Weka declines in the north and north-west of the South Island, New Zealand

A. J. BEAUCHAMP

71 Church Street, Onerahi, Whangarei, New Zealand

ABSTRACT

Population trends in the Western Weka (*Gallirallus australis australis*) in Golden Bay and the Marlborough Sounds were examined by field surveys and reference to the literature. Weka declined on the southern margin of Kenepuru Sound in 1995-96, but they were still at 0.10 and 0.06 ha^{-1} at Big Bay, Endeavour Inlet, and Long Bay near St. Omer, respectively.

Weka numbers have declined in lowland Golden Bay to less than 0.01 ha^{-1} since 1986. The reasons for this declines is unknown, but it appears that high densities of mustelids peaks and climatic extremes are times when Weka populations need close monitoring.

KEYWORDS: Western Weka, *Gallirallus australis*, distribution, decline.

INTRODUCTION

Weka (*Gallirallus australis*) populations have historically been unevenly distributed in New Zealand (Annabell 1922, Myres 1923, Hogan 1994). Weka were abundant during the late 1880s to the 1920s, when bush was being cleared for farming in the North Island. However, by the late 1920s they became restricted to Northland and inland East Cape (Myres 1923, Moncrieff 1928), and since then these populations have collapsed (Beauchamp 1997a, Beauchamp *et al.* 1998).

Weka were common in many parts of the South Island, but after the 1920s have persisted only in parts of the north and west (Pascoe 1983, Evison 1993, Anderson 1994, Brailsford 1996). Major declines occurred in Westland Valleys after mustelids arrived late last century (Harper 1896, King 1983). Further changes in distribution and numbers have occurred over the past 50 years.

Weka have disappeared from southern Westland, south of the Cook River, and from mid Westland, except the Copland Valley, since the late 1940s (Anon 1942, Stidolph 1951, Sibson 1957, Edgar 1974). They also disappeared from coastal Nelson during the late 1930s (Anon 1940, Gaze 1988).

There have been re-invasions or expansions into Kenepuru Sound of the Marlborough Sounds in the late 1960s (Edgar 1972, Beauchamp 1987b), the outer western Marlborough Sounds in the late 1980s (I. Henderson, pers. comm.), the

Maruia Valley in the mid 1940s (Anon 1946), the eastern tributaries (Branch River, Wye River, Bounds Range) of the Wairau River in the early 1970s (Edgar 1972), mid-Westland including the Brunner-Hokitika in the late 1980s (Anon 1942, Edgar 1972, Coleman *et al.* 1983, Gaze 1987, O'Donnell & West 1989, 1994), and western Arthur's Pass in the 1980s (Edgar 1976, O'Donnell & West 1990). Numbers have fluctuated in other parts of Westland (Penniket 1955, Edgar 1976, Gaze 1987) and the Gouland Downs (Williams 1960, Gaze 1986).

In other areas numbers were more stable. Weka were common in lowland Golden Bay from at least the 1920s until 1986-88 (Sibson 1959, Edgar 1972, R. Page, pers. comm., Gaze 1988, O'Donnell & West 1989) and remained widespread until 1992 (O'Donnell & West 1990, 1991, 1994). They were also common on Farewell Spit in the late 1950s (Sibson 1959, 1959a, Bell *et al.* 1961, Edgar 1962, Andrew 1967), and in rural Westland north of the Taramakau River, Inungahua and Karamea in the 1980s and 1990s (Edgar 1972, Coleman *et al.* 1983, O'Donnell & West 1990, 1992, O'Donnell 1995). However, generally Weka were at moderate to low density (<0.2 Weka ha^{-1}) and well distributed in the rest of the northern South Island (Penniket 1955, Coleman *et al.* 1983, Beauchamp 1987b).

The only population studies of Western Weka were conducted in Double Cove, Marlborough Sounds (Beauchamp 1987b) and Mt. Bryan O'Lynn, northern Westland (Coleman *et al.* 1983).

At Double Cove, density was stable over three years at 0.27 Weka ha^{-1} (Beauchamp 1987b, unpubl. data). At Mt. Bryan O'Lynn the population was male biased and declined from an estimated 0.05 to 0.02 Weka ha^{-1} (Beauchamp, unpubl. data) between 1976 and 1978 (Coleman *et al.* 1983). Coleman *et al.* (1983) considered that avian diseases and/or endoparasites were more likely causes of this decline, but did not regard stoats (*Mustela erminea*) and cats (*Felis catus*) as a problem in northern Westland or elsewhere in the South Island, because Weka established at Mt. Bryan O'Lynn in their presence during the mid 1960s.

