

**A SURVEY OF PLAINS-WANDERERS
AND THICK-BILLED GRASSWRENS
IN THE NORTH-EAST PASTORAL ZONE OF SOUTH AUSTRALIA.**



A Report Prepared for
South Australian Arid Lands Natural Resources Management Board

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Roman Urban (SA Dept. for Environment and Heritage) produced the maps contained in the report.

Historical records for Thick-billed Grasswren and Plains-wanderer in South Australia were sourced from databases held by South Australian Museum, South Australian Ornithologists Association, South Australian Dept. for Environment and Heritage and Birds Australia.

1.0 EXECUTIVE SUMMARY

Several species of birds with conservation significance have been recorded in the past from the north Olary Plains in north-east South Australia. Two of the species of conservation significance that are known to occur in this region are the Plains-wanderer (*Pedionomus torquatus*) and the eastern sub-species of the Thick-billed Grasswren (*Amytornis textilis modestus*). It is thought that both species have suffered a severe decline in both their known distributions and population numbers since European settlement. While there been some recent records for both of these species within the region there has been a lack of systematic survey work in an effort to determine distribution, population characteristics, habitat parameters or management considerations.

The aim of this project was to determine the current distributions of both the Plains-wanderer and the eastern sub-species of the Thick-billed Grasswren in the north-east pastoral zone and to attempt to identify habitat preferences and any issues that may be affecting their management in the region. For each species this included a desk-top collation of records from the region using relevant databases combined with surveys to assess numbers and habitat characteristics.

The encounter rate of Plains-wanderer during this survey was much lower than recorded in the more mesic Riverina but slightly higher than the encounter rate in more arid south-western Queensland. The encounter rates recorded during this survey were also substantially lower than those reported by locals familiar with the species - probably due to current climatic conditions in the region. While the areas where Plains-wanderers have been recorded and may occur in the region are currently too sparse and hold relatively low densities of birds, the total area available to the species there is extensive with the number of Plains-wanderers likely to be similar to numbers on a hypothetical Riverina property of a similar size, even during dry periods. In wetter years when grass and other native vegetation recovers, Plains-wanderer numbers are likely to be substantially higher in the north-east pastoral region.

This survey confirmed and extended the known range of the Thick-billed Grasswrens in the north-east pastoral region. Thick-billed Grasswrens were recorded in sufficient numbers during this survey to indicate that the population in this region is probably adequate to maintain long-term viability. The apparently disjointed and clumped distribution of the species in the region evident from this survey cannot be explained by the vegetation assessment conducted here. Much apparently structurally and floristically similar vegetation to that known to support Thick-billed Grasswrens was searched without locating birds. If the species is largely dependent upon a specific habitat type of a particular low open chenopod shrubland then its distribution and abundance in the north-east pastoral region will take the form of a series of small populations in discrete pockets of habitat separated from other small populations by areas of unoccupied habitat. This type of distribution and abundance of populations across the regional landscape would have implications on how the species is managed and conserved compared with if the species can be found to utilise other chenopod shrubland habitat types in the region. The continued presence of this species in the region indicates that it is able to tolerate some level of grazing pressure and habitat alteration given the widespread and historical land use practices in the district combined with feral herbivores.

The results of this survey provide an initial baseline of information on the distribution, abundance and habitat characteristics of these two species of conservation significance in the north-east pastoral region. This information can be used to provide a basis for the conservation and management of both species in the region with a number of recommendations being made for these outcomes.

A considerable amount of location data for other local bird species was also collected during this survey, including for several species of conservation significance.

2.0 INTRODUCTION

A number of species of birds with conservation significance have been recorded from the north Olary Plains in a part of South Australia known as the north-east pastoral region. This area is bounded by the SA/NSW border to the east, the top of Lake Frome to the north, the eastern outliers of the central and northern Flinders Ranges in the west and just south of the Barrier Highway in the south.

Two of the species of conservation significance that are known to occur in this region are the Plains-wanderer (*Pedionomus torquatus*) and the eastern sub-species of the Thick-billed Grasswren (*Amytornis textilis modestus*) (Playfair and Robinson 1997, Black and Baxter 2003, and Rogers 2003). The Plains-wanderer is listed as Vulnerable in South Australia under the *National Parks and Wildlife Act 1972* and as Vulnerable nationally under the *Environment Protection and Biodiversity Conservation Act 1999*, though Garnett and Crowley (2000) recommended that it be reclassified as nationally endangered. The eastern sub-species of the Thick-billed Grasswren is listed as Rare in South Australia and Vulnerable nationally under the national and state legislation mentioned above.

