seeds was found, most common being of the grass family, with clover and sedge next in order of importance. Insects predominated in the animal food taken, the most important being beetles, wetas and grasshoppers. Earthworms also were a major item of diet, while insect eggs and millipedes were frequently found.

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BREEDING CYCLE OF THE NORTH ISLAND WEKA

It is common for Wekas to nest more than once a year although chicks are particularly numerous during the spring months. Mr. A. Blackburn of Gisborne observed a pair of Wekas which raised four broods during one year — the first in March, the second in June, the third in September and the fourth in December. Each brood numbered two or three chicks. Mr. C. Burland of Patutahi reported similarly, the broods he observed being raised in June, August, November and March. There are usually 3 - 4 eggs in a clutch although Mr. Blackburn reported 6 eggs as not abnormal and 5 quite usual.

I have been able to find the following nesting records:—

25/10/52	nest	(Notornis, *5:* 222. J.D.C.)
5/8/52	nest with 3 eggs	(Notornis, *6:* 94. J.M.M.)
24/5/54	nest, 4 hatched	(Notornis, *6:* 94. A.B.)
10/9/54	nest with 2 eggs	(Notornis, *6:* 94. Mr. P. Benson)
6/53	nest, 4 hatched, 3 reared	
8/53	nest, 2 hatched, 2 reared	
11/53	nest, 3 hatched, 3 reared	(Notornis, *6:* 94, Mr. C. Burland)
3/53	nest, 3 hatched, 3 reared	
6/54	nest, 3 hatched, 3 reared	

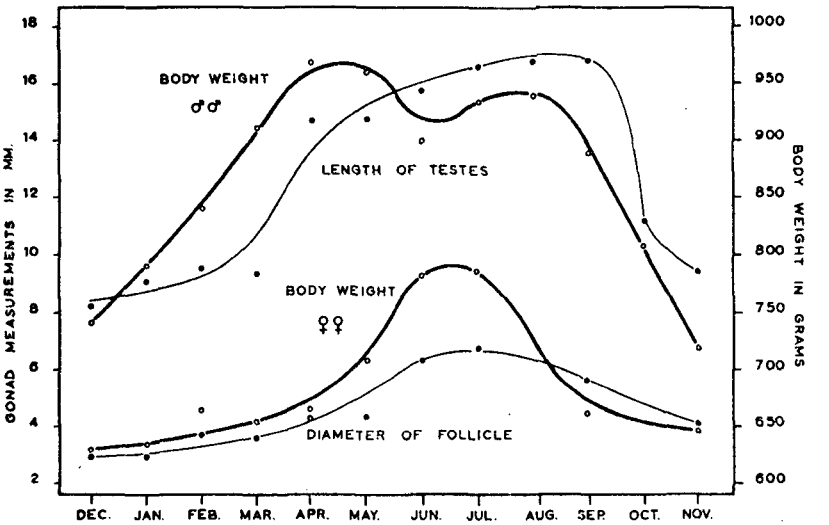

Fig. 1 — Showing seasonal variation in body weight and gonad size of North Island Weka. Note the peak months.

10/7/54	nest with 2 eggs	
26/6/55	nest with 3 eggs	Records of O.S.N.Z. Nest Records
9/61	nest with 4 eggs	Scheme.
7/9/62	nest with 4 eggs	
7/9/62	nest	Recorded by Mr. T. P. Fisher.

A study of this limited information showed that the greatest nesting activity would seem to occur between the months of June and September.

Examination of the gonads of 37 adult males showed increased development of testes from March to September, reaching a maximum in August. Activity of the ovaries in 26 adult females appeared to be greatest between May and September. Unfortunately, few females were collected except during November and December. However, as the breeding cycle shown from nesting records confirmed the results of examination of the gonads, it is reasonable to assume that, although breeding might occur throughout the year, it increases in winter and early spring, that is, from June, reaching a peak about September.

It is interesting to note that weight increase and subsequent gonadal development start in mid-summer and reach a peak in mid-winter with main breeding in winter and early spring, in contrast to many other New Zealand birds both native and introduced, e.g. pheasant (see Westerskov 1956: 62).

A study was made of body weights in relation to size of gonads throughout the year. Gonad measurements used in preparation of the graphs were length of testes and diameter of the largest follicle. The graph shows fluctuation in body weight and gonad size throughout the year, also the relationship between these two phenomena, using the method of the three-point running mean.

In males, increase in body weight tended to precede increase in size of testes. This is the usual sequence in the breeding season.

In females, the monthly figures for body weight and size of follicles appeared to follow a similar pattern. Unfortunately specimens were few, so the results here were of limited value.

SUMMARY

From nesting records and gonad measurements a study was made of the breeding cycle. It appears that, although breeding occurs throughout the year, it reaches a peak during winter and early spring (June to September).

Wekas' commonly raise more than one brood in a year; up to four have been recorded. The average number of eggs in a clutch is 3-4, although 5 or 6 are not abnormal.

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SEXING OF WEKAS

As Wekas are a monomorphic species it was necessary to find a reliable method of sexing the birds.

Length of culmen and weight of body were the two criteria used, and the birds then sexed by dissection. This method proved successful with adult birds, males commonly having greater culmen length and body weight than females. Juvenile birds may be confused with adult females, but are usually easily identified by their dark-coloured eyes and grey legs. Adults have red eyes and their legs are more brown or red-brown than grey.

It is important that measurement of the culmen should be taken from the proximal end of the horny part and not from the feathers, which often mask the true end of the culmen. When this is done, the margin of error in sexing is very small.

Among the 94 birds examined, the culmen length of adult males ranged from 44 mm to 51 mm, with the greatest numbers in the 47-50 mm group (average 47.8 mm). Length of culmen in adult females ranged from 41 mm to 47 mm, with the highest proportion in the 42-44 mm group (average 43.1 mm).

Weights of males ranged from 532 gm to 1053 gm, with 55 per cent. of birds weighing between 900 gm and 1,000 gm (average 912.7 gm). Female weights varied from 382 gm to 1,010 gm (average 698.7 gm), but only two specimens weighed more than 806 gm. Of these, one weighed 950 gm, culmen 46.5 mm; the other 1,010 gm, culmen 44.5 mm. These birds were both exceptionally fat.

The table shows a significant relationship also between length of tarsus and sex of bird. However, it could be difficult to take this measurement successfully on live birds, whereas accurate measurement of the culmen is an easy matter.

The other two measurements, of middle toe and claw (M.t.c.) and of claw only, were too widely variable to be of any value in determining sex, although the average length of each was, as one would expect, less in females than in males.