

THE DISTRIBUTION OF THE BLUE DUCK,
HYMENOLAIMUS MALACORHYNCHOS, IN THE
SOUTH ISLAND: A PRELIMINARY SURVEY

R.E. FORDYCE,

Department of Zoology, University of Canterbury,
Christchurch, New Zealand.

and

G.A. TUNNICLIFFE,

Canterbury Museum, Rolleston Avenue,
Christchurch, New Zealand.

ABSTRACT

The past and present distribution of the blue duck, *Hymenolaimus malacorhynchus*, in the South Island, is briefly reviewed. The data presented here indicate that the blue duck is widely distributed throughout the mountainous areas of the island. It is suggested that since early European times there has been a gradual disappearance of ducks from the lower reaches and gorges of many rivers, especially in more developed agricultural areas. Several possible causes of this decline are discussed. Man appears to have been the cause of the restriction in distribution by changing physical parameters of the environment, and by predation.

INTRODUCTION

The purpose of this paper is to assemble recent sight records of the blue duck in the South Island. Most references to the distribution of the blue duck have been briefly qualified (Turbott 1969, Kear and Burton 1971); these reports indicating that the species is comparatively rare, and restricted to mountainous areas. This paper endeavours to provide a more precise insight into blue duck distribution, and to appraise this data where there is sufficient information.

It must be emphasised that the lack of records of ducks in the higher, rugged mountain streams does not imply their absence from these areas. On the other hand, the lack of any records of ducks in lowland areas. e.g., on the Canterbury Plains, does indicate an uneven distribution which warrants closer appraisal. Sightings tend to be concentrated in areas which perhaps attract greater numbers of trampers and shooters, and therefore reflect an observational bias on the occurrence of ducks in these areas.

METHODS

Most records are from actual sightings, although a few are from calls. Personal communications and sightings abstracted

from literature constitute the majority of records, while others are from museum collections of midden and skeletal material, eggs, and study skins collected in the late nineteenth and early twentieth century.

OBSERVATIONS

Information from the sources mentioned is shown on a distribution map (Fig.1) which illustrates a comparatively extensive distribution in both early and recent times.

Altitude does not appear to limit distribution appreciably. In remote areas, e.g., Fiordland, ducks have been recorded at sea-level both in the past (Buller 1888) and present. In less remote areas, such as Motunau, populations of ducks were living at sea-level as late as 1893 (E.Roberts pers.comm.). Upper altitude limits may occur at the permanent snowfields, though ducks usually range between 450 and 1350 m above sea-level.

HABITAT

Field observations (about 8 hours) in the Otehake River, Westland (R.E.Fordyce), suggested that areas frequented by blue ducks are those associated with rapids, gorges, and swiftly descending stretches of water. Observations by others who supplied data for this survey reinforce this. Areas of river where ducks forage and swim are usually pools, 10 to 20 m long, with rapids above and below. While in these stretches of river, ducks spend most of their time foraging just above or below the rapids, then withdraw sporadically to slower-flowing water to preen or rest.

DISCUSSION

FOOD AND FEEDING IN RELATION TO DISTRIBUTION

The blue duck is territorial, defending a stretch of water against other individuals of the same species (Douglas in Pascoe 1969, Kear and Steel 1971). Field observations (R.E. Fordyce; N.H. Bettle and M.J. Glue pers. comm.) suggest that the ducks may range considerably throughout the territory at least during the day (also observed by Soper 1965, and Kear and Burton 1971). The territoriality may well relate to dietary requirements, each territory supplying sufficient food for survival of a pair of ducks and their offspring.

The concept of territory and its application to the behaviour of birds is discussed in the foreward (by Huxley and Fisher) of Howard (1964). Using this concept, blue duck territories may be defined as 'Type A' of Mayr-Nice-Armstrong, a "Large breeding area within which nesting, courtship, and mating and most food-seeking usually occur".

Most of the food taken appears to consist of aquatic invertebrates, although the ducks have been observed to catch surface insects and other floating invertebrates (observed in the Takaka River, April 1972, R.E. Fordyce; Oliver 1955). It is unlikely that surface insects constitute more than a small proportion of the diet. Gut and faecal analyses (Kear and Burton 1971) indicate the presence of the following invertebrates:

