

Some Ecological Aspects of the Hutt Valley as an Animal Habitat

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This contribution is not the result of a long-term intensive ecological study of the Hutt Valley. It is rather a series of notes on those aspects of the valley and its animals that have come to the notice of a zoologist living in the middle of the lower portion of the valley. The selection of topics perhaps mirrors the bias of the observer and certainly there has been no attempt to be comprehensive. The writer has at different times considered the Hutt Valley from the following viewpoints:—

1. An area devoted primarily to human occupation, industry and farming, with hills of bush or rough scrub on each side.
2. A river system edged with narrow strips of waste land, acting in part as a corridor and in part as a habitat in itself.
3. A series of small isolated native habitats in a sea of induced habitat of little real interest.
4. A major habitat utilised largely by an introduced fauna.
5. An area in which some native species appear to have adapted themselves to a very altered habitat either by occupying niches which are essentially the same as those they filled originally or by changing their habits by a sufficient margin to survive. In other words a laboratory in which dozens of ecological experiments are being conducted, all essentially uncontrolled.

Birds are a convenient group to use as illustrations for some of these viewpoints as they are obvious and well known.

1. A few native birds such as the harrier, N.Z. falcon and tui appear in the valley mainly in transit between the eastern and western hills and vice versa. Probably more species than this are involved but the three above have been actually observed. The tui does descend to gardens when the kowhai is in flower.

2. The river with its associated surrounding waste lands is in many respects the most important bird habitat in that it affects the greatest number of species. Typical freshwater birds such as the shags, ducks, kingfisher and swan can be seen feeding along it and some of them nest along its banks. The only wader to utilise the river banks is the banded dotterel which once used to nest along the river flats. Although not common the odd pair of birds in breeding plumage are still to be met in places. A single white heron was observed during the peak season of 1957/58. But the most important species are the marine forms, red-billed gulls, Caspian terns and black-backed gulls. Of these the black-backed gulls are the most consistent and probably the most significant species. Their behaviour patterns in relation to the river are complex and have so far failed to submit to the writer's analysis. Some birds are usually to be seen along the river. When the whitebait are running in the spring and again when young bullies are running in the autumn there are usually a couple of gulls stationed at every rapid and along the more extensive shallow reaches. In summer large flocks settle regularly on a number of favoured gravel flats. These are all normal enough activities and are what one would expect.

But the most constant, most noticeable activity is a well-marked seemingly rhythmic movement of birds up and down the river. Unfortunately the rhythm of the movements cannot be explained as yet. Some birds do pass up the river to move out of the valley over the Haywards Saddle and so gain access to the Pauatahanui Harbour.

The river is of course a perfectly good habitat in itself as well as acting as a corridor. Some of its aquatic animals, in particular the vertebrates, carry out quite definite regular movements up and down its length. Old illustrations of the valley indicate a much more

sluggishly flowing river with heavily wooded banks and obviously graded reaches. At present the river bed for a great deal of its course in the middle valley is a bed of rather bare, moving gravel. Like all gravel rivers it is constantly changing its course within the limits of its flood banks. There are numerous fairly regularly spaced gravel extraction plants which affect the river as a habitat very considerably and prevent adjacent stretches of river from ever attaining a stable pattern. Over most of the lower and middle valley the river is clouded with silt stirred up by the workings of these plants during normal working hours and for some hours afterwards. Many of the plants work a half day on Saturday so that in fact the river water is heavily clouded with silt during most of the daylight hours for six days of the week. Anyone who measured the light penetration qualities of Hutt River water on Sundays would gain a completely wrong picture of average conditions. The amount of sunlight cut out by the soup-like water during the rest of the week must have a considerable effect on the development of aquatic plants. The heavy concentration of silt must also affect filter-feeding animals.

There is some evidence to show that even since 1900 there have been quite significant changes in the invertebrate fauna of the river. Freshwater molluscs are almost entirely lacking from the main Hutt River system from the estuary at least as far up as Silverstream. Some species are present in backwaters and small tributary streams. Collections made around 1900 show that more species were present at that time and they were obviously commoner than they are today.

The river is tidal as far as the new Melling Bridge and at this point, river flounder, yellow-eyed mullet and kahawai have been observed. Most of the freshwater fishes have very definite migratory movements up and down the river, the movements almost always concerned with the breeding cycle. Eels and *Galaxias attenuatus* (the adult form of whitebait) move down to the sea to breed, lampreys come upstream to breed. The larval young of the *Galaxias* come upstream in schools in the spring and there are upstream migrations of young bullies in autumn.

