

## REVIEW OF THE STATUS AND DISTRIBUTION OF THE CHESTNUT-BREASTED WHITEFACE *APHELOCEPHALA PECTORALIS*

LYNN PEDLER

### SUMMARY

The Chestnut-breasted Whiteface *Aphelocephala pectoralis* was reported from only 33 localities (5 unconfirmed) prior to 1990, almost all in low bluebush-gibber habitats in central-northern South Australia. In 1990, 31 of these localities and over 100 sites with similar habitat were searched, locating *A. pectoralis* at seven previously reported, and seven new localities, spread throughout its known distribution. The range of habitats used is described and factors influencing population are discussed. Total species population is estimated to be less than 6000. This small population is distributed patchily in small groups and subject to continuing habitat degradation, caused mainly by rabbits.

### INTRODUCTION

The Chestnut-breasted Whiteface *Aphelocephala pectoralis* was described from a single specimen collected in South Australia (Gould 1872). That specimen was lost and no further evidence of the species found until 1914 when Captain S. A. White obtained 29 specimens in gibber tableland west of Oodnadatta (White 1914a, b, c, 1915a, b). The next record, a specimen taken in 1923, marked the start of a further 43 years with no records. Since 1966, however, a steady trickle of records has come from the arid inland of South Australia. Almost all of these records were of brief, chance encounters with small groups of birds, with few details recorded except dates and localities. Prior to the discovery and frequent observation of a population at Mt Lyndhurst (Drummond 1988), only two nests had been found and the species was regarded as rare and nomadic (e.g., Blakers *et al.* 1984). The Chestnut-breasted Whiteface has thus remained one of Australia's least known endemic birds, with an unusual distribution, restricted to the arid chenopod-gibber areas of northern South Australia. Recent data on the status and distribution of *A. pectoralis* were lacking. Furthermore few sites of previous observations had been re-visited and there had been almost no systematic searches of appropriate habitats. Conservation requirements of the species were largely unknown.

The purpose of this study was to: (1) review and assess all previous records of the Chestnut-breasted Whiteface; (2) revisit all previous locations where the species had been seen; (3) describe the habitats in which the birds were seen; and (4) search

additional areas of suitable habitat in the northern parts of South Australia.

### METHODS

All available records of *A. pectoralis* prior to 1990 were examined. As well as searching Australian ornithological literature, requests for information were made in several ornithological newsletters and individuals known to hold unpublished observations were contacted. Specimens held in the South Australian Museum were examined and details obtained of specimens held in other collections. Copies of all original RAOU atlas data sheets (Blakers *et al.* 1984) for this species were examined.

Searches for *A. pectoralis* were made over 30 days between February and October 1990. The main searches were on 18-23 April, 8-15 July and 21 August-3 September, and involved one or two observers. Thirty-one localities where Chestnut-breasted Whitefaces had been reported prior to 1990 were examined. At these locations searches were made to determine whether *A. pectoralis* was present. Areas of similar habitat near or between these localities were also searched. In total, over 130 sites throughout the species' range were examined. Habitat details and other bird species seen were recorded for each site. The time spent searching on foot at each site varied from a few minutes to several hours depending on weather conditions and the extent of suitable habitat. Some sites examined briefly, or in adverse conditions, were searched again on later visits. Tape recordings of contact calls and song of *A. pectoralis* were played at most sites from July onwards. Limited time was spent at Birdsville Track localities in April due to wet weather and deteriorating roads. The only sites of previous reports of *A. pectoralis* not visited were those of two unconfirmed records, near Nonning and Kulgera.

### REVIEW OF PREVIOUS RECORDS

In this review each record, or series of observations from the one locality, is given in chronological order. The number appearing against the discussion of records from each locality corresponds with the number shown on Map 1 and

with the number against each specimen locality in Table 1. The localities mentioned in discussing White's journey in 1914 are shown on Map 2. All known specimens (mainly those obtained by White) are listed in Table 1.

## 1870 — 1923 RECORDS

### 1870/1871 Type Specimen

1. The Chestnut-breasted Whiteface was first described by Gould as *Xerophila pectoralis* with the type locality **Port Augusta**. The specimen was forwarded to Gould by Waterhouse in March 1871 (Sutton 1929). The identity of its collector and date of collection remain unknown, and the specimen has long been lost (White 1915a&b, Sutton 1929). Ragless (1969) suggested that F. W. Andrews may have obtained the specimen as he collected for the South Australian Museum about that time, travelling to the Gawler Ranges at least as early as 1872 (Forshaw 1976). No subsequent records of the species have come from the Port Augusta area and Ragless (1969) suggested that the specimen originated from the Pimba-Woomera area north of Port Augusta. The habitat in the Pimba area is not typical of that used by *A. pectoralis* (see below), having more samphire and mainly lacking grasses and herbs. Large areas of more typical habitat exist closer to Port Augusta along the Stuart Highway, and even the areas immediately west and north-west of the town (towards Lincoln Gap and the numerous low hills in that area) may have supported *A. pectoralis* and possibly still do. Several areas near the western flanks of the Flinders Ranges, between Port Augusta and Lyndhurst, also appear to have suitable habitat for *A. pectoralis*.

### 1914 S. A. White's Records

After its discovery *A. pectoralis* was not found again for 43 years, leading to speculation that the specimen described by Gould was actually an immature Banded Whiteface *Aphelocephala nigrincincta* (McGilp 1921, White 195a&b). However the series of specimens collected by White in 1914 which included adults and immature birds (White 1915a&b), confirmed that the Chestnut-breasted Whiteface was indeed a distinct species.

Captain S. A. White had joined an expedition of geological exploration into the north-west of South Australia as the naturalist, and was assisted in collecting by J. P. Rogers. They reached Oodnadatta by train on 19 June 1914 and while waiting for the

arrival of their camels, spent some of the time collecting around Oodnadatta. The expedition set out on 28 June, heading westwards from Oodnadatta following up the course of The Neales and later The Alberga watercourses. They returned in early September having travelled as far as the Musgrave and Everard Ranges.

Among the numerous specimens collected during the expedition were 29 skins of "Gould's long lost bird, *Xerophila pectoralis*" (White 1914c). These were collected by White and Rogers on eight days from 29 June to 22 August 1914, between Oodnadatta and the vicinity of Wantapella Swamp. White did not always record exact locations or the number of specimens from each locality (White 1914a & 1915b). However examination of specimen labels, published material and White's field diary has enabled the collecting localities to be identified. White may have seen *A. pectoralis* at other localities between those where specimens were collected but he did not record any such observations. Details of the specimens collected with the localities from White's labels are given in Table 1. These localities appear to be those of the campsites where specimens were prepared even though on many occasions White and Rogers collected between camps as they walked on either side of the slowly moving line of camels.

2. The locality for the two specimens taken on the morning of 29 June (the first taken since the type specimen) is given as "30 miles west of Oodnadatta". However they were actually collected between the previous campsite **13 miles west of Oodnadatta** and the point reached by about midday of that day, i.e., **ca 21 miles west of Oodnadatta** (White 1915b).

3. Similarly, the specimen collected on the following day and labelled "40 miles west of Oodnadatta" was actually taken somewhere between the previous night's camp (**at 27 miles**) and **40 miles west from Oodnadatta**.

