



Government of South Australia

South Australian Arid Lands Natural
Resources Management Board



October 2009

South Australian Arid Lands Natural Resources Management Board

Distribution and habitats of the Grey Grasswren *Amytornis barbatus* in South Australia

Andrew Black, Graham Carpenter, Lynn Pedler,
Peter Langdon & Reece Pedler

DISCLAIMER

The South Australian Arid Lands Natural Resources Management Board, and its employees do not warrant or make any representation regarding the use, or results of use of the information contained herein as to its correctness, accuracy, reliability, currency or otherwise. The South Australian Arid Lands Natural Resources Management Board and its employees expressly disclaim all liability or responsibility to any person using the information or advice.

© South Australian Arid Lands Natural Resources Management Board 2010

This work is copyright. Apart from any use permitted under the Copyright Act 1968 (Commonwealth), no part may be reproduced by any process without prior written permission obtained from the South Australian Arid Lands Natural Resources Management Board. Requests and enquiries concerning reproduction and rights should be directed to the General Manager, South Australian Arid Lands Natural Resources Management Board Railway Station Building, PO Box 2227, Port Augusta, SA, 5700

INTRODUCTION

The Grey Grasswren (*Amytornis barbatus*) is a small elusive bird of floodplain habitats in inland river systems dominated by Lignum *Muhlenbeckia cunninghamii* (Higgins et al. 2001). The species is relatively new to science, being first seen in 1921 on the Bulloo floodplain on the Queensland/New South Wales border (Chenery 1922, Macgillivray 1923, McAllan 2000), seen again in that area in 1942 and 1967 by Norman Favaloro and described from specimens taken soon afterwards (Favaloro and McEvey 1968, Robinson 1973). For some years it was only known from that locality but a second population was found in South Australia in 1975 during a biological survey conducted by the Nature Conservation Society of South Australia (Cox 1976, Foale 1982). Six pairs were recorded in Lignum and sedge floodplain vegetation in Goyder Lagoon between Koonchera Waterhole and Pandiburra Bore and frequent sightings have since been made in the former vicinity. This population is now recognised as a separate subspecies *A. b. diamantina*, distinct from the Bulloo Overflow population, *A. b. barbatus* (Shodde & Christidis 1987).

The known range of the Grey Grasswren has gradually been extended in South Australia and Queensland. Ian May saw Grey Grasswrens on two occasions a few months apart in 1982 and again about a year later at Embarka Swamp on the main branch of Cooper Creek west of Innamincka (May 1982 and Ian May, pers. comm.). Subsequent visits to Embarka Swamp by other ornithologists failed to confirm this record but Grey Grasswrens were later identified further upstream in the Cooper Creek system near Ballera in south-west Queensland (Carpenter 2002). These sightings show that the species is present in a third inland river system, Cooper Creek, but the taxonomic (subspecific) status of this population is not known. Upstream of Goyder Lagoon in Queensland there have been further observations of Grey Grasswrens in floodplains of both the Georgina River/Eyre Creek (Joseph 1982) and Diamantina River systems (Jaensch & McFarland 2002).

The Grey Grasswren's habitat is generally regarded as Lignum and Swamp Canegrass *Eragrostis australasica* on swamp flats (Schodde & Christidis 1987, Higgins et al. 2001) in a variety of forms, including areas with large expanses of dense lignum clumps, perhaps with an overstorey of River Cooba (*Acacia stenophylla*) (Carpenter 2002) as well as the outer fringes of swamp habitat with a sparser, less dense cover (Jaensch & McFarland 2002). These areas also support a range of sedge and rush species, the presence of which is related to inundation events (Carpenter 2002). Joseph (1982) found Grey Grasswrens in more open shrubby areas on Eyre Creek in contrast to the findings of Hardy on the Bulloo who found them only in taller and denser Lignum patches. More recently the population occurring in Goyder Lagoon/Warburton Creek has been recorded in relatively open flood plain areas dominated by Old Man Saltbush *Atriplex nummularia* subsp. *nummularia* (Julian Reid pers. comm., LP, pers. obs.).

A. b. diamantina is currently listed as *Rare* in Schedule 9 of the SA National Parks & Wildlife Act 1972. The species and its floodplain habitat are identified as a Conservation Priority in the SA Arid Lands Draft Biodiversity Strategy (2008). Given the quite extensive areas of possibly suitable habitat for this species in the Goyder Lagoon area and associated Diamantina, Warburton and Kallakoopah floodplains the grasswren's distribution may well be more widespread than is currently known. The channels of the Cooper Creek system also support large areas of potential habitat for the species and there is a high probability that they may be discovered in other areas with appropriate search effort (Carpenter 2002).



The significance of potential threats to the Grey Grasswren also requires further investigation. Like most grasswrens, this species is thought to have poor dispersal ability and may therefore be at risk from localised disturbance. Impacts on vegetation through intensive grazing by domestic stock and introduced herbivores has been determined as a major threat to the Bulloo Overflow population subspecies *barbatus* (Hardy 2002) and this may also apply to the northern population subspecies *diamantina*.

More information is needed on the current status of the Diamantina/Warburton and Cooper Creek populations of the Grey Grasswren, including their distribution, their habitats, the subspecific identity of the latter and the identification of potential threats to their conservation as a result of current or altered circumstances.

METHODS

We collated previous records of the Grey Grasswren in South Australia, including specimens in the South Australian Museum Adelaide, Biological Survey SA records and published and unpublished records of the authors and others.

Two field surveys were carried out with the aim of re-visiting as many sites of previous records as were practicably accessible and searching elsewhere in places containing apparently suitable habitat. Four observers searched Embarka Swamp, Cooper Creek, from 24-29 May 2009 and five observers searched Goyder Lagoon and Warburton River, south to Kallakoopah Creek from 18-27 October 2009.

At each locality we walked slowly through the area over a period of 30 minutes, looking and listening for grasswrens. Most were located by hearing their high-pitched calls, rather than by seeing them but almost all records were confirmed by subsequent direct observation. Calls were given spontaneously or in reaction to the disturbance created by the observers and only rarely in response to high-pitched squeaks or to the playing of their own recorded calls or those of other grasswrens. We made habitat measurements at localities where Grey Grasswrens were found and all occupied sites were recorded with a hand-held GPS unit.

