

SHORT NOTE

Changes in abundance of New Zealand falcon (*Falco novaeseelandiae*) in Marlborough

PETER GAZE

Department of Conservation, Private Bag 5, Nelson,
New Zealand. pgaze@doc.govt.nz

INGRID HUTZLER

P.O. Box 1022, Nelson, New Zealand

Anecdotal reports imply that the number of New Zealand falcon (*Falco novaeseelandiae*) in the open country of inland Marlborough has declined. Like many similar reports on changes in bird abundance it is difficult to validate these observations. When studying falcons 27 years ago in the Waihopai Valley, Marlborough, Fox (1977) received similar comments from landowners. At that time he obtained evidence that there were more birds present than were being observed by landowners, and he suggested that, as farmers became more sedentary and tended to move about their properties in vehicles more, a decrease in sightings was likely.

Fox, who recorded the locations of all active nest sites in his 300 km² study area during 1974-76 (Fox 1977) also undertook surveys of these sites in four years during the 1980s. These data, which he kindly made available to the authors, included details of traditional nesting sites and their occupancy. We repeated his surveys in order to detect trends in the number of breeding pairs.

Falcons return to the same nest site in consecutive years (Fox 1978) or will nest within, at most, 500m of previous nests (S. Lawrence pers. com.). Therefore, we searched for falcons in Fox's (1977) study area by visiting nesting sites he identified and adjacent suitable habitat within, at least, 500m radius. Our searches involved two people for three weeks in November 2000 and for two weeks in November 2001. At this time of year we expected falcon to be strongly territorial about their nest site and to betray their presence readily (Fox 1978). At least two hours, but often considerably longer, was spent in the near vicinity of each of these sites to determine whether it was occupied. Although searching also included much of the country between sites, the number of sites

visited in each year provides an indication of the search effort expended. Searching involved walking, watching and listening. In the third week in 2000, falcon calls were played from audio tape and amplifier to a breeding pair in 2000 and elicited an immediate aggressive response. Thereafter, and throughout both weeks in 2001, calls were broadcast at traditional sites and elsewhere, to try and prompt a response. Landowners were visited and recent reported sightings were followed up where possible.

Fox (1977) recorded 25 nesting sites within his study area; we visited 23 of these in 2000 and 17 in 2001. One active nest site was found during each year of our study. Two single birds were also sighted in each year and, in 2001, a non-breeding pair. Each sighting could be associated with one of the 23 locations. The broadcast calls were responsible for helping locate only a single bird.

Assuming each pair of falcons will nest in consecutive years at the same site or, possibly, alternate between a number of adjacent sites, we restricted our analysis to 14 locations where breeding was confirmed for one or more years between 1974 and the present. The location and history of each of these sites is presented in Table 1. Population change was determined by comparing the number of active nests identified in each season (Table 2). Only one pair of falcon bred in the study area in 2000 and 2001 whereas in previous years, two - five breeding pairs were discovered.

Determining changes in a falcon population is difficult because falcons have large territories (Fox 1978) in which they can evade detection. Furthermore, the species is probably long-lived, which would mask any failure in productivity. It has been possible to follow the Waihopai population because of historical data being available, including the location of nesting sites. The apparent reduction, from three breeding pairs to one, during the last 10 years is dependent on a consistency in search effort during the 27 year study period. This search effort can be measured by the number of nest sites checked in each year (Table 2) and apart from 1982 and 1986 this has been consistent. The reduced search effort in those two years still managed to reveal two or three breeding pairs. We did not accept previous records of a pair of birds or a pair of birds present and possibly nesting as evidence of confirmed breeding so results presented in this paper are likely to be an under-statement of the breeding pairs present prior to 2000.

Farmers in the study area were consistent in their view that fewer falcons were present than previously. This apparent decline in the

Table 1 The history of each site within Waihopai Valley where falcons are known to have bred, 1974 - 2001. Breeding is indicated by bold type. Legend: nil – no birds present; bd – single bird seen; Pr – pair seen, no nesting; Pr? – pair possibly present; PrN? – pair seen, possibly nesting; PrN – pair nesting; PrN/E/Y – pair nesting, with number of eggs(E) or young(Y) present; no data – site not inspected.

Nestsite	Grid ref	Map O29	1974	1975	1976	1982	1986	1989	1990	2000	2001
1	523 495		bd	PrN/Y3	PrN/Y2		PrN/Y4			nil	bd
2	519 469		PrN/Y4	Pr	nil	PrN/Y		PrN?	Pr	bd	
3	480 447		nil	Pr	PrN/Y2	PrN		PrN/Y2	bd	nil	nil
4	447 440		PrN	nil	nil	Pr ?	Pr ?	Pr ?	Pr ?	bd	nil
5	461 394		bd	nil	nil	Pr ?	Pr ?	Pr ?	PrN	nil	
6	534 442		Pr	nil	nil	PrN?	PrN?	PrN?	PrN	PrN/Y2	Pr+bd
7	599 442		nil	nil	PrN/Y3		nil		bd	nil	nil
8	597 394		nil	PrN/Y2	nil					nil	nil
9	620 419		nil	nil	PrN/Y2					nil	nil
10	645 456		Pr	PrN/Y3	PrN/Y2	PrY	PrY	bd?	1 bird	nil	nil
11	456 423							PrN	nil	nil	nil
12	448 389							Pr	PrN	nil	
13	479 435							PrN/Y2			
14	617 413										PrN/E3

Table 2 Number of active falcon nests in the Waihopai Valley, 1974 - 2001.

	1974	1975	1976	1982	1986	1989	1990	2000	2001
No. of nesting sites checked	10	10	10	6	6	9	9	12	10
No. of sites with active nests	2	3	5	3	2	3	3	1	1
Total no. of eggs or young recorded	4	8	11	?	4+	4?	?	2	3

falcon population was difficult to quantify or even to establish when it might have happened. There is no obvious cause for any decline but changes in pest animal numbers over this time need to be considered. For example, falcons are almost certainly susceptible to nest disturbance and predation by possums (*Trichosurus vulpecual*), stoats (*Mustela erminea*), ferrets (*Putorius p. furo*) and Australian magpies (*Gymnorhina tibicen*) but whether numbers of these pest animals have increased sufficiently to cause a decline in falcon is unknown. Rabbit (*Oryctolagus cuniculus*) numbers have reduced dramatically since the arrival of the rabbit haemorrhagic disease in 1999 and this may have changed the behaviour of rabbit predators. In a separate study, however, Lawrence (2002) has shown that this eastern form of the New Zealand falcon raises young from 92% of nests, suggesting that any decline is more likely attributable to poorer adult survival rather than to nest failure. The extent to which falcons may be susceptible to poisoning from pesticides is not well documented; a range of toxins have been used to kill possums and rabbits in the study area over the last decade.

Habitat changes within the study area over the last 20 years have included the clearing of matagouri (*Discaria toumatou*) and scrub vegetation and its replacement with pasture. Some small catchments are now entirely in pine (*Pinus radiata*) plantations and there are plans for expansion of this land use. One of the nest

sites we visited was originally in rough pasture and is now completely covered by 15-year-old pines. If the establishment of pines has an adverse effect on falcons, this may be due to less prey being available or to the changed characteristics of the site. Smaller streams may be drying out sooner these days, due in part to the expansion of exotic forestry. There is some evidence that the availability of water influences where and when falcon nest (J. Leiendecker pers.comm.).

We conclude that the number of falcons in the Waihopai Valley has declined over the last 10 years. This decline may also have occurred more widely in Marlborough; wildlife managers now need to determine this, and its cause, so that any mitigating measures may be enacted.

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