4. Three specimens collected on 1 July (as noted in White's diary) as the expedition approached Todmorden Station were either labelled "**Todmorden**" or "**60 miles west of Oodnadatta**" and dated 2 July 1914. It seems that as the party reached Todmorden at 4.00 pm and was entertained that evening by the owners Mr and Mrs Breaden, the skinning of specimens was delayed until the following day. This would have been possible in the cool conditions at the time and White (1914a) noted that other specimens were sometimes not skinned until the next day or evening.

5. The expedition passed **Lambina Soak** on its outward journey on 5 July and continued on seven miles to reach Lambina Station, (the present site of Warrungadinna Bore) in the dark at 6.45 pm. White's diary entry for 5 July included "shot today 5 *Xrophila* (*sic*) like Milligan's bird", (a reference to the Southern Whiteface *Aphelocephala leucopsis castanaeiventris*), but *pectoralis* was not recorded until the following day's entry. This included "Got away at 12 noon kept going till 4.30" and "we did not get much today 1 Bellbird (over from yesterday)". He then listed nine other birds and "1 *Xrophila pectoralis*" and noted that they had "travelled over stony tableland all day". No specimen of *A. pectoralis* is dated 6 July. However a specimen in the Museum of Victoria, NMV (HLW) 2876, is labelled "Lambina Soak or native well", with the date 22 August 1914 (L. Christidis *in litt.* March 1991). This is clearly an error as the expedition did not reach Lambina until late on 24 August on the return journey. I suggest that (HLW) 2876 was collected at Lambina Soak (as labelled), on 5 July, and like the Bellbird, was kept "over from yesterday", then skinned, and included in the diary entry for 6 July. Another explanation could be that it was collected as the diary implies, on 6 July, in which case the locality should be Vaughan Hill where the expedition camped that night. Curiously, a Red-capped Robin *Petroica goodenovii* collected on 6 July is labelled Vaughan Hill, while another with that date is labelled Lambina Soak, as are at least five other specimens collected on 5 July.

6-7. A further 21 specimens of *A. pectoralis*, all labelled "**Wantna Pilla Swamp**" by White, were collected on three dates in July and August 1914. Apparently five of these specimens dated 9 July were taken as the expedition approached Wantapella from the previous camp in a small watercourse in rough, stony country to the east and crossed "a fine plane (*sic*) covered in saltbush & mulga on the hills surrounding it". Referring to these birds, White noted "I met with a small party on the tableland" so it seems that the birds were collected on the saltbush plain, or more likely, before leaving the stony, rising country earlier in the day. The species was not among the birds recorded on the following day (10 July), spent around the dry swamp, and was not encountered again from the time the expedition moved on north-west, towards the Musgrave Ranges, until returning from the Everard Ranges on 18 August. Upon entering the tableland with a few patches of saltbush and bluebush somewhere

between **Mt Johns and Chambers Bluff**, *A. pectoralis* was found in company with *A. nigricincta*. Seven specimens of *A. pectoralis* were obtained and Wantapella Swamp was reached a little before 9.00 pm that night (White 1914a, 1915a&b). The next two days were spent at **Wantapella Swamp** and on 21 August Rogers "set out for the **tableland country to the SW**" while White worked around the dry swamp. Rogers returned at 2.00 pm with 15 birds, at least nine of which were *A. pectoralis* (White 1914a).

8. A further specimen was obtained on 22 August when the expedition moved north to the **Indulkana Creek**, followed it downstream about ten miles, then followed a camel pad for two or three miles and camped. White noted in his diary "after tea skinned birds only got four today". The return journey to Todmorden Station was at a faster pace, much of it along the sandy bed of The Alberga. Little collecting was done, and no more *A. pectoralis* were noted.

#### 1923 Wood-Jones Record

9. The species was next encountered when F. Wood Jones collected a single specimen on 20 August 1923 on the **Stuarts Range**. There are no other details with this specimen which is in the South Australian Museum (see Table 1.).

#### 1966 — 1967 RECORDS

Once again nothing was seen of the Chestnut-breasted Whiteface for 43 years. Then in 1966 and 1967, by coincidence it seems, several groups or ornithologists came upon this elusive species within the space of a few months.

10. On 5 September 1966, L. Potts and R. Cleggett observed a group of four *A. pectoralis* on **Nilpinna Station** (Glover 1968). The exact locality was "**40 km northwards along the Oodnadatta Track from William Creek**", (L. Potts pers. comm.).

11. On 6 September 1966 R. Lovell observed three *A. pectoralis* at William Creek (Glover 1968). These were seen on the first rise after leaving that locality, about **1 km south of William Creek**, (B. Hutchins pers. comm. 1990).

12-15. Further observations were made in April and May 1967, when C. Austin, M. Gunn, G. Pizzey and N. Wettenhall found the species at several localities while travelling along the Stuart Highway. Austin reported in Glover (1968) that it was "not uncommon, and observed fairly often . . . between

Mt. Eba and Coober Pedy, in gibber country with small bluebushes, April-May, 1967". These records were submitted to the RAOU Atlas scheme (Blakers *et al.* 1984) by M. Gunn and copies of the original data sheets show that the species was actually encountered only on four occasions, as follows:

12. On 23 April 1967, two birds were seen and one specimen collected by C. Austin (M. Gunn pers. comm. 1990, RAOU Atlas data) at a site **"20 miles along the road towards Coober Pedy from The Twins"**. This was along an alternative track east of the old Stuart Highway in the vicinity of **Teal Hole Dam** (M. Gunn pers. comm.).

13. On the same day N. Wettenhall and M. Gunn saw a group of three birds in "gibber and sparse bluebush" (RAOU Atlas data), **between 30 miles and 60 miles north from The Twins** along the same track. This corresponds with the area from near Mt Sandy to a point on the old Stuart Highway, approximately 45 km south of Coober Pedy.

14. On 9 May 1967, C. Austin observed the species **"22 miles along from Marla Bore towards Welbourne Hill"** (M. Gunn pers. comm., RAOU Atlas data.) There are two specimens (skeletons) in the NMV labelled "20 miles North of Welbourne Hill, May 1967" collected by C. Austin (L. Christidis *in litt.*). These two localities are referable to the same site if the specimen localities are taken as 20 miles north *along the old alignment of the Stuart Highway*. (i.e. actually west) from Welbourne Hill, which was the route travelled by the party (M. Gunn pers. comm.). Gunn was not aware of specimens of *A. pectoralis* taken by Austin, except at the first locality where they had found them. Thus, localities of one or both the NMV skeleton specimens are possibly referable to "near Teal Hole Dam".

15. On 10 May 1967, G. Pizzey observed the species at another locality on the **Stuart Highway (old alignment) somewhere between Ingomar and The Twins**, but he did not record more exact locality details (G. Pizzey pers. comm.).

#### 1968 First nest and eggs

16. G. Ragless located an old nest and a pair of Chestnut-breasted Whitefaces at a partly built nest, in July 1968 on **Myrtle Springs Station, 14 miles (22 km) south-west of Lyndhurst**. He returned on 10 August and obtained the first clutch of eggs of this species to be described (Ragless 1969). One of the adult birds was also collected. Ragless and others, including myself, have visited this site just

north of Mt Playfair Well on numerous occasions since then without finding any whitefaces.

#### 1969 — 1989 RECORDS

17. A sighting of one Chestnut-breasted Whiteface (later retracted because it was outside the known range of the species, M. Arthur pers. comm.) was made in gibber country at **Scrubby Hills, north of Nonning** in the Gawler Ranges on 19 June 1969, by M. J. Arthur (Glover 1971, Stewart 1977). While this record is regarded as unconfirmed, the locality and the general region towards Port Augusta and northwards should not be discounted as having possible habitat for *A. pectoralis*. No comment was made on this record by Paton (1975) or Joseph and Black (1983).