An anticipated constraint on this study was the difficulty of finding grasswrens unless seasonal and viewing conditions are optimal, even at localities where they have been recorded previously. This is due to the extremely cryptic behaviour of this species (Cox 1976). Grasswrens were not presumed to be absent if they were undetected during a 30 minutes search period and we did not therefore attempt to define unoccupied control sites for comparison with those where grasswrens were present.

Habitat measurement

Where grasswrens were recorded, a vegetation transect was undertaken. Percentage cover was calculated from the ground substrate or plant species present at each 2 m point along a 200 m transect laid over the habitat from where the birds were first located and in the direction that the birds travelled. The heights of ground cover plants were recorded in 25 cm categories at each point using a range pole. Vegetation types were described at each site based on the estimated cover and species in the highest stratum or storey (after Specht 1972). Any vegetation cover above 4 m high was recorded as canopy. Canopy species with 2% or less cover were considered emergent and the vegetation type was defined by the next highest stratum.



RESULTS

We found 110 records of Grey Grasswrens in South Australia from 25 separate localities (see Appendix 1). All but the one Cooper Creek record were from floodplains of the Goyder-Warburton-Kallakoopah system. Until recently the most southerly of the latter localities was at the division of the Warburton River and Kallakoopah Creek (Ian May and Peter Taylor pers. comm.) but observations from near the Warburton on Kalamurina Station about 90 km to the south-west (Chris Coleborn and Judith Hoyle per Richard Jordan, Australian Wildlife Conservancy) and from the Kallakoopah several kilometres below its origin (Mark and Tess McLaren pers. comm.) provided evidence of an expanded range downstream.

An extensive examination was made of Embarka Swamp, sampling particularly its best watered south-eastern section including the locality of Ian May's earlier sightings (see map). A small flood had reached its peak at Gidgealpa Homestead, Embarka Waterhole about a week earlier and had inundated the south-eastern parts of the swamp, particularly an internal terminal swamp which was luxuriant. Water was flowing in many small channels beyond this area and into parts of the swamp visited subsequently in the west and north. The lignum and associated vegetation were generally healthy in the south and east but appeared dry or dead in places in the north of the swamp, as it was on the evidently long dry flood plains examined upstream. No Grey Grasswrens were seen or heard despite a very thorough examination (see Map Figure 1).

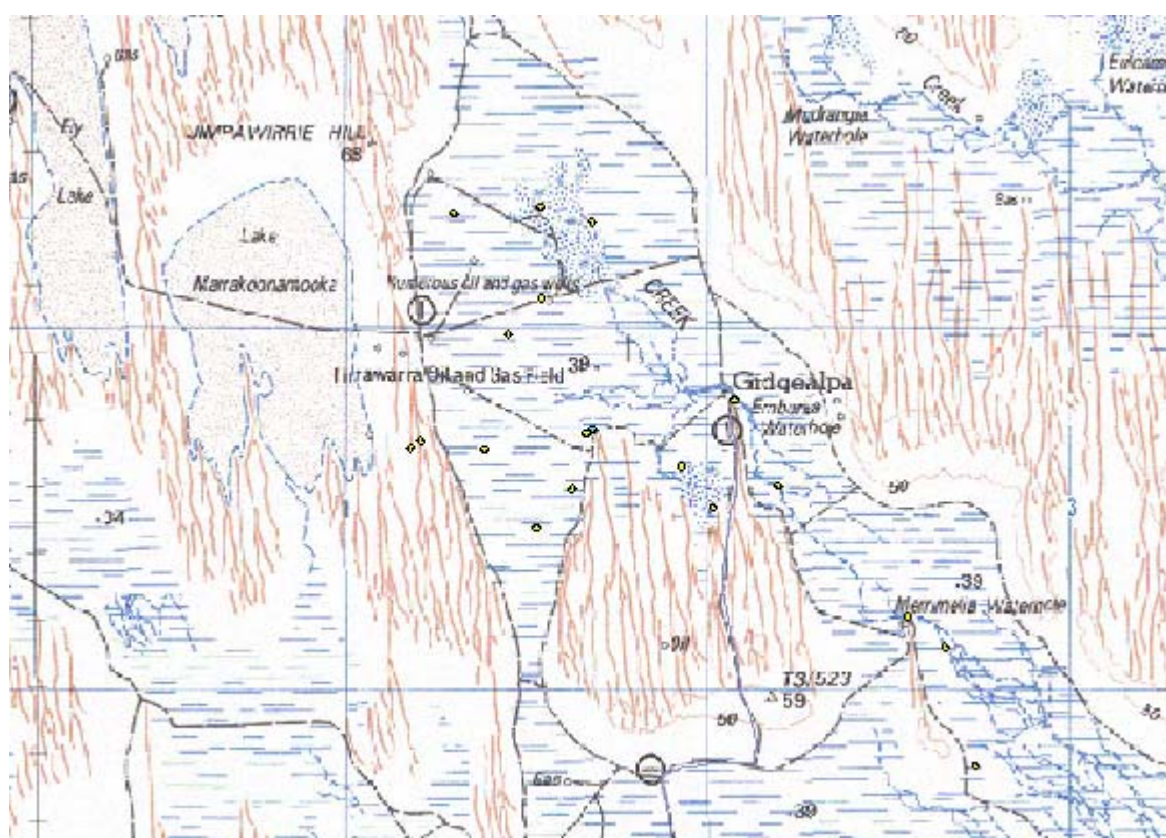


Figure 1. Area of Embarka Swamp, Cooper Creek, showing Ian May's record site (blue) and sites searched in this study (yellow).

Of 24 previous record localities from Goyder's Lagoon and the Warburton four were not re-visited, the two recently recorded on Kalamurina Station and the Kallakoopah



Creek and Outside Track sites because of uncertainty of precise locality at the time. Our field study followed the occurrence of a moderately large flood of Eyre Creek, the Diamantina and Warburton-Kallakoopah in the summer-to-autumn period of 2008-2009 that had caused over three quarters of Lake Eyre to be covered. The presence of grasswrens was confirmed at 16 and unconfirmed at four localities. In total we identified Grey Grasswrens at 54 sites, 16 at confirmed and 15 at new localities and 23 close to one or the other (see Map Figure 2 and Appendices). We completed analyses of vegetation transects at 42 sites.