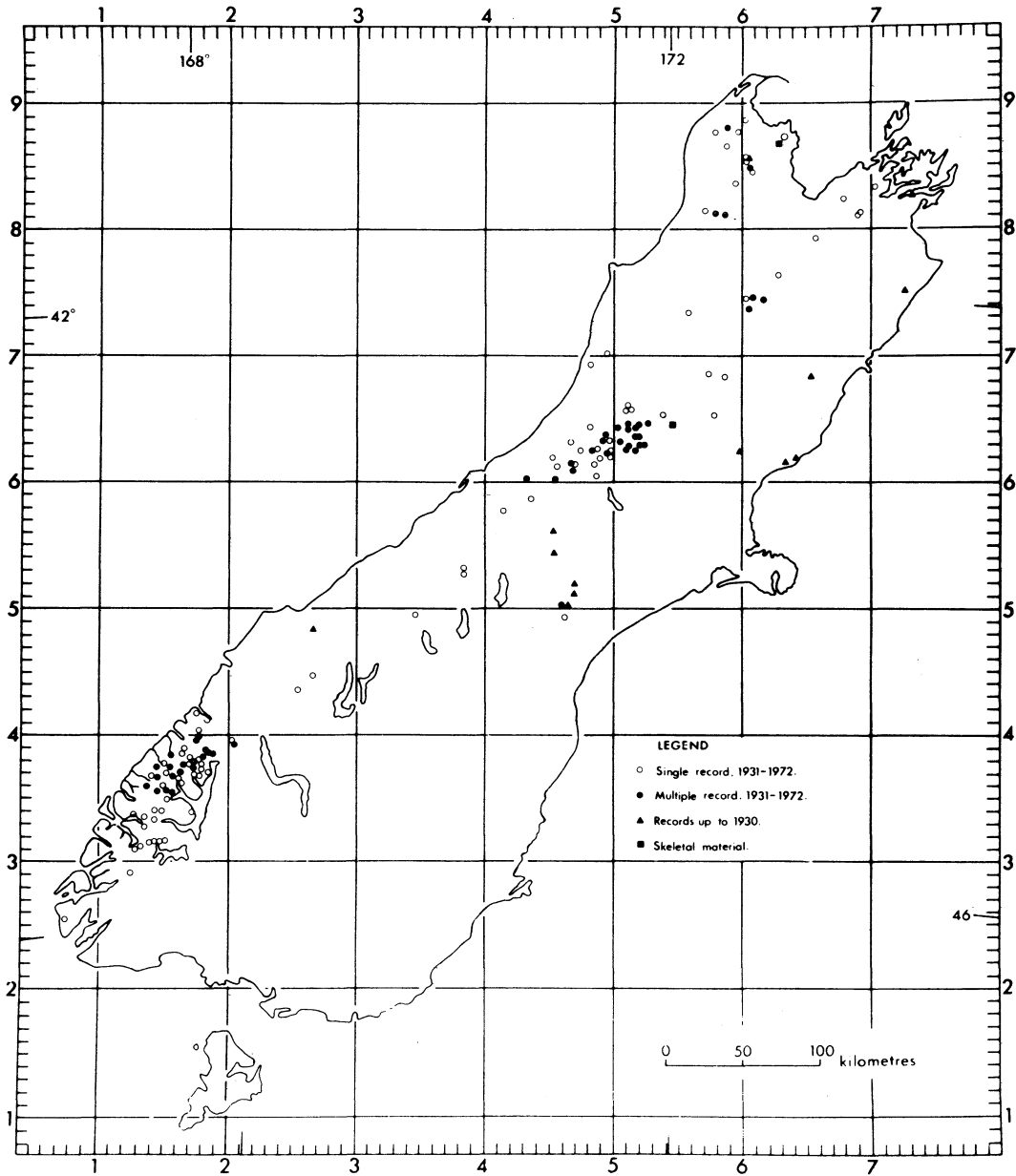


Fig. 1. Distribution of blue duck records in the South Island before and after 1930.

CLASS INSECTA

Caddis larvae (O. Trichoptera), cased and freelifving.

Stonefly larvae (O. Plecoptera).

Mayfly nymphs (O. Ephemeroptera)

Chironomid larvae (O. Diptera).

Beetle larvae (O. Coleoptera).

CLASS ARACHNIDA

Mites (O. Acarina).

Many of these invertebrates are found only in rapidly flowing water, and characteristically possess efficient structures for clinging to the substrate. These mechanisms may take the form of suckers, as in O. Diptera, Fam. Blepharoceridae, or clinging mechanisms, as in O. Plecoptera (Stout 1969). A.G. McFarlane, Canterbury Museum (pers.comm.) reports that small freshwater invertebrates are concentrated at points of velocity change of water, and suggests that this may be associated with a greater availability of oxygen.

Freelifving and filamentous algae were also recorded as minor constituents of the above samples.

It is likely that the physical features of rivers effect the distribution of blue duck by determining the availability of suitable habitats for aquatic invertebrates. The physical setting may be modified in a number of ways (directly and indirectly) by man, causing a reduction in potential blue duck habitats. As a result of burning and the introduction of large mammals, especially ungulates, there has been extensive acceleration of erosion over the last 100 years, leading to silting of rivers. The introduction of hydroelectric schemes, topdressing, and irrigation has also modified the condition of many rivers and hence affected the invertebrate fauna of freshwaters (Stout 1969).

