

A REVIEW OF THE DISTRIBUTION, HABITAT AND CONSERVATION STATUS OF THE WESTERN WHIPBIRD *PSOPHODES NIGROGULARIS LEUCOGASTER* IN THE MURRAY MALLEE

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SUMMARY

We list all known records, including several recent unpublished reports of the Murray Mallee subspecies of the Western Whipbird, *Psophodes nigrogularis leucogaster*. It is known from 12 areas in the Big Desert and Sunset Country (Victoria) and Ninety-mile Desert and Billiatt regions (South Australia). Contemporary habitat and present vegetation and tenure are described and compared for these sites. Habitat is characterized more by vegetation structure than vegetation age or floristics. Most sites where this subspecies has been recorded have a dense shrubby understorey (1.5 to 2m) below an open mallee layer (3 to 5m). In contrast with the older ages apparently preferred by Western Whipbirds in Western Australia, Western Whipbirds in the Murray Mallee have been recorded from vegetation of diverse ages, though mostly from areas last burnt from 10 to 25 years previously.

The conservation of the Western Whipbird in this region is a formidable problem, because of the small size and probable impermanence of local populations, difficulty of locating and censusing, insufficient knowledge of their ecology, the catastrophic effects and unpredictability of severe fires, and the continued clearing of mallee vegetation.

INTRODUCTION

The subspecies of the Western Whipbird occurring in the Murray Mallee of South Australia and Victoria (*Psophodes nigrogularis leucogaster*) has been recorded rarely and intermittently. Its discovery, at Manya in the Sunset Country of Victoria in 1932 (Howe & Ross 1933), was spectacular. The species had by then become listed as "probably extinct" (R.A.O.U. 1926). Previously, it had been recorded only from the coastal south-west of Western Australia. The collection of the first specimen at Manya followed a long search for an elusive bird whose "mystery" call and unusual nest first attracted attention and speculation some thirteen years previously (Howe 1928). Its subsequent history has also been remarkable. Two new populations were discovered within ten years of the 1932 record in neighbouring areas of South Australia, and nearby in the Big Desert of Victoria. These, and the Manya group, apparently disappeared not long after. By 1966, the subspecies had been

unreported for 25 years and was regarded as "probably extinct" by Condon (1966). One year later a population was located at Comet Bore in the Ninety-mile Desert of South Australia (Condon 1969). Further populations have since been reported sporadically and, again, most seem not to have persisted.

In this paper, we summarize all known records of *P. n. leucogaster* and include several recent unpublished reports. We direct attention especially to habitat information, as the maintenance of optimal habitat may now provide the most suitable management procedure for the conservation of the Western Whipbird in this region.

Though their subspecific status requires clarification, other populations of *P. nigrogularis* are known from Kangaroo Island and Yorke Peninsula in South Australia (*P. n. pondalowiensis*) and Eyre Peninsula, South Australia, and scattered localities in the southern coastal area of Western Australia (*P. n. nigrogularis*). All populations are regarded as rare or uncommon, and it has probably declined throughout its range (Blakers *et al.* 1984).

P. n. leucogaster has been known as the Mallee Whipbird or Mallee Western Whipbird (e.g. Bryant 1938; McGilp & Parsons 1939; Hunt & Kenyon 1970). These vernaculars are not used here as all subspecies occur in mallee vegetation.

A detailed account of the discovery of the Western Whipbird in the Murray Mallee and notes on its habits were presented by Howe & Ross (1933). Hunt & Kenyon (1970) added much more ecological information. Condon (1966) summarized the then known distribution and ecological data for all subspecies of the Western Whipbird. Keast (1958) considered its evolutionary history. The distribution, conservation status and habitat of the species in Western Australia were reviewed recently by McNee (1986).

METHODS

We compiled distribution data from all published records and museum specimens of this subspecies, and from several recent unpublished records. The latter include some where identity has not been confirmed. We include such records because this species is notoriously difficult to detect, because the total number of records is so few, and in the hope that the listing of possible records may encourage further searches in these areas. In all cases we indicate records that are unconfirmed.

