

A LITERATURE SUMMARY OF THE PRINCESS PARROT *Polytelis alexandrae* AND A SUSPECTED RECENT BREEDING EVENT IN SOUTH AUSTRALIA

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ABSTRACT

Historical records of the distribution, breeding and diet of the Princess Parrot *Polytelis alexandrae* in Australia, from its first discovery in 1862 to the year 2000 are summarised. We hope to stimulate a greater interest in Princess Parrots, an increase in reported observations and further expand knowledge of it and its conservation requirements.

We recently sighted the Princess Parrot in the Unnamed Conservation Park of the Great Victoria Desert, South Australia during October 1998. This significant observation involves what was possibly a breeding pair attending a hollow in a marble gum *Eucalyptus gongylocarpa*.

This observation of the Princess Parrot is discussed in relation to other observations of this species, particularly those from South Australia. This comparison helps to identify trends in the Princess Parrot's ecology including distribution, seasonal occurrence, breeding, habitat requirements, favoured areas and feeding behaviour.

Finally the conservation requirements of this species are discussed. Descriptions of its conservation status range from endangered, vulnerable and rare, to declining, in apparent decline or indeterminate, due to insufficient knowledge. A possible link between the Princess Parrot and marble gum woodland in the Great Victoria Desert of South Australia is identified. It is recommended that this habitat is searched more thoroughly and frequently for evidence of Princess Parrot presence and breeding.

INTRODUCTION

The Princess Parrot *Polytelis alexandrae* is generally regarded as a rare nomadic inhabitant of the vast sandy deserts of central and western Australia (Forshaw 1981; Fleming 1992; Pizzey and Knight 1997), occurring mostly throughout the Great Sandy, Little Sandy, Gibson, Great Victoria and Tanami Deserts of Western Australia, South Australia and the Northern Territory.

Its favoured habitat appears to be spinifex and hummock grassland *Triodia/Plechtrachne* spp. covered dunes with desert oak *Allocasuarina decaisneana*, marble gum *Eucalyptus gongylocarpa*, mulga *Acacia aneura*, black oak *Casuarina cristata* [and *C. pauper*], sandhill bloodwoods *E. chippendalei* and desert walnut *Owenia reticulata* being the dominant trees (Forshaw 1981; Fleming 1992). Significant smaller trees and shrubs include desert poplar *Codonocarpus cotinifolius*, acacias *Acacia* spp.,

hakeas *Hakea* spp., grevilleas *Grevillea* spp., eremophilas *Eremophila* spp., sennas *Cassia* spp. and *Senna* spp., crotalaris *Crotalaria* spp. and parakeelya *Calandrinia* spp. (Forshaw 1981; Fleming 1992; Carter 1993).

Until recent years Princess Parrots were rarely seen. However, four wheel drive camping adventures into Australia's vast desert wilderness have now become very popular and consequently the frequency of sightings of Princess Parrots has increased markedly during the last fifteen years. This has been particularly so along the Canning Stock Route of the Great Sandy and Little Sandy Deserts of Western Australia where numerous observations including single flocks of 100+ birds were made during the early 1990s (Carter 1993).

The most notable breeding events have occurred along river red gum *Eucalyptus camaldulensis* creeks arising out of mountain range country in central Australia, particularly east, west and south of Alice Springs, during the late nineteenth and early twentieth centuries (North 1911; Forshaw 1981). On these occasions, large numbers of birds have suddenly irrupted out of their isolated desert wilderness and quite spectacular communal nesting events have occurred in places near human habitation (Spencer 1896; Keartland 1906; North 1911; Cain 1934; McGilp 1935).

The Appendix provides a gazetteer of locations cited in this paper.

Discovery and collection history

The Princess Parrot was discovered and first collected by Europeans at Howell's Ponds in northern Australia by Mr Frederick G. Waterhouse, a former curator of the South Australian Museum, Adelaide during Stuart's Trans-continental Expedition in 1862 (North 1896, 1911).

John Gould described this species from Waterhouse's specimens in the *Proceedings of the Zoological Society*, London in 1863. In

dedicating it to the daughter of the King of Denmark, the Princess Alexandra of Wales (who was betrothed to the Prince of Wales, the future King Edward VII), he named it *Polytelis alexandrae* (North 1911).

During the period 1862–1894, between Waterhouse and Keartland's observations and collection, Princess Parrots were rarely seen and shot on only three or four occasions (North 1896; Spencer 1896).

In about May 1890, a pair of live Princess Parrots was brought to Adelaide by Mr F.G. Magarey. They were collected during the breeding season of 1889 from Crown Point on the Finke River, Northern Territory about 50 miles NW of Charlotte Waters and about 600 miles S from where the type specimens were obtained. One of these birds was given to his cousin, Mr Alex Magarey of Crafers, the other to Mr W.J. Magarey of 'Heathpool'. This information was made public by Mr M. Symonds Clarke of Adelaide in the columns of the *South Australian Register* on 28 August 1890 (North 1911; Keartland 1906; Sutton 1929b).

Dr E.C. Stirling, Director of the South Australian Museum, shot three Princess Parrots at Newcastle Waters, Northern Territory during Lord Kintore's overland trip from Port Darwin in 1891. One was lost in the long grass and the two specimens collected were males. This locality is approximately 20 miles from Howell's Ponds where the type specimens were obtained in 1862 (Keartland 1906; North 1911; Sutton 1929b).

Mr G.A. Keartland secured 15 specimens whilst on the Horn Scientific Expedition into Central Australia in 1894–95. This was in desert oak habitat between Glen Edith and Deering Creek at the western extremity of the MacDonnell Ranges (almost due north of Lake Amadeus) on 16 June 1894 (North 1896; Spencer 1896; Keartland 1906).

Mr Charles Pritchard, a gold prospector of central Australia, collected three eggs from a clutch of five from a nest hollow on the Hale River east of Alice Springs in 1894. He sent them to Mr Alfred J. North to describe and these eggs are now in the Australian Museum in Sydney (North 1896). Pritchard also collected a number of nestlings at this time (Keartland 1906).

G.A. Keartland wrote to A.J. North on 28 April 1895 telling him, 'Mr Winnecke, one of

the members of our late Expedition, has sent me a pair of live *Polytelis alexandrae*.' These were nestlings taken from nest hollows near their camp, presumably on the Hale or Hugh Rivers east and west of Alice Springs (North 1896).

Specimens collected by Keartland during the Horn Scientific Expedition were studied and described by A.J. North in 1895. North changed the generic name from *Polytelis* (Gould, 1863) to *Spathopterus*, in recognition of the spatulate third primary feather of the adult male (North 1896; Spencer 1896).

Keartland collected further specimens whilst a member of the Calvert Exploring Expedition into north-western Australia during 1896–97. Some were collected in August 1896 in the Great Sandy Desert about 300 miles NE of Lake Way; others were collected northwards towards Separation Well, but these were left with the abandoned collection at Joanna Spring. Two more were collected about 50 miles N of Joanna Spring in March 1897 (North 1896; Keartland 1906).

