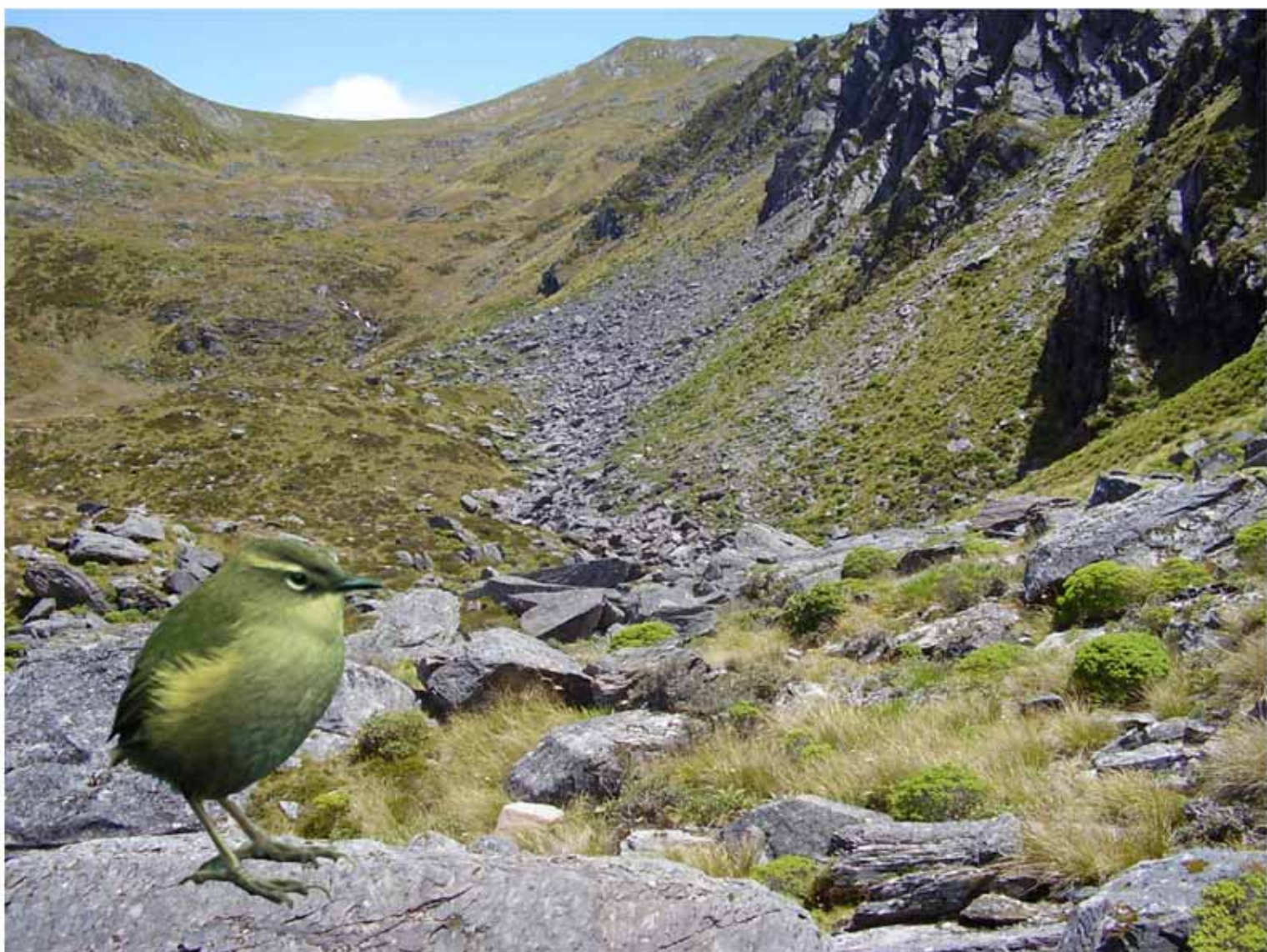




A Five Year Study of Rock Wren in Henderson Basin, Kahurangi National Park

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Te Papa Atawhai

A Five Year Study of Rock Wren in Henderson Basin, Kahurangi National Park

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CONTENTS

ABSTRACT	4
1. STUDY AREA	5
2. BACKGROUND	7
2.1 Rock Wren	7
2.2 Previous Work at Henderson Basin	7
2.3 Project Initiation	8
2.4 Project Objectives	8
3. METHODS	9
3.1 Trapping	9
3.2 Banding of Birds	10
3.3 Rock Wren Sightings/Annual Census	10
3.4 Nests	10
4. RESULTS	11
4.1 Trapping	11
4.2 Banding	11
4.3 Re-sighting of Banded Birds	13
4.4 Annual Census of Birds and Nests	15
4.5 Other Observations	16
4.6 Other Birds in Henderson Basin	16
4.7 Mammals in Henderson Basin	17
4.8 Other Species	17
5. DISCUSSION	18
5.1 Trapping and Predation	18
5.2 Finding Rock Wren	18
5.3 Rock Wren Distribution	19
5.4 Population Trends	19
5.5 Nesting	20
5.6 Competition	20
6. CONCLUSIONS	21
7. REFERENCES	22
8. ACKNOWLEDGEMENTS	23
LIST OF TABLES	
Table 1: Annual Effort in Henderson Basin	9
Table 2: Trapping Effort and Catch for Each Season	11
Table 3: Banding Data	12
Table 4: The Sight Recovery of Colour-Banded Birds	13
Table 5: The Annual Census of Rock Wren and Nests in Henderson Basin	16

