

THE WHITE-FACED HERON IN NEW ZEALAND

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The White-faced Heron (*Ardea novaehollandiae* Latham 1790) is one of at least seven species of Australian birds which have colonized New Zealand during the past century. Long known here as an occasional visitor or solitary resident, it has within the last thirty years become firmly established as a breeding species and is now the most common heron in the country, being found widespread in both coastal and inland habitats.

HISTORICAL

Early references to White-faced Herons are few. I have found only 23 definite records dated earlier than December 1940. These referred to 16 specific places.

Although previous works on the avifauna of New Zealand had described at least three other species of heron, the first listing of White-faced Herons was by Buller in 1868: "*Ardea novae-hollandiae*, Latham, of which I have obtained several specimens in the North Island, is a fresh addition to this section of our ornithology." Oliver (1955) noted its reported presence in Nelson in 1868.

In 1871 Hutton commented on its occurrence in "both Islands, Australia and Tasmania." Buller wrote in 1873, "The White-fronted Heron is very sparingly dispersed over the New Zealand coasts, being extremely rare in the far north"; also, "A pair of these birds which I obtained in the Porirua Harbour, near Wellington, in the month of April, had their stomachs filled with shrimps." It was listed by Sharpe (1875). Travers (1882) defined its range as, "Both Islands and habitats outside of them, and the Chatham and Auckland Islands." Reischek (1884) described it as "very rare in the Sounds, common from Jackson's Bay to Bruce Bay."

In 1888 Hamilton wrote, "I have not seen a specimen for many years; but the one now before you was killed at Waipawa in May last." Also in 1888 Buller noted, "In the Hairini Bay, at Tauranga, I saw a pair of these birds on the flats just above the bridge," and he quoted Edward Wakefield's communication, "a friend of mine at Collingwood told me that he had observed these birds in the southern estuaries of Blind Bay [Tasman Bay] for years." Handly (1895) reported its presence in Marlborough; although he gave no locality reference, he associated it in his text with other heron species sighted at Wairau Lagoons at that time.

In 1905 Buller wrote, "I have a specimen in my collection which was driven ashore on Centre Island, in Foveaux Strait, after a very heavy gale at sea. On the mud flats at Tauranga I saw one in the winter of 1892. . . . I had observed one in exactly the same locality when crossing the bridge seven years before — quite likely the same individual bird. The species is very sedentary and has been known to frequent the same spot for years together."

In addition to these reports, two records of Reef Heron (*Egretta sacra*) given by Buller — a pair at Lake Taupo in October 1875 and a single bird in flight at Lake Rotoiti in October 1884 — were probably of White-faced Herons. Reef Herons are rare so far inland; but see McKenzie. *Notornis* IX, 20.

I found no further early references and, from 1905 until 1937, no mention of the species, apart from a passing note in very general terms made by Matthews and Iredale in 1913. In 1937 four solitary birds were reported at Lake Taupo (Potts) and "a few years after 1935" a pair at Richmond, Nelson (Rogers). Subsequent records became increasingly numerous and will be considered in a later section of this paper.

GROWTH OF POPULATION

The colonization pattern followed by White-faced Herons, i.e. a long initial period of occasional visits followed by a rapid increase in numbers and widespread exploitation of suitable habitat, is not uncommon in invasions overseas. Similar patterns were described by Thomson (1964) with special reference to the Cattle Egret (*Ardeola ibis*) in South America and the Spur-winged Plover (*Lobibys novae-hollandiae*) in New Zealand.

Early occurrences of White-faced Herons were widely scattered, perhaps the result not only of chance land-falls by involuntary visitors but of seasonal dispersal from a resident breeding colony. Nesting was not proven although Wakefield wrote to Buller in 1888, "it breeds here sometimes" and Falla (1942), after careful investigations at Okarito, reported, "It seems likely that it has been a common breeding species there during the whole period of European settlement, and before." This theory was supported by Reischek's note, "common from Bruce Bay to Jackson Bay" (1884), whereas early sightings in other localities were usually of single birds, occasionally a pair.

It is not certain whether the population of later years sprang originally from one initial colony or from a few independently established colonies, although evidence generally favours the latter assumption. Early reports indicate that first points of landfall and settlement of White-faced Herons in New Zealand were in South Westland and possibly Tasman Bay.

In order to elucidate events in this country a study was made of climatic conditions in eastern and southern Australia during the relevant period, in an attempt to correlate years of drought and strong westerly winds there with dates of suddenly-increased numbers of White-faced Herons here. Hitchcock and Carrick (1958) wrote, "Nomadism is strongly developed in Australian birds, is frequently accompanied by opportunist breeding and may culminate in large scale movements, even emigration. It is exemplified by several species of waterfowl, especially ducks and ibis." The heron family, comprising "birds of powerful flight and wide-ranging propensities," (Myers and Atkinson 1924) would certainly fall into this category.

Reported occurrences showed a sudden rise during the years 1938, 1951-52, 1955, 1960 and 1965-66. Except for 1960 these dates agreed fairly closely with drought periods in eastern Australia. However, more severe droughts occurred in other years when no compar-

able rise in population was noted. This discrepancy may be explained by inadequacy of records caused by variable diligence and numbers of observers but could equally well be because Australian conditions have, in fact, had only a limited influence on the growth of the White-faced Heron population in New Zealand. The dearth of banded birds prevents accurate assessment of the situation, but the fact that this species remained persistently sparse here until breeding was established strongly indicates a local origin of the population explosion.

Breeding was first confirmed at lower Shag Valley, Otago, in 1941 (Ellis 1944) and subsequently reported at the Wainui River mouth, Nelson, in 1946, Blueskin Bay, Otago, in 1950 and Porirua Harbour, Wellington, in 1952 — the first North Island nesting record. During this period a rise in population became apparent in many parts of the country, accelerated during the 1950s and exploded in the 1960s. By 1968 many observers reported the peak apparently passed and numbers stable or rising only slowly.

The following table shows numbers of reported occurrences over the past 30 years. Six of the twenty sightings before 1939 were recorded during 1937 and 1938.

TABLE 1

<i>Years inclusive</i>	<i>Number of Reports</i>
1939-43	8
1944-48	23
1949-53	116
1954-58	210
1959-63	227
1964-68	481

The proportion of solitary sightings was higher in earlier years. Flock sizes increased rapidly over the period.

From a study of available data it appears that, excluding seasonal phenomena of flocking and dispersal, the maximum permanent colony size in any locality was usually not great and was soon attained. In large tracts of favourable habitat colonies have coalesced and heavy occupation resulted.

The pattern of establishment of a colony occurs typically as follows:— after preliminary visits by a solitary bird, extending over one or more years, a pair appears. Nesting usually ensues and a family group forms. The total resident population may remain at one pair for many years but the group may increase until apparently its maximum size is attained, often three to five pairs. In the absence of a banding scheme it is impossible to determine whether subsequent colony members are birds from elsewhere or juveniles which, on reaching breeding age, remain loyal to their natal home.

Estimates of the approximate total population of a district is possible when winter flocks are counted, as between seasons birds frequently congregate in suitable areas such as mud-flats or wet pastures. Maximum flock size is usually 15-30 birds although not uncommonly as high as 60. In especially favourable localities numbers are sometimes very large, as shown in Table 2.