This paper reports on changes in density and distribution of Weka in part of Kenepuru Sound, Marlborough Sounds, and in lowland Golden Bay, and assesses the need for monitoring and management.

METHODS

During 27- 29 February 1995 and 3 - 9 June 1996 I surveyed Weka near Portage, Kenepuru Sound. On the 6 June 1996 I counted Weka at Big Bay, Endeavour Inlet. On the 7 June 1996 I visited St Omer and counted at Long Bay (Fig. 1). Between 9 and 15 June 1996 I surveyed parts of the Takaka Hills, Takaka and Aorere Valleys, Kaituna Track, Whanganui Inlet, Puponga and Separation Point for Weka and litter probe marks and disturbance feeding signs and faeces (Beauchamp 1987a; Fig. 2).

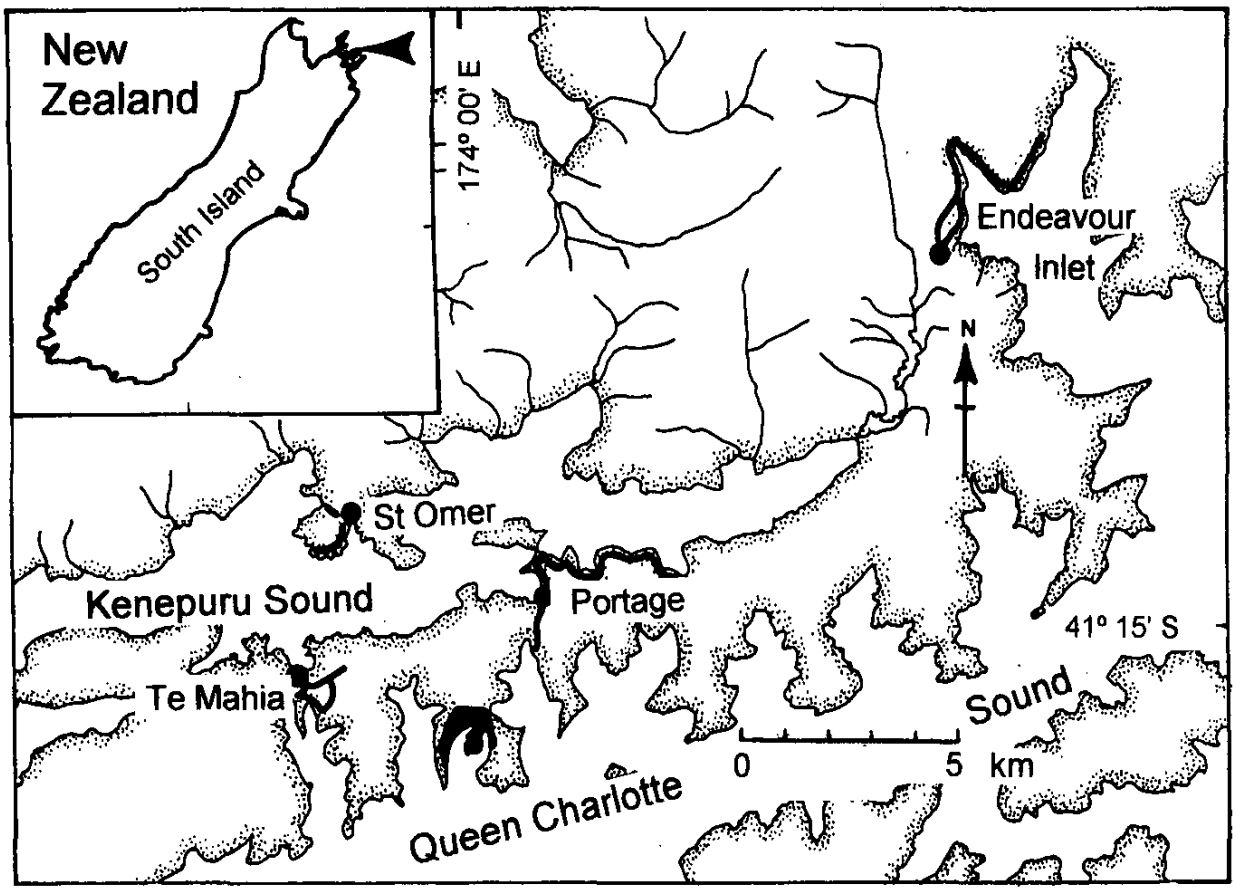

FIGURE 1 - The location of Weka count stations in the Marlborough Sounds. • = count stations, —— = walked routes. The solid area is the location of the Double Cove study area (Beauchamp 1987b).

