

THE STATUS OF THE NEW ZEALAND PIPIT (*Anthus novaeseelandiae*) IN THE WELLINGTON REGION

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ABSTRACT

Pipit (*Anthus novaeseelandiae*) numbers on nine count routes in the Wellington region ranged from 0.16 to 6.22 per km on average. Estimated densities in regions with some favourable habitat varied between 1.0 and 2.5 per square kilometre. Highest numbers were in the hills south and west of Karori, and on the southern and western beaches between Owhiro Bay and Titahi Bay. Densities were lower over the rest of the region due to intensive farming, unfavourable plant succession pathways to bush, and urban development.

KEYWORDS: Pipit, *Anthus novaeseelandiae*, density, distribution, Wellington.

INTRODUCTION

Pipits (*Anthus novaeseelandiae*) were common throughout New Zealand during the transformation of forest and tussock to pasture (Guthrie-Smith 1927, Turbott 1967, Garrick 1985). They are still probably more common than in pre-European times (Oliver 1955), but over the past 40 years there has been a decline in many regions (Hodgkins 1947, Stidolph 1974), and the species is now restricted to beaches (Young 1976), open tussock grassland (Dawson & Cresswell 1949, Challies 1966), young and cut exotic forests, gravel river and beach margins and alpine habitats (Oliver 1955). This decline has coincided with potential interspecific competition with Skylark (*Alauda arvensis*) (Mooed 1975, Garrick 1981), the sealing of roads, increased traffic densities and road speeds (Stidolph 1974), the spread and increase in density of White-backed Magpies (*Gymnorhina tibicen*) (Stidolph 1971, 1974, 1977), increased spraying of roadside verges (Stidolph 1974), avian diseases (Westerskov 1953, Quinn 1971), accidental poisoning (Oliver 1955, Garrick 1985) and reduction in breeding habitats (Stidolph 1974). There may also have been competition with other introduced passerines, predation (Oliver 1955, St Paul & McKenzie 1975, 1977) and a reduction in over-wintering habitats (Hamel 1972).

Pipits have remained in higher numbers in Poverty Bay (Garrick 1981) and on the Volcanic Plateau during the expansion of exotic forestry (Ryder 1948, Weeks 1949). However, anecdotal records suggest that there are significant annual fluctuations in numbers there. This may reflect differences in breeding success, as Pipits are capable of producing at least two clutches of up to four young between September and February (Garrick 1985).

The history of landscape modification in lowland (<500 metres) rural Wellington is typical of many parts of New Zealand, and Pipits are not common. There were no records of the distribution and numbers of Pipits until Secker studied them at Makara, Ohariu Valley, Gollan's Valley, Mt Wainui at Paekakariki and Karori between 1951-54 (Secker 1955). He found that the distribution was restricted to pasture with weeds and tauhinu (*Cassinia leptophylla*) clumps, and stunted manuka (*Leptospermum scoparium*) and gorse (*Ulex europaeus*). Secker noted declines after tauhinu and rushes were cleared. He also found that Pipits appeared in suburban gardens and parks during the late summer and winter.

I undertook this study to assess the current distribution and number of Pipits, and the importance of different aspects of habitat to them in Wellington.