Abstract

This study of rock wren in Henderson Basin, Kahurangi National Park continues on from earlier work in the late 1980s. Predator trapping, banding and observation of the rock wren population began in 2000. It was difficult to obtain consistent counts of rock wren, nevertheless, the population appears to have varied from a high of 29 in 1986 to a low of 10 in 2004-05 with a spectacular recovery to 23 in 2005-06. The resighting of banded rock wren has revealed a female at least 6 years old. Only one banded bird has been re-sighted beyond the area of contiguous favourable habitat in which it was banded.

1. Study Area

Henderson Basin is a sub-alpine area on the south face of Mt Cobb in the Roaring Lion catchment of Kahurangi National Park, north-west Nelson. North-west Nelson is the northern limit of rock wren distribution. The Department of Conservation database of rock wren sightings indicates that there are small, scattered and probably isolated populations through out north-west Nelson.

The study area is described by Williams (1982):

“Lake Henderson (1196 m) (NZMS260 M26 688145) lies on the north-western flank of the Peel Range and drains into the Roaring Lion catchment, which in turn is part of the Karamea catchment. The climate of the study area is humid, cool, and cloudy, with westerly winds bringing most of the precipitation, which probably totals about 4500 mm p.a. (New Zealand Meteorological Service 1973). Snow may fall in any month, as indeed it did during January 1991 field work for this study, but it lies for long periods only during winter.

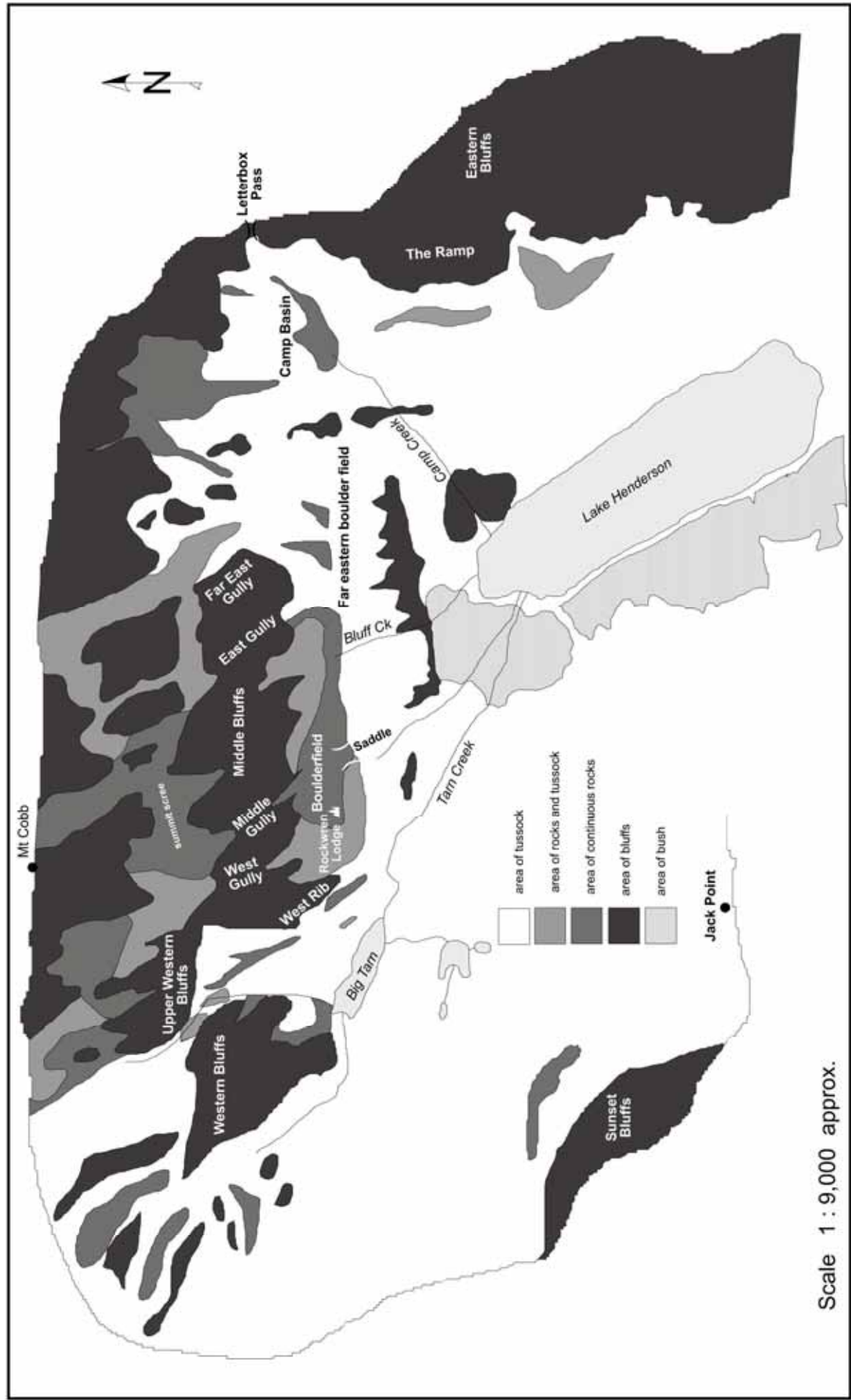
The rocks of the study area are within the Western Sedimentary Belt, of lower Ordovician age. They are uniformly of the Roaring Lion Formation, which is a thick, graded, non calcareous, grey quartz-mica greywacke sandstone. These rocks are relatively infertile and in combination with cool moist climate, produce soil of very low fertility.

