

Interim Recovery Plan No. 4

INTERIM RECOVERY PLAN NO. 4

**NIGHT PARROT (*PEZOPORUS OCCIDENTALIS*)
INTERIM RECOVERY PLAN
FOR WESTERN AUSTRALIA**

1996 to 1998

by John Blyth

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FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (CALM) Policy Statements Nos 44 and 50.

Where urgency and/or lack of information mean that a full Recovery Plan can not be prepared, IRPs outline the recovery actions required urgently to address those threatening processes most affecting the ongoing survival and begin the recovery process of threatened taxa or ecological communities.

CALM is committed to ensuring that Critically Endangered taxa are conserved, through the preparation and implementation of Recovery Plans or Interim Recovery Plans and ensuring that conservation action commences as soon as possible and always within one year of endorsement of that rank by the Minister.

This IRP was approved by the Director of Nature Conservation on 21 March, 1996. Approved IRPs are subject to modification as dictated by new findings, changes in status of the taxon or ecological community and the completion of recovery actions. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at 14 March, 1996.

CONTENTS

FOREWORD	iii
SUMMARY	vi
1 INTRODUCTION	1
1.1 History, Taxonomy and Status	1
1.2 Distribution and Habitat	2
1.3 Biology And Ecology.....	4
1.4 Threatening Processes	5
1.5 Number, Size and Trend of Populations	5
1.6 Strategy for Recovery.....	6
1.6.1 Deciding Where to Start	6
1.6.2 Finding Populations of Night Parrots.....	7
1.6.3 Catching and Studying the Birds	8
2. RECOVERY OBJECTIVE AND CRITERIA.....	9
2.1 Objective.....	9
2.2 Criteria	9
3. RECOVERY ACTIONS	10
3.1 Field Survey.....	10
3.1.1 Binarangie Station, Lake Cowan	10
3.1.2 The Lake King/Varley/Holt Rock Area.....	11
3.1.3 The Eastern Pilbara and Northern Goldfields	12
3.1.4 Historical Sites.....	12
3.2 Research and Monitoring	13
3.3 Management Actions.....	13
3.3.1 Control of Feral Animals	13
3.3.2 Managing Fire Regimes	14
3.3.3 Preventing Excessive Disturbance.....	14
3.3.4 Taking Birds for Captive Breeding.....	15
REFERENCES	16

SUMMARY

***Pezoporus occidentalis*, Night Parrot**

Family: Platycercidae

CALM Regions: Kimberley, Pilbara, Goldfields, Midwest, Wheatbelt (possibly).

Recovery Team: The establishment of a recovery team for the Night Parrot will be an early action under this Interim Recovery Plan.

Current status: Listed as Threatened Fauna under W. A. Wildlife Conservation Act; classified as Insufficiently Known by Garnett (1992); ranked as Critically Endangered by W. A. Minister for the Environment in September 1995, following assessment by an expert panel using the latest IUCN criteria.

Habitat requirements: Night Parrots are assumed to be largely birds of the arid zone, and require areas of dense spinifex, samphire or other structurally similar vegetation, and, at least in the absence of succulent vegetation, sources of water.

IRP Objective: To decrease the probability of extinction of the Night Parrot by achieving the following aims:

1. find one or more populations of the Night Parrot that can be studied and monitored, and learn how best to locate the birds in the wild;
2. conduct research on movements, home range, activity patterns, food and feeding behaviour, breeding biology, detailed habitat requirements and major threatening processes;
3. use the information gathered:
 - to plan larger scale searches and more detailed research programs;
 - to plan and conduct any emergency management actions (eg predator-control and fire management) seen to be necessary to maintain the population(s);
 - as the basis for a recovery plan.

Recovery criteria:

1. the location of one or more populations in the wild;
2. the development of methods of finding, studying and monitoring birds in the wild;
3. the gathering of sufficient information to begin management actions for the conservation of the species in the wild;
4. an improvement in the status of one or more populations in the wild, as measured by increases in the number of birds being counted, and/or the expansion of the area being used;
5. the establishment of a Recovery Team and the writing of a Recovery Plan.

The criterion for failure is not finding a population of Night Parrots during the life of this Interim Recovery Plan.

Recovery Actions:

1. Conduct field survey as appropriate in response to reports of sightings of Night Parrots.
Cost (first year) \$12 500.
2. In the event of one or more populations being found:
 - control feral animals as appropriate;
 - manage fire to protect critical habitat;
 - combine publicity releases, supervision involving neighbours, and if necessary, restricted access, to ensure that finding the species does not result in excessive disturbance,
 - design and conduct a captive breeding program as appropriate.

Cost of all of the above actions will depend upon finding population(s) and their circumstances. Minimum cost per year \$10 000.

1 INTRODUCTION

1.1 History, Taxonomy and Status

The first known specimen of the Night Parrot was collected by John Mcdouall Stuart, on an expedition led by Charles Sturt, in October 1845 north of Coopers Creek in far northern South Australia (Cleland 1937). Sturt assumed the specimen to be the Ground Parrot, *Pezoporus formosus* (now *P. wallicus*), and sent it to John Gould, who apparently also mistook it for the already known Ground Parrot. The specimen was sent to England under that name (Forshaw *et al.* 1976).

The Night Parrot was finally described by Gould as *Geopsittacus occidentalis*, with a bird collected near Mount Farmer in Western Australia in 1854 as the type specimen (Wilson 1937). The bird illustrated in Gould's *Birds of Australia* was not the type specimen but was from South Australia. The correct identity of the first specimen, collected by Stuart, was discovered by Gregory Mathews in 1928 (Forshaw *et al.* 1976).

Although placed in its own monotypic genus, *Geopsittacus*, by Gould, the Night Parrot's close relationship to the Ground Parrot has long been recognised. More recent taxonomic work, both anatomical (Ford 1969; Schodde and Mason 1980) and molecular (Leeton *et al.* 1994) confirms that the two species should be placed within the same genus, *Pezoporus*, which appears to be related to the grass parrots, *Neophema* spp., and the Budgerigar, *Melopsittacus undulatus* (Christidis and Boles 1994). Mathews (1917) maintained that the Western Australian population of the Night Parrot was a recognisable sub-species (*occidentalis*), but this distinction has not been recognised in later works.

Sightings of Night Parrots appeared to be very occasional until the 1870s, when another 20 specimens were collected and numerous sightings recorded between 1870 and 1890. Of the 22 specimens collected last century only two (possibly three) were from Western Australia and none of these remain in Australian museums. The Western Australian Museum does not hold any specimens, although both the type specimen, and the specimen used by Mathews (1917) to illustrate his *Birds of Australia*, were from this State.

At least sixteen of the 23 specimens of Night Parrots now in collections around the world were collected from South Australia by one man, F. W. Andrews, a naturalist collecting for the South Australian Museum. Andrews clearly had a considerable knowledge of the habitat and behaviour of Night Parrots. He spent much time in the field studying the birds during their years of apparent abundance in the 1870s and 80s, and referred to the birds coming and going "according to the nature of the season. When the early season is wet the porcupine grass flourishes and bears large quantities of seed, on which many birds feed; but if on the contrary, the season is a dry one the grass does not seed, and no birds are to be seen". This observation has led some authors (eg. Wilson 1937) to postulate that the period of abundance and many sightings in the 1870s and 80s was abnormal, resulting from a string of unusually wet years throughout much of inland Australia, and that the Night Parrot may usually be sparsely scattered throughout its range.

We could also postulate that the very presence in the 1870s and early 1880s of an experienced field ornithologist who made himself expert in the behaviour and movements of the Night Parrot meant that an unusually large number of these very secretive birds was able to be found and confirmed by collection. The decline in numbers being observed and collected may have had as much to do with Andrews' death in 1884 (by accident while in the field) as with actual changes in abundance of the species. The fact that the species is nocturnal and secretive and occurs in isolated areas little frequented by humans could create an impression of excessive rarity which may not necessarily be a true reflection of its status.

In any case, from the middle of the 1880s onwards confirmed sightings became rarer and by the turn of the century stopped almost completely. The literature contains a number of reports from people who had been familiar with Night Parrots in the period from 1875 to 1885, noting that it appeared to have disappeared entirely from their area since then (eg Campbell 1915;

Whitlock 1924). There are also several references to deliberate searches, in previously known habitats, which were unsuccessful. Mathews (1917) was convinced of its extinction, noting that the separation into eastern and western subspecies “seems quite valid, but cannot arouse much interest owing to the extinction of the species.”

Nevertheless, Night Parrots were apparently being seen during the forty or more years from 1890 to the 1930s, although most of these sightings did not become generally known for many years (eg Wilson 1937). Among these was the collection of a specimen by Martin Bourgoin in the upper Gascoyne area of Western Australia, in 1912. This specimen, although confirmed, was poorly preserved and later lost (Wilson 1937).

Apart from a flurry of reported sightings in the 1960s and early 1970s (at least 15 in WA alone), and almost no reports for the ten or so years around each of the two world wars, most decades this century have seen several reported sightings in the literature or in the files of State conservation agencies and museums. The twenty years since 1975 have yielded fewer reliable reports, with a total of about six in Western Australia. Perhaps more ominously, many expert ornithologists, both amateur and professional, have spent much time over this period in parts of the arid zone of this State and have not made any sightings of Night Parrots.

For most of this century ornithological opinion about the status of the Night Parrot has ranged from presumed extinct, to indeterminate and perhaps not threatened at all. More recently two events have proved that the Night Parrot is still extant. In 1979 the late Shane Parker, Curator of Birds at the South Australian Museum, saw a bird he identified as a Night Parrot in “samphire-like Bassia (*Sclerolaena intricata*)” in the far north-west of South Australia, and another member of his party saw three in the same locality (Parker 1980). More conclusively still, in 1990, Walter Boles, ornithologist at the Australian Museum, found a dead specimen in south-western Queensland (Boles *et al.* 1991, 1994). This find was followed by a paper by Garnett *et al.* (1993) reporting seven separate sightings in 1992 and 1993 near Cloncurry on the Mount Isa Uplands. An attempt in 1994 by the Queensland Department of Environment and Heritage to confirm the Cloncurry sightings, and to gather information needed to produce a recovery plan, was not successful (Maher 1995, Jordan 1996).

Australia-wide the Night Parrot is listed as Endangered by ANZECC (1991) although in the Action Plan for Australian Birds, Garnett (1992) listed it as Insufficiently Known. In Western Australia it is gazetted under the Wildlife Conservation Act as threatened or “rare or likely to become extinct”. The application of a ranking system, based on international standards and adapted within CALM for Australian conditions, results in the Night Parrot being ranked as Critically Endangered.

1.2 Distribution and Habitat

Night Parrots are essentially birds of the arid zone and apparently require dense, low vegetation, under or in which they hide during the day. Most commonly they have been found in hummock grasslands of porcupine grass or ‘spinifex’ (*Triodia and Plectrachne* species) or ‘samphire assemblages’. Breeding records (unconfirmed; no acknowledged eggs of the Night Parrot exist in any known collection) exist for both habitats (Andrews 1883, Wilson 1937, Parker 1980). They have also been reported in low chenopod shrublands with saltbush and bluebush (eg Kershaw 1943, Powell 1970). Parker (1980) suggested seasonal movement from samphire flats to hummock grasslands when the *Triodia* species are seeding. Reports from hummock grasslands have almost universally referred to the presence of nearby water and many records have come from waterholes. Garnett (1993) suggested that the birds may not need free water when feeding on the succulent foods available in samphire areas.

Reports in the literature of Night Parrots come from every mainland state of Australia: from the western Kimberley, through the north-western Northern Territory to the Mount Isa Uplands in the North; to the Victorian Mallee and through the Gawler Range in South Australia to near Cue and Perenjori in Western Australia in the south. Habitat which superficially appears suitable is found across most of the inland, constituting as much as half of the area of the continent (see map 1).

Joseph (1988) and Garnett (1993) referred respectively to four and five main centres of distribution for the Night Parrot. These were: the Gawler Ranges-Lake Torrens-Flinders Ranges region; the Coopers Creek Floodplain and nearby Simpson Desert region; the salt lakes of inland Western Australia and associated *Triodia* breakaways and saltbush flats; northwestern Victoria (all from Joseph 1988); and the Mount Isa-Cloncurry-Boulia region in Queensland (Garnett 1993).

However, if unconfirmed but reasonably convincing sightings from the southern Northern Territory, and many from the Gascoyne, Pilbara, and southern Kimberley are included, the picture of centres of distribution is considerably blurred (eg Storr 1960, 1977, 1980; Serventy and Whittell 1976; Wilson 1937). Given what is known about the biology and ecology of the species there would be little reason to be surprised at it being found anywhere within arid (or even semi-arid) Australia where well grown or mature spinifex, samphire or saltbush occurs along with fresh water during summer.

The current publicity campaign (see 1.6.1 'Deciding where to start') to elicit reports of sightings of Night Parrots from the general public has resulted in 25 reports, from the 1930s to 1995. Most of these are from areas consistent with the historical view that the Night Parrot is a bird of samphire and spinifex of the arid zone (Map 2).

Map 1 Potential habitat for Night Parrots across Australia Map 2 Reported sightings of Night Parrots in WA. Δ, □ 'historical' reports from literature or CALM files; O, O from current CALM public survey

Amongst these reports however, is an unexpected cluster of seven sightings from near salt lake systems in the southern Wheatbelt. These include six reports from the Lake King/Varley area, within a radius of about 50 km, and spread from the 1930s through the 1940s, 1950s and 1980s, with the most recent in August 1995. Not all of these reports are particularly convincing in themselves, and the area is not one anyone would have predicted, being several hundred kilometres south of the nearest previous reports in WA. Nevertheless, at least three of the reports from the area cannot be dismissed lightly, and that six false reports, all quite unrelated, should come from such a small area by coincidence seems unlikely.

In addition, there is a historical report from Ghost Rocks south of Lake Ballard (Storr 1986), and a current rather convincing one from the northern end of Lake Cowan. Considering the vast amount of unpopulated salt lake and 'saltbush' country around Lakes Johnston, Hope and Tay, we could postulate that the potential distribution of Night Parrots extends from more inland salt lake systems north of Kalgoorlie to the salt lake country of the southern Goldfields and southeastern Wheatbelt. The nineteenth century stronghold of the species in the Gawler Ranges in South Australia is at roughly the same latitude as these Wheatbelt sites, and an

accepted 1950s record from northwestern Victoria (Menkhorst and Isles 1981) is slightly further south, with similar average annual rainfall.

1.3 Biology and Ecology

The species is secretive and usually assumed to be genuinely nocturnal. The degree to which it is nocturnal rather than crepuscular is occasionally queried, based largely upon the apparent absence of specific adaptations for nocturnal behaviour (eg Garnett 1993, Maher 1995). Maher (1995) notes that if the species does feed at night it would be the only seed eating bird in the world to do so, and it does not appear to possess any mechanism to find small seeds at night. However, the extent to which Night Parrots eat small seeds taken from the ground as opposed to green herbage, or fruit and seeds taken directly from plants is unknown (see last paragraph this section).

Almost all confirmed sightings of Night Parrots apparently feeding or drinking have come after dark, Aboriginal people familiar with the bird have usually referred to its nocturnal behaviour, and a number of sightings have been of birds flushed by the movement of domestic stock at night (eg Andrews 1883, Whitlock 1924, McGilp 1931, Bourgoin in Wilson 1937). In addition, Murie (1868) referred to a captive bird being active throughout the night. By contrast, daytime sightings have almost always been of birds flushed, by herds of domestic animals, dogs or fire, from nests or hiding places.

Little is known of the detailed biological and ecological characteristics of Night Parrots. The natural history information supplied by early observers, especially Andrews (1883), McDonald (in McGilp 1931) and Bourgoin (in Wilson 1937) does, however, provide a useful general description of the day-to-day routine of the species.

The Night Parrot's dependence upon healthy, dense spinifex or samphire, into or under clumps of which it tunnels or burrows, both for nesting and for daytime refuge, was stressed by all early observers. Only very close disturbance, actually affecting the clump of vegetation in which a bird is hiding, seemed to flush them during the day (Wilson 1937).

The Night Parrot and its congener the Ground Parrot, are unique among Australian parrots in not only constructing a nest, albeit a rudimentary one, but in nesting on or very near the ground and not in hollows of some kind (Campbell 1900). The nest of Night Parrots is constructed with a layer of small sticks, or bitten-off lengths of grass stems, being laid together in an expanded cavity at the end of a tunnel under a clump of porcupine grass or a samphire bush (Wilson 1937). Clutch size is reported by Andrews (1883), McDonald (in McGilp 1931) and Aboriginal informants of Keartland (in North 1898) to be four, while Bourgoin (in Wilson 1937) never saw a nest, but reported watching two adult parrots with a brood of six young birds.

The three early observers all reported the birds flying to water once dark had well fallen, uttering a low but carrying two-toned whistle while doing so. Andrews (1883) referred to this as their first activity for the night, after which they flew to their feeding area, to feed on the seeds of porcupine grass. He also noted that several return trips may be made to water during the night.