18. G. S. Chapman (*in litt.* June 1990) observed two *A. pectoralis* and obtained photographs of one bird at the **Coober Pedy airfield** in April 1973.

19. In May 1975, D. and P. Vincent observed four *A. pectoralis* about **3 km south-west of Marree** along the track to **Callanna Station** (Reid 1975, D. Vincent pers. comm.).

20. J. B. Cox briefly observed three *A. pectoralis* with three *A. leucopsis* on 15 August 1975, about **30 km SSE of Koonchera Waterhole** in the far north-east of South Australia (Cox and Pedler 1977).

21. The second nesting record for *A. pectoralis* was made on 6 September 1976 when D. Stewart found a pair at a nest containing three young, **3.2 km south of Cannuwaukanninna Bore** on the Birdsville Track (Stewart 1977). J. McKean found no whitefaces at the site a month later.

22. On 3 November 1978 T. Cox (1980) reported a Chestnut-breasted Whiteface **30 km SSE of Tarcoola** along the dog-proof fence (Cox 1980, Bransbury 1984). This locality was recorded as *ca* 35 km S Tarcoola by Joseph (1979). The habitat in this area is most unusual for *A. pectoralis* (see below) and thus the presence of the species in this area is most unlikely.

23-24. During 1979 and 1980 when B. and M. Wright lived on **Witchelina Station**, they observed *A. pectoralis* only twice, even though they regularly passed the same sites before and after those sightings. On 12 March 1979 M. Wright and F. Badman saw two birds **3 km south of North Tank** and on 22 June 1979 B. Wright saw four birds among scattered shrubs in heavily grazed hills near **Kingston Bore** (Badman 1981, Bransbury 1984, RAOU Atlas data, B. Wright *in litt.* February 1990).

25. J. Pegler and several other observers saw three Chestnut-breasted Whitefaces on 13 September 1981 near the **Granite Downs Station airstrip** (*in litt.* May 1990, RAOU Atlas data). Three *A. pectoralis* were subsequently seen at this site on 6 September 1983 by M. Carey and two days later by J. McKean and A. McBride (Pegler *in litt.*, McKean *in litt.*). J. and P. Waugh also saw three birds there on 11 June 1987 (J. Waugh *in litt.*).

26. I have an unconfirmed sighting of *A. pectoralis* on 29 and 30 September 1982 in open gibber tableland **7 km east of Cowarie Station**. Two chestnut coloured whitefaces flushed from the roadside during a dust storm and were found in the same area the following day, when one of the pair was seen at long range with binoculars and appeared to have a chestnut breast band (L. & J. Pedler *et al.* unpubl.).

27. A group of five *A. pectoralis* was seen by P. A. Bourke on 13 November 1983 about **18 km west of Marree** on the Oodnadatta road (J. McKean *in litt.* February 1991). I have no other details of this sighting, except a brief habitat description.

28. In late October 1984, while assisting with a South Australian Museum faunal survey, J. Reid, J. Pedler, L. Pedler and J. MacNamara saw two *A. pectoralis* in gibber country **18 km south of Manguri Siding on Mabel Creek station** (Kemper *et al.* 1985).

29. J. Waugh observed five *A. pectoralis* on 23 December 1986, near the **Indulkana Creek**, approximately 5 km west of the Granite Downs airstrip (Waugh *in litt.* February 1991). The area in which this sighting and those from Granite Downs airstrip were made corresponds well with the locality for the specimen taken by S. A. White on 22 August 1914, (i.e. Indulkana Creek, see 8. and 25.).

30. An unconfirmed sighting was made in the southern Northern Territory, **62 km east of Kulgera on the road to Finke**, on 19 September 1987, when one bird was seen in poor light (J. McKean *in litt.* February 1991). With inadequate description and no habitat details the record cannot be accepted but the locality should be checked.

31. R. Drummond (1988) located three Chestnut-breasted Whitefaces on 30 June 1987 after seeing one fly across the **Strzelecki Track 27 km from Lyndhurst**. A week later he observed groups of two and three birds. Subsequent visits to this site by many observers from July 1987 onwards have located

several active nests and shown that the area supports a number of groups of *A. pectoralis*.

32. I. A. May observed two *A. pectoralis* about **1 km west of Leigh Creek South** in late 1987. Two birds from a group of five which perched briefly on power lines, were identified as *A. pectoralis* (May *in litt.* March 1990).

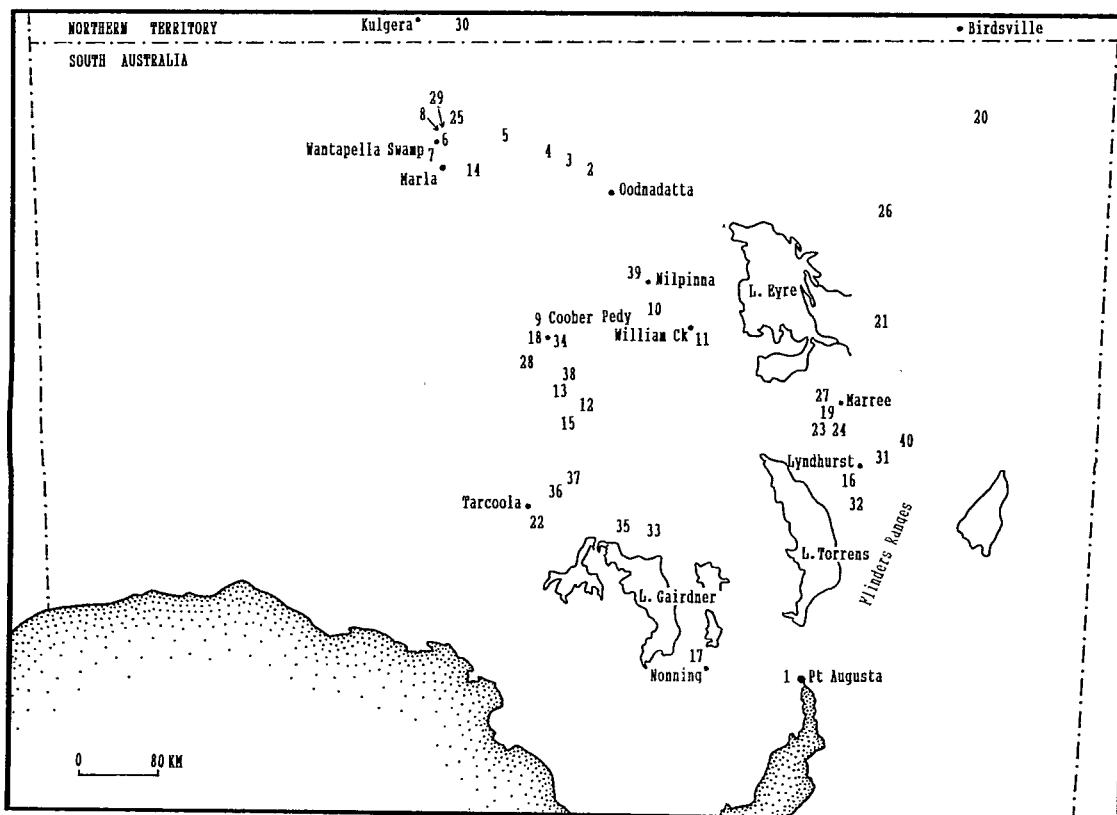
33. I received verbal reports of two sightings of *A. pectoralis* during 1989 at **Glendambo**. Insufficient details were given to confirm the presence of the species in Myall *Acacia papyrocarpa* woodland and at the periphery of its range. The species has not been found in this habitat elsewhere.

### 1990 RECORDS

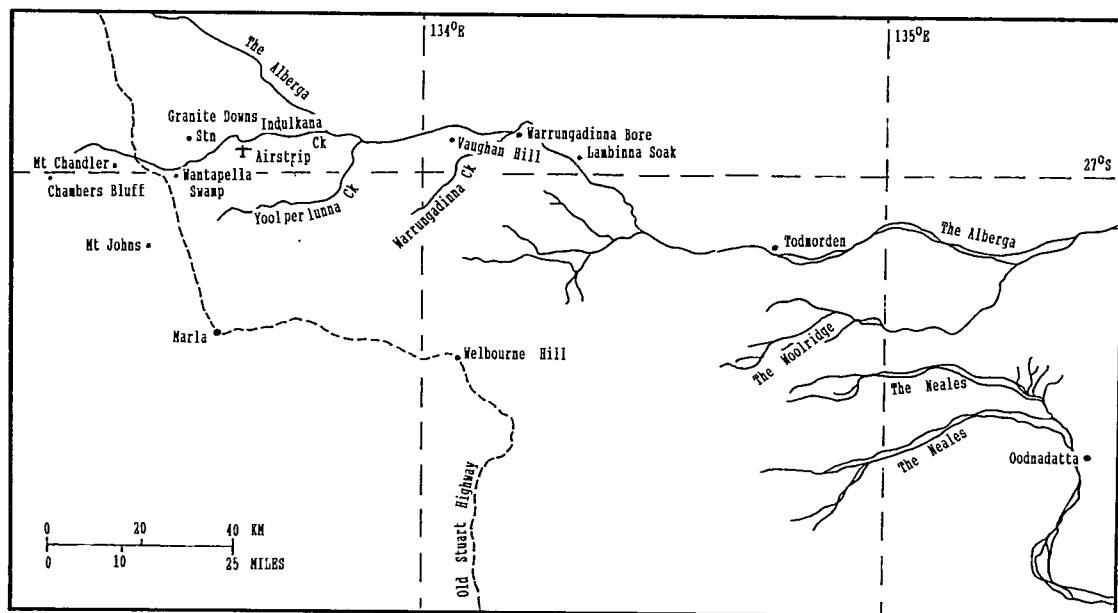
Chestnut-breasted Whitefaces were found at seven of the 31 previously reported localities which were searched and at seven new localities in 1990. These records are from all parts of the species' known range (see Table 2, and Map 3). All observations of *A. pectoralis* made during 1990 are presented in Table 2 with the results of searches made at previously reported localities and the dates of those previous records. Localities 1 – 33 given in Table 2 are as defined by the above discussion of records from 1870 to 1989. Localities 34 – 40 in Table 2 are where new populations were found in 1990. Failure to find this species, however, does not imply its absence from a locality, because of its unobtrusive nature, largely unknown mobility and low population density (Pedler *in prep.*). Varied responses to taped calls were observed due to frequent windy conditions and locally differing stages of breeding activity. However, at several localities, the taped calls resulted in responses by birds which might otherwise have been overlooked.

Also included in Table 2 are observations of other *Aphelocephala* species found in 1990 at each locality, in some cases, with or near *A. pectoralis* at those places. The records of Chestnut-breasted Whitefaces occur in three main areas with a few outlying localities (see Map 1) and for convenience the localities given in Table 2 are divided into these three regions as follows: Coober Pedy – Port Augusta; Oodnadatta; Lyndhurst – Birdsville Track.

The lack of records from areas between these regions probably reflects both a lack of searching by ornithologists and more sparsely distributed suitable patches of habitat. This emphasises how little is understood of the patchy distribution of *A. pectoralis*, rather than implying any separation of regional populations.



Map 1. Location of all reports of *Aphelocephala pectoralis* until 1990. Numbers 1-40 correspond with those shown for each locality in text.



Map 2. Location of places referred to in discussion of S. A. White's journey and subsequent records from the Oodnadatta region.

Table 1. List of all specimens of *Aphelocephala pectoralis*. Abbreviations: SAM (South Australian Museum, Adelaide); White coll. (S. A. White's collection, in SAM); AMNH (American Museum of Natural History, New York); NMV (Museum of Victoria, Melbourne); ANWC (Australian National Wildlife Collection, Canberra); SAW (collector = S. A. White); FWJ (F. Wood Jones); CA (C. Austin); GR (G. Ragless). Localities and Dates are from Specimen labels. An asterisk \* marks details revised in the text. Bracketed numbers against localities correspond with numbered localities in text and Map 1.

Date	Locality	Collector	Collection and Reg. No.
1870/71 (1)	Port Augusta	Type, sent to Gould by Waterhouse, now lost.	
29/6/1914 (2)	*30 mi W Oodnadatta	SAW	SAM B20905
" "	" " "	SAW	White coll.
30/6/1914 (3)	*40 mi W. Oodnadatta	SAW	SAM B1708
2/7/1914 * (4)	60 mi W Oodnadatta	SAW	White coll.
" " * (4)	Todmorden	SAW	AMNH No. 683491
" " * (4)	Todmorden	SAW	AMNH No. 683492
9/7/1914 (6)	Wantna Pilla Swamp	SAW	SAM B20906, AMNH No. 683493, AMNH No. 683494, AMNH No. 683501, White coll. NMV R6576, White coll., White coll., White coll., AMNH No. 683495, AMNH No. 683499, AMNH No. 683500.
18/8/1914 (7)	Wantna Pilla Swamp	SAW	AMNH No. 683496, AMNH No. 683497, AMNH No. 683498, White coll., White coll., NMV R6575, NMV (HLW) 2877, SAM B1709. White coll.
21/8/1914 (7)	Wantna Pilla Swamp	SAW	
21/8/1914 (7)	Tableland near Wantna Pilla Swamp	SAW	
22/8/1914 (8)	Indulkana Creek	SAW	AMNH No. 683490
22/8/1914 * (5)	Lambina Soak	SAW	NMV (HLW) 2876
20/8/1923 (9)	Stuarts Range	FWJ	SAM No. 4412
May 1967 (14)	*20 mi N of Welbourne Hill	CA	NMV B8980, B9054
10/8/1968 (16)	Myrtle Springs	GR	ANWC No. 11034

### HABITATS USED BY *APHELOCEPHALA PECTORALIS*

Typical habitat of *A. pectoralis* has been assessed by visiting most sites or areas where the species has been reported, and by observing the species at some of these sites and at other new localities. Representative photographs of habitats were taken at sites of most historic and new records of *A. pectoralis* (e.g. see Figs 1-3). Habitats may have altered at some sites since *A. pectoralis* was last found there, however the habitats observed in 1990 and reported here should at least indicate the type of habitat formerly present, while in some areas evidence of past changes was found.

Chestnut-breasted Whitefaces were found at six of the sites which could be accurately identified using locality details of previous records, (all other sightings were at previously unknown sites or in the vicinity of less accurately defined localities of previous records, e.g. "Stuarts Range"). The six localities (see below, 7, 12, 23, 25, 28 and 31), where *A. pectoralis* has been found over periods of three

to 76 years can be assumed to be representative of the species' habitat requirements, and although these sites are from all parts of the bird's range, their habitat structure and species composition is very similar. These are described below followed by brief descriptions of habitats at the other localities where *A. pectoralis* has been reported.