The study area comprises a single large cirque basin above Lake Henderson (Fig. 1). The ridge on the northern side has a mean height of c. 1650 m with Mt Cobb (1716 m) being the highest point. The ridge height drops gradually round the western end of the basin and reaches its lowest level of c. 1300 m on the south side of Lake Henderson. The basin floor drops in a series of steps from c. 1400 m at the western end to 1196 m at Lake Henderson. Glacial features of the basin include over-steepened slopes, ice shaved surfaces, benches, cirque lips, and small cirque lakes. These combine with post-glacial fluvial and colluvial processes to produce landforms of highly variable slope, surface features, depth of regolith, and stability.”

The vegetation of the basin is mainly herbfield, tussockland, and scrub, with small areas of forest below 1300 m, and large areas of unvegetated rock above 1450 m.

Principal features are shown and named in Fig. 1. Where possible, the names given by Ballance (1989) were used. The study area is approximately 200 hectares.

Fig 1 Rockwren Project Henderson Basin



Scale 1 : 9,000 approx.

2. Background

2.1 ROCK WREN

The rock wren belongs to the Acanthisittidae, the New Zealand Wrens, an ancient and taxonomically very significant family once comprising at least seven species in five different genera. The rock wren, *Xenicus gilviventris* is a diminutive, ground-feeding passerine found only in mountainous regions along or close to the Southern Alps of the South Island of New Zealand. Remaining throughout its life above bush-line, the rock wren is New Zealand's only true alpine bird species. It occupies a specialised niche in an environment typified by harsh climatic conditions and rugged terrain. Work on rifleman, the only other remaining New Zealand Wren, has been limited to a dozen or so authors and all is descriptive of their biology and behaviour with no investigation of trends in abundance or distribution having been completed. Published work on rock wren is even more limited (Michelsen-Heath and Gaze in prep).

In the last five years there has been a study into changes in distribution (Michelsen-Heath and Gaze in prep), an attempt to establish a new population on Anchor Island, Fiordland (Willans and Weston, 2005) and a study into changes in abundance in the Murchison Mountains, Fiordland (Weston pers.comm).

2.2 PREVIOUS WORK AT HENDERSON BASIN

Rock wren were studied in Henderson Basin for eight days in December 1989 (Ballance 1989). The study included census, banding and predator survey. It was estimated there could be as many as 29 birds of which 5 were recently fledged juveniles. Five birds were banded; no stoats were trapped in 140 trap-nights but four mice were caught at a rate of 1.16 per 100 trap-nights. A review of the maps of the sightings suggest an overestimate of the number of rock wren, but there would have been a minimum of nine pairs plus a number of odd birds at that time. Unfortunately this project was discontinued and the data give no indication as to what was happening to the rock wren population. As part of what was meant to be a long-term study the vegetation was mapped in January 1991 (Williams. 1992).

That study provided the incentive for this study and a base line for long term monitoring of the rock wren population in Henderson Basin.

The Department of Conservation has maintained a database of rock wren sightings by staff and other visitors to alpine areas in north west Nelson.

2.3 PROJECT INITIATION

Following the 1989 census, Chris Petyt made day visits to the basin in March 1996 and March 1998 seeing only one family party on each occasion. In 1999 he spent 16th and 17th February covering the basin as thoroughly as he could by himself. He found at least three pairs, each with one or two young, a single female at the Western Bluffs, and a single male seen at East Gully. Allowing for these single birds to have had partners (as Ballance did when she estimated the total population), this would have given a population of 16 birds. This represented an appreciable drop over 10 years. However, there was no clear indication as to whether the population was in decline or whether it was undergoing short term fluctuations.

Predation was considered to be the most likely single greatest cause in the decline of the population and this project was proposed to assist the population by reducing predation pressure. It is acknowledged that there is no indication as to the effect of competition (say from hedge sparrows) or losses from adverse climatic conditions. Michelsen-Heath (1989) had already shown that rock wren nests were preyed on by both mice and stoats and it was therefore considered that stoat control may benefit the population at Henderson Basin.

This work began in 2000. It was operated by two Golden Bay families (Milne/Garrett & Stocker/Garrett) and Chris Petyt with support from D.O.C. and O.S.N.Z. and other individuals.

2.4 PROJECT OBJECTIVES

At the outset of the project it was intended to:

1. enhance the rock wren population by reducing stoat predation by trapping stoats;
2. monitor trends in the rock wren population by walk-through counts (*c.f.* Ballance 1989).

Frustration with variable walk-through counts led to a rethink of the population monitoring and the second objective was modified to include nest counting as a method of monitoring the population.