TABLE 2

<i>Locality</i>	<i>Year</i>	<i>Birds estimated present</i>
Kaipara Harbour	1965	723
Manukau Harbour	1966	200
Mangere	1965-66	200 - 300
Whangamarino River	1967	300 +
Piako Swamp	1967	300 +
Havelock	1966	c. 100
Farewell Spit	1962	c. 435
Westhaven Inlet	1962	87
Invercargill Estuary	1965	70

From 1960 to 1968 inclusive, a total of 245 colonies and/or flocks of ten or more birds was recorded. One hundred and forty groups were located in the North Island and of these 50 had already been recorded before 1960. All except three of the older groups occurred in coastal localities but colonies were found in many inland places after 1960, especially around Lake Taupo and the Waikato hydro-lakes. Three others were recorded before, but not after, 1960. Of the the 105 South Island groups, at least 61 were established before 1960. As in the north, these were predominantly in coastal habitat. More than half the colonies recorded after 1960 were inland and associated with lakes or rivers. Seven other colonies were reported before, but not after, 1960.

TABLE 3 — *Reported First-Nesting*

<i>Years inclusive</i>	<i>North Island</i>	<i>South Island</i>
- 1943	—	2
1944 - 1948	—	1
1949 - 1953	2	5
1954 - 1958	8	10
1959 - 1963	10	4
1964 - 1968	25	16

TABLE 4 — *Reported First-Sighting*

<i>Year</i>	<i>Locality</i>	<i>Year</i>	<i>Locality</i>
1937	Richmond	1961	Lake Rotorua
1938	Lake Wairarapa	1962	Balclutha
1938	Waitaki River at Tawai	1964	Redhill
1938	Bushey Park	1964	Taihapa area
1944	Takaka	1964	Rangitaiki
1951	Kaiapoi	1965	Broadwood
1952	Lake Hatuma	1965	Unitoke
1953	Lake Tarawera	1965	Te Karae
1955	Woodville	1965	Runaruna
1957	Halcombe	1966	Okaihau
1957	Ohiwa Harbour	1968	Ruatahuna
1961	Titoki		

It must be remembered that these figures refer to known colonies only. The true number could be considerably higher. However, settlement clearly progressed from coastal to inland districts and in general from south to north. The sequence of reported first nesting occurrences supports this assumption. See Tables 3 and 4.

Unlike other members of its family in New Zealand, the White-faced Heron is a versatile species. Although most frequently found from sea level to 1,000 feet it is common in much of the volcanic plateau and not unknown in other elevated areas, e.g., South Island high country. Its prime requirements are suitable nesting sites and proximity to water. Nesting is almost invariably in large trees, especially in plantations of *Macrocarpa* or *Eucalyptus*. Water may be permanent or seasonal e.g. flooded pastures in winter.

Land development has greatly extended its range. Conversion of forests, scrubland and swamps into pasture, construction of ponds and clearing of stream verges has provided improved feeding and loafing facilities. Sibson (1966) noted, "Its rapid spread has been aided by the construction of farm dams which are quickly colonized by the introduced Australian green frog (*Hyla aurea*)," a favoured food of the herons. Hydro-electric schemes also have provided extensive new habitat. Hamlett (*in litt.*) noted that by 1966 all Waikato hydro-lakes were supporting as many as ten resident birds, whereas five years before only occasional visitors were seen.

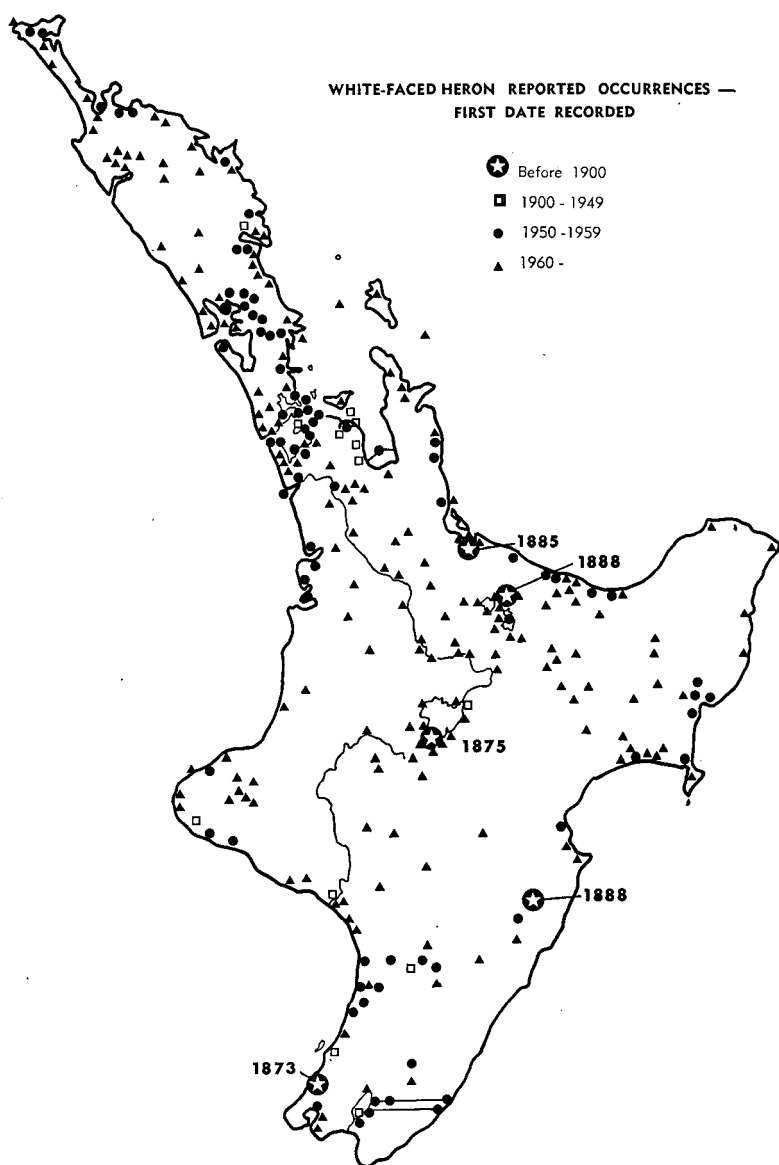
The species has become sufficiently numerous in some areas to be considered a nuisance, its fishing activities reputedly conflicting with those of local fishermen. Indeed, as early as 1952, the South Canterbury Acclimatisation Society requested its removal from the protected list because of its alleged predation of trout. This request has so far not been granted but as birds continue to increase there will inevitably be further similar applications; thus, in order to provide a firm foundation on which to base future decisions, the present study was undertaken.

