

# Records of the Night Parrot *Pezoporus occidentalis* in South Australia, including its 'rediscovery' in the North East in 1979 and a review of its habitat use

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## Abstract

*At a time when the Night Parrot, one of the world's rarest birds, is being studied within well documented populations on either side of the Australian continent, we review its historical occurrence in South Australia. It was in this State, then a British colony, that the first specimen was taken and preserved for science; and it was here for a period that almost all that the world knew of the Night Parrot came through the work of a collector F. W. Andrews and a museum curator F. G. Waterhouse. Then, in the period between 1912 and 1990 during which no specimen was taken to confirm its continuing existence, another curator, S. A. Parker, became the first professional ornithologist to seek the species and find it. We here itemise reports of the Night Parrot that have accumulated since the 1880s at intervals of a few years to a decade or more. While none can be confirmed in the absence of verifiable specimen material or photographs, we accept nine as valid records and more as plausible. Most recent records are from the far north and north-eastern parts of the State, with others in the Flinders Ranges, but only one possible report from the Gawler Ranges, where Andrews had most of his field experience. We have analysed evidence of the Cooper Creek habitat in which Parker's observation was made that complements other documented habitat data for the species. The occurrence of so few records over such a vast area remains to be explained and invites speculation.*

## INTRODUCTION

The Night Parrot *Pezoporus occidentalis* (Gould, 1861) has long been held to be one of the world's most enigmatic and elusive birds. The first specimen (Figure 1) was taken in South Australia (SA) in October 1845, to the east of Lake Toontoowaranie and south of Lake Lady Blanche (Reid 2000) in the Coongie Lakes region, by John McDouall Stuart on Sturt's 1844-1846 expedition into the interior of Australia but it was thought to be an [Eastern] Ground Parrot *Pezoporus wallicus* (Kerr, 1792) and not a new species (Sturt 1849 Vol. 2: 35). The error was repeated in the list of birds recorded during the expedition, that included the names of specimens collected, as identified by Gould; here it was described as having red above the bill (Sturt 1849 Vol. 2 Appendix: 41). Gould's apparent error is discussed in Appendix 1.

The next specimen to be collected, the holotype taken near Mount Farmer in Western Australia (WA) in September 1854 by Kenneth Brown, a young member of Robert Austin's survey party, was sent to Gould but remained unnamed for another seven years (Gould 1865; Wilson 1937). It too had been mistaken for the Ground Parrot (Forshaw *et al.* 1976; Gould 1861). A little later, in 1867 and 1873, two birds were taken alive to London, where, during their truncated lives, their nocturnal habits amazed the members of the Zoological Society (Murie 1868; Sclater 1873).

Most of the known specimens of the Night Parrot were collected in the 1870s and perhaps three were exhibited at international exhibitions, in Philadelphia in 1876 and possibly in Paris in 1878. Of the 25 documented 19th century specimens, 21 or 22 were collected by one person, Frederick William Andrews, probably

one only from Cooper Creek in SA in 1875 and the others in the Gawler Ranges, all, as far as is known, in the years 1870 to 1873 (Black 2012; Horton *et al.* 2018; South Australian Museum (SAMA) archival documents). The next three skin specimens collected were taken in September 1912 at Nichol Spring in the Pilbara, WA (M. A. Bourgoïn in Wilson 1937) and in western Queensland in October 1990 (36 km north

of Boulia) and September 2006 (Diamantina National Park) (Boles *et al.* 1994; Cupitt and Cupitt 2008; McDougall *et al.* 2009).

Between 1912 and 1990, when no Night Parrot specimen was collected, occasional and mostly chance observations continued to be claimed but, in the absence of substantive evidence, many were treated with scepticism (Storr 1960; Garnett



**Figure 1.** The first Night Parrot specimen collected, taken in the Coongie Lakes area, South Australia, October 1845, by John McDouall Stuart on the Charles Sturt expedition to Central Australia. World Museum, Liverpool D640c. a) ventral, b) dorsal.

Images P. Horton

1993; Pyke and Ehrlich 2014), yet among them were undoubtedly a number of valid sightings. In particular, M. A. Bourgoin convincingly described several encounters in the Little Sandy Desert, WA, between 1920 and 1935 (Wilson 1937) and David Stewart (pers. comm. to AB 25 March 2018) flushed a Night Parrot in the Great Sandy Desert WA between wells 35 and 36 of the Canning Stock Route in April 1967 and saw it fly about 60-70 metres between spinifex [*Triodia*] clumps. He later found that many indigenous people knew Night Parrots from the western deserts, identifying the species from Cayley's *What Bird is That?* (Cayley 1966). Another encounter was the result of a targeted excursion to Cooper Creek in SA in 1979, on the initiative of the late Shane Parker, then Curator of Birds at SAMA. During this expedition Night Parrots were observed near an unnamed lake south of Cooroomunchena Waterhole and their report was widely celebrated as the rediscovery of a lost species.

Since May 2013, small populations of Night Parrots have been seen and photographed (Dooley 2013; Murphy 2013; Jones 2017) and have become subjects of intense field study in western Queensland (Murphy *et al.* 2015, 2017a, b, 2018) and inland central WA (Jackett *et al.* 2017; Hamilton *et al.* 2017). In publications of and publicity for these recent records and research, Parker's 'rediscovery' has received relatively little attention or has been overlooked entirely.

In North East SA a single feather of the species was reportedly found in the nest of a Zebra Finch *Taeniopygia guttata* on Kalamurina Wildlife Sanctuary in July 2017 (McCarthy 2017; Australian Wildlife Conservancy 2017; Appendix 1, record 44) and led to the claim, later retracted (Menkhorst *et al.* 2020), as the first record from northern SA since that of McDouall Stuart 170 years earlier. That was incorrect; Parker's record was less than 40 years earlier and his and Andrews's in 1875, when he took one or possibly more specimens, were all from

Cooper Creek in the same drainage as Stuart's.

Some aspects of Parker's observations have been published (Parker 1980; Wilson 1980; Ellis 1982, 2014; Pyke and Ehrlich 2014; Horton *et al.* 2018; Olsen 2018). In the light of intense recent interest in the Night Parrot and its possible persistence across the Australian continent, we take the opportunity of placing Parker's record in that context, including unpublished habitat information of potential value in future field investigations. We also document information recorded by Parker, following his scrutiny of other likely records of the Night Parrot in SA, and we add further reports that have come to our attention.

## METHODS

We reviewed recent literature concerning the Night Parrot. We examined documents relating to the Night Parrot held in SAMA, including Shane Parker's field notebook of May-June 1979 and the extensive files and correspondence that he accumulated before and after the discovery. We have contacted some of the members of the 1979 expedition for corroborative evidence.

We sought South Australian reports of Night Parrots incorporated in newspaper items and through colleagues, including reference to the extensive database of records compiled by IM, which incorporates Parker's files. We included all reports except those that lacked supporting evidence or appeared improbable from descriptions of the bird or its behaviour or locality. We accepted historical records if it was clear that the observer was familiar with the Night Parrot, and more recent reports if a description of the bird was persuasively of the species and usually accompanied by behavioural and habitat information. We judged reports that fell short of providing full diagnostic details as provisional, and any that might as likely represent misidentification as in doubt. Birth and death dates of early observers are from the Genealogy SA Database (Web1).

We have examined the habitat of the Cooroomunchena area in which Night Parrots were observed in 1979, as described by members of the expedition and later corroborated by vegetation mapping during 1991-92 of the Kanowana Lakes, Cooper Creek, region, in which Cooroomunchena is situated (Gillen and Drewien 1993). We provide more detailed descriptions of the habitats and vegetation from visits made by one of us (JR) in August 2015 and September 2020. In 2015 the percent cover of the dominant plant species was estimated

at nine points around each of two automatic sound recorders placed near the presumptive locality of the 1979 Night Parrot observations. A complete list of vascular plants recorded in an area of approximately 40 km by 30 km centred on the observation locality (west to Lake Perigundi, south to Round Waterhole (WH), east to Lake Bulpanie and north to 5 km north of Cooroomunchena WH) was extracted from the Atlas of Living Australia (Web2) and compared with known and suspected dietary items of the Night Parrot (Murphy *et al.* 2017b).

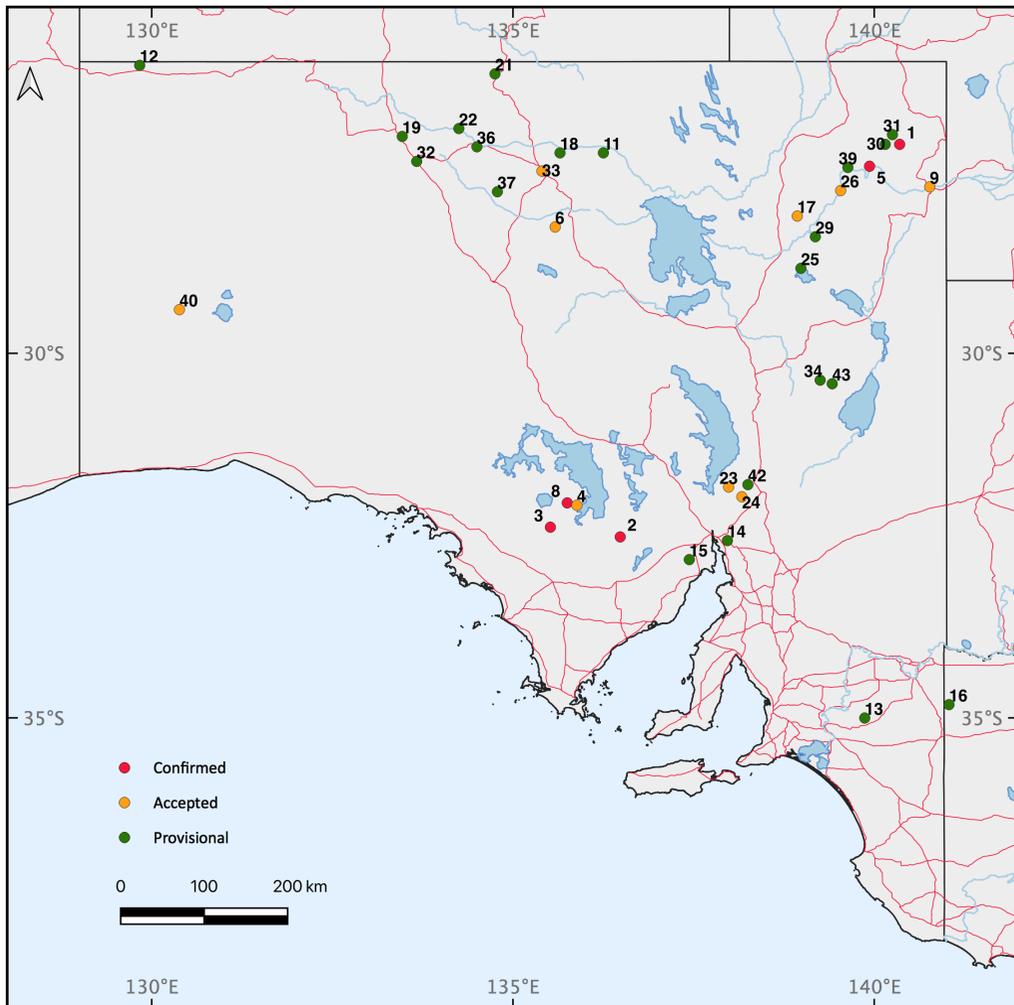


Figure 2. Map of South Australia showing Night Parrot records as listed in Table 1. Red dots are confirmed (specimen) records, orange dots are accepted records and green dots are provisional records. Doubtful records are not mapped.

## RESULTS

Records of the Night Parrot accepted by Shane Parker, together with additional reports collated by the authors, are shown on the map (Figure 2) and chronologically in Table 1 (p. 94) and are annotated in Appendix 1. We compiled 44 records from SA and included one from western Victoria very close to the SA border, covering a period of 175 years. Of these we consider eight records as in doubt (not mapped in Figure 2) and 23 as provisional; we accept nine sight records and the remaining five are museum specimens and thereby confirmed.

