it occurs throughout the country except for the south-west, though apparently only sparsely in Western Australia and Tasmania. It may be expected that the two Invercargill birds would belong to this race. Some useful information on the status of the Gull-billed Tern in New South Wales is given by Keast (*Emu*, 43, p. 180) and McGill (*Emu*, 45, pp. 84 - 85).

TAKAHE RESEARCH 1954 - 1955 SEASON: A SUMMARY

By J. G. KENNEDY, Wildlife Division*

The study period on this occasion was a continuous one lasting from 30 November 1954 to 23 January 1955 – that is, approximately eight weeks. There were two parties, each composed of two observers – Party No. 1 (J. G. Kennedy, Field Officer, and G. R. Williams, Biologist) was in the area from 30 November to 5 January; Party No. 2 (M. M. Small, Field Officer, and K. H. Miers, Biologist) arrived on 3 January and left on 23. Accompanying this party for one week was Mr I. C. McKellar, Geological Survey, D.S.I.R., who, in the course of doing his own work, very kindly assisted in the banding operations.

The aims before both study groups, outlined earlier by one of us (G.R.W.), in brief, were these: that, over an extended period of about three months, the degree of nesting and rearing success should be carefully ascertained – especially insofar as these might be affected by possible predators and competitors which were not to be disturbed during this time; and that banding and general observations should be continued, to the fullest extent possible without unduly disturbing breeding birds and nestlings. These aims were fairly fully realised and the object of this report is to give a brief account of results which are to be published in detail after the outcome of the 1955 - 56 breeding season has been studied.

DURATION OF THE BREEDING SEASON

It was clear that incubation was already well advanced in most nests by the beginning of December. Of the eight nests found that contained – or had contained – eggs, five had chicks hatched from them before mid-December. One nest contained a pipping egg on 21 December and another contained a fresh egg on 4 January. (This last was probably a result of renesting.) Judging from the age of some of the chicks, laying apparently began about the end of October and, from the nest described above, had occurred at least as late as the beginning of January.

LOSSES CAUSED BY DESERTION, ET CETERA

Two nests, each containing one egg, were found deserted, and in two more nests, from each of which one chick had hatched, the remaining egg was deserted. In three of these four cases the remaining egg was later found destroyed – probably by the takahe themselves. Another nest which had apparently never contained an egg was incubated for about a month.

CHICK SURVIVAL

At one time or another eight (less probably, nine) different chicks were accounted for (two coming from nests that were not found). Of these chicks, four (or probably five) were in Takahe Valley and four in the Point Burn. By late January only six of these could be traced with any degree of certainty. We know that seven of these chicks were surviving for minimum periods varying between two and six weeks. As far as this season's nests or chicks are concerned we found no direct evidence that possible predators or competitors had affected either unfavourably in any way. (Stoats, deer, opossums, harriers and wekas were all seen in the study area.)

BANDING OPERATIONS

(1) *General*: Twenty-four birds were caught and banded, nineteen for the first time. A total of 29 takahe have now been marked with a combination

*Killed by an avalanche in the Dobson Valley 4/8/55.

of numbered aluminium bands and coloured plastic bands and five more birds are unaccounted for that should bear plastic bands only. Four takahe marked with aluminium and plastic bands during the 1953 - 54 season were not recorded during our stay in the area, but there is good reason to believe that at least two of these were still surviving in mid-January as two unidentified birds bearing aluminium bands were seen but not captured. Because we now know that the unmodified plastic spiral or wrap-on bands may be readily lost (although some have lasted in the field for just over two years) it is very likely that the five takahe still unaccounted for that were banded with plastic rings in 1952 may never be traced. In fact, it is not improbable that some of them may have already been rebanded. In an attempt to cut down this loss, a plastic cement was used to close wrap-on bands used this year. It is too early yet to judge the extent of any improvement made. A further difficulty is that colours have shown a tendency to fade to such an extent that fleeting sight records might not be reliable. To avoid this, colours not likely to be confused with each other under these circumstances will be chosen in future.

(ii) *Breeding age:* Another prima facie case of takahe breeding in their first year is afforded by the instance of a bird caught and marked as an approximately three-month-old chick in February 1954 being twice captured with one other adult guarding a chick of about one month of age in January 1955. This family group was also identified by band sightings on a number of other occasions.

(iii) *Movements:* Present information indicates that, as a general rule, takahe take up breeding territories close to, or nearly identical with, those occupied in the previous year. It is obvious that there must be exceptions to this rule and one is known of a bird that, banded as a chick in one breeding territory, has been recorded in two different and relatively distant territories in each of the two subseqent breeding seasons.