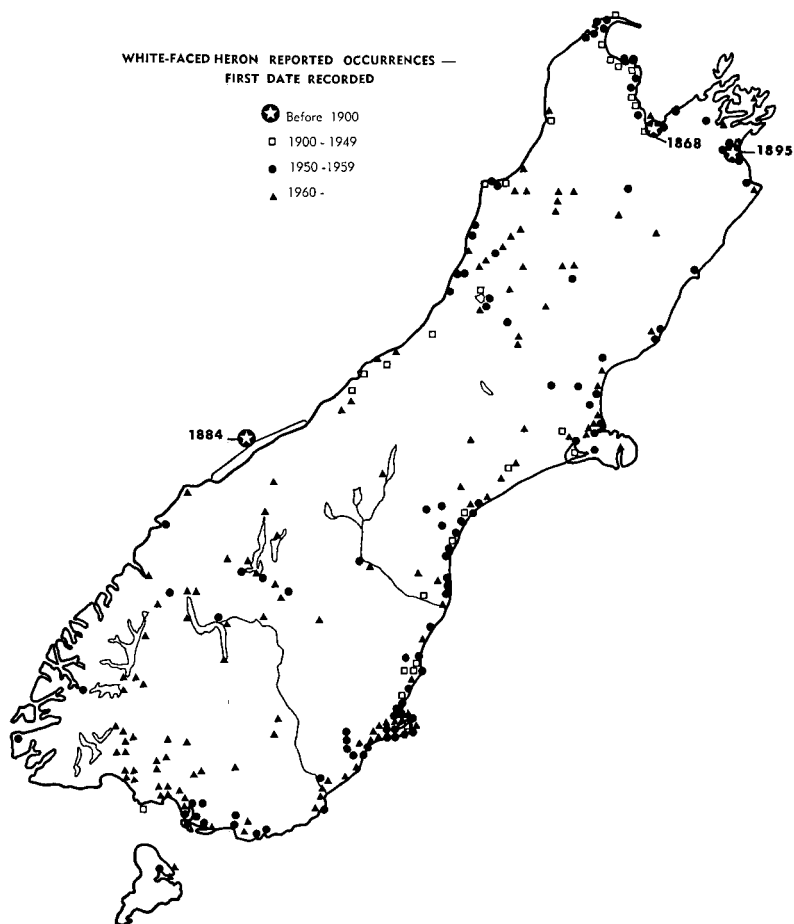
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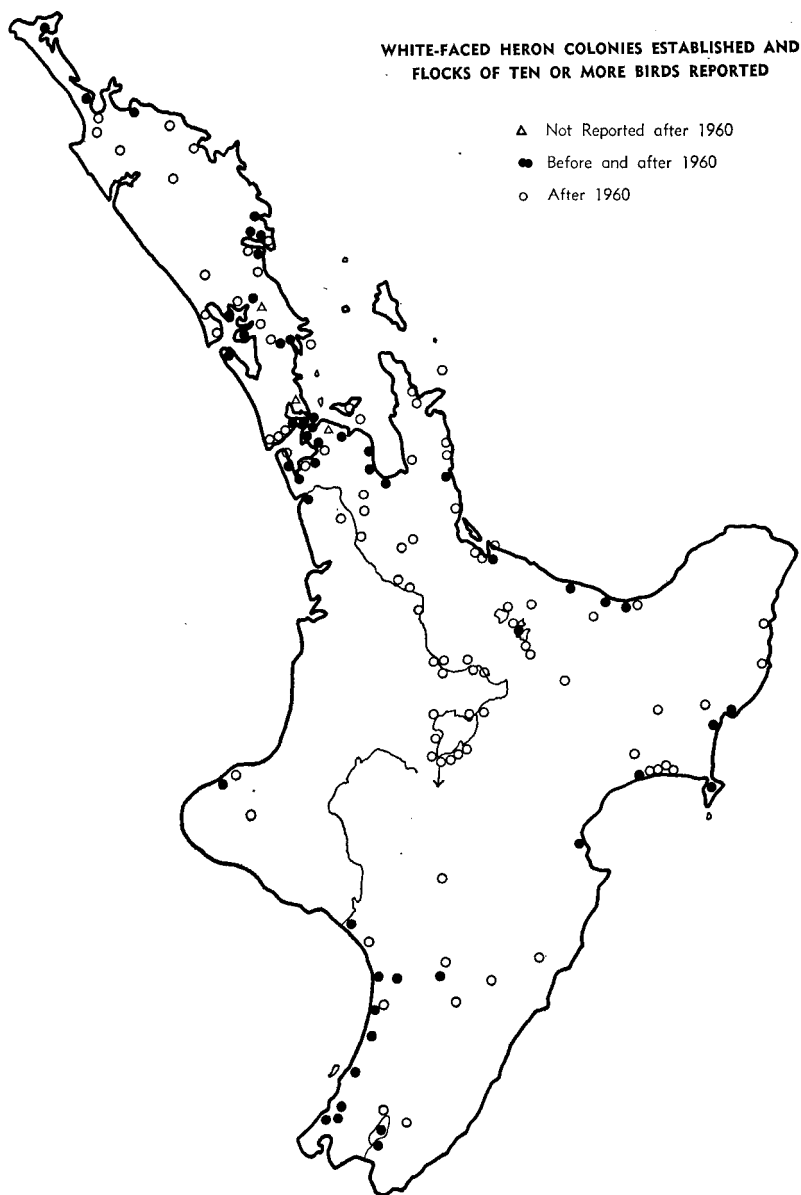
Most of the records were supplied by Field Officers of the Wildlife Service and acclimatisation societies, members of the Ornithological Society of New Zealand and of the Royal Forest and Bird Protection Society. Information was gathered also from departmental records, books, journals, reports, personal comments and letters.

Fortunately, because of the characteristic appearance and large size of the bird, sighting records are likely to be more comprehensive than those of less conspicuous species. Early occurrences, first sightings, first nestings, establishment of colonies and reported population trends have been noted and relevant material arranged chronologically and geographically. These data, although undoubtedly incomplete as a consequence of uneven distribution and reliability of observers, should be sufficient to give a reasonably accurate picture of population trends and present status.

It is hoped that this paper will stimulate readers to (a) provide information which will augment our present knowledge and (b) submit reports in the future.

