seen below the bush canopy on Hen Island. There is some traffic between the mainland and Hen Island.

Starlings were first recorded from Big Chicken in 1923 (Falla, *pers. comm.*), and there is now a small resident population on this island, as also on South-western, Middle and Eastern Chickens. In the 1930's Starlings from the mainland were twice recorded roosting on North-western Chicken (Cranwell and Moore, 1935; Fleming, *pers. comm.*), and they may still do so.

? AUSTRALIAN RAVEN (*Corvus* sp.)

On 3/1/48 a large black bird of corvine appearance passed along the inland cliffs of Hen Island. R. B. Sibson, who was familiar with ravens in Europe, had "no doubt that this was a large member of the *corvidae*" (Sibson, 1959). At the time it was suspected that this may have been the same bird that was earlier observed at the Mokohinaus (Turbott, 1947) and Little Barrier (Turbott, 1947). However, Turbott (1961) considers the bird seen at the Mokohinaus and Little Barrier was probably a young Rook. The Hen Island sighting, if accepted, is the only New Zealand record.

NORTH ISLAND SADDLEBACK (*Philesturnus carunculatus rufusater*)

Hen Island is the last stronghold of the N.I. Saddleback, a bird once abundant on the mainland. Saddlebacks were not present on the Chickens in 1880, though at that date they were probably still present on Great and Little Barrier Islands, Cuvier Island, and various places on the mainland. There have been two attempts to establish Saddlebacks from Hen Island on the Chickens. In July 1950 six Saddlebacks were released at South Cove, Big Chicken (Department of Internal Affairs files). At least two birds were still present in December 1953 (Chambers *et al*, 1955), but there were no subsequent records. Wilson (1959) quotes the *Wanganui Chronicle*, 14 December, 1957, which stated that two pairs were seen in August 1955. This record is definitely incorrect (I. A. E. Atkinson, *pers. comm.*). In January 1964 23 birds were transferred to Middle Chicken, and some were still thriving five months later.

★

A POPULATION ESTIMATE OF THE NORTH ISLAND SADDLEBACK ON HEN ISLAND

By P. D. G. SKEGG

The North Island Saddleback was discovered on Hen Island "in abundance" in November 1880, and in February 1883 they were considered to be "still more numerous" (Reischek, 1887 b). In 1923 Mr. W. M. Fraser reported Saddlebacks "very plentiful" (Myers, 1923), and in the following year they occurred "in large numbers" (Hamilton, 1925). The first estimate made results from a "census" conducted on a day-visit in October 1925, the estimated population being 300 birds (Department of Internal Affairs Files). On his returning from Hen Island in December 1927, Mr. A. T. Pycroft stated that it was difficult

to establish the number of Saddlebacks, but he thought there were "probably several hundreds," the numbers not appearing to have diminished since 1903 (*Auckland Star*, 27 December, 1927).

The first careful estimate of the Saddleback population was made in November-December 1939. Majors G. A. Buddle and R. A. Wilson and Messrs. C. A. Fleming and E. G. Turbott carried out a full census of the bush birds in an 83-acre valley. The Saddleback "appeared to be somewhat less plentiful than in 1935 or 1937" (Fleming, 1940), but eleven pairs were found breeding, this being considered the total population of the valley (Turbott, 1940). By various methods an estimate of the Saddleback population on Hen Island was made. The party considered there were "probably about 200 pairs, certainly not less than 150 pairs, nor more than 250" (Wilson, 1959).

In December 1960 and December 1961 the members of the King's College Bird Club parties were unanimously of the opinion that the population was now greatly in excess of the 1939 estimate, but no careful estimates were made. In August 1963 the members of an expedition organised by Wildlife Branch, Department of Internal Affairs, made careful observations on the population. A census of the 83-acre valley was made, and a check of this figure was made by measuring the territory of one pair. Members of the expedition also kept counts of Saddlebacks seen in other parts of the island, so that an idea of their general distribution could be obtained. The observations listed below are those of the whole party, but the writer bears full responsibility for the conclusions reached.

THE CENSUS

The Census Area. The census area is located on the south-western side of the island, behind Pukanui Bay, Dragon's Mouth Cove, and part of Lighthouse Bay. The 83-acre area rises from the coastline to the precipitous inland cliffs. The greatly varying landforms and the variety of vegetation makes the area broadly representative of Hen Island as a whole. Mr. I. A. E. Atkinson is at present preparing a paper on the vegetation and soils of Hen Island, and he has kindly made available a chart of relative density counts of trees and shrubs in representative portions of the census area (See Table 1).

The Method. The census was achieved by seven observers making simultaneous parallel contour transects across the census area. The observers would synchronise watches, and starting from the west end of the census area would move across the area, noting the time each Saddleback was recorded, and whether the bird was up-slope, down-slope, in front or behind. The observers would move for a certain number of minutes, then stop for a certain number of minutes, and so on. The observer on the centre-most contour transect would blow a whistle at each stopping or starting time, so as to give the other observers some idea of the line which they should be in. It took 60-75 minutes to make the count.

On returning to camp each observer would check with those in the adjacent transects, making sure that there was no overlap in the birds recorded. The observations would then be plotted on a large-scale map.

TABLE 1: RELATIVE DENSITY COUNTS FOR FOREST IN HEN ISLAND BIRD CENSUS AREA

Forest		Taraire - Tawa		Pohutukawa
Height above sea level		300-800 ft.	150-800 ft.	10-200 ft.
Beilschmiedia tarairi	taraire	25%	29%	3%
B. tawa	tawa	24%	20%	1%
Brachyglottis repanda	rangiora	1%		1%
Coprosma macrocarpa		3%		8%
C. repens	taupata			7%
Cordyline australis	cabbage tree	1%		1%
Corynocarpus laevigata	karaka	1%	15%	3%
Cyathea dealbata	ponga	1%		
Dysoxylum spectabile	kohekohe	2%	13%	
Entelea arborescens	whau			3%
Hedycarya arborea	pigeonwood	1%		
Hoheria populnea	houhere	5%	1%	
Hebe bollonsii				1%
Knightia excelsa	rewarewa	6%	6%	4%
Leptospermum ericoides	kanuka	1%		3%
Macropiper excelsum	kawakawa			1%
Melicope ternata	wharangi			1%
Melicytus ramiflorus	mahoe	10%	4%	10%
Metrosideros excelsa	pohutukawa	3%		32%
Myrsine australis	mapou	1%	1%	1%
Neopanax arboreum	fivefinger	5%		1%
Paratrophis banksii	milk tree		1%	
Phormium tenax	flax			3%
Planchonella novo-zelandicum	tawapou		4%	1%
Phopalostylis sapida	nikau	2%		
Sophora microphylla	kowhai			3%
Vitex lucens	puriri	8%	6%	12%
		100%	100%	100%
Number of canopy trees or shrubs counted		150	80	75

Note: The 150-800 feet count in the Taraire-Tawa forest was made in the valley sites leading up behind Dragon's Mouth Cove — probably a little moister and hence the larger proportion of Karaka and Kohekohe.

The Counts. In late August 1963 two counts, both in the late morning, were made.

The first count, on 25 August, was made in clear sunny conditions. The wind was calm (Beaufort Scale 0: less than 1 m.p.h.), and the Saddlebacks were calling well. The observers kept to their contour transects well, moving for six minutes and stopping for four minutes. As most of the pairs were recorded at the stops the observers considered that many of the single Saddlebacks had mates concealed nearby.

TABLE II: COUNT OF SADDLEBACKS IN CENSUS AREA
25 AUGUST 1963

Contour Transects	Singles	Pairs	Threes	Fours	Eights	Totals
7	12	5				22
6	6	3		2		20
5	8	1				10
4	8	4				16
3	4	1	1			9
2	2	2				6
1	4	3	2		1	24
Totals	44	19	3	2	1	107

The second count, on 27 August, was made under poor conditions. There was much nimbo-stratus cloud, and only occasional periods of sunshine. A fresh north-westerly breeze was blowing (Beaufort Scale 5: 19-24 m.p.h.), and the birds were not calling at all well. A mix-up on contour transects three to six resulted in a considerable area not being covered. This time the observers moved for four minutes and stopped for six minutes. The decrease in the number of small flocks recorded was probably because the breeding season was two days more advanced — by early September no small flocks were seen.

TABLE III: COUNT OF SADDLEBACKS IN CENSUS AREA
27 AUGUST 1963

Contour Transects	Singles	Pairs	Threes	Fours	Total
7	8	5	1		21
6	4	5			14
5	9	1			11
4	10	4		1	22
3		2			4
2	4	4			12
1	4	1			6
Total	39	22	1	1	90

The reliability of the counts depended upon whether or not the Saddlebacks were paired and on territory in late August. It had earlier been noted (King, 1956) that recognisable pairs of Saddlebacks were regularly seen in the same areas in May, this suggesting that territorialism is not restricted to the breeding season. By late August the breeding season had begun, with almost all birds on territory and mating in progress. When a single bird was kept under observation for some time its mate would almost invariably appear.

A check of the size of one pair's territory, and of whether Saddlebacks were keeping strictly to territory, was made on 1 September.

Replaying tape-recorded Saddleback calls had already given a good idea of the extent of the territory of the particular pair. The observers were spread around the border of the suspected territory, and notes were kept of the time and direction from which Saddlebacks approached the observation posts. Two hours, one in the morning and one in the afternoon, were spent making these observations, which were later plotted on a map. It was found that the territory of this particular pair, at Dragon's Mouth Cove, was 1.4 acres in extent.

Discussion. The observers reported that the number of birds recorded was less, and in some cases probably considerably less, than the number actually present. As has been noted, most of the pairs were recorded when the observers were stopped, and most of the singles when the observers were on the move, so it seems likely that a large proportion of the singles recorded actually represented pairs.

If the number of pairs recorded, plus half the number of singles recorded, is taken the figure, with both counts, is 42. When allowance is made for the small flocks not provided for, and for the singles which actually represented pairs, it seems that a figure of 42 pairs is too low.

A more realistic figure, though perhaps still too conservative, is obtained by taking the number of pairs recorded plus three-quarters of the number of singles recorded. The result, for both counts, is 52. It therefore seems likely that the Saddleback population in the census area is 50+ pairs, certainly not less than 40 pairs, and probably not greater than 60 pairs.

THE ESTIMATE

Earlier writers have continually stressed how even is the distribution of Saddlebacks on Hen Island. Reischek (1887 b) stated "I found everywhere, both on the ranges and near the seashore." Hamilton (1925) observed that "their distribution over the island appears to be general," and Sibson (1949) also considered that they "must be distributed fairly evenly over the island." Heather (1957) noted that they were "encountered wherever one went." Counts kept by members of the recent expeditions during tramps over much of the island all indicated a remarkably even distribution. This being so, it seems reasonable to make an estimate of the population on an area basis.

Hen Island is 1775 acres in extent, the census area being just over one twenty-first of the total area. If the census area is accepted as representative of Hen Island as a whole, and if allowance is made for 80 or 90 acres of totally unsuitable or very thinly populated country, the total population of the island is twenty times greater than that of the census area. With an estimated 50+ pairs in the census area, the population of the North Island Saddleback on Hen Island in August 1963 may have been 1000+ pairs, about five times more than in 1939. At least it must be over 800 pairs, or four times as many as in 1939.

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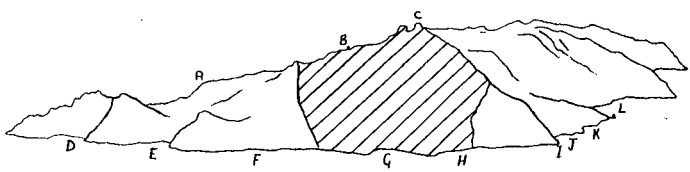
APPENDIX



PLACE NAMES ON HEN ISLAND

The outline diagram of Hen (Taranga) Island shows the census area (shaded) on the western side of the island. The letters denote the names coined for various places. Moran's Lookout (A) is named after James Moran, who, in 1870, made the first survey of the island. Balancing Rock (B) is the abrupt precipitous weathered rock which overlooks Dragon's Mouth Cove. According to Mr. Frank Holman, the Pinnacles (C) were known by this name late last century. Wilson Bay (D) and Stead Bay (E) are named after Major R. A. Wilson and Mr. E. F. Stead, whose expeditions to this and many other islands contributed greatly to our knowledge. There is a navigational light 357 feet above sea level on the headland between Stead Bay and Lighthouse Bay (F). A hawser runs down from the light to Lighthouse Rock, in the bay. Most expeditions have camped at Dragon's Mouth Cove (G), so named because of the rock in the cove which was said to resemble a dragon's mouth. The rock, which has also been called Mushroom Rock, has weathered somewhat since the name was coined. Pukanui Bay (H) takes its name from the fine stand of Pukanui **(Meryta sinclairii)** behind the bay. A favourite fishing rock, Lamb Rock (I) is named after Dr. O. Fyffe Lamb, a keen naturalist and fisherman, who acted as medical officer on many King's College Bird Club expeditions. Sibson Bay (J) is named after Mr. R. B. Sibson, who has led eleven K.C.B.C. expeditions to offshore islands, including four to Hen Island. Reischek Bay takes its name from Andreas Reischek, the Austrian naturalist-collector who made ornithological surveys of this and other offshore island during the 1880's. The cabbage trees **(Cordyline australis)** around the shore have led to the bay also being known as Cabbage Tree Bay. Old Woman Cove (L), or Wahine Bay, is so named because of the alleged likeness of the chimney-like rock at the western end of the cove to an old woman. The Gaelic pioneers knew the rock as Cul-na-kalach (Old Lady of the Sea). Pycroft Bay, a bay below the Pinnacles on the north side, is named after Mr. A. T. Pycroft, who camped on Hen Island for six weeks in 1903, and who climbed to the summit from this bay on a later trip.

The localities named can be more clearly seen on the Whites Aviation photograph (Ref. 41915), on p. 160.