One population, at Malinong, South Australia (35°34-39'S 139°31-32'E), was monitored by HJE from 1977 onwards. The current status of all other recorded populations was examined in a 20 day search (by JW) between 25 October and 14 December 1985. Additionally, JW spent about 150 days at various locations in the Big Desert in (unrelated) fieldwork during 1985. Broadcasts of previously recorded whipbird calls were made frequently every day during the intensive searches and occasionally over the rest of the year. Throughout this period JW listened specifically for whipbird calls and actively searched through a broad range of heathy vegetation.

RESULTS

Summary of all records

Records are listed in chronological order for each locality. Asterisks denote unconfirmed reports. The locations of all sites are as given in Figure 1. Museum specimens are from the South Australian Museum (SAM) and Museum of Victoria (MV). There are no specimens of *P. n. leucogaster* in the C.S.I.R.O. Australian National Wildlife Collection, the H. L. White collection or the Australian Museum. Throughout, "current tenure and habitat" refers to status as at the time of our latest fieldwork (late 1985).

1. MANYA (Victoria). 35°06'S, 141°01'E.

First record: 1919 (Howe 1928; Howe & Ross 1933).

Latest records: 1932 (Howe & Ross 1933; Bryant 1938; Howe & Burgess 1942; Chisholm 1946).

Museum specimens: MV B6 (skin).

Contemporary habitat: Howe & Ross (1933) listed it from areas of "scrubby pine" (presumably *Callitris verrucosa*), an extensive tea-tree *?Leptospermum coriaceum*) flat of dense scrub including Broombush *Melaleuca uncinata*, Porcupine Grass *Triodia irritans* and occasional

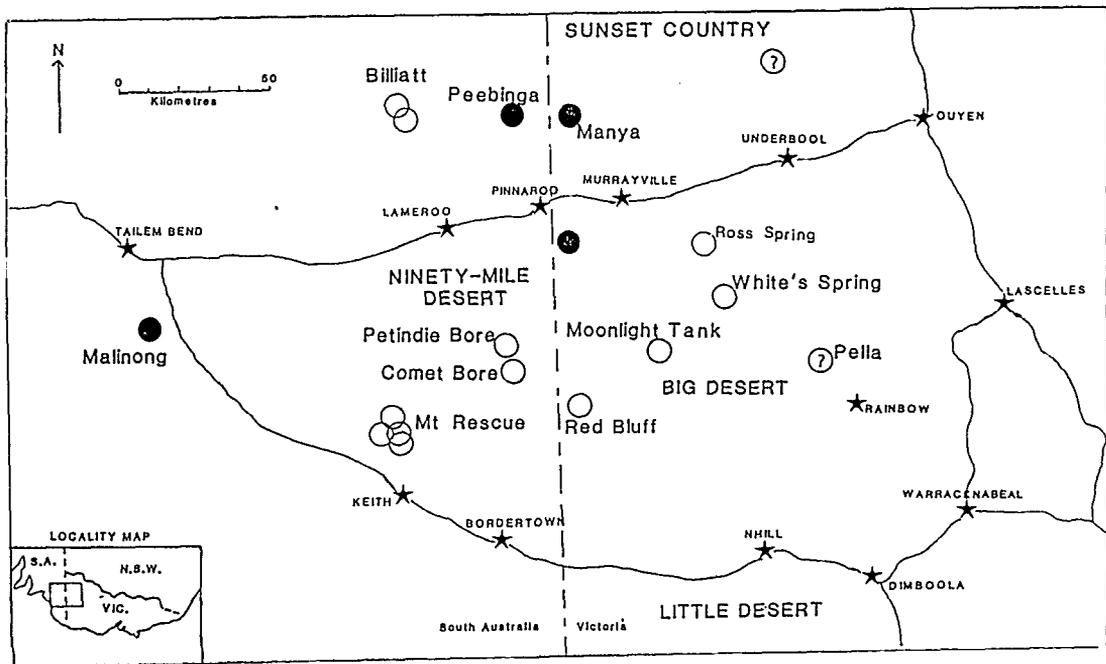


Figure 1. Map of portion of the Murray Mallee, showing locations of records of *Psophodes nigrogularis leucogaster*. Shaded circles denote localities with museum specimens, open circles denote other records, and open circles with question marks denote records considered unconfirmed.

Quandongs *Santalum* sp. They also saw birds in short scrub (low *Triodia*, broombush and tea-tree) burnt "a year or two before".