The most important features in the habitats described appear to be the presence of perennial chenopod shrubs (mainly *Maireana astrotricha*), a variety of small herbs and grasses, areas of bare substrate, and in most areas a few larger shrubs or small trees which provide shade or shelter. Gibbers or similar stony surfaces are present at all except one confirmed *A. pectoralis* locality, 36, but their importance in the habitat is unclear. Stones often comprise a large percentage of the surface area, but this varies with the amount of ephemeral or annual herbage and grasses, which presumably provide most of the seed and invertebrates eaten by *A. pectoralis* (White 1915, Pedler unpubl.). However a dense cover of these small plants may restrict the

Table 2. Summary of Chestnut-breasted Whiteface Records, 1870-1989 and 1990 Observations. The number against each locality corresponds with those in the text and on Map 1; \* indicates localities of unconfirmed records; Presence of *Aphelocephala leucopsis* (S.Wh.) or *A. nigricincta* (B.Wh.) is shown, "nearby" = found in adjacent area.

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COOBER PEDY -- PORT AUGUSTA REGION

Locality	Previous Records	1990 Observations
1. Port Augusta	1870?	Aug - None found (S.Wh. common)
9. Stuart Range	Sep 1923	Jul, Aug - found at 4 sites in this loosely defined area (12, 28, 34, 38.)
12. Teal Hole Dam	Apr 1967	Aug 2-3 birds (S.Wh. nearby)
13. From Mt Sandy to Old Stuart Hwy	Apr 1967	Jul, Aug - not found (see nearby site 38.)
15. Old Stuart Hwy, between Ingomar & The Twins	May 1967	Aug - not found
17. *Scrubby Hills, N of Nonning	Jun 1969	Not visited.
18. Coober Pedy Airfield	Apr 1973	Jul, Aug - not found
22. *30 km SSE of Tarcoola	Nov 1978	Aug - not found (S.Wh. common)
28. 18 km S of Manguri Siding	Oct 1984	Jul - one pair (B.Wh. nearby)
33. *Glendambo	1989	Jul, Aug - not found (S.Wh. common)
34. 12 km SE of Coober Pedy (Stuart Ra.)	---	Jul - 3 birds
35. 31 km West of Glendambo	---	Aug - 1 pair
36. 7 km NE "No.3 Co. tank", Wilgena Stn	---	Aug - 1 pair with 1 juv. (S.Wh. nearby)
37. 11 km NE "No.3 Co. tank", Wilgena Stn	---	Aug - 3 birds
38. 70 km S of Coober Pedy (Stuart Ra.)	---	Aug - 2 groups (4 & 5 birds)

OODNADATTA REGION

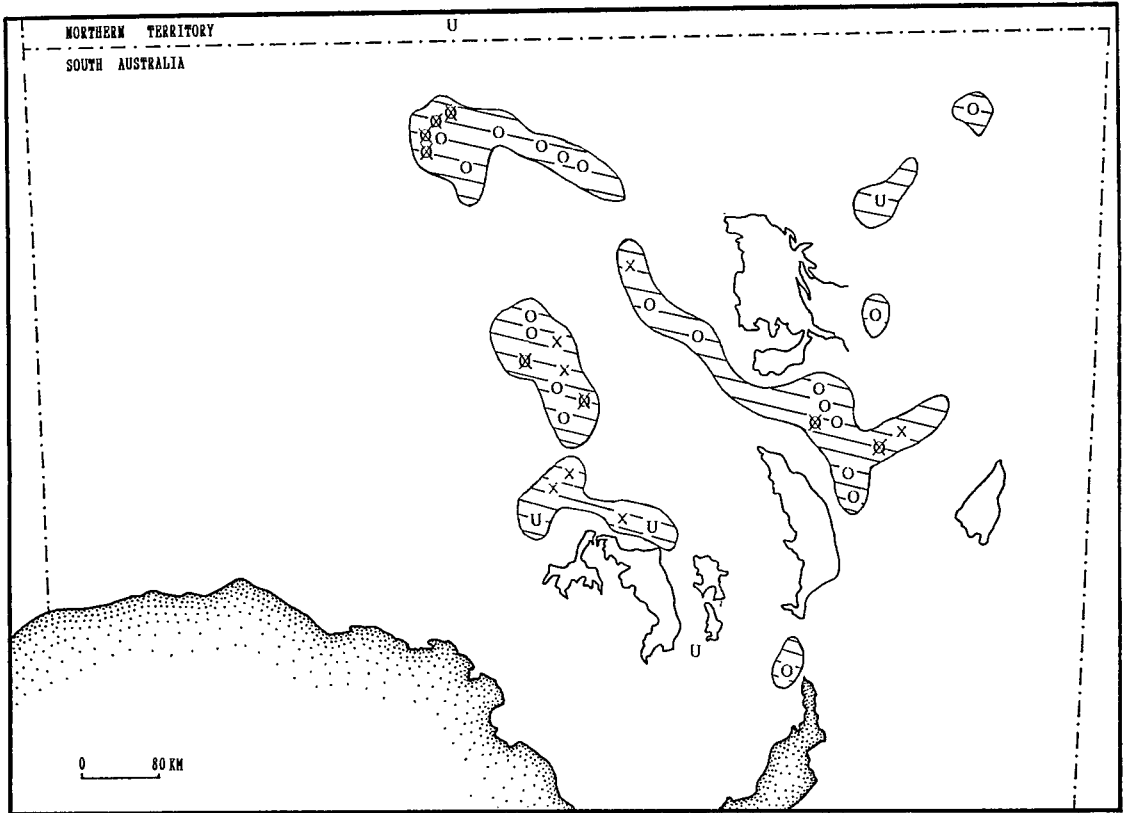
2. 21-33 km W of Oodnadatta	29 Jun 1914	Jul, Aug - not found (B.Wh. found)
3. 43-64 km W of Oodnadatta	30 Jun 1914	Jul - not found
4. Todmorden Stn 64-90 km W of Oodnadatta	1 Jul 1914	Jul, Aug - not found (B.Wh. & S.Wh. found)
5. Lambina Soak (see text)	5 Jul 1914	Aug - not found (S.Wh. found)
6. Tableland E of Wantapella Swamp	9 Jul 1914	Jul - not found (S.Wh. found)
7. Between Mt Johns & Chambers Bluff, tableland and SW of Wantapella Swamp	18 & 21 Aug 1914	Jul - 2 groups of ca 12 & 2-3 birds (with S.Wh.)
8. Indulkana Creek	22 Aug 1914	Aug - group of 4 and 2 pairs
10. Nilpinna Stn 40 km N of William Ck	5 Sep 1966	Jul, Aug - (see 25, 29 in this area) (B.Wh. found)
11. 1 km S of William Creek	6 Sep 1966	Jul, Aug - not found (B.Wh. found)
14. 35 km E of Marla	9 May 1967	Aug - not found (B.Wh. nearby)
25. Granite Downs Stn Airstrip	13 Sep 1981	Jul - not found (S.Wh. found)
	Sep 1983	Jul - 2 birds Aug - 2 birds (with B.Wh. & S.Wh.)
	Jun 1987	
29. Indulkana Ck 3-5 km W Granite Downs Airstrip	23 Dec 1986	Jul - not found Aug - 3 birds attending a nest, 2 young (with B.Wh.)
30. *62 km E Kulgera	19 Sep 1987	Not visited.
39. 7 km WNW Nilpinna Station Homestead	---	Jul - not found Aug - 1 bird (B.Wh. nearby)