While natural events, such as the Murchison earthquake of 1929 (R.E. Clouston, in Williams 1960) may have modified the river environments by silting, it is unlikely that these have affected duck distribution to the same extent as have man's activities.

PREDATION

Prior to man's arrival in New Zealand, blue duck populations had probably been subjected to only limited predation from the largest birds of prey and possibly fish such as the eel (Kear and Steel 1971). There is no evidence to suggest a decline after the arrival of the Maori, although midden material and Buller (1888) indicate that the ducks were taken for food. The arrival of the European, and other mammalian predators, probably brought about a readjustment of blue duck populations. The blue duck apparently formed a staple part of the diet of early settlers in some regions during 1870-1880 (E. Roberts pers. comm.). Furthermore, Douglas (quoted by Pascoe, 1969) indicates that the ducks were "good eating . . . very acceptable to survey parties

and explorers". It is likely that the taking of blue duck for food was significant in modifying their distribution and in some instances their numbers.

There is considerable controversy over the effect of carnivorous mammals, especially mustelids, on blue duck distribution. Douglas (quoted in Pascoe 1969), while commenting on the ease of catching the ducks and their absence in localities where they were once plentiful, attributed the disappearance of many native birds in the Karangarua River Valley (1892) to "the Digger with his Dogs, Cats, Rats, Ferrets and Guns . . . ". He also commented on ducks in the Waitatoto Valley (1891): "What is up with the Blue Ducks? They are very scarce, & so wild that the Dogs can't catch them & they wont let me within shot them. On the Haast & Okura the Ferrets are pitching into all the Birds, is it possible that an Aesthetic breed of those Vermin have come into the Waitatoto a breed too refined for Vulgar game but must have Ducks alone?" Douglas's comments on the effects of mustelids and other predators probably still apply to the situation in New Zealand today. A population survey of mustelids (Marshall 1963) indicates that the ". . . effect of mustelids on native birds is more obscure and must be viewed in the light of many other events in New Zealand's short but crowded history . . . whereas the land area of New Zealand has not changed, the pressures of vertebrate organisms, including man, has multiplied by immeasurable degrees".

Predation is probably becoming less important now, in comparison with those factors indirectly influencing the food supply of blue duck. The blue duck population of New Zealand has been subjected to essentially the same pressures as many other natives birds. Modification of distribution has probably occurred as a result of inability to adapt to a changing environment.

ACKNOWLEDGMENTS

Mr O. Hughes provided much help in the field while data were being recorded, and also assisted with the preparation of this paper. The information provided by Mr D.J. Wakelin (Fiordland National Park) and by members of the Canterbury University Tramping Club was invaluable. We would also like to express our gratitude to the many others who contributed to this survey.

LITERATURE CITED

- BULLER, W.L. 1888. Buller's Birds of New Zealand. Edited version of 2nd edition, by E.G. Turbott, 1967. Whitcombe and Tombs, Christchurch. 262 pp.
- HOWARD, E. 1964. Territory in bird life. Fontana, London. 239 pp.
- KEAR, J. and BURTON, P.J.K. 1971. The food and feeding apparatus of the Blue Duck Hymenolaimus. Ibis 113: 483-493.
- and STEEL, T.H. 1971. Aspects of social behaviour in the Blue Duck. Notornis 18: 187-198.
- MARSHALL, W.H. 1963. The ecology of mustelids in New Zealand. Information Series No. 38, Department of Scientific and Industrial Research, Lower Hutt. 32 pp.

- OLIVER, W.R.B. 1955. New Zealand birds, 2nd edition. A.H. & A.W. Reed, Wellington. 662 pp.
- PASCOE, J.D. 1969. Mr Explorer Douglas. A.H. & A.W. Reed, Wellington. 331 pp.
- SOPER, M.F. 1965. More New Zealand bird portraits. Whitcombe and Tombs, Wellington. 101 pp.
- STOUT, V.M. 1969. Invertebrate fauna of the rivers and streams. In: Knox, G.A. (Ed.), The natural history of Canterbury, Royal Society of New Zealand: 471-497. A.H. & A.W. Reed, Wellington. 620 pp.
- TURBOTT, E.G. 1969. Native birds. In: Knox, G.A. (Ed.), The natural history of Canterbury, Royal Society of New Zealand: 426-434. A.H. & A.W. Reed, Wellington. 620 pp.
- WILLIAMS, G.R. 1960. Birds of the Goulard Downs, northwest Nelson. Notornis 8: 236.