

A recent specimen of the Night Parrot *Pezoporus occidentalis* and a summary of information on the species in Western Australia including a clutch of eggs

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ABSTRACT – We report on the finding of a Night Parrot (*Pezoporus occidentalis*) specimen injured on a fence that subsequently died and was brought to the Western Australian Museum in 2022. This specimen confirms the continuing survival of the species in the eastern Pilbara. We summarise historical and recent records of the Night Parrot in Western Australia, including a clutch of three eggs collected near Lake Way in 1976 and confirmed here as eggs of the genus *Pezoporus*, and update the distribution of *P. occidentalis* in Western Australia.

KEYWORDS: juvenile-immature plumage, aftershaft, cornified palate, skeleton, stomach-gizzard, DNA

INTRODUCTION

The Night Parrot, *Pezoporus occidentalis*, was first described by John Gould in 1861 from a study skin he received from Perth, Western Australia (Gould 1861). The only information accompanying the specimen was that it came from the interior of Western Australia (WA). Since the late 1800s confirmed sightings of this species are rare due partly to its nocturnal and secretive behaviour and the fact that it occurs largely in the arid zone in areas visited by few observers.

It transpired that Gould's specimen, the holotype, was actually collected on the Western Australian Government Exploring Expedition under Robert Austin, in granite breakaway country near Mount Farmer (Wilson 1937). The type locality was fixed as 'eight miles (13 km) south-east of Mt Farmer in the Murchison District near the west end of Lake Austin' where on the 23 September 1854, a specimen was collected by Mr Kenneth Brown. The objective of the expedition was to explore the country northwards from Lake Cowcowing to the Gascoyne River for land or minerals of use to the colonists. Austin was also instructed to observe and collect natural history specimens when time permitted (Austin 1855).

Historically, no more than three specimens, including the type, were collected in Western Australia, all of which are now in overseas museums (Black 2012). The Western Australian Museum (WAM) did not hold any specimens (except for some recent eggshell and feathers), despite the fact that both the type specimen and the specimen used by Mathews for illustration in his *Birds of Australia* (1917) were from this State.

Noteworthy is that the first known specimen of the Night Parrot for Australia was actually collected by John McDouall Stuart on an expedition led by Charles Sturt, in October 1845 north of Coopers Creek in far northern South Australia (Wilson 1937), but overlooked by Gould because it was mistakenly identified as a Ground Parrot by Sturt (Olsen 2018) and apparently also later by John Gould when it was sent to England. Gould originally described the Night Parrot in the genus *Geopsittacus* however more recent taxonomic work and molecular studies (e.g. Joseph et al. 2011) place the Night Parrot and Ground Parrot in the same genus, *Pezoporus*, with the grass parrots *Neophema* spp. and the Budgerigar *Melopsittacus undulatus* their closest relatives

After more than a century of sightings uncorroborated by physical evidence, in 2013 the Night Parrot was

rediscovered by John Young in eastern Queensland (Worthington 2013) and verified photographs and voice recordings taken (e.g. Dooley 2013).

Here we report on the finding of an injured bird that hit a fence in the eastern Pilbara, Western Australia on 13 August 2022. A kangaroo shooter, A. Gibbs was hunting near the western edge of the Little Sandy Desert and noticed a parrot that was caught by the wing on a fence line. The bird had an injured wing and neck, was unable to fly and was picked up and taken back to his home. On 14 August, the bird was still alive, with a broken wing, and photographs were taken, but it died later and was subsequently wrapped in a plastic bag and buried in a dry creek bed. A photo of the bird was sent to one of us, Lena Long, to inform her about the parrot and for possible identification. Realising the importance of the specimen, Lena then contacted and forwarded the photo to Neil Hamilton (Ghost Bird Consultancy) who confirmed that it was a Night Parrot and asked that the specimen be retrieved and, if possible, sent to WAM. The specimen was retrieved, frozen and brought to Perth on 15 August 2022. Upon receiving the specimen, WAM signed a non-disclosure agreement generated by the local community. After consultation, the local community reversed the non-disclosure agreement and gave WAM the right to display, research and publish about the specimen, as long as the exact location and name of the community was not publicly released. As a result, we are not providing the exact location where the specimen was found to respect the local community's wishes.

Despite being damaged and buried, following discussions by staff at WAM it was decided that the specimen be mounted for display in the Western Australian Museum Boola Bardip along with its close relative, a Western Ground Parrot, *Pezoporus wallicus*. The mounted specimen was prepared by WAM taxidermist Kirsten Tullis. Before the specimen was prepared for exhibition it was taken to the University of Western Australia for a CT scan (Computed Tomography scan), measured and weighed, and liver, heart and muscle tissue were taken for DNA analysis.

As Lesberg et al. (2021) noted there remain many basic gaps in our knowledge of the Night Parrot, much of this due to the rarity of the species, the lack of reliable legitimate records (many records probably due to mistaken identity), and the lack of specimens with biological data. The acquisition of a recent reasonably fresh Night Parrot specimen provided an opportunity to generate biological information, with the collaboration of researchers across disciplines, to add to knowledge of Night Parrot biology.

Since then, much has been published on the biology and conservation of the species (for a summary see Yeap et al. 2025), including the release in December 2023 of a reference genome for the species (RefSeq accession: GCF_034315485.1; CSIRO Applied Genomics Project; Yeap et al. (forthcoming)). This reference genome was generated from a Western Australian specimen voucher (WAM A40385) from the eastern Pilbara. Characterising that specimen, collected in 2022 in the eastern Pilbara,

is the focus of this paper. Around this time, WAM staff came across undetermined eggs held in the collection (Kolichis Oological Collection) that were suspected as belonging to Night Parrot.

The main objective of this paper is to provide a comprehensive account of the recently acquired specimen. This includes characterising its plumage (as descriptions of juvenile-immature plumages are poorly known); providing details of the afterfeather (showing downy base); gathering anatomical details with CT scans, including the bill shape and illustrating the cornified palate (not previously described), identifying the stomach-gizzard which include numerous gastroliths; and providing DNA sequence data. This paper also provides an opportunity to attempt identification of the undetermined clutch of eggs in the Kolichis Oological Collection believed to be from a Night Parrot, and compare DNA material from one of these eggs with some confirmed Night Parrot eggs and eggshell from the same region. A further aim was to provide a list of historical and contemporary records of the Night Parrot for Western Australia as a reference for future observations.

METHODS

DESCRIPTION

The study principally describes a new specimen WAM A40385, which has since been mounted for display, with the rest of its body kept in alcohol.

CT SCANNING

X-ray computed tomography (CT) scanning was conducted at the Centre for Microscopy, Characterisation and Analysis (CMCA) at the University of Western Australia. The specimen was scanned using a Nikon XT H 225ST large field-of-view scanner using the static reflection target at 75Kv, 73uA, with an exposure time of 2 seconds through 1200 projections, producing a voxel resolution of 0.068672 mm. The resulting data was first reconstructed in CTPro3D, converted to DICOM format, then ingested into Drishti 3.0 volume editing software environment (Limaye 2012). Drishti Paint (Hu et al. 2020) was used to highlight target tissues within the volume while removing extraneous data (e.g. the container and tissue paper used to house and stabilise the parrot during scanning). Target tissues were tagged, exported from Drishti Paint, and reopened in Drishti for examination and the generation of 2D image files.