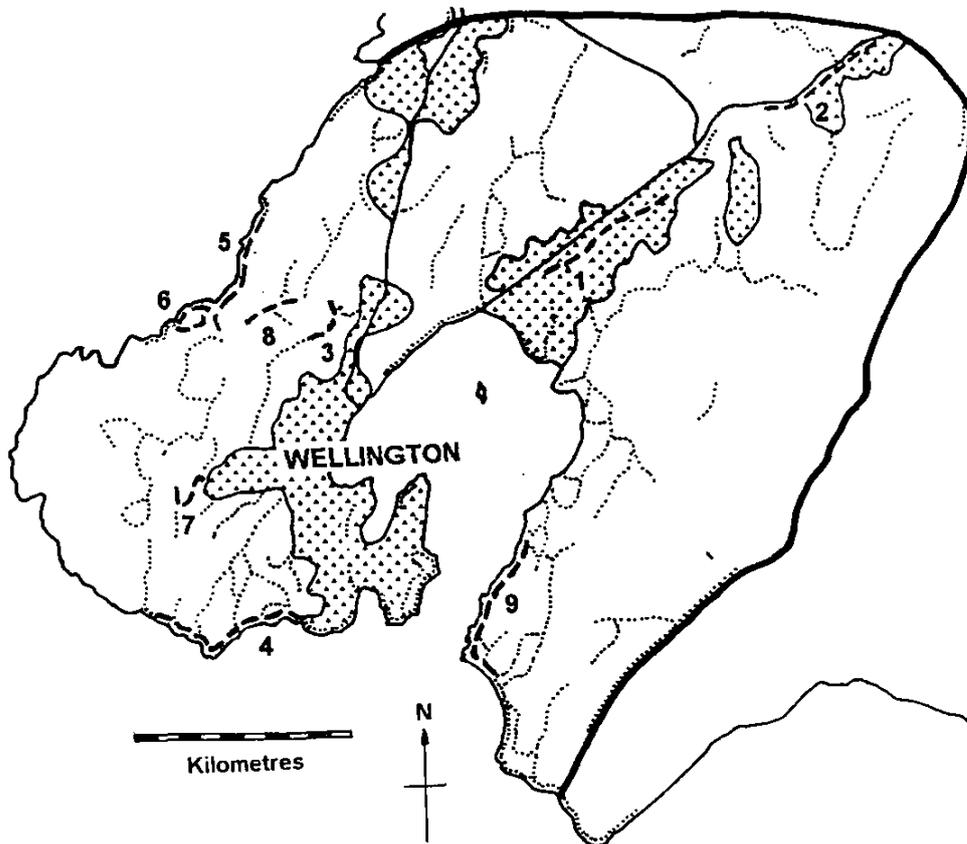


FIGURE 1 – The location of count routes (dashed lines) and areas traversed (dotted lines) while obtaining Pipit distribution data (see tables 1 & 2). Small triangles indicate the urban area, and the thick line is the inland boundary of the region studied. The major routes used for density estimation were (1) Hutt River lower, (2) Hutt River upper, (3) Mt Kaukau South, (4) Owhiro coast, (5) Makara coast north, (6) Makara walkway, (7) Makara Hill, (8) Takarau Gorge, (9) Eastbourne to Lake Kohangatera.

TABLE 1 – The routes, route lengths and count months used to assess the density and distribution of Pipits (*A. novaeseelandiae*) in the Wellington area.

Route	Length (km)	No. of counts	Count months
Lower Hutt River	5.5	6	Jul, Oct'88, Jan, Apr, Jul, Oct'89
Upper Hutt River	5.5	5	Oct, Nov'88, Jan, Apr, Jul'89
Mt Kaukau south	1.0	6	Jan, Apr, Jul, Jan'89
Owhiro Bay to Karori Stream	8.0	12	Nov'87, Feb, Jun, Dec'88, Jan, Feb, Mar, Apr, Jun, Oct'89
Makara Stream to Pipinui Point	5.0	5	Apr, May, Aug, Dec'88
Makara Walkway	4.0	7	Jan, Apr, Jun, Aug, Oct'88, Aug'89
Makara Hill	1.5	7	Feb, Apr, Jul, Oct, Nov'88, Jan'89
Takarau Gorge	3.0	5	Jun, Aug, Oct'88, Jan, Feb'89
Eastbourne to Lake Kohangatera	8.0	5	Apr, Jun, Jul, Sep, Oct, Dec'88
Miramar walkway and Seatoun	5.5	3	May, Aug, Sep'88
Mt Albert	1.0	1	Sep'88
Happy Valley tip road	1.0	2	Feb'89, Oct'89
Hawkins Hill	5.5	3	Oct'88, Feb'89, Mar'89
Long Gully	3.5	2	Mar & Dec'88
South Karori Road	1.5	1	Aug'88
Mill Road Makara	2.8	1	Sep'88
Wilton's Bush margin	6.5	1	Jan'88
Johnsonville walkway	1.0	1	May'88
Colonial Knob	3.0	1	Oct'87
Titahi Bay	0.5	1	Aug'87
Titahi Coast	3.4	1	Aug'87
Porirua Harbour Mouth	2.7	1	Mar'89
Pauahatanui	4.0	1	Mar'89
Horokiwi Road	5.8	2	Aug, Oct'88
Belmont Hills	10.6	3	Dec'88, Aug'89, Sep'89
Hayward's Hill	2.2	2	Nov'88, Jan'89
Moonshine Road	8.2	2	Nov'88, Jan'89
Mt Climie	4.0	3	May'86, Nov'86, Jan'87
Stokes Valley	4.2	1	Nov'88
Whiteman's Valley tops	4.5	1	Nov'88
Butcher's and Orongorongo Valley	6.5	2	Dec'87, Feb'89
Orongorongo Coast Road	3.5	1	Dec'87