Current tenure and habitat: Much of the area is alienated and now cleared. Some pockets of public land remain, and are of "uncommitted" status. Where native vegetation persists, it is now tall (5-10m) and floristically depauperate, dominated by *M. uncinata*. No fires have been reported for at least 50 years.

2. PINNAROO/PEEBINGA AREA (S.A.). 35°03'S, 140°48'E.

First record: 1936 (McGilp & Parsons 1939), 16 miles north of Pinnaroo.

Latest records: 1940 (Condon 1966).

Museum specimens: SAM B22381 (skin), SAM B22382 (skin), SAM B22010 (eggs), SAM B19913 (eggs), SAM B30691 (nest).

Contemporary habitat: 'mallee scrub with plenty of cover consisting of short broom, tea-tree and acacia with a predominance of rather tall "spinifex" (McGilp & Parsons 1939).

Current tenure and habitat: Most of the area has been alienated and cleared. Some is reserved in Peebinga Conservation Park where the vegetation is tall mallee, including patches of broombush to 8m and senescent *Triodia*, apparently unburnt for at least 50 years.

3. MURRAYVILLE AREA (Victoria). 35°20'S, 141°02'E.

First record: 1940 (SAM specimen). 15 miles S of Pinnaroo; 1941 (Howe & Burgess 1942; Condon 1966), 13 miles SSE of Pinnaroo.

Latest records: 1941 (Howe & Burgess 1942; Condon 1966; Hunt & Kenyon 1970).

Museum specimens: SAM B2291 (eggs).

Contemporary habitat: 'Broombush six feet high' (W. Barrett, in Hunt & Kenyon 1970).

Current tenure and habitat: Northern fringe of the Big Desert is alienated and cleared. Immediately south of this location is uncommitted public land of mainly tall mallee with a dense shrub layer of *M. uncinata* and *C. verrucosa*. The most recent major fire was in the 1940s.

4. COMET BORE (S.A.). 35°45'S, 140°48'E.

First record: 1967 (Condon 1968; Hunt & Kenyon 1970; Hatch 1977). Note that this locality was mistakenly (Hunt 1976) called Bunn's Bore in Hunt & Kenyon (1970).

Latest records: 1973 (Hatch 1977), 1978 (T. Hunt pers. comm.).

Contemporary habitat: 'Scrub-mallee, 4 to 6 feet high, and the rest mainly young broombush 2 to 3 feet high, with occasional clumps of porcupine grass' (Hunt & Kenyon 1970); 'thick broombush' (Hatch 1977).

Current tenure and habitat: Included in the extensive Ngarkat Conservation Park. Open mallee (*Eucalyptus incrassata* with or without *E. foecunda* and *E. dumosa*) over dense heathy understorey (*M. uncinata*, *Banksia ornata*, *Leptospermum myrsinoides*, *Allocasuarina pusilla* and *Baeckea behrii*); last burnt between 1954 and 1959 (Anon. 1984).

5. PETINDIE BORE (S.A.). 35°38'S, 140°46'E.

First record: 1968 (M. Steeter pers. comm.).

Latest records: 1978 (T. Hunt pers. comm.); *1985 (K. Menkhorst & M. Schulz pers. comm.).

Contemporary habitat: Dense heath (1-2m) of *Banksia ornata*, *L. myrsinoides*, *M. uncinata*, *Baeckea behrii*, *A. pusilla* and *Phyllota pleurandroides* and scattered *E. incrassata* to 2m.

Current tenure and habitat: Included in Ngarkat Conservation Park. Vegetation as above. Last burnt between 1954 and 1959 (Anon. 1984).

Unpublished records: M. Steeter observed a whipbird calling on 5 October 1968 in *Banksia* heath about 8 km N of Petindie Bore. The bird flew about 30m and when approached again it ran towards the observer and gave a scolding call.

K. Menkhorst & M. Schulz briefly sighted a Western Whipbird in open *Banksia* heath 2 km S of Petindie Bore on 7 April 1985.

6. RED BLUFF (Victoria). 35°53'S, 141°04'E.

First record: 1969 (Hunt 1969, Hunt & Kenyon 1970).

Latest records: 1979 (T. Hunt pers. comm.); *1984 (this survey).