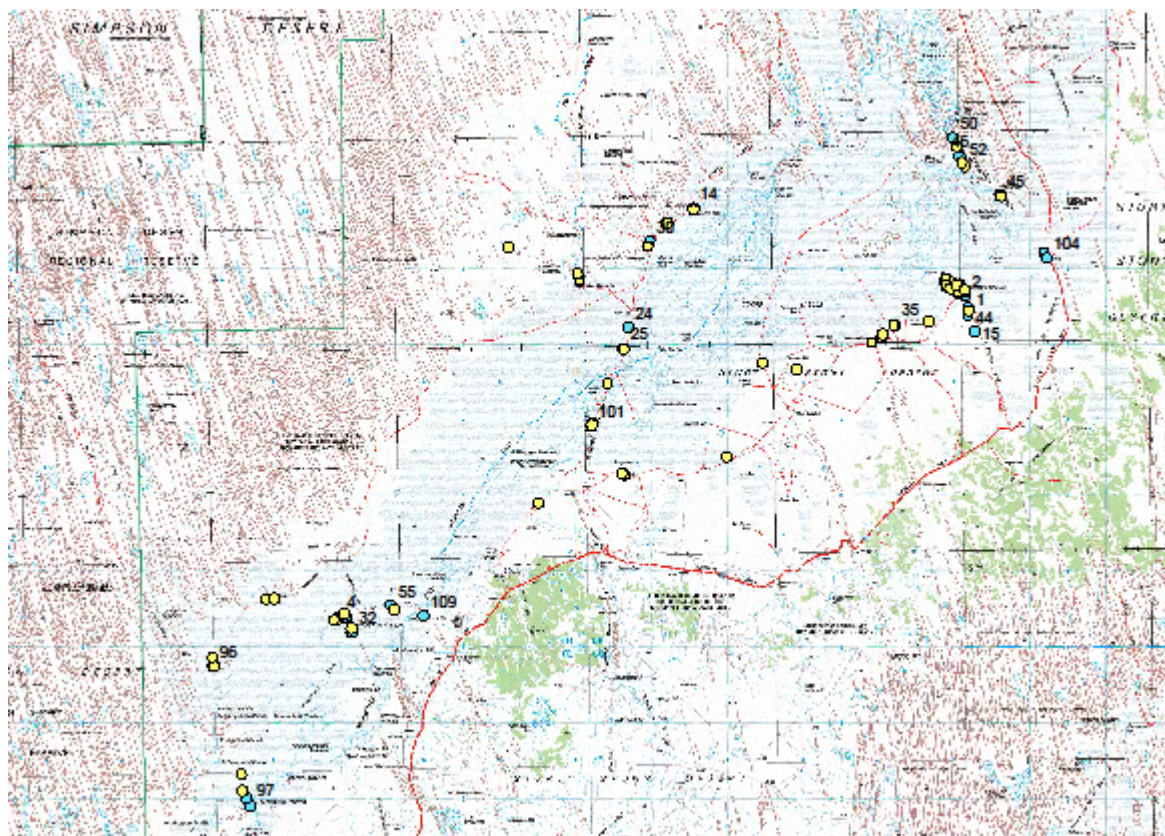


Figure 2. Area of Goyder Lagoon and upper Warburton River showing previous Grey Grasswren record localities (blue and numbered) and sites where they were recorded in this survey (yellow).

Breeding

We found evidence of breeding at four sites. A nest in Ruby Saltbush within a lignum shrub was found at site B8 and a nest of fine grasses with two feathered young in a thicket of Lignum sticks protruding through the base of a small Old Man Saltbush was seen at site B9, both near locality 96, on 21 October. At the latter nest one adult performed a distraction display for several minutes within three metres of the observer. A short-tailed juvenile was seen with four adults in Lignum at site B12, south of Koonchera Waterhole on the same day. A nest with one pin-feathered nestling and one dried unhatched egg was found near site B25 north of Pandiburra Bore on 22 October.



Habitats

Of the 54 sites at which Grey Grasswrens were identified the vegetation types were as shown in Table 1.

Table 1. Vegetation types at sites with *A. barbatus*

Vegetation type	No. sites	%
Cooba low woodland	2	4
Lignum shrubland	31	57
Old Man Saltbush shrubland	10	19
Lignum & Old Man Saltbush shrubland	4	7
Queensland Bluebush shrubland	1	2
Lignum & Queensland Bluebush shrubland	4	7
Queensland Bluebush & Swamp Canegrass shrubland	2	4
	54	

Detailed analysis of cover type at the 42 sites at which vegetation was measured is shown in Table 2.

Table 2. Cover type at sites with *A. barbatus*

Cover type	Mean % (SD)	Max cover %	No. sites present (%)
Bare ground	34.5 (18.2)	77	41 (98)
Litter	31.5 (19.6)	82	42 (100)
Shrub 0-25cm	1.0		
Shrub 26-50	1.4		
Shrub 51-75	4.4		
Shrub 76-100	7.1		
Shrub 101-125	6.5		
Shrub 126-150	4.8		
Shrub 151-175	2.8		
Shrub 176-200	3.0		
Shrub 201-225	0.9		
Shrub 225-250	0.5		
Shrub >250	0.1		
Lignum		76	37 (88)
Old Man Saltbush		28	18 (43)
Cooba		11	7 (17)
Queensld. Bluebush		14	24 (57)
Live herb		16	20 (48)
Swamp Canegrass		12	3 (7)
Litter and live herb	32.9 (21.0)	82	

A complete list of all plant species present at sites occupied by Grey Grasswrens is shown in Table 3.