Some idea has been obtained of the considerable extent of movement of individual birds or family groups that may occur from day to day. More information is needed on this subject, but the difficulties of observing and identifying the birds in the thick snowgrass make the collection of these data slow and rather tedious.

(iv) *Pair formation:* Three instances are known of birds changing mates in different breeding seasons. It is not possible to be certain at present whether the original mates were surviving at the time the new pairing occurred.

Now that what must be a considerable proportion of the takahe inhabiting the two main colonies has been banded, some extremely interesting results may be expected from future study periods. Among other things it may be possible under certain conditions to estimate the total population size by using a modified Lincoln-Petersen index, and, of course, raw material for a life-table study of the species is now in existence and will be added to continuously. There is no indication that properly fitting bands are causing the birds any discomfort or inconvenience.

Other birds banded: Wekas and keas in Takahe Valley are being banded with numbered aluminium and coloured bands as opportunities arise. So far, three wekas and one kea have been so marked.

MEASUREMENTS, ET CETERA

All birds captured during the last two seasons have been weighed, various standard body measurements taken and the appearance of the plumage and soft parts noted. Because the sexes are so similar in plumage, colour of the soft parts and size, discrimination between them has depended in the past solely upon supposed behaviour differences and this method has never been satisfactory. Now one of us (G.R.W.) has suggested a technique (using a combination of weight and culmen measurement) which seems reliable for sexing captured adults. However, it will be subjected to further testing during the next breeding season and this in turn should throw more light on the extent of sexual differences in behaviour. By means of the plumage and

soft parts study it is hoped that the technique for ageing the birds will be much improved, too.

GENERAL OBSERVATIONS

Information on various aspects of takahe behaviour such as copulation, feeding habits and calls, and territorial fighting between takahe themselves and takahe and wekas has been added to and will be discussed at the end of another season's work. As the opportunity has arisen observations have been made on the behaviour of other species that may perhaps play a significant role in the ecology of the takahe. For example, during the breeding season confusion may arise – unless care is taken – between at least two of the calls of takahe and weka, especially as wekas very frequently answer takahe. Confusion of these calls could cause misinterpretation of the significance of behaviour, and re-reading of some observations that have already been published suggests that such misinterpretation has occurred in the past.

DEER AND TAKAHE (K. H. MIERS)

Although deer do not seem to be significant competitors with takahe on the valley floors where *Danthonia rigida* is dominant, in the head basins where feeding and nesting requisites of takahe are at a critical level the modification of the vegetation being brought about by deer is a cause of some concern and should be carefully watched. In May 1954 deer heavily grazed small areas of *Danthonia flavescens* on the bench in the head basin of Takahe Valley, where a pair of birds are believed to have nested in previous years. This summer the extent of the heavy grazing was considerably greater – so much so as to deplete seriously the amount of *D. flavescens* available to the birds. Experience has shown that presence of this species in a flourishing state is almost certainly an important element in site selection by nesting birds in such areas, and in almost every head basin examined the presence of takahe sign is associated with the distribution of *D. flavescens* rather than that of any other species of plant in the subalpine zone. Checks on the extent of the utilisation by deer of various plants, including *D. flavescens,* are being maintained.

A CASE OF ASPERGILLOSIS IN THE BLACK-BACKED GULL

By G. R. WILLIAMS, Wildlife Division

In April this year an honorary ranger of the Wellington Acclimatisation Society reported seeing a number of dead Black-backed Gulls (*Larus dominicanus*) on the Shendon Golf Links near Trentham. A specimen was obtained and sent to the Wallaceville Animal Research Station, where the cause of death was found to be aspergillosis. According to the Diagnostic Officer's reports 'examination of the bird showed a heavy growth of moulds on all the airsac membranes and accumulations of caseous material in all the cervical airsacs. The mould was also recovered from the lungs, although macroscopically they appeared normal. The caseous material was full of mycelia. The mould has been confirmed as *Aspergillus fumigatus.*' No other specimen has since been submitted for examination, but it is presumed that the other gulls had died of the same disease.

This observation is worth recording as it is apparently the first of aspergillosis being found among a wild population of birds in New Zealand, although the disease has been reported from a number of wild species overseas. In North America it has been described from four species of gull: the Herring gull and Thayer's gull, *Larus argentatus smithsonianus* and *L. a. thayeri* (Davis and McClung, 1940; Cowan, 1943; and Beaudette, 1945), the Glaucous-winged Gull (*L. glaucescens*) (Herman and Bolander, 1943), and Western and Californian Gulls (*L. occidentalis* and *L. californicus*) (Herman and Rosen, 1947).