IDENTIFICATION OF POTENTIAL EGGS AND SITE DESCRIPTION

In April 1976 licensed oologists T.C. Allen and N. Kolichis were camped 51 km south of Wiluna near Lake Way homestead. During the evening a bird was flushed from a patch of spinifex. The site was searched the next morning and a nest under the spinifex revealed a clutch of three white eggs. The nest consisted of short stems of spinifex (*Triodia* sp.) placed well under the outer part of

the ringed clump. The eggs were collected and became part of the N. Kolichis Oological Collection, most of which is now lodged in WAM. For 48 years the eggs sat unidentified in the collection, as it was unknown what species had laid the eggs. To identify the species that laid the Kolichis Oological Collection eggs (WAM A48894), a DNA sample was taken from one of the eggs for comparison with sequences from recent Night Parrot specimens, including WAM A40385 from the eastern Pilbara and another set of eggshell samples WAM A39768, collected by N. Hamilton and A. Burbidge north-east of Wiluna in April 2017. The site where the eggs were collected is also described in detail.

MOLECULAR ANALYSIS

DNA was extracted from *P. occidentalis* eggshell fragments (WAM A39768) and undetermined eggshell fragments (WAM A48894) using a Qiagen DNeasy Blood & Tissue kit (Qiagen, Clayton, Australia) following manufacturer's instructions. DNA extraction and amplification were performed at the WAM Genetic Resources Laboratory. Sequencing was carried out at the Australian Genome Research Facility (AGRF) Perth node. Reagent controls were included for each set of reactions and produced negative results. Sequences were assembled and edited in Geneious Prime 2020.0 (<https://www.geneious.com>), with flanks manually trimmed, then aligned with other relevant sequences available in the NCBI GenBank Nucleotide database with the MAFFT v7.490 plugin, using the automated algorithm (Katoh et al. 2002, Katoh & Standley 2013) and trimmed to the target region.

Eggs (WAM A39768)

DNA was extracted as described above, with modifications as described by Bush et al. (2005) and Trimbos et al. (2009), including using the supernatant a second time on the spin-column to maximise DNA yield. Attempts to amplify and sequence a 237 bp fragment of 12S rRNA (hereafter 12S) using bird-specific primers developed for use with eggshell samples (12SA:12SH, Cooper 1994) failed and attempts to amplify and sequence partial COI (LCO1490:HCO2198, Folmer et al. 1994) and ND2 (L5216:H6313; Sorenson et al. 1999) produced sequences of low quality. Although unsuitable for comparison with the undetermined eggshell data, the partial ND2 and COI sequences were more similar to *P. occidentalis* than to any other species (NCBI core nucleotide database BLAST). These data are not further analysed here.

Eggs (WAM A48894)

Fragments of the dried inner membrane and shell were taken from around the existing aperture of one of the three blown eggs to avoid further damage to these eggs. Extractions were carried out within a sterilised UV-hood to minimise contamination. Attempts to amplify and sequence partial COI (LCO1490:HCO2198, Folmer et al. 1994; LCOIp:HCOIp, Wright et al. 2008), ND2 (L5216:H6313; Sorenson et al. 1999), and 12S rRNA (12SA:12SH and 12SA:12SO, Cooper 1994) either failed

or produced sequences identified as human, though negative results were obtained from all reagent controls (suggesting possible contamination during specimen or sample handling).

Subsequently, a second sample of eggshell and membrane was taken from the same specimen, and DNA extracted using the same method. Attempts to amplify partial COI and ND2 failed or resulted in low quality sequence that could not be reliably identified. 12S (12SA:12SH, Cooper 1994) was successfully amplified and sequenced. A maximum likelihood tree was generated and analysed using RAxML v8.2.11 (Stamatakis 2014) using GTR GAMMA nucleotide model and 100 rapid bootstrap inferences. Fewer sequences of related species were available for 12S than for COI and ND2 genes. The data were visualised in a phylogenetic framework with selected 12S sequences of closely related species (*P. occidentalis* and *P. wallicus*) including a sequence generated from WAM A40385, the eastern Pilbara specimen examined in this paper, generated by CSIRO. Since 10 of the 12 *P. occidentalis* 12S sequences were identical, eight of the identical sequences were omitted from the analysis.

RESULTS

We reviewed all records of the Night Parrot in Western Australia and below provide an updated distribution for the species.

DESCRIPTION

Juvenile male (WAM A40385) (skull appearing not fully ossified and testes 5.9 x 2.7 and 4.6 x 2.7 mm); total length 232 mm; weight 60 g (with little body or subcutaneous fat; exposed culmen 17 mm; entire culmen 23.5 mm; bill width 10.1 mm; bill depth 15.1 mm; wing 151 mm; tail 110 mm; tarsus 23 mm; middle toe and claw 22 mm. Iris grey brown; bill short and broad, upper mandible grey, tip paler and lower mandible (broad and scoop-like) pinkish horn; cere bare, slightly swollen, pinkish grey; legs and feet pinkish red.

Forehead, crown and nape pale green, the feathers with broad black shaft streaks; lores, cheeks, ear coverts and sides of neck green with some feathers slightly lighter and yellower and with narrow black tips. Back, rump and lesser upperwing coverts yellowish green, mottled with dark brown, black and yellow, the feathers with dark brown bases and V-shaped yellow and black spots and transverse bars. Uppertail coverts yellow barred with black and edged with pale green. Tail pointed but with central feathers slightly shorter than outer feathers, uppertail blackish brown, edged green and notched with greyish white on edges and tinged with pink towards tip. Greater upperwing coverts mostly blackish brown, broadly edged with pale grey (post juvenile moult). Primaries and secondaries dark brown, edged with grey and with a white to pale yellowish spot or notch on inner web, the yellowish white increasing in extent on secondaries where it encroaches on the outer web.

Chin and throat mottled with pale green, yellow and black, feathers with mostly yellow bases a black V-shaped bar and pale green tips. Breast, belly and thighs bright yellow; sides of breast yellow, feathers with kite-shaped black bars and pale green tips. Vent and undertail coverts yellow with grey bases and a fine blackish shaft streak. Undertail mostly yellow on inner

webs to whitish on outer webs and with narrow black bars on inner webs and broader dark bars on outer webs. Lesser underwing coverts pale green with dark brown shaft line; rest of underwing greyish brown (darker on primary coverts) and with white to yellowish white spots or blotches on inner webs which combine forming a broad underwing stripe narrowing outward.