Table 3. Plants present at sites with *A. barbatus*.

xxx=prominent at many sites; xx=prominent at some sites; x=present in low numbers

Species	Common name	Abundance
<i>Acacia stenophylla</i>	River Cooba	xx
<i>Alternanthera nodiflora</i>	Common Joyweed	xxx
<i>Atriplex crassipes</i>	Saltbush	xx
<i>Atriplex nummularia</i> ssp. <i>nummularia</i>	Old-man Saltbush	xx
<i>Atriplex spongiosa</i>	Pop Saltbush	x
<i>Brachyscome ciliaris</i>	Variable Daisy	x
<i>Calotis hispidula</i>	Hairy Burr-daisy	x
<i>Centipeda cunninghamii</i>	Common Sneezeweed	x
<i>Chenopodium auricomum</i>	Queensland Bluebush	xx
<i>Chenopodium cristatum</i>	Crested Goosefoot	x
<i>Cullen australasicum</i>	Tall Scurf-pea (Native Verbena)	xx
<i>Dentella pulvinata</i>	Mud-mat	x
<i>Dissocarpus biflorus</i>	Two-horn Saltbush	xx
<i>Echinochloa inundata</i>	Channel Millet	x
<i>Eleocharis acuta</i>	Common Spike-rush	x
<i>Enchylaena tomentosa</i>	Ruby Saltbush	xx
<i>Eragrostis australasica</i>	Swamp Cane-grass	xx
<i>Eremophila bignoniiflora</i>	Bignonia Emubush	x
<i>Eryngium supinum</i>	Little Devil	x
<i>Eucalyptus coolabah</i>	Coolibah	x
<i>Frankenia serpyllifolia</i>	Thyme Sea-heath	x
<i>Goodenia glauca</i>	Pale Goodenia	xx
<i>Haloragis aspera</i>	Rough Raspwort	xxx
<i>Halosarcia indica</i>	Brown-head Samphire	x
<i>Lachnagrostis filiformis</i>	Perennial Blown-grass	x
<i>Lechenaultia divaricata</i>	Tangled Lechenaultia	x
<i>Leiocarpa leptolepis</i>	Pale Plover-daisy	x
<i>Malva behriana</i>	Australian Hollyhock	xx
<i>Marsilea drummondii</i>	Common Nardoo	xxx
<i>Muehlenbeckia florulenta</i>	Lignum	xxx
<i>Mukia micrantha</i>	Desert Cucumber	x
<i>Nicotiana velutina</i>	Velvet Tobacco	xx
<i>Panicum decompositum</i>	Native Millet	x
<i>Plantago drummondii</i>	Dark Plantain	xx
<i>Portulaca intraterranea</i>	Buttercup Purslane (Munyaroo)	xx
<i>Pycnosorus melleus</i>	Long-head Buttons	xxx
<i>Pycnosorus eremaeus</i>	Inland Buttons	xx
<i>Rhodanthe floribunda</i>	White Everlasting	xx
<i>Rutidosis helichrysoides</i>	Grey Wrinklewort	x
<i>Salsola kali</i>	Buckbush	x
<i>Santalum lanceolatum</i>	Plumbush	x
<i>Sclerolaena intricata</i>	Tangled Bindyi	x
<i>Senecio lanibracteus</i>	Inland Shrubby Groundsel	xxx
<i>Solanum oligacanthum</i>	Desert Nightshade	xx
<i>Stemodia florulenta</i>	Bluerod	xx
<i>Tetragonia eremaea</i>	Desert Spinach	x
<i>Teucrium racemosum</i>	Grey Germander	xx
<i>Trigonella suavissima</i>	Native Clover	x



DISCUSSION

Distribution and status

We have been unable to confirm the presence of the Grey Grasswren in Cooper Creek within South Australia but find evidence of a large population of the subspecies *Amytornis barbatus diamantina* occupying much of Goyder Lagoon and extending downstream in floodplains associated with the Warburton River and its anabranches including Kallakoopah Creek. This population is found in a variety of habitats associated with the irregularly inundated floodplains of this inland river system, from dense tall Lignum shrublands to lower open shrublands of Old Man Saltbush or species-combinations including Old Man Saltbush, Lignum, Queensland Bluebush and Swamp Canegrass. Previous observations from Goyder Lagoon have been in swamp shrublands associated with both the eastern and western terminal branches of the Diamantina River. The majority of the eastern records have been in Lignum near Koonchera Waterhole, with others to its west near Pandiburra Bore and to its north, east of Clifton Hills Outstation. The western records have been from many places along the Birdsville Inside Track near the terminating channels of the Diamantina and initiating channels of the Warburton. In this study we found grasswrens further to the west, near Tepamimi Waterhole where Eyre Creek reaches Goyder Lagoon and at many places near the lagoon's southern margin between Pandiburra Waterhole and north of Clifton Hills Homestead. These findings suggest that the species may be present in suitable habitat across the extent of irregular inundation of Goyder Lagoon. Downstream a similar conclusion could be inferred from both historical and current observations, at least as far as the division of the Warburton and Kallakoopah. Beyond that point there are but three very recent Grey Grasswren records and its status across this less frequently inundated area is therefore uncertain. Upstream of Goyder Lagoon Grey Grasswrens have been reported from both of its main tributaries, Eyre Creek between lakes Machattie and Koolivoo north of Birdsville (Joseph 1982) and the Diamantina River in channels west of Farrars and Browns Creeks between Durrie and Beetoota (Jaensch and McFarland, 2002). These records, each of very limited extent, are about 200 km north and 180 km northeast of Goyder Lagoon respectively and to date there has been no intervening report to demonstrate connectivity between these populations. The extent of the identified Eyre Creek and Diamantina River populations and their relationship to that in Goyder Lagoon require further examination.

Habitats

Grey Grasswrens of the Goyder-Warburton population are found in densely vegetated Lignum swamps and Lignum-lined channels but also in much more open vegetation well beyond the Lignum swamps. Such vegetation is found within the floodplain but away from all major and most minor channels and is less likely to be inundated deeply and persistently during and following floods. The contrast between these two types of habitat is striking and raises the question of whether each is equally preferred or whether movement occurs between the two, depending on local conditions, particularly the extent and depth of inundation at the time. Hardy (2002) made observations of Grey Grasswrens in an 11 hectare area of mostly tall dense Lignum in the Caryapundy Swamp of the Bulloo Overflow during nine years between 1984 and 2000. He trapped 193 individuals in this time and found their numbers to be greatest between 1991 and 1994 (the year of the single breeding record) when conditions were dry and there was no surface water. In 2000, following the first flooding of the swamp for ten years, no grasswrens were present and he concluded that "dense, tall Lignum serves as a refuge during periods of climatic extremes" and



that the grasswrens had dispersed. An alternative interpretation is that Grey Grasswrens occupy dense, tall Lignum during the long dry and hot times that are normal; Hardy had no information to indicate where they might go during a flood. One likelihood is that they move to habitats at the periphery of flooded areas such as Sandhill Canegrass on nearby dune fringes, as at Koonchera Dune in the 80s (R Kernot pers. comm. to GC) or to those that are only briefly and less deeply inundated such as the Old Man Saltbush and other more open shrublands identified in this study. A possible illustration of the latter was our failure to find grasswrens near the Yelprawaralinn Track crossing of the Warburton or in extensive Lignum along the Warburton immediately above the Kallakoopah and near Yelprawaralinn Waterhole, yet recording them in more peripheral parts of the floodplain. It was also noteworthy that grasswrens were unconfirmed or found only at the habitat edge after prolonged searches at three sites east of Clifton Hills Outstation in a very extensive dense and healthy Lignum swamp that retained significant surface water.

Of four unconfirmed localities, site 109, near the Warburton crossing and site 46, east of Clifton Hills Outstation, have been discussed above. Site 15, south of Koonchera Waterhole, was an area of sparse Samphire and low and almost dead Old Man Saltbush and presumably had deteriorated from prolonged drought and/or lack of inundation. Site 24, near Tourist Dam on the Inside Track, consisted of several hectare areas of Lignum separated by luxuriant herb-fields, the result of the recent flooding. Occupied sites were found to the south nearby and it is possible that prolonged recent inundation may have been responsible for the dispersal of grasswrens from such relatively isolated habitat patches or that populations had not persisted during dry periods prior to the flood.

The other unconfirmed locality was at Embarka Swamp on the Cooper where we found extensive habitat suitable for Grey Grasswrens but could not confirm their presence. The reports from that single locality covered a short period of about a year and there have been no reports from other Lignum swamps nearby, such as those on the northwest branch. This suggests that the local grasswren population in 1982 was a limited one that is now extinct. In 1974 both the Cooper and Diamantina systems were in major flood. If our argument above concerning dispersal of Grey Grasswrens during flood is valid then a major displacement might have resulted, allowing for the subsequent development of small satellite populations distant from their origin, such as in swamps associated with the Cooper wherever suitable habitat occurred. During such exceptional periods of high rainfall and repeated major flooding as in the mid 1970's it seems possible that Grey Grasswrens might have been able to cross normally inhospitable areas between Goyder Lagoon and the Cooper floodplain using vegetation such as Swamp Canegrass in gilgais and depressions flooded for unusually extended periods. Alternatively a population in Embarka Swamp might have been founded during this period by movements downstream along the Cooper Creek from floodplains in Queensland through the relatively narrow channel in the Innamincka area.