### The 1979 Cooper Creek observation

In May 1979 Parker arranged with outback safari operator Rex Ellis to take a team of observers by camel (Figure 3) across the channels and floodplains of Cooper Creek in north-eastern SA, from near Gidgealpa Homestead to the Birdsville Track, thus examining where he believed that F. W. Andrews may have secured one or more Night Parrots in 1875 (Ellis 1982; see Appendix 1). Parker reasoned that a string of camels might flush birds from their roosts, as cattle, sheep and horses have been shown to do (Whitlock 1924; Powell 1970; reports herein), and allow direct observation in daylight. He also knew that Andrews (1883) had found that Night Parrots occupied 'patches of shrubby samphire, on the salt flats bordering on the creeks [channels of Cooper Creek]' and that at least one nest had been found in 'a samphire bush' by John McDonald of Macumba Station, when on Cootanoorina Station south of Oodnadatta in the 1870s and 1880s (McGilp 1931). His attention was therefore directed to 'samphire-bassia' and not 'porcupine grass', in which Andrews had found Night Parrots in the Gawler Ranges (Ellis 1982).

Parker's notes of 1 June [1979] (SAMA file) read:

Late afternoon, passing down into Bassia  
[= *Sclerolaena* sp.] flat on eastern side of

Cooroomunchena Lake [at ca 27° 46' S, 139° 31' E, an unnamed lake immediately south of Cooroomunchena WH] - fat yellowish-green parrot rose from Bassia near thicket of lignum, about *Neophema* size but tail short & dark, wing ends dark, back same colour as the Bassia, flew 4-5 yds [= metres] then dropped back into bassia. (Spent two days in area searching, but not seen again). 3 others seen same spot by J. Mason within the hour. In the margin is written 'probably Night Parrot'.

In contrast to Parker's ambiguous annotation, he gave no impression of being other than entirely convinced at the time, stating that he had 'just seen a Night Parrot' (Ellis 1982) and later telling a member of the party, Malcolm Wilson (1980), that it was 'one of the highlights of his ornithological career'. The other member of the party to see Night Parrots, John Mason, was in no doubt about his identification either (pers. comm. to AB 14 April 2014). Eastern Bluebonnets *Northiella haematogaster pallescens* and Red-rumped Parrots *Psephotus haematonotus caeruleus*, which are moderately common in the area, had been observed over previous days. At the time, the locality of the observation was usually reported as 'east of Lake Perigundi' in the popular press (e.g. Anon. 1979, Tilbrook 1979; also Parker 1980). Ellis (1982) noted that the first Night Parrot had been flushed from 'under the feet and feeding heads of the camels', the animals being partial to the succulent bassia.

The 'bassia' that Parker noted as a samphire-like plant, was dominant in the flat where Night Parrots were observed (Figure 4) and evidently of a sufficiently dense and intricate structure to provide protective refuge for the parrots. A specimen prepared by Brian Crisp, a member of the party, was identified by Michael Crisp at the Canberra Botanic Gardens Herbarium as *Sclerolaena divaricata*. It was among ten plants collected earlier, on 26 May at 27° 50' S, 140° 08' E [ca two km west of Gidgealpa WH], and was thought to represent the 'bassia' among which Night Parrots were seen. The latter, on the other

hand, was consistently named as another species Tangled Poverty Bush *Bassia* [or *Sclerolaena*] *intricata* (Parker 1980; Wilson 1980; Olsen 2018), almost certainly correctly (see below), but only two plant specimens were collected at the actual Night Parrot site and not the abundant and critically pertinent 'bassia'.

### **Vegetation and Habitats around Cooroomunchena**

Descriptions of the vegetation at the locality, given at the time of or soon after the sightings of Night Parrots, are scant. Parker's brief habitat notes recorded above are matched by a published account of Wilson (1980: 7-8):

... a bassia flat with odd clumps of lignum between a low sandridge on the eastern side and thick lignum on the western side extending along the lake side. The bassia which averaged one foot [= 0.3 m] high was *Bassia intricata*. Two sandridges back from the lake was a large isolated patch of spinifex on a sandridge; also in many places in this area it was noticed that something had been nipping off short pieces of bassia and leaving them lying around the plant.

Ellis (1982: 217-218) described the location similarly: between a dune to the east and 'a freshwater lake, brimming full and surrounded by the usual coolabahs, river coobas, and other growth', 'a narrow flat near the lake covered with bassia', 'about 200 metres wide by about 400 metres long'.

The general locality is shown on recent Landsat images of the north-eastern margins of 'Lake Cooroomunchena' (Figure 5) and a broader image of the Cooroomunchena area (Figure 6).

A vegetation survey of lakebeds and floodplains in the Kanowana Lakes region, based on objective analyses of vegetation data gathered at 168 sites, downstream from Lake Apanburra (Coongie Lakes district) to Round

WH (Kanowana ruins, 13 km south-east of Cooroomunchena WH), identified five major vegetation types around 'Lake Cooroomunchena' (Figure 6; Gillen and Drewien 1993). One survey site KK2I was close to Parker's Night Parrot locality. The then dry lakebed of 'Lake Cooroomunchena' was mapped as Rat's-tail Couch *Sporobolus mitchellii* grassland (Gillen and Drewien 1993 Appendix F, fold-out 3), while the floodplain margins of the lakebed, including the Night Parrot locality, were mapped as Lignum *Duma florulenta* shrubland. Cooroomunchena and Round WHs, and other well-defined channels, were mapped as lined with Coolabah *Eucalyptus coolabah* woodland, and a sparse, less floristically diverse version of this marks the district's lake shores (e.g. Lakes Cooroomunchena and Bulpanie, the latter being 4 km east of Cooroomunchena WH). The westernmost part of the floodplain to the east of the fringing dune shown in Figure 5 (labelled 'C') was mapped as Nardoo *Marsilea drummondii* herbland, while floodplains east of there and south to Round WH were mapped as Lignum or Lignum-Nitre Goosefoot *Chenopodium nitrariaceum* shrublands. Common associates of Lignum in the two shrubland associations included the shrubby chenopods Old-man Saltbush *Atriplex nummularia*, Brown-head Samphire *Tecticornia indica* subsp. *leiostachya* and Tangled Poverty Bush, as well as several herbs and forbs indicated by Murphy *et al.* (2017b: Appendix S8) as potential food plants of the Night Parrot, e.g. *Portulaca oleracea*, *Trianthema triquetra*, *Alternanthera* sp. and *Frankenia* sp. All common associates of the Lignum and Lignum-Nitre Goosefoot shrubland associations identified by Gillen and Drewien (1993) are listed in Appendix 2 and, although not necessarily recorded around Cooroomunchena, the associations are widespread in the greater Kanowana Lakes region.

In recent years during and following the extensive Millennium Drought (2002-2009), no flats of dense Tangled Poverty Bush have been detected in the area described by the 1979 expeditioners.



Figure 3. The camel expedition leaving Lake Perigundi, Cooper Creek, 5 June 1979. Shane Parker, wearing his white pith helmet, is on the camel second from the right. Image M. Wilson



Figure 4. Floodplain on eastern shore of 'Lake Cooroomunchena', Cooper Creek, 1 June 1979. The Night Parrot seen by Shane Parker rose from this patch of samphire-like 'bassia' (*Sclerolaena intricata*). Image M. Wilson

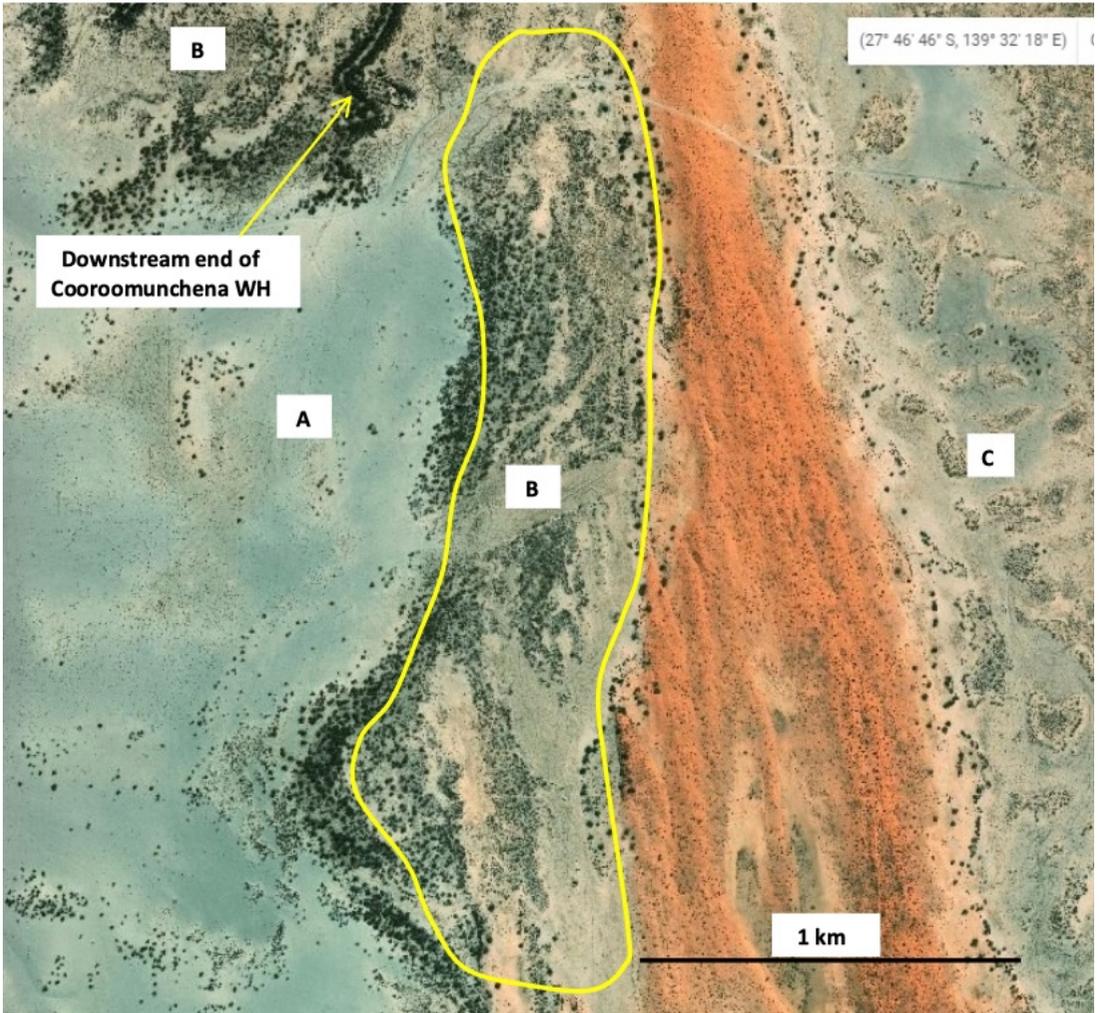


Figure 5. North-eastern section of 'Lake Cooroomunchena' (A) showing the floodplain (B) immediately east of the lake margin and west of adjacent dune, with the area outlined in yellow indicating where we think the Night Parrots were flushed by Shane Parker and party on 1 June 1979. C is the western edge of the floodplain east of the dune. Landsat 8 image, ca 2020 (Web8); scale approximate, North at top.