Weka were surveyed by counting "spacing calls" for an hour from 30 minutes before sunset (Beauchamp *et al.* 1993, Beauchamp 1997a). Solitary calling Weka were sexed, by assigning high pitched and faster calls as females, and low pitched and slower calls Weka as males (Beauchamp 1987a). Weka locations were plotted onto topographic maps with a scale of 1:20,000, and the area of coverage was defined during the count so that the density could be calculated (Beauchamp 1997a).

I interviewed seven people that had lived in the regions for more than 10 years, about the past and present status of Weka. I also searched the literature to ascertain the previous changes in distribution and decline of Weka in the South Island.

I obtained monthly rainfall figures from the National Institute of Water and Atmospheric Research (NIWA) from three sites; Bainham (Collingwood Valley: 1917-1996), Takaka (Takaka Valley: 1956-1996) and Tarakohe (eastern Golden Bay coast: 1932-1988), and analysed rainfall patterns using the differences between running bimonthly sums, and the value for each period averaged between 1974 and 1988 (Beauchamp *et al.* 1998). Bimonthly totals were chosen because Weka can withstand sort term food shortages caused by changes in soil moisture by using stored fat reserves (Beauchamp 1987a). This analysis also reduced extremes of monthly variability that would hide more general trends.

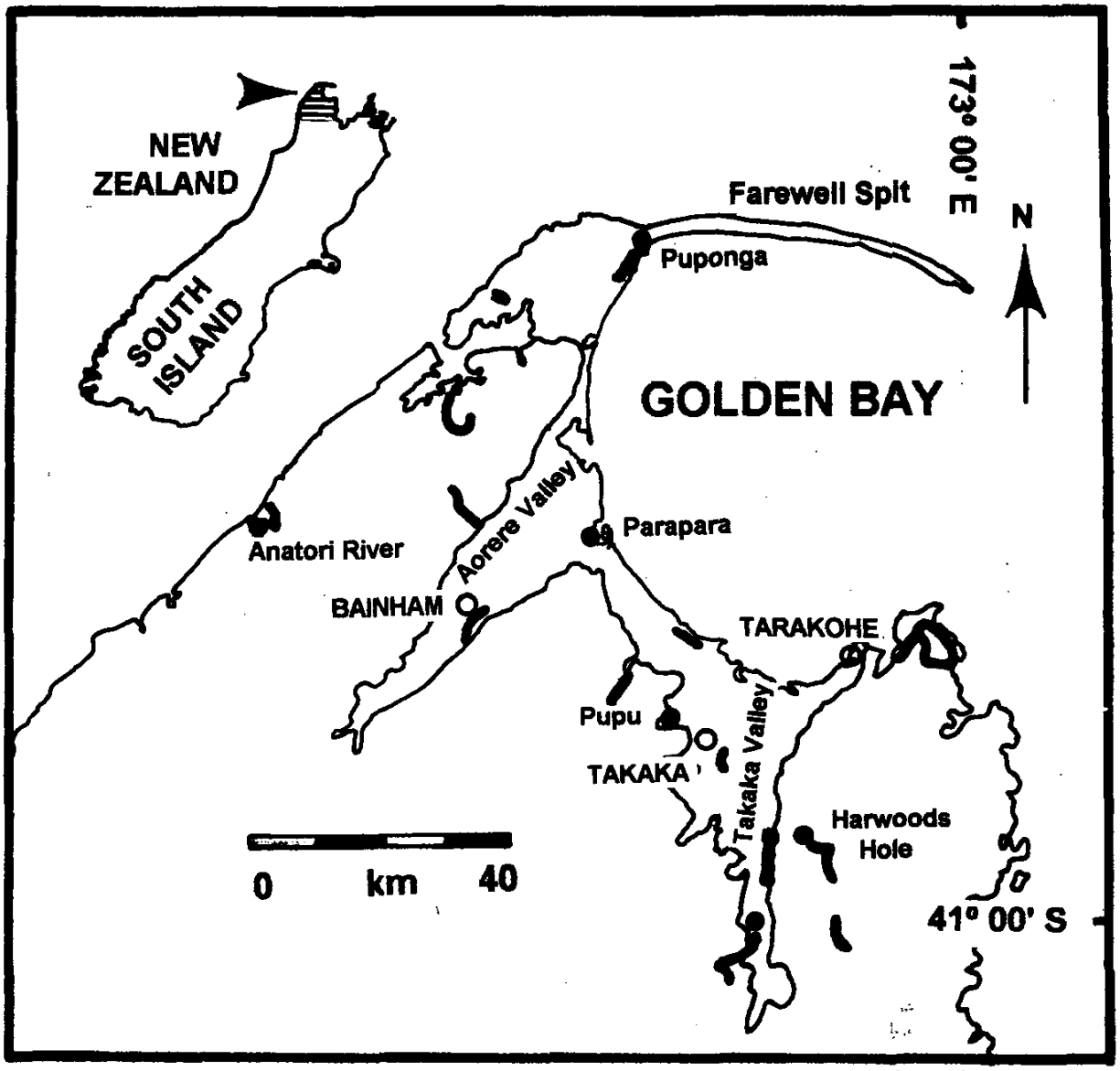

FIGURE 2 - Weka count stations, routes walked looking for Weka feeding sign and weather stations in Golden Bay. o = weather stations, • = count stations, —— = walked routes.

RESULTS

Marlborough Sounds

The density at Long Bay near St Omer in June 1996 was 0.06 Weka ha^{-1}, and that at Big Bay in Endeavour Inlet was 0.11 Weka ha^{-1} (Fig. 1). At Portage, site fixed Weka declined from 0.1 ha^{-1} in February 1995 to none in June 1996, and only one transient Weka was seen there in June 1996 (A. Freshwater, pers. comm.). In addition, Weka had declined from three pairs to one male during this time at the Te Mahia Resort (NZMS 260, P27, 914984; T. Hook, pers. comm.).

The decline in the western margin of Kenepuru Sound (Fig. 1) is likely to have occurred during November and December 1995, after increases in rodent and stoat numbers (T. Hook, pers. comm.). During this time, stoats were seen frequently on the road and one property owner killed seven in two months (T. Hook, pers. comm.).