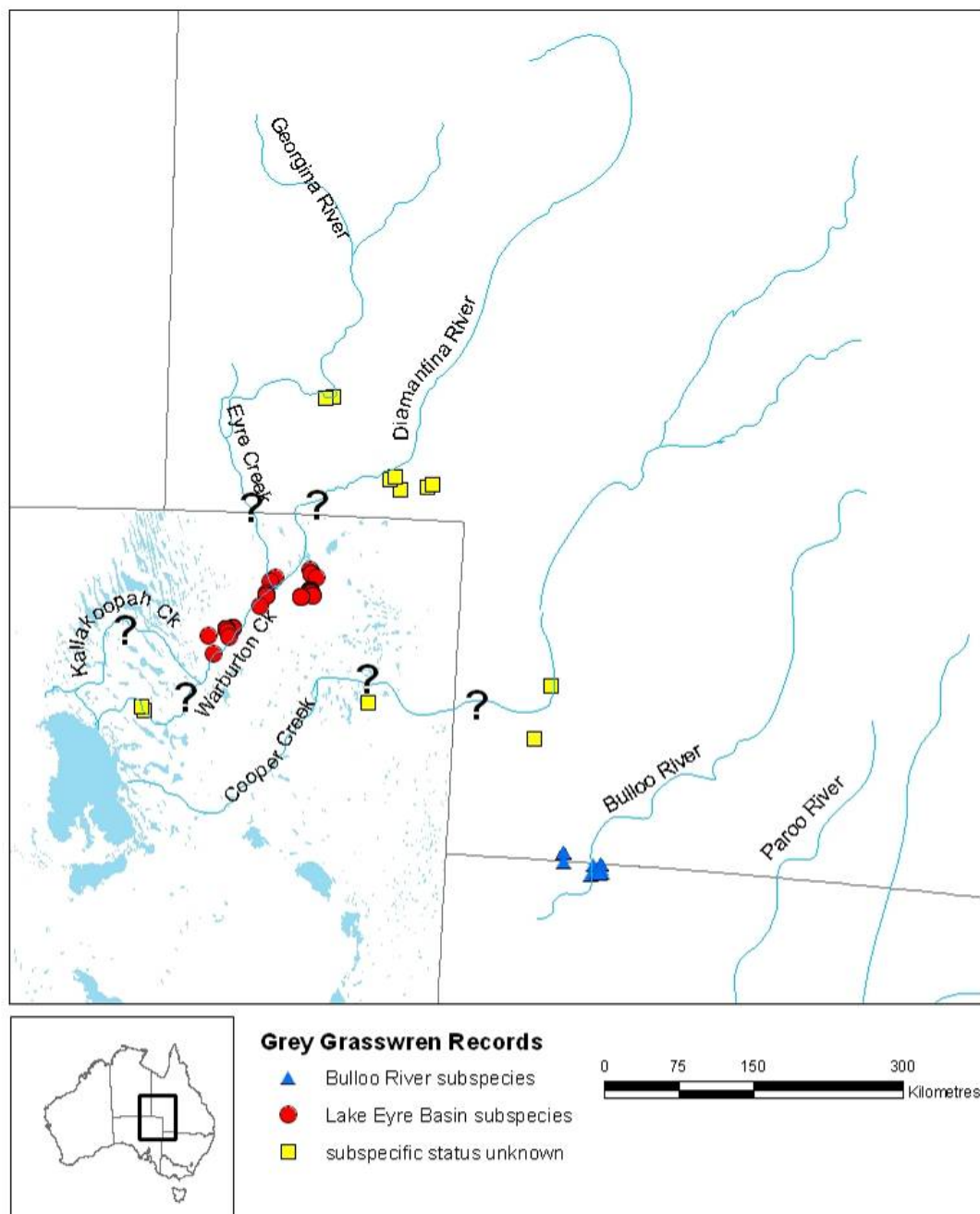


Figure 3. National distribution of the Grey Grasswren, showing known locations of the Lake Eyre Basin subspecies (*A. b. diamantina*), the Bulloo River subspecies (*A. b. barbartus*) and records for which the subspecific status is yet to be confirmed. Areas of potential habitat where the species distribution is unknown are shown by question marks.



Conservation and Management

Threats to the Grey Grasswren have been identified by Garnett and Crowley (2000) and Hardy (2002) as habitat degradation from grazing pressures of stock and rabbits and from disturbance by the rooting of feral pigs. While their preoccupation was on the preservation of areas of dense Lignum our findings suggest that such degrading influences might be even more relevant to the more accessible mixed open shrublands of other species such as Old Man Saltbush. Other influences on the quality of Lignum habitat include fire and desiccation. Climate change could lead to increases in both and the former can be used as a management tool for opening up areas to enhance stock access. We did not find evidence to indicate significant deterioration of habitat for the species on the Goyder/Warburton floodplains. Potentially the most significant threat is a major change in the frequency of inundation with or without more frequent and more extended drought. Such an outcome is possible as a result of climate change or from regulation and excessive exploitation of the upstream water resources of the Georgina/Eyre, Diamantina, Cooper and Bulloo catchments.

Questions unresolved

The occurrence of Grey Grasswrens along the Kallakoopah and lower Warburton requires further study to establish whether there is continuous distribution or if there are only small outlying groups that might represent potential founder populations. In addition it remains to be shown if there is continuity between the Goyder Lagoon population and those upstream in Eyre Creek and the Diamantina River which have not been fully assessed for their distribution and size or for subspecific status. The size and extent of the Cooper Creek channels population also remains poorly known and its subspecific status too has not been determined (Figure 3).

ACKNOWLEDGMENTS

Funding for this study was provided by SANTOS through the Marree-Innaminka District NRM Group and in-kind support provided by the SA Arid Lands NRM Board. The assistance and support of Jane-Marie and Jason Barns of Gidgealpa Station, SANTOS Tirrawarra Manager Mark Moffatt, the Oldfield family of Cowarie Station, Gilby family of Clifton Hills Station and John Hughes, Clifton Hills Pastoral Co. is gratefully acknowledged.



REFERENCES

- Carpenter, G (2002) The Grey Grasswren on the Cooper Creek south west Queensland. *Sunbird*, 32: 52-55.
- Chenery, A (1922) Notes on birds seen during a recent visit to the Western Darling, NSW, Part 3. *South Australian Ornithologist* 6, 153-155.
- Cox, J B (1976) Grey Grasswrens and Grass Owls at Goyder's Lagoon, South Australia; *South Australian Ornithologist*, 27, 96-100.
- Department for Environment and Heritage (2008) Draft South Australian Arid Lands Biodiversity Strategy, Channel Country Conservation Priorities.
- Favaloro, N J and McEvey, A (1968) A new species of Australian Grasswren; *Memoirs of the National Museum of Victoria*, 28, 1-9.
- Foale, M R (Ed) (1982) The Far North East of South Australia; A biological survey conducted by the Nature Conservation Society of SA (Inc.) 2nd -30th August 1975; Nature Conservation Society of South Australia; Adelaide.
- Garnett, S T and Crowley, G M. (2000) The Action Plan for Australian Birds Commonwealth of Australia.
- Hardy J W (2002) A Banding Study of the Grey Grasswren *Amytornis barbatus barbatus* in the Caryapundy Swamp of South-western Queensland. *Corella* 26:106-109.
- Higgins, P J, Peter, J M and Steele W K (2001) Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant-flycatchers to Chats. Oxford University Press, Melbourne.
- Jaensch R & McFarland, D (2002) A population of Grey Grasswren *Amytornis barbatus* in the Diamantina channel country, Queensland. *Sunbird*, 32, 56-61.
- Joseph, L (1982) A further population of the Grey Grasswren. *Sunbird*, 12; 51-53.
- Macgillivray, W (1923) A trip to the north and north-west of Broken Hill. *Victorian Naturalist* 39, 131-147.
- McAllan, I A W (2000) On some New South Wales records of the Grey Grasswren and Thick-billed Grasswren. *Australian Bird Watcher* 18, 244-246.
- May, I A (1982) In: Bird Notes (Ed. B. Glover): *South Australian Ornithological Association Newsletter*, 102, 11.
- Robinson, L (1973) The Grey Grasswren: *The Australian Bird Watcher*, 4; 251-256.
- SA National Parks and Wildlife Act 1972
- Schodde, R & Christidis, L (1987) Genetic differentiation and subspeciation in the Grey Grasswren *Amytornis barbatus* (Maluridae) *Emu*: 87, 188-192.



Appendix 1.

Previous records of the Grey Grasswren in South Australia.

Site	At,or near	zone	East	North	No.	day	month	year	observer	location	Reference
98					6 pairs	12,13,14	8	1975	Cox, J	near Koonchera WH and Pandiburra Bore	SA Ornithologist 27: 96-100
1		54	352033	7044533	1	12	8	1975	Cox, J	Koonchera Dune	BIRD ATLAS DATA 1996-2006
2		54	351570	7046282	1	13	8	1975	Cox, J	Koonchera WH	BIRD ATLAS DATA 1996-2006
3	2	54	351589	7047082	1	18	9	1976		Koonchera WH	BIRD ATLAS DATA 1996-2006
4		54	268929	7003877	1	18	9	1976		7.5 km NNW Yelpawaralinna WH	BIRD ATLAS DATA 1996-2006
5	2	54	350751	7047750	1	19	9	1976		Koonchera WH	BIRD ATLAS DATA 1996-2006
6	2	54	351648	7046744	1	19	9	1976		Koonchera WH	BIRD ATLAS DATA 1996-2006
7	1	54	352033	7044533	1	19	9	1976		Koonchera Dune	BIRD ATLAS DATA 1996-2006
8	1	54	351949	7044624	1	19	9	1976		Koonchera Dune	BIRD ATLAS DATA 1996-2006
9	2	54	351703	7046714	1	19	3	1982		Koonchera WH	BIRD ATLAS DATA 1996-2006
97		54	257000	6979000	numerous	19	3	1982	May, I.	Kallakoopah-Warburton Ck junction	SAOA Newsletter 102
10		54	416950	6937300	3	22	5	1982	May, I.	Embarka Swamp, Cooper Creek	SAOA Newsletter 102
11	2	54	351312	7047048	1	22	5	1982		Koonchera WH	BIRD ATLAS DATA 1996-2006
12	2	54	351284	7047079	1	22	7	1983		Koonchera WH	BIRD ATLAS DATA 1996-2006
13	1	54	351921	7044686	1	10	9	1985		Koonchera Dune	BIRD ATLAS DATA 1996-2006
14		54	315575	7057861	4	17	7	1989	Cohen, B.	Birdsville Inside Track, Burt WH	DEH Biosurvey Goyder Lagoon
99	2	54	351000	7047000	numerous	18	7	1989	Mahar, P	Koonchera	SAOA Newsletter 142
15		54	352833	7041613	2	7	10	1992	Cohen, B.	Koonchera Dune	DEH Biosurvey Goyder Lagoon
16, 17	15	54	352833	7041613	2	16, 17	11	1993	Cohen, B.	Koonchera Dune	DEH Biosurvey Goyder Lagoon
18-23	2	54	351002	7047224	20	7, 8	11	1993	Cohen, B. & Pedler, L.	Koonchera WH	DEH Biosurvey Goyder Lagoon
24		54	307074	7042048	2	12	11	1993	Copley, P.	Birdsville Inside Track, S of Tourist Dam	DEH Biosurvey Goyder Lagoon
25-29		54	306371	7039308	5	12, 13, 14	11	1993	Copley, P. & Canty, P.	Birdsville Inside Track Warburton channel	DEH Biosurvey Goyder Lagoon
30		54	309908	7053525	2	14	11	1993	Copley, P. & Hemmings, D.	Birdsville Inside Track, SW of Burt WH	DEH Biosurvey Goyder Lagoon
31	4	54	269703	7003698	1	14	11	1993	Hopton, D.	7.5 km NNW Yelpawaralinna WH	DEH Biosurvey Sandy Deserts



32		54	270460	7001790	1	14	11	1993	SAM	5 km NNW Yelpawaralinna WH	SA Museum data
33, 34, 42	2	54	350751	7047750	3	14-17	11	1993	SAM	Koonchera WH	SA Museum data
35-41		54	342200	7042500	7	18-20	11	1993	SAM	Pandiburra Bore, N of	SA Museum data
43	2	54	351223	7047078	6	20	11	1993		Koonchera WH	DEH Biosurvey Rare Rodents
44		54	351986	7043736	2	22	11	1993		Koonchera Dune	DEH Biosurvey Goyder Lagoon
45		54	356208	7059470	3	22	11	1993	Pedler, L.	Clifton Hills OS, 11km SE	DEH Biosurvey Goyder Lagoon
46-49, 51		54	350742	7064623	2	22	11	1993	Pedler, L.	Clifton Hills OS, 5km E	DEH Biosurvey Goyder Lagoon
50		54	349896	7067137	2	22	11	1993	Pedler, L.	Clifton Hills OS, 5km NE	DEH Biosurvey Goyder Lagoon
52-54		54	351171	7063754	1	22	11	1993	Pedler, L.	Clifton Hills OS, 5km E	DEH Biosurvey Goyder Lagoon
55, 56, 65		54	275687	7005359	2	25, 26	11	1993	Pedler, L.	Yelpawaralinna Track W of Warburton crossing	DEH Biosurvey Goyder Lagoon
57-63, 66-71	4	54	269263	7003706	4	25, 26	11	1993	Pedler, L.	7.5 km NNW Yelpawaralinna WH	DEH Biosurvey Goyder Lagoon
109		54	280000	7004000			11	1993	Pedler, L.	Yelpawaralinna Track E of Warburton crossing	pers. obs.
72	4	54	269263	7003706	3	1	4	1994	Pedler, L.	7.5 km NNW Yelpawaralinna WH	DEH Biosurvey Goyder Lagoon
73, 74	55	54	275687	7005359	1	14, 25	6	1998	Pedler, L.	Yelpawaralinna Track W of Warburton crossing	DEH Biosurvey Goyder Lagoon
75-79	4	54	269263	7003706	2	24	6	1999	Pedler, L.	7.5 km NNW Yelpawaralinna WH	DEH Biosurvey Goyder Lagoon
						to 12	9	1999			
80-82	4	54	269263	7003706	3	3, 13	8	2000	Pedler, L.	7.5 km NNW Yelpawaralinna WH	DEH Biosurvey Goyder Lagoon
96	96	54	252160	6997335	1			2000		Warburton Track, 5km N Poothapia WH	BIRD ATLAS DATA 1996-2006
101		54	302154	7029127	several	3	1	2005	Rogers C. & Cox J.	Birdsville Track, Goyders Lagoon S end	SAOA Newsletter 193
106	104	54	362350	7051270	4	20	9	2006	Ramsay, B.	Birdsville, 90km S	Birding Aus website
108	97	54	256000	6980000					Taylor, P.	Kalamunkinna WH c 1 km W	pers.comm.
104		55	362000	7051940	2	21	5	2007	Biggs, D et al.	Birdsville Outside Track, 90km S Birdsville	Birding Aus website
105	101	54	302154	7029127	5	12	10	2007	Rogers, C. & Hornbuckle, J.	Birdsville Inside Track, S end	SAOA Newsletter 204
93		53	781530	6920100	3		9	2008	Hoyle, J.	Kalamurina, near Warburton River	pers.comm.
94		53	778200	6923600	1		9	2008	Coleborn, C. & Turner, A.	Kalamurina, near Warburton River	pers.comm.
110		54						2009	McLaren, M & T	Kallakoopah Creek	pers.comm.