METHODS

I censused all habitats in the area south and west of a line from Titahi Bay, Pauahatanui, Upper Hutt, Mt Climie and the Orongorongo River (Table 1, Fig. 1). I counted Pipits seen and heard 50 metres either side of nine routes between January 1988 and October 1989. These areas are the first nine areas listed in Table 1. I also mapped Pipits in other areas during occasional or systematic counts between 1987 and 1989 (Table 1, Fig. 1).

I estimated the density of Pipits by combining the averages from counts in 1988, and by mapping the coverage of Pipit that were followed during time budget and other observation periods. These densities were then extrapolated to the known area of the habitat type in each zone to give the estimated number of Pipits per zone.

I assessed habitat use by following 30 Pipits between April 1988 and April 1989, and scoring activity every five seconds. Birds were thus observed at Eastbourne, Makara Hill, Makara Walkway, Takarau Gorge pines, Titahi Bay, Mt Kaukau, Whiteman's Valley tops, Owhiro Bay and the Hutt River banks at Silverstream and Pomare. Observations were made during the mid morning to late afternoon (10:00 hours to 16:00 hours in winter, and 19:00 in summer, New Zealand Standard Time). Pipit behaviour was scored on beaches, gravel roads and rough pasture in all seasons. Pipit behaviour was scored on cliffs during each season except spring. Individual Pipits were followed for a maximum of 15 minutes on each visit, but generally little of this time could be spent scoring behaviour as birds flew away or hid behind objects.

Pipit habitat use was analysed by combining the activities of all birds observed in four sub-habitat groups; beach, cliff face, gravel road and rough pasture.

RESULTS

Fig. 2 shows where Pipits were recorded in the Wellington region in 1987-89. The habitats used included gravel and dirt roads and tracks, coastal cliffs, sand and gravel beaches, mixed shrubland and pasture with rock or exposed banks, pasture near shrublands with significant exposed soil, lowland tussock grasslands, young pine plantations and river margins.

Pipits were found in all sites throughout the year, but their numbers and conspicuousness differed with the weather. Cool winds from the south reduced the number found on the exposed hill tops. Numbers were also lower on shaded southern faces and beaches in winter.

Some movement occurred in the late autumn to lowland sites. Pipits were found near the Hutt River at Pomare (April to July 1989), urban Eastbourne (July 1988) and Seatoun (May to September 1988). Pipits arrived at the Heretaunga/Silverstream portion of the Hutt River Bank in the winter of 1988, and 2 pairs stayed until at least November 1988 and January 1989 respectively. The age of dispersing birds was not known.

Table 2 gives the minimum and maximum numbers of Pipits found in each of the regularly counted routes. The average number recorded per kilometre varied from 0.06 birds per km route in habitats used only in winter, to 6.22 birds per km route in areas used throughout the year.

Table 3 gives Pipits densities per square kilometre of suitable habitat. The highest densities were found in the hills west and south of Karori and Makara Beach, and along the exposed south and west coastlines. The hill areas of the south Wellington Peninsula were predominantly covered in rough open pasture, shrubland, tauhinu and tussock grasslands with a network of gravel roads and fire breaks. Gorse and broadleaf forests were only common on the margins of the Wellington suburbs, and were patchy south of Karori.

