

PHEASANT BANDING IN NEW ZEALAND, 1948-51.

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1. HISTORY OF PHEASANT BANDING IN NEW ZEALAND.

Pheasants have been banded in New Zealand by various acclimatization societies prior to 1948 as well as later. The only detailed account published of banding results is Gurr's report (1950) on the liberation of 710 banded pheasants in Otago.

The Wildlife Division of the Department of Internal Affairs began pheasant banding in 1948, and since then all pheasants released within the Rotorua Acclimatization District have been banded, and pheasant bands have also been supplied to various acclimatization societies in the North Island.

The bands used have been the ordinary bird-ring type of aluminium with the inscription: Return—Wildlife Serv. Govt. Bldgs. Wgtn. N.Z. and a serial number. Two sizes were used, one for cocks, with an internal diameter of 13 mm., and one for hens, with an internal diameter of 9 mm.

2. LIBERATIONS.

Over the four years, 1948-51, a total of 3485 pheasants were banded, 384 in 1948, 518 in 1949, 2086 in 1950, and 497 in 1951.

(a) Age and Origin of Stocked Birds.

The banded pheasants liberated from the Ngongataha Game Farm near Rotorua, are of mixed breed. Three pheasant subspecies are found on the farm: The English blackneck (*Phasianus colchicus colchicus*); the Chinese ringneck (*Phasianus colchicus torquatus*); and the Kirghiz or Mongolian pheasant (*Phasianus colchicus mongolicus*); none of these subspecies are represented by "pure" specimens, i.e., all the birds are interbred to some extent, but many pheasants are found which have all the characteristics of the blackneck or ringneck or Mongolian. The mutant or green pheasant (*Phasianus colchicus mut. tenebrosus*) is also found on the game farm; it is a mutant of the English blackneck. The dominating type of pheasant found on the farm is predominantly ringneck-looking; these birds have a white ring around the neck and light, greyish-bluish forewing; the females are rather light coloured.

Most of the released pheasants were three months old when liberated (40 per cent.). The birds for which ages were recorded are listed in Table 1.

TABLE 1.—Ages at Release of 2252 Banded Pheasants.

Ages of Pheasants in months.	Total Number of Birds.	Number of Liberations.	Per Cent.
3	899	44	39.9
4	224	15	9.9
5	6	1	0.3
6	14	1	0.6
7	219	14	9.7
8	81	7	3.6
9	114	9	5.1
10	253	26	11.2
11	51	11	2.3
12	217	19	9.6
13	56	3	2.5
14	4	2	0.2
16	38	3	1.7
18	69	5	3.1
Older	7	1	0.3
Total	2252	161	100.0

(b) Liberations in Various Districts.

In order to compare pheasant liberations in various parts of New Zealand to see whether any different survival rates were apparent, the North Island was divided into ten arbitrary districts. The number of pheasants liberated in each district and in isolated areas is shown in Table 2.

TABLE 2.—Number of Pheasants Liberated and Number of Liberations, 1948-51, by Districts.

District Number	District	Number of Liberations.	Number of Birds Liberated.	Average No. of Birds per Liberation.
1	Dargaville	11	38	3
2	Waiuku	8	175	22
3	Rotorua	74	457	6
4	Whakatane	215	1213	6
5	Galatea	20	108	5
6	Taupo	13	63	5
7	Wairoa	67	580	9
8	Napier	27	174	6
9	New Plymouth	43	209	5
10	Opunake	9	35	4
11	Isolated areas	51	366	7
12	Not traceable	11	67	6
Totals		549	3485	—

Average number of birds per liberation of total 6.3

It will appear from Table 2 that banded pheasants have been liberated in many parts of the North Island. It will also be seen that the average number of birds per liberation in these districts varies between three and 22, with an average 6.3 birds per liberation for all releases.

3. RECOVERIES.

(a) Total Recovery Percentage.

Out of the 3485 banded pheasants only 117 were recovered by 1 June 1952. That means that 3.36 per cent. were recovered, which is a very low percentage and lower than in most other places where pheasant liberations are carried out.

Believers in pheasant propagation may argue that the 3.4 per cent. recovery is not a true indicator of survival rates, and that a number of banded pheasants are recovered without being recorded. It is possible that more banded birds are recovered, indicating a higher survival. Only more banding work on a larger scale will in future years provide the necessary data for a final consideration and evaluation of the pheasant liberation programmes. The need for sportsmen to co-operate by sending in of pheasant bands is evident.