Significant additions to the information provided by the three observers referred to above have been made recently with the rediscovery by the late Shane Parker of a population of Night Parrots in extensive stands of *Bassia* on Coopers Creek (Parker 1980), not far from the site of collection of the first specimen by Stuart in 1845, and the paper by Garnett *et al.* (1993), describing several presumed sightings of Nights Parrots while spotlighting at night in the Cloncurry area. These sightings, often of birds apparently feeding, were usually in open grasslands with species of 'soft' grasses and herbs present. This, the presence of green herbage in the crop of a specimen shot by Bourgoin (in Wilson 1937) and the observation by Murie (1868) that a captive bird showed a preference for green food, suggest that green plants, or unshed fruit or seeds may be a significant part of the Night Parrot's diet.

1.4 Threatening Processes

Wilson (1937) and Garnett (1992) have considered some of the possible reasons for the assumed decline of the Night Parrot. Garnett (1992) lists:

- predation by foxes and feral cats (several early observers referred to cats as a major problem for Night Parrots, and this view was supported by Keast (1952), although Wilson (1937) did not believe that feral cats were likely to have been a primary factor causing their decline;
- altered fire regimes;
- grazing by stock or rabbits;
- reduced availability of water as a result of over-use by feral camels (to this latter reason one could suggest the decline of waterholes because of reduced maintenance by Aboriginal people).

Garnett (1992) was unconvinced that sufficient information is available to confirm that the species was threatened, and therefore referred to all of his suggested threatening processes as "speculative". Similarly, Wilson (1937) considered that the numbers of Night Parrots fluctuated mainly in response to climatic variation and that the period 1870 to 1885 was probably one of exceptionally good seasons which allowed the species to expand its numbers and range.

Two other threatening processes related to the impacts of introduced grazing animals, especially domestic stock and rabbits, may well be as important for the Night Parrot as those discussed above (P. Mawson, CALM, 1995; pers. comm.).

- The first of these, partly covered by Garnett's (1992) 'grazing by stock or rabbits', is competition by introduced herbivores for, and degrading effects upon, critical areas of above-average nutrients and moisture in the arid zone, especially during times of drought (Morton 1990).
- The second possible impact is the degrading effect by hard-hoofed animals around watering points (eg. Stafford-Smith and Pickup 1990), perhaps resulting in the more or less permanent loss of palatable herbage within a reasonable flying distance for the Night Parrot.

All of these possible threatening processes remain speculative in relation to the Night Parrot, until its status is confirmed and more information is available about its biology and ecology.

Nevertheless, in the CALM ranking system, the susceptibility of any species to particular threatening processes is considered on general ecological and biological grounds and such processes do not need to have been observed directly in relation to the particular species being ranked. There are some similarities in behaviour of the Night Parrot to that of many of the extinct and endangered medium-sized mammals of the arid zone, and foxes (and more recently cats) have been shown to be capable of eliminating populations of such species. Introduced predators and herbivores, particularly together, are likely to constitute a real threat to the Night Parrot over much of its range.

Although no direct evidence exists of the operation on the Night Parrot of particular threatening processes, the list given above is realistic. It provides reasonable hypotheses, that the processes listed do constitute threats, singly and especially together, to the survival of a species with the distribution and behavioural characteristics of the Night Parrot. Such hypotheses provide a good starting point for research and experimental management.

1.5 Number, Size and Trend of Populations

There is firm evidence of only one current population, that around the Mount Isa uplands in Queensland, from which the specimen obtained by Boles *et al.* (1991,1994) near Boulia in 1990 presumably originated. However, it is not known whether there are one or more populations in the general area of north-western Queensland, let alone what size such populations may be or whether they are stable, increasing or declining (Garnett 1993). It can be said, though, that detailed searching by two experienced field ornithologists, conducted for

the Queensland Department of Environment, failed to find any Night Parrots around Cloncurry in 1994 (Maher 1995, Jordan 1996).

Whether or not the numbers of Night Parrots were unusually high in the 1870s and 80s as suggested by Wilson (1937) (or may have appeared to be high because of Andrews' skill at finding and collecting them), their decline since that time has been noted by several residents of the arid zone (eg Campbell 1915, McDonald in McGilp 1931). Further, given the searches that have been made for no result (eg. Howe and Tregellas 1914, Mathews 1917, Davies *et al.* 1988, Maher 1995, Jordan 1996), it seems clear that the species is not at all common, even if it should turn out to be widely distributed.

Most of the threatening processes discussed in the section above are probably still operating across most of the Night Parrot's assumed range. Further, anecdotal sightings since the early 1970s (prior to CALM's publicity campaign) seem to have decreased; some people responding to the publicity campaign referred to Night Parrots declining in their area; and the searches for the 'Cloncurry population' in 1994, and a large number of searches by ornithologists in Western Australia over the last twenty years, have failed to find the species. An assumption of continuing decline is not unreasonable.

1.6 Strategy for Recovery

1.6.1 Deciding where to start

The fundamental requirement is to find one or more populations of the species, to study and to monitor, and if appropriate, to conduct protective management such as control of feral animals. There are two different starting points. First, from the literature and other reported sightings, we can select several points from which records have come in the past and launch expeditionary surveys to those places. Preliminary analysis might seek to establish which of these historical sites is likely to be least modified since the original sightings. In this case it would be best to choose years in which dry conditions prevail across much of the putative range of the Night Parrot, but in which there are good conditions, or at least permanent water, at the selected sites.

The second approach is the one currently being taken by CALM; that is, conducting a publicity campaign, with distribution of leaflets seeking reports from members of the public, of recent and ongoing sightings. Coloured leaflets (Appendix 1) have been, and are being, distributed to roadhouses along inland highways, major trucking lines working inland routes, pastoralists (by mail), and landcare groups, kangaroo shooters, Agriculture Protection Board 'doggers', and mining companies with interests in the appropriate areas. Reported sightings are followed by interview with and careful questioning of informants according to a prepared series of questions (Appendix 2).

Responses to reports of Night Parrot sightings involve the following steps.

(i) Receive input from the public; contact Officers are John Blyth, Woodvale; Andy Chapman, Goldfields Region; Peter Kendrick, Pilbara Region; Gordon Graham, Kimberley Region, and Mal Graham, Wheatbelt Region. If one of these people is to be out of reach for more than one or two days, that person will ensure that someone else in the office is able to take the information, question the informant according to the assessment form, and record the responses on the form.

(ii). Ensure that the information is seen and discussed by at least two experienced ornithologists or birdwatchers with good knowledge of Western Australian birds, especially those of the arid zone. If no such person is likely to be present in the receiving office for several days, the information should be sent to Woodvale for the attention of John Blyth, Allan Burbidge, Andrew Burbidge, or Phil Fuller.

(iii) If the consensus between all of the assessors is that the birds reported are probably not Night Parrots, no field work will be conducted. If the information provided

is not good enough to make a decision one way or the other, then field work will be conducted only in the event that it fits in with other commitments.

(iv) If all of the assessors agree that the information strongly suggests Night Parrots, a short trip of three or so days should be conducted by two or more experienced people as soon as possible, to find the birds which have been reported and to confirm or refute that they are Night Parrots. More detailed field work could then be based upon the results of this trip.

Where confirmatory field work is going to be expensive and time consuming, it may be necessary to conduct a further and more detailed interview between the informant and the assessors before making a decision to proceed .

(v) Once the presence of Night Parrots is either confirmed by a short preliminary trip, or judged by all assessors, after interview with the informant(s), to be sufficiently reliable to justify a substantial field survey, an expedition involving as many experienced people, vehicles and varieties of equipment as possible will be organised.

Survey trips should be carried out as quickly as possible after the sightings are reported, and for larger expeditions to more remote places would probably involve staff of CALM and the Western Australian Museum, as well as volunteers, especially from the RAOU.

1.6.2 Finding Populations of Night Parrots

Whether investigating historical sites or reports of modern sightings, many of the field methods likely to be useful would be the same. Much of this section is based upon the assumption that Night Parrots are genuinely nocturnal birds, which remain inactive and hidden during daylight, and probably until darkness is well advanced (Andrews 1883, McDonald (in McGilp 1931) and Bourgoin (in Wilson 1937). Much of the searching effort will need to be at night, especially for the first couple of hours after sunset and the same before sunrise.

Methods would be selected to suit the particular circumstances and would include some or all of the following.

Surveillance at selected waterholes by birdwatchers with good hearing and long experience of arid zone birds. Bourgoin (in Wilson 1937) and McDonald (in McGilp 1931) both refer to birds calling while coming to water after dark and two or three times during the night, and provide descriptions of the calls (see Appendix 3). Further, experienced birdwatchers should be able to recognise as different a call that they had never heard before. In an area where there might be several discrete waterholes, or wide distribution of promising habitat over a distance of several to many kilometres, it would be desirable to have several small camps rather than one large one, and each camp could maintain listening surveillance in its area.

Equipping listeners referred to above with a field microphone and tape recorder to record unknown calls. Once such recordings are available and reasonably assumed to be those of Night Parrots, they could be played back in areas where the calls have been heard in an attempt to entice the birds nearer to observers, or perhaps into mist nets. Recording the call of the Night Parrot would probably be a major breakthrough towards finding more populations and further research.

Mist nets could be set opportunistically at or near waterholes and monitored throughout the night.

Spotlighting at night, which could be used in two ways. The first of these would be to concentrate upon waterholes (especially those around which promising calls had been heard) and in response to sounds or perceived movement, spotlight around the perimeter. This approach will be enhanced by the possession of a 'night scope' or

similar device for aiding night vision. Such a device would allow movement around the waterhole to be detected and so could make the spotlighting more selective. Waterhole surveillance will be most useful in a situation where there are few waterholes, little other available water and hot conditions.

The second approach to spotlighting is to search for Night Parrots while they are feeding. On the basis of the slight information available we would concentrate upon areas around the edges of particularly healthy, seed-bearing 'spinifex' (*Triodia* and *Plectrachne* spp.), upon barer soils with new green growth and especially with low seed-bearing herbage, and perhaps around the edges of dense, flowering or fruiting samphire.

Spotlighting could, perhaps, also be used in conjunction with night application of the flush-searching described below as a daylight method. In that case, the dragging or beating would be done across potential feeding areas rather than the denser refuge areas.

Arrangements should be made to join station workers for any intended movement of stock through potential Night Parrot habitat, whether at night or during the day.

Flush searching during the day (likely to be most effective at first and last light) could include the use of dogs, beating across an area of dense spinifex or samphire with a large number of people or, in combination with the line of people or with two or more vehicles, dragging a rope across such an area of cover. Points from which birds first flushed would be marked and a thorough search conducted around that point for hide or nest.

There are one or two references in the literature to Night Parrots hiding in caves during the day, so any breakaways nearby with caves and crevices would be examined.

There is also reference in the literature to Night Parrots being flushed during daylight by burning spinifex clumps. Given the status of the species, CALM does not believe that this is an acceptable method, either for general searching in an area that seems suitable for Night Parrots, or to flush a particular bird whose hiding place is known or suspected. However, it does suggest that Aboriginal communities or pastoralists, who regularly burn spinifex as a part of their land management, may be most likely to have observed Night Parrots during the day. Further campaigns to gather public input towards the finding of Night Parrots should be concentrated upon these two groups of people;

A second group of 'daylight' methods would include: searching around waterholes and in the nests of other birds for the presence of Night Parrot feathers, which are very distinctive; and searching for nesting or roosting 'burrows' and tunnels around and into dense clumps of spinifex or other dense vegetation, and associated tracks.