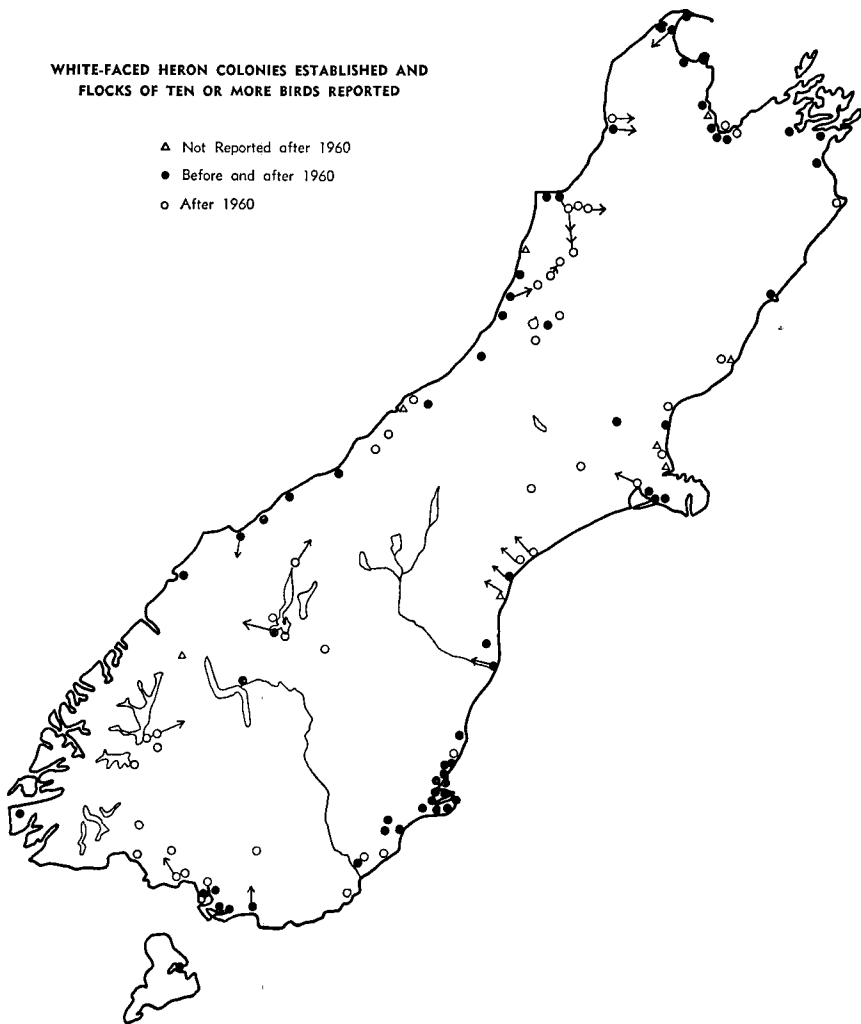






WHITE-FACED HERON COLONIES ESTABLISHED AND
FLOCKS OF TEN OR MORE BIRDS REPORTED

- △ Not Reported after 1960
- Before and after 1960
- After 1960



DISTRICT SUMMARIES

District boundaries coincide with those of acclimatisation societies, where geographically appropriate, but have, where necessary, been modified to suit the requirements of this study.

North Auckland

This district extends from North Cape to Helensville and Whangaparaoa Peninsula. The earliest record is of a single bird frequenting Onerahi, Whangarei, from 1949 to 1954 (E.K.S.). Another was sighted at Taipa River in April 1953 (R.B.S.) and a few had settled at Parangarenga Harbour by 1952. In 1955 the first proven breeding in northern New Zealand occurred at Kaipara Flats and two unconfirmed nesting reports were received from localities near Kaipara. In July 1956 nesting occurred at Hoteo Valley, Kaipara (J.P., H.R.McK.) and at Lower Kourawhero (P.F.H.). By 1958 birds were breeding freely around Kaipara Harbour and nesting also at Kaiwaka (K.C.B.C.), Warkworth (J.G.M.) and Silverdale (F.B.).

By 1955 widespread settlement was becoming apparent although then and for the next five years birds were numerous only in the Kaipara-Warkworth area. A population explosion began about 1961 and resulted in the species spreading rapidly northwards, colonizing most of the suitable habitat as it proceeded. During 1968 the rate of expansion appeared to decrease generally, although the range continued to extend in a few areas, e.g. Edgar reported from Kaikohe and Okaihau, "reports of birds where not previously seen," and at Awanui, Rangaunu Bay, large flocks have appeared very recently. (68 maximum, "Auckland Age," April 1969).

White-faced Herons are now found throughout North Auckland, with colonies established at all harbours and estuaries as well as many inland localities. Although birds are especially numerous in the vicinity of Whangarei and Kaipara Harbours, flocks of 15-20 have in the last three years been counted at Parengarenga Harbour, Awanui Harbour, Kaimaumau, Kerikeri Inlet, Maunganui River and Warkworth.

Auckland

This district extends from Helensville and Whangaparaoa Peninsula southward to Waiuku and eastward to Waihi, and thus includes the Coromandel Peninsula.

The first White-faced Heron sighted here was a solitary bird at Kaiaua, Firth of Thames, in 1948 (H.R.McK.). The following year, solitary birds were reported from Puketutu, Clevedon and Miranda (R.B.S., H.R.McK.). During the next decade, single birds or small parties were reported from an increasing number of localities. Nesting, first recorded at Manukau Heads in 1957, may well have occurred before this date.

By 1960 the species was well established. Nesting was reported at Glenfield, near Birkenhead, and Sibson (1960) noted birds present at all seasons in most creeks of the Auckland Isthmus. They had become typical inhabitants of the coast, creeks and ponds around Manukau Harbour and colonies flourished along the west and south coasts of the Firth of Thames, also at Clevedon (H.R.McK.).

A population explosion began in 1961, reached its peak by 1966 and apparently subsided during the following two years. The Auckland Acclimatisation Society reported in 1967 the sighting of birds in small numbers in remote areas not before settled and by 1968 noted the population to be "more or less static."

Numbers were highest around and immediately south of Manukau Harbour, with heavy concentrations in the Mangere area e.g. 200-300 counted in 1966 (E.K.S.). Clevedon Estuary, the coast from Kaiaua to Thames and eastern Coromandel harbours were all heavily colonized by 1967; e.g. Clevedon 1966, 60 seen (E.B.); Miranda July 1967, up to 50 on farm paddocks (A.T.); Whangamata August 1967, 20+ seen (D.P.). The only exclusively inland group recorded was 40 birds at Island Block 12 miles from the coast. Presumably they were living near the Whangamarino Swamp.

At present it appears that White-faced Heron colonization of the Auckland district, although decelerating, will continue while large tracts of apparently suitable habitat await exploitation.

South Auckland - Waikato

This district extends from south of Waiuku eastward to the main mountain ranges, south to Lake Arapuni, thence westward through Te Kuiti to Tirua Point.

The first record of White-faced Herons here was not until May 1952, when a pair appeared at Kauroa, south of Raglan Harbour. During the next two years birds were occasionally seen on all the large harbours, usually singly or in pairs, although six occurred together at Waipuna, Kawhia Harbour, in 1954 (H.R.McK.). The first record of their nesting was in 1955 at Ahikuri, Raglan Harbour (E.K.S.), and the next at Waikato Heads in 1959.

R. T. Adams (*in litt.*) reported the species to be comparatively rare in 1957; by 1960 groups of two, three or four birds were common and by 1963 several flocks of up to 20 were seen. He noted a steady increase throughout the district in inland waterways, harbours and estuaries. Atkinson in 1968 (*in litt.*) confirmed this and added, "increasing . . . now to be found inland almost anywhere. All hydro-lakes have colonies."

Large aggregations of birds were recently recorded at Lake Whangape "flocks of 20-30" (J.D.), Lake Waikare 70 (E.B.), Whangamarino Swamp 90+ (R.T.A.), Piako Swamp 300+ (H.A.), Cambridge Racecourse 15-20 (H.A.) and Long Swamp Bridge 70 (H.R.McK.). Otherwise the population was scattered. Atkinson noted in 1967, "any farm with a shallow pond with a pine tree near its edge will nearly always have a pair of White-faced Herons." The most isolated sighting was in November 1958 of a single bird in heavy bush at the Waipa River, south of Te Kuiti.

The colonization of this district appears to be still proceeding steadily and as yet shows no sign of reaching its maximum range.

Waimarino

Bounded on the west by the Wanganui River and on the east by high country from Waiouru to Tongariro, this district extends from Taumarunui south to Koriniti. Its altitude is predominantly above 1000 ft. and rises to 3000 ft. in many places.

There is little information about White-faced Herons here except that in 1967 approximately 50 to 100 were reported from Karioi Lake, Raurimu, Oio and Raetihi North (J.C.C.), thus indicating a widespread distribution. It is not clear from the records whether the figures refer to each locality or represent the total for the area.

Taranaki

This district extends from Tirua Point south to Waitotara.

The first sighting here was of a solitary bird at Pihama in 1948 (B.D.H.), the second, also of a solitary bird, at New Plymouth in May 1956 (K.C., B.C.). A year later three appeared in this area (P.W.L.), also five at Otakeho (B.D.H.). Nesting was recorded only twice — in 1966 and 1967 at Wharehuia (J.C.J.).

Although settlement apparently was slow, birds are now scattered throughout most of the district, either singly or in small groups. Two flocks of twelve were reported, one at the Waiongana River mouth in January 1967 (D.M.) and the other at Barrett Lagoon, New Plymouth, in July 1968 (C.P.).

Acclimatisation society officers reported in 1967 and 1968 a continuing growth of the White-faced Heron population in their districts.

Wanganui

Lying between the Waitotara and Wangaehu Rivers, this district entirely encompasses the lower Wanganui River system.

The first sighting here was of a single bird at Wanganui in 1945 (C.G.F.). Subsequent reports indicated the continuing presence of a few birds at Wanganui and after 1960 one or two were usually present at the river, South Beach, Victoria Lake and Lakes Kaitoke and Wiritoa (W.J.P.).

In 1962 two appeared at Nukumarū (A.T.E.) and in May 1964 "as many as 50 at one time" at the Wangaehu River (R.V.). The only truly inland occurrence recorded was of a pair 21 miles from the coast, at Mangamahu in 1966 (K.H.).

The Wanganui Acclimatisation Society reported in 1967, "fairly plentiful and a fairly substantial increase over the past years." A marked influx of birds occurred during 1956 and 1957 (Pengelley pers. comm.), the population subsequently increasing until approximately 1966, when it appeared to become stable. White-faced Herons are now well-established and commonplace residents throughout most of the Wanganui district.

Manawatu-Wellington

This extends from Wangaehu to Taihape, south to Paekakariki and is bounded on the east by the main mountain ranges.

White-faced Herons arrived here before 1946 as Fleming reported them then to be already regular visitors at Waikanae. In 1947 a solitary bird was sighted at Palmerston North (T.A.). During the next ten years solitary or small groups appeared along the coast from Waikanae to the Manawatu Estuary and as far inland as Ashhurst.

Breeding was reported in 1954 at Waikanae (C.A.F.) and Oturoa Road, Foxton, (M.J.I.), in 1959 at Rongotea (E.D.) and in 1960 four miles up the Manawatu River (O.S.N.Z. report). Settle-

ment has since continued steadily throughout the district. As late as 1964 birds were first seen at Taihape and by 1967 had become common in that area.

Numbers appeared generally to be small except at Foxton, where Dear counted 40+ birds in spring 1965 and reported the presence of a large breeding colony at Round Bush in 1966. Resident groups were also reported at all estuaries and at Rongotea, Ashhurst, Pohangina Valley and Lake Horowhenua.

In 1967 the Wellington Acclimatisation Society noted an increasing population especially during the past few years.

Bay of Plenty

This district comprises the wide belt of coastal lowland which extends from Waihi to Cape Runaway.

Although Buller observed single White-faced Herons in the vicinity of Hairini Bay, Tauranga, in 1885, 1888 and 1892, the species apparently failed to establish itself here until about 1957. It remained very rare elsewhere in the district and was reported as a newcomer at Ohiwa Harbour and Waiotahi mudflats as late as May 1957 (A.H.).

By 1960 numbers were increasing around Tauranga Harbour; Fitzgerald and Hodgkins noted, "now regularly seen, 30 reported," and in 1961 the first proven nesting occurred at Waikarino Inlet, followed by further nesting at Welcome Bay in 1963-64 (M.H.). By 1967 the Tauranga Acclimatisation Society reported them as being "well distributed through the district and found at all open river and tidal flat areas." Flocks of 20 or more had been seen at Welcome Bay (1964, M.H.), Otumoetai (1966, Mrs. McL.), Wairoa River (1964, M.H.) and Bowentown (1965, P.J.N.).

Further east, colonization proceeded rapidly. By 1967 large numbers of birds occurred on all major harbours, estuaries and wetlands and smaller parties appeared in many inland areas. Between 1965 and 1967 flocks of ten or more were seen at Matata, Whakatane, Ohiwa Harbour, Taneatua, Waimana, Waiotahi Pa and Opotiki. G. Anderson reported in 1968, "the number of birds in Matata-Whakatane and Opotiki has increased 30-40 per cent during the past year and they are now more widely spread."

Rotorua-Taupo

That part of the Rotorua Conservancy west of the main ranges, it includes most of the volcanic plateau and upper Waikato River system.

Buller made two references to "Reef Herons" one seen at Lake Taupo in October 1875 and another "on the wing" at Lake Rotoiti in October 1884. These have been mentioned earlier in this paper. The first positive report was from Taupo, "four solitary birds have been seen during the past eleven years" (Potts 1948).

Until 1960 the species remained rare, indeed I have discovered only one report, a first-sighting at Lake Tarawera in June 1953 (F.H.H.). By 1961 birds were occasionally to be seen at Lakes Tarawera, Okareka, Rotomahana, Rerewhakaitu, Rotoehu, Taupo, Waikato hydro-lakes and Ohau Channel. In May 1961 the first White-faced Heron at Lake Rotorua was sighted (H.R.McK. *et al.*).

During subsequent years numbers increased in the Rotorua area although Veitch (1967) (*in litt.*) reported birds still not particularly common. Generally seen in swamps, near lakes and stable, spring-fed streams." Still in 1967, Hamlett (*in litt.*) noted that they were to be "found around shores of most lakes but decreasing in the last year." Flocks of more than ten birds have rarely been recorded in this sector, except, notably, at Rotomahana, where 41 were counted in October 1968 (L.J.R.).

In the Taupo district, also, the species increased after 1961. Main (1966) reported from the northern sector, "a number are roosting around rocky outcrops at the north and west end of Lake Taupo. As many as seven are seen in one day. Single birds are reported from most ponded areas, where there is permanent water. There is no information about nesting sites and birds appear to leave the area in winter." He remarked that no significant rise in population was apparent after 1967, when he estimated the district total to be 50-70 birds.

From southern Lake Taupo, Biddle (*in litt.*) reported in 1966 that birds were becoming more numerous and by 1968 were present over the whole lake shoreline, particularly at stream outlets. Thomson (1968) (*in litt.*) reported their presence along margins of streams and rivers as far south as Lake Rotoaira.

In November 1964 the first White-faced Heron at Rangitaiki was seen on a small pond near the Napier-Taupo highway. Subsequently one was regularly seen in this area (D.M. 1966).

By 1966 every Waikato hydro-lake was reported to be supporting at least ten birds.

South-east of Rotorua, in the upper Rangitaiki, Horomanga and Whirinaki valleys, herons have been reported since 1966, not uncommon near Galatea and Te Whaiti (L.J.R.) and nesting at Murupara (H.H.). Further east, in the forest settlement of Maungapohatu, a solitary bird was seen in 1967 and again in 1968 (L.J.R.).

It appears that White-faced Herons are still actively colonizing the Rotorua-Taupo district and may be expected to continue doing so while extensive areas of unoccupied habitat remain.

Gisborne - East Coast

This district extends south from East Cape to Mohaka.

The first sighting here was of two birds at Waipaoa in April 1953 (J.M.C.). In 1957 two were seen at Awapuni Lagoon (J.B.). Nesting was first observed at Wairoa but undated, the report reading, "One pair nesting for the past few years" (T.P.F. 1958).

Subsequently, birds spread to many other localities. In 1966 they were present from Tiniroto to Ruatoria and inland at Rere, Matawai, Motu and Tahunga (T.P.F.), with a single occurrence recorded at Lake Waikaremoana (E.B.). They were especially numerous on coastal flats near Gisborne. By 1968 the period of rapid growth in this area had apparently ended.

In 1966 they were present, sometimes numerous, at Mahia Peninsula, Opoutama, Hereheretau and Awamate and abundant at Wairoa and nearby coastal lagoons. Bucknell (1966) (*in litt.*) recorded

“a marked increase in the past two years” in country extending from Wairoa to Waikaremoana.

In 1968 the species was reported to be still increasing in the Wairoa area, with many birds to be seen on coastal lagoons and quiet inland waterways (T.P.F.).

It appears that the population of this district is widespread and still expanding.

Hawkes Bay

This extends from Mohaka south to Cape Turnagain and west to the Manawatu Gorge.

Hamilton, when recording the first dated sighting of a White-faced Heron in the district (Waipawa, 1888), observed, “I have not seen a specimen for many years until this one,” thus indicating the probability of previous occurrences in the area.

The species was still very rare in Hawkes Bay in 1948 and remained uncommon until 1955 (N.McK.). In July 1952 a solitary specimen was seen at Ahuriri Lagoon (D.B.) and at Lake Hatuma in 1952 birds were reported as present and breeding (K.C., B.C.).

From 1956 to 1967 McKenzie conducted an annual count at Ahuriri Lagoon, Napier. This showed numbers to be increasing particularly rapidly between 1962 and 1965, attaining a maximum of 60 in 1965 and apparently diminishing during the next two years. Perfect (1968) reported an increase but, as he submitted no figures, a valid comparison is impossible.

By 1964 the species was established in much of Hawkes Bay. Reports originated predominantly in inland localities, the most remote of which was Noman's Hut in the mountains south of Kuripanga, where a solitary bird was seen in 1962 (N.B.). Birds were common not only at Napier but in country surrounding Dannevirke and Waiwaka.

Although McKenzie reported in 1967 that the species “seems now to have occupied most available habitat,” apparently colonization was still proceeding, as in 1968 Swinburne wrote to the Hawkes Bay Acclimatisation Society, “It is generally agreed they are more widespread than before and appear to be in greater numbers.”

Wairarapa - Wellington

This district extends from the Manawatu Gorge and Cape Turnagain to Cape Palliser and includes Wellington City and its environs.

As early as 1873 Buller noted White-faced Herons present but scarce at Porirua Harbour. No further observations were made until 1938 and 1940 at Lake Wairarapa (R.S.). In 1951 nesting occurred at Porirua Harbour (R.B.S.) and a solitary visitor was seen at Kumenga, Lake Wairarapa (W.N.).

By the following year they had spread from Lake Wairarapa eastward to the coast and were to be seen throughout that area, sometimes “as many as twenty on one paddock” (Stidolph 1952). Five were seen at Porirua Harbour (R.H.D.S.) and breeding occurred at Pauatahanui in November (R.A.F.). Reports from many localities indicated subsequent rapid colonization. Dates and numbers are as

follows:— 1954 Lake Onoke (1, B.D.H.), 1955 Woodville (1, R.B.S.), 1955 Hutt River (W.R.B.O.), 1956 Paremata (29, E.J.), 1957 Raumanga Bridge at Featherston (breeding, H.S.), 1957 Masterton (nesting in several localities, R.H.D.S.), 1960 Gladstone (nesting, J.C.), 1967 Pahiatua area (breeding for several years, I.S.R.), 1967 Mt. Bruce Reserve (nesting, W.J.P.), 1968 Lake Kohangatira (2, J.K.), 1968 Wainuiomata (present, J.K.), 1968 Western Lake Wairarapa (33 in one flock, W.J.P.), 1969 Pigeon Bush (nesting, R.D.). The long-established populations at Lake Wairarapa, Paremata and Porirua Harbours continued to increase and birds are now abundant in these areas.

It appears that White-faced Herons are still actively colonizing the Wairarapa-Wellington district.

Nelson

This extends from south of the Heaphy River mouth eastward to Havelock and from Tasman Bay to Lewis Pass.

The first definite observation made here was by Wakefield in 1888, when he noted that the species had already been present in the southern estuaries of Tasman Bay for many years. A report from Rogers of Richmond mentioned its continuing scarcity until after 1935. He described the establishment of a colony in his locality, a single bird first arriving about 1937-40, "joined a few days later by a companion. From that time the birds continued to increase until now [1957] they are quite common."

Between 1945 and 1949 most coastal areas in Golden and Tasman Bays were colonized. Nesting was observed in 1946 at the Wainui Piver mouth (F.H.), but not again until 1952 when it was reported at the Aore River mouth (B.V.). At Farewell Spit birds were reported present in 1948 (R.S.). By 1955 they had become numerous at nearby Whanganui Inlet and in the surrounding country from Puponga to Pakawau and Paturau (B.D.H.). Farewell Spit is a flocking area for many species of birds; Hartley-Smith (*in litt.*) noted that, although few nested there, the flocking population of White-faced Herons in May 1962 was approximately 435.

About 1951 there began a rapid acceleration of population growth, which continued until 1966 or 1967. During this period birds spread throughout the district. Zumbach (1966) (*in litt.*) reported, "40-50 birds are common especially round the sea coast or near nesting areas. Apart from these big flocks, they are either in pairs or on their own and nearly always near water." Occasionally they have appeared far inland; in January 1959 three were seen between Wash Bridge and Tophouse (R.B.S.) and the following May one was seen flying in the vicinity of Doubtful River, south of Lewis Pass (H.R.McK.). In 1966 they were present at the Matakaitaki River near Murchison and in 1967 at Lewis Pass, Maruia River, Wairau River and Tarndal Station (D.V.Z.), all in the southern high country.

Although White-faced Herons are now abundant in coastal areas and have spread inland in many places, there is no clear indication as to whether the population has yet reached its maximum size in the Nelson district.