LYNDHURST -- BIRDSVILLE TRACK REGION

16. Myrtle Springs Stn, 22 km SW of Lyndhurst	10 Aug 1968	Sep - not found
19. Callanna Stn, 3 km SW Marree	May 1975	Apr, Jul - not found
20. 30 km SSE of Koonchera W.H.	15 Aug 1975	Apr - not found (B.Wh. found)
21. 3.2 km S of Cannawaukaninna Bore	6 Sep 1976	Apr - not found
23. Kingston Bore, Witchelina Stn	12 Mar 1979	Apr - 3 birds, Aug - 3 birds
24. 3 km S North Tank Witchelina Stn	22 Jun 1979	Apr, Aug - not found (S.Wh. nearby)
26. *7 km E of Cowarie Station	30 Sep 1982	Apr - not found (B.Wh. nearby)
27. 18 km W of Marree	13 Nov 1983	Aug - not found
31. Mt Lyndhurst	30 Jun 1987	Feb-Oct, this population studied during 1990
32. 1 km W of Leigh Creek South	1987	Sep - not found (S.Wh. found)
40. 18 km NE of Mt Lyndhurst Stn	---	3 groups seen (S.Wh. nearby)

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Map 3. Summary of *Aphelocephala pectoralis* distribution. Hatched areas were searched in 1990, O indicates records prior to 1990, X indicates records during 1990, ⊗ indicates records during 1990 at sites of previous records, U indicates unconfirmed records.

feeding areas available, while too few may limit food resources. An apparent trend is that at localities where there have been repeated observations or more than one group of *A. pectoralis* seen (i.e., possibly sites with larger and/or more stable populations) the habitat tends to have a greater cover of chenopod shrubs and herbs. However at some localities of single observations where subsequent searches have been unsuccessful, habitats are very open (i.e., few shrubs and extensive bare gibber). Possibly the species only moves into the latter areas after population increases and/or during favourable seasons. Alternatively, the birds may occur at very low density in very large home ranges in such areas, so that their presence at any one site is infrequent, leading to the appearance of a nomadic existence. Notably observations near Cannuwaikaninna and Koonchera followed seasons of exceptional rains in the region.

Obvious degradation of chenopod habitat has occurred due to past heavy grazing (e.g. in the

Oodnadatta area), and this may explain the lack of recent observations at some of White's localities. Severe damage to perennial shrubs (defoliation, ringbarking, root damage) and the widespread destruction of palatable annual plants, by Rabbits *Oryctolagus cuniculus* was observed at many sites in 1990. The large proportion of dead perennial shrubs and severe damage to most of those remaining indicates an alarming trend of shrub decline.

Considerable areas (thousands of hectares) of suitable habitat have been, and are still being destroyed, by heavy opal-mining machinery in the Coober Pedy area and more recently on Lambina Stn.

**7. Tableland South-West of Wantapella Swamp.** This is an extensive area of gently undulating Low Bluebush-gibber tableland, with a mosaic of small bare stony pans and low stony rises. About 40% of the area was bare substrate. Shrub



Figure 1. Typical habitat at Mt Lyndhurst, Locality 31.

cover was predominately *Maireana astrotricha*, *Eremophila freelingii*, with some Bladder Saltbush *Atriplex vesicaria*. A few widely scattered 2-3 m Mulga *Acacia aneura* and Dead Finish *Acacia tetragonophylla*, and numerous small dead mulgas occurred in patches. Much dried herbage remained from the previous excellent season, mainly small grass tussocks, several small *Sclerolaena* spp. and *Rolypoly Salsola kali*.

**12. Teal Hole Dam.** The habitat comprises extensive areas of low undulating gibber hills crossed by several minor watercourses lined sparsely with small Mulga (2-4 m) and Dead Finish (2 m). Perennial shrub cover (to 40 cm) was mainly Low Bluebush and Bladder Saltbush, mixed with scattered *Ptilotus obovatus* and *Rhagodia spinescens* and several areas of Bluebush *Maireana sedifolia* (60 cm high and 2-5 m apart). Dried remains of previous season's small *Sclerolaena* spp. and grass tussocks were present but over 50% of the area was bare gibber.



Figure 2. Typical habitat on tablelands South-west of Wantapella Swamp, Locality 7.

**24. Kingston Bore, Witchelina Station.** This is an area of low gibber covered hills within ca 1 km of a much used stock watering point where the habitat formerly closely resembled that at Mt Lyndhurst described below (as judged by nearby less heavily grazed areas on Witchelina). Larger shrubs *Eremophila freelingii* and *A. victoriae* and Dead Finish (1-2 m) were spread 50-100 m apart and small *Rhagodia spinescens*, *M. astrotricha* and *Maireana pyramidata* (30-40 cm) were sparsely scattered 2-30 m apart. Small *Sclerolaena* spp., *Atriplex vesicaria* and grasses were browsed to less than 10 cm and much bare substrate and loose stone was apparent.

**25. Granite Downs Station Airstrip.** In this area there are extensive gently undulating gibber tablelands extending into nearby low flat-topped hills with similar vegetation. Scattered sparse patches of small mulga (3-4 m) occur with a sparse shrub understorey of *E. freelingii* and *Cassia* sp. (1-2 m) and occasional Dead Finish (2-3 m) and mixed smaller chenopods, *Maireana triptera*, *M. astrotricha*, *M. pyramidata*, *Atriplex vesicaria*, *Sclerolaena cuneata* and other small *Sclerolaena* spp., both scattered among the small trees and in open areas lacking larger shrubs. There was a sparse cover of small grass tussocks, *Calandrinia* and *Sclerolaena* spp. and dry everlastings *Gnephosis* less than 10 cm high, with over 40% bare soil and stones.

**28. 18 km South of Manguri Siding.** This area is gently sloping Bluebush-gibber tableland with widely scattered larger shrubs (2 m), mainly Dead Finish and some *Eremophila*, bluebushes included *M. astrotricha* & *M. sedifolia*. Also *M. pyramidata*, *M. triptera*, *Maireana ovata*, *Atriplex vesicaria*, *Ptilotus obovatus*, and *Rhagodia spinescens* were



Figure 3. Typical habitat near Teal Hole Dam, Locality 12.

well represented. Small Bindii *Sclerolaena* spp., grass tussocks and dead *Salsola kali*, formed sparse cover with over 50% bare soil and stones.

31. **Mt Lyndhurst Study area.** Low gibber and shingle covered hills, dissected by numerous minor drainage lines. Low, open shrubland, mainly Low Bluebush *M. astrotricha*, mixed with Saltbush *Atriplex vesicaria* and scattered *M. ovata*, *M. aphylla*, *M. pyramidata*, *Rhagodia spinescens*, *Sclerolaena longicuspis* and *S. cuneata*. Larger shrubs (1-2 m) widely scattered or sparsely spread along drainages were mainly *Eremophila freelingii*, *E. duttoni*, *E. longifolia*, *Acacia tetragonophylla*, *A. victoriae*, *Santalum lanceolatum*, and occasional small Mulga. Low herbage, mainly dried from previous seasons, included small grass tussocks, several small *Sclerolaena* spp. and Everlastings including *Gnephosis arachnoidea*. Bare stony substrate made up 60-80% of the surface area.