3. Methods

Work in the basin was influenced by access (entailing a 10 hour return trip on foot which, during times of heavy snow or extreme weather, is impractical) and weather which can prevent work in the basin for extended periods at any time of the year. There were a number of visits that had to be aborted in the Cobb Valley when weather or snow prevented crossing Peel Range to Henderson Basin. Sometimes the basin was gained but the weather prevented work. The length of visits varied from day visits to extended stays of up to 5 weeks. The annual variation in this effort is shown in Table 1.

Initially, visits were scheduled to set traps before the nesting season,(early November)and to maintain the traps at fortnightly intervals until they were closed down before the winter snows (April). However, weather and personal commitments played affected the interval between visits. Also, as more was learnt about the stoats and rock wren the timing of the visits was changed

During the visits the traps (usually all traps) were serviced, and various parts of the basin visited to check for rock wren, which were banded whenever possible.

TABLE 1. ANNUAL EFFORT IN HENDERSON BASIN

SEASON	PERSON-DAYS IN BASIN
2000-2001	83
2001-2002	48
2002-2003	55
2003-2004	17
2004-2005	34
2005-2006	101

3.1 TRAPPING

In the first season 14 wooden tunnels with single Mk IV Fenn traps were used. These were distributed around the lake, tarns, creeks and lower margins of boulder fields. In the second season these were replaced by galvanised steel tunnel traps. By the 2005-2006 season, these 14 steel tunnel traps had been augmented with 3 additional traps. As the project advanced, the traps were slowly moved from the lake margins into the boulder fields until the 2003-2004 season when there were no traps left below the bushline. Bait used included hen eggs, sardine, canned tuna, freeze dried rat and salted hare. Records of baiting were not adequate to compare the

effectiveness of different baits but the impression gained is that salted hare and hens eggs were more effective.

3.2 BANDING OF BIRDS

Banding was top priority whenever conditions permitted. All birds were caught in a mist net. Most birds had to be shepherded into the net but at one location the net was set up across a route the rock wren were using while going to and from a nest and one bird was caught without shepherding. All birds were banded with one metal and two colour bands (except for five below the Western Bluffs on 29/12/2005 when metal bands were not available. With time, the blue and green bands became hard to distinguish. The metal, white and yellow bands also became hard to distinguish from a distance in adverse conditions. Recent band combinations were organised to avoid ambiguity. No rock wren died during banding but one lost a rear claw. Rock wren were weighed as part of the banding process.

3.3 ROCK WREN SIGHTINGS/ANNUAL CENSUS

Apart from trap maintenance and efforts to band birds a widespread search or 'walk through' occurred whenever time permitted. All sightings were mapped. When rock wren were definitely heard but not seen they were recorded as present too.

3.4 NESTS

An effort was made to locate nests during the regular visits but in 2005 a continuous presence was maintained from 23 November to 23 December in order to locate all nests and to determine the nesting success. Nests were located by watching birds and noting returns to the same place. This was straight forward, and as far as it could be determined, reasonably successful.

4. Trapping

4.1 TRAPPING

The trapping effort and catch is presented in Table 2. The only catch apart from stoats was a rat in a bushline trap and a weasel in early winter in a high boulder field – these are not tabulated.

TABLE 2. TRAPPING EFFORT AND CATCH FOR EACH SEASON

SEASON	TRAPPING SEASON (NIGHTS)	NUMBER OF TRAPS	TRAP CHECKS	BAIT CHANGES	CATCH
2000-2001	139	14	7	5	6
2001-2002	182	14	7	7	4
2002-2003	140	14	4	4	1
2003-2004	134	14	3	3	1
2004-2005	166	14	4	4	2
2005-2006	331*	17	7	5	7*
*includes the 2005 winter					

4.2 BANDING

The banding is an essential part of the project – without the banding there would be no data on age, movement of rock wren or weights. The banding details for each bird is given in Table 3.

TABLE 3. BANDING DATA

DATE	METAL BAND		COLOUR BANDS		SEX	AGE	WEIGHT	LOCATION	BANDERS
	NUMBER	LEG	LEFT	RIGHT					
2/11/2000	61611	R	W	M/R	F	Ad	23.5	Middle gully	RS & CP
7/12/2000	61612	R	Y	M/B	M	Ad	15.5	Western Bluffs	RS, DS & CP
10/01/2001	61613	R	R	M/Y	M	Ad	17	Middle Gully	AM, RS, CP
10/01/2001	61614	R	W	M/G	?	juv	20	Middle Gully	AM, RS, CP
11/01/2001	61615	R	Y	M/W	?	juv	19	Far East Gully	MM,RS,CP
12/01/2001	61616	R	W	M/B	F	Ad	21.5	Ramp	AM,RS,CP
20/03/2001	61618	R	R	M/R	F	Ad	17	Western Bluffs	RS,PG,PG
20/03/2001	61619	R	B	M/Y	M	Ad	16.5	Western Gully	RS,PG,PG
21/12/2002	61620	L	B/M	G	M	Ad	16.5	Camp Basin	RS & PG
14/01/2004	61621	R	G	M/Y	M	Ad	17.5	Western Bluffs	AM & RJ
14/01/2004	61622	R	G	M/R	?	juv	19.2	Western Bluffs	AM & RJ
24/11/2005	61623	L	W/M	W	F	Ad	18.5	under high Western Bluffs	AM, PG, RPS
2/12/2005	61624	L	R/M	W	F	Ad	16	westRib	AM,TM,RS
28/12/2005	61625	L	M/B	R	M	Ad	15.5	Camp Basin	RPS, BM,KM,TM,AM
28/12/2005	61626	L	M/B	R	F	juv/subAd	16.5	Camp Basin	RPS, BM,KM,TM,AM
28/12/2005	61627	L	M/R	B	F	juv	18	Boulderfield Saddle	RPS, BM,KM,TM,AM
28/12/2005	61628	L	M/Y	Y	M	juv?	17.5	Boulderfield Saddle	RPS, BM,KM,TM,AM
29/12/2005	no band		W	R	M	juv	15.5	Western Bluffs	RPS, BM,KM,TM,AM
29/12/2005	no band		Y	B	F	juv	14.5	Western Bluffs	RPS, BM,KM,TM,AM
29/12/2005	no band		G	G	M	juv	14.5	Western Bluffs	RPS, BM,KM,TM,AM
29/12/2005	no band		R	G	F	juv	15.5	Western Bluffs	RPS, BM,KM,TM,AM
29/12/2005	no band		Y	R	F	juv	15.5	Western Bluffs	RPS, BM,KM,TM,AM
29/12/2005	61629	L	M/R	Y	F	juv	15.5	R/w Lodge area	RPS, BM,KM,TM,AM
7/01/2006	61630	L	M/R	R	F	Ad	15.5	Boulderfield Saddle	MM, RS
7/01/2006	61631	L	R/M	R	M	Ad	14	Boulderfield Saddle	MM, RS
6/05/2006	61632	L	M/B	B	M	Ad	22.5	Far East boulderfield	AM, RVS, TXM, HD
7/05/2006	61633	L	M/G	R	M	Ad	21	below Boulderfield	AM, RVS, TXM, HD

4.3 RE-SIGHTING OF BANDED BIRDS

We had hoped that re-sightings of banded birds would help provide greater accuracy to our annual census, however, while 68% of banded birds were seen again these birds proved remarkably difficult to re-find with any consistency. Table 4 documents whether or not a colour banded bird was seen on subsequent visits. Note that in this table an entry is made only if the area usually inhabited by the individual was searched. It was not at all unusual for an individual to be undetectable for several months and numerous visits.

Two notable resightings were:

- #61616 was seen in 2005-06 as a 6+ year old bird.
- there has been only one sighting of a rock wren (y-b) in a different area from where it was banded. It was banded below the Western Bluffs and re-sighted in the Boulderfield.

TABLE 4. THE SIGHT RECOVERY OF COLOUR-BANDED BIRDS

Band No.	611	612	613	614	615	616	618	619	620	621	622	623	624	625	626	627	628	w-r	y-b	g-g	f-g	y-r	629	630	631	632	633
Date	Bf	Wb	Bf	Bf	Bf	Ramp	Wb	Bf	Camp	Wb	Wb	WB	Bf	Camp	Camp	Bf	Bf	WB	WB	WB	WB	WB	BF	BF	BF		
2/11/00	B																										
5/12/00	x																										
6/12/00	x																										
7/12/00	x	B																									
9/01/01	x	x																									
10/01/01	x	x	B	B																							
11/01/01	x	x	x	x	B																						
12/01/01	x	x	x	x	x	B																					
13/01/01	x		x	x	x																						
3/02/01	x	x	x	x	x																						
22/02/01	x	x	x	x	x	x																					
7/03/01	x	x	x	o	x	x																					
8/03/01	x		x	o	x																						
19/03/01	x		x	o	x																						
20/03/01	x	x	x	x	x		B	B																			
6/11/01	x	x	x	x	x		x	x																			
20/12/01	x		x	x	x			x																			
22/12/01						o																					

Band No.	611	612	613	614	615	616	618	619	620	621	622	623	624	625	626	627	628	w-r	y-b	g-g	f-g	y-r	629	630	631	632	633
Date	Bf	Wb	Bf	Bf	Bf	Ramp	Wb	Bf	Camp	Wb	Wb	WB	Bf	Camp	Camp	Bf	Bf	WB	WB	WB	WB	WB	BF	BF	BF		
29/12/01	x		x	x	x			o																			
16/01/02	x	x	x	x	x		x	x																			
17/01/02	x	x	x	x	x		x	x																			
30/01/02	x	x	x	x	x		x	x																			
31/01/02	x		x	x	x	x		x																			
25/03/02	x	x	x	x	x		x	x																			
26/03/02	x		x	x	x			x																			
27/03/02	x		x	x	x	x		x																			
17/04/02	x	x	x	x	x	x	x	x																			
18/04/02	x	x	x	x	x	x	x	o																			
6/05/02	x		x	x	x			x																			
21/11/02	x	x	x	x	x	x	x	x																			
22/11/02	x		x	x	x	x		x																			
12/12/02	x		x	x	o			x																			
15/12/02	x	x	x	x			x	x																			
16/12/02	x	x	x	x	o	x	x	x																			
21/12/02						x			B																		
22/12/02	x	x	x	x	o		x	x	x																		
18/01/03	x	x	x	x	o	x	x	x	x																		
19/01/03			x	x	x		x	x																			
23/04/03	x	x	x	x	x		x	x	x																		
8/12/03						x			x																		
9/12/03	x	x	x	x	x		x	x																			
10/12/03									o																		
18/12/03	x	x	x	x	x	x	x	x	x																		
13/01/04						x		x																			
14/01/04	x	x	x	x	x	o	x	x		B	B																
31/03/04	x	x	x	x	x	x	x	x	x	x	x																
10/11/04	x	x	x	x	x	x	x	x	x	x	o																
11/11/04	x	x	x	x	x		x	x	x	x	o																
7/12/04	x	x	x	x	x	x	x	x	x	x	x																
10/01/05									x																		
11/01/05	x	x	x	x	x		x	x	o	x	x																
12/01/05	x	x	x	x	x	o	x	x	x	x	x																
4/02/05	x		x	x	x			x	o																		
5/02/05	x	x	x	x	x		x	x	x	x	x																
6/02/05									x																		
25/04/05	x		x	x	x			x	x																		
22/11/05	x		x	x	x			x																			
23/11/05	x	x	x	x	o		x	x	x	o	x																
24/11/05	x	x	x	x	o		x	x		x	x	B															
28/11/05	x		x	x	?	o		x	x																		
29/11/05		x					x			x	x	x															