Contemporary habitat: Dense patches of broombush under open mallee, with some *Triodia* (Hunt & Kenyon 1970). Broad dune swales dominated by broombush, generally below waist height. Scattered mallee eucalypts to 6 feet high and occasional patches of *Triodia* and heath (Hunt 1969).

Current tenure and habitat: Included in the Red Bluff Fauna Reserve. Vegetation in the area of the 1969-1979 sightings is now mid-dense broombush (*M. uncinata* and *Baeckea behrii*) to 2-3m under open mallee. Last burnt in 1959.

Unpublished records: On 5 November 1984, JW (with L. Williams) heard a probable whipbird call about 1 km W of Red Bluff. This bird did

not respond to playbacks and was not again recorded in seven subsequent visits. Vegetation was sparse mallee (*E. incrassata*) to 3-5m over open, floristically diverse heath (*Banksia ornata*, *Calytrix tetragona*, *A. pusilla*, *A. muelleriana* and *L. coriaceum*).

7. MOONLIGHT TANK (Victoria). 35°48'S, 141°24'E.

First record: 1974 (Reilly 1974; Hunt 1976).

Latest records: 1974 (T. Hunt pers. comm.).

Contemporary habitat: "mallee-broombush" (Hunt 1976).

Current tenure and habitat: Public land designated "uncommitted", with broombush harvesting permitted during the last decade. Patches of dense and moderately tall (to 2m) broombush (*M. uncinata* and *Baeckea behrii*) under open mallee and scrubby heath dominated by *Hakea muelleriana* and *L. coriaceum*. Last burnt in 1959.

8. MALINONG (S.A.). 35°34-39'S, 139°31-32'E.

First record: 1974 (J. Riddell pers. comm.).

Latest records: 1985 (HJE).

Museum specimens: SAM B39062 (skin), SAM B32752 (nest), SAM B32753 (nest), SAM B32754 (nest), SAM B32755 (nest), SAM B37215 (nest), SAM B32756 (nest), SAM B32434 (nest).

Contemporary habitat: Low (1m) dense heaths on ridges interspersed with mallee (to 3m) swales. Dominant species include *E. diversifolia*, *E. incrassata*, *E. foecunda*, *Banksia ornata*, *L. coriaceum*, *L. myrsinoides*, *Phyllota remota*, *P. pleurandroides*, *Baeckea behrii*, *B. crassifolia*, *Adenanthos terminalis*, *Allocasuarina muelleriana*, *A. pusilla*, *Lasiopetalum bauerii*, *L. behrii*, *Xanthorrhoea semiplana* and *X. australis*.

Current tenure and habitat: All land here is alienated and the general district is extensively cleared. The areas where HJE recorded whipbirds (sections 120 & 121 hundred of Coolinong) are protected by Heritage Agreement over 500 ha of uncleared land, and are tenuously linked to a further ca 2500 ha of uncleared land immediately south (property of J. Riddell). The most recent fire in the Riddell block was probably in the 1950s and that in Eckert's was about 1960.

Unpublished records: Whipbirds were recorded by Mrs J. Riddell in August 1974. The next record was by HJE in late February 1977. Animated calling from several birds was heard between then and October 1977, and again from late autumn to early spring of 1978 and 1979. During these

periods, calling occurred during all daylight hours, though it was most common in mornings and evenings. Calling was not heard on cold, windy or overcast days.

In 1979, HJE (with G. B. Ragless) established that the population here comprised at least six pairs, in territories of less than 20 ha. On 8 September 1979, HJE located a nest ready for eggs, but this was found to be deserted on 16 September. A nest with two eggs was found in a different territory on that date, and on 13 October a nest with two dark naked young was located near the original (deserted) nest. These young left between 20 and 24 October. A further nest was found almost completed on 13 October and with one egg on 20 October, but it was deserted soon after. Several other old nests were also located and are presumed to derive from before 1979. All nests were in clumps of *Xanthorrhoea*, and were from 10 to 50 cm above ground.

During 1980 and 1981 the population in this area declined to one or two pairs and calling was much reduced. A severe drought occurred in 1982 and no calling was then heard. Subsequently, few calls have been heard, however the intensity of searching has also been very limited. The apparent high density of whipbirds between 1977 and 1979 coincided with an unusual abundance of the moth *Synemon sophia* (Castniidae).

9. BILLIATT (S.A.). ca 34°58'S, 140°29'E.

First record: 1975 (Hatch 1977: Carpenter & Matthew 1986).

Latest records: 1984 (Carpenter & Matthew 1986), 1987 (D. Kraehenbuehl & G. Carpenter pers. comm.).

Contemporary habitat: Records were of birds seen in several different vegetation types. G. Carpenter (pers. comm.) recorded whipbirds in (i) dense *Callitris verrucosa* (1-2m high) under scattered *E. incrassata*, which was last burnt at least 35 years before, (ii) scattered *E. incrassata* (3-4m high) over a moderately dense scrub layer of *Allocasuarina muelleriana*, *L. coriaceum*, *Spyridium subochreatum* with some *Baeckea behrii*, *Phebalium bullatum*, *C. verrucosa*, *Grevillea pterosperma*, *Hakea muelleriana* and *Triodia irritans* on a small dune last burnt in 1960/61, (iii) a flat area dominated by *Eucalyptus socialis*, *E. foecunda*, *E. calycogona*, and *E. dumosa* (2-3 m tall) over a moderately dense shrub layer of *Baeckea behrii*, *C. verrucosa*,

Melaleuca lanceolata and *M. acuminata* to 1m. The record of D. Kraehenbuehl & G. Carpenter was in regrowth mallee shoots on farming land just south of Billiatt.

Current tenure and habitat: Most sightings are within Billiatt Conservation Park. Vegetation as described above.

10. MOUNT RESCUE (S.A.). 35°52-58'S, 140°18-22'E.

First record: 1977 (Hatch 1977; J. Reid pers. comm.).

Latest records: 1980 (J. Reid pers. comm.); 1985 (this survey).

Contemporary habitat: Recorded at several locations, near Gosse Hill, Rabbit Island Soak and Jimmy's Well. Vegetation described by N. Reid (J. Reid pers. comm.) as "low whipstick, *Triodia* and broombush", "whipstick", "*Allocasuarina pusilla* dominated heath", "depauperate mallee on limestone" and "*Eucalyptus diversifolia* scrub with dense *Banksia ornata*, *L. myrsinoides*, *Xanthorrhoea ?australis* and *Baeckea behrii* (to 1.5m), overtopped by scattered *Hakea muelleriana* (to 3m)". The 1985 record was in open heath dominated by low *Banksia ornata* and *Xanthorrhoea ?australis*, with scattered taller *Hakea muelleriana*.

Current tenure and habitat: Reserved in Mount Rescue Conservation Park. Vegetation as described above. The most recent fire was about 1980 at Jimmy's Well, and between 1960 and 1969 at other sites (Anon 1984).

Unpublished records: JW saw and heard at least three whipbirds about 2 km SE of Jimmy's Well (near survey marker "Ngarkat BS172") on 1 and 2 November 1985.

11. WHITE'S SPRING (Victoria). 35°29'S, 141°29'E.

First record: *1980 (PM & J. Davies pers. comm.).

Latest records: *1985 (T. Campbell pers. comm.).

Contemporary habitat: Moderately dense, low (3m tall) mallee (*Eucalyptus incrassata* and *E. foecunda*) with a dense understorey dominated by *C. verrucosa*, *L. coriaceum*, *H. muelleriana*, *Phebalium bullatum*, *Baeckea behrii* and *Calytrix tetragona* (to 1-2m tall).

Current tenure and habitat: Public land zoned as "uncommitted", with broombush-harvesting licensed in the area. Vegetation as above; last fire in 1959.

Unpublished records: Between 10 and 12 November 1980, PM (with J. Davies, G. Horrocks and A. Isles) heard calls identified as those of the Western Whipbird about 10 km S of White's Spring in the Big Desert. Since 1980, Tom Campbell, a local resident, has heard these calls on several occasions in this area.

12. ROSS SPRING (Victoria). 35°22'S, 141°30'E.

First record: *1982 (J. Davies pers. comm.).

Latest records: *1984 (T. Campbell pers. comm.).

Contemporary habitat: "1m tall *Banksia-Callitris* heath with some patches of mallee" (J. Davies pers. comm.).