It is thought that both species have suffered a severe decline in both their known distributions and population numbers since European settlement. Garnett and Crowley (2000) consider the decline in distribution and abundance of the eastern sub-species of the Thick-billed Grasswren to have been historical and that both the population and its distribution is now stable. However, they consider that the decline in distribution and abundance of the Plains-wanderer to be of an ongoing concern as the population is small and sparsely spread in specific habitat types that continue to be modified or lost completely due to changing agricultural practices.

While there been some recent records for both of these species within the north-east pastoral region there has been a lack of systematic survey work in an effort to determine distribution, population characteristics, habitat parameters or management considerations.

2.1 The study area

2.1.1 Location and land use

This survey centred on a number of properties on the North Olary plains north of the Barrier Highway approximately 400km north-east of Adelaide and approximately 100km west of Broken Hill (Figure 1).

These properties support several different land-uses. On Plumbago Station, Kalabity Station and the Kalkaroo section of Boolcoomatta Station the land-use is extensive sheep grazing on natural fodder for wool and meat production. This has been the primary land-use type in this region since the country was taken up by large pastoral interests about 150 years ago following European settlement. Bimbowrie Station previously supported a sheep grazing enterprise but was purchased by the SA Department for Environment and Heritage in early 2004 for conservation purposes and has been de-stocked since that time (DEH 2005). The Boolcoomatta section of Boolcoomatta Station previously supported a sheep grazing enterprise but was purchased in early 2006 with funds provided by the Federal Government and Nature Foundation of South Australia. The property has been de-stocked since then and is owned and managed by the Australian Bush Heritage Fund for conservation purposes.

