had merely become concentrated in these two areas.

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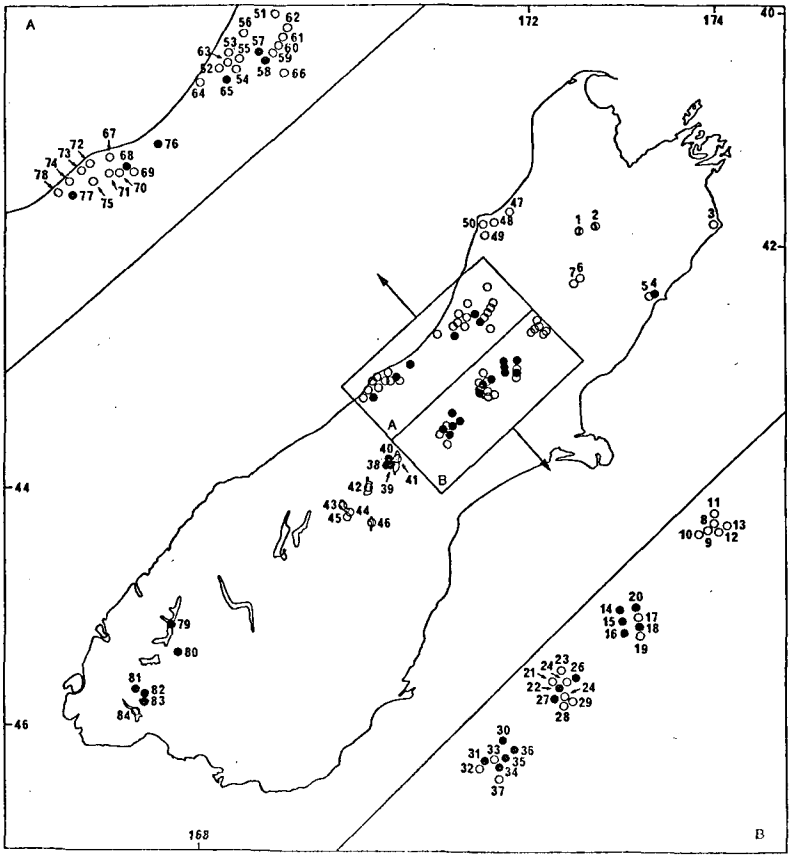

FIGURE 1 — Locations of South Island lakes survey 29 November - 14 December 1980. Closed circles — lakes where Crested Grebes were seen; open circles — lakes where Crested Grebes were not seen. Numbers correspond to lakes listed in Table 1.

Therefore, in 1980 OSNZ organised the first national survey to determine the distribution and numbers of adult Crested Grebes in New Zealand and to provide a basis of comparison for future surveys.

METHODS

Only the South Island was surveyed because any Crested Grebes seen in the North Island would be reported promptly. Effort put into the survey varied in light of local knowledge of Crested Grebe distribution. Thus, as many lakes as possible were surveyed in Canterbury, Westland and Fiordland, whereas only lakes where Crested

Grebes had been reported recently were surveyed in Nelson and Marlborough. No lakes were surveyed in Otago and Southland.

Studies overseas (e.g. Prestt & Mills, 1966; Hughes *et al.* 1979) have shown that Crested Grebes can be counted with reasonable accuracy, as long as large lakes and lakes with marginal vegetation are surveyed very carefully.

Crested Grebes are best counted during the breeding season, when most birds are defending breeding territories and only non-breeders may be moving from one lake to another. Surveys of Crested Grebes in Britain have shown that ideally all lakes should be visited on the same day to minimise the possibility of movement (Hughes *et al.* 1979). However, because of the large number and remoteness of lakes and the few observers in the South Island, three weekends and two weeks were allowed for the survey (29 November - 14 December 1980).

Observers were asked to complete a simple record form with the following details: Observer; date and time of count; lake; district; number of grebes counted during visit; number of grebes estimated to be present (to account for birds out of sight during the visit, for example, assumed to be on nests); breeding (yes/no/unknown); the number of grebes seen during any previous visit; and remarks (to include weather, suitability of lake for grebes, an assessment of the efficiency of the count).

Additional observations were obtained from the OSNZ Recording Scheme and the OSNZ Bird Mapping Scheme, 1969-76.

Lakes covered are listed in Table 1 and their locations are shown in Figure 1. See Irwin (1975) for the map number, full grid reference, area and altitude of lakes mentioned in the text.

RESULTS

Distribution and Numbers

No Crested Grebes were reported in the North Island during November-December 1980. A total of 170 adult Crested Grebes were counted and 20+ more were estimated in the South Island during the survey (Table 1), a total of 190+ adults. Grebes were found on 28 and estimated to be on 1 of the 84 lakes covered.

Nelson

No grebes were seen on Lakes Rotoroa and Rotoiti during the survey period. The only recent record known is of a single bird seen on Lake Rotoiti in June 1979 (J. Hawkins, pers. comm.).

Marlborough

A single grebe was seen on Lake Rotorua during the survey, but previous sightings show that up to four birds may have been present. Two adults were seen on Lake Rotorua on 19 September

1979 and four on 23 October 1980 (B. Elliott, pers. comm.). No grebes were seen on Lake Elterwater. A pair raised three young on Elterwater in 1976/77, and two birds seen courting in August 1977 apparently failed to breed successfully and had disappeared by January 1978 (Taylor 1979).

TABLE 1 — Counts and estimates of Crested Grebes made during the first national survey, 29 November-14 December 1980.

Lake	Number of Crested Grebes Counted	Number of Crested Grebes Estimated	Lakes	Number of Crested Grebes Counted	Number of Crested Grebes Estimated
Nelson			Canterbury (cont'd)		
1. Rotoroa	0	0	35. Maori Lakes	2	2
2. Rotoiti	0	0	36. Emily	2	2
Marlborough			37. Denny	0	0
3. Elterwater	0	0	38. Alexandrina	38	38
4. Rotorua	1	4	39. McGregor	8	8
5. Rotoiti	0	0	40. Glenmore Tarns	4	4
Canterbury			41. Tekapo	0	0
6. Tennyson	0	0	42. Pukaki	0	0
7. Guyon	0	0	43. Ohau	0	0
8. Sumner	0	0	44. Raupo Lagoon	0	0
9. Mason	0	0	45. Swan Lagoon	0	0
10. Katrine	0	0	46. Benmore	0	0
11. Marion	0	0	Westland		
12. Taylor	0	0	47. Denniston Dams	0	0
13. Sheppard/Mary	0	2	48. Gillows Dam	0	0
14. Sarah	2	2	49. Westport Reservoir	0	0
15. Grasmere	4	4	50. Addisons Road	0	0
16. Pearson	3	4	51. Hochstetter	0	0
17. Hawdon	0	0	52. Mudgie	0	0
18. Marymere	1	1	53. Kumara Reservoir	0	0
19. Vagabonds Inn	0	0	54. Okuku Reservoir	0	0
20. Letitia	3	4	55. Dillman's Dam	0	0
21. Henrietta	0	0	56. Arnold Dam	0	0
22. Selfe	3	3	57. Brunner	3	4
23. Lilian	0	0	58. Poerua	2	2+
24. Evelyn	0	0	59. Kangaroo Lake	0	0
25. Ida	0	0	60. Lady Lake	0	0
26. Catherine	5	6	61. Haupiri	0	0
27. Coleridge	7	7	62. Ahaura	0	0
28. Georgina	0	0	63. Bell Hill	0	0
29. Lyndon	0	0	64. Mahinapua	0	0
30. Heron	27	29	65. Kaniere	1	2
31. Clearwater	11	11	66. Kaurapataka	0	0
32. Camp	0	0	67. Saltwater Lagoon	0	0
33. Roundabout	0	0	68. Rotokino	2	4
34. Emma	8	10	69. White Heron Lagoon	0	0

TABLE 1 (Continued)

Lake	Number of Crested Grebes Counted	Number of Crested Grebes Estimated	Lake	Number of Crested Grebes Counted	Number of Crested Grebes Estimated
Westland (cont'd)			Fiordland		
70. Darby	0	0	79. Te Anau	4	4+
71. Joan	0	0	80. Thomas	3	3+
72. Windemere	0	0	81. Island Lake	7	7+
73. Okarito Lagoon	0	0	82. Green Lake	3	3+
74. Three Mile Lagoon	0	0	83. Monowai	2	2+
75. Wahapo	0	0	84. Hauroko	0	0
76. Ianthe	7	8			
77. Mapourika	7	10	TOTAL	170	190+
78. Five Mile Lagoon	0	0			

Canterbury

Grebes were seen on 16 and estimated to be present on 1 of the 41 lakes surveyed and 128 adults were counted and 9 estimated as being present.

No grebes were seen on lakes of the Lake Sumner group (lakes 8-13, Table 1), but two birds seen on Lake Sheppard in early November 1980 (R. Novis, pers. comm.) were included for this area. The remaining grebes were distributed as follows: Lake Pearson group (lakes 14-20) 13 counted and 2 estimated; Lake Coleridge group (lakes 21-29) 15 counted and 1 estimated; Ashburton Lakes (lakes 30-37) 50 counted and 4 estimated; Lake Alexandrina group (lakes 38-40) 50 counted. No grebes were seen on Lake Ohau, where two pairs were seen in October 1970 (Child 1972) and two birds were seen in January 1980 (M. Heine and J. Pearson, pers. comm.).

West Coast

Grebes were seen on six of the 32 lakes surveyed with 22 adults counted and 8+ estimated as being present, 30+ altogether.

None of the small coastal lakes and artificial reservoirs (lakes 47-50 and 53-56) supported grebe populations and the general impression of observers was that most were not suitable for Crested Grebes.

No Crested Grebes were seen on Kangaroo Lake, Lady Lake and Lakes Hochstetter, Mudgie, Haupiri, Ahaura, Mahinapua and Kaurapataka and there have been no reports to the OSNZ Recording Scheme.

Although three birds were seen on Lake Brunner, two pairs were estimated to be present and breeding. A maximum of four birds have been seen on this lake during many visits made over the past 2.5 years (R. Simpson, pers. comm.). Crested Grebes are known to

have bred at Lake Poerua, the latest being of a pair feeding young in 1979 (A. Brett, pers. comm.).

One Crested Grebe was seen on Lake Kaniere, but early 1980 sightings support the estimate of two (N. Ward, pers. comm.). A pair seen on the lake in November 1974 were the first seen there for several years (R. Simpson, pers. comm.) and none has been reported since, until now.

Although Saltwater Lagoon is a known Crested Grebe area, none was seen during this survey, despite a careful search (D. P. Murray, pers. comm.). None was seen in April 1980, when half the lagoon was surveyed by boat (N. Word, pers. comm.). The recent opening of the lagoon mouth has created tidal conditions unsuitable to grebes, probably explaining why none was recorded. This situation occurs every few years (D. P. Murray, pers. comm.).

Lake Rotokino is a known Crested Grebe lake and, although breeding has not been confirmed, it is probable (D. P. Murray, pers. comm.). The nearby White Heron Lagoon is visited by grebes probably from Lake Rotokino.

No grebes were seen on Lakes Darby and Joan during the survey and none has been reported previously.

No grebes were seen on the Okarito group (lakes 72-74) during the survey. One Crested Grebe was seen on Lake Windermere, which is attachd to Okarito Lagoon, in December 1978 (M. Heine, pers. comm.). Occasional sightings are reported on Okarito Lagoon, e.g. two in October 1974 (R. Simpson, pers. comm.) and one in January 1980 (D. P. Murray, pers. comm.). As the main part of the lagoon is tidal and may change rapidly during floods, it usually does not provide good breeding habitat, and may only be visited by occasional birds (D. P. Murray, pers. comm.). However, the northern end of Okarito Lagoon, which has the least tidal influence, may have a pair of grebes regularly; but few observers reach this end, and so records are few (R. Simpson, pers. comm.). Grebes are not known from either Three Mile or Five Mile Lagoons and they are unlikely to occur there during the breeding season as both lagoons are tidal and subject to drying out.

No grebes were seen on Lake Wahapo, which is probably too silty for grebes (W. J. Wood, pers. comm.).

Lakes Ianthe and Mapourika are known grebe lakes, birds having been reported there in most months and breeding has been reported in previous years.

Fiordland

Crested Grebes were seen on five of the six lakes surveyed. Nineteen adults were counted, but more are likely to have been present.

The large area of Lakes Te Anau and Monowai made them difficult to survey and the Middle and North Fiords of Te Anau were not visited during the survey. However, the results do indicate that

the large numbers of Crested Grebes reported on these lakes in the past for example, up to 70 on Lake Monowai in 1948 (Anon. 1948), do not now occur.

Only two Crested Grebes were counted on Lake Monowai during the survey and W. H. Mannix reports that their numbers have declined in recent years. However, this lake appears to be used more in winter as six separate grebes were seen at various locations on the lake on 31 May 1980 (E. J. Gibbs, pers. comm.).

There are few reports of Crested Grebes for Te Anau in the records of the Fiordland National Park Board for the period 1969-80 and most of these are either of single birds or of family groups (K. & J. V. Morrison, pers. comm.).

No grebes were seen on Lake Hauroko during the survey and both O. Linscott and K. Hamilton report consistent nil returns from there since at least 1975.

Birds were seen swimming in close pairs and exhibiting courtship display on Island Lake and Lake Thomas during the survey.

Breeding

Breeding was reported at some Canterbury lakes only. Single-egg clutches were found at Lakes Pearson (1), Catherine (1) and Clearwater (1) and a two-egg clutch at Lake Selfe. A brood of two striped chicks was seen on Lake Clearwater and a brood of three striped chicks on both Lake Coleridge and Glenmore Tarns.

A chick hatched from the Lake Clearwater nest and eventually fledged about Christmas 1980. Soon after this chick left the nest another pair of Crested Grebes built a nest under the same willow, laid four eggs and hatched two in March 1981 (D. H. Ackerley, pers. comm.). All three chicks on the Glenmore Tarns fledged (R. J. Pierce, pers. comm.).

DISCUSSION

The main source of error in the present survey is the lack of adequate coverage of lakes in South Westland and Fiordland, especially some known to be used by Crested Grebes. However, the results do provide a good basis for comparison with future surveys. The following are the known grebe lakes not covered during this survey, together with the maximum number of Crested Grebes reported since 1950: Christabel (2), Daniells (2), Gault, Matheson (1), Paringa (4), Rasselas, Moeraki (6), Tawherekiri, Pratt (1) and Ellery in Westland (OSNZ Recording Scheme and R. Simpson, pers. comm.) and Wilmot, Fergus (4), Gunn (4), Ronald, Manapouri (5), Thompson, Hankinson, lake in Mid Burn, lake in Poseidon Valley, Poteriteri and Hakapou (2) in Fiordland (OSNZ Recording Scheme, OSNZ Bird Mapping Scheme 1969-76, and K. Morrison, pers. comm.). Thus, at least 21 lakes where grebes have been reported were not covered during the survey. I estimate that the maximum possible number of Crested Grebes that these support is

50-60 birds. The addition of these to the 190+ on the lakes covered during this survey indicates that the New Zealand population of Southern Crested Grebes is 240-250.

Therefore the estimated distribution and numbers of Crested Grebes (based on information from this survey, OSNZ Recording Scheme and the OSNZ Bird Mapping Scheme, 1969-76) are: Nelson 0; Marlborough 4 birds on 1 lake; Canterbury 137 birds on 17 lakes; Westland 45-50+ birds on 16 lakes; Fiordland 50-55+ birds on 15 lakes, Otago 0; Southland 0.

Movement of birds from one lake to another at different times of the year may be essential in maintaining the population as a whole in any one area. That Crested Grebe distribution can vary in a group of lakes between and within years is well known (Hughes *et al.* 1979).

Because of this changing distribution, birds may recolonise lakes that have not been used for several years and abandon others. We cannot, therefore, compare in detail the results of this survey with those of Westerskov (1971, 1972), but the following general trends are apparent.