Pipit densities were higher on the north-western Wellington coastline than on the Owhiro Bay and Eastbourne/Fitzroy Bay coastlines. The preferred area was warmer in winter and had little disturbance.

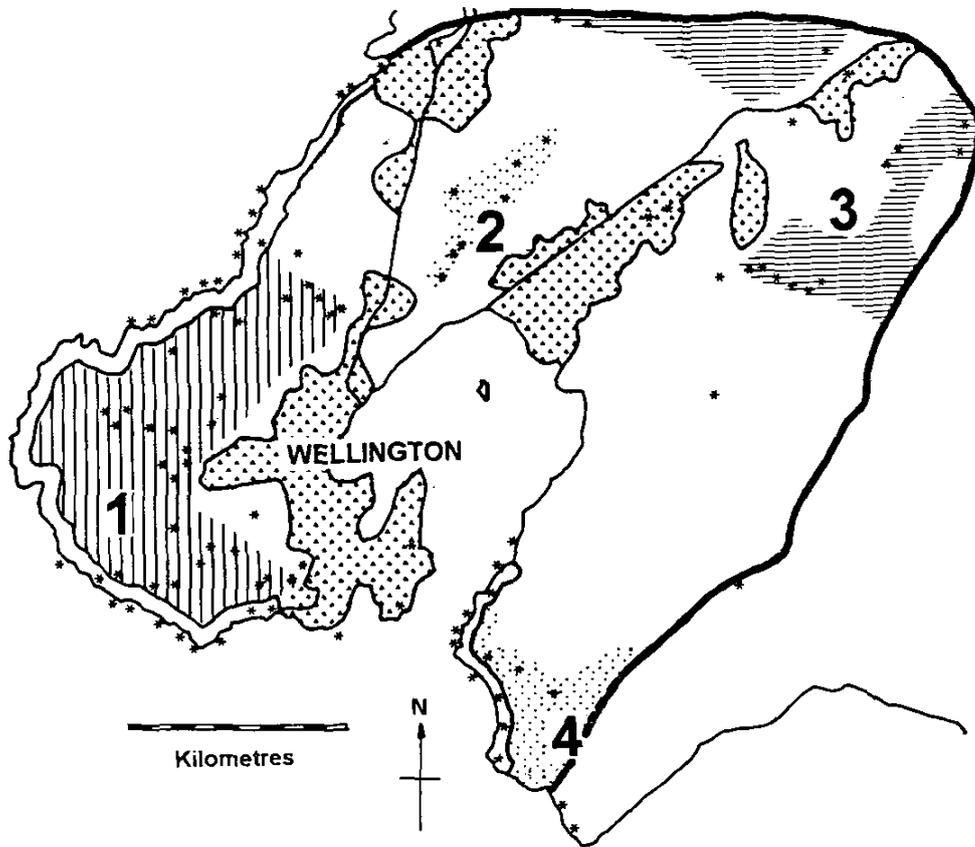


FIGURE 2 – The distribution of the New Zealand Pipit (*Anthus novaeseelandiae*) in the Wellington region. Asterisks are locations where Pipits were seen. Small triangles indicate the urban areas and the thick line is the inland boundary of the region studied. Densities were estimated for the zones with known suitable habitat (see Table 3).

TABLE 2 – The number of Pipits observed on count routes in the Wellington area, 1988 - 1989.

Count Routes	Number of Pipits observed		
	mean \pm S.D.	min. (month,year)	max. (month)
Hutt River, lower	0.06 \pm 0.17	0 (Oct'88)	2 (Apr'89)
Hutt River, upper	0.16 \pm 0.17	0 (Jan'89)	4 (Nov'88)
Mt Kaukau south	2.30 \pm 2.50	0 (Jan'89)	7 (Jan'88)
Owhiro coast	0.43 \pm 0.44	0 (Nov'88)	11 (Nov'89)
Makara coast north	1.12 \pm 0.26	4 (Apr'88)	7 (Dec'88)
Makara walkway	0.88 \pm 0.37	0 (Jan'88)	4 (Aug'89)
Makara Hill	6.22 \pm 2.85	4 (Feb'89)	14 (Oct,Nov'88)
Takarau Gorge	3.00 \pm 0.74	4 (Jan'89)	8 (Aug'88)
Eastbourne to Lake Kohangatera	0.48 \pm 0.07	2 (Oct'88)	4 (Apr,Jun'88)

TABLE 3 – Estimated total number of Pipits in suitable habitats in the Wellington Region 1989 (zones as in Fig 2).