1.6.3 Catching and studying the birds

Given the legendary elusiveness of Night Parrots, gathering further information once populations are found will depend heavily upon capturing, examining and radio-tracking birds, probably over several seasons. The aim would be to discover much more about the basic biology and ecology of Night Parrots, especially daily and seasonal movements, detailed habitat requirements, breeding biology and social structure. This information could then be used to find other populations, to assess any trends in the known one(s), to determine any obvious threats, and to design more detailed research and recovery plans.

The identification of possible Night Parrot tunnels or tracks could be followed by the placement of noose-mats as used at Lake Gore for Hooded Plovers (Weston 1995). Carefully placed Elliott-style traps, with associated drift fences, could also be used where the presence of Night Parrots is suspected, with or without baiting with grass-seeds and with or without

grass-seed trails leading to the traps. The possibility of using an adaptation of hair tubes will be investigated; the sparse literature on moulting in Australian birds suggests that summer would be the best time to try such a method, which would depend upon capturing feathers being moulted by birds passing through the tubes. Any of these methods could be used in conjunction with drift lines or with identified tunnels through dense vegetation.

If tracks and other signs suggest the presence of Night Parrots hidden in dense vegetation then a combination of beating and mist nets could be used in trying to capture birds. Alternatively, if tracks indicate the use of a waterhole by Night Parrots, mist nets could be erected across possible flight paths. (The literature suggests that the species flies directly to the water's edge to drink, rather than walking in from some distance like bronzewing pigeons, or landing initially in fringing trees like most other parrots).

During the three year life of this interim recovery plan, specimens of the Night Parrot will not be taken from the wild without Ministerial approval (see 3.3 Management Actions). If birds are captured, proof of identity will normally be by photographs and the collection of feathers. Any remains or birds found dead will be retained for study and reference.

2 RECOVERY OBJECTIVE AND CRITERIA

2.1 Objective

To decrease the probability of extinction of the Night Parrot by achieving the following aims:

1. find one or more populations of the Night Parrot that can be studied and monitored, and learn how best to locate the birds in the wild;
2. conduct research on movements, home range, activity patterns, food and feeding behaviour, breeding biology, detailed habitat requirements and major threatening processes;
3. use the information gathered:
 - to plan larger scale searches and more detailed research programs;
 - to plan and conduct any emergency management actions (eg predator-control) seen to be necessary to maintain the population(s);
 - as the basis for a recovery plan.

2.2 Criteria

On the assumption that the Night Parrot does still exist in Western Australia, the criteria for successfully achieving the objective are:

1. the location of one or more populations in the wild;
2. the development of methods of finding, studying and monitoring birds in the wild;
3. the gathering of sufficient information to begin management actions for the conservation of the species in the wild;
4. an improvement in the status of one or more populations in the wild, as measured by increases in the number of birds being counted, and/or the expansion of the area being used;
5. the establishment of a Recovery Team and the writing of a Recovery Plan.

Initially, the sole criterion for failure in achieving the objective will be the failure to find a population of Night Parrots. Actions taken, methods being used, and information gathered will be reviewed at the end of each year, and changes made to this plan if appropriate.

3. RECOVERY ACTIONS

This interim recovery plan will remain in force until the above criteria for success have been met, or for three years when it will be reviewed if the aims have not been achieved by that time. If the aims have been completely or largely achieved, this interim plan will be replaced by a recovery plan for the Night Parrot across its whole range, to be prepared by a national recovery team.

Costing this interim plan is difficult because all subsequent actions are dependent upon finding one or more populations. The plan therefore makes the assumption that populations will be found early enough in the life of this plan that the objective can be achieved within three years, and that all actions named in the plan will be funded within that time.

3.1 Field Survey

Since the release in mid 1995 of the leaflet seeking reports of sightings of Night Parrots from members of the public, about 25 reports have been received. On the basis of these there are several areas where field work may be justified. These are: a pastoral property to the north of Lake Cowan near Norseman; the nature reserve system based on the chain of salt lakes along the Hyden to Lake King Road; the Newman /Nullagine/ Rudall River area of the eastern Pilbara, and the GlenAyle/Carnegie/Cosmo Newbery area in the Goldfields. The first two, although outside the area traditionally considered as the stronghold of the Night Parrot, are based on salt lake systems which are more or less continuous with such systems much further north, extending well into the species' known range (see Map 2).

3.1.1 Binarangie Station, Lake Cowan.

Although this is a single report from one person (the station leasee, Mr Mick Cotter) it refers to one sighting, of many birds by spotlight, and several subsequent records based on calls, at the same dam over a period of some years up to the present. Mr Cotter's imitation of the calls seems consistent with the historical description of those of Night Parrots. The nature of Mr Cotter's report, the identification of a specific site at which the birds have been recorded repeatedly, implying residential status, and the relative nearness to Kalgoorlie and Perth give this high priority for further investigation.

Initial survey will be in response to notification from Mr Cotter that he has heard the birds again very recently, and would require only two or three experienced people for a few days to find and positively identify the birds.

Responsibility: CALM Goldfields Region

Cost: travel and field expenses

\$550

Priority: very high

If it is confirmed that the birds are Night Parrots, follow-up field work would be arranged immediately, perhaps taking three vehicles (two from Perth, one from Kalgoorlie), with two or three people in each, and as much equipment such as spotlights, night scopes, field microphones, mist nets, radio collars and leg bands as the particular personnel will be able to use. Assuming the presence of at least one person experienced with the use and fitting of radio collars, banding, and mist nets, the following items should be taken.