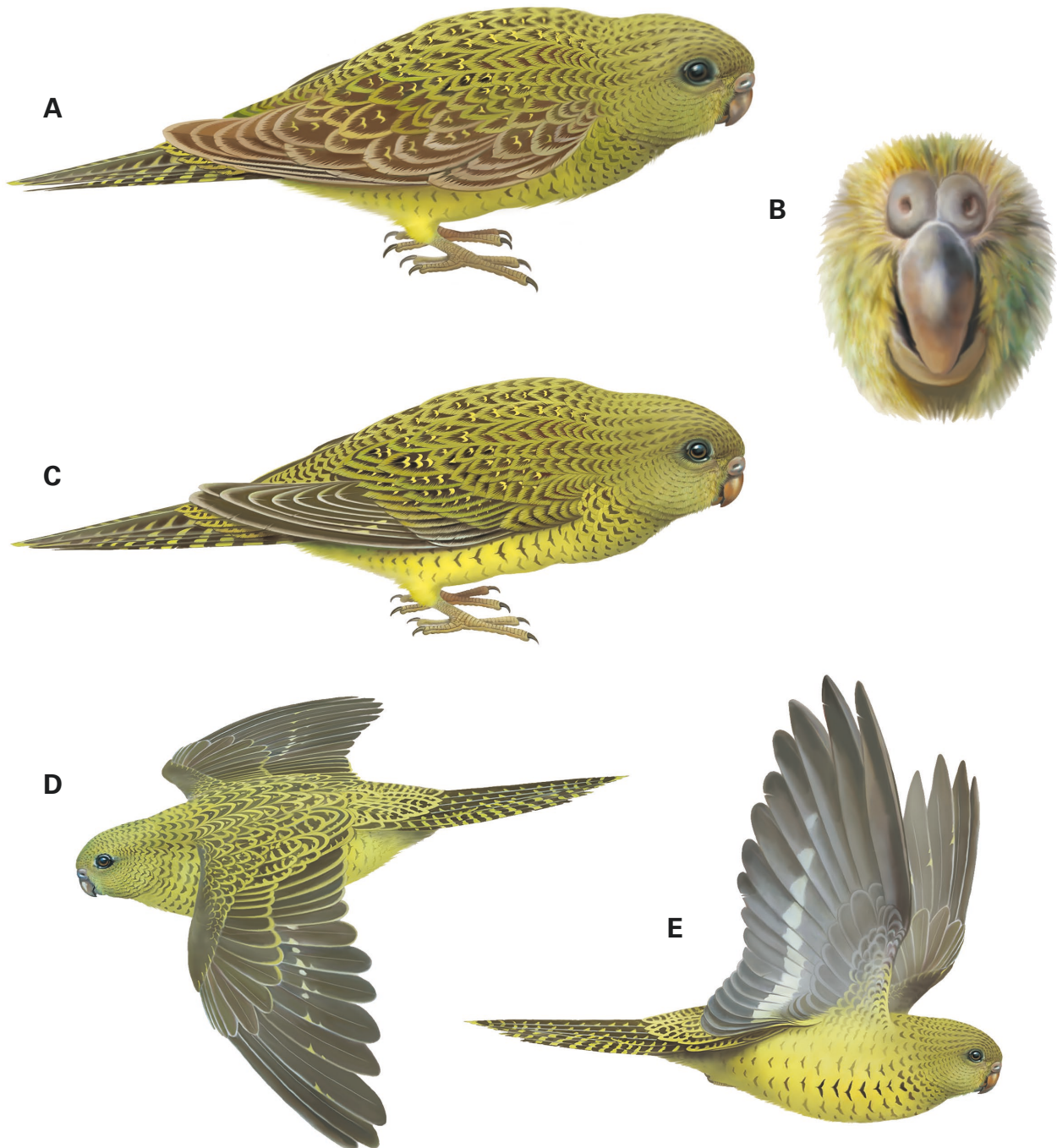


FIGURE 1 A) Immature plumage of WAM A40385; B) Broad bucket shape of the lower mandible and enlarged nostrils; C) Adult from east Murchison with bright upperparts and more yellow underbelly; D) Fine spotting on the upperwing of mist netted bird from east Murchison; E) Extent of the underwing stripe of mist netted bird from east Murchison. (Illustrations Rob Fleming.)



FIGURE 2 Wing stripe of juvenile WAM A40385. (Photo Kirsten Tullis.)

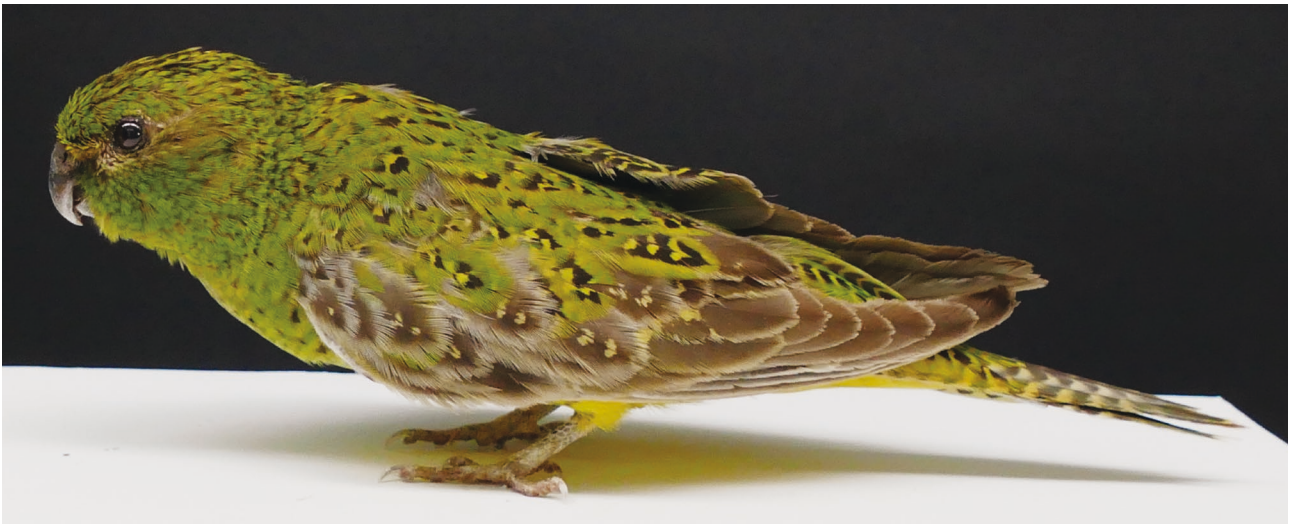


FIGURE 3 Taxidermied specimen of juvenile WAM A40385. (Photo Kim Sarti.)



FIGURE 4 The two shafts of a Night Parrot feather. (Photo Neil Hamilton.)

The extent of the wing stripe appears to be related to age in many parrots, often longer in young birds. Most parrots acquire the adult body plumage at the post-juvenile moult. As the underwing stripe extends as vague blotches to the outermost primaries (Figure 2), this is a further indication that the bird was probably less than a year old, moulting out of juvenile plumage into adult plumage. This is also indicated by the pale grey upperwing coverts and the extent of the underwing stripe, which is broader and more extensive than might be expected of an adult bird.