Habitat	Average density, indiv./km ²	Estimated total no. of birds
Beach and Coastal Cliff	2.0	52
Land south of Highway 1 (Zone 1)	2.5	178
Land between Highways 1, 2 & 58 (Zone2)	1.8	20
Hutt and Whiteman's Valley (Zone 3)	1.7	60
Eastbourne and Orongorongo (Zone 4)	1.0	15

TABLE 4 – Activities undertaken by Pipit in the major habitat types.

Activity %	Habitat type			
	Beach	Coastal cliff	Gravel road	Rough pasture
Standing	18.9	8.9	15.2	17.6
Walking	26.4	28.4	43.3	49.4
Dashing	19.0	1.3	5.3	3.4
Hopping/Jumping	2.8	1.8	0.03	0.08
Feeding	26.8	38.7	9.0	20.3
Preening	1.7	14.7	9.6	4.0
Sunning	0	1.8	0	0.01
Bill cleaning	0	0.05	0.03	0.08
Dust bathing	0	0	10.5	0
Flying	3.2	3.6	6.0	4.0
Chasing	1.1	0.01	0	0
No. of Pipits observed	10	7	11	16
Observation periods	11	7	11	23
No. of 5 sec units	462	380	598	1294

In the Takarau Gorge, Pipits left the road when they heard oncoming traffic and did not return immediately. On the Owhiro coast streams of cars, bikes and people were likely to have been responsible for the lower densities of Pipits recorded there in summer. Pipits were seen in neighbouring habitats. At Upper Hutt one pair of Pipits foraged on the sealed kerb of the Upper Hutt motorway where the traffic densities were high and speeds were up to 100 km per hour.

Pipits were also found on the hilltops where there were rock outcrops with shrublands. At Makara and Mt Kaukau Pipits flew regularly to gravel roads 200 metres further down the hills.

Pipit numbers were high in the upper hills surrounding Whiteman's Valley and in the tops near Mt Climie. This area had remnant burnt stumps and logs and scattered scrubland. Pipits were seen on the gravel roads and

fire breaks behind Stokes Valley, and on the roads at Moores Valley. Pipits were not encountered on the fire breaks surrounded by continuous tall gorse and regenerating forest.

Pipits were never encountered in the bush during 5 minute counts in the Belmont Regional Park in 1989-90, despite being found near the forest margins (Beauchamp unpubl. data). Low numbers of Pipits were found in the south-eastern Wainuiomata Valley hills where there was extensive new low patchy gorse and forest regeneration.

Activities were scored for 3.79 hours throughout the year. Table 4 summarises the activities of Pipits in the four sub-habitats studied. Pipits spent a high proportion of the time foraging (walking, dashing, hop-jump, feeding and standing). The beach and rough pasture were the important foraging sites. Pipits hunted invertebrates in seaweed and vegetation using dash and hop-jump actions to catch flying insects. The roads were important for dust bathing and viewing the territory, and the cliffs and banks were important feeding and preening sites. Other preening, sunning and viewing sites were tall rock outcrops and fence posts.

Pipits generally flew only to partners, boundaries, or to distant regions of the territory. All chasing of neighbours was in flight. The lack of aggression in habitats other than beaches reflected the lack of common boundaries there.

More in depth analysis of activity information was not possible due to successive observations lacking independence, and bias in data collection. There may be seasonal changes in habitat use, but this cannot be assessed from these data. Scored activities ranged from 10 to 116 five second units in each 15 minute period (Mean \pm S.D. = 48 ± 21 on beach, 38 ± 32 on coastal cliff, 42 ± 23 on gravel road and 44 ± 28 on rough pasture). The data collected on beaches were biased towards winter (61% of observations), and the data collected on the cliff faces and gravel roads were biased towards summer (48% of observations).