Current tenure and habitat: Public land designated "uncommitted", with broombush-harvesting permitted. Vegetation as above (dominant species *C. verrucosa*, *L. coriaceum*, *Hakea muelleriana*, *Banksia ornata*, *A. pusilla*, *L. myrsinoides* and *Phebalium bullatum*). Last burnt in 1959.

Unpublished records: On 25 May 1982 near Ross Spring, J. Davies heard calls similar to those heard near White's Spring (above). These calls were also heard here by T. Campbell intermittently over the next two years.

Other records

We are aware of some other records tentatively attributed to Western Whipbirds in this region.

F. Noelker (pers. comm.) made a brief sighting of a bird he identified as a probable Western Whipbird near Pella (35°48'S, 141°51'E) on the eastern edge of the Big Desert in September 1979. This sighting was in an area of tall (3-5 m) old broombush (*Melaleuca uncinata* with some *Baeckea behrii*) with scattered *E. foecunda*, *E. incrassata* and *C. verrucosa*, and had not been burnt for at least 60 years. Noelker later obtained a report of a clutch of eggs labelled as whipbirds, collected from the same area also in 1979. These eggs "vanished" from the collection before Noelker could view them, and subsequently the collector was evasive.

P. Disher (pers. comm.) reported a Western Whipbird nest "south of Underbool" in 1971, and a possible sighting of a Western Whipbird in the Sunset Country between Pink Lakes and Mopoke Tank in the 1960s. There are no further details for these records.

DISCUSSION

Habitat

McGilp & Parsons (1939) and Hunt & Kenyon (1970) speculated that Western Whipbirds in the Murray Mallee were associated particularly with Broombush *Melaleuca uncinata*. This view has since been widely accepted (e.g. Schodde 1981; Ahern 1982) and has led to concern about the effects of an expanding broombush-harvesting industry. Alternatively, J. Reid (pers. comm.) considered that the distribution of Western Whipbirds in South Australia was correlated with the presence of limestone and with vegetation dominated by *Eucalyptus diversifolia*, this association holding for birds on Eyre Peninsula, Yorke Peninsula, Kangaroo Island and Mount Rescue. The floristic descriptions of many of the sites listed here (e.g. Petindie Bore, Malinong, Billiatt, White's Spring, Ross Spring) fall into neither of these categories. These sites are characterized rather by vegetation consisting of dense species-rich heath (dominated usually by *Hakea muelleriana*, *Callitris verrucosa*, *Leptospermum myrsinoides*, *Banksia ornata* and/or *Allocasuarina pusilla*). No particular floristic component is common to all sites where whipbirds have been reported.

Meredith (1982) suggested that Western Whipbirds favoured young vegetation. Hunt & Kenyon (1970) likewise inferred that whipbirds may occur typically in vegetation burnt relatively recently. In contrast, Smith (1985) and McNee (1986) claimed that in Western Australia the Western Whipbird inhabits old vegetation and requires long periods (30 to 50 years) without fire. Again, the records documented here show no consistent pattern in vegetation age (Table 1), with periods since fire varying from less than two years (Manya) up to at least 40 years (Murrayville, and the possible Pella record). Nonetheless, intermediate ages (ten to 25 years post-fire) seem most characteristic for whipbird sites. This is about the successional stage at which the density of terrestrial invertebrates reaches a peak, at least for broombush vegetation (Woinarski 1988a). Vegetation age is an important factor in the distribution of many other terrestrial insectivorous and omnivorous birds of the mallee. For example, the Shy Hylacola *Sericornis cautus* and Chestnut Quail-thrush *Cinclosoma castanotum* occur most commonly in regrowth of less than ten years; the Southern Scrub-robin

Drymodes brunneopygia occurs mostly in intermediate aged (ten to 30 years) regrowth; Malleefowl *Leipoa ocellata* and the White-browed Babbler *Pomatostomus superciliaris* are found mostly in areas where fire has not occurred for at least thirty years (Carpenter & Matthew 1986; Woinarski 1988b). Such relationships with vegetation age may be modified or blurred by responses of birds to occasional and localized outbreaks of particular invertebrate species, such as may have occurred with the Malinong population of whipbirds.

Table 1. Approximate periods since fire for all sites where *Psophodes nigrogularis leucogaster* has been reported. Note that some sites may occur in several age classes if whipbirds were recorded there over a period of several years.