TABLE 1 - Density of Weka in Golden Bay

Location & habitat (NZMS 260 map reference)	Date	Density ha^{-1}
Harwood's Hole. Scrub and silver beech forest. (N26 989286)	10/6/96	nil
Pupu. Farmland and kanuka and mixed forest margins. (M26 891389)	11/6/96	0.008
Parapara Inlet. Marshland, gorse, kanuka and pine margins (M25 832528)	12/6/96	nil
Anatori River. Rata and nikau forests. (M25 563555)	13/6/96	nil
Puponga. Sandhills, kanuka, lowland forest margins. (M24 876945)	14/6/96	0.01
Takaka Valley. Farmland and scrub with blackberry. (N26 944180)	15/6/96	0.003

Golden Bay

Densities were very low (Table 1), and no feeding sign was found in ideal Weka habitat in Abel Tasman National Park from Harwoods track and Canaan Road north of the Marble Arch Quarry; the track form Wainui Bay to Separation Point, Totaranui and Gibbs Hill; Takaka Valley including the Cobb Road area opposite Rheumatic Creek, the southern end of the east Takaka Road and Paynes Ford Scenic Reserve; the coast between Takaka and Collingwood including shrublands at Patons Rock and Parapara; the Aorere Valley including the gold lands and Kaituna Gorge; nikau and rata forests north of the Anatori River and beside the Kaihoka lakes; red beech forest near Whanganui Inlet; and shrublands and farmland at Puponga at the base of Farewell Spit.

Timing of decline, predators and climate

There was a substantial population of Weka on the farmland and foothills of Golden Bay until 1986-87 (R. Page, pers. comm.). The main decline occurred between 1986 and 1989 (R. Page, B. Burnett, pers. comm.) and then Weka were widespread but uncommon. In the Pupu region, Weka numbers increased until 1994, and then declined (C. Warlock, pers. comm.). In 1993-94, Weka declined in Abel Tasman National Park (I. Miller, pers. comm.). In the Kaituna region and the area south of Whanganui Inlet, Weka had been absent since at least 1984, and Weka are now absent on Farewell Spit.

Ferrets (*Mustela furo*) were only present in the mid Takaka Valley (C. Warlock, pers. comm.), but stoats and feral cats occurred throughout Golden Bay and were very numerous in 1995-96 (B. Bennett, A. Bagnall, pers. comm.). Pigs (*Sus scrofa*) were introduced to the bush margin behind Patons Rock in the 1980s and abandoned pig dogs (*Canis familiaris*) were causing problems to stock (C. Warlock, pers. comm.).