Band No.	611	612	613	614	615	616	618	619	620	621	622	623	624	625	626	627	628	w-r	y-b	g-g	r-g	y-r	629	630	631	632	633
Date	Bf	Wb	Bf	Bf	Bf	Ramp	Wb	Bf	Camp	Wb	Wb	WB	Bf	Camp	Camp	Bf	Bf	WB	WB	WB	WB	WB	BF	BF	BF		
30/11/05	x		x	x	o	o		x	x																		
1/12/05		x					x			o	o	x															
2/12/05	x		x	x	o	x		x	x				B														
5/12/05	x		x	x	o	x		x	x																		
7/12/05	x	x	x	x	x			x		o	o		o														
8/12/05	x		x	x	x			x					x														
9/12/05	x		x	x	x			x					x														
10/12/05		x			o		x			o	o																
11/12/05	x		x	x	x	o		x					o														
15/12/05					x																						
16/12/05										o	o		o														
17/12/05	x	x	x	x	x			x					o														
18/12/05	x		x	x				x		x	x	o	x														
28/12/05	x		x	x	x			x	x				x	B	B	B	B										
29/12/05	x		x	x	x			x				o	o	x	x	x	x	B	B	B	B	B	B				
30/12/05	x	x	x	x	x		x	x	x			o	x	x	x	x	x	o	o	o	o	o	x				
7/01/05	x	x	x	x	x		x	x	x	o	x	o	x	o	o	x	x	x	x	x	x	x	x	B	B		
8/01/05	x		x	x	x	x			x	o	x		x	o	o	x	x						x	x	x		
20/01/06	x	x	x	x	x		o?	x	x	x	o?	x	x	o	o	x	x	x	x	x	x	x	x	x	x		
21/01/06	x	x	x	x	x		o?	x	x	x	x	x	x	o	x	x	x	x	x	x	x	x	x	x	x		
22/01/06									x					o	o												
22/03/06	x		x	x	x			x	x				x	x	x	x	x						x	x	x		
23/03/06	x	x	x	x	x		x	x		x	x	x	x			o	x	x	o	x	x	x	x	x	x		
24/03/06	x		x	x	x	x		x	x				x			o	x		x				x	x	x		
6/05/06	x		x	x	x	x		x	x				x	x	x	o	x		o				x	o	x	B	
7/05/06	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	o	x	x	x	x	o	o	x	B

Key: B = banded
o = seen
x = not seen

4.4 ANNUAL CENSUS OF BIRDS AND NESTS

Each annual census (Table 5) used all data obtained during the season including birds banded, birds re-sighted from previous years and unbanded individuals. All birds were seen on open bluffs, bare boulderfield, *Dracophyllum longifolium* & *Olearia colensoi* scrub on steep flanks, and benches within the bluffs and *Hebe toparia* scrub along the lower edges of the boulder fields. Nests were usually found only in December.

TABLE 5. THE ANNUAL CENSUS OF ROCK WREN AND NESTS IN HENDERSON BASIN

YEAR	JUV	ADULT	TOTAL	NO OF NESTS	SEARCH EFFORT (PERSON-DAYS) DURING DECEMBER
2000-2001	3	11	14	5	9
2001-2002	1	9	10	3	11
2002-2003	3	8	11	3	46
2003-2004	2	10	12	3	10
2004-2005	1	7	8	2	2
2005-2006	12	11	23	4	70

4.5 OTHER OBSERVATIONS

Rock wren were seen feeding on *Coprosma sp.* berries and feeding in flax flowers (whether on flax nectar or insects in the flower could not be seen).