Vegetation age (years)	No. of sites.
0 - 5	3
5 - 10	4
11 - 15	6
16 - 20	6
21 - 25	9
26 - 30	4
31	2

In comparison with the variability between records in vegetation age and floristics, most whipbird records are from areas with relatively similar vegetation structure (open mallee layer of three to five metres above a dense shrubby understorey of 1.5 to 2m). A preference for such vegetation structure may explain the whipbird's apparent flexibility in use of different vegetation types and ages. Because it reproduces vegetatively, broombush may grow rapidly after fire, and hence may be the preferred habitat for whipbirds following extensive fire. About ten to 12 years post-fire, the growth rate of broombush vegetation is surpassed by that of heath species (Specht 1966) which reproduce mostly by seed. Consequently, whipbirds may then shift into the relatively productive heath vegetation. The decampment resulting from such a strategy may explain the apparent impermanence of most of the known whipbird populations. The probability of whipbirds locating areas of the most suitable habitat would be dependent on the availability of a broad range of vegetation types and ages.

Conservation

The Western Whipbird in the Murray Mallee presents a difficult conservation problem. Clearly, it is rare; its preferred habitat cannot yet

be predicted accurately; it is difficult to locate and census; and its local populations, which typically contain few birds, apparently do not persist in any given area over a long period. The serendipitous discovery of new populations has, in the past, typically been greeted with claims that whipbirds may well be common and/or widely distributed across the mallee area (e.g. McGilp & Parsons 1939; Hunt & Kenyon 1970; Attwood 1977; Hatch 1977; Parker & Reid 1979; Close 1982). This optimistic presumption is probably not well founded. Rather, it is more prudent to categorize the bird's status as rare or uncertain. Accordingly, all known and newly discovered sites where whipbirds occur should merit protection. In South Australia this, admirably, appears now to be the case (Parker & Reid 1979; Anon 1984). In contrast, most of the Victorian sites occur in "uncommitted" public land and are vulnerable to disturbance (e.g. broombush-harvesting).

Egg-collecting has been, and may still be, a threat to the survival of local populations of whipbirds. This problem dates back to the initial discovery of whipbirds in this region by the enthusiastic egg-collectors Howe and Ross. Subsequently, collectors took eggs intensively from the Manya and Peebinga populations (Howe & Ross 1933; Bryant 1938; McGilp & Parsons 1939), and presumably from the Murrayville site (Howe & Burgess 1942). T. Hunt (1976 and pers. comm.) considered that egg-collectors were also active at Comet Bore, and F. Noelker's report shows clearly that egg-collectors remain extremely interested in this species. The impact of such activity on the Western Whipbird could be particularly significant given the small size of local populations and the relatively slow rate of natural recruitment. Unfortunately, the policing or prevention of this practice is extremely difficult in this fairly remote area. This difficulty is exacerbated by the low staffing levels maintained by conservation authorities throughout this region.

Local populations of whipbirds may also be adversely affected by the harvesting of broombush, an industry which is well-entrenched in the South Australian mallee and is expanding rapidly in the Victorian mallee (Woinarski 1988a). The clearing of vegetation on the outskirts of public land in the mallee (or even in public land in the Victorian mallee) may also decrease the survival chances of Western Whipbirds. The scale

of this clearing was lamented by naturalists as long as 50 years ago (Rix 1937; Bryant 1938; McGilp & Parsons 1939). Bryant (1938) even then blamed injudicious clearing for the loss of the Manya population. Areas of cleared vegetation may limit or inhibit the dispersal of whipbirds (McNee 1986). This may prevent them from reaching new sites following senescence, clearing or burning of previously-occupied areas.

Extensive bushfires have always been a natural hazard for mallee birds. For Western Whipbirds, they may now pose an even more serious threat because of the diminution of possible refuge areas. The particularly large fires of 1959, which burnt out most of the Big Desert, 1985 (Big Desert), 1986 (Ninety-mile Desert) and 1988 (Billiatt) may have obliterated many local populations and prevented survivors from locating suitable areas for recolonization. A pattern of small-area mosaic burning of mallee areas may be needed in order to ensure the availability of a broad spectrum of vegetation ages and to decrease the probability of catastrophic extensive bushfires.

Any serious effort to conserve this species in this region would require a thorough study of the biology of at least one local population.

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