A notable feature of some of the bird's body feathers are feathers with aftershafts. The aftershaft is part of the complete primitive feather, which consists of two shafts, an outer one (the feather we see) and an inner one, the afterfeather (see Figure 4). In some families

the aftershaft is nearly equal to the main feather in size. In the tinamous and pheasants, the aftershaft is large and appears to be of importance in insulation (Thompson 1964). Many herons, hawks and parrots have aftershafts, but it is still less like the main feather with a rather feeble rachis. This appears to be the case in this species and could well be an insulative adaptation to living in desert areas that experience low temperatures. This feature is also known in the Ground Parrot (*Pezoporus wallicus*), Bourke's Parrot (*Neopsephotus bourkii*), and Galah (*Eolophus roseicapilla*) (Johnstone pers. obs.).

Shute et al. (2023) examined some of the unique cranial features of *P. occidentalis* and noted specialised ear anatomy, suggesting that the Night Parrot has enhanced acoustic abilities. From observing the CT scans of WAM A40385, another distinctive feature is the broad bucket shape of the lower mandible (Figure 5).

Homberger (1980) showed that parrots developed a wide variety of surface structures on the palatal plate during their early radiation phases, which now can be considered group indices.

The Cacatuinae, for example, can be clearly distinguished from other Psittaci based on their palatal plate characteristics, as both the underlying living tissue

and the surface structure and general shape exhibit a specific form. The palatal plate of Loriinae, Psittacinae and Loriculinae are all structured with palatal ridges, but the individual subfamilies differ in terms of the palatal plate shape, the nature of the horn surface, and the ridge structure. The palatal ridge pattern was shown by Homberger to be a suitable character for grouping genera of the Psittacinae. It also can be used for phylogenetic derivations of individual genera. Figure 6 illustrates for the first time the cornified palate of *P. occidentalis* (drawn from CT scan) and highlights similarities of the genera *Neophema*, *Melopsittacus* and *Neopsephotus* (after Homberger).

CROP-STOMACH-GIZZARD CONTENTS

The crop of WAM A40385 contained predominantly inorganic gastrolith (stomach stones), 'sand' grains of size 'coarse sand (CS) – 1000 μ m–2000 μ m'. These were well-sorted, but with an accompanying organic component of varying size and gelatinous character, probably derived from an insect (possibly parts of an insect larva or termite). The organic material was variously gelled and clumped together with some of the inorganic components (Figure 7). It is known that

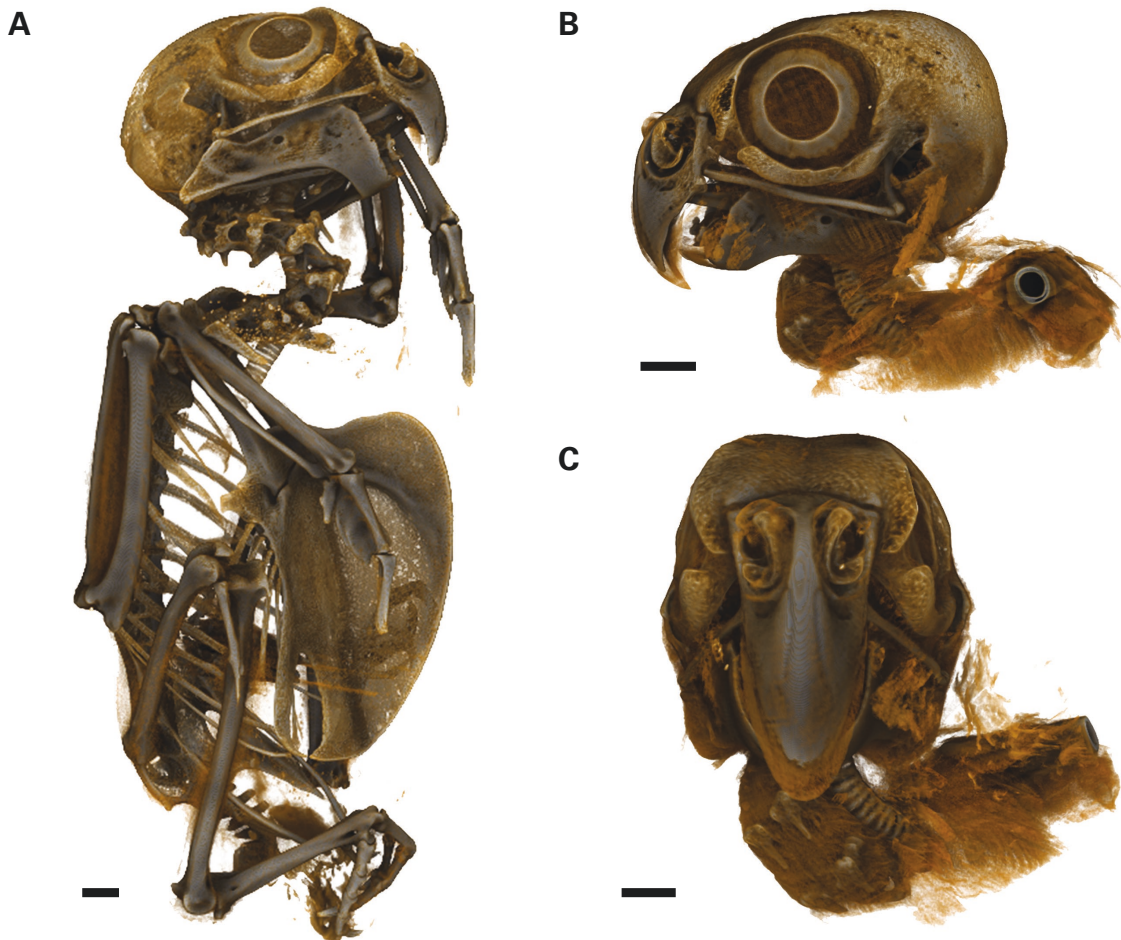


FIGURE 5 CT scans of WAM A40385: A) complete skeleton; B–C) head, bill and nostrils. Scale = 10 mm.