Princess Parrots were captured for the cage bird trade near Fossil Downs, Western Australia, shortly after 1896 (Kimber 1986).

Three chicks were taken from a nest at Coolgardie, Western Australia in about 1902 and were sent to Melbourne (Keartland 1906; North 1911). A specimen taken from Coolgardie (presumably also at this time) is held in the H.L. White collection in Melbourne (Forshaw 1981).

Mr and Mrs Hunter arrived in Melbourne from Menzies, in the East Murchison District, Western Australia with a pair of live Princess Parrots in 1903. They explained, '...the blacks procured the parrots, about twenty five miles from that town, last October 1902. The blacks had never previously noticed these birds in the district.' (Hurst 1903).

It was reported in the South Australian Ornithological Association minutes, dated 8 January 1904, that Mr L.C.E. Gee, warden of Goldfields at Arltunga, about 80 km ENE of Alice Springs, Northern Territory, 'had successfully brought to Adelaide half-a-dozen specimens of the Princess of Wales Parrots (*Polytelis alexandrae*)' (Symonds Clark 1948).

By 1911, the only type specimen (several were collected) apparently still in existence was the one received by Dr E.P. Ramsay from the late Mr F.G. Waterhouse and placed in the Australian

Museum, where it remains (North 1911).

Ten young Princess Parrots were captured on Lambinna (now Lambina) Station 110 miles NW of Oodnadatta in 1926. They were taken from nesting sites on the Alberga River. One escaped, the other nine were delivered into the aviary trade in Adelaide, being sold for five to ten pounds a pair. It was stated, 'They are very rare. It is hard to tell where they come from. I have been in this country for the last forty years, and this is about the third time I have seen them between here and Alice Springs.' (SAOA 1927; Cleland 1927).

McGilp (1935) reported that a number of birds from the Musgrave Ranges in South Australia were sent to Adelaide for the captive bird trade in 1934.

In 1935 John Sutton reported that two specimens of the Princess Parrot, a male and a female, were additions to the South Australian Museum collection (Sutton 1935).

During November 1943, specimens were collected from Lake Tobin, on the Canning Stock Route, in the Great Sandy Desert of Western Australia in casuarina woodland and desiccated marshland vegetation on a dry lake and sent to the Western Australian Museum (Forshaw 1981).

Aboriginal people at Hermannsburg Mission on the Finke River, Northern Territory collected nestlings for food in 1963 (Forshaw 1981).

A specimen was collected on 23 March 1964, at Wanjarri Station, Western Australia as a bird came to drink at a garden hose. This unsexed immature is now in the Western Australian Museum (Forshaw 1981).

A specimen was collected on 27 October 1965, 8 km E of Atlee Creek, Northern Territory (Parker 1969; Forshaw 1981).

DISTRIBUTION

Western Australia

Serventy and Whittell (1976) state that the Princess Parrot is an inhabitant of the arid interior of Western Australia, occurring north almost to the Fitzroy River, south to Wiluna, Sandstone and occasionally Menzies, and eastwards through the Great Victoria and Gibson Deserts to the central range country (Rawlinson and Warburton Ranges). The following observations support their summary.

In about the 1880s an unspecified number of

birds were observed at Fossil Downs, on the Upper Fitzroy River, Western Australia (Buchanan 1933; Parker 1971). This represents the most northerly record for Western Australia. Also, Mr L.A. Wells, leader of the Calvert Exploring Expedition into north-western Australia, saw Princess Parrots within 50 miles of the Fitzroy River, West Kimberley in May 1897 (North 1911; Keartland 1906).

Keartland observed 22 birds at Joanna Spring, about 230 km NW of Lake Tobin in the Great Sandy Desert during April 1897 (Storr 1981).

Coolgardie and Rawlinna in the southern Great Victoria Desert are the most southerly locations for Princess Parrots in Australia (North 1911; Blakers, Davies and Reilly 1984). Rawlinna on the southern end of the Connie Sue Highway, southern Great Victoria Desert, still features in relatively recent observations (Blakers, Davies and Reilly 1984). However, there appear to be no published records of this species from Coolgardie since the breeding event in 1902.

Le Souef (1914) claimed that drought conditions in Western Australia had seen the Princess Parrot moving as far south-west as Three Springs and that several young had been seen there in 1913. This was later challenged by Lendon (1973) who stated, '...the record from Three Springs, not far from the coast, is difficult to accept.' Forshaw (1981) supported this and suggested '...this record outside the arid zone could be attributed to mistaken identification of [Regent Parrots] *Polytelis anthopeplus*.'

At Lake Christopher, at the western end of the Rawlinson Range, near the Northern Territory border, a loose flock of at least 100 birds, in flights of a dozen, sometimes more, were in desert oak-sandhill country during early November, 1932 (Terry 1937; Parker 1971).

Princess Parrots were reported from Lake Tobin on the Canning Stock Route in casuarina woodland and desiccated marshland vegetation by K.G. Buller on 6 November 1943. He also saw a few at Well 37 on 27 November 1943 and large flocks between Wells 36 and 37 on 30 November 1943 (Storr 1981).

Buller also saw flocks at Lake Tobin on 4 January 1944 (Storr 1981).

Most Princess Parrot observations from the mid-1960s onwards are summarised in the *Handbook of Australian, New Zealand and*

Antarctic birds (HANZAB) (Higgins 1999) and are therefore not duplicated here. However, some general comments are included here in order to maintain a balanced perspective on the frequency of observations during that period. Several observations not mentioned in HANZAB are also included here.

Five birds were seen by L.A. Smith in desert oaks near Lake Tobin on 5 May 1979 (Storr 1981).

The *Atlas of Australian birds* (Blakers, Davies and Reilly 1984) mapped the distribution and breeding localities of Australian birds, including the Princess Parrot, during the period 1977–81. Only 16 records were reported from 11 one degree grid blocks for the whole of Australia during this time. A reporting rate of >40% occurred for seven 1° blocks covering the following locations in Western Australia: the Rawlinson Range (one block); the Great Sandy Desert, from near Balgo at the northern end of the Canning Stock Route, SW to Lake Tobin and approximately 300 km NW to Joanna Springs (five blocks); and near Rawlinna in the extreme southern Great Victoria Desert (one block).

The only other block for Western Australia, with a reporting rate of 11–40%, was from the north-western edge of the Great Sandy Desert, in the vicinity of the Oakover River, headwaters of the De Grey River some 350 km SE of Port Hedland. Here a flock of 15 adults was seen at water, and was the largest flock recorded during the five-year Atlas project. During the Atlas project there were no reports of breeding (Blakers, Davies and Reilly 1984).

A flock of four were observed at Well 40 on the Canning Stock Route in August 1981 (Hutchins and Lovell 1985).

Since 1980, observations in its northern range in Western Australia have been on or close to the 20th parallel in the northern Great Sandy Desert (Carter 1993; Parish and Bamford 1983; Blakers, Davies and Reilly 1984).