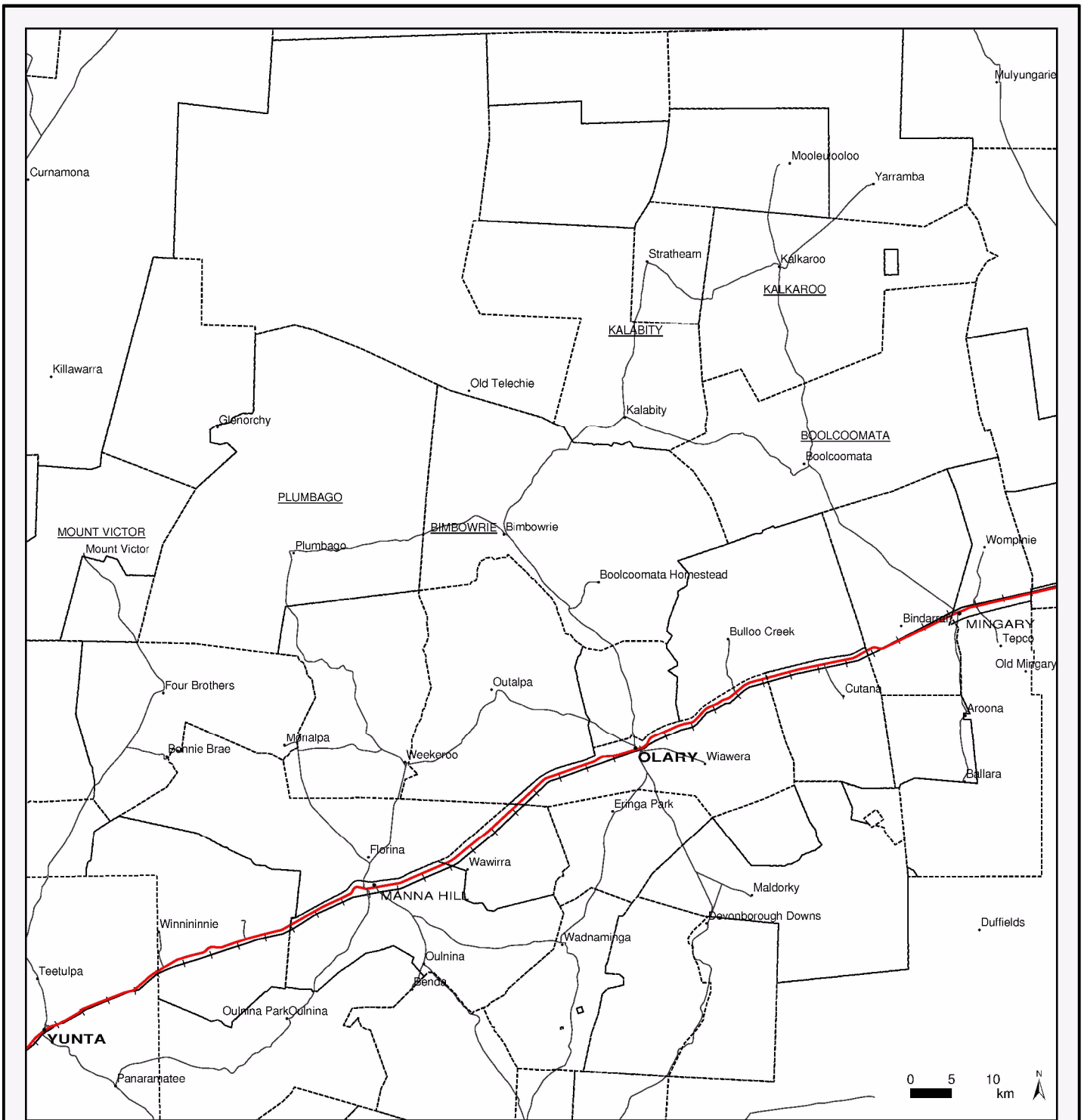


Figure 1: Location of study area in north-east pastoral region

Legend

-  Pastoral Lease
-  Major Road
-  Minor Road
-  Railway
-  Locality

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Data source: Birds records from Keith Bellchambers.
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2.1.2 Vegetation

Playfair and Robinson (1997) provides a thorough description of each vegetation community they found on the North Olary plain region and maps their distributions. The dominant vegetation communities to be found in the region are the various low Chenopod shrub-lands occurring as either communities dominated by single species or as mosaics of several species on the plains and low rises. Smaller areas of grasslands are also found on the plains. Shrub-lands and low woodlands are found on areas of hills and low rises or outwash formations from these areas. Tall woodlands are generally restricted to riparian areas.

Much of the vegetation presently found in the study area is a result of past land-use practices that altered vegetation structure and species composition. While land management is much improved in recent times, Playfair and Robinson (1997) cite Jessup who wrote in 1948 that 'the floristic composition of the pastures has almost certainly been greatly modified by stocking. Areas which are now shrublands of bluebush probably at one time carried other more palatable species. It is impossible to assess the original condition of these pastures. The continued reduction of bluebush by stock grazing causes the appearances of bindyis following winter rain and spear grass following summer rain. Eventually overgrazing results in the complete destruction of the bluebushes. The land loses its protective cover and the rate of soil loss is greatly increased'. Even as far back as 1892 Dixon, (in Playfair and Robinson 1997), was reporting the dramatic alteration of the vegetation composition brought about by livestock grazing in the region.

2.1.3 Climate

The study area has an arid climate with hot, dry summers and mild, dry winters. Rainfall is relatively low and unreliable and usually falls as infrequent heavy rainfall events. Using available climatic data from Yunta, which is the closest Bureau of Meteorology station (approximately 120km south-west), average daily maximum temperatures range from 32.6°C in January to 15.4°C in July. Average daily minimum temperatures range from 15.0°C in January and February to 3.0°C in July. The average annual rainfall is 236mm with a relatively even spread of rain recorded in all months ranging from an average of 22.9mm in May to 15.6mm in March. The average annual rainfall recorded at several other Bureau of Meteorology stations in the region includes 204.5mm at Bimbowrie Station and 257mm at Broken Hill (approximately 100km east). Annual evaporation rates are much higher than average rainfall.

Rainfall records have been kept at Bimbowrie Station for the past 108 years and during that time the average annual rainfall recorded at the site is 204.5mm. During the past 7 years of rainfall data, when the region has been going through what has been considered an extended dry period, the average annual rainfall has been 199.6mm. During this time there has been 1 year of average, 2 years of well below average, and 4 years of above average rainfall recorded there. This indicates that the recent past has been no drier than the average over the past century and that vegetation recovery may not be as limited by total rainfall so much as by other factors such as timing of rainfall and total grazing pressure. The start to the 2006 season has been average in the district with 37mm recorded at Bimbowrie in February and 23mm recorded in April which freshened the country a bit and resulted in some surface water.

2.2 Aims

The aim of this project was to determine the current distribution of the Plains-wanderer and the eastern sub-species of the Thick-billed Grasswren in the north-east pastoral zone and to attempt to identify their habitat preferences and issues affecting their management in the region. The aims of this project were designed with reference to the National Recovery Plan for Plains-wanderers

(Baker-Gabb 2002b) and The Action Plan for Australian Birds (Garnett and Crowley 2000). Both of these documents identify population surveys and critical habitat identification as priorities for these two species.

For each of the two species the project would consist of three basic components:

- a desk-top collation of records from the region using relevant databases,
- a survey to assess bird numbers and habitat characteristics, and
- data analysis, report production and dissemination of information to land managers.

The information collected during this survey for each of the species follows with each species discussed separately.

A number of other bird species were observed during the field survey work and this information is also presented at the end of the report.