At least three spotlights, preferably six or more;
three night scopes;
three field microphones;
'several' mist nets;
four 'Ground Parrot radio collars';
one or two radio tracking device(s);
measuring equipment, such as rulers and calipers;
recording sheets to note measurements and descriptions for each bird;

cameras, a range of lenses and film, & cage or terrarium for setting up photographs;
 plastic bags for feathers, and appropriate containers for blood samples;
 freezer for fresh feathers and blood samples;
 leg bands, and associated equipment, appropriate to Ground Parrots;
 any equipment for live sexing (fresh feathers or blood for genetic analysis may allow this);
 at least three maps of property, showing all relevant tracks and features;
 stakes/markers to delimit areas where birds observed;

Five days and nights on site should be adequate for this first trip, with an arrangement that one vehicle and its occupants are able to stay behind for a total of two weeks and monitor movements if any birds have been caught and radio-collared. Much of the equipment could be borrowed for this first trip, although once research and monitoring start the project will have to have all of the above items of equipment on a regular basis. Radio collars, and the recording equipment, would need to be purchased for the first trip.

Field efforts should be concentrated at night, especially the first couple of hours after sundown and the last two before sunrise. Ideally, listening and watching posts should be established at two or three likely watering points during this time, and spotlighting conducted around the edges of likely nesting/roosting areas and in potential feeding areas. With three cars and nine people and spotlights a significant area of potential habitat could be covered in four nights. Each participant will need their own binoculars and note book.

Some daylight hours should be spent finding and examining the nests of other birds which might contain Night Parrot feathers (Keartland in North 1898 and Davies *et al.* 1987) and looking for nesting/roosting burrows in areas near where birds have been flushed or which look suitable.

Responsibility: WATSCU	
Cost: travel and field expenses	\$5 200
equipment (field microphone, 4 radio collars)	\$2 600
consumables (markers, maps, leg bands, film etc)	\$ 500
Total	\$8 300
Priority: very high	

3.1.2 The Lake King/Varley/Holt Rock area.

As discussed in section 1.2 above this apparently unlikely place for Night Parrots has been the source of six reports within a circle of about a 50 km radius, with a seventh from north of Needilup, less than 100 km further south.

Given the inconclusive nature of reported recent sightings from this area, a serious field search like that recommended above for Binarangie Station, does not seem warranted immediately. More preliminary investigation, especially interviewing local landholders and examining the sort and abundance of suitable habitat, needs to be conducted first.

A joint CALM/RAOU field outing will be arranged for Easter 1996, to conduct qualitative surveys of potential Night Parrot habitat, and day and night searches for birds, in and around the Lake King/Lake Camm Nature Reserve and around other salt lakes where apparently suitable habitat for Night Parrots exists.

Responsibility: WATSCU, Katanning District	
Cost: (Katanning District: travel, consumables)	\$ 350
Priority: very high	

CALM's Katanning District intends to conduct a review in early 1996 of priorities for threatened fauna survey on nature reserves in their district. Preliminary investigation in relation to Night Parrots, especially in the Lake King and Lake Camm Nature Reserves, should be done during that review.

Responsibility: Katanning District
Cost: nil to this interim recovery plan
Priority: very high

3.1.3 The eastern Pilbara, and northern Goldfields

While there are many sightings reported from these two much larger areas over the last thirty years, and based on previous knowledge they seem more likely to harbour Night Parrots, there are no sufficiently recent reports available to CALM to give a clear guide as to where to start looking. Further, given the isolation and harshness of this country, any field trips to these areas will be more expensive and logistically demanding than to either of the two referred to above.

A privately organised expedition to the northern goldfields and adjacent desert country, involving a number of well-known people including Harry Butler, Vincent Serventy and Dick Smith, is currently being planned by Mr Bill Crocker of Perth for October 1996. Mr Crocker claims to have informants who are familiar with the Night Parrot and are suggesting specific sites for investigation. He intends planning and conducting the expedition in consultation and cooperation with CALM. If this trip eventuates, it would be valuable for CALM to provide at least one vehicle and three people.

Responsibility: vehicle from Kalgoorlie Region, at least one person from each of the Region and WATSCU
Cost: (vehicle, travel and field allowances) \$3 000
Priority: high

The planning of expeditions led by CALM to these areas should await the outcome of investigations in the more accessible areas, and, perhaps, the outcome of Mr Crocker's expedition. This remote area would require a minimum of two vehicles and a minimum of 4 people.

Responsibility: WATSCU
Cost per trip: approximately \$6 000
Priority: high if confirmed sightings are made.

3.1.4 Historical Sites

In the meantime, and especially if the species is relocated, it would be useful to visit all of the historical sites, to determine what if any changes have occurred since the original sightings, and compare them with any new sites of occurrence. Thus, the following Western Australian locations should be located accurately on a map and the status or ownership of the land determined:

- those of Bourgoin's five sightings (Nichol Spring on a southern tributary of the Ashburton; Bolgers Soak, between Three Rivers Station - now owned by a mining company - and Lake Nabberu; Pinyerinya Pool, on a small creek to Lake Nabberu; Winditch Spring; and Neds Creek, ten km south-east of Bolgers Soak);
- the Mount Farmer type-location;
- that of the Keartland 1896-97 record;
- the three (or four) sites in the Kimberley referred to by Storr, (1980);

- and the two current and two recent/historic records shown in the Atlas of Australian Birds (Blakers *et al.* 1984).

Responsibility: WATSCU

Cost: purchase of maps

\$ 300

Priority: moderate.

Thus the total cost of exploratory fieldwork in the first year would be \$12 500 if CALM does not itself conduct an expedition into remote areas within that year, approximately \$15 500 if involvement in a private 'remote expedition' is replaced by a CALM expedition, or \$18 500 for involvement in both the CALM and private 'remote expeditions'.