Hutchins and Lovell (1985), in discussing the distribution of the Princess Parrot, report that in recent years most sightings appear to have been made around Warburton Mission and some areas south of there. This mission is in the Warburton Range, Western Australia 240 km W of the junction of the South Australian, Northern Territory and Western Australian borders.

Three birds were sighted by Stephen Davies and Mandy and Michael Bamford at Lake

Disappointment, Great Victoria Desert, Western Australia in September 1987 (Davies, Bamford and Bamford 1988).

Quite considerable flocks have been seen along the Canning Stock Route in recent years. Carter (1993) lists 27 observations in Western Australia from 1987 to 1993, involving hundreds of birds sighted along the northern Canning Stock Route from about Well 36 through Lake Tobin to Well 44. A single traverse by Carter *et al.* of this section of the Canning Stock Route in 1993 found almost 300 of this rare parrot (Carter 1993).

Northern Territory

Storr (1977) described its Northern Territory distribution as the southern half of the Territory, north to Howell's Ponds.

Since the collection of the type specimens at Howell's Ponds in 1862—the most northerly occurrence for Australia—most Princess Parrot observations have been restricted to the southern Northern Territory, mostly around Alice Springs.

There appears to have been only one other recorded sighting from the far northern part of the Northern Territory since that time. Dr E.C. Stirling, then Director of the South Australian Museum, shot three princess parrots at Newcastle Waters, Northern Territory in 1891 (North 1911; Sutton 1929b). Fleming (1992) quite correctly states, '...in the 19th Century Alexandra's Parrot was recorded from as far north as Newcastle Waters, but there have been no subsequent sightings in the region.'

However, two other northern records warrant mention. J.B. Cleland observed two birds along a 250 km stretch of spinifex covered plains between Cockatoo Creek and The Granites, during August 1936. The Granites are situated on the Tanami Track near the Western Australian border about 500 km NW of Alice Springs (Cleland 1938). Also, the *Atlas of Australian birds* reported a pair of Princess Parrots breeding near Tanami, approximately 500 km NW of Alice Springs in the Western Desert Region of the Northern Territory, during 1968 (Blakers, Davies and Reilly 1984). Both of these observations occurred well north of its usual Northern Territory range.

Most records have come from the Central Range country further south. Storr (1967) comments that their movements in the Northern Territory seemed to be governed by the

occurrence of ephemeral waters and the flowering of acacias. At irregular intervals, often more than twenty years apart, they appear on the larger tree-lined watercourses arising in the MacDonnell Ranges, breed in river gums, then disappear with their young as abruptly as they arrived.

Lendon (1973) summarised its distribution further by commenting, 'There have been so few observations of this species that its range is extremely difficult to determine, as, like many other desert forms, it is presumably nomadic. In central Australia the records are all from places on or about the 24th parallel (Ellery Creek, Todd, Hugh and Hale Rivers).' He adds that more recent records are from 'the Bonython Ranges and half-way to the Petermann Ranges, and on Ringwood and Numery east of Alice Springs.'

Other than breeding events (covered later in this paper), only spasmodic sightings of relatively few birds have been recorded since 1862. They are as follows:

Princess Parrots were reported by Mr Liddle as present in mulga country near the eastern end of the Basedow Range SW of Alice Springs in October 1932 (Finlayson 1933).

J.B. Cleland observed a possible Princess Parrot during June 1935 whilst on a camel trip across a 100 mile stretch from Ayers Rock, ENE to Angas Downs Station. This stage was 'without water' and was through 'belts of mulga and more open country' and also 'red sandhills with desert oaks and porcupine grass (*Triodia*) with flats between.' (Cleland 1936).

Shane Parker reported observations from four separate localities W and NW of Alice Springs during the mid-1960s. They were reported without details of numbers from 8 km E of Atlee Creek on 27 October 1965. Also, five birds were seen at Mount Doreen; six 50 km W of Haast's Bluff and another two at Napperby, all observed during August–September 1967 (Parker 1969).

Parker (1971) also observed one bird in open mulga country 10 km N of Aileron on 10 April 1968 and another in open shrubland 21 km N of Alice Springs on 10 July 1968.

Robert Jenkins sighted one bird in July 1977 near Angas Downs station in acacia scrubland with *Triodia* sp. ground cover (Forshaw 1981).

The *Atlas of Australian birds* recorded Princess Parrots in a total of three 1° blocks for the Northern Territory, 1977–81 (Blakers, Davies

and Reilly 1984). The reporting rate for all three was >40%. They covered from Docker River on the Northern Territory–Western Australia border, NE to the James and MacDonnell Ranges and east to Alice Springs.

HANZAB lists a further 12 confirmed observations of mostly single birds, pairs and small flocks throughout the southern and SW parts of the Northern Territory from 1980 to 1996 (Higgins 1999). One of these observations, that of c. 40 birds sighted near Jupiter Well in July 1990, is incorrectly included in the Northern Territory section. Jupiter Well is situated many hundreds of kilometres to the west in the Gibson Desert of Western Australia.

South Australia

The first record of the Princess Parrot in South Australia was in 1905. It was described by Keartland (1906) who wrote that Princess Parrots had been found '...breeding within eighty miles of Oodnadatta, the terminus of the trans-continental railway. This is the first time they have been noted in South Australia proper, and the most southerly point by several hundred miles of which we have any record. Hitherto Crown Point was the southern boundary.'

McGilp (1935) suggested that the Musgrave Ranges are probably the southern limit of the Princess Parrot's distribution in South Australia, despite earlier references which detailed breeding as far south as the Alberga River, NW of Oodnadatta (Keartland 1906; North 1911).

Condon (1968, 1975) stated that all South Australian records of the Princess Parrot were from the extreme north of the state and that it ranged as far south as Oodnadatta.

Lendon (1973) summarised its distribution further by commenting, 'There have been so few observations of this species that its range is extremely difficult to determine, as, like many other desert forms, it is presumably nomadic...' and that its range extends, '...southward to places near the South Australian border (for example Tomkinson Ranges, Finke, Abminga, and Lambinna) and farther south to the vicinity of Alberga and Oodnadatta.'

There are no records from north-eastern South Australia (Blakers, Davies and Reilly 1984; Fleming 1992).

Sightings of non-breeding birds have been few and far between. In fact, Shane Parker, then Curator of Birds at the South Australian

Museum, informed Joe Forshaw in 1979 that there had been no recorded sightings of Princess Parrots in South Australia since 1933 (Forshaw 1981). This appears to be slightly inaccurate, as according to McGilp (1935), Princess Parrots were present in the Musgrave Ranges in 1934.

Observations of non-breeding Princess Parrots appear below.

Two birds were seen at Mt Irvine (probably now Mt Irwin) 100 miles W of Hamilton (Creek) Bore in 1926 (Cleland 1927).

Higgins (1999) incorrectly reported Princess Parrots to be plentiful in the Musgrave Ranges during October 1932, citing information from Finlayson (1933). In fact, Finlayson's account gives no indication of the abundance of Princess Parrots at this time, and more importantly, is for birds observed in the Basedow Range of the Northern Territory.

An unknown number were reported by Fraser Vickery in the Musgrave Ranges in 1961 and by Darrell Kraehenbuehl *et al.* in the Everard Ranges in 1968 (Allen 1987).

Four birds were observed and photographed by Ross Allen in the Unnamed Conservation Park, Great Victoria Desert, South Australia on 10 September 1986. They were in mulga and black oak with marble gum on the ridges. Cassias, crimson turkey-bush *Eremophila latrobei* and lobed spinifex *Triodia basedowii* made up most of the understorey (Allen 1987).

A road-killed individual was found between Marla and Coober Pedy in December 1986 (Higgins 1999).

George and Ruth Aspley *et al.* sighted four birds 136 km W of Vokes Hill Corner in the Unnamed Conservation Park, Great Victoria Desert on 12 October 1989. These birds were photographed by Mark Shephard (SAOA 1991; Shephard 1995).

Lyn Crossley sighted a single bird in Tallaringa Conservation Park, eastern Great Victoria Desert, during an Australian and New Zealand Scientific Exploration Society (ANZSES) preliminary expedition into this region in October 1993 (Crossley 1994; Shephard 1995).

The *Atlas of Australian birds* received no reports of Princess Parrots in South Australia during 1977-81 (Blakers, Davies and Reilly 1984).

Queensland

Storr (1973) in a list of Queensland birds cites a literature record that includes the lower

Diamantina River in south-western Queensland within the Princess Parrot's range. Condon (1975) in *The checklist of the birds of Australia* also included south-western Queensland within this species' distribution. Forshaw (1981) states that he knows of no other records for that state.

More recently, HANZAB reports that there are only two reports from Queensland, both unconfirmed. One is from near Cloncurry in 1968 and the other E of Windorah in November 1991 (Higgins 1999).

BREEDING

Past Breeding

The earliest literature summarising the breeding habits of the Princess Parrot stated, '...whilst most species of parakeets resort to the same districts to breed year after year, *Spathopterus alexandra* usually makes its appearance in some locality where it has never been seen before. Immediately the young ones are able to fly they assemble in flocks, and suddenly take their departure.' (North 1911).

This breeding phenomenon was first alluded to by Baldwin Spencer (1896), who in writing about this species' ability to irrupt in large numbers stated, '...they were very rare indeed before they seem from some cause to have appeared in considerable numbers at one or two spots, such as the Hale River to the east of Alice Springs and at Illamurta in the James Range in the early summer months of 1894 (November), but since then they have again disappeared.'

North (1911) added to this, stating that in November 1894, Princess Parrots 'came in great numbers to several places in the vicinity of Alice Springs, Central Australia, much to the surprise of residents who had been in the locality for thirty years without seeing them.'

The first recorded breeding of Princess Parrots in the wild was in about May 1889. This was substantiated in 1890, when a pair of live birds was brought to Adelaide by Mr F.G. Magarey. They were collected during the breeding season of 1889 from Crown Point on the Finke River, Northern Territory, about 50 miles N of Charlotte Waters and about 600 miles S from where the type specimens were obtained (North 1911; Sutton 1929b).

In 1894 further breeding occurred, this time along the Hale River and other rivers east of

Alice Springs. Mr Charles Pritchard, a gold prospector, in writing to A.J. North on 15 November 1894, stated, '...this is the first time on record that they have made this their breeding ground, but I do not think they have come to stay, and perhaps in a year or so they may be as rare as ever.' Pritchard stated that they were nesting in eucalypts on the banks of the Hale River and other large watercourses in the area. The birds nested in hollows, laid a clutch of five eggs and that several pairs of birds may nest in hollows in the same tree. He also stated that they do not always perch along the limb as Keartland found at Glen Edith, but also perch, as other parrots do, across the limb (North 1896, 1911).

Mr C.E. Cowle also wrote to North on 15 November 1894, informing him that Princess Parrots occasionally flew about his camp at Illamurta in the James Range, SW of Alice Springs and that they were breeding on the Hugh River (North 1896).

This breeding event was further substantiated by Kimber (1986) who wrote, 'In June 1894 a small flock of about 15 were seen in the western MacDonnell Ranges, but by November of that year they were in both the western and eastern MacDonnell Ranges and were breeding in large numbers.'

By 1897 captive birds were not the rarity they were a decade ago. Mr A. Zietz, Assistant Director of the South Australian Museum, claimed to be the first person to successfully breed this species in captivity, with a fully feathered young leaving its nest box on 17 January 1897 (North 1911). It is interesting to note that Hutchins and Lovell (1985) claimed that the first official captive breeding of this species in South Australia was by Mr F.P. Kell in 1929.

The first breeding reported from Western Australia was in 1902, from Menzies in the east Murchison District. As with other breeding, all Princess Parrots had disappeared a few weeks after the last chicks had fledged. They also bred at Coolgardie, Western Australia around this time (North 1911).

The *Atlas of Australian birds* (Blakers, Davies and Reilly 1984) includes 1903, 1909 and 1920 in a list of years that breeding took place in the Central Range region of Australia. The only literature we have found to support this is for the period 1903–05. The following extract from

an SAOA Journal, dated 8/1/1904, indicates that breeding took place in 1903. Mr L.C.E. Gee, warden of Goldfields at Arltunga about 80 km ENE of Alice Springs, Northern Territory, 'had successfully brought to Adelaide half-a-dozen specimens of the Princess of Wales Parrots (*Polytelis alexandrae*).' (Symonds Clark 1948). Also, Kimber (1986) states that Princess Parrots were again back in central Australia from August 1903 to 1905.

The first breeding record from South Australia was in 1905. Mr Alfred North received a letter from Mr Keartland dated 29 May 1905 detailing the following information: 'I had a letter from Mr L.A. Wells the other day, in which he informed me that whilst out on his last trip he saw *Spathopterus alexandrae* breeding on the Alberga River, about 80 miles NW from Oodnadatta. He also saw them in the Musgrave Ranges. They were, therefore, in South Australia proper, as the southern boundary line of the Northern Territory is only 4 miles S of Charlotte Waters.' (Keartland 1906; North 1911).

It appears likely that breeding also took place at Abminga in South Australia in 1905, as evidenced by Cain (1934), who in writing about this species breeding at Abminga in 1933, stated that it was 28 years since they were last there.

Ten young Princess Parrots were captured on Lambinna Station (now Lambina Station), 110 miles NW of Oodnadatta in 1926. They were taken from nesting sites on the Alberga River. The person reporting this stated, 'They are very rare. It is hard to tell where they come from. I have been in this country for the last forty years, and this is about the third time I have seen them between here and Alice Springs.' (SAOA 1927; Cleland 1927).

Princess Parrots 'arrive in fair numbers' near Abminga during 1933 and breeding takes place (Cain 1934).

They were reported by McGilp (1935) to have been fairly numerous and nesting in eucalypts in the Musgrave Ranges country in 1934.

During January 1963 Princess Parrots nested in river red gums along the Ellery Creek and further west along the Gilbert Creek, which is a tributary of the Finke River near Hermannsburg Mission SW of Alice Springs, Northern Territory. They were in such large numbers the local Aboriginal people were able to collect nestlings for food (Forshaw 1981).

A pair was reported breeding near Tanami in

the Western Desert region of the Northern Territory in 1968 (Blakers, Davies and Reilly 1984).

Alan Lendon visited Hermannsburg Mission Station during August 1968 and was informed by local Aboriginal people that Princess Parrots visited and bred on the Finke River about four or five years earlier and that this species was '...quite unknown to any of the Aborigines who were less than about thirty-five years old.' (Lendon 1973). This is presumably the same breeding event that Forshaw (1981) described as occurring on the Finke River near Hermannsburg Mission in January 1963.

They were reported breeding in the Laverton district of Western Australia 11 km E of Mt Luck and '25 miles from Menzies', Great Victoria Desert in October 1984 (Storr 1986).

Fleming (1990) reported Princess Parrot nesting near Cloncurry in 1968, this being the first breeding record for Queensland. Garnett (1992) added that this breeding had occurred in the Selwyn Range, approximately 80 km S of Cloncurry in NW Queensland. After closer

scrutiny, this report of breeding has been listed in HANZAB as unconfirmed (Higgins 1999).

Adult Princess Parrots with dependant young along the Canning Stock Route, Great Sandy Desert on 22 July 1993, were indicative of recent breeding in this area (Carter 1993). There have been a few other recent breeding observations from this locality, including evidence of poaching of eggs and young (Higgins 1999).

Recent breeding (suspected)

At about 1200 h on 2 September 1998 whilst driving E along the Anne Beadell Highway in the Unnamed Conservation Park, Great Victoria Desert the authors flushed a Princess Parrot from a marble gum near the edge of the track. The brightly coloured male flew a short distance and landed in another marble gum about 30 m away.

Having braked to a sudden halt and amid much excitement, our attention was with this bird. However, it had disappeared from view in a leafy canopy and so we returned our attention to the tree from which it had first come and noticed



Figure 1. A female Princess Parrot in a hollow of a large marble gum at Unnamed Conservation Park on 2 September 1998 (photo, Chris Baxter).

an obvious hollow in the upper branches about 15 m above the ground. At that instance a female raised its head and shoulders out of the hollow entrance. We had a clear view of the bird from our parked vehicle which was about 50 m from the tree. The bright lime green in the shoulder of the wing and beautiful pastel pink of its throat and bill could be clearly seen.

It stayed there, side on to us and motionless for about five minutes. During this period several photographs were taken with a 35 mm Pentax SLR camera fitted with a 200 mm zoom lens. The final photo, of the female in the hollow, was

from about 30 m (see figure 1). During this time RH searched for the male. After some minutes of fruitless observation, the male suddenly burst from the leafy canopy and calling several times in flight, flew quickly back to the nest tree. Once again it disappeared amongst the foliage. Upon our closer approach with the camera, the female left the nest hollow and with the male, flew low and direct to another marble gum some 300 m away on a dune crest.

The birds were left alone. A closer inspection of the nest hollow showed the main trunk of the nest tree went up for 15 m, then forked into two main branches angled at about 45° (see figure 2). Both had broken off in the distant past and now had dead hollows in them. The nest hollow was about 1 m above this main fork, coming off the left hand branch and rising as a vertical spout to a height of about 40 cm. It was an obvious hollow, its entrance being rimmed with a fifteen centimetre-wide collar of dead timber. Otherwise, its exterior was covered with creamy white marbled bark, which matched the outward appearance of the rest of the tree.

CB scaled the tree with a torch and saw that the interior walls of the nest hollow were quite shiny and smooth, the dead wood appearing shiny from constant rubbing. The spout was about 15 cm in diameter, went straight down for about 30 cm, then curved where it joined the main branch. Unfortunately, the bottom of the nest hollow could not be seen and the presence of eggs or young remained unconfirmed.

The site is 42 km W of Vokes Hill Corner in the Unnamed Conservation Park of far-western South Australia. This is part of the Great Victoria Desert and is about 120 km E of Serpentine Lakes on the Western Australian border (see figure 3). The nest hollow tree was growing in the swale of east-west orientated five metre-high dunes, among a lovely open eucalypt woodland of many large and small marble gums. Also, there was an association of scattered mulga, horse mulga *Acacia ramulosa* and occasional stunted mallee, thought to be mostly beaked red mallee *Eucalyptus socialis*.

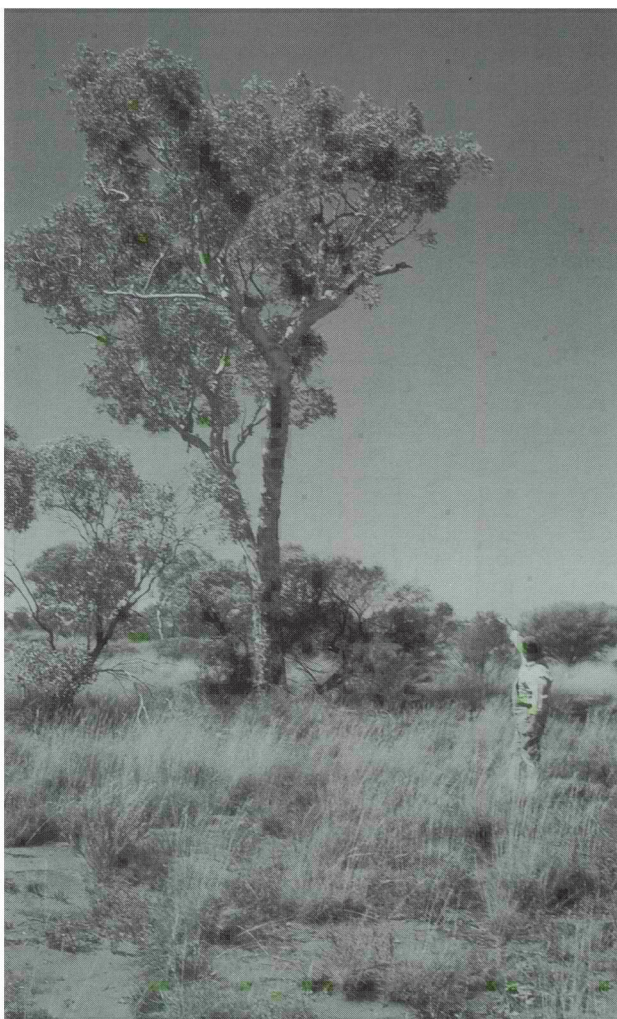


Figure 2. The suspected nest hollow is approximately 16 m above the ground in the left-hand fork of the main trunk of the marble gum (photo. Chris Baxter).

The understorey was dominated by lobed spinifex, with a few other scattered smaller shrubs and grasses comprising mostly *Senna* spp., crimson turkey-bush, and desert thryptomene *Thryptomene maisonneuvei*

Aware of this species communal nesting habit, we briefly searched the surrounding area for other occupied nest trees, but found none.