West Coast - Westland

This district extends from Karamea to Martin's Bay and lies west of the main mountain ranges.

Early accounts indicated that White-faced Herons were, even in pre-European times, frequent visitors and perhaps established residents in some coastal areas. In 1888 they were common from Bruce Bay to Jackson Bay (Reischek) and Falla (1942) was satisfied that they were already breeding at or near Okarito before European settlement occurred. In January 1940 Sibson found at least three at Okarito.

From 1940 to 1949 solitary or small flocks of birds frequented many coastal localities from Karamea to Lake Mapourika and were seen also at the Arnold River below Lake Brunner in October 1941 (one doubtful, C.A.F.), along the Buller River in 1949 (usually several pairs, V.M.R.) and near Harihari in October 1949 (1, R.H.D.S.). It appears from comments made in later records that birds were present in other localities also at this time.

Nesting was first observed at Westport Sanctuary in July 1952 (Richardson), subsequently at Big Bay in 1955 (Oliver) and Kaiata, Greymouth, in October 1955 (L.O.). By 1959 colonies were established or flocks of ten or more were seen at the following places:— Karamea River, Westport, Orowaiti and Buller Rivers, Rotomanu, Western Paparoa Range from Bullock Creek to Seventeen-Mile Bluff, Greymouth, Lake Poerua, Kowhitirangi, Okarito Lagoon and Big Bay.

A steady acceleration in population growth was apparent after 1960 and by 1966 colonization had progressed in all sectors of the district. Flocks occurred mainly in coastal localities and river beds north of Bruce Bay; elsewhere, particularly in farmlands, the population was thinly scattered. A local diminution was noted at Okarito Lagoon, where White-faced Herons had been reported regularly from before 1940 until 1958 but were then not seen in 1959, 1961, 1965 or 1966. Although Wright (*in litt.*) observed a single bird in January 1968, subsequent visitors to the area found none. Whether this should be regarded as an example of the fallibility of observations even in a comparatively well-documented area or whether a colony has in fact dispersed is not clear. Alternatively, all sightings may possibly have been itinerant birds rather than successive members of a long-established colony.

Reports from departmental and acclimatisation society field officers in 1967 all agreed that population growth had decreased. Large numbers of birds occurred in several localities, e.g. Karamea River (34, R.W.S.). Kopara (30, R.W.S.). Inchbonnie (40, R.W.S.), Barrytown (15, R.W.S.). In south Westland the species, although increasing, remained sparsely distributed despite the presence of abundant suitable habitat. Nesting probably occurred at Maori Lakes, Okuru, (H.W.A.) but has not otherwise been recently reported in this area.

G. P. Adams (*in litt.*) estimated the 1967 total for the Westland Acclimatisation District to be approximately 500 birds. Sanson assessed the southern West Coast Acclimatisation District total to be at least 288 but gave no estimate for the northern part of his territory.

Reports made in 1968 indicated no further change in White-faced Heron population trends throughout the district.

Marlborough

This includes the Marlborough Sounds area and extends as far south as Kaikoura.

Handly noted the presence of White-faced Herons here in 1895 but unfortunately specified no locality. It would be reasonable to assume their occasional occurrence in the district during the following 57 years although I have found no records for that period.

From 1952 to 1956 single or small parties of birds were observed at Havelock, Blenheim, Woodbourne, Lake Grassmere and Kaikoura. Nesting was first reported in 1954 at Blenheim and then in 1956 at Havelock.

The Marlborough Acclimatisation Society reported that before 1960 birds were sparse and mainly confined to tidal flats. Subsequently, population growth accelerated until in 1967 the estimated total was 726. After 1965 the rate of increase reduced and numbers became relatively stable. The species by this time was widespread. A local population explosion occurred at Havelock, where numbers had risen from one bird in 1955 to approximately 100 by 1966 (N.). Elsewhere flock sizes were variable although generally small.

Latest reports indicate a continuing but diminished expansion of the White-faced Heron population in Marlborough.

Canterbury

This district lies between the Waiau and Waitaki Rivers and is bounded on the west by the Southern Alps.

White-faced Herons were first reported in 1938 at Tawai, near the Waitaki River (W.T.D.). However, there are at least two indirect references to much earlier occurrences:— at Lake Ellesmere, "one seen for some months, the first record for over 40 years from Ellesmere" (August 1945, E.F.S.), and at Sutherlands, "one, the first seen in 30 years" (1953, B.G.E.).

During the 1940s, solitary birds were reported from Halkett (O.S.N.Z. report), Ellesmere (E.F.S.), Tinwald (E.O.W., J.M.C.), Te Muka (R.A.F.), Kingsdown (L.W.McC.) and Waimate (R.A.F.). By 1950 widespread colonization was beginning, predominantly in coastal regions. Several inland occurrences were also recorded:— 1953 Sutherlands (1, B.G.E.), 1954 Albury (5, P.W.), 1955 Okuku River (present, B.D.N., W.C.C.) and 1957 Mt. Oxford (2, O.E.C.).

Nesting was first recorded at Waikuku (Oliver, 1955) then in 1958 at Springbrook (M.S.).

In North Canterbury, settlement proceeded, coastal habitats being generally utilized first. Concentrations of birds were recorded in 1962 at the Waimakariri Estuary (maximum 30 in January, when many juveniles were seen, D.G.D.) and in 1963 at the Ashley River (43, O.S.N.Z.). Between 1961 and 1963 they had spread up rivers and creeks in the vicinity of Mina and in 1968 at Leithfield the population was reported to have increased threefold during the preceding few years. A flock of 30 had been observed here in one field (M.W.). Furthest inland reports were of a solitary bird between

Lake Sumner and the Hope River in October 1964 (B.D.B.), at the Poulter-Cox River junction in October 1963 (W.J.P.) and, in much the same area, two resident birds in 1967 (E.S.B.).

Near Lake Ellesmere birds appear to have been widespread for about fifteen years, usually singly or in small groups, although approximately 40 were seen at nearby Lake Forsyth in January 1961 (E.W.C.), and in 1959 they were sufficiently numerous to be accused of menacing the trout population of the Selwyn River.

In 1960 Bell wrote of the North Canterbury District, "The population has made an explosive expansion over the past few years and now appears to be commencing to level out to a more normal stable population in many districts." Barker reported in 1968, "Numbers are definitely increasing. A census conducted on August 13th showed no notable increase but this was in coastal areas. They are increasing more inland and are a reasonably common sight in comparison with previous years."

The Ashburton Acclimatisation Society reported in 1966 that birds were fairly numerous and evenly distributed throughout the district, with flocks of up to 12 frequently occurring. The 1966 report noted, "It is probably fair to say the population has trebled in recent years."

Southern South Canterbury was populated early with White-faced Herons. By 1952 they were so numerous along the Waitaki and Waihao Rivers that the acclimatisation society requested removal of their protection in these areas. Elsewhere birds were widely scattered, with concentrations usually restricted to coastal lagoons and rivers. Roderick (1964) (*in litt.*) reported a marked increase during and after 1956, with nesting occurring in many places. He noted that flocks of 20-40 were common and described the heaviest aggregation he had ever seen "at Tripp Settlement 1962, where on a heavily-grassed cow pasture of about a quarter of an acre approximately 180 were counted after heavy rain."