But a strong point against the postulate, that not all pheasant bands are turned in and the survival of the birds therefore is higher, is found in the duck banding results in New Zealand. There is little reason to believe

that duck hunters should return a many times higher percentage of duck bands than pheasant bands, and often the sportsman hunts pheasants as well as ducks. The duck recoveries for the 1948-51 period are shown in Table 3, from which it will appear that the average return of all duck bands for all years is 22.7 per cent., or about seven times higher than pheasant returns; for grey ducks banded in 1949 no less than 40.7 per cent. were recovered and reported! A surprisingly high kill and a surprisingly high return of bands.

The reason for this startling difference, to my way of thinking, is the fact that the ducks are wild-bred (and therefore much more hardy and able to fend for themselves) and the pheasants are artificially propagated (less hardy, unaccustomed to new surroundings, unfamiliar with new foods, enemies, etc.). The greater glamour attached to the widely ranging ducks is also a factor to be considered.

We need much more detailed data to get a true picture of the survival of pen-reared pheasants. Until then, we must regard the 3.4 per cent. survival of propagated pheasants as an indicator of survival to be compared with the 23 per cent. recovery of banded wild ducks. The ratio between returns of pheasant and duck bands should be approximately the same, and it is very unlikely that very many more banded ducks are shot than are reported upon—the duck population could not possibly stand a much higher annual drain.

TABLE 3.—Record of Ducks Banded and Recovered by the Wildlife Service, 1948-51.

Species	Year	No. Banded.	No. Returned.	% Recovery
Grey Duck	1948	342	29	8.5
Grey Duck	1949	403	164	40.7
Grey Duck	1950	2796	885	31.7
Grey Duck	1951	1199	248	20.7
Mallard	1948	274	15	5.5
Mallard	1949	613	149	24.3
Mallard	1950	1349	254	18.8
Mallard	1951	743	58	7.8
Grey x Mallard cross	1948	10	0	—
Grey x Mallard cross	1949	57	6	10.5
Grey x Mallard cross	1950	386	53	13.7
Grey x Mallard cross	1951	32	4	12.5
Totals		8204	1865	
Average recovery of totals				22.7%

(b) Recovery in Various Districts.

In order to see whether the banding data might give any indication of different survival rates of pheasants liberated in various parts of the North Island, the releases and subsequent recoveries were grouped in districts as mentioned above. The number of birds liberated, recovered and recovery percentages are shown in Table 4.

TABLE 4.—Number of Pheasant Recoveries in Various Districts, 1948-51.

District No.	District.	Number of Birds Liberated.	Number of Recoveries.	Per cent. Recovery
1	Dargaville	38	4	10.5
2	Waiuku	175	6	3.4
3	Rotorua	457	12	2.6
4	Whakatane	1213	28	2.3
5	Galatea	108	1	0.9
6	Taupo	63	0	—
7	Wairoa	580	14	2.4
8	Napier	174	4	2.3
9	New Plymouth	209	11	5.3
10	Opunake	35	2	5.7
11	Isolated areas	366	35	8.1
12	Not traceable	67	0	—
Totals		3485	117	
Average				3.4

It will appear from the data presented in Table 4 that the recovery percentages from the ten districts has varied between 0 and 10.5 per cent.

Dargaville is well-known as a pheasant-hunter's Mecca, and the Dargaville liberations also show the highest returns, namely 10.5 per cent. Other areas with fair returns are: Opunake (5.7%), New Plymouth (5.3%) and Waiuku (3.4%). Very poor was Taupo with no returns.

The material at hand is not conclusive and large enough for any general statements on this matter. Several more years of extensive banding will be necessary to build up a solid amount of data; but it should be possible, however, to use the recovery rates presented to give some indication of the suitability of the various areas for pheasant liberations.

(c) Causes of Mortality.

Of the 117 pheasants recovered and reported upon, 92 were shot (=78.6 per cent.). It is only natural that by far the highest proportion of the birds reported were shot and bagged, as it is rare in nature to find birds killed in other ways. It is interesting in this connection that Ginn (1947) from Indiana, U.S.A., records 73.8 per cent. of all recoveries from shot birds, a figure fairly close to the New Zealand figure.