We departed this remote location at 1300 h and did not return.

DIET

It is widely accepted that the favourite food of the Princess Parrot is the seeds of spinifex *Triodia* spp., and that the birds are seldom found outside this habitat (Kearland 1906; North 1911; Serventy and Whittell 1976; Forshaw 1981).

North (1911) comments, '...this species usually breeds about the time the spinifex seed is ripening, and in the vicinity of water; as many as ten nests have been found in one tree. Whenever I saw them in either central or north-western Australia, it was invariably amongst the spinifex, the seed, which is like very small canary seed,

they are extremely fond of.' He went on to say that the food of this species consists almost exclusively of small grass seeds and that a Mr Fred Turner, to whom he submitted the contents of a crop of one of Kearland's birds for examination, referred the seeds to the following species: spinifex *Triodia mitchelli*, mulga grass *Danthonia bipartita* [syn. bandicoot grass *Monachather paradoxa*] and common purslane *Portulaca oleracea* (North 1896, 1911).

Serventy and Whittell (1976) state that the food consists chiefly of the seeds of spinifex (*Triodia irritans*) and purslane *Portulaca* sp., and the bird is almost restricted to spinifex. Slater (1978) comments that breeding usually takes place when the spinifex is seeding and surface water is freely available. Forshaw (1981) refers to past literature which indicates that these parrots feed mainly on seeds of grasses, acacia seeds and herbaceous plants, procured on or near the ground. He adds, 'I suspect that fruits, berries, blossoms and insects and their larvae are also eaten.'

Storr (1967) differs slightly, stating that its movements are mainly governed by the occur-

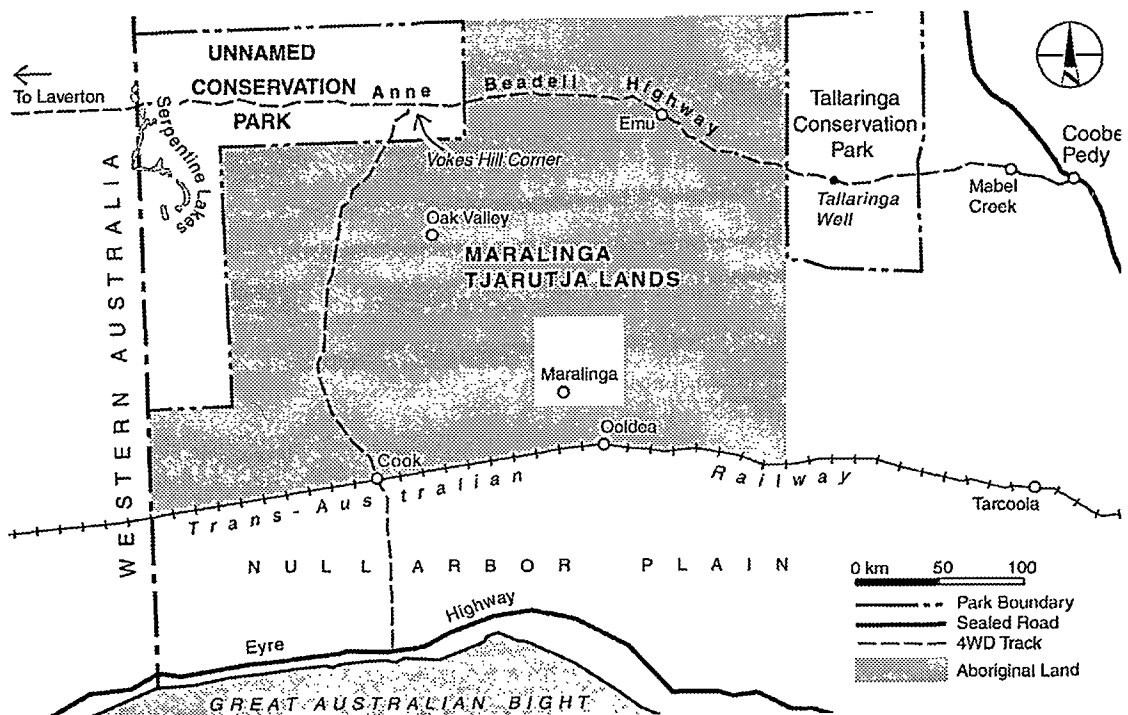


Figure 3. Map showing the locations of Vokes Hill Corner, the Anne Beadell Highway and Unnamed Conservation Park (Source: Department for Environment and Heritage).

ence of ephemeral waters and the flowering of mulga. Carter (1993) also differs somewhat saying that the Princess Parrot is an avid blossom feeder and that long-leaf corkwood *Hakea suberea*, *Grevillea wickhamii* and birdflower *Crotalaria cunninghami*, along with the leaves of desert poplar, are also part of their diet. He also adds that his and other recent sightings on the Canning Stock Route show native grass seeds to be part of the diet, but not spinifex, and that they are only occasionally terrestrial.

Other feeding observations include birds apparently feeding on the seeds of thread-petal *Stenopetalum anfractum* (Allen 1987), parakeelya and the introduced natal grass *Rhynchelytrum repens* and taking nectar from crotalaria flowers (Fleming 1990). Also, the fruits of mistletoe (e.g. *Amyema* spp.) are included in the diet (Reader's Digest 1986).

DISCUSSION

The current sighting was very close to where Ross Allen observed and photographed four Princess Parrots on 10 September 1986 (Allen 1987). His observation, the most southerly record for South Australia, was also on the Anne Beadell Highway, 24 km W of Vokes Hill Corner and only 18 km E of our sighting. The only other record from this vicinity was of four birds sighted by George and Ruth Aspley and photographed by Mark Shephard, 136 km W of Vokes Hill Corner on 12 October 1989 (SAOA 1991; Shephard 1995). These birds, which fed amongst spinifex tussocks and perched in mulga trees, were 94 km W of our location. These three records from the Anne Beadell Highway are on much the same latitude and hence the latter two do not extend the species' known southern range for South Australia.

The seasonal timing was also much the same, all three being in early- to mid-spring. Allen's observation being effectively only eight days different from ours. Consistent with past sporadic sightings of this nomadic species, the current observation appears to be the first recorded sighting in South Australia since Aspley and Shephard's in 1989—a span of nine years. It is rather more sobering to realise that a report by McGilp (1935), of birds breeding in the Musgrave Ranges in 1934, was the last recorded sighting for South Australia until

Vickery's record in 1961, some twenty seven years later! Another span of 18 years occurred between Kraehenbuehl's sighting in 1968 and Allen's in 1986 (Allen 1987).

There have been only five previous confirmed reports of breeding in South Australia. Two from the Alberga River (1905, 1926); two from the Musgrave Ranges (1905, 1934) and one from Abminga on the lower Finke system in 1933 (North 1911; Cain 1934; McGilp 1935).

Most of the past breeding events, particularly those notable ones involving larger flocks, have been in hollows of river red gums growing along the larger watercourses, mostly those occurring in Australia's Central Range Region around Alice Springs and in far northern and north-western South Australia. There is only the occasional reference to an isolated pair breeding far from water, in *Casuarina* spp. particularly the desert oak (Forshaw 1981).