In August 2015 three species dominated the cover of 27 plants in the vicinity of the 1979 Night Parrot observation (Table 2), namely Lignum 5.3%, Elegant Wattle *Acacia victoriae* 3.7% and Coolibah 3.1%. The sound recorders were deliberately placed near the fringing dune, and ca 1-2 km south of the presumptive Night Parrot locality, due to the decision of the senior investigator Dr S. Murphy to locate them closer to an extensive patch of Lobed Spinifex *Triodia basedowii* in the adjacent dunes (Figure 6),

potential roosting habitat for Night Parrots (Murphy *et al.* 2017a, b). Other prevalent species included Ruby Saltbush *Enchylaena tomentosa* 2.2%, generally growing under Coolibahs, and Sandhill Canegrass *Zygochloa paradoxa* 2.0%. The prevalence of the last species and Elegant Wattle indicate the ecotonal nature of the vegetation close to a sand dune. Another 28 herbaceous species were recorded in the vicinity of the sound recorders (Appendix 3). Several potential food plants of the Night Parrot indicated by Murphy *et*

*al.* (2017b) are included in these plant lists, as are most of the associates of Gillen and Drewien's (1993) Lignum shrubland association. Samphire and Tangled Poverty Bush, although present, were scarce ( $\leq 0.5\%$  cover) at this location (Table 2) and were not prominent anywhere along the eastern margins of 'Lake Cooroomunchena' at that time (JR, personal observations). In September 2020, the general area between the fringing dune and north-eastern part of the dry lake had even less vegetation cover than in 2015 and appeared to have been heavily grazed and drought affected. A permanent stock-watering point had been installed in the north-western margin of 'Lake Cooroomunchena' some time before the August 2015 visit, when large numbers of cattle were present. There were smaller but still considerable numbers of cattle locally in 2020.

## DISCUSSION

The 40 Night Parrot sight and auditory records presented in Table 1 and Appendix 1 collectively illustrate the difficulty of identifying this species in the field. Prior to the 1990 specimen find in western Queensland, few would have been considered likely and even now we have confidence in accepting only about a quarter. Assessing the validity of sight records is always imprecise and subjective (see Leseberg *et al.* 2020) and we acknowledge that many provisional (P) and some doubtful (D) records might be of Night Parrots, and that some accepted records (A) might not.

Leaving aside doubtful records, some tentative interpretations can be offered. Several records illustrate the apparent tendency of Night Parrots to remain hidden in vegetation until imperative for them to move, because of fire (Appendix 1, record 10), trampling large herbivores (6, 17, 23, 24, 26), prolonged harassment from a dog (33), or a rolling boulder (34). Once flushed, a common behaviour appears to be that the bird will fly a short distance at low level, then drop back down into vegetation or to the ground

and run to cover (6, 17, 19, 23, 24, 26, 33, 34, 36, 40). Powell (1970) remarked 'This is by far the shyest bird I have ever seen and when hiding in suitable cover is almost impossible to find unless nearly trodden on.' and this observation is confirmed by behaviour observed at current sites in Queensland and Western Australia (N. Leseberg, pers. comm.).

Since the first SA Night Parrot record in 1845 there have been reports in every decade until the present, except for the 1850s, 1940s and 1950s, although Night Parrots were reported from these decades elsewhere in Australia



**Figure 6.** Google Earth image of 'Lake Cooroomunchena', ca 2016, showing the presumptive Night Parrot sighting locality (green thumbtack) and location of two automatic sound recorders (yellow thumbtack) where semi-quantitative vegetation data were gathered in 2015; scale approximate, North at top.

**Table 1. Chronological list of reports of Night Parrot from South Australia. In the first column are the numbers shown on the map (Figure 2) and in Appendix 1. Latitudes and longitudes, particularly for older records, may be only a close approximation. The final column categorises records as confirmed (C) if specimen-based, accepted (A) if we find a sight record to be highly probable, provisional (P) if better substantiated than others, and in doubt (D) including reports in the public domain that lack corroboration and others for which evidence is inconclusive but which cannot be entirely dismissed. Further details of each record are given in Appendix 1. Geographical regions are: EP = north-eastern Eyre Peninsula, FR = Flinders Ranges, GR = Gawler Ranges, MM = Murray Mallee, NE = North East SA, NW = North West SA.**

Map no.	Year	Locality	Region	Latitude & Longitude	Observer	
1	1845	East of Lake Toontoowaranie	NE	27° 08' S, 140° 21' E	John McDouall Stuart	C
2	1867	Nonning Station	GR	32° 31' S, 136° 29' E	donor: Charles Ryan	C
3	1872	Yardea Station	GR	32° 23' S, 135° 31' E	F. W. Andrews	C
4	early 1870s	Murnea Rockholes near Lake Gairdner	GR	32° 05' S, 135° 53' E	F. W. Andrews	A
5	1875	Cooper Creek (Munjooroanie Waterhole)	NE	27° 26' S, 139° 56' E	F. W. Andrews	C
6	1870s-1880s	Cootanoorina Station	NW	28° 16' S, 135° 35' E	John McDonald	A
7	1880?	Coralbignie Station	GR	32° 37' S, 136° 22' E	F. W. Andrews	D
8	1880?	between Lakes Gairdner and Acraman	GR	32° 03' S, 135° 45' E	F. W. Andrews	C
9	early 1880s	Innamincka Station	NE	27° 43' S, 140° 46' E	Alfred Walker	A
10	ca 1881	Port Augusta region, perhaps Gawler Ranges	NW/EP	unknown	Norman Richardson	P
11	1899	Macumba Creek	NW	27° 15' S, 136° 15' E	Angus McKenzie	P
12	1902/1907	Tomkinson, Mann and Musgrave Ranges area	NW	26° 03' S, 129° 50' E (Mann Ranges)	Tommy Dodd	P
13	1910	Ned's Well	MM	35° 00' S, 139° 52' E	a camel driver	P
14	before 1911	between Port Augusta and Mount Brown	FR	32° 34' S, 137° 58' E	Thomas C. Ash	P
15	before 1912	Mount Whyalla	EP	32° 49' S, 137° 26' E	Norman Richardson?	P
16	1913	North of Bellbird Bore, near SA/Victoria border	MM	34° 49' S, 141° 02' E	J. J. Scarce	P
17	1922	between Mungeranie and Lake Appadare	NE	28° 07' S, 138° 56' E	Hurtle J. Lewis	A
18	1926	Macumba Station	NW	27° 15' S, 135° 39' E	a station hand	P

Map no.	Year	Locality	Region	Latitude & Longitude	Observer	
19	Late 1920s	Wantapella Swamp	NW	27° 01' S, 133° 28' E	Charlie O'Toole	P
20	1931	Mulka, N of Cooper Creek	NE	28° 22' S, 138° 40' E	George Aiston	D
21	1933	near NT border	NW	approx. 26° 10' S, 134° 45' E	two Aborigines	P
22	1934	100 miles NW of Oodnadatta	NW	26° 55' S, 134° 15' E	several bushmen	P
23	1963-70	Neuroodla	FR	31° 50' S, 137° 59' E	Brian Powell	A
24	1969	Partacoona	FR	31° 58' S, 138° 10' E	Brian Powell	A
25	1977	Lake Kopperekoppinna	NE	28° 50' S, 138° 59' E	Joan Osborne	P
26	1979	Unnamed lake S of Cooroomunchena Waterhole, Cooper Creek	NE	27° 46' S, 139° 32' E	Shane Parker, John Mason	A
27	early 1980s?	between Watson and Cook, and Ooldea and Fisher, Nullarbor Plain	NW	30° 30' S, 131° 30' E (Watson)	Sid Dooling	D
28	1982	Dalhousie Springs	NE	26° 25' S, 135° 19' E	Dick Kimber	D
29	1986	Lake Walpayapeninna, Cooper Creek	NE	28° 24' S, 139° 11' E	Daryl Bell	P
30	1987	Lake Toontoowaranie, Coongie Lakes	NE	27° 08' S, 140° 09' E	Julian Reid	P
31	1987	Lake Marradibbadibba, Coongie Lakes	NE	27° 00' S, 140° 15' E	Julian Reid	P
32	1989	South of Marla	NW	27° 22' S, 133° 40' E	Bob Eveston, Dick Gloster	P
33	1989	Angle Pole Waterhole near Oodnadatta	NW	27° 30' S, 135° 24' E	Phil Gee	A
34	1990	SE of Arkaroola	FR	30° 22' S, 139° 15' E	Brett Schuppan	P
35	1992	Yardea Station	GR	32° 07' S, 135° 51' E	Allan Lees	D
36	1993	55 km E of Welbourn Hill	NW	27° 10' S, 134° 30' E	Bob Sim	P
37	1995	Arckaringa	NW	27° 47' S, 134° 47' E	Ralph Foster	P
38	2001	near Port Augusta	NW	32° 35' S, 137° 50' E	Maxine & Glyn Francis	D
39	2005	Deparanie Waterhole, Cooper Creek	NE	27° 27' S, 139° 38' E	Jake Gillen	P
40	2007	30 km west of Oak Valley, Great Victoria Desert	NW	29° 24' S, 130° 23' E	Bob Sim	A
41	2009	Kallakoopah Creek	NE	27° 23' S, 138° 27' E	Richard Green	D
42	2014	Hookina Creek	FR	31° 48' S, 138° 15' E	David Hunter	P
43	2015	Wooltana Station	FR	30° 25' S, 139° 25' E	Andy Bennett	P
44	2017	Kalamurina Sanctuary	NE	undisclosed	John Young	D
45	2019	Coongie Lakes	NE	undisclosed	(per R. Brandle)	P

(Leseberg *et al.* in review). Nevertheless, most were of apparently single birds and over the 175-year period the reporting rate is extremely low. F. W. Andrews obtained more than 20 specimens in the Gawler Ranges in the 1870s but noted that by 1883 on Moonaree Station 'the sheep now running loose over the large fenced-in paddocks' [as opposed to being shepherded in smaller numbers] had driven away 'all kinds of birds and animals' (Andrews 1885). This undoubtedly contributed to his apparent lack of success in finding Night Parrots in that year. Alfred Walker (record 9) saw Night Parrots at Innamincka Station in the 1880s but by 1885 they had disappeared. Hurtle Lewis (17) was familiar with Night Parrots in the 1890s but considered that they vanished from most parts after the Federation Drought, ending around 1902. John McDonald (6) reported that Night Parrots were 'fairly numerous' on Cootanoorina Station in the late 1870s to early 1880s. Norman Richardson (10) used to see them in the Port Augusta region in the early 1880s but in 1911 stated that he had not seen them 'for many years' (White 1912a). These scant records suggest that in SA the species declined severely from the mid-1870s to around the turn of the century; this is consistent with the findings of Leseberg *et al.* (in review).

### The 1979 Cooper Creek sighting

Parker's observation was the first made by a professional ornithologist since Andrews a century earlier and he received both public and private messages of congratulation. Many such letters and copies of articles about the discovery are retained in 'Night Parrot' files in SAMA, along with letters from individuals whom he contacted over several years in order to document what he accepted as reliable published and unpublished records, for inclusion in a paper on Night Parrot occurrences Australia-wide. His companions on the camel trip waited in vain for that paper to appear and some outside that group began to question if the observation had been genuine. Julian Ford, for example, wrote to one experienced observer among the camel

party, Malcolm Wilson of Dalby, Queensland, to express his doubt (M. Wilson pers. comm. to AB 14 April 2014). Enigmatically Parker himself had only written in his contemporaneous notes 'probably Night Parrot' but he gave no indication that he was in any doubt about his identification. He emphasised (pers. comm. to PH) that the parrot was a brighter green on the dorsum than was evident from faded museum skins, an observation amply confirmed by recent photographs of wild birds.

Malcolm Wilson corresponded with Parker over several years and asked him why he had not published formally. Parker had told him in several letters that he was preparing 'to write up the Night Parrot articles' and on 24 February 1982 wrote that he had 'all the basic references and was ready to go' (M. Wilson pers. comm. and copies of letters to AB). Parker is not known to have provided an answer to his fellows but told one reporter a decade after his sighting (Park 1989) that while 'personally happy that I've seen them, as a scientist, I find sight records unsatisfying.' As a professional ornithologist, he had come to accept that he could not publish the 1979 sighting without more concrete evidence. To him a sighting was only a probable record; a specimen of some kind was needed, or at the very least a photograph, before he could present his observation formally for the scrutiny of his peers. He might also have been embarrassed about his incomplete documentation of the habitat where his observations were made, as noted above. In addition, most records of other observers that he had accumulated were likewise unverifiable sightings which, if written up, would have made a lengthy paper fraught with doubt. By 1985 Parker began to relinquish his career as an ornithologist, working thereafter on marine invertebrates (Horton *et al.* 2018). In April 1987 he wrote and asked IM if he would take over the Night Parrot files and shortly afterwards forwarded his card index and some of his paperwork (*in litt.* to IM 'Easter Sunday' 1987).