#### **Brief habitat descriptions (all other *Aphelocephala pectoralis* localities)**

##### *Port Augusta — Coober Pedy Region*

1. Port Augusta — areas of open stony chenopod shrubland, shrubs mainly *M. sedifolia*, *M. pyramidata*, *M. astrotricha* and *Atriplex*. Widely scattered larger shrubs and occasional patches of Mulga or Myall.

9. Stuarts Range — Low stony hills and breakaways, see localities 12, 28, 34, and 38 for examples in this area.

13. Mt Sandy — Old Stuart Highway — Mainly *M. astrotricha* and *Atriplex*, stony low open shrubland with scattered patches of small Mulga.

15. Old Stuart Highway between Ingomar and The Twins — As for 13 above and with areas of *M. sedifolia*.

18. Coober Pedy airstrip — Now a degraded area surrounds the airfield with numerous bulldozed tracks and large areas of bare mullock heaps, remnant gibber tableland with scattered *M. aphylla*, *M. triptera*, *Atriplex*, *Salsola*, *Sclerolaena* spp. and grasses. Scattered shrubs including *Acacia victoriae* and *Cassia* sp.

22. 30 km South-South-East of Tarcoola — Black-oak *Casuarina cristata* woodland (to 9 m) with a mixed *Acacia*/*Eremophila* shrub understorey on sandy flats between sandhills with *Eucalyptus socialis*, *Eucalyptus pyriformis* and *Triodia* sp.

33. Glendambo — Myall *A. papyrocarpa* open

woodland (to 6 m) scattered Bluebush *M. sedifolia* and herbage mainly Ward's Weed *Carrichtera annua*, Ball Bindii *Disocarpus paradoxus* and other small bindiis.

34. 12 km South of Coober Pedy — Low gibber breakaway with scattered small Mulga, Dead Finish and *Eremophila* spp. and *Cassia* sp, sparse cover of small shrubs included *M. sedifolia*, *M. astrotricha*, *M. triptera*, *Atriplex vesicaria* and *Ptilotus obovatus*, sparse cover of small bindiis and grasses leaving over 40% bare substrate.

35. 31 km West of Glendambo — Gently undulating gibber tableland with mixed *M. astrotricha* & *M. sedifolia*. Scattered larger shrubs included *Eremophila freelingii*, *Rhagodia spinescens* and *Lycium australe*. Small *Sclerolaena* spp. and grasses and everlastings leaving over 50% bare stony areas.

36. 7 km North-East of No.3 Company Tank, Wilgena Station. — A broad *Atriplex vesicaria*/*M. astrotricha* plain of red sandy soil with patches of *M. sedifolia*, *Lycium australe* and thinly scattered small Mulga. Small *Sclerolaena*, *Disocarpus* & grasses leaving over 50% bare soil.

37. 11 km North-East of No.3 Company Tank, Wilgena Station. — A low stony hill with small *M. sedifolia*, *M. triptera* and *Atriplex vesicaria* and mixed small bindiis, grasses and dry everlastings leaving over 60% bare stone & soil.

38. 70 km South of Coober Pedy — low rocky rise with widely scattered small Mulga, Dead Finish, *M. sedifolia*, a few small *M. astrotricha*, *Atriplex*, *Rhagodia spinescens* and *Ptilotus obovatus* and dry Roly poly, everlastings and small grasses.

##### *Oodnadatta Region*

2, 3, 4. Oodnadatta to Todmorden area — Broad slightly undulating gibber plains crossed at intervals by *Acacia* lined watercourses, and with occasional sparse patches of Mulga, Dead Finish and *Eremophila freelingii*. Sparse chenopod cover, variously *M. astrotricha*, *Atriplex vesicaria*, *M. aphylla*. Ground cover comprised *Sclerolaena* spp., *Disocarpus*, small grasses and dry everlastings leaving large bare gibber areas.

5. Lambina Soak — The *Eucalyptus camaldulensis* and Mulga lined Alberga watercourse is flanked by low stony hills sparsely covered with Mulga, very few small shrubs and a sparse cover of grasses.

6, 8, 29. Indulkana Creek to Wantapella Swamp — see description for 25. Granite Downs Station airstrip.

10. Nilpinna, 40 km North of William Creek. — Low stony hills with scattered small Mulga, Dead Finish, *Eremophila freelingii*, *M. astrotricha*, *Atriplex vesicaria*, dry herbs and grasses and extensive bare gibber comprising 75% of the surface area.

11. 1 km South of William Creek — Gibber tableland with scattered *M. pyramidata*, *Atriplex vesicaria*, small bindiis and dry grasses.

14. 35 km East of Marla — Gently undulating well grassed gibber tableland with scattered patches of Mulga. Sparse cover of *Atriplex* & *Sclerolaena* spp. and a few areas of shrubs including *E. freelingii*, *E. sturtii*, *Cassia* sp. & *A. tetragonophylla*.

39. 7 km West-North-West of Nilpinna — Low flat topped hills and undulating gibber with widely spaced Dead Finish, *E. freelingii* & *E. duttoni*, *Rhagodia spinescens*, a few patches of *M. astrotricha* & *M. pyramidata*, and small *Atriplex vesicaria*, dead bindiis and grasses, leaving about 80% bare stones and soil.

#### Lyndhurst — Birdsville Track Region

16. 22 km South-West of Lyndhurst — Low gibber hills with a sparse cover of small *M. pyramidata* & *Zygophyllum aurantiaceum* and nearby areas of sparse *M. astrotricha*. *E. freelingii* and Dead Finish were widely scattered. Sparse cover of small bindiis and grasses with much bare stony substrate.

19. Callanna, 3 km South-West of Marree — Broad plain of white quartz gibber patches with areas of mixed low chenopods mainly *Atriplex vesicaria*, with some *M. pyramidata*, *M. astrotricha* and scattered larger Old man Saltbush *Atriplex nummularia*. Small bindiis and dry grasses left 60-80% bare substrate.

20. 30 km South-South-East of Koonchera WH — Broad gibber plains between widely spaced sandhills, sparse patches of *M. astrotricha* and a few *A. ligulata* and *Cassia* sp. and 80-90% bare gibber.

21. 3.2 km South of Cannuaukaninna Bore — Isolated clumps of *M. pyramidata* and several Dead Finish to 3m in a broad expanse of mainly bare gibber.

24. 3 km South of North Tank, Witchelina Station. — Very similar to 31. Mt. Lyndhurst but

with extensive areas of white quartz gibber and denser cover of dry grasses.

26. 7 km East of Cowarie Station. — Extensive slightly undulating tableland over 75% bare gibber, a few widely spaced *M. pyramidata*, *Rhagodia spinescens*, small *Atriplex vesicaria*, small bindiis and grasses.

27. 18 km. West of Marree — Undulating gibber sparsely shrubbed with *M. pyramidata*, *E. freelingii*, Dead Finish and sparse herb cover of bindiis & small grasses.

32. 1 km West of Leigh Creek South — Low stony hills with sparse cover of *M. astrotricha*, a few larger shrubs & small trees and mixed bindiis and grasses.

40. 18 km North-East of Mt Lyndhurst Station. — as for 31 Mt Lyndhurst study site.