The current suspected breeding appears to be the first report of an isolated pair nesting far from water in South Australia. It also appears to be the first record of Princess Parrots nesting in a marble gum. It is worth noting here that two separate individuals were observed in marble gum habitat far from water, near Lake Amadeus in the Northern Territory during November 1981 (M. Fleming pers. comm.; Blakers, Davies and Reilly 1984). However no sign of breeding was found.

It is not surprising that the current pair showed signs of breeding. There had been heavy rains in the surrounding countryside and the desert was looking very healthy. This was particularly so south of Vokes Hill Corner where for many kilometres the desert swales were covered with a mass of white flowering daisies and other numerous flowering ephemeral species. Spinifex dominated the desert and was noted to be lush and green and seeding in several places, including near the current observation.

Carter (1993) describes Princess Parrots as being-avid blossom feeders and having a strong liking for long-leaf corkwood and *Grevillea wickhamii* flowers growing along the Canning Stock Route in the Great Sandy Desert. Is it possible that similar plants in the Great Victoria Desert may also provide an attractive food source? Grevilleas and hakeas are well represented with three species of each occurring in the Great Victoria Desert, including long-leaf corkwood. During the time of our visit, fork-

leaf corkwood *Hakea francisiana* was flowering profusely, its eye catching pink-red flowers being a feature of the Unnamed Conservation Park. Desert rattlepod *Grevillea stenobotrya* and parakeelya were also in flower.

Also of interest is that four of the past five observations in South Australia have come from the Great Victoria Desert. Three of these have been in localities with marble gum present or nearby. It seems logical that these large and stately trees, with suitable hollows for nesting, would be attractive breeding habitat for the Princess Parrot, particularly during good seasons.

Conservation requirements

Much more work needs to be done in order to understand this species' feeding and breeding biology and its overall ecological requirements. Its status is presently poorly understood.

Reports from last century, particularly of breeding birds, were of large spectacular flocks and tended to capture one's imagination (North 1911). In more recent times there has been none of this, the last communal nesting in South Australia being as far back as 1934 (McGilp 1935). In central Australia, the last communal nesting was on the Finke River near Hermannsburg in 1963 (Forshaw 1981). It must be remembered that even in those days such breeding events were few and far between.

Unfortunately our written knowledge of this species only dates back to 1862. It is difficult to accurately assess whether the current trend of diminished observations in its eastern range (e.g. Oodnadatta district of South Australia) is cause for alarm or a natural phenomenon. We do not know what this species' movements and breeding trends have been over the last few hundred years. Perhaps the conditions that stimulated it to breed several times in several localities in northern South Australia between 1905 and 1934 may yet prevail and communal nesting will once again occur in the Musgrave Ranges, or on the Alberga River or at Abminga. However this does seem unlikely and it would appear that its absence from the eastern parts of its former range indicate population decline due to detrimental European impacts.

Fleming (1992) in *Threatened and extinct birds of Australia*, stated that the remoteness of the range of the Princess Parrot does not guarantee its safety. He pointed out that many

central Australian mammals have become extinct or declined as a result of detrimental impacts since European settlement and that these detrimental factors may still be operating. He also mentions that increased water supply to remote areas by pastoralists may have favoured more water dependent parrot species to the detriment of the Princess Parrot. Carter (1993) also suggests it may be a truly desert adapted species which may be adversely affected by competition from other opportunist species which could not survive as well in the desert, if at all, without permanent surface water.

Stephen Garnett (1992), in *The Action Plan for Australian birds*, lists the species as endangered in South Australia but insufficiently known to assess its conservation status in Western Australia, the Northern Territory, Queensland or for Australia as a whole.

Smith (1979) in assessing the status of Australian parrots, described the Princess Parrot as a declining species. Curry and Hacker (1990) also support this view, whilst Reid and Fleming (1992) remain somewhat more cautious in describing it as a species in 'apparent decline.'

Fleming (1992) says there is still too little information to make an informed assessment of its status, but it is presumed to be at least rare and that it may be vulnerable. Forshaw (1981) mentions that its nomadic nature and the remoteness of its range must be taken into account when assessing its status. He adds that, like the Scarlet-chested Parrot *Neophema splendida*, it may yet prove to be locally common in some areas. This has already proven to be true to some extent with the relatively large numbers of Princess Parrots that have been seen along parts of the Canning Stock Route in recent years (Carter 1993).

Blyth and Burbidge (1997) think that one of the 'major problems in attempting to assess the status of the Princess Parrot is the belief (Pizzey 1980; Forshaw 1981; Blakers, Davies and Reilly 1984; Simpson and Day 1996) that the species is intrinsically nomadic.' True nomads have no clear centre of distribution where they can be found, instead they wander about exploiting food resources wherever they can find them without any regular pattern in time or space. They say this is not necessarily true of the Princess Parrot.

They believe it is probably more correctly an irruptive species. That is, having a core habitat

where it can normally be found in most years, only moving out of it in response to good seasons or as a result of drought. Past communal nesting events are examples of it irrupting out of its core habitat, which Fleming (1992) and Carter (1993) suggest is around Lake Tobin in the north-eastern Great Sandy Desert. They suspect the species is resident there except in years of extreme drought and that it is basically sedentary and irruptive rather than nomadic.

Blyth and Burbidge (1997) in further discussion suggest that even if the Princess Parrot is perhaps common in its core area, it may still be 'vulnerable'. They suggest that it may well be under pressure if its core range and total population are small, its habitat needs are very specific, and habitat changes due to outside influences (e.g. such as those caused by artificial water points) cause detrimental impacts from more opportunistic competitors. Further to this, they mention that temperature induced climate change, possibly causing increased rainfall across much of arid Australia, may compound this competition effect even further.

Finally, the revised *Action Plan for Australian birds 2000* by Stephen Garnett and Gabriel Crowley (2000) describes the Princess Parrot as 'Near Threatened'. The reason for this listing is 'Although always scarce, an apparent reduction in sighting frequency in the eastern part of range since last century suggests a decline in density over 50% of range.' They speculate that threats may include habitat degradation due to altered fire regime and introduced herbivores such as sheep, rabbits and camels reducing food availability.

There is a definite need to acquire much more information on this species if we are to gain a clearer understanding of its status, abundance, distribution and habitat requirements. In South Australia it would seem logical to target marble gum woodland areas of the Great Victoria Desert during spring or during good seasons after rain. Perhaps this species may be found to be much more dispersed and sedentary than first thought and that a small core population exists and breeds in the remote marble gum woodland areas of the Great Victoria Desert.

John Blyth and Allan Burbidge are currently compiling a complete database of sightings of this species and in their paper *What do we know about the Princess Parrot?* (Blyth and

Burbidge 1997), they make a plea for observers to inform them of their sightings. This request, along with the need to get a comprehensive coverage for the current RAOU Bird Atlas project, are two exciting stimulants we can use to further our knowledge of this magnificent species and its vast desert wilderness home.