Six birds were found dead and another nine were reported upon without information as to cause of death. One bird got entangled in scrub and was killed. Two birds were killed by hawks, presumably harriers (no information as to the condition of the birds when preyed upon).

Man accounted for the highest toll. Two pheasants were killed flying against viz., a car and a truck; two birds were killed by mowing machines, and man's friends, cat and dog, each killed one of the banded pheasants; one bird was caught in a rabbit trap.

(d) Mortality Periods.

Accurate data were given for 60 pheasants shot during the open season. The highest number of any date was killed on the opening day (as may be expected), namely 18 per cent. The first three days of the open season accounted for 27 per cent. of the birds being bagged.

It is conspicuous that the following four days account for only two (=3%) after which another peak follows, accounting for no less than 23 per cent. in four days. This must undoubtedly be interpreted as the kill being highest in weekends, and the kill following the weekend cycle.

More than half of all the birds recorded were killed during the first two weekends of the shooting season.

(e) Age of Birds at Recovery.

Complete records showing age of the banded pheasants at the time of liberation were given for 36 birds bagged. Of these birds 8 (=22%) were killed in their first year, i.e., within twelve months from hatching; 27 (=75%) were killed in their second year; and 1 (=3%) was killed in its third year.

As, however, the ages at release of the banded pheasants varied between 3 and more than 18 months, these survival percentages are not true indicators of life lengths of liberated pheasants. Of more interest is the period between liberation and recovery which is the time the birds have survived in the wild. This information for a total of 69 pheasants is given in Table 5.

TABLE 5.—Periods Between Liberation and Recovery of 69 Banded Pheasants.

Period between Liberation and Recovery.	Number.	Percentage of Total
1 month	5	7.3
2 months	7	10.1
3 months	8	11.6
4 months	8	11.6
5-9 months	7	10.1
10 months	11	15.9
11 months	10	14.5
12 months	3	4.4
13-24 months	9	13.0
Above 24 months	1	1.5
Total	69	100.0

From Table 5 it will be seen that 85 per cent. of the pheasants were recorded within the first year after liberation; 13 per cent. in their second year, and 2 per cent. in their third year. It might be of interest to compare this data with survival figures for pheasants in Wisconsin, U.S.A., and two other game birds, the common partridge (*Perdix perdix*) in Denmark, and the willow ptarmigan (*Lagopus lagopus*) in Norway (cf. Table 6).

TABLE 6.—Survival Rates in Various Game Birds as Indicated by Banding Data.

Species.	Area	Newly Banded yr. class	Return of birds newly banded.				Authority
			1yr. ago	2yr. ago	3yr. ago	4yr. ago	
Pheasant	Wisconsin	100	16	6	3	0.4	Buss, 1946
Pheasant	New Zealand	100	15	2	0	0	This study
Partridge	Denmark	100	19	5	0	0	Westerskov, 1951
Willow ptarmigan	Norway	100	25	5	2	0	Westerskov, 1950

It should be pointed out that the New Zealand pheasant data is not large enough for a direct comparison with the Wisconsin data, and furthermore that the latter data was collected by trapping of released birds on a study area, whereas the New Zealand records are based on birds liberated in a variety of habitat types, and information on recoveries is left to the interest and mercy of the person who happens to shoot or find a banded bird.

In Table 6 the data from New Zealand pheasants have been converted to a scale comparable with the one used in the other studies referred to by giving the recovery percentage of the newly banded year class the value of 100, and raising the other figures proportionately.

As the pheasant banding programme in New Zealand, on which this study is based, only dates back four years, the possibility for recoveries in the fourth year group is consequently limited to the birds liberated during the first year of liberations. The next few years may provide the data to fill the gaps for the missing second, third and fourth year groups.

The New Zealand data shows that out of 100 released and banded pheasants (which survive the heavy death period following release) there will be 15 left the following year and two another year ahead. Possibly more data on later age groups will appear during the coming years, making the survival pattern of New Zealand pheasants more like the one found in Wisconsin, where banded pheasants have been recorded in their fourth year.

The Danish partridge data refer to artificially raised birds, whereas the willow ptarmigan were caught in the wild and banded.

(f) Dispersal of Birds.