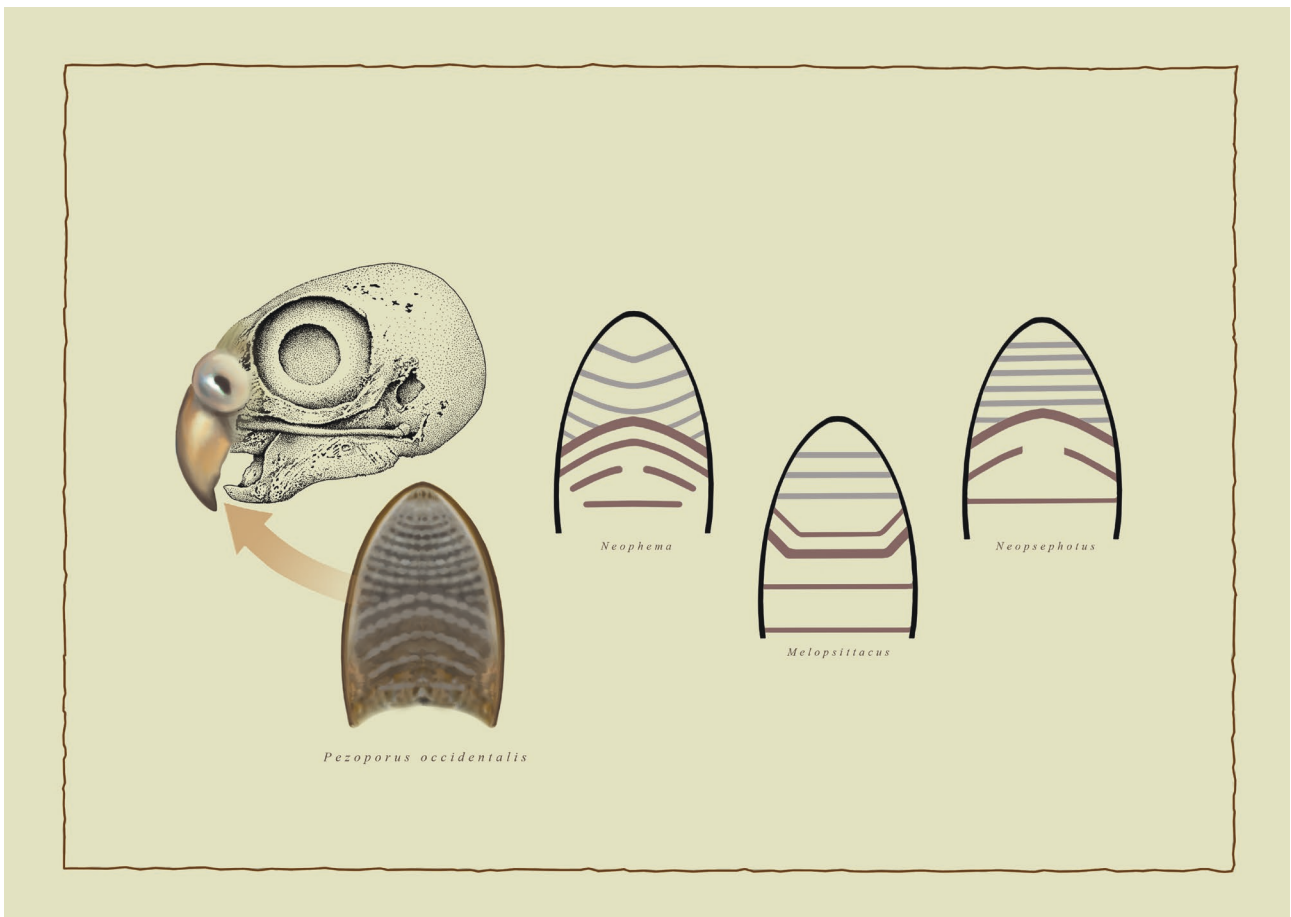


FIGURE 6 Skull and cornified palate of *Pezoporus occidentalis* and genera *Neophema*, *Melopsittacus* and *Neopsephotus*. (Illustrations Rob Fleming.)

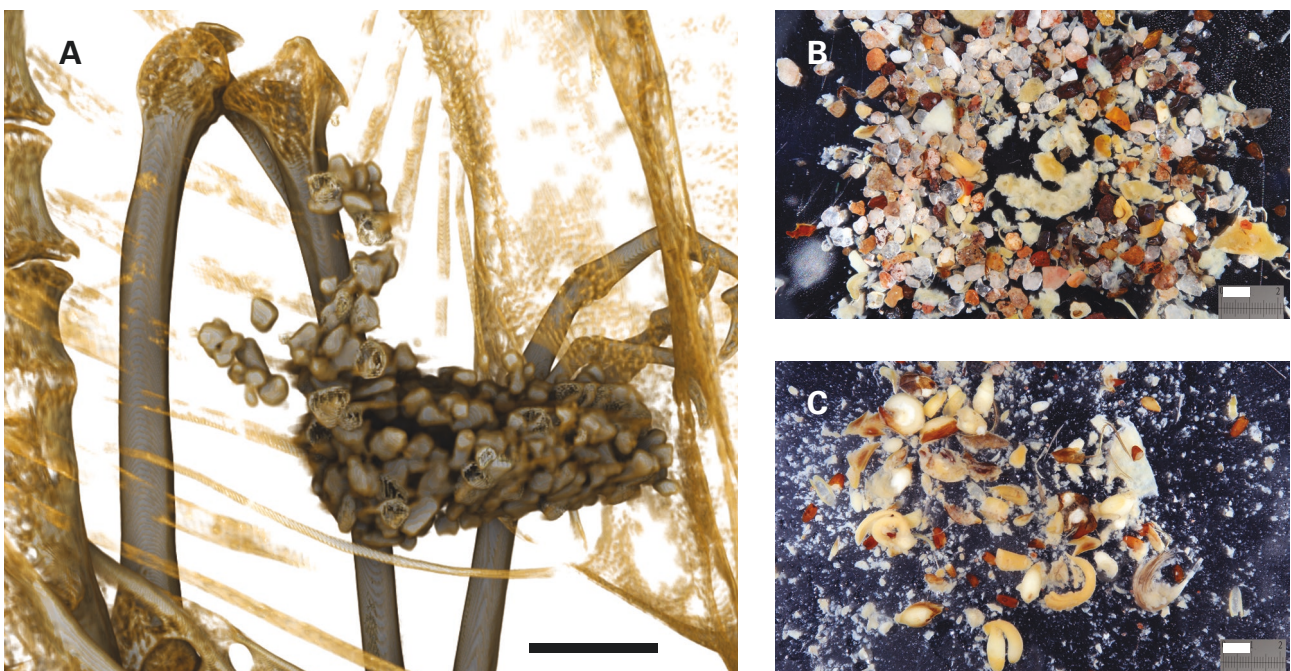


FIGURE 7 A) CT scan of WAM A40385 showing stomach-gizzard contents with huge number of gastroliths; B) 10x magnification photo showing stomach-gizzard contents; C) 10x magnification photo showing crop contents. Scale = 10 mm.

most parrot species will feed on invertebrates, such as termites and larvae; this has been observed on numerous occasions, both in the wild and in captivity (N. Hamilton pers. obs.).

Gastroliths and Inorganic grains

1. Quartz: comprises some 60% of the sample, varying from clear, crystalline (but not euhedral) through bucky white to 'pink' iron-oxide stained. Grains vary from rounded to subangular (R-SA) and are well-sorted within the coarse-sand (CS) size range.



FIGURE 8 The clutch of three eggs (WAM A48894), identified as *Pezoporos* genus.



FIGURE 9 Present-day image of the 1976 collection locality of the three *Pezoporos* eggs (WAM A48894), showing massive habitat change. The grazing pressure by cattle and impact of fire has greatly reduced the extent of *Triodia* in this area. (Photo Neil Hamilton.)

2. Dark rock/mineral: a combination of iron-oxide rich grains, haematite, goethite and ilmenite (magnetic) comprise 10–12% of the sample. Grains well-rounded to rounded (WR-R) also within the CS size range.
3. Rock fragments: Predominantly leucocratic (granitic composition), comprising 5–10% of the sample and ranging from rounded to angular (R-A), again in the CS size range.
4. Carbonate: none apparent — several of the grains appear calcite-like, but did not react with HCl.

A total of 475 sand grains (medium grains 0.25–0.5 mm and coarse grains 0.5–2 mm), gastrolith pebbles and small stones (up to 2.3 mm) were found in the gizzard, mostly sub-rounded, rounded and well-rounded and ranging in size from 0.2 mm to 2.3 mm in length. These aid in food digestion of tough plant materials.

Organic grains

These consist of pale green/yellow to colourless grains, unidentified and tending to clump with inorganic grains to form very coarse (VC) angular, but soft and squishy aggregates, which can be disaggregated with a scalpel blade.

IDENTIFICATION OF PUTATIVE NIGHT PARROT EGGS AND SITE DESCRIPTION

The three white short sub-elliptical eggs, WAM specimen A48894, measure 24.22 x 20.98 mm, 24.49 x 21.18 mm and 25.61 x 21.71 mm (Figure 8).

According to N. Kolichis (pers. comm.), the nest site was in low, open, mainly Mulga (*Acacia aneura*) scrub with a ground cover of spinifex about 60 cm high and forming rings about 2–3 m across. The ground cover also contained some low grasses and seasonal herbage forming a greenish tinge on the flat loamy soil. The contemporary photo below (Figure 9) highlights the loss of hummock grass since 1976 with the habitat now severely degraded by the grazing of rabbits as well as sheep and cattle.

MOLECULAR RESULTS

The WAM A48894 12S sequence was identical to a sequence of *P. wallicus* isolated from the Australian National Wildlife Collection specimen B61680 collected in Strahan, Tasmania, and differed from sequences of *P. occidentalis* at 5–6 nucleotide positions. These results confirm the eggs belong to the genus *Pezoporos* and while the results suggest they belong to the Eastern Ground Parrot *P. wallicus* (Figure 10), this is highly unlikely given the collection locality. We note that compared to other gene regions commonly used for bird species identification, the relatively short fragment of 12S generated for this analysis provides limited characters for comparison with reference sequences

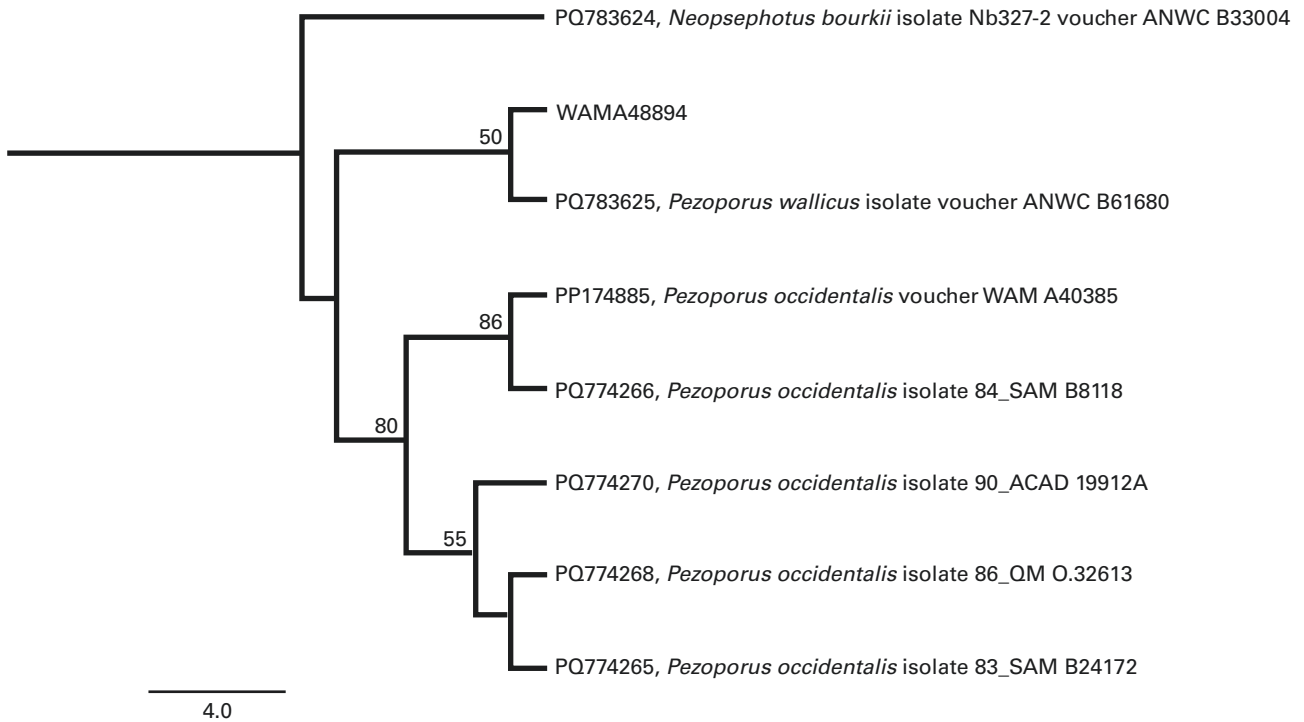


FIGURE 10 Maximum likelihood tree of partial mitochondrial 12S rRNA, including egg specimen WAM A48894. Branch numbers reflect bootstrap support values.

and the sequenced region may not have diagnostic ability. In addition, limited 12S sequences were available from vouchered specimens as references and thus identification of the WAM A48894 eggs as other *Pezoporus* species or sub-species is not excluded. Further analyses, including DNA extraction in a dedicated historical DNA facility, using techniques to extract higher-quality DNA from historic eggshell, and sequencing of longer reads or multiple loci, are recommended to conclusively identify the WAM A48894 eggs.

REVIEW OF NIGHT PARROT RECORDS IN WESTERN AUSTRALIA

Here we list the most plausible reports for Western Australia from Western Australian Bird Notes (Birdlife Western Australia), published accounts in the literature, newspaper articles and unpublished observations (G.M. Storr and R.E. Johnstone). There are other records deemed less plausible or erroneous by us for various reasons and not included. For example, both the Elegant Parrot and Bourke's Parrot (parrots of similar size) fly during the twilight which to an observer can create confusion with the Night Parrot. Also, many observers did not realise that the Elegant Parrot is a rare autumn-winter visitor to the Pilbara from the south-west of WA.

Of interest, F.L. Whitlock questioned indigenous people in the Millstream area as to the presence of a

parrot breeding in the spinifex, 'but all shook their heads. They had never heard of a parrot that did not breed in a tree' (Whitlock 1924).

1. On 23 September 1854, a specimen was collected 8 miles (13 km) south-east of Mount Farmer in the Murchison district by Kenneth Brown, a member of the Western Australian Government, during an exploring expedition under Robert Austin. This bird was eventually described as the type specimen by John Gould in 1861 (Gould 1861).
2. In 1896, G.A. Keartland (North 1898: 171) saw a bird on a stony rise clothed with spinifex and scattered mulgas; the locality was unspecified but presumably north of Lake Carnegie. He was informed by the indigenous people of the nature of this parrot's nest and that it laid four eggs.
3. On 21 September 1912, the drover Martin Augustus Bourgoïn shot a strange parrot while hunting Bronzewing Pigeons for food, at Nichol Spring on one of the southern tributaries of the Ashburton River, WA. In a letter to Hugh Wilson, Bourgoïn stated the bird was flushed from spinifex (Wilson 1937), and suspecting that it was a Night Parrot he attempted to skin and preserve the bird. In May 1913 he came to Perth with the specimen and met the surveyor-explorer Alfred Canning who was also interested in the Night Parrot. Canning suggested showing the remains to Ernest Le Souef, Director

of the South Perth Zoological Gardens. He did so, though he only had the wings and tail feathers, the head and feet. This was insufficient to confirm the identify the species, however Le Souef's opinion was that it was the very rare Night Parrot. The remains were then sent to a Mr A.E. Breaman, a surveyor and ornithologist in Gippsland (Victoria) to confirm that they were not of a Swamp Parrot (Ground Parrot), and he concurred that the remains were of the Night Parrot.

4. Storr (1980), lists four unconfirmed records from the arid south of the Kimberley region: A.J. Jeapes saw parties of 2–5 birds in spinifex on sandy and gravelly soils east of the Sisters Plateau at night in 1933–36 (Storr 1960). In 1958 D.L. Serventy was told of sightings southeast of Fitzroy Crossing. (1) H. Scrivener claimed that pairs were regularly seen at dusk in spinifex country around a flowing bore ca. 30 miles (50 km) SE of Old Cherrabun towards the Poole Range; (2) the manager of Gogo Station said that he had recently flushed one at a local billabong and that the parrots had been flushed at Christmas Creek after dark (Storr MS).
5. Sergeant C.B. Sherry (WA Police Force) reported to G.M. Storr on 10 August 1962 (pers. comm.) that in 1950 a little after sundown, 48 km from Flora Downs on way to Nicholson, east Kimberley, he flushed a bird which his trackers called a Night Parrot. It was flushed from vegetation growing around a waterhole.
6. Note in J.R. Ford (1964 MS) that on 1 September 1964 a Mr Jack Harvey of Mininer Station informed him that several years ago a Mr Carlisle trapped a 'Night Parrot' at Milli Milli Soak on Juna Downs.
7. In a letter to D.L. Serventy on 27 August 1965 Louis Ward wrote:

'Early in July while mustering out west on the west mill run, two natives and I lit a fire in soft spinifex country. After it had swept through nearly a hundred yards of rubbish, I noticed the sound of what I thought were shell parrots (Budgerigar). Noticing where the birds landed, I rode over. Dismounting quite a way back I crept up to the spot where a parrot about a foot long sat crouched in an opening, the distance I was from him was what I estimated to be 8 feet.

Its appearance were a speckled green back, light green breast, its tail was speckled 4–5 inches long and rounded at the end. Its neck and head were light green with large yellow spots around his eyes its beak was set back in the feathers and only the top half could be seen. The parrot's legs were very short and his call was like a shell parrot's only much louder.

I crept up to him three times and each time he flew about thirty yards and landed so quickly I didn't see whether he glided to land or dived.'
8. On 14 July 1970, N.L. Ives located what was probably a Night Parrot nest in a dormant tussock of *Triodia* about 16 km north-east of Balfour Downs. The nest was just or nearly completed and the area had received good rains a fortnight earlier. The following day, while travelling cross country, four birds, almost certainly this species, were flushed from spinifex 96 km north-east of Balfour Downs. They flew low over the spinifex then dropped from view (Ives 1971).
9. In a 1972 letter to The Australian Broadcasting Commission regarding the TV series *In the Wild with Harry Butler*, Mr W.W. Wilson of Balaklava, South Australia reported that he had a Night Parrot in captivity at Lady Edith Lagoon in the Great Sandy Desert. It was captured from spinifex.
10. In the summer of 1987, Mr Bill Gorrie (dogger/pro prospector) of Leonora reported to R.E. Johnstone a possible Night Parrot at Mount Strawbridge. He flushed two birds from spinifex, one landing low in a mulga tree, and the other running along the ground making a lot of noise. He described the birds as being smaller than a Bourke Parrot but plumper, drab yellow with no distinctive tail feathers, black speckling on back and front, more green-yellow throughout, the head like a budgie, and the call a sharp, deep chatter.
11. Storr 1985 lists unconfirmed reports from the upper Ashburton, at Nichol Springs and Chalk Springs (both on the Ethel River). In his review of birds in the Gascoyne region, Storr (1985) lists Chalk Spring on the Ethel River as another locality at which Night Parrots had been found but did not provide supporting details. It was based on J.R. Ford's field notes from 26 August 1964 at Nichol Spring, Ethel Creek (Curry 2021):

'On morning of 26/8/64, a larger (than Bourke's Parrot) parrot-like bird flew just in front of me while I was walking over stony hill overlooking a spring. It was not calling and had a direct rather than an undulating flight. Unfortunately, the light was too poor for me to discern the colouration of the bird. 26 August 1964, Chalk Springs, Ethel Creek (strange notes heard at 11:30 pm near the water edge possibly attributed to this species; notes mournful and parrot-like ...)'

Ford was a highly experienced ornithologist — especially with desert avifaunas — and discussed this observation with WAM Bird Curator, Glen Storr, and compared descriptions of calls made by the species when coming to water at Nichol Spring and Windich Springs (Wilson 1937).
12. Storr (1985) also lists unconfirmed reports from Bolgers Soak, the head of Neds Creek and Pinyerinya Pool (all north of Lake Gregory in the far eastern Gascoyne region).