Recommendations

We recommend that:

1. The Princess Parrot be classified as a Threatened Species until conclusively proven otherwise and that this conservation status be used as a tool for attracting funding for long-term research on this species.
2. That the marble gum woodland areas of the Great Victoria Desert, especially those in South Australia, be the focus of a concerted long-term search for Princess Parrots, particularly breeding pairs.

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- Received: 19 April 1999

APPENDIX

Gazetteer of localities cited in the text. An extensive area (e.g. desert) or a linear feature (e.g. highway or river) is represented by coordinates for a single representative point rather than a range of points.

| Place name | Latitude, Longitude | Place name | Latitude, Longitude |
|----------------------|----------------------|--------------------|---------------------|
| Abminga | 26°07'S, 134°58'E | Cosmo Newbury | 27°59'S, 122°55'E |
| Adelaide | 34°56'S, 138°36'E | Crafers | 35°00'S, 138°40'E |
| Aileron | 22°38'S, 133°21'E | Crown Point | 25°30'S, 134°23'E |
| Alberga River | 27°00'S, 134°50'E | Darwin | 12°27'S, 130°50'E |
| Alice Springs | 23°42'S, 133°52'E | Deering Creek | 23°40'S, 131°25'E |
| Angas Downs | 25°02'S, 132°16'E | De Grey River | 20°41'S, 120°20'E |
| Anne Beadell Highway | 28°32'S, 130°15'E | Diamantina River | 21°36'S, 141°49'E |
| Arltunga | 23°26'S, 134°42'E | Docker River | 24°52'S, 129°05'E |
| Atlee Creek | 21°48'S, 131°25'E | Ellery Creek | 23°52'S, 132°58'E |
| Ayers Rock (Uluru) | 25°21'S, 131°02'E | Everard Ranges | 27°05'S, 132°30'E |
| Balgo | 20°09'S, 127°58'E | Finke | 25°35'S, 134°34'E |
| Basedow Range | 25°07'S, 132°36'E | Finke River | 24°47'S, 133°26'E |
| Bonython Range | 23°38'S, 128°58'E | Fitzroy River | 18°10'S, 124°26'E |
| Canning Stock Route | 20°42'S, 126°24'E | Fossil Downs | 18°09'S, 125°47'E |
| Carlisle Lakes | 29°10'S, 127°10'E | Frazier Downs | 18°48'S, 121°43'E |
| Charlotte Waters | c. 25°50'S, 135°00'E | Gary Junction Road | 23°15'S, 125°13'E |
| Cloncurry | 20°42'S, 140°30'E | Gibson Desert | 25°00'S, 125°00'E |
| Cockatoo Creek | 22°05'S, 132°02'E | Gilbert Creek | 23°55'S, 132°29'E |
| Connie Sue Highway | 30°30'S, 125°30'E | | |
| Coolgardie | 30°57'S, 121°09'E | | |

APPENDIX continued

| <u>Place name</u> | <u>Latitude, Longitude</u> | <u>Place name</u> | <u>Latitude, Longitude</u> |
|--------------------------|----------------------------|--------------------------------------|----------------------------|
| Glen Edith (Helen?) | 23°25'S, 132°14'E | Port Hedland | 20°18'S, 118°35'E |
| Great Sandy Desert | 21°15'S, 124°10'E | Prescott Lakes | 20°41'S, 125°05'E |
| Great Victoria Desert | 28°00'S, 129°00'E | Queen Victoria Spring Nature Reserve | 30°10'S, 123°20'E |
| Haast's Bluff | 23°27'S, 131°53'E | Rawlinna | 31°01'S, 125°20'E |
| Hale River | 23°35'S, 135°00'E | Rawlinson Range | 24°52'S, 127°55'E |
| Hamilton (Creek) Bore | 26°40'S, 135°17'E | Ringwood | 23°50'S, 134°57'E |
| Hermannsburg | 23°57'S, 132°46'E | Sandstone | 27°59'S, 119°18'E |
| Howell's Ponds | 17°06'S, 133°17'E | Selwyn Range | 21°28'S, 140°19'E |
| Hugh River | 23°56'S, 133°27'E | Separation Well | 22°51'S, 124°00'E |
| James Range | 24°16'S, 133°06'E | Serpentine Lakes | 28°52'S, 129°11'E |
| Joanna Spring | c. 20°00'S, 124°00'E | Sydney | 33°53'S, 151°13'E |
| Jupiter Well | 22°53'S, 126°36'E | Tallaringa Conservation Park | 29°00'S, 133°20'E |
| Lake Amadeus | 24°45'S, 130°50'E | Tanami | 19°59'S, 129°43'E |
| Lake Christopher | 24°43'S, 127°29'E | Tanami Desert | 20°00'S, 131°00'E |
| Lake Disappointment | 23°30'S, 122°45'E | Tanami Track | 22°35'S, 132°15'E |
| Lake Tobin | 21°42'S, 125°37'E | The Granites | 20°35'S, 130°20'E |
| Lake Way | 26°57'S, 120°28'E | Three Springs | 29°32'S, 115°46'E |
| Lambina | 26°54'S, 134°04'E | Todd River | 23°51'S, 134°30'E |
| Laverton | 28°38'S, 122°24'E | Tomkinson Ranges | 26°10'S, 129°00'E |
| Little Sandy Desert | 24°00'S, 122°00'E | Unnamed Conservation Park | 28°30'S, 130°00'E |
| Lyngett Tank Track | 19°42'S, 121°27'E | Vokes Hill Corner | 28°33'S, 130°40'E |
| MacDonnell Ranges | 23°36'S, 132°55'E | Warburton | 26°08'S, 126°35'E |
| Melbourne | 37°49'S, 144°58'E | Warburton Range | 25°55'S, 126°42'E |
| Menzies | 29°42'S, 121°02'E | Well 36 | 22°10'S, 125°18'E |
| Mount Doreen | 22°02'S, 131°20'E | Well 37 | 22°11'S, 125°28'E |
| Mount Irvine (Mt Irwin?) | 26°25'S, 133°45'E | Well 39 | 21°45'S, 125°40'E |
| Musgrave Ranges | 26°17'S, 131°30'E | Well 40 | 21°40'S, 125°45'E |
| Napperby (Creek) | 22°43'S, 132°40'E | Well 41 | 21°33'S, 125°50'E |
| Neale Junction | 28°10'S, 125°47'E | Well 42 | 21°17'S, 125°50'E |
| Newcastle Waters | 17°23'S, 133°24'E | Well 44 | 21°01'S, 126°09'E |
| Nullarbor Plain | 31°30'S, 125°30'E | Wiluna | 26°35'S, 120°14'E |
| Numery | 24°01'S, 135°25'E | Yeo Lake | 27°58'S, 124°20'E |
| Oakover River | 20°50'S, 120°50'E | | |
| Oodnadatta | 27°33'S, 135°27'E | | |
| Petermann Ranges | 25°00'S, 128°56'E | | |