#### Association with other bird species

Several species commonly occur in the habitats used by Chestnut-breasted Whitefaces *A. pectoralis* (e.g. White-winged Wrens *Malurus leucopterus*, Calamanthus *Sericornis campestris*, Thick-billed Grasswren *Amytornis textilis* and Cinnamon Quailthrust *Cinclosoma cinnamomeum*) but have wider distributions, are also found in a larger variety of habitats and where they occur with *A. pectoralis*, are usually more numerous. The only small sedentary passerine occurring in similar habitat, which was less frequently encountered in 1990, was the Samphire Thornbill *Acanthiza iredali*, (observed twice on Wilgena Station). That species is known to have declined in the region, but with so few early records, such declines in *A. pectoralis* are not clear, and can only be demonstrated through changes in habitat, as suggested above.

*A. pectoralis* occurs with other *Aphelocephala* species in some areas (see Table 2). The larger Southern Whiteface *A. leucopsis* occurs with *A. pectoralis* where tree-lined watercourses or patches of trees are adjacent to gibber-chenopod areas, and competition from *A. leucopsis* seems a possible factor in the absence of *A. pectoralis* from timbered areas.

Mixed groups of *A. pectoralis* and Banded Whiteface *A. nigricincta*, as first noted by White (1915a, b.) were only seen in one area in 1990. A pair of *A. pectoralis* watched among a large feeding group of *A. nigricincta* and *A. leucopsis* were usually the last birds to leave when the group moved, and they remained quiet while the other species

called noisily and *A. nigrincincta* displayed frequently. No interspecific aggression was observed even when two *A. nigrincincta* fed with three *A. pectoralis* which were feeding young in a nearby nest.

*A. nigrincincta* occurs widely within the northern range of *A. pectoralis* and was more frequently seen in 1990, even in areas of chenopod-gibber apparently suitable for *A. pectoralis*. However *A. nigrincincta* was usually in or adjacent to sandy habitats which it also typically occupies in its wider distribution. *A. nigrincincta* may continue to occupy areas degraded by grazing (e.g. with reduced chenopod shrub cover and more sand drifts) which may formerly have been used by both species. Whatever competition there is between these two species, it is not the sole factor contributing to the low population of *A. pectoralis* as the latter is thinly distributed even in areas where *A. nigrincincta* rarely occurs.

The association with Cinnamon Quailthrush noted by Drummond (1988) was often observed at several localities in 1990, to the extent that it became a deliberate strategy while searching for *A. pectoralis* to look for smaller birds near any Quailthrush seen. The whitefaces fed among feeding Quailthrush, and if the Quailthrush left an area the whitefaces soon followed. This made close observation of *A. pectoralis* difficult when with Quailthrush as it was seldom possible to approach such groups without the wary Quailthrush retreating.

### Breeding behaviour & displays

The rising display flight and song of *A. nigrincincta* described by Goodwin (1967) were observed at several localities during 1990, and an increase in this activity and early morning singing by *A. nigrincincta* was noted at several localities after overnight rain. At several other localities in July and August where new plant growth showed that there had been recent rain, a few *A. pectoralis* gave display flights closely resembling those of *A. nigrincincta*, with a song closely resembling the *A. nigrincincta* song but not so prolonged or frequently repeated. All calls given by *A. pectoralis* were distinct from other species in their thin, high pitched quality lacking the varied fluty tones of *A. nigrincincta* and the loud hard double noted calls of *A. leucopsis*. Tape of *A. pectoralis* contact calls played to a mixed group of the three whiteface species received no response except from the two *A. pectoralis* present. These approached and gave contact calls and one bird sang briefly.

At Mt Lyndhurst no song or display was observed in *A. pectoralis* except briefly in answer to tape recorded calls, and no early morning calling was heard, although J. Reid (pers. comm.) heard early morning calling at this locality in September 1988. Only two of the 11 groups observed there in late October 1990 had reared single juveniles and two nests near completion in September were later abandoned unused. This very limited breeding observed at Mt Lyndhurst in 1990 was surprising, even though mainly dry conditions prevailed, as other sedentary passerines in the same area had fledged young in early September (e.g. Calamanthus, Cinnamon Quailthrush, Thick-billed Grasswren, White-winged Wren).

Hooded Robins *Petroica cucullata* had newly fledged young and two White-winged Wrens were incubating presumed second clutches of eggs in late October. This limited breeding response to conditions adequate for other species may contribute towards low population levels. However *A. pectoralis* may attempt to raise successive clutches when conditions are more favourable as suggested by observations (T. Hunt pers. comm., G. Holmes in litt.) at a nest at Mt Lyndhurst between August and October 1989.

### Total population size and status

There have been no previous attempts to estimate the total population of *A. pectoralis*. The ease with which the species is overlooked means that its presence or absence in large areas of its range is difficult to determine.

This study found populations at 14 localities spread throughout the species' previously reported range. The above includes populations found at seven of the 33 previously reported localities. The birds appear to be sedentary within large home ranges in at least some areas (Pedler in prep). Whether populations are sedentary in the most sparsely vegetated gibber areas or whether these areas are used by the species only after favourable seasons is not known. The actual area occupied and the population densities in that area are still largely unknown and figures given below should be regarded as informed guesses.

Areas of bluebush-gibber habitat comparable with that at Mt Lyndhurst, and thus likely to have similar populations of *A. pectoralis*, comprise a very small portion of the distribution of the species. Much more sparsely vegetated gibber areas, with presumed far lower densities of *A. pectoralis* make up a larger



portion. Mulga or Myall woodlands and sandhill areas within the species' distribution are believed to contain very few or no *A. pectoralis*.

Up to approximately 20 groups (c. 70 birds) were found in or near a 14km<sup>2</sup> area studied at Mt Lyndhurst in 1990 (Pedler in prep.). A population density of up to 6.6 birds/km<sup>2</sup> found at Mt Lyndhurst in 1990 was believed to be above average following several excellent seasons, and may fall to much lower levels, perhaps as low as 1 or 2 birds/km<sup>2</sup>, after poor seasons. In addition the number of areas searched without locating the species suggests that for unknown reasons their local and wider distribution is patchy. The effect on population density from competition with *A. nigricincta* and *A. leucopsis* in areas of sympatry is unknown.

The confirmed population at the sites where *A. pectoralis* was found in 1990 is no more than a few hundred birds, and the species is probably no longer found at some previously reported localities. The paucity of early records, however, makes it difficult to define any changes in the species' distribution or abundance.

Rough population estimates for the three regions are as follows: Lyndhurst — Birdsville Track, less than 1500; Oodnadatta, less than 2000; Coober Pedy — Port Augusta, less than 2500; giving a total estimate of less than 6000. The species' conservation status is best described as vulnerable in recognition of its small population size, relatively confined, patchy and incompletely known distribution, its possible poor breeding response to seasonal conditions acceptable to other small sedentary arid-zone species, and most importantly the continued degradation of its habitat by rabbits and possibly livestock. Greatly increased effort and research into rabbit control in the arid zone is arguably the most important and urgent requirement for conservation of many species inhabiting inland Australia. The effects on *A. pectoralis* of perennial shrub and tree loss and the alteration of habitat through the grazing of rabbits and stock should be investigated.

Opal mining also threatens to destroy further extensive areas of suitable habitat.

Further searches of the previously reported localities and similar areas are required to confirm continued presence or absence of *A. pectoralis*, and to determine the extent of populations found in 1990. Continued monitoring of populations through a range of seasons is needed to understand the species' population dynamics and ecological requirements.

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