Accurate information about the distances travelled by pheasants could be extracted from 63 records. Of these 63 birds, 32 or 50.8 per cent. were recovered within a mile from the release point; this figure is, however, possibly not quite correct as some of the information supplied on cards was not specific enough so that in a few cases the birds might have travelled a little further. A total of 76 per cent. of the released birds were recovered within five miles from the liberation point.

Of special interest are two cocks, of which one, in three months, travelled from Galatea to Awakerei (ca. 30 miles as the crow flies), and the other cock travelled from Broadlands to Mamaku (about 35 miles directly). Birds liberated in inferior habitat seem to travel much further than birds liberated in better suited areas, but the material at hand to substantiate this point is too meagre for any general statement.

TABLE 7.—Distances Travelled from Release Point by Pen-reared Pheasants, released 1948-51.

Recovery.	Total	Per cent.
Within a mile	32	50.8
1-2 Miles	6	9.5
2-3 Miles	2	3.2
3-5 Miles	8	12.7
5-10 Miles	11	17.4
10-20 Miles	2	3.2
Over 20 Miles	2	3.2
Total	63	100.0

4. DISCUSSION.

It has been pointed out above that the pheasant banding data is not comprehensive enough for general and definite conclusions.

This paper has been presented, however, in order to stimulate interest in the banding programme, to tell co-operators and sportsmen a little about what can be found out and what good can come out of the work, and finally, to present the facts found so far as they provide information of interest.

The data collected give some indication of various phenomena in pheasant populations, phenomena which are of interest in pheasant management.

One of the points of main interest in pheasant liberations is the economy and value of the programme: "Does it pay to release birds? Do they survive?"

The recovery of only 3.4 per cent. pen-reared pheasants indicates a very low survival rate which must be considered, if not proof, at least a very strong indication of the high costs and low value of this management procedure, especially when birds are liberated in all kinds of habitats.

Whereas the pen-reared pheasants only gave 3.4 per cent. return, the wild-bred and trapped ducks gave an average of 22.7 per cent. return, seven times higher. It is in this connection also worth mentioning what has been found in America on the question of wild-bred versus pen-reared pheasants.

Hicks (1937) in Ohio, says: "Research data now on file would indicate that these choice naturally produced birds (i.e., wild-bred, trapped birds.—K.W.) have a stocking value equal to at least 1.5 to 2.0 typical game farm adults and equal to 3 to 8 artificially propagated baby pheasants of 8 to 12 weeks of age due to greater survival and reproductive ability."

In Wisconsin, Buss (1946) found that trapped pheasants "showed a year-to-year survival two to three times that of the artificial pheasants herein described."

And Harper et al. (1951) in California, found that: "Returns from transplanted wild birds were considerably greater than from game farm birds when both were liberated at comparable ages three months or more before the season." As an example it may be mentioned that two groups of birds, 6-10 weeks old were released about the same time before the opening of the season. Of the pen-reared birds 12.0 per cent. were recovered, whereas 34.9 per cent., or almost three times more, of the transplanted wild birds were recovered.

No trapping and transplanting of pheasants has so far been carried out in New Zealand, so comparable data is not available. A practical suggestion therefore, is to try trapping of wild-bred pheasants for release, in which way possibly the economy as well as the practical value of pheasant stocking might be considerably improved.

If we view the pheasant liberations as a means of providing birds for shooting—and a fair number of sportsmen have that opinion—it may pay to calculate the actual cost of birds bagged this way.

Of the 117 bands returned, 71 were from cocks and 11 from hens, and no information as to sex was given about the remaining 35 birds. If

we assume a similar ratio between cocks and hens in the 35 birds not accounted for, there should have been 101 cocks and 16 hens. Of the 3485 banded pheasants, 2129 were cocks and 1356 hens. So, 101 cocks out of 2129, or 4.7 per cent., were recovered.

Of the birds actually killed and bagged by shooters, 62 were cocks, 4 were hens, and no information was given about 26 birds shot. Although there is a possibility that no sex was recorded because the bird killed was a hen in some of these cases, most of these records were from a series of cards with very incomplete information. So we should be justified in assuming a similar ratio of bagged cocks and hens among the 26 birds not accounted for, which would mean that 86 cocks and 6 hens were shot. Pheasant hens are not legal game in the North Island, and have undoubtedly been killed accidentally (the reporters are to be congratulated for information about this kill, in spite of it being illegal; during field work I have happened to encounter a sportsman who accidentally shot such a banded pheasant hen; he had reported the case, but had omitted signing his letter about the kill).