3.2 Research and monitoring

The key questions to be addressed relate to establishing numbers in the population(s), whether those numbers are stable, increasing or decreasing, what the most critical factors are in limiting numbers, and determining what steps are required for their recovery or conservation. Designing and costing such research is impossible until one or more populations have been found, because of the much greater costs involved in field work if more than one population is found, if any population(s) being studied are in remote areas, and so on.

Nevertheless, it is clear that such a project will require the employment of a full-time research officer or consultant and that wherever the population(s), field work will require much travel and is likely to rely heavily upon radio-tracking and finding methods of observing nocturnal behaviour. Therefore, at least \$60 000 per year will be required, with an extra \$10 000 for equipment in the first year of study.

CALM may require external funding to help cover these costs, and a significant task following the finding of one or more populations will be the writing of detailed proposals to submit to various funding agencies and/or to use in seeking sponsorships from Australian companies.

Responsibility: WATSCU

Priority: very high once populations are found

3.3 Management actions

Until one or more populations are found and some information gathered about it/them, it is difficult to identify specific management issues, and impossible to cost them. However, there are four points which can be made on the basis of existing knowledge.

3.3.1 Control of Feral Animals

It seems likely that if a population is found, immediate control of any feral herbivores present in large numbers and foxes (and feral cats once appropriate techniques are available) would be likely to benefit the survival and expansion of the population. This would be particularly so if, as seems likely for any population found on Binarangie Station, the birds appear to reside in, or regularly use, the site. Such work would be done as experimental management, with a hypothesis as to the outcome and a carefully designed control and monitoring strategy.

Responsibility: WATSCU and relevant CALM region

Cost: from less than \$1 000 to several thousand dollars per year depending on circumstances

Priority: high, if population is found.

3.3.2 Managing Fire Regimes

Given the importance of dense mature vegetation such as spinifex and samphire for shelter and breeding sites, attention should be given to preventing fire at the location

of any population, until its status and ecological needs are understood. The principles of experimental management would also be applied to these activities.

Responsibility: relevant CALM region

Cost: from negligible to several thousand dollars per year depending on circumstances

Priority very high if population is found.

3.3.3 Preventing Excessive Disturbance

Because of the 'mystique' and high public profile of the Night Parrot, it is inevitable that if and when a population is found, many people, throughout the world, will be very keen to visit the site and try to find the birds. It is not hard to imagine attempts to make the bird a tourist draw-card, with wide promotion and publicity. Unless carefully controlled, the resulting visitor pressure could have an adverse effect on the species. This is especially so because, given the shy and secretive nature of the species, searching for it is likely to be of an intensive and intrusive nature. The Night Parrot is not a species for which you can move unobtrusively across the landscape, with a reasonable chance of sighting the birds as they go about their normal activities.

Thus, a contingency plan is required in the event of finding one or a very few small populations of Night Parrots, especially if one or more of those populations are in areas relatively easy of access. The following steps or approaches would be applied as appropriate.

- If any population was found on land managed by other than CALM, the owner or manager would immediately be informed. The location of a population of Night Parrots would otherwise be kept confidential until a strategy for publicity and management, appropriate to the particular case, had been developed.
- Initial publicly released information would refer to the area of occurrence in general terms only; eg. southern Goldfields, eastern Pilbara etc.
- The cooperation of owners and managers on whose land populations of Night Parrots are found will be sought, both in terms of gaining support for any necessary management actions, and for helping to supervise access to the population.
- Ministerial agreement will be sought that sites containing populations of Night Parrots on land managed by CALM will be gazetted as restricted access areas under provisions of the CALM Act if, and for as long as, that is appropriate.
- The immediate neighbours of lands managed by CALM, or of vacant Crown land, which contain populations of Night Parrots will be informed and their cooperation sought in limiting and supervising access to any areas which have been gazetted as of limited access.

3.3.4 Taking Birds for Captive Breeding

Captive breeding is likely to play a significant role for such a rare and cryptic species. It is all too likely that a population could be found, perhaps studied for a short time and then the species 'disappear' again. A captive breeding program would provide a safeguard against such a disappearance leading, albeit perhaps gradually, to the final extinction of the species.

CALM and the Perth Zoo will cooperate in designing a captive breeding program, early in the life of this interim recovery plan. Input into the design of a captive breeding program may be sought from private or other avicultural experts. In the event of a population of Night Parrots being discovered, a concerted search for nests with either eggs (preferred) or young birds will be made early in the first breeding season. If a population is found and believed able to sustain the taking of specimens to establish a captive population, CALM will establish and maintain such a population, in collaboration with Perth Zoo and/or selected avicultural experts, starting with at least two birds of each sex. The three other management actions referred to above would be applied as appropriate to the source population, to ensure its retention in the wild.

Such a captive breeding program would be designed to be consistent with CALM Policy Statements No 29, "Translocation of threatened flora and fauna"; No. 33, "Conservation of threatened and specially protected fauna in the wild"; No. 44, "Wildlife Management Programs"; and No 50, "Setting priorities for the conservation of Western Australia's threatened flora and fauna". All established protocols as to recording all captive specimens in a stud book, and maintaining genetic diversity to the greatest extent possible, will be followed.

There is likely to be pressure from aviculturists to obtain Night Parrots as soon as any population is found. A captive breeding program would provide the possibility of releasing birds to approved aviculturists. Conditions would be imposed to ensure the availability of birds and their progeny for eventual relocation in the wild, if that was required under an approved recovery plan.

During the three year life of this interim recovery plan, specimens of the Night Parrot will only be taken from the wild, with Ministerial approval, to establish the captive breeding program referred to above.

Responsibility: CALM (WATSCU) and the Perth Zoo

Cost: to be assessed by staff of the two responsible agencies, and will depend upon particular circumstances

Priority: high if population is found and believed able to sustain the taking of the birds necessary to establish a captive population.

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