In discussing the 'scientific record' of a rare bird

such as the Night Parrot, Leseberg *et al.* (2020) asked what standard of proof is required to consider a sight record confirmed? Leaving the question unanswered, they argued that any report of a 'confirmed' sight record should be treated as ambiguous and interpreted only after considering the evidence upon which it had been deemed confirmed and in the context of more substantive and objective evidence, gained primarily from reliably documented voucher specimens. Parker's record was accepted as a 'rediscovery' but was not claimed as the first 'confirmed' record since 1912. Yet, in review now and in the context of present broad acceptance of the bird's existence, it provides a valuable contribution to knowledge of the species. Likewise, it was only after Parker had seen a living Night Parrot and gained suitable evidentiary context, that he was prepared to gather other records and accept those he found reliable. We have listed well-substantiated cases as accepted by us but other cases lacking in critical details only as provisional. We have listed as confirmed only those supported by specimen evidence with corroborative documentation.

### Night Parrot habitats

All published visual and auditory reports of Night Parrots over the last 10 years have come from *Triodia*-dominated environments (Murphy 2013; Hamilton *et al.* 2017; Jackett *et al.* 2017; Murphy *et al.* 2017 a, b), and Murphy *et al.* (2017a) and Jackett *et al.* (2017) have described the species nesting within *Triodia* clumps in south-western Queensland and the East Murchison, WA, respectively. Of the 25 SA records presented here (excluding doubtful) with adequate habitat notes, twelve (6, 10, 13, 15, 16, 17, 18, 19, 21, 25, 34 and 40) state that *Triodia* was present at or in the immediate vicinity of the observation sites, including two that described nesting within *Triodia* (6, 17).

Figure 2 shows that the SA records are not distributed across the entire state, there being

none in the wetter, southern regions (South East, Adelaide-Mount Lofty Ranges, Yorke Peninsula, most of Eyre Peninsula). Nor are there records in the central region dominated by Mulga *Acacia aneura* woodlands, acacia or chenopod shrublands or stony plains, with little or no *Triodia*. Most records are clustered in the North East, northern central SA, Flinders Ranges and Gawler Ranges, with two in the Murray Mallee, in all of which *Triodia* is patchily or abundantly present (Nature Maps, Web3). The solitary records from the far North West (12) and Great Victoria Desert (40) and absence from the Yellabinna may reflect the relative inaccessibility (to human observers) of these regions, where *Triodia* is also abundant. Alternatively, we speculate that Night Parrots may be largely absent from the interior of vast spinifex deserts, such as parts of the Great Victoria Desert and Yellabinna, given that research at Pullen Pullen, western Queensland (Kearney *et al.* 2016; Murphy *et al.* 2017b; S. Murphy, pers. comms) suggests Night Parrots may need to drink regularly, perhaps daily under hot and dry conditions.

Despite this apparent association with *Triodia* in the broad landscape, thirteen observations were made in other habitats: samphire (1, 5), samphire and saltbush (29), Tangled Poverty Bush (26), Nitre Bush *Nitraria billardierei* (33), long grass (11), grass and forbs (37), saltbush (23, 43), Wards Weed *Carrichtera annua* (24, 42) and lignum (with or without other shrubs: 30, 39), although in several instances *Triodia* occurred within a few kilometres. Jackett *et al.* (2017) similarly noted the presence of adjacent samphire flats at three localities from where the species has been recorded this century in WA, and cited earlier documentation of Night Parrots using samphire habitats (Andrews 1883; McGilp 1931; Forshaw *et al.* 1976).

Murphy *et al.* (2017b; S. Murphy and N. Leseberg, pers. comms) make the distinction between roosting and feeding habitat requirements of the Night Parrot at Pullen

Pullen, with dense cover at ground level characterising daytime roost sites (typically *Triodia*) and productive vegetation patches used for nocturnal foraging, as in run-on and floodplain environments. We observe that the habitat of most or all observations made during the day can be assumed to be where the parrots were roosting. The most significant feature of these habitats may not be the plant species but the shelter they provide – dense low cover that often happens to be *Triodia* but can be any other structurally suitable plant.

### Habitats in the Cooper Creek drainage

In the Cooper Creek drainage in south-west Queensland and north-east South Australia, 19th and early 20th century Night Parrot observations were made in two broad habitats: *Triodia* hummock grassland on red sands (C. Sturt, 12 February 1845, cited by Leseberg *et al.* 2020; H. J. Lewis, 1922, record 17), and samphire low shrubland on saline flats and floodplains (J. M. Stuart, October 1845, record 1; Andrews 1883, record 5). The February 1845 observation in south-western Queensland ('we flushed a ground parrot', 'Dark green speckled black. It rose and fell like a quail', Davis 2002: 156) was most likely to the west of Orientos Homestead at about 28° 05' S, 141° 25' E (*pace* Leseberg *et al.* 2020 who positioned it further east). Parker's 'bassia flats' at Cooroomunchena represent a third broad habitat: ephemeral (and short-lived perennial) low chenopod shrubland. The habitat around Stuart's presumptive locality, *ca* 10 km south of Lake Lady Blanche, had only a sparse cover of samphire during a survey in October 2013, but under suitable (wetter) conditions would probably support a flora similar to Parker's Cooroomunchena habitat (JR, personal observations).

Above-ground plant growth varies enormously in the Cooper Creek floodplains over time depending on flooding, local rainfall and grazing history. In the Kanowana Lakes region long-lived perennials, such as Coolibahs, are

generally sparse to absent away from the river channels, particularly in the heavier clay soils, where annual species, biennials and short-lived perennials predominate but only after floods or heavy rains. Three of the dominant shrub species in the heavier soils of the floodplains, Lignum, Nitre Goosefoot and Golden Goosefoot *Chenopodium auricomum*, shed their leaves as the soils dry out, while short-lived perennials like Tangled Poverty Bush die and the surface area is mostly bare ground, as recorded in August 2015 (Table 2) and witnessed in September 2020. Brown-head Samphire, the dominant and perhaps only samphire species occurring on floodplains in the Kanowana region, occurs on more saline soils (Gillen and Drewien 1993; Gillen 2010), and while retaining its leaves during drought is prone to extensive mortality events if subject to lengthy inundation (JR, personal observations).

The vegetation in the area occupied by the Night Parrot around Cooroomunchena in 1979 is therefore likely to be highly variable, in terms of floristic composition and biomass, depending on antecedent conditions. At the time of Parker's observations, following the above-average rainfall of 1973-76 and 1978-79 (Web4), the country was probably in optimal and even exceptional condition. As well as the dense stands of Tangled Poverty Bush documented, there may have been a rich flora of short-lived, autumn-winter growing-season species, including daisies (Asteraceae), 'annual' *Atriplex* species and other chenopods, as well as many of the species listed in Table 2 and Appendix 3. However, in the more customary extended drier periods, these same floodplains carry scant vegetation, and we believe these habitats would be unsuitable for Night Parrots under such 'normal' conditions.

The preceding speculation leads us to consider the Night Parrot's residency status in the Cooper Creek region. All the evidence from six years of intensive study of a population on the Pullen Pullen Reserve (Diamantina River drainage) in

**Table 2. Visual estimates of mean cover and height of woody and more substantial herbaceous plants around two automatic sound recorders, located in 2015 on the eastern margin of 'Lake Cooroomunchena', Cooper Creek, at ca 27° 47' 30''S, 139° 32' 0''E. Only the groundlayer species and categories at the bottom of the table sum approximately to 100%, as the cover of shrubs and trees was estimated in different strata.**

<b>Species</b>	<b>Lifeform</b>	<b>Cover (%)</b>	<b>Height (m)</b>
<i>Eucalyptus coolabah</i>	Tree	3.1	7.2
<i>Acacia salicina</i>	Tall shrub-Small tree	1.1	3.8
<i>Acacia stenophylla</i>	Tall shrub-Small tree	0.3	3.3
<i>Hakea leucoptera</i>	Tall shrub-Small tree	0.1	3.0
<i>Eremophila bignoniiflora</i>	Tall shrub	0.5	3.8
<i>Acacia oswaldii</i>	Tall shrub	<0.1	2.8
<i>Acacia victoriae</i>	Tall shrub	3.7	2.2
<i>Acacia murrayana</i>	Shrub	0.5	1.4
<i>Eremophila longifolia</i>	Shrub	<0.1	1.4
<i>Duma florulenta</i>	Shrub	5.3	1.3
<i>Chenopodium nitrariaceum</i>	Shrub	0.6	1.2
<i>Acacia ligulata</i>	Shrub	0.8	1.2
<i>Rhagodia spinescens</i>	Shrub	<0.1	1.0
<i>Atriplex nummularia</i>	Shrub	<0.1	0.8
<i>Enchylaena tomentosa</i>	Small shrub	2.2	0.9
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	Small shrub	0.1	0.6
<i>Sclerolaena intricata</i>	Small shrub	0.5	0.2
<i>Teucrium racemosum</i>	Small shrub	0.3	0.2
<i>Sclerolaena diacantha</i>	Small shrub	0.1	0.1
<i>Senecio lanibracteus</i>	Robust forb	0.4	1.0
<i>Crotalaria eremaea</i>	Robust forb	0.4	1.0
<i>Solanum oligacanthum</i>	Robust forb	0.7	0.6
<i>Swainsona laxa</i>	Forb	0.7	1.2
<i>Salsola australis</i>	Forb	1.0	0.2
<i>Haloragis aspera</i>	Forb	0.7	0.1
<i>Zygochloa paradoxa</i>	Hummock grass	2.0	1.0
<i>Cynanchum floribundum</i>	Hummock grass (Forb)	0.4	1.0
	<i>grasses</i>	13	
	<i>ephemerals</i>	3	
	<i>litter</i>	13	
	<i>bare ground</i>	58	

western Queensland points to the species being sedentary, with adults occupying stable roost sites in Bull Spinifex *Triodia longiceps* (Murphy *et al.* 2017b; S. Murphy and N. Leseberg, pers. comms). A GPS-tracked bird there was found to travel widely each night, within a radius of about 10 km from its roost site, to (presumably) feed in alluvial landscapes supporting very different vegetation to that around roost sites (Murphy *et al.* 2017b).

The distribution of Lobed Spinifex in the Strzelecki Desert about Cooper Creek is patchy but, in the more richly coloured dunes away from the downwind margins of floodplains, patches of *Triodia* can be moderately dense (Reid and Gillen 1988). There are examples of these *Triodia* patches near Stuart's specimen locality south of Lake Lady Blanche (JR, personal observations), in the Coongie Lakes district (Reid 2000) and around Cooroomunchena (Wilson 1980; JR, personal observations), while there are also extensive dunefields within the region that are dominated by Lobed Spinifex, e.g. east of the upper Strzelecki Creek, south of Innamincka, and between the Cooper floodplain and gibber plains around Mungeranie (LAB 1986; Reid and Gillen 1988; JR, personal observations).

Extensive patches of samphire are also widely distributed in the Cooper Creek region (LAB 1986; Reid and Gillen 1988; Gillen and Drewien 1993; Gillen 2010), being especially prominent in the North-West Overflow of the North-West Branch, west of Coongie Lakes, and the lower reaches of Cooper Creek, including downstream of Waukatana WH (Badman 1989; Gillen and Drewien 1993; Gillen 2010). Nitre Bush has also concealed a roosting Night Parrot (P. Gee, record 33), but this species is less widely distributed in the Cooper Creek region, occurring as extensive stands mainly in the lower reaches of Cooper Creek and Strzelecki Creek, such as the Cobbler Sandhills.

We conclude, therefore, that structurally suitable roosting and nesting habitats exist throughout

most of the region. However, there are areas of floodplain largely devoid of dunes with *Triodia*, and devoid of samphire, which may be occupied only temporarily by Night Parrots; the Cooroomunchena area is an example of such a landscape. We speculate that some local nomadic behaviour by the species would allow for the temporary occupation of productive floodplain landscapes following large floods and sequences of heavy rainfall, when the luxuriant vegetation would provide a diversity and ample supply of seeds. Presumably the Night Parrot could make temporary roosts in the more substantial individuals of Tangled Poverty Bush, or in samphire or Lignum which would generally be present in or about such landscapes.

## CONCLUSION

This review includes reports of the Night Parrot from many parts of South Australia, which reflect its historical extent of occurrence. More recent reports are restricted to the far north and north-east of the State and Flinders Ranges. In no respect should these widespread reports be construed as challenging the Night Parrot's accepted status as rare and endangered (Garnett *et al.* 2011; Murphy *et al.* 2017a, b, 2018), recently as Critically Endangered (Leseberg *et al.* in press). The records are few and are the product of years of arid zone experience by many careful observers, some long unrewarded in their quest (e.g. Kimber in Olsen 2018; Ellis 1982). We are uncertain how to interpret this sparse record and whether it indicates the continuous presence of Night Parrots across northern South Australia in very low densities, as inferred by Leseberg *et al.* (2020). The species' exceptional capacity to remain hidden, as reported here, might support that inference. Alternatively, we do not discount the possibility that the very occasional valid sightings are of birds that have dispersed from more productive portions of the species' range in Queensland and WA.

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Web3: <http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps> (accessed 6/11/2020)

Web4: <http://www.bom.gov.au/climate/maps/rainfall>

Web5: <https://recordsearch.naa.gov.au/SearchNRRetrieve/Interface/ListingReports/ItemsListing.aspx>

Web6: [https://www.naturalresources.sa.gov.au/aridlands/news-resources/news/Night\\_parrot\\_an\\_elusive\\_bird](https://www.naturalresources.sa.gov.au/aridlands/news-resources/news/Night_parrot_an_elusive_bird)

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## APPENDIX 1. South Australian Night Parrot records

Here we list only reports for which we have obtained reasonable documentation, either directly or through reliable third person sources. Included are all accepted by Shane Parker in his SAMA file document, shown as (SAP). In many cases exact details are not known and may be given as at the nearest named place with only an approximate date. Each record is numbered according to its listing in Table 1 and, with the exception of doubtful records, on the map (Figure 2). The records are grouped according to geographical region of SA. One record from Victoria is included in the Murray Mallee region because it is very close to the border with SA and because it is a southerly record of potential significance.

Abbreviations: HS = Homestead, SA = South Australia, WA = Western Australia, WH = Waterhole.

### North East

1. East of Lake Toontoowaranie, 1845 (SAP) John McDouall Stuart was the surveyor on Captain Charles Sturt's expedition to Central Australia, which by October 1845 was in the Coongie Lakes, Cooper Creek region. While crossing 'a plain of great breadth' on which was growing 'samphire, salsolae, and mesembryanthemum', Stuart shot the specimen of 'a beautiful ground parrot' (Sturt 1849, Vol. 2: 34-35). It is not clear whether this occurred on 15 or 16 October (Sturt 1849); in his journal Sturt gave the date for the locality as the 16th (Davis 2002) but without reference to either Stuart or the parrot. Reid (2000) assessed the likely locality

as some 20 km east of Lake Toontoowaranie and south of Lake Lady Blanche.

Speculation concerning Gould's presumed error in the specimen's initial identification (see Introduction) allows that he sent (Forshaw *et al.* 1976) or even sold it (Olsen 2018: 30) to Lord Derby, in whose collection it passed to the World Museum, Liverpool, where it now resides (D640c, Figure 1; Fisher 2017). An entry for the specimen in the Derby Stock Book in Liverpool under *Pezoporus formosus* [= *wallicus*] provides support for such suggestions: 'D640c. Presented by Capt. Sturt per Mr Gould, Nov. 1847' (Clem Fisher *in litt.* to AB 9/11/2018). Yet Sturt made direct donations to Lord Derby, and Sauer (2001) published several of Derby's letters to Gould that highlight Sturt's generous intentions towards Derby. Moreover, one box of specimens intended for Derby did go astray, not to Gould (*pace* Olsen 2009) but to another un-named collector and retrieval of that box, perhaps containing the Sturt/Stuart specimen, was facilitated through Gould's establishment; we find no evidence that Gould sold Derby any Sturt material (Sauer 2001). It is plausible that Sturt knew that Gould would not need another Ground Parrot specimen and included it among those intended for Derby. Gould might never have possessed it and almost certainly never saw it. In 1928 Gregory Mathews reidentified the specimen and Forshaw *et al.* (1976) brought it to the world's attention.

#### 5. Cooper Creek, 1875 (SAP)

F. W. Andrews (1883) wrote that he 'shot some specimens at Cooper's Creek in 1875 ... They were in that district observed to conceal themselves during the day in the thick patches of shrubby samphire, on the salt flats bordering on the creeks and on Lake Eyre.' This was during the Lewis Lake Eyre Expedition of 1874-1875 but only one specimen was reported among the expedition's collection; it is now in Museum Victoria (NMV B36256, Black 2012; Forshaw *et al.* 1976). Andrews's statement is misleading, since Lewis's journal (Lewis 1876) shows that Andrews was directed away from Lake Eyre because there

was 'nothing for him to collect' there. He rejoined the main party to explore Cooper Creek during May 1875 from about Lake Hope upstream and was camped on a lagoon at 27° 25' 49" S between 17-25 May, with full moon on 20 May. Around full moon was the most likely time when Andrews collected Night Parrots, as evidenced in a letter (State Records of SA GRG19/333) he sent from Moonaree, Gawler Ranges, 25 November 1883, to the SA Institute Museum Director J. W. Haacke: 'next moon is the time at which I have always obtained night parrots there.' The stated latitude of the lagoon is at Munjoorooanie WH and that appears likely to be the collection locality of the Night Parrot.

9. Innamincka Station, approx. 1880-1885 (SAP) Alfred Walker (*ca* 1851-1933) was manager of Innamincka Station, Cooper Creek, and saw Night Parrots there 'in the eighties'. They disappeared from the district 'after an invasion of cats which came from New South Wales'; the last parrot was seen in 1885 (Campbell 1915; Whitlock 1924). No habitat information was given but during Walker's careful management of the station from 1880 to 1908, whenever floodwaters of the Cooper Creek receded, 'the feed grew so luxuriously that sometimes it was thick and tall enough to hide the cattle' (Anon. 1933).

17. Between Mungeranie and Lake Appadare, 1922

Hurtle John Lewis (1884-1939), familiar with Night Parrots in the late 1890s, said that 'after the great 1902 drought' they vanished from most parts (Lewis 1931). The last he observed were 'in the big spinifex [*Triodia*] bunches between Mungerannie [HS] and Lake Appadare', Cooper Creek, in 1922. Two birds 'hopped' from a spinifex clump beneath Lewis's camel's feet, on the top of a large sandhill; both 'gave three little squealy chirps, then flew a short way and rested in the spinifex.' Their nest, secreted inside the spinifex, contained three small white eggs. Lewis was born at Beltana, Flinders Ranges, and was a dogger (Rufus 1930) and kangaroo shooter

(World War I service records, Web5). He wrote articles in SA newspapers in the 1920s and 1930s about life in the Flinders Ranges, northern SA and western Queensland, so probably encountered Night Parrots in several localities in the 1890s.

#### 20. Mulka, 1931

In the early 1930s Mounted Constable George Aiston was living at Mulka HS on the Birdsville Track, north of Cooper Creek, and reported that his cat had caught what he thought was a Night Parrot and taken it up on top of a shed. When asked to recover feathers, Aiston explained that after more than three inches [76 mm] of rain in March, any feathers would be mixed up in the rotting thatch of the shed (Vox 1952). That rain event took place in March-April 1931 (*The Advertiser and Register*, 2 April 1931: 10, 9 April 1931: 11) so the parrot was caught some time before then.

#### 25. Lake Kopperekoppinna, 1977

While travelling cross-country in mid May 1977, Joan and John Osborne made a stop towards evening, among dunes with spinifex near a boomerang-shaped lake, in overcast conditions with light drizzle. While out of the vehicle, Joan saw a bird walk out of one spinifex clump near her and into another clump: 'definitely a parrot, greeny-brown with a fat head and a fanned scruffy tail.' The recollected locality (as related years later to JR) was confused but concluded as between Lakes Kopperekoppinna and Gregory, and thus south-east of Cooper Creek on Etadunna Station.

#### 26. Eastern shore of 'Lake Cooroomunchena', Cooper Creek, 1979

See main text for full report.

#### 28. Dalhousie Springs, 1982

On 24 September 1982 at 7.30-8.00 pm, while driving to Alice Springs with vehicle lights on high beam, R. G. (Dick) Kimber flushed a parrot with a green back and yellow belly that had been drinking from a pool of water on the road

about 17 km NW of Dalhousie Springs (*in litt.* to S. A. Parker 28/9/1982). The bird flew low to the ground and landed about 20 metres away at a little gilgai surrounded by a dense scatter of 2 ft high saltbushes but could not be flushed from there; spinifex and samphire occurred within 1-2 km of the area. Kimber was not confident of its identity so the record remains doubtful.

#### 29. Lake Walpayapeninna, 1986

Daryl Bell reported 'three bright green medium sized parrots with short tails' at the southern end of Lake Walpayapeninna, Cooper Creek, in July 1986 (Badman 1989: 69). He observed them through the scope of a rifle over the course of about an hour soon after sunrise as they fluttered from shrub to shrub, remaining near the ground at all times. Their legs and tails were short, and they were unlike any parrot seen previously, a mottled green and the size of a fat 'budgie' (Budgerigar *Melopsittacus undulatus*). They were in moderately dense samphire, Old-man Saltbush and stunted Coolibahs (*in litt.* to AB 7/11/2018, 7/11/2020).

#### 30. Lake Toontoowaranie, 1987

At about 9.00 pm on 2 February 1987, while driving along the south-western margin of Lake Toontoowaranie (Coongie Lakes region) at about 20 km/h, Julian Reid (Reid 2000) flushed two plump perhaps greenish (colour 'bleached' by headlights) parrot or pigeon shaped birds about 5-10 m ahead. They rose off the track quail-like and flew unerringly directly ahead and out of sight. The habitat in the vicinity comprised patchy, open Lignum, Golden Goosefoot and Tangled Poverty Bush shrubland on the edge of a floodplain, with the most prominent 'annuals' being the small saltbushes, *Atriplex pseudocampanulata* and *A. crassipes*, a spurge *Euphorbia wheeleri*, purslane *Portulaca oleracea*, Nardoo and Roly-poly *Salsola australis* (data from Site 4W, in Reid and Gillen 1988).

#### 31. Lake Marradibbadibba, 1987

At about 9.00 pm on 12 August 1987, Julian Reid (Reid 2000) heard a small group of birds, giving

a repeated, distinctive but unrecognised guttural call, as they flew from the south directly towards the southern shore of Lake Marradibbadibba (Coongie Lakes region). The calling stopped as the birds drew level with the shore about 100 m to 200 m distant and resumed about two minutes later, as the same guttural call was heard from the birds returning south. Also audible was the sound of wing beats, distinct yet different from those of Bourke's Parrots *Neopsephotus bourkii*. The unseen birds were assumed to drink at the bare shoreline, and a sparse fringe of Coolibahs grew *ca* 10 m back from the water's edge. The birds were flying over sand dunes sparsely vegetated with Sandhill Canegrass and (in patches) Lobed Spinifex.