Westerskov (1972) reported that Lakes Rotoroa and Rotoiti were the only lakes in Nelson to have supported Crested Grebe populations. Breeding ceased in the 1950s and only stragglers were reported at Lake Rotoroa in 1952 and 1967. The record of a single bird on this lake in 1979, and the results of this survey indicate that Crested Grebes are still only stragglers in Nelson.

There are no records of Crested Grebes in Marlborough before 1972 (Westerskov 1972). Therefore the results of this survey show that Crested Grebes have either colonised Lake Rotorua for the first time or they have recolonised it after many years' absence. The breeding and disappearance of Crested Grebes from Lake Elterwater confirm the transitory and unpredictable movements of the species.

Westerskov (1971) collated sightings of Crested Grebes in Canterbury during the period 1964-1970 and he visited some of the lakes in January 1970. He concluded that about 50 pairs of Crested Grebes were nesting in 1969-70 and present as regular breeders on 23 lakes. This represented a decline of 35-40% from the 80+ pairs he estimated had been present in the 1940s. Much of this decline had occurred on the northernmost lakes. The results of the present survey (137 birds estimated to be present on 17 lakes) indicates a marked increase in numbers, but Westerskov did not visit all lakes during his survey and a large part of his information came from people who did not visit lakes primarily to count Crested Grebes. Therefore, he probably underestimated the number of Crested Grebes in Canterbury and so we cannot confirm an increase in the population between 1970 and 1980. However, Westerskov (1971) and the present survey confirm the continued population decline of Crested Grebes on lakes of the Sumner group from an estimated 16 pairs in 1940-1950, to 4 pairs in 1969-1970, and to 1 pair in 1980.

Soper (1972) and Falla *et al.* (1979) reported that Crested Grebes were most common in Fiordland and South Westland. However, the results of the present survey indicate that this is not the present situation. Canterbury lakes now support the bulk (c. 55%) of the New Zealand population, and most of these are on just two groups of lakes — the Ashburton Lakes and Lake Alexandrina group, which support c. 42% (104 of 240-250) of the New Zealand population between them. Lake Alexandrina supported the highest number of Crested Grebes (38) of any lake in the country, followed by Lake Heron (29) in the Ashburton Lakes.

This has been caused by a decline in the Fiordland population rather than an increase in the Canterbury population. Crested Grebes have been reported from 16 lakes in Fiordland (see above and Table 1) and the population decline was under way at least as early as the late 19th century, when Richard Henry (1903) noted that Crested Grebes were formerly numerous on Lakes Te Anau and Manapouri. Numbers have dropped drastically on Lake Monowai, where 11 pairs were counted in December 1947 (Anon. 1948), five pairs in 1975-1977 (K. Hamilton, pers. comm.) and two birds in 1980 (this survey). On 21 April 1948 two flocks of Crested Grebes on Lake Monowai contained 36 and 24 birds (Anon. 1948). Another report of a large concentration of Crested Grebes comes from Lake Thompson, where 54 were counted in March-April 1951 (Wood 1951). There are no known subsequent reports on large concentrations of Crested Grebes in Fiordland. Several pairs of Crested Grebes bred on Lakes Fergus and Gunn from 1950-1972 (OSNZ Recording Scheme and OSNZ Bird Mapping Scheme, 1969-1976) but none has been seen there, despite frequent visits, during 1976-1981 (K. Morrison, pers. comm.). Suggested reasons for the decline of Crested Grebes in New Zealand have been discussed previously (Westerskov 1971, Falla 1975).

The current estimate of 240-250 Crested Grebes and the concentration of c. 42% of this population on just two groups of lakes give cause for concern over the future of this species in New Zealand.

Little can be inferred from the breeding observations reported in this survey. The incubation period of the European race averages 28 days (Cramp & Simmons 1977). Assuming a similar time for the New Zealand race and back-calculating from sightings of chicks and hatching dates, the breeding season appears to be extended, with laying from at least October to February. The European race also has an extended breeding season which may cover up to 8 months (Cramp & Simmons 1977).

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