4.6 OTHER BIRDS IN HENDERSON BASIN

- kea – occasionally present, seen in flocks of up to 9 birds, adults and juveniles, possible nest building found in winter 2006.
- black back gull – adults occasionally present, probably breeding in tussock north of Mt Cobb, get chased out of the basin by kea.
- black shag – seen occasionally
- paradise duck – often present, bred on the big tarn 2005-2005, hatched 6 & raised 4
- falcon – occasionally seen
- dunnoek – almost always seen, nests found on Boulderfield and above Camp Basin. Calls of juveniles can be confused with rock wren
- redpoll – often seen in flocks
- bellbird – often heard in the bush around Lake Henderson
- chaffinch – often seen
- morepork – occasionally heard from the bush around Lake Henderson
- weka – heard on several occasions from the bush near the outlet of Lake Henderson
- silvereye - present
- blackbird – sometimes seen singularly
- tomtit – present in the bush around Lake Henderson, a nest was found in a crevice in the lower bluffs adjacent to the bush
- harrier – seen only very occasionally
- grey duck – seen occasionally on the big tarn and Lake Henderson

- pipit – often seen in the tussock
- great spotted kiwi – heard once from near the outlet to Lake Henderson
- fantail – seen once in boulders
- brown creeper – a small flock was seen in the bush below the lower bluffs

4.7 MAMMALS IN HENDERSON BASIN

- red deer – occasionally seen, never shot!!, fresh sign often seen
- possum – sign often seen
- rat – caught once in a trap on the bushline
- mouse – droppings found in tunnels
- goat – used to be seen frequently but DOC cullers have eliminated them from the Basin
- hare – occasionally seen in the tussock
- humans – the occasional party passed through, maybe once a year
- chamois – seen once in the Basin
- long-tailed bat – seen in Camp Basin and picked up on bat box at the base of the lower bluffs adjacent to the bush

4.8 OTHER SPECIES

- large scree slug (sp?) – found several times a year on boulders
- tussock weta – approximately 6 found around the camp and in tussock
- fish in the lake – have been found on several occasions
- no reptiles seen despite widespread searching (by day only)

5. Discussion

5.1 TRAPPING AND PREDATION

It has not been possible to determine whether trapping made any difference to the rock wren population. This is partly due to the lack of any comparison with a non-treatment area but additionally, the study has been relatively brief.

It may be possible to determine the effect of predator control on the Henderson Basin population by stopping the trapping and comparing the response to this. Alternative ways to determine the impact of predation might be to entice some birds to breed in predator-proof nest boxes or to install cameras at the nests.

This study found no evidence of predation. Only one stoat was found to have feathers in its stomach – and these were not identified. Although Alison Ballance reported catching mice in traps, the only sign of mice we found in the basin was droppings in one of the trap tunnels. A rock wren was once observed to give what might have been an alarm call, then hide when a falcon called indicating some wariness of falcon. Very few harriers were seen in the basin. Only one rat was caught and that was on the bushline well away from rock wren habitat.

5.2 FINDING ROCK WREN

At the start of the project it was envisaged that population census would be done by walk-through counts much as Alison Ballance carried out. However, it was found that sometimes no rock wren would be seen during a trip but the next time a significant number of rock wren would be seen. This issue was further complicated by the experience that sometimes a bird could be heard calling near-by but not be seen or that on other occasions a bird close at hand would inexplicably disappear – as if it was hiding or taking a short nap. This inconsistent recording of a bird's presence is well illustrated in the history of banded birds shown in Table 4. The anomalies that this caused cast doubt on the appropriateness of a walk-through count as a means of census and led to nest counts being used as an alternative indication of changes in the population.

In instances when rock wren were heard but not seen they were recorded as present. The older, male, rock wren hunters are losing (or have already lost) their high frequency hearing – it was very noticeable how effectively the female and particularly younger rock wren hunters could locate rock wren by ear. A bat box was tried as a method of locating rock wren. It was not successful as it was too directional to pick up a call that may come from any direction. The bat box was used successfully in listening to nests to determine the presence of chicks as the bat box could be pointed directly at the nest. It was useful for those audially disadvantaged but it was noticed

that the bat box was not better at hearing chicks than some of the kids with their better hearing.

5.3 ROCK WREN DISTRIBUTION

There is only one sighting of a banded rock wren outside of the general area in which it was banded. A juvenile was banded 29/12/2006 in the boulders below Western Bluffs and was first resighted on 23/3/2006 in the Boulderfield near Bluff Creek and then subsequently in the Boulderfield. All 45 other sightings of banded rock wren were within the area of contiguous suitable habitat in which they were banded. It seems that the rock wren in Henderson Basin generally do not move over terrain that they will not live in. Tussock slopes appear to be a barrier to their movement. It is possible that if the population increases then there will be more pressure on the rock wren to move to unoccupied territory and some of these barriers will be overcome. The juvenile that was seen to move was one of a clutch of 5 and it is possible that a high concentration of rock wren did cause this one to move. Rock wren appeared to range almost entirely over contiguous area of suitable habitat (*e.g.* Middle Bluffs and Boulderfield). This brought at least 2 family groups together in the Boulderfield in 2006. None of the banded rock wren were seen outside of Henderson Basin though only the areas west of Jack Point were searched. There have been enough sightings of rock wren on the western side of Jack Point to confirm that they are breeding there.

Elsewhere in north west Nelson there are areas where rock wren have been reported historically but where there have been no sightings in the last 5 years *e.g.* Mt Xenicus!! It is uncertain how many places there have been sightings of rock wren in the last 5 years but no sightings before this *e.g.* Mt Perry and Mt Arthur.

5.4 POPULATION TRENDS

The apparent sedentary nature of these rock wren was used when compiling population numbers. If a bird of the same description (*e.g.* adult male) was seen repeatedly in the same location during a season then it was counted as one rock wren. In areas such as the Boulderfield where "territories" seem to overlap, it is almost certain that this assumption lead to an underestimation of the number of unbanded rock wren.