#### 39. Deparanie Waterhole, 2005

An hour or two after sunset one evening in October 2005 Jake Gillen, camped at the eastern end of Deparanie WH (*ca* 40 km upstream of Cooroomunchena WH, see record 26), Cooper Creek, heard one or two birds calling while flying immediately to the east and overhead. The call was a double frog-like sound 'rook rook' or 'roke roke' or 'gruk-gruk, gruk-gruk' with the first note slightly higher than the second. This call was preceded by a plain (not shrill) whistle call. The calls sounded like two individuals communicating. The habitat was Cooper Creek floodplain with Coolibah and Lignum and open patches with ephemeral vegetation.

#### 41. Kallakoopah Creek, 2009

About 20 minutes after sunset on 8 July 2009, a typically fast-flying parrot was seen by Richard Green and viewed immediately through binoculars. It was small with a very short tail and the wing shape and movements were atypical, wings straight, not swept back, and rounded, not pointed, wingbeats fast and fluttery. It made one circle around before continuing in its original direction. The bird was in view for about 10 seconds before it disappeared behind the tree canopy. It was flying about five to eight metres above the ground, so was viewed chiefly from side on. The locality was reported as Warburton

River but, according to the coordinates provided, would have been Kuncherinna WH, Kallakoopah Creek (SARC 13, Black *et al.* 2020).

#### 44. Kalamurina Sanctuary, 2017

An ABC report featured a fairly fresh, unweathered feather said to have been found by John Young in the nest of a Zebra Finch at Kalamurina Wildlife Sanctuary in July 2017 and confirmed as a Night Parrot feather at the Western Australian Museum (McCarthy 2017). It also showed the finch nest lining with the Night Parrot feather but unlike the former, this feather appeared weathered. The patterns on the two feathers were also recognisably different. When only the neater of the two was presented to SAMA in September 2018, its representative asked the Australian Wildlife Conservancy (AWC) for details about the provenance of both feathers. AWC requested but failed to obtain answers from Young, and so appointed an independent panel of inquiry, which found insufficient evidence to confirm the presence of Night Parrots on Kalamurina (Menkhorst *et al.* 2020).

#### 45. Coongie Lakes, 2019

Acoustic recorders set up in the Coongie Lakes Ramsar project site by SA Arid Lands NRM staff captured possible Night Parrot calls, later analysed by Nick Leseberg and Steve Murphy (Web6; R. Brandle *in litt.* to AB 16/6/2020). Two calls were the Pallid Cuckoo *Cacomantis pallidus*-like calls, which are problematic whenever they are detected, a third being a faint 'didit' call that could not be assigned to another species (S. Murphy *in litt.* to AB 23/9/2020). Further investigation is continuing in the area.

### Gawler Ranges

#### 2. Nonning Station, 1867 (SAP)

This was a live bird (collector unknown) forwarded by Charles Ryan, pastoralist and lessee of Nonning Station, to Ferdinand von Mueller of Melbourne who sent it by ship to the Zoological Society of London, where it was

received on 17 November 1867 (Sclater 1867; Olsen 2018: 38). The bird died near the end of January 1868 and was preserved as a skin and sternum plus pectoral girdle (Murie 1868) and is now in the Natural History Museum, Tring (BMNH 1868.4.15.3/BM 1990.7.1, Black 2012). White (1913d) stated that F. W. Andrews 'made his headquarters at Nonning' when collecting in the Gawler Ranges but he is most unlikely to have been responsible for this bird; the first documented receipts of Andrews's birds from the Gawler Ranges were in 1871 (Black 2014).

### 3. Yardea Station, 1872 (SAP)

A specimen collected by F. W. Andrews on 12 November 1872 (three days before full moon) at Yardea Station is in the Australian Museum (AM O17831, Forshaw *et al.* 1976). Another specimen (AM O17832) bears the same date but its locality is simply recorded as 'Gawler Ranges'; it too was almost certainly from Yardea. According to S.A. White, Andrews's collecting locality of the SAMA specimen (B8118) was 'a small well south-west of Lake Gairdner' (Anon. 1911); Yardea HS is situated some 33 km south-west of the lake and the well may have been on Yardea Station, but see the next record.

### 4. Murnea Rockholes, early 1870s (SAP)

This locality, 8 miles from (13 km south of) Moonarie HS (now Moonaree) has been widely assumed to be one of F. W. Andrews's main Night Parrot collecting localities and, although better described as west of Lake Gairdner, could be the 'small well south-west of Lake Gairdner' (Anon. 1911, see above) if White had mis-interpreted a rockhole as a well. In a letter Andrews wrote from Moonaree HS to SA Institute Museum Director J. W. Haacke on 25 November 1883, he said:

My journey tomorrow is 8 miles through nothing but heavy sand. I shall take all my things and rations and not return here but work away until Mr Davies calls for me, when I shall go on to Yardea. Next moon is the time at which I have always obtained

night parrots there.

Horton *et al.* (2018: 257-258) assumed for this and other reasons that Yardea was Andrews's main collecting locality for Night Parrots. However, detailed reading of Andrews letters archived in the SAMA Bird Section and State Records of SA (GRG19/333) shows that the Moonaree Station/Murnea Rockholes area was the main focus for his apparently unsuccessful attempt to find Night Parrots in 1883 and therefore likely to have been where he collected at least some of his specimens in the 1870s. This is supported by a letter from then SA Institute Museum Curator F. G. Waterhouse to E. P. Ramsay at the Australian Museum, 24 August 1874, stating that 'our collector went expressly nine miles' to collect Night Parrots (Ramsay Papers, Mitchell Library; Olson 2018: 42-43) – possibly the '8 miles' from Moonaree HS to Murnea Rockholes stated by Andrews in his letters of 1883. There are, however, no known specimens labelled as from Moonaree or Murnea. A letter Andrews wrote on 17 December 1883 to SA Institute (Museum) Secretary Robert Kay stated that the rockholes were 'in the mallee sandhills', and further evidence for the habitat is provided by his collection there of Malleefowl *Leipoa ocellata* (Andrews 1885). The only extensive area of deep sand within 'eight miles' of Moonaree HS is a band running roughly east-west to the south and west of the homestead (Wakelin-King 2009) and Murnea Rockholes are immediately south of it.

### 7. Coralbignie Station, 1880

This record has not been verified. Referring to his own 'Coralbignie Camp' some four miles (6.5 km) NE of Coralbignie HS on the track to Nonning, Sutton (1926) noted that F. W. Andrews had obtained the Night Parrot 'near this place in 1880'. He added 'but there are thousands of acres of porcupine grass [*Triodia*] on the Gawler Ranges and its spurs round about Coralbignie and Nonning' (Sutton 1926: 178), so it is possible he was referring to a collection

made on Nonning Station. Furthermore, we have no evidence that Andrews collected Night Parrots in 1880 (Horton *et al.* 2018; Olsen 2018).

**8. Between Lakes Gairdner and Acraman, possibly 1880**

A specimen with this information, collected by F. W. Andrews, is in the American Museum of Natural History (AMNH 623833; Forshaw *et al.* 1976; Greenway 1978) and is the holotype of Mathews' (1915: 129) subspecies *Geopsittacus occidentalis whiteae* (Mathews number 8954). This locality was probably on Moonaree Station, or possibly Yardea. S. A. White stated that an early owner of Nonning Station obtained the specimen from Andrews and sent it to a relative in Scotland (Rufus 1929); Mathews persuaded its Scottish owner to part with it for £50. The entry in Mathews' Daybook states: '8954 – South Australia, Newman 22-4-12', Newman being the person he bought the specimen from (M. LeCroy, AMNH, *in litt.* to S.A. Parker 3/1/1980). The possible year of collection is in doubt, as above.

**35. Yardea Station, 1992**

One late morning towards the end of September 1992, Allan Lees flushed two parrots from flourishing one-metre high 'cottonbush' [Silvertails] *Ptilopus obovatus* on southward-sloping rocky ground above a sandy flat near the northern boundary of Yardea with Moonaree Station, about 5 km SW of Murnea Rockholes. Each bird flushed from almost under his feet, about 15 seconds and 5 m apart, and rose abruptly to about 1.5 m before flying low and directly away downslope, becoming lost beneath a small stand of Mulga 100 m distant. Each uttered an alarm call of 6-7 syllables, resembling that of a Budgerigar. *Triodia* was abundant on hills to the west and samphire equally so on the shores of Lake Gairdner to the east. The observer is red-green colour-impaired but assessed the parrots as similar in size, shape and in their strong flight to a Musk Lorikeet *Glossopsitta concinna*; he particularly noted yellow in the tail between its darker centre and outer edge. He had visited the Murnea Rockholes area

about annually for more than 20 years, hoping to encounter a Night Parrot, and was uncertain of his identification at the time. The birds were distinguished from quail and other parrots that occur there, larger than a Budgerigar and differing from Port Lincoln Parrot [Australian Ringneck] *Barnardius z. zonarius* and Mulga Parrot *Psephotellus varius* in flight pattern and tail length. Publication of images of a Night Parrot in flight in WA has enhanced his belief in the identity of his birds. The year 1992 remains the wettest on record for the Gawler Ranges and Eyre Peninsula (Web4).

**North West**

**6. Cootanoorina Station, 1870s to 1880s (SAP)**  
John McDonald lived on Cootanoorina Station in the late 1870s to early 1880s and reported that Night Parrots were fairly numerous at that time but were only ever seen singly when flushed from *Triodia* after the clumps were disturbed such as during mustering. The birds would fly 20 to 40 yards, drop to earth suddenly, then run off at right angles to the line of flight. When flying to and from waterholes in the evening, apparently several birds in company, they frequently uttered 'a sweet low two-note whistle'. He observed several nests in *Triodia* and also one in a samphire bush 'in the vicinity of the dry salt lakes' (McGillp 1931). S. A. Parker (unpublished notes) considered that this was most likely near Lake Conway and with Terry Sim made a field trip to that lake in September 1978; they found no evidence of Night Parrots.

**11. Macumba Creek, 1899**

Brothers Angus and Kennie McKenzie took a lease of '700 to 800 miles of Macumba Creek country' in about 1899 (Vox 1938, 1950). When asked if he had ever seen or heard the Night Parrot, the former said that he had caught one in tall grass, but it got away from him. He told Sir Edward Stirling, who took him to view parrot specimens at the Museum and asked him to pick out the Night Parrot. McKenzie 'selected one with green and black feathers, and that satisfied

Sir Edward' (Vox 1950).

**12. Tomkinson, Mann and Musgrave Ranges area, 1902/1907**

In a letter (held SAMA Bird Section) of 1 March 1968 to Patrol Officer David Stewart (Weapons Research Establishment, Woomera), Patrol Officer B. J. Verburgt described a sighting of Night Parrots in central northern WA in August 1966, made by himself and guide Tommy Dodd, an elderly Aborigine living at Musgrave Park (Amata) (Web7). Notes with the letter state that 'Tommy Dodd accompanied the Hann Expedition in 1902 or 1907 when several of these [Night] parrots were collected in the Tomkinson, Mann and Musgrave Range areas.' Bushman and explorer Frank Hugh Hann made two journeys from Laverton, WA, to Oodnadatta, SA, and back in 1903-1904 and 1906-1907 (Donaldson and Elliot 1998). His diaries occasionally mention birds, usually those shot for eating, but no Night Parrots; however, the diary for Oodnadatta to Laverton in 1904 is missing and could potentially have noted the capture of Night Parrots.

**18. Macumba Station, 1926 (SAP)**

J. B. Cleland visited Macumba Station during the first week of January 1927 and was told by Mr Kempe, the station manager, that the Night Parrot 'had been seen unquestionably by one of Mr. Kempe's hands a few months previous to our visit in "spinifex" (*Triodia*) country near the station' (Cleland 1927). By this locality Cleland would almost certainly have meant near the homestead and the date may have been around September 1926.

**19. Wantapella Swamp, late 1920s**

R. G. (Dick) Kimber made notes of an 8 August 1974 conversation with Frank Sprigg who was told of the then elderly prospector Charlie O'Toole's recollection of seeing Night Parrots in the 'level stony desert land with spinifex' in the area of Wantapella Swamp in the late 1920s. O'Toole and other workmen had heard them fly in at night and, while riding, an occasional

bird had been flushed in daylight. 'They flew very low to the ground, in a wave-motion, then landed a very short distance away and ran very fast, keeping low and concealed' (*in litt.* Kimber to S. A. Parker 7/1/1985). Kimber also found evidence in the State Library of South Australia that explorer R. T. Maurice recorded a 'green porcupine parrot'; this was in an unannotated list of mostly mammals that appears to have been pinned to another document dated 1897 (PRG 762/3/2/21 & 22). Elsewhere in the Maurice papers, Kimber had noted that the parrot may have been captured in a net near the SA/NT/WA border around 1896 (*in litt.* to IM 29/11/1990) but an examination of files there by Kimber in January 1990 and by AB on 21/12/2018 and 4/1/2019 (PRG 762/3) failed to rediscover the relevant document.

**21. Near NT border, 1933**

At 'an abandoned station near the border of South and Central Australia', shortly before February 1933, two Aborigines flushed a Night Parrot from porcupine grass while out rabbiting. Not having seen them since childhood, they were excited to inform "Old Jack" of Oodnadatta, who considered the report reliable enough for him to load his camels with rations and make a search. While still fairly numerous in the early 1880s, the Night Parrot was by 1933 considered extinct in the area (Barrett 1933).

**22. 100 miles NW of Oodnadatta, 1934**

A newspaper report of March 1934 stated that a bushman had seen a Night Parrot 'about 100 miles [160 km] north-west from Oodnadatta' and that 'Recently several experienced bushmen have reported having seen *Geopsittacus Occidentalis* in the far north of South Australia and west of the railway to Alice Springs' so that 'naturalists have reason to believe that the night parrot, for many years regarded as "lost," or on the verge of extinction, still exists' (Anon. 1934).

**27. Between Watson and Cook, and between Ooldea and Fisher, early 1980s?**

Sid Dooling, Welfare Officer, reported that Night

Parrots had been seen between the above railway sidings on the Nullarbor Plain. They were 'sighted only at night, feeding in pairs; green olive with dark markings through it; longer tail and legs than budgie.' Dooling made it clear that he recognised Inland Dotterel *Peltohyas australis*, Port Lincoln Parrot, Eastern Bluebonnet *Northiella h. haematogaster* (near Tarcoola), Australian Bustard *Ardeotis australis* (in big numbers that year) and Owllet-nightjar *Aegotheles cristatus* (near Immarna) (notes made by AB at Watson, south of Maralinga, 27 August 1983).

### 32. South of Marla, 1989

On 29 September 1989 Bob Eveston was transporting stock from the Alice Springs area south along the Stuart Highway. Darkness fell at Kulgera (25°50' S), and as he was driving in the dark, he noticed a bird hit the front of the truck some distance south of Marla. He reached R. (Dick) Gloster's property Albemarle Station, 150 km south of Wilcannia NSW, three days later, where Gloster noticed the bird caught in the radiator grill. It was patterned or speckled green and yellow and had a parrot's bill. Using a number of bird identification guides, he determined that the bird was a Night Parrot, but threw it away before realising its significance. Later he noticed that photographs in Inder (1991) of the Night Parrot found by Boles in October 1990 agreed exactly with the bird he had removed from the radiator grill. He was well acquainted with birds in the area of his property and remained confident of the Night Parrot identification. (Pers. comm. to IM 23/7/1991; per Joanna Gloster *in litt.* to AB 11/11/2018.)

### 33. Angle Pole Waterhole, 1989

On 10 October 1989 Philip (Phil) and Ifeta Gee parked by a relatively isolated 1.5 m diameter Nitre Bush immediately beside Angle Pole WH, about 7 km NW of Oodnadatta in the floodplain of the Neales River, in an area of Nitre Bush with scattered *Acacia salicina* and *A. victoriae* but no *Triodia*. The Gees boiled the billy for morning tea and bird-watched within three feet (< 1 m) of the bush. Their terrier was harassing what

they assumed was a rabbit in the bush, but after half an hour of harassment a parrot ran out and flew off in front of Phil. The dog gave chase but Phil called it back and the parrot landed on the ground about 15 m away. Phil observed it with binoculars for about 30 seconds in flight and on the ground. His immediate thought was that it looked like a Night Parrot and he noted that its cryptic colouring was yellower than he might have expected, more yellow than green. He also noted that it was plump, it gave a piercing look from its near-side eye as it flew by, and its flight was low (chest-height) and rather clumsy. He remains in no doubt that it was a Night Parrot. (P. Gee, pers. comm. to PH, 2018, 2020.)

### 36. 55 km east of Welbourn Hill, 1993

Returning to Mintabie one evening in August 1993, R. (Bob) Sim was driving along the Oodnadatta to Marla Track when, just on dark at 55 km east of Welbourn Hill, a bird flew from the roadside into the lights of the vehicle, where it was briefly visible. It was identified as a probable Night Parrot based on its size and colour, that identification reinforced by his observation (40) below. Recent rains had resulted in extensive growth of seeding green grasses. (*In litt.* to AB 5/3/, 30/4/, 27/10/2018.)

### 37. Arckaringa, 1995

In late September 1995 while spotlighting after dark on the road north of a biological survey camp, Ralph Foster saw a group of five stocky green parrots fly diagonally from the left rear through the headlights for 2 to 3 seconds about 5 to 6 m ahead and into the darkness to the right. The vehicle was travelling at approx. 40 km/h and the birds, on a similar trajectory, were travelling faster with a reasonably rapid wing beat and a direct flight. Foster saw them well and thought they were possibly Night Parrots. The impression was of an all green bird with paler, yellower flanks. The locality was a flat with reasonably good grass and forb cover but no *Triodia* unless in nearby rocky hills. (Pers. comm. to PH, April 2018.)

**38. Near Port Augusta, 2001**

One evening in late November 2001, Maxine and Glyn Francis were driving along a levee bank about 12 km SSE of Port Augusta, in an area of samphire flats with mangrove swamps 200-300 yards (metres) away. They saw two parrots on the ground ahead, appearing to pick up bits off the side of the road. As they proceeded the birds flew ahead several times, flying low and always landing on the ground, and calling softly to each other. They watched the birds for about 10 minutes until it was too dark to see where they went. The parrots were dumpy with short tails and a heavier build, and softly mottled green. Their posture was more horizontal; the birds did not 'sit up'. At the time, they did not know what the parrots were; they were unfamiliar with neophemas and did not consider Night Parrot. In mid-2018 Maxine saw a Facebook discussion about Night Parrots, including video footage, and immediately felt that their parrots were the same (pers. comm. to PH 2001, 2002, 2018). PH visited the site in December 2018 and found the habitat suitable for Elegant Parrots *Neophema elegans*; confusion with that species could not be ruled out.

**40. 30 km west of Oak Valley, 2007**

At 8 am on 27 September 2007, a warm and sunny morning, R. (Bob) Sim, Principal at Oak Valley School, was driving on Business Road to Tjuntjuntjara, 30 km west of Oak Valley. A bird rose from a very green roadside patch of vegetation in a football-oval sized depression that had contained shallow water extending 100 metres to the north following good rains. The open area contained Mulga and scattered spinifex and shrubs including chenopods but was surrounded by extensive areas of dense spinifex in open mallee. Similar green patches were dotted along each side of the road, up to several acres (a few hectares) in extent over at least 40 kms. Grasses were at the stage of seeding. The bird was flushed by the approaching vehicle and flew up, almost hitting the bull bar and passing the windscreen and driver's open window, before diving back into

vegetation. It initially spread both wings and, being close as it was flushed, it gave a very good view. It was immediately recognised as a Night Parrot by shape, the size of a well-fed Red-rumped Parrot, plump with a rather stumpy tail; distinctive colouring, green and yellow above, more yellow below, and 'herring bone' or cross-hatched plumage. In both this and Sim's sighting above, the birds' immediate response on being startled was to return to ground cover rather than fly into the distance. (*In litt.* to AB as 36 above.)

**Flinders Ranges****14. Between Port Augusta and Mount Brown, before 1911**

In October 1911 S. A. and Ethel White made a field trip to the Port Augusta district (White 1912b). S. A. White's field notes for 12 October 1911 state that the man in charge of horse-drawn transport for the latter part of this trip was T. Ash (State Library of South Australia PRG 335/49/23/2). Previously the Whites had been at Mount Brown in the ranges and on 12 October they made their way down to the plain where they reached 'a piece of country covered in low acacia & tobacco trees where Ash had seen *Geopsiticus* [*sic*] some time ago. We hunted all through it but failed to find a trace of them. Shot male white-winged wren, ...' That White-winged Fairywren *Malurus leucopterus*, a male now held in SAMA, bears a label stating that it was collected in 'salt bush south of Port Augusta'. Thomas Catterns Ash (1871-1957) moved with his family from Moonta to Port Augusta in 1880 (Anon. 1927), so his observation of Night Parrots was most likely made at some time from the early 1880s to early 1900s.

**23. Neuroodla, 1963-1970 (SAP)**

On five occasions Brian Powell observed what he believed to be Night Parrots about eight miles (13 km) west of Neuroodla Railway Siding, usually flushing them while mustering cattle (Powell 1970). The habitat was of annual and perennial saltbush *Atriplex* spp. with some

bindii *Sclerolaena* sp. and Blackbush *Maireana pyramidata*; there was no *Triodia* for 'several miles' distant. When flushed the birds would fly approximately 50 metres keeping very low to the ground and on landing would quickly rush to cover. Powell (1970) gave no dates but had made the observations after arriving in the region in 1963.

#### 24. Partacoona, 1969 (SAP)

On 15 August 1969 at about three miles (5 km) north of Partacoona HS, Brian Powell (Powell 1970) flushed a single bird while droving sheep across an area of Wards Weed, annual saltbush, bindii and spear grass *Austrostipa* sp.; there was an area of *Triodia* two miles (3 km) to the west. Powell observed the bird for 15 minutes and from as close as six feet (2 m), noting that it was dark green with an overlay giving it a mottled appearance, and had a yellow cheek patch and dark feathers along the edge of the wing. It was the same size as or larger than a Red-rumped Parrot, squatted very tightly to the ground and when disturbed darted from the bush very quickly, hugging the ground closely. It preferred to run for cover and would only fly when really pressed. Powell (1970) commented in relation to this parrot and those seen west of Neuroodla, that they were almost impossible to find unless nearly trodden on.

#### 34. SE of Arkaroola, 1990

On 27 April 1990 Brett Schuppan was with fellow geology students from Flinders University halfway up a steep quartzite gully a few km SE of Arkaroola. A boulder became dislodged, flushing a bird from a spinifex clump to Schuppan's left (*in litt.* to *Australian Geographic* 12/11/1990; pers. comm. to IM 5/2/1991). The bird flew a few metres in front of him, close to the ground, before dropping into spinifex 20–30 m to his right. He recognised it as a Night Parrot as he was familiar with its picture from field guides. It appeared dark green with the black mottling standing out and a body shaped like a large Budgerigar with a 'stumpy' tail. He attempted to flush the bird a second time but was unsuccessful.