3. The small isolated native habitats, areas of scrub or bush are mostly close to the eastern or western hills. Most of them have been somewhat altered but they do give good indications of the original plant cover of the valley. Such patches are usually too small to serve as refuges for native birds, though they are used by the

species present in the valley, native and introduced. These patches of scrub or bush do, however, preserve a sample of the invertebrate animals which formerly lived in the valley.

4. The study of the introduced fauna in an area such as the Hutt Valley is in its infancy, as it is in New Zealand generally. Apart from species which are potential or actual pests (most marked amongst the insects and the mammals) these introductions have never been fully listed much less adequately documented. Some apparently came in so early that they are usually claimed as natives, e.g., the katydid and praying mantis. Others in spite of all efforts at quarantine have arrived unheralded and unrecorded. In a country such as New Zealand there is often a prejudice against studying introduced species, a prejudice that is only slowly overcome. It is overcome when the plant or animal comes into direct competition with man. Until it does become a recognised pest its study receives little or no monetary support and the results of such study little scientific recognition.

In the Hutt Valley there is a vast unrecorded introduced fauna, much more neglected in scientific literature than the invertebrates of Campbell Island.

5. Perhaps the most interesting feature of relationships between animals and their environment in the valley is the way in which some native animals are surviving in the most changed areas. The species which do this most easily are those occupying a niche which is largely reproduced in the new habitat. Providing there has been a means of transition from one physical habitat to another, such species may survive readily enough and if they can change or adapt themselves to some new conditions they may even increase in numbers. The common tree weta (*Hemideina thoracica*) is a good example. In bush or scrub this orthopteran lives in knot holes, hollow limbs, or bark, coming out to feed at night. In suburban gardens this weta may be commoner than in any comparable area of native plant cover. Privet hedges, stumps, wood heaps, the gaps between weatherboards, and countless other places in backyards provide adequate cover. The major adaptation that this species has had to make is in relation to food plant. Any change that was made was probably a gradual process, but at the same time many gardens have *Coprosma*, *Hebe* and *Leptospermum* well represented.

An allied weta (*Hemiandrus similis*) living in shallow burrows in soil seems much commoner

in garden habitats than it is in undisturbed areas. Vast areas of cultivated soil which have been made available by the efforts of countless gardeners present a much more accessible physical habitat. Again there must have been a change in food plants, but in backyard vegetable gardens there has been a wealth of nutritive food to select from.

Several species of stick insects have made themselves at home in Hutt Valley gardens, some on ornamental manuka, but others seem well adapted to a selection of ornamental shrubs and some especially to pip-fruit trees and raspberry canes.

A few ground beetles, especially species of the genus *Cilibe*, seem thoroughly at home in gardens. Tiger beetles of the family Cicindellidae are probably much commoner as there is much more ground suitable for larval burrows. Mantis (*Orthodera ministralis*) and katydid (*Caedicia simplex*) are certainly far commoner in gardens than they are amongst native vegetation, but both of these are probably introduced insects and the mantis appears to be a most adaptable animal over its whole range.

All the examples considered so far have been insects and it is not surprising that members of this group should be well represented amongst the more adaptable native animals. It is perhaps more surprising that representatives of groups which lack a protective exoskeleton and which must keep themselves in a damp habitat should also be well represented. Our native earthworms are classic cases of animals which disappear as soil is stripped of native vegetation and cultivated. One large exception is well known in the Hutt Valley—*Octochaetus multiporus*, which lives deep down in heavy clay and is abundant in garden areas which are heavy and not over-well cultivated. In fact of course its original niche is still present and available practically unchanged.

Two native land molluscs provide an interesting example of how two allied animals with different habitat requirements have managed to survive. Our native slugs belong to the family Athoracophoridae, and differ markedly in structure and habit from the introduced European slugs which have established themselves most satisfactorily in both native and altered habitats in New Zealand. The two groups are so different in habit that they do not appear to come into competition with one another and this fact has probably assisted these two species of natives to become adapted to garden conditions.

Athoracophorus bitentaculatus is largely an arboreal species. It is small, less than an inch in length and is common in gardens usually in rougher areas around the outskirts. These animals follow rather a fixed pattern of movement. When foliage is wet they are active at night, crawling on leaves etc., remaining on the undersides or in curled-over leaves during the day time. When conditions become too dry they migrate downwards and take refuge on grass roots, bases of flax bushes, amongst fallen leaves etc.

Pseudaneitea papillata is considerably larger, up to 3 inches in length when quiescent, but may be 5–6 inches long when extended. This species is strictly terrestrial and in natural habitats is usually associated with rotten wood, probably because it feeds upon small fungi which it seems to ingest together with some rotting wood. Surprisingly enough this species turns up fairly regularly in local gardens and not only in newly established ones at that.

Some spiders seem to have accepted the conditions brought by human occupation rather easily. The largest common form around gardens in the Hutt Valley and even in central parts of Wellington is the tunnel web spider, *Porrhothele antipodiana*. This is probably the commonest single animal sent in for comment and identification to the Dominion Museum year after year. It is fortunate that the bite, though painful, is not as generally poisonous as its Australian counterpart which seems equally common in built-up areas.

Two birds show progressive stages in the colonising of habited areas by native species. Fantails have established themselves fairly generally, hawking small flies over compost heaps and under shrubs and trees. We have two or three semi-permanent residents in our own quarter-acre section. These birds are present (continuously as far as one can be certain) for six to seven months of the year. They vanish during the breeding season and seem to seek out conditions approaching their original native preferences for breeding. For those species which can move readily, the fact of breeding in a new habitat can be taken as a criterion for determining complete integration. Contrasting with the fantail and grey warbler (which follows much the same pattern), the white-eye, within the framework of its seasonal communal flocking and migration behaviour as outlined by Mr. Bull has reached the stage where it will nest in gardens fairly regularly if there is sufficient cover.

One method by which some members of the so-called cryptozoic fauna may have made the transition from native bush to suburban gardens may be outlined. Under isolated rotting logs in well-established pastures live quite a number of these animals which require a moist habitat. The species present include several land snails, planarians, millipedes, centipedes, ground

beetles of the family Carabidae and even *Peripatus* (which is also well established under gorse scrub).

Gardens are of course only an extreme form of induced habitat and the species which have adapted themselves to gardens have been stressed to show that the total transition is possible.

Birds of the Hutt Valley

P. C. Bull

INTRODUCTION

The present paper consists of two parts: the first deals with the movements of birds from one place to another, and the second, in the form of an appendix, provides a preliminary list of the species that occur in the area.

The Hutt Valley provides good examples of several types of bird movements, but few of these have been studied in detail. The present account includes an interim report on a current study of the movements of blackbirds and thrushes in the Hutt Valley, a summary of miscellaneous observations on the movements of other species in the area, and a discussion on the significance of these movements to general ecological problems. The scientific names of species mentioned in the text are listed in the appendix.

MOVEMENTS OF BLACKBIRDS AND THRUSHES

There are no marked seasonal changes in the distribution of blackbird and thrush populations in the Hutt Valley, and ringing has therefore been used to detect movements made by individuals. The birds are caught in modified Potter traps, and marked with aluminium rings provided by the Ornithological Society; coloured plastic rings are also used to identify individual birds without recapture. Most of the ringing has been done in Waterloo Road, but six sub-stations, all within two miles of the main station, have been operated from time to time. The study was started in July 1951, and 614 blackbirds and 164 thrushes have been ringed since then; of these, 428 blackbirds and 123 thrushes were ringed at the main station.

The movements of non-migratory species, such as blackbirds and thrushes are of two kinds. Adult birds merely move from place to place within the immediate vicinity of their breeding territories, but young birds disperse over much greater distances. The author's ringing station is surrounded by numerous small private gardens, and this makes it difficult to measure the size of territories. The few observations available, however, suggest that blackbirds' territories in this part of Lower Hutt are somewhere between the 0.4 to 0.6 acres found by Snow (1956) in Oxford (England) and the 1.5 to 2 acres reported by Gurr (1954) from Dunedin.

More satisfactory data are available on dispersal of young birds. A total of 71 ringed blackbirds and 16 thrushes have been found dead so far.* The dispersal pattern of birds ringed at Waterloo Road is shown in Fig. 1 which is based on 22 blackbirds and eight thrushes recovered more than 220 yards from the ringing station; a further 34 blackbirds and four thrushes, recovered at lesser distances, are omitted from the figure. Most of the birds were recovered within half a mile of the ringing station, but a few moved considerably greater distances. For instance, a blackbird moved from Waterloo Road to Lowry Bay (three miles) and a thrush to Moore's Valley Road, Wainuiomata (four miles). This last recovery is of particular interest since the bird had

*Grateful acknowledgement is made to D. Arthur, M. Buchler, R. K. Dell and R. H. Taylor who have ringed birds at the sub-stations and also to the many members of the public who have co-operated in returning dead birds to the Dominion Museum.