When, therefore, 86 out of 2129 liberated cocks are eventually bagged, it shows that no more than 4.0 per cent. of the released cocks were shot, and 6 out of 1356, or 0.4 per cent., of the hens were shot, too, or one hen for every ten cocks.

The value of liberated pheasants must, therefore, be as seed stock to produce in the wild; but also here is the survival rate the all dominating question.

5. ACKNOWLEDGMENTS.

Thanks are due to all who have co-operated in this scheme, game breeders and field officers of the Wildlife Service and members of acclimatisation societies who have banded pheasants for release; and sportsmen for reporting the kill of banded birds. Well-kept records and detailed information on recoveries are the two essential factors in bird banding work.

6. SUMMARY.

Over the four-year period, 1948-51, a total of 3485 pen-reared pheasants were banded and liberated in the North Island. They varied in age between 3 and 20 months, but 40 per cent. of the birds were three months old when released. The average number of birds per liberation was six.

A total of 117 band returns were received up to 1 June 1952, representing 3.4 per cent. of the total release. It is pointed out that the recovery of banded ducks in New Zealand is 23 per cent., or about seven times higher, which difference undoubtedly mainly is due to the much higher survival rate of the wild-bred (trapped and released) ducks. The band returns seem to give an indication of the suitability of various districts for pheasant liberation. Of the birds reported upon, 78.6 per cent. were killed by shooters. More than half of these birds recorded were killed during the first two weekends of the open season.

Eighty-five per cent. of the birds recovered were killed within the first year after release; 13 per cent. in the second year; and 2 per cent. in the third year.

Distances travelled by 117 pen-reared pheasants between the points of liberation and recovery were as follow: 50.8 per cent. recovered within a mile of liberation point; 25.4 per cent. from 1 to 5 miles; 20.6 per cent. at distances from 5-20 miles; and 3.2 per cent. over 20 miles

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A RECENT ATTEMPT TO INTRODUCE VIRGINIAN QUAIL INTO NEW ZEALAND.

By L. Gurr, Nelson.

Virginian quail or "Bob-White" (*Colinus virginianus*) were first introduced into New Zealand in 1898 when the Wellington Acclimatisation Society imported about 400 birds. These and another 756 birds imported by the same society in 1899 were distributed throughout the country from Auckland to Southland. They failed to establish themselves and disappeared in most districts within about ten years (Thomson, 1922). Nothing more was heard of them until 1923 when, according to the annual report of the Auckland Acclimatisation Society for 1923, a number of Virginian quail were caught during the winter between Waingaro and the sea coast and these were liberated at the Cambridge Game Farm. Thomson (1926) states: "... the local Acclimatisation Society is now distributing them through the Waikato country." Apparently they managed to maintain a small population in the Auckland district, and the secretary of the Auckland Acclimatisation Society (in litt.) states that they still do in some areas, especially where the bush or scrub has recently been burnt off.

No more attempts, to the author's knowledge, were made to establish the bird until 1947, when the Otago Acclimatisation Society obtained a permit to import 1000 eggs from the United States of America. Two separate consignments each of 200 eggs were forwarded by air freight from Oakland, California. They arrived at Dunedin on 19 June, 1947 and 3 July, 1947, respectively, the journey taking five days in each case. The eggs were allowed to stand for 48 hours, then placed in the incubator at the society's Game Farm at Waitati. Many of the eggs were infertile and others, although they began to develop, died before hatching. From the first consignment 33 and from the next consignment 31 chicks were hatched. Only 40 of these birds survived the difficult stage of the first fortnight. Thereafter, the numbers dwindled until early December, when the six remaining birds died, all within three days of one another. Three of these dead birds were sent to the Animal Research Station, Department of Agriculture, Wallaceville, for examination. Although the birds showed certain pathological conditions of the gut no obvious signs of a recognisable disease were present. The society has not made any further attempt at importation.

I am indebted to Mr. Leonard Millar, the manager-secretary of the Otago Acclimatisation Society, for placing the records of the society at my disposal and permission to publish this account of their attempt to introduce the bird into New Zealand.

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