DISCUSSION

The Pipit is still widespread in many regions of New Zealand, but there are few records of absolute densities. Andrew (1967) recorded 63 along 10 miles of road at Westhaven in 1967, and flocks of 12 to 14 were recorded in Clifton Hawkes Bay by V. Todd (Howell & Gaze 1987, Keeley *et al.* 1989), and on the Matukituki River by P. Child (Booth 1984). In Northland, the density is low and distribution is patchy (Beauchamp unpubl. data).

Pipits still occur in the areas of Wellington where Secker (1955) recorded them in 1951-54. Densities have decreased in Gollan's Valley, which in 1951-54 was a grassy valley with open scrubland in the side valleys, and is now predominantly tall gorse and regenerating forest. Secker (1955) recorded bonding behaviour associated with a flock of 10 Pipits in June 1951. No breeding or flocks were found in 1988. Both studies recorded dispersal into the urban area in autumn and winter, but the number of Pipits using the sub-urban area was small. Historically Pipits have used the Hutt River bed (Bull 1959). In 1988-89, only two of the 10 Pipits found there were close to housing.

During 1975-76, Pipit densities were 0.66 per km on the road between Eastbourne and Pencarrow Head, 0.02 per km at the Hutt River mouth, and 0.01 per km along the coastline beside the Wellington-Hutt motorway (Dave Dawson, pers. comm.). Pipits were not found near the Hutt River mouth and Wellington-Hutt motorway beaches during a replicated survey in 1987-88. This study found that there were 0.48 Pipits per km between Eastbourne and Pencarrow, with the majority of birds south of Inconstant Point.

Counts on the Makara walkway in May and November 1987 found Pipits at an average density of 3.00 per km. During 1988 and 1989 counts gave 0.88 per km. This difference may reflect annual variations in breeding success.

This study did not examine the large number of factors suggested as causes for Pipit decline. However some of this work can be used to examine habitat issues.

Stidolph (1971, 1974) suggested roads became unsuitable in the 1950's for use by Pipits due to increases in traffic density, speed and sealing. This study found that the reaction of Pipits to traffic density and the road surface varied considerably. Pipits were found on gravel roads with moderate traffic, and beside sealed road with high traffic densities and speeds up to 100 kilometres per hour. However, no Pipits were found on gravel roads surrounded by pure pasture in the Northern Ohario Valley, or on fire breaks or roads surrounded by dense gorse and forest. This variability suggests that road surfaces and traffic density and speeds are not the sole factor in the reduction of Pipits, but the surrounding habitat is also important.

This distribution pattern is backed up by observations in Northland (Beauchamp unpublished). Pipits were seen on the manuka margined sealed and gravel roads at Oakura, but were not seen on neighbouring gravel and sealed roads surrounded by pasture. Skylarks congregated at up to 10 per kilometer on gravel roads surrounded by pasture beside Parengarenga Harbour. Pipits were never seen there. However, just 10 kilometres further north on the shrubland-surrounded Te Hapua Road, their density reached 1.1 per km.

In Wellington, changes in farm management and forest succession are controlling the density and distribution of Pipits. Forest succession used to start with tauhinu and manuka, but since the 1940s succession has started with gorse and introduced weeds (Druce 1957). The "gorse and weed" succession pathways skip tauhinu and manuka, and thus reduce the amount of habitat for Pipits. Until recently, gorse succession was not widespread on the western and southern hills behind Wellington city but this is changing. Important habitats are being lost, and Pipits are likely to be progressively restricted to the cliffed coastal fringe.

ACKNOWLEDGEMENTS

I thank the members of the Ornithological Society of New Zealand, Wellington Branch, who undertook the Wellington Harbour counts, and Kerry Oates for records from Colonial Knob. I thank Ed Minot, Brian Gill, Ray Pierce and Gábor Lövei for comments that have improved this paper.

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Received 18 April 1994, revised & accepted 2 May 1995