3.0 PLAINS-WANDERERS IN THE NORTH-EAST PASTORAL ZONE OF SOUTH AUSTRALIA.

3.1 INTRODUCTION

3.1.1 Status

The Plains-wanderer *Pedionomus torquatus* is listed as vulnerable in Australia (*Environment Protection and Biodiversity Conservation Act 1999*), though Garnett and Crowley (2000) recommended that it be reclassified as nationally endangered. It is listed as endangered in South Australia under the *National Parks and Wildlife Act 1972*.

3.1.2 Distribution and threats

The Plains-wanderer occurs in temperate lowland native grasslands in eastern Australia (Marchant and Higgins 1993). Bennett (1983) and Baker-Gabb (1990) described ten locations where Plains-wanderers were often recorded in the past, but birds are routinely found in only four of these locations nowadays. Widespread cultivation of temperate native grasslands has been the main reason for the demise of all viable populations with the highest densities in the six locations nearest the coast. The species is now mostly recorded from four inland locations: north-eastern South Australia, south-western New South Wales, north-central Victoria and south-western Queensland. Widespread overgrazing during droughts threatens these relatively stable inland populations (Baker-Gabb *et al.* 1990). Other current threats of indeterminate magnitude include predation by Foxes *Vulpes vulpes*, and pesticides used to control locusts (Baker-Gabb 1998). Cultivation of native grasslands is an additional threat to the remaining populations in south-western New South Wales and north-central Victoria.

3.1.3 South Australian records

Over the past 30 years there have been scattered, infrequent records of Plains-wanderers from the Eyre Peninsula and the Riverland, where little suitable habitat remains, and the arid interior where the bird occurs following infrequent seasons with good rainfall (Bennett 1983, Baker-Gabb 1990, Webster 1996). There are also some recent records from the Willochra Plain near Quorn (Webster 1996). However, the bulk of recent South Australian records of Plains-wanderers come from the north-east in an area north of the Barrier Highway and west of Broken Hill, and centered on Boolcoomatta Station and Mulyungarie Stations (Webster 1996, Baker-Gabb 2002a, Rogers 2003). Peter Absolom *pers. comm.* has recorded several hundred Plains-wanderers on Boolcoomatta Station (Boolcoomatta and Kalkaroo pastoral leases) over the past 18 years during his nocturnal work on feral and pest animals, but has seen only a few birds on neighbouring properties such as Kalabity and Mulyungarie Stations. In years with good rainfall, Peter Absolom *pers. comm.* has recorded an estimated 300-400 Plains-wanderers per year on Boolcoomatta, but in the last few years with very low rainfall the number of Plains-wanderers seen there has declined markedly to the point that no birds were seen during the eight months prior to the recent rains in February and April 2006. Since this rain, numbers have begun to recover, with six Plains-wanderers seen in one night in July 2006.

A total of 95 South Australian records for Plains-wanderer were recovered from South Australian Museum, Birds Australia, South Australian Ornithologists Association and DEH Biological Survey databases. These records date back to 1881 and include specimens and sighting observations. Most of these records are from the period 1881 to 1930 and are from the Adelaide Plains, Lower Murray and Mid-north regions of the state. Following this period there are fewer records and the locations

are scattered across the state. This may reflect the complete loss of Plains-wanderer habitat in the more closely settled parts of the state for agricultural purposes. It is likely there are some additional South Australian records of Plains-wanderer in other museum collections. There are also likely to be a number of additional sighting records for Plains-wanderer that are not recorded on either the Birds Australia, South Australian Ornithologists Association or DEH Biological Survey databases, for example, the Absalom records from the north-east pastoral region.

3.2 PURPOSE OF THE SURVEY

Since Boolcoomatta Station was purchased with funds from the Federal Government and the Nature Conservation Foundation of South Australia in 2006 to become a reserve owned and operated by the Australian Bush Heritage Fund, there has been a series of questions posed about Plains-wanderers on the property. These questions include: (a) where is the Plains-wanderer habitat on Boolcoomatta, (b) how much habitat exists there, (c) how suitable is the habitat now and therefore what is the likely population density of Plains-wanderers, (d) what should be done to maintain or enhance the habitat, (e) and what further surveys and monitoring are required?

With only a few days available for survey work on Boolcoomatta Station, these questions could not be answered with any statistical rigour during this study, even though survey and habitat data were collected. Rather, the survey relied to a considerable extent on Peter Absalom's 18 years of nocturnal work on and around Boolcoomatta Station, and David Baker-Gabb's more than 20 years experience in studying and monitoring Plains-wanderers, and conducting surveys in all of the range States (eg Baker-Gabb 1988, 1990, 1998, 2002b, Baker-Gabb *et. al.* 1990, Maher and Baker-Gabb 1993).

3.3 METHODS

Peter Absalom marked on a map of Boolcoