

ABUNDANCE OF YELLOWHEADS IN THE HAWDON RIVER VALLEY, ARTHUR'S PASS NATIONAL PARK, IN 1983 AND 1984

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ABSTRACT

Yellowheads (*Mohoua ochrocephala*) have disappeared from many parts of the South Island. The northernmost self-sustaining populations now occur in Arthur's Pass National Park, where we surveyed Yellowheads in the Hawdon River Valley during their breeding in 1983 and 1984. Survey techniques were developed for assessing Yellowhead numbers at low densities. In 1983, 11 breeding pairs were found in 500 ha of forest, and in 1984, 21 breeding pairs were found in 2900 ha. About 70% of the birds occurred as breeding pairs, and the rest were itinerant non-breeders and helpers at nests. Yellowheads were spread throughout the valley but were more common at low altitudes. Breeding pairs preferred red beech (*Nothofagus fusca*) forests. There is some evidence that the nationwide decline of the species is continuing in the Hawdon River Valley.

INTRODUCTION

Yellowheads (*Mohoua ochrocephala* Gmelin 1789) were once widespread in most forests of the South Island and Stewart Island. However, they disappeared from some forests before the turn of the century and by the 1920s had all but disappeared from Marlborough, much of the Nelson district, the podocarp forests of Westland and all of Stewart Island (Gaze 1985). In the remaining parts of Westland the decline has continued through the 1960s and Yellowheads are now absent from almost all Westland forests (O'Donnell & Dilks 1986). There is now concern over the conservation status of the species, and the New Zealand Wildlife Service considers it threatened (B. D. Bell, pers. comm.). Today the species remains in Fiordland and Mount Aspiring National Parks and parts of Otago and Southland. The northernmost sustained population apparently occurs in Arthur's Pass National Park (Gaze 1985).

There are indications that, until recently, Yellowheads were more widespread in Arthur's Pass National Park than they are now. As far as we are aware, sightings west of the main divide in the late 1960s and early 1970s (C. Burrows, pers. comm.) and around Arthur's Pass township in the mid-1970s (OSNZ Bird Mapping Scheme) have not been repeated. Yellowheads are now widespread in only five valleys in the park – the Poulter and Hawdon Rivers and the East Hawdon, Andrews and Sudden Streams. Sightings elsewhere are now rare and are usually of single birds, for example, Binser Saddle in 1983 (A. Wilson, pers. comm.) and Mt O'Malley in 1984 (New Zealand Forest Service, pers. comm.).

In 1983 we began a study of the number and distribution of Yellowheads in the Hawdon River Valley to provide a baseline for measuring future population trends in the area and also for comparison with Yellowhead numbers elsewhere.

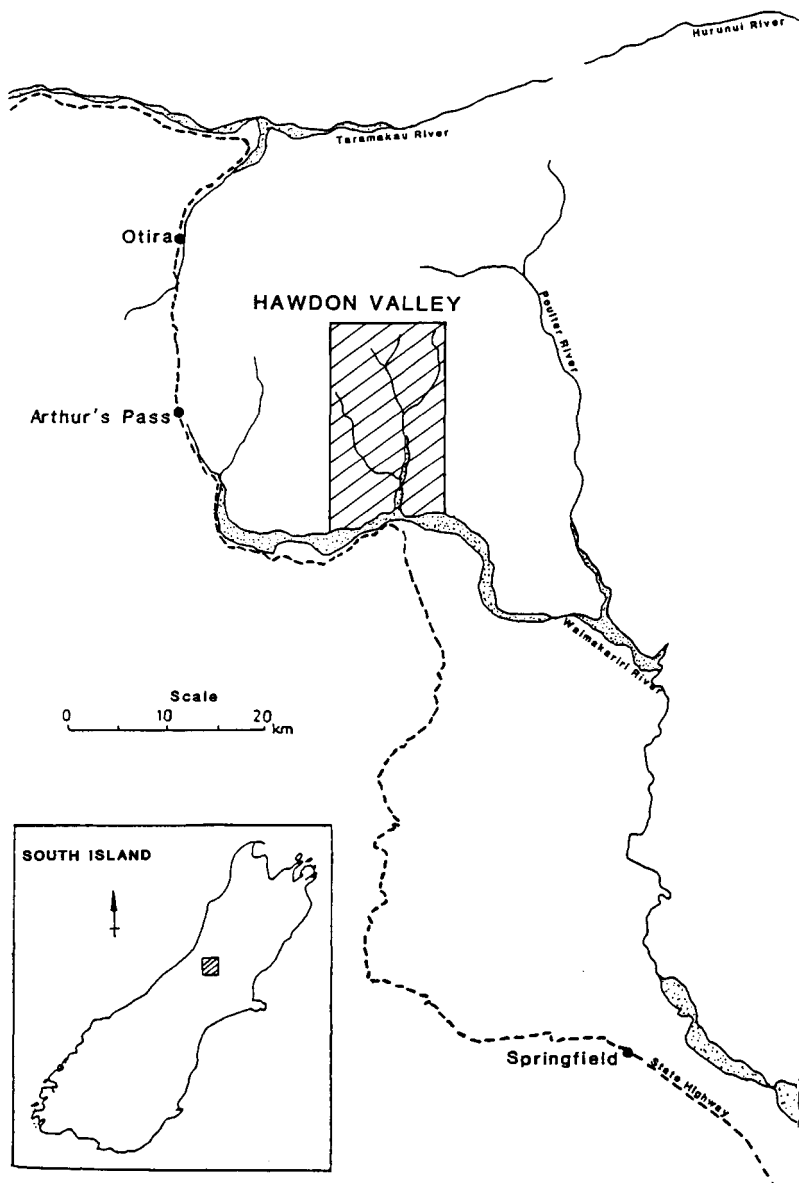


FIGURE 1 — Location of Hawdon Valley

STUDY AREA

The Hawdon River (42°58' S, 171°45' E) is a tributary of the Waimakariri River, which flows eastwards from the main divide (Figure 1). The Hawdon River Valley is of glacial origin, with steep slopes and fluvio-glacial terraces along the valley floor. The river drains from peaks 1800 m a.s.l. and is steep and gorged in its upper reaches. Below the junction with the East Hawdon Stream it becomes braided and meanders across a wide flood plain to its confluence with the Waimakariri at 600 m a.s.l. (Figure 2).

The slopes and lower terraces are covered by montane beech (*Nothofagus*) forest, which rises to a sharp timberline at 1200-1300 m a.s.l. Mountain beech (*Nothofagus solandri* var. *cliffortioides*) is the dominant tree species, but there are stands of red beech (*N. fusca*) at the toe of the slopes to about 750 m a.s.l. and small stands of silver beech (*N. menziesii*) north of the confluence with the East Hawdon Stream. A more detailed description of the history, landforms, vegetation and fauna of the area is given by Read (1984).

METHODS

Two surveys of Yellowhead distribution were undertaken: (i) late November and early December 1983 (12 person-days) and (ii) late November 1984 (20 person-days). As the Yellowheads are breeding, this is the ideal time for distribution surveys because the birds are most conspicuous (Read 1984) and stay in the area around their nests (Read 1987). In 1983 about 500 ha of forest were surveyed up to 1000 m a.s.l. (Figure 2). The survey was extended in 1984 to cover about 2900 ha of forest up to the bushline over the whole valley and the East Hawdon Stream (Figure 3).

In 1983 Yellowhead distribution was mapped by teams of observers following traverses 300-400 m apart along the contours of the hills. The Yellowheads were very vocal and calls could be heard over 200 m away in good conditions. Tape recordings of Yellowheads from Eglinton Valley, Fiordland National Park, were played in an attempt to elicit a vocal response from the birds. The tape was played for 1-2 minutes every 200 m, followed by 1-2 minutes of silence and a repeat playing. If nothing was heard the observer moved on another 200 m with frequent listening pauses. If a Yellowhead was heard, the tape was immediately stopped, the bird(s) located and followed, and the number and sex of the birds, the altitude and a vegetation description were recorded. To distinguish breeding Yellowheads near a nest from itinerant non-breeders (Read 1987), we assumed that a female together with a male in bright yellow plumage represented a breeding pair. All transects were repeated, and birds encountered twice at the same location were also taken to indicate a home range and a breeding pair.

Based on the experience of the 1983 survey, two methods were applied in 1984. Using similar traverses, but without playing tape recordings, one team searched the area surveyed in 1983. At least two visits were made to each area where Yellowheads were located in 1984 to see whether the birds were a breeding pair. The second method was the intensive bird distribution mapping developed by O'Donnell & Dilks (1986). Observers walked through

each 1000-yard grid square (NZMS 1 S59 Otira) in the study area, and all Yellowheads seen and heard were counted and their positions and a vegetation description recorded. Transects traversed each grid square along the most practical route, for example, up ridges and across terraces. The observers walked slowly along each transect, pausing to record birds for 2-3 minutes about every 100 m. On average, 52 minutes (SD 23; range 16-100) were spent in each 1000-yard square. A female together with a male was regarded as a breeding pair. A second visit was not made to localities where Yellowheads were found by the mapping method.

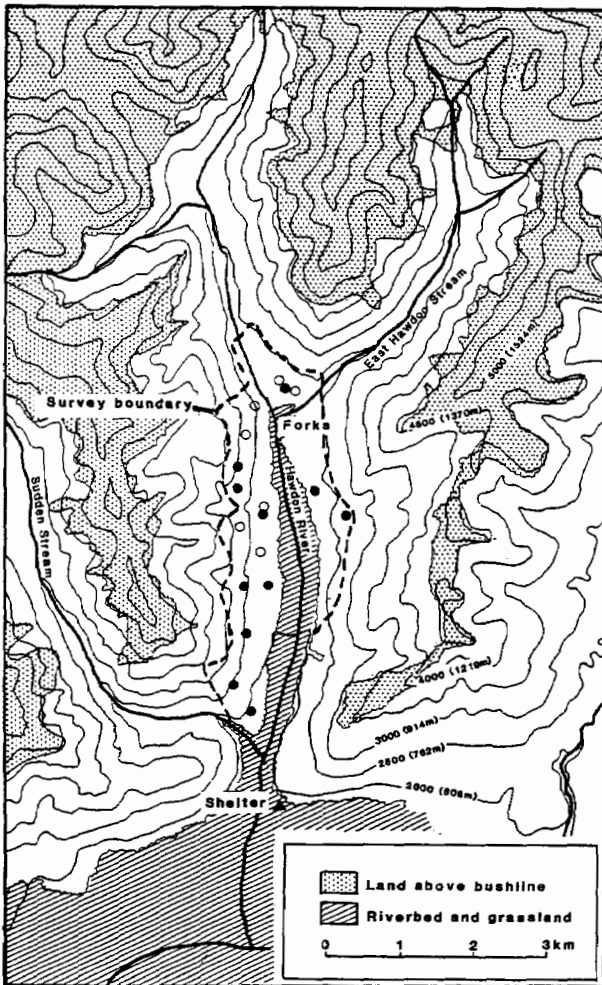


FIGURE 2 — Yellowhead distribution in the Hawdon Valley, November 1983 (● pair, ○ single bird)

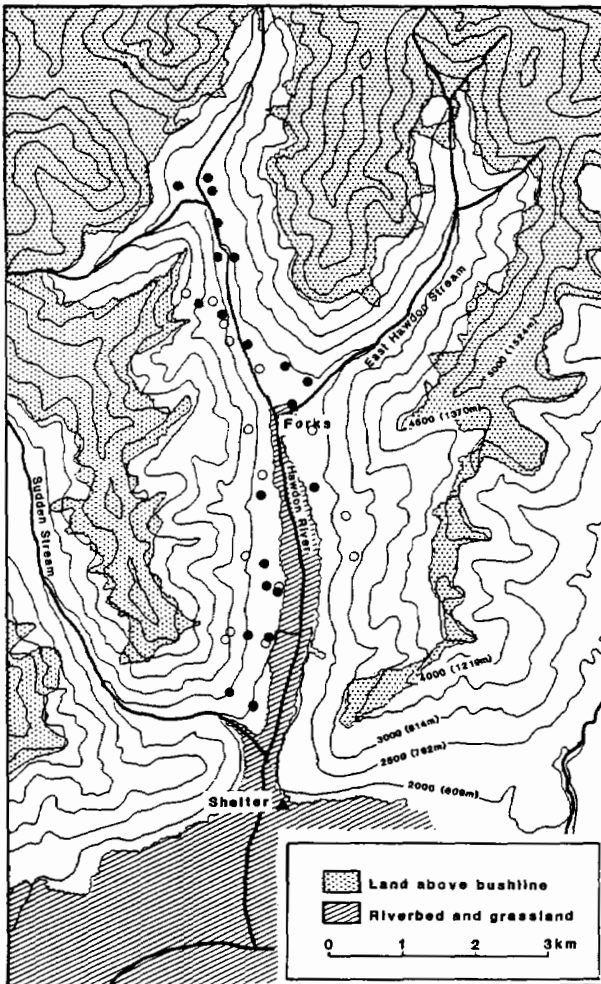


FIGURE 3 — Yellowhead distribution in the Hawdon Valley, November 1984 (● pair, ○ single bird). Survey boundary = bushline

RESULTS

Totals of 31 and 35 Yellowheads were found in the lower section of the valley in 1983 and 1984 respectively (Table 1; Figures 2 and 3). About 70% of the birds occurred as breeding pairs, and the rest were itinerant non-breeders or helpers associated with the pairs. A flock of 4-6 birds seen on 23 November 1983 was the latest a flock was seen in either year. The density of breeding pairs found in the lower section of the valley was one pair per 45.5 ha in

1983 and one pair per 41.7 ha in 1984. In 1984, 59 were found in the whole valley (Table 1, Figure 3). The approximate average distance between breeding pairs was 650 m, the closest being 300 m apart. Read (1987) found that adults ranged up to 150 m from the nest during breeding. He did not see any adjacent pairs interact, and so the home ranges of these pairs were probably not contiguous.

Yellowheads were concentrated at lower altitudes in the valley, on terraces and the toes of slopes (Table 2, Figures 2 and 3). The highest breeding pairs were at about 900 m a.s.l., but most were at between 600 and 800 m a.s.l. Single birds were found up to 1200 m a.s.l. Breeding pairs were most often found in forests with predominantly red beech canopies (Table 3). Itinerant non-breeders were distributed more evenly between red and mountain beech forests.

During the 1983 survey, 60% of the Yellowheads were detected by their response to the tapes. The proportion of itinerant non-breeders and pairs responding to the recordings was the same. We cannot tell, however, whether the use of tapes increased the chances of finding Yellowheads.

DISCUSSION

Our estimates of the number of Yellowheads in the valley are not likely to be exact because itinerant non-breeders, which are not individually recognisable, could have been missed or counted twice. To be valid, comparisons of our results with those from other areas or with future surveys in the Hawdon Valley should be based only on breeding pairs. Breeding pairs may, however, be harder to count when they are at much greater densities and their home ranges are close together.

Our survey results probably give a reliable estimate of the density of breeding pairs, and not just a relative index. There was no evidence that we had missed any breeding pairs after the first transect through or near their home ranges: at no stage was a breeding bird detected after we had moved through a home range, nor were additional pairs found after the first survey of an area. Furthermore, the pairs were so far apart that we were not likely to underestimate the number of home ranges, which can occur when home ranges are contiguous, making individual pairs hard to distinguish (Dawson 1981).

The density of Yellowheads in the Hawdon Valley is very low for a forest passerine. Although directly comparable data are lacking, several sources suggest that Yellowhead numbers can be much greater. In his three Fiordland study areas which contained Yellowheads, Kikkawa (1966) found an average density of one pair per 3.7 ha, a density 12 times greater than that found in the Hawdon Valley. In the 1983 breeding season in the Caples Valley, Wakatipu State Forest, breeding pairs could be heard from adjacent nest sites (G. Elliott, pers. comm.). In the Eglinton Valley, Fiordland National Park, during breeding in 1984, G. Elliott (pers. comm.) recorded one family group per 2.85 ha. Buckingham (New Zealand Forest Service, Unpubl. Report, Invercargill, 1982) found that in the Catlins State Forest during

TABLE 1 — Yellowheads seen in the Hawdon Valley during the 1983 and 1984 surveys

	Forks to Shelter 1983		Forks to Shelter 1984		Whole Valley 1984	
	No. birds	%	No. birds	%	No. birds	%
Pairs	22	71.0	24	68.6	42*	71.2
Birds associated with pairs	3	9.7	2	5.7	2	3.4
Itinerant non-breeders	6	19.4	9	25.7	15	25.4
Total	31		35		59	

TABLE 2 — Altitude of Yellowheads seen in the Hawdon River Valley during the 1983 and 1984 surveys

	Altitude (m a.s.l.)				
	600-700	701-800	801-900	901-1000	>1000
1983					
Breeding pairs n=11	5	5	1	0	-
Itinerant non-breeders n=6	1	3	2	0	-
1984					
Breeding pairs n=21	6	9	5	1	0
Itinerant non-breeders n=15	2	5	4	1	3

TABLE 3 — Dominant canopy species of forest in which Yellowheads were seen in the Hawdon River Valley during the 1983 and 1984 surveys

	Dominant Canopy Species			
	Red Beech	Mountain Beech	Mixed Red and Mountain Beech	Silver Beech
1983				
Breeding pairs n=11	7	2	2	-
Itinerant non-breeders n=6	3	3	0	-
1984				
Breeding pairs n=21	12	7	1	1
Itinerant non-breeders n=15	4	7	4	0

1981-82 Yellowheads were not evenly distributed through the forest, but were concentrated in beech forest gullies. In these areas pairs were 50-200 m apart, much closer than any of the Hawdon Valley pairs. Guthrie-Smith (1936) believed that Yellowhead pairs in what is now Abel Tasman National Park occupied a range of 8-10 acres (3.2-4.0 ha). By following birds in the Hawdon Valley in 1983, AR estimated that a nesting pair ranged over a maximum area of 7 ha (Read 1987). Thus, a large area between pairs was apparently unused by Yellowheads until their young were fledged and their nests abandoned.

Read (in prep.) sampled the vegetation of an area in the Hawdon River Valley similar to that surveyed here (but with different boundaries) to determine the composition of the forests. Using these figures as an approximate indication of forest availability, and relating them to Yellowhead distribution and abundance, it seems that Yellowhead pairs preferred forests with canopies dominated by red beech: 59-64% of pairs were found in such forests, whereas red beech dominated only 18% of the forested area. Mountain beech dominated 73% of the forested area, and mixed red and mountain beech canopies dominated the rest. Red beech forests are believed to occupy more fertile sites with a more equable climate. The trees are taller, on average older, with larger stem diameters and greater canopy spreads than mountain beech trees at the same altitude (Burrows 1977). As a result, arboreal invertebrates may be more numerous in red beech forests. If so, this may be why we found more Yellowheads (which are almost entirely insectivorous) in these forests. A more detailed habitat-use analysis demonstrated similar preferences in the Hawdon Valley after the breeding season (Read, in prep.).

The low number of Yellowheads in the Hawdon Valley, compared with that found in other areas, suggests that the national decline could be continuing in Arthur's Pass National Park, particularly given that their range is contracting to the north, west and east of the park (Gaze 1985, O'Donnell & Dilks 1986). However, the distribution of pairs and the number of Yellowheads in the lower section of the valley were similar in 1983 and 1984 (Figures 2 and 3). Two additional pairs were present on the terraces at the East Hawdon Stream junction in 1984, but two pairs were not found on the adjacent western valley slopes. The location of itinerant birds was different, but these are likely to be more mobile than pairs. So, at least between 1983 and 1984, there was no local decline. Nevertheless, because large areas of forest in the Hawdon River Valley were unoccupied by breeding pairs, there were apparently fewer Yellowheads than the forests could support, even though the carrying capacity does not seem low for birds overall (see bird counts by Read 1984). Only by monitoring the birds over the next few years can we tell whether the low number of Yellowheads in the Hawdon River Valley is part of a continuing decline of the species nationally.

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SHORT NOTE

Cattle Egrets in Fiordland National Park 1973 - 1987

Various observers have seen Cattle Egrets (*Bubulcus ibis coromandus*) in Fiordland National Park, some near landfalls. These Cattle Egret records supplement those published by Heather (1978, 1982, 1986). I am very grateful to the following for their information: I. G. Adam, K. F. Bradley, N. M. Drysdale, W. Ellis, M. A. Gunn, R. D. Kerr, J. Landreth, J. S. Ombler, B. W. Paddon, R. J. Peacock, A. J. Pearce, B. Roderick, G. A. T. Taylor, B. W. Thomas, I. D. Thorne, J. G. Trotter, K. Wells, A. Wright.

1973: Preservation Inlet, Puysegur Point lighthouse farm, P. Daniels, lighthouse keeper, saw 1 feeding near cows during the last week of April and the first week of May (Wright, A., 1973. Preservation Inlet: July 1973. Unpubl. report. NZ Wildlife Service; Heather 1982 : 254).

1974 - 1976: No records.

1977: Lower Hollyford Valley, Hollyford Camp, 2 feeding with horses in May (WE, MAG).

1978: No records.

1979: Lower Hollyford Valley, Hollyford Camp, 13 stayed a few days in May (MAG).

1980: Preservation Inlet, Puysegur Point lighthouse farm, 1 sheltered under a cow when attacked by a New Zealand Falcon (*Falco novaeseelandiae*) on 16/4 (RJP; Heather 1982 : 254). Lake Te Anau, near Te Anau Wildlife Centre, seen in lake shallows adjacent to shore roost : 3 on 28/4, 3 on 29/4, 13 on 1/5, 7 on 6/5, 2 on 8/5, 7 on 9/5, 7 on 11/5, 7 on 15/5, 1 on 19/5, 1 on 24/5 (pers. obs.).

1981 - 1982: No records.

1983: Eglinton Valley, Lake Lochie, 1 near shore on 5/5 (JGT).