As far inland as Lake McGregor birds were recorded in February 1963 (2, H.R.McK.) and were common in the upper Waitaki Valley, especially at Lake Benmore, by 1967 (A.F.M.L.). Brady (1968) reported that a phase of rapid growth appeared to have started in the Waitaki Valley Acclimatisation District and from Waimate McLay reported in 1967 a large and expanding population which he estimated to total several hundred birds.

It appears that White-faced Herons are still actively colonizing many parts of Canterbury.

Otago

This district lies between the Waitaki and Mataura Rivers.

White-faced Herons were reported to have nested at Bushey Park, North Otago, before 1939 (E.S.) but breeding was first proven for this district, and indeed for all New Zealand, in 1941 at the Shag River (B.A.E.). Nesting was not recorded again until 1950 at Blueskin Bay (L.E.W.), then in 1952 at Waikouaiti (W.L.P.) and Waititi (I.L.).

By the end of 1949 sightings had been reported from Shag River mouth 1948 (25+, G.R.H.), Palmerston 1949 (2, C.J.L.), Merton 1949 (2, L.E.W.), Dunedin 1949 (L.E.W.) and Portobello, Shelly Bay, 1940-1950 (30-40, A.R.H.). By December 1954 birds were scattered along the coast from Shag Point to Taieri Mouth, usually singly or in small groups. Larger gatherings occurred at Merton, Karitane, Waitati, Portobello and Shelly Bay.

During the next ten years the population increased rapidly around the estuaries and mudflats of Waikouaiti, Karitane, Blueskin Bay and Otago Peninsula and Lakes Waipori and Tuakitoto. In these localities flocks of from 20 to 35 birds were common. It is interesting that at Shelly Bay a recession was recorded. Harris (*in litt.*) observed that, whereas White-faced Herons had numbered 30 to 40 in the 1940s and 1950s, there were by 1964 rarely more than six present and Pied Oyster-catchers had now become the dominant species. Elsewhere throughout the Otago coastal belt, birds occurred in appreciable numbers and were known to be present as far inland as Moa Flat and Heriot.

It appears that colonization originated in the Shag Point-Dunedin area, later spreading southwards and finally inland. In 1968 the Otago Acclimatisation Society reported that the species appeared to be still increasing rapidly especially in coastal habitats.

Southland

This district extends from the Mataura River to the mountains west of Te Waewae Bay.

I have found only one early reference to White-faced Herons here — that of Buller, already quoted, recording a solitary bird driven ashore on Centre Island during a heavy storm in 1905.

Apparently nothing further was recorded until the sighting of 15 birds at Awarua, Invercargill Estuary, in 1951. This large number strongly suggested that the species had already been present here for some time before 1951.

In 1952 five birds were seen at Waituna Lagoon (H.R.O.) and one at Mokomoko entrance, Invercargill Estuary. Nesting was reported in 1954 at Invercargill Estuary. By 1955 flocks were established at Awarua Plain (13, B.D.H.), Oreti Estuary (33, B.D.H.) and Invercargill (8+, H.R.McK.) and by 1958 at the lower Mataura River (43 maximum, S.L.).

Records indicate a sudden population expansion after 1960, when colonization intensified in the Oreti-Invercargill area and spread thence north and west into new territory. The "Southland Times" reported, in 1968, that herons were "present for 30 to 40 years in small numbers until six or seven years ago, then a population explosion occurred."

Especially large flocks have gathered in lagoons and estuaries e.g. Awarua Bay, Invercargill Estuary, Oreti Estuary, the Aparima-Pourakino Estuary and Waiau Lagoon at Te Waewae Bay and at Motu Bush on the Waiau River. Elsewhere the population in Southland is generally scattered but still increasing.

Southern Lakes

This district extends from Haast Pass to Te Waewae Bay, thence west and north along the coast as far as Martin's Bay.

The first report here was of a pair at Glendhu Bay, Lake Wanaka, by Vercoe (1950) (*in litt.*). In April 1951 he observed a solitary bird at Queenstown Bay and noted this to be probably the first occurrence at Lake Wakatipu. During the next ten years only occasional sightings were recorded:— in 1955 at Dusky Sound (present, W.R.O.B.), in 1956 at Doubtful Sound (present, W.A.W.), in 1956 at Timburn Station, Lindis Valley (one resident, H.W.A.), in 1957 at Lake Hayes (1, M.S.), in 1958 at Oldham's Lagoon, Queenstown (one seen, unusual visitor, M.S.) and in 1960 at Te Anau - Manapouri Road (2, A.T.E.).

By 1967 the species had penetrated most of the district. Birds occurred on nearly all lakes, along many rivers and at Milford Sound but were numerous in only a few localities. They were known to breed at Tarras and on the flats and shores of Lake Wanaka. Colonies were established or flocks of ten or more observed at the following places:— Makarora River, Matukituki River, Lake Wanaka, Ewings Flat, Tarras, Lake Te Anau, Upukerora River, Whitestone River, Kakapo Swamp and Lake Manapouri.

Field officers in this district report a gradual population expansion resulting in birds being now fairly common in many areas. As much habitat yet remains unoccupied one could reasonably expect the species to increase further in the immediate future.

Islands

White-faced Herons have occurred on many inshore islands.

At Stewart Island they were first recorded in 1954 (J.W.) and are now common at Paterson Inlet.

They have been reported by Sibson to be now established at Waiheke, Kawau, Ponui and Great Mercury Islands and are known to have visited Little Barrier (R.H.B., 1965), Great Barrier (S.H., 1961-63), Mokohinau (R.B.S.) and Rangitoto Islands (A.D.G.S., 1958). All these are situated off the northern half of the North Island.

They occur also on some of the outlying island groups. As early as 1882 Travers recorded their presence at the Auckland and Chatham Islands. A small resident population has been established on the Chathams, at Te Whanga Lagoon, since about 1966 (B.D.B.). At Campbell Island one was reported in April 1951 as "present for some time" (Aldridge per Sorensen). Further sightings were made here by officers of the Meteorological Station during the following seven years, since when nothing more has been recorded. Officers of a similar station at Raoul Island reported the arrival of one White-faced Heron on 20/4/69, immediately following a particularly violent southerly storm in New Zealand.

SUMMARY AND CONCLUSION

Although an occasional visitor and possibly restricted resident in New Zealand during pre-European times, the White-faced Heron apparently failed to establish itself as a breeding species here until approximately 1940. Population growth remained almost imperceptible in most places until about 1950, when it began to accelerate and, in many districts, was progressing rapidly by the early 1960s.

Now the species occurs throughout the country, especially in coastal areas, around lakes and near rivers. Settlement as a rule has proceeded inland from the coasts. In a few districts suitable habitat appears to be now fully exploited but colonization generally continues, the rate varying according to the kind of locality.

Although distribution is wide, birds usually occur singly or in small groups. However, after midsummer large aggregations are to be found on many shallow harbours, estuaries and lagoons.

The White-faced Heron is still establishing itself in suitable habitat throughout the country and, if this trend continues, is expected finally to become one of our more common resident species.

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