Analysis of the two monthly running sums of rainfall at three sites found no drought or rainfall event that could have triggered the decline. The main decline took place after summers that were far wetter than usual on the coast (1983-84, 1984-85 & 1985-86), and these were followed by months with very variable rainfalls.

Inland, the summer of 1987-88 was very wet, and was followed by three years of wetter than average weather and then drought.

DISCUSSION

The Western Weka is still common in northern Westland (O'Donnell 1995) and the outer Marlborough Sounds, but this survey found it was uncommon in lowland Golden Bay and parts of the inner Marlborough Sounds. Before 1986, Weka were very common in Golden Bay, but the population declined and has not recovered. This situation parallels declines of North Island Weka (*G. a. greyi*) at East Cape (Beauchamp 1997a).

Predators

This survey found Weka declined in a part of southern Kenepuru Sound, Marlborough Sounds, between February 1995 and June 1996. Anecdotal reports suggest that higher than normal stoat predation was a possible explanation.

Substantial reductions in the number of Weka and other birds occurred with the appearance of ferrets in the mid 1890s (King 1984). Weka were common on the Gouland Downs between 1916-18 but then declined to low numbers in 1918-19 after a peak in stoat numbers (Williams 1960). H. R. McKenzie recorded a substantial loss of Weka after a stoat peak in the Hollyford Valley in 1937, and attributed the lack of Weka there until 1965 to stoats (Edgar 1972) . In 1953-54, a ranger caught numerous stoats in the Clinton Valley, Milford Track, following a substantial reduction in Weka (Stidolph 1955). Weka recovered there by 1963 (Soper 1972).

Peak stoat numbers in the South Island are associated with good spring food supply for females and good summer food supplies for their young (King 1984). Also peak stoat numbers can occur after mast beech seeding years, but the exact relationship between beech seeding, mice and stoat abundance (King 1983, Wardle 1984) and declines in Weka numbers, are unknown.

Climate

The relationship between climate and declines in Weka numbers is also poorly understood. Weka are seldom killed by climatic extremes, but by micro-habitat changes (Bramley 1994), reduced food supplies (Beauchamp 1987a), increased disease and parasite susceptibility (Beauchamp 1997b) and increased vulnerability to predators (Bramley 1994). The Weka population decline in Golden Bay was not associated with drought, and so differs from recent declines in the North Island (Beauchamp 1997a, 1997b). However, some climate associated disruption to Weka breeding or survival cannot be dismissed.

P. Moncrieff noted that a few years before 1940 Weka disappeared from the

coast between Nelson and Separation Point after the Weka became "smaller" or were "replaced by smaller birds having the same characteristics as North Island Weka" (Anon 1940). Stoats and escaped pig dogs were suggested as possible reasons for this decline. However, the change in Weka size suggests to me that other factors, such as reduced food supplies or parasites, were affecting Weka (Beauchamp 1987a, 1997b).

P. Moncrieff also considered that possum trapping was an important factor in the decline of Weka behind Nelson between 1940-41 (Anon 1941). However, the summers of 1939-40 and 1940-41 were also very wet and corresponded with five years of highly negative Southern Oscillation Index values (strong El Niño)(A. McKerchar, NIWA, pers. comm.) and extreme weather events in other parts of New Zealand.

Wet periods can detrimentally alter Weka breeding and survival. Weka deserted nests during intense heavy rainfalls and thunder storms in aviaries (M. Jenkinson & J. Lamont, pers. comm.), and stopped breeding during the very wet 1989-90 summer on Kapiti Island (Beauchamp 1987a). On Kawau Island, Weka disappeared during wet periods (Beauchamp 1997b).

Until the late 1980s there was little concern about the long-term survival of Weka in the North and South Islands. The decline of North Island Weka on East Cape (Beauchamp 1997a) was recognised in 1983, but the population was initially considered to be robust, and management was almost too late. The reductions in Western Weka numbers and distribution in lowland Golden Bay were substantial, but no remedial conservation management was undertaken, probably because there are still two large populations of Weka on the South Island, in the Marlborough Sounds and North Westland. The limited data available suggests that the North Westland and Marlborough Sounds populations may be unstable in the medium term (Coleman *et al.* 1983). This suggests that more intensive research, monitoring, and management are required to understand and safeguard Weka in the South Island.

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