Alison Ballance assumed that all rock wren seen as a single bird had an unseen mate. This assumption was not made in this study. The Ballance tally of 29 birds would have been closer to 24 using our method. This study recorded annual counts of between 10 and 23 birds with an average of 13.5 birds and was based on an average of 57 person days each season compared with her 16 person days. Despite the greater search effort, this study was still frustrated by difficulties in getting an accurate count. A good example of this is the 2004-2005 season ending with a tally of 8 adults

yet in spring of 2005 there were 11 adults present. Despite these problems, it appears that the rock wren population in Henderson Basin has been significantly less than in 1989 but it is hard to say yet that the population is declining.

5.5 NESTING

Without exception, all nests found were behind vegetation in cracks in bluffs. All nests had some degree of protection from stoats, some being near the toe of the bluffs and poorly protected but some being up to 7 m above the toe of the bluff in a site reasonably secure from stoats. The nest found in the central bluffs in 2005 (with ♂ #61615) was behind *Helichrysum selago*. When it was checked after fledging to see if there had been any predation (there had been none), another older nest was also found in the shrub only 200mm below the recently abandoned nest. It was assumed to be from a previous season (rather than an earlier nest attempt that season) as the fine grasses in the nest were older than the fine grasses in the just abandoned nest. Rock wren were observed nesting in this vicinity in 2000/01. This ♂ (#61615) was observed to nest in a site 150 m to the west along the foot of the bluffs in 2002.

Locating nests appears a more straight forward way of monitoring population changes than does walk through counts. The problem with using nest numbers is that it requires almost continuous observation from late October through to the end of December. Unfortunately the weather is usually much more difficult at this time of year compared to later in the summer. Also, periodic visits would still be required through out the summer to check the trap line. In 2005-06 it appears that all nests were located except for a pair of rock wren on the Ramp which may have nested high in the bluffs above the Ramp in December 2005 in an area which was inaccessible and a pair in Camp Basin which could have completed nesting before 23/11/2005.

The comparison of the number of nests with the number of rock wren (Table 5) confirms that there is no simple and direct relationship. This may be indicative of the problems in counting these birds or it may also be that the discrepancy between the nests and population may just be caused by variable breeding success in that season.

5.6 COMPETITION

Dunnock occupied a similar niche as rock wren for at least part of the season in Henderson Basin and they were estimated to be at least half as numerous. They have been found nesting in the *Hebe toparia* which grows along the lower margins of the boulder fields and where rock wren are sometimes found foraging. There is potential for dunnock to compete with rock wren but there is no evidence as to whether or not the competition is significant.

6. Conclusions

Walk through counts are a difficult and dubious means of determining population changes. The best time for a population census appears to be after nesting and before family dispersal.

There is no evidence for a decline in population of rock wren in Henderson Basin although this conclusion may be influenced by the predator control effort. There is no evidence of the effect of predation on the rock wren population nor is there evidence that predator control has had any effect on the rock wren population.

There is potential for competition to be affecting the rock wren population but no evidence for this.

It is not clear which factors control the rock wren population in Henderson Basin. More needs to be learned about the habits and biology of the rock wren in order to successfully carry out the field work required to identify those factors control the rock wren population.

A female rock wren has been observed to live for at least 6 years.

Rock wren are sedentary in respect of territory at the population densities in Henderson Basin.

With no hard data from this study indicating a trend in rock wren numbers we can only hope (possibly against our better judgement) that the views of Sir Walter Buller may yet be proven correct:

"Xenicus gilviventris, I am glad to think, is one of the species likely to survive changes that from the forester's and field naturalist's point of view have desolated New Zealand. The ravages wrought elsewhere by deer, rabbits, opossums, birds, and other imported vermin are unlikely to affect the welfare of the rock wren. Even weasels and rats — and I know they ascend to great heights — are hardly likely to draw sufficient recompense in prey from such unpeopled solitudes. Plant life, furthermore, in these high altitudes and in this showerbath climate is certain to remain undominated by an alien flora. The vegetable kingdom thus unaltered, native insect life is consequently secure. With cover and food supplies unmodified, the rock wren may be considered relatively safe." Buller, 1873

7. References

- Ballance A. Rock Wren Study – Lake Henderson, North West Nelson. Report on Field Trip 6-14 December 1989. Unpublished DSIR report.
- Buller 1873. A History of the Birds of New Zealand. Walter Lawry, Buller, London.
- Michelsen-Heath, S. 1989. The breeding biology of the rock wren, *Xenicus gilviventris*, in the Murchison Mountain, Fiordland National Park, New Zealand. Unpublished M.Sc. thesis, University of Otago
- Michelsen-Heath, S. and Gaze, P. (in prep). Changes in the abundance and distribution of rock wren (*Xenicus gilviventris*) in the South Island of New Zealand.
- Willans, M. and Weston, K. 2005. Translocation of rock wren (*Xenicus gilviventris*) from the Murchison Mountains to Anchor Island, Dusky Sound, Fiordland. Department of Conservation, Te Anau.
- Williams P. 1992: The Ecology of an Isolated Rock Wren Population: Habitat Description. Investigation No: 381. DSIR Land Resources 1992.

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