#### 42. Hookina Creek, 2014

NW of Hawker near Hookina Creek in mid July 2014, David Hunter, an experienced station worker, was moving cattle along a fenceline and through a gutter when he saw a small parrot walking/hopping around in the shallow, sandy gutter. He was able to approach on his motorbike to within 2 m. The bird was calling. It was 'a carbon copy' of the recently released John Young Night Parrot photos, 'darker than a budgie', its tail was 'not like a normal parrot tail, more rounded/broad at the end' and its beak was different from other parrot beaks, having a 'broader, dished' shape. The site is in gently undulating country supporting Blackbush nearby and at the time of the sighting had a thick carpet of ankle-high green Wards Weed and Cannonball *Dissocarpus paradoxus* following significant rainfall in April of that year. The site is approximately 20 km from Powell's observations in thick flowering Wards Weed. Reece and Lynn Pedler visited the site on 27 August 2014 and observed Elegant Parrots, with which the observer is familiar and which he is confident were not what he had reported earlier. During visits over the following 20 months, the area was searched, fencelines, finch and martin nests examined, and remote camera traps were set, which detected high numbers of feral cats and foxes. With Steve Murphy, two SM3 sound recorders were deployed in early April 2015, one recording continuously at the site until July 2017, while the second was moved within a 10-15 km radius, including to nearby hills supporting *Triodia*. No Night Parrot calls were detected (R. Pedler *in litt.* to AB 16/10/2019). The observer is familiar with the parrots of SA's arid zone but has not seen one like this before or since (pers. comm. to AB 25/10/2020).

#### 43. Wooltana Station, 2015

At 4.50 pm on 28 August 2015, as Andy Bennett was driving south and approaching a cattle grid about 400 m south of Wooltana Homestead, a bird flew from right to left about 15-30 cm from the ground, passing about 3-4 metres directly ahead. It was olive green, larger than a

Budgerigar or Red-rumped Parrot but smaller than an Australian Ringneck. There was extensive black spotting across the side of the head and on the breast and neck. Its large head and non-protruding bill identified it as a parrot and its fairly uniformly green wings without patches of blue or other colour were noteworthy. The habitat was of saltbush, possibly bluebush, and some acacia (?Mulga); there may have been *Triodia* in the ranges a few hundred metres to the west. Bennett stopped and searched for about 20 minutes and returned on the following two evenings, noting the time of sunset at the site as 5.40 pm. As his actions show, he strongly suspected a Night Parrot but is uncertain, its tail appearing slightly longer than shown in the Pizey and Knight field guide (*in litt.* to AB 24/9/2020, 3/11/2020).

#### North-eastern Eyre Peninsula

##### 10. Port Augusta region, ca 1881

For the first part of the field trip that S. A. and Ethel White made to the Port Augusta district in October 1911, their transport driver was Norman Richardson. White (1912a) described him as 'an old bushman' and his response to White's enquiry about Night Parrots was 'Why yes, they used to be in these parts once, but I have not seen them for many years now. I mind some 30 years ago I used to burn the porcupine grass to make these birds fly.' Norman Alexander Richardson (1855-1941) of Port Augusta held all the mail contracts for the Gawler Ranges and north-west districts (Port Augusta to Yardea and to Tarcoola) for 42 years from 1876 (Richardson 1925). He was also a pastoralist and from the late 1880s onwards owned several stations to the north-west of Port Augusta. As there is little or no *Triodia* around Port Augusta, the question is where did Richardson consider was 'in these parts'? The nearest *Triodia* is in the adjacent Flinders Ranges, but it seems more likely that Richardson saw the Night Parrots in *Triodia* on north-eastern Eyre Peninsula or in the Gawler Ranges (see also the Mount Whyalla record below).

##### 15. Mount Whyalla, before 1912 (SAP)

S. A. White had been told by an un-named bushman that Night Parrots once occurred at Mount Whyalla (White 1913d). In 1912 the Whites found a fairly thick scrub of Black Oak *Casuarina pauper* at the base of the mount, and spinifex with a few acacia bushes further up its slopes, but after beating the spinifex found no sign of the Night Parrot (White 1913c, d). Olsen (2018) stated that it was the Whites' driver T. C. Ash who was the bushman informant, but this may not be so because White (1913d) referred to Ash as 'our driver' and 'our man (Thos. Ash)' and it seems unlikely that in the same article he would also refer to him anonymously as 'a bushman'. Ash had a varied working life sinking dams, wheat tallying, running a livery stable, working on the railways, racing horses and prospecting (Anon. 1952). White (1913b) noted that Ash had experience as a drover and had 'a splendid knowledge of the country for many hundreds of miles around Port Augusta', so he could have been termed a bushman. It is more likely however that the bushman was Norman Richardson (see the record immediately above) who had seen Night Parrots 'in these parts' many years previously. White's field notebook for the 1912 trip has not survived (Linn 1989) and so cannot confirm the bushman's identity.

#### Murray Mallee

##### 13. Ned's Well, 1910 (SAP)

In October 1911 S. A. White and his wife met a camel driver who told them that the previous year, while carting water with camels from Ned's Well for the Brown's Well railway survey, he had seen, among the spinifex, birds which answered to the description of Night Parrots (White 1911, 1913a). The Whites travelled to the mallee in November 1911 and made the second of their three overnight camps at Ned's Well, some 10 km NNW of present-day Karoonda. There they beat the spinifex which extended 'for miles around the camp' but found no sign of Night Parrots. The Brown's Well railway

extended from Taillem Bend east through Karoonda to Brown's Well (near Paruna) where it opened in April 1913 (D. P. Smith, Australian National Railways, *in litt.* 2/11/1979 to SAP). The Night Parrot observations would have occurred between April and November 1910, the likely period during which the camel team worked from Ned's Well (Anon. 1910a, b, c). Further clues to the habitat at Ned's Well are given by White's collection there of three Red-lored Whistlers *Pachycephala rufogularis* (SAMA B54352; AMNH 659348, 659349) in 1911. Critical requirements for this species are *Triodia* and broombush in mallee that is 5-40 years post-fire, usually with a dense understorey and open canopy of less than 10% projected cover (Higgins and Peter 2002). However, Shane Parker noted in his 1983 SAMA exhibition on the Night Parrot that the original vegetation around Ned's Well had been almost completely cleared for agriculture.

#### 16. North of Bellbird Bore, Victoria, near the SA border, 1913 (SAP)

In September 1913 F. E. Howe and T. H. Tregellas visited the camp of a Victorian government boring party under the supervision of J. J. Scarce, at Lingerandye (or Lingerandie or Cliff) Bore, NNW of Murrayville (Howe and Tregellas 1914). From there they moved camp north to Bellbird Bore and walked for some distance further north. Scarce told them he had met with Night Parrots 'a few miles farther north than we reached in September'. The birds were in thick, large *Triodia* and were seen feeding out on the edges of the grass, where it spread onto a small plain. There were round burrows right through each grass clump. No date was given but it was probably not long before September 1913. Distances given by Howe and Tregellas (1914) are misleading but Howe and Ross (1933) gave further details of the locations of the bores, so the approximate position of Scarce's observation can be confidently set at about 10 km north of Bellbird Bore or 51 km NNW of Murrayville (17 km NE of Peebinga in SA, about 1 km east of the border). This is now within the Murray-Sunset National Park. Menkhorst and Isles (1981) detailed another

Night Parrot sighting made by Scarce, some 70 km to the SE and close to a series of observations made by Evan Walton during 1954-1959 at Ross Spring, also in north-western Victoria.

**APPENDIX 2.** Plant species which frequently form components of the Lignum and Lignum-Nitre Goosefoot shrublands classified by Gillen and Drewien (1993; floristic associations 8 & 9) in the Kanowana Lakes region, Cooper Creek. The Parker Night Parrot Cooroomunchena locality was classified by Gillen and Drewien (1993) as Lignum shrubland.

#### a) Perennial associates

Tree: *Eucalyptus coolabab*

Shrubs: *Duma florulenta*, *Chenopodium nitrariaeaceum*, *Atriplex nummularia*, *Senecio lanibracteus*

Subshrubs: *Tecticornia indica* subsp. *leiostachya*, *Sclerolaena intricata*, *Solanum oligacanthum*

Forbs: *Rutidosis helichrysoides*, *Teucrium racemosum*, *Ethuliopsis cunninghamii*, *Haloragis aspera*, *Dentella pulvinata*, *Frankenia* spp., *Wahlenbergia* spp., *Boerhavia schomburgkiana*

#### b) Annual associates

Forbs: *Alternanthera nodiflora*, *Trianthema triquetra*, *Portulaca oleracea*, *Stemodia florulenta*, *Atriplex spongiosa*, *Atriplex intermedia-crassipes* complex, *Schenkia australis*, *Zygophyllum ammophilum*, *Tetragonia tetragonioides*, *Tribulus terrestris*, *Phyllanthus lacunarius*

Grasses: *Dactyloctenium radulans*, *Tragus australianus*

**APPENDIX 3.** Additional plant species, listed by family, observed a) around two automatic sound recorders, located at ca 27° 47' 30"S, 139° 32' 0"E, and b) additional species in the broader Cooroomunchena district (August 2015, September 2020).

#### a) Around sound recorders

Amaranthaceae: *Ptilotus polystachyus*

Asteraceae: *Gnephosis eriocarpa*, *Polycalymma*

*stuartii*, *Pterocaulon sphacelatum*, *Senecio gregorii*  
 Boraginaceae: *Heliotropium curassavicum*,  
*Trichodesma zeylanicum*  
 Chenopodiaceae: *Atriplex velutinella*  
 Euphorbiaceae: *Euphorbia inappendiculata*  
 Fabaceae: *Cullen* sp., *Tephrosia sphaerospora*  
 Goodeniaceae: *Lechenaultia divaricata*  
 Loranthaceae: *Anyema preissii*  
 Malvaceae: *Abutilon otocarpum*, *Sida ammophila*  
 Phyllanthaceae: *Phyllanthus lacunarius*  
 Plantaginaceae: *Stemodia florulenta*  
 Poaceae: *Aristida holathera*, *Eragrostis basedowii*,  
*Eragrostis dielsii*, *Eragrostis setifolia*, *Sporobolus*  
*mitchellii*, *Triraphis mollis*  
 Portulacaceae: *Portulaca intraterranea*, *Portulaca*  
*oleracea*  
 Solanaceae: *Nicotiana velutina*  
 Zygophyllaceae: *Tribulus eichlerianus*,  
*Zygophyllum howittii*

**b) In broader Cooroomunchena district**

Aizoaceae: *Glinus lotoides*, *Minuria denticulata*,  
*Tetragonia tetragonioides*, *Trianthema triquetra*  
 Amaranthaceae: *Alternanthera denticulata*  
 Araliaceae: *Trachymene glaucifolia*  
 Asteraceae: *Brachyscome ciliaris*, *Calotis hispidula*,  
*Calotis porphyroglossa*, *Rutidosis helichrysoides*,  
 ?*Leiocarpa brevicompta*  
 Chenopodiaceae: *Atriplex spongiosa*, *Sclerolaena*  
*bicornis*  
 Convolvulaceae: *Convolvulus* sp.  
 Cyperaceae: *Cyperus gymnocaulos*, *Fimbristylis*  
*dichotoma*  
 Euphorbiaceae: *Euphorbia tannensis*  
 Fabaceae: *Crotalaria cunninghamii*, *Crotalaria*  
*smithiana*, *Glycine canescens*, *Senna artemisioides*,  
*Sesbania cannabina*, *Swainsona phacoides*  
 Frankeniaceae: *Frankenia* sp.  
 Gentianaceae: *Schenkia australis*  
 Loranthaceae: *Lysiana exocarpis*  
 Malvaceae: *Hibiscus krichauffianus*, *Malva*  
*preissiana*  
 Nyctaginaceae: *Boerhavia* sp.  
 Poaceae: *Aristida contorta*, *Dactyloctenium*  
*radulans*, *Diplachne fusca*, *Enneapogon avenaceus*,  
*Setaria dielsii*, *Triodia basedowii*, *Tripogon loliiformis*  
 Proteaceae: *Grevillea stenobotrya*

Rubiaceae: *Dentella pulvinata*  
 Solanaceae: *Solanum nigrum*  
 Zygophyllaceae: *Zygophyllum howittii*

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