13. On 5 July 1995, Kevin Coate and Geoff Lodge located what they believed was a Night Parrot nest at Mount Brophy Springs in the Gardner Range, near the location of the above record from Storr. They located four immaculately clipped tunnels leading into small cavities in the tops of three spinifex tussocks that were possibly made by Night Parrots. The spinifex had been bitten off at a 45° angle, consistent with parrot clippings (Coate et al. 1998).
14. In 2004, environmental consultants from Biota Environmental Sciences made a possible sighting during surveys at Moojarri Well near the Fortescue Marshes in the eastern Pilbara (Biota 2005; Olsen 2018).
15. In 2005, R. Davis and B. Metcalf observed what they believed to be Night Parrots drinking at dusk at Minga Well (Davis and Metcalf 2008).
16. In October 2005 Mark Ditcham, a Paruku IPA co-ordinator, reported to Sue Mather of Birds Australia that one of the community members observed what they thought was a Night Parrot along the road at Ruby Plains Station, WA (S. Mather pers. comm.)
17. In March 2017 a Night Parrot and a nest with one egg was discovered in the east Murchison, in an area of spinifex where ornithologist Bruce Greatwich obtained the first known photograph of a wild Night Parrot in Western Australia (Jacket et al. 2017).
18. On 21 April 2017 the nest site found in March in east Murchison was revisited and found to contain two broken eggs. This nest was either abandoned or possibly predated on by rodents or reptiles (Hamilton et al. 2017). The nest remnants, including egg fragments and faeces, are lodged in WAM. One egg from this nest, WAM specimen A39768, measured 25.3 x 20.7 mm.
19. In August 2017 researchers returned to the east Murchison site (Millrose) and mist nets were set in the late afternoon and evening. After a short period, a Night Parrot was flushed from a clump of spinifex near a set of mist nets and was caught that evening. The Night Parrot was fitted with a GPS and radio tracking antenna. After failing to track the Night Parrot on foot, a light plane was brought in and the bird was found to have travelled 35 km from the original site of capture. Unfortunately, no further trace of the bird's transmitter was recorded, and its fate is unknown (N. Hamilton pers. comm.)
20. In June, August-September and December 2017, and March-April 2018, targeted surveys for Night Parrots were undertaken by Greg Harewood at various points along the Talawana Track, Willjabu Track and around the north-western edge of Lake Disappointment near sections of Savory Creek, WA. These surveys included the use of autonomous recording units (ARUs), searches for feathers, and camera traps placed at watering points. This work confirmed the presence of Night Parrots along parts of the Willjabu Track just north of Lake Disappointment. Most recordings were in interdunal swales containing open low woodland of *Corymbia opaca*, low scrub of *Acacia/Grevillea* and ground cover of the hummock grass *Triodia basedowii* (Harewood 2018).
21. In October 2017 a blurry image of a Night Parrot was taken using a remote camera by World Wide Fund for Nature/Paruku Indigenous Rangers (July 2017, ABC News) south of Lake Gregory in the Great Sandy Desert, WA. The image was published by Vanessa Mills and Ben Collins of ABC Kimberley on 16 October 2017.
22. Between 2020 and 2023 acoustic recorder units were used by Ngurrpa Rangers to survey for the presence of Night Parrots in the Great Sandy Desert, central eastern Western Australia between Balgo and Kiwirrkurra. Night Parrots were detected at 17 sites over a vast area of sandplains and dune fields across a distance of 160 km from north to south and 90 km from east to west (Ngurrpa Rangers et al. 2024). A nest with one rotten egg (measured 26.59 x 22.39 mm) and eggshell was collected on 29 September 2024, and another nest with an addled egg (measured 25.49 x 21.33 mm) was collected and sent to WAM.
23. Footage of a Night Parrot drinking was captured in September 2025 by Martu Rangers using a remote camera in the east Pilbara about 320 km east of Port Hedland. The image was published by Kelsey Reid and Kelly Gudgeon of ABC Pilbara on 23 November 2025 (Reid and Gudgeon 2025).

DISCUSSION

This specimen has provided us with a unique opportunity to document the juvenile-immature plumage stage (including the details of wing stripe and aftershaft feathers), details of the complete skeleton, the skull including the bill and nostril shape, illustrate the cornified palate, and show the stomach-gizzard with an extraordinary number of gastrolith pebbles and small stones, a large percentage of these being quartz and thus chemically resistant to acids in the gizzard. The gastrolith sources could prove to be an important part of the habitat for this species and may involve some local movements between feeding sites, and sites to ingest gastroliths for help in the digestion of hard, tough desert plant seeds.

The clutch of eggs collected near Lake Way highlights the habitat destruction and alteration in that region caused by introduced stock and altered fire regimes. Sadly, this former breeding site is now no longer suitable for this species and the regeneration of *Triodia* hummocks is extremely slow and would take many years. These eggs remain the only known clutch of this species in museum collections.

There is little doubt that in many areas of Western Australia, Night Parrot population declines occurred due to degradation of habitat by grazing of stock (sheep, cattle and feral camels), altered fire regimes and predation by cats and foxes (Ashby 1924; Whitlock 1924). The species has persisted in areas where there is little grazing pressure from sheep and cattle and where cat numbers are low (Blyth 1996). It is of interest that many recent reports are from areas where birds have been reported historically (see Figure 11 for an updated distribution for the Night Parrot in Western Australia).

Judging from reports, the species has always been rare, with irregular irruptions during good seasons. Part of its scarcity and lack of good, authenticated records is no doubt due to the difficulty of finding a rare, secretive, nocturnal bird in desert country with little or no habitation that is rarely visited by naturalists (Garnett and Baker 2021). In Western Australia during the good rainfall years from the 1860s to the 1890s, explorers like Ernest Giles were able to travel through the western deserts with horses. Later it could be crossed only by camels. This was the period when pastoralists pushed out into the interior and established stations which were later abandoned. It is interesting that in the late 1800s the Night Parrot was encountered by virtually every desert traveller (Garnett and Baker 2021). Since that time, it appears that Australia's climate has become drier and its 'dead heart' bigger. This change may have created beneficial habitat for the Night Parrot.

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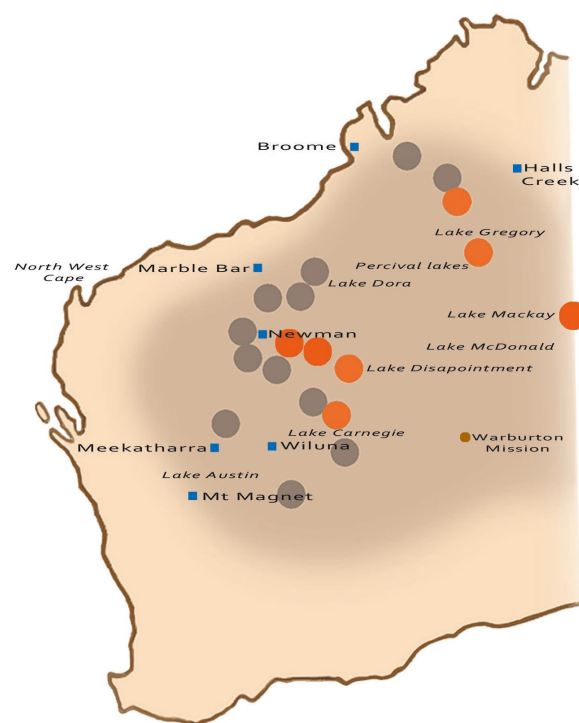


FIGURE 11 Distribution map of accepted *Pezoporos occidentalis* in Western Australia with most recent records in orange.

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