Appendix 2.

Sites where Grey Grasswrens were recorded during this study.

Site	Location	Old site	No.	Day	Mnth	Yr	East	North
b1	Kalamunkinna WH, 2km NW	97	2	19	10	2009	256100	6980930
b2	Kalamunkinna WH, 4km NNW		1	19	10	2009	256020	6983100
b3	Yelpawaralinna Track, Warburton River crossing	55	1	20	10	2009	276000	7004770
b4	Yelpawaralinna Track, 7.5km NNW Yelpawaralinna WH	4	2	20	10	2009	268600	7003520
b5	Yelpawaralinna Track, 7.5km NNW Yelpawaralinna WH		2	20	10	2009	269550	7004300
b6	Yelpawaralinna Track, 7.5km NNW Yelpawaralinna WH		2	20	10	2009	268150	7003400
b7	Yelpawaralinna WH, 5km N	32	2	20	10	2009	270500	7002400
b8	Warburton Track, 5km N Poothapia WH	96	1	21	10	2009	252200	6998460
b9	Warburton Track, 5km N Poothapia WH		1	21	10	2009	252460	6997290
b10	Yelpawaralinna WH, 16km NW		2	21	10	2009	259220	7006140
b11	Yelpawaralinna WH, 16km NW		1	21	10	2009	260250	7006300
b12	Koonchera Dune	1	5	22	10	2009	352020	7044210
b13	Koonchera WH	2	1	22	10	2009	351300	7047100
b14	Koonchera WH		2	22	10	2009	350600	7046550
b15	Koonchera WH		1	22	10	2009	350560	7046800
b16	Koonchera WH		1	22	10	2009	349630	7048000
b17	Koonchera WH		1	22	10	2009	349050	7048370
b18	Koonchera WH		1	22	10	2009	348930	7048130
b19	Koonchera WH		1	22	10	2009	348950	7048500
b20	Koonchera WH		1	22	10	2009	349040	7047600
b21	Koonchera WH		1	22	10	2009	349450	7047130
b22	Koonchera WH		1	22	10	2009	350460	7047610
b23	Koonchera WH		2	22	10	2009	351540	7046980
b24	Pandiburra Bore, 3km N	35	3	22	10	2009	342240	7042490
b25	Pandiburra Bore, 3km N		2	22	10	2009	342090	7042400
b26	Clifton Hills OS, 11km SE	45	2	22	10	2009	356170	7059550
b27	Clifton Hills OS, 11km SE		5	22	10	2009	356240	7059310
b28	Clifton Hills OS, 5km NE	50	1	23	10	2009	350350	7065950
b29	Clifton Hills OS, 5km E	52	2	23	10	2009	351520	7063460
b30	Clifton Hills OS, 5km E		1	23	10	2009	351170	7063890
b31	Birdsville Inside Track, Burt WH	14	4	24	10	2009	315800	7057780
b32	Birdsville Inside Track, Burt WH		1	24	10	2009	315600	7057550
b33	Birdsville Inside Track, 4km SW Burt WH		2	24	10	2009	312100	7055800
b34	Birdsville Inside Track, 4km SW Burt WH		3	24	10	2009	312250	7055890
b35	Birdsville Inside Track, 7km SW of Burt WH	30	2	24	10	2009	309650	7052800
b36	Tepamimi WH		1	24	10	2009	300650	7048290
b37	Tepamimi WH		1	24	10	2009	300600	7048450
b38	Tepamimi WH, 10km WNW		2	24	10	2009	291300	7052600
b39	Tepamimi WH		2	25	10	2009	300420	7049150
b40	Birdsville Inside Track, Warburton River channel	25	2	25	10	2009	306470	7039170
b41	Birdsville Inside Track, Warburton River channel		4	25	10	2009	304330	7034780
b42	Birdsville Inside Track, Dead Horse WH	101	4	25	10	2009	302250	7029450
b43	Birdsville Inside Track, Dead Horse WH		1	25	10	2009	302170	7029250



b44	Clifton Hills, 3km W Lumkins Dam		1	25	10	2009	324740	7037370
b45	Clifton Hills, 2km SE Lumkins Dam		1	25	10	2009	329390	7036630
b46	Clifton Hills, Pandiburra WH		1	26	10	2009	346750	7042900
b47	Clifton Hills, 3km NW Pandiburra Bore		5	26	10	2009	340450	7040770
b48	Clifton Hills, 3km NW Pandiburra Bore		4	26	10	2009	340580	7041160
b49	Clifton Hills, 4km W Pandiburra Bore		2	26	10	2009	339200	7040100
b50,51	Clifton Hills, 2km N Lizzie Dam		2	26	10	2009	320100	7024940
b52	Clifton Hills, Scorpion Dam		2	26	10	2009	306600	7022600
b53	Clifton Hills, Scorpion Dam		2	26	10	2009	306290	7022800
b54	Clifton Hills HS, 10km NNE		2	26	10	2009	295150	7018800

APPENDIX 3

Photos at sites where *A. barbatus* was found – demonstrating diversity of habitat types



Figure 1. Site B12, near Koonchera Waterhole – sparse lignum; possibly not inundated during the most recent flooding.





Figure 2. Site B8 on Warburton Track, Cowarie Station – recently inundated mixed Lignum and Old man Saltbush, with scattered emergent Coolibahs.



Figure 3. Site B1, 2 km north-west of Kalamunkinna Waterhole, in open Old Man Saltbush shrubland.





Figure 4. Site B7, north of Yelprawaralinna Waterhole. Recently inundated Lignum in depressions.



Figure 5. Site B31, near Burt Waterhole – open Lignum/Queensland Bluebush/Old Man Saltbush with emergent Coolibah and fresh growth of herbage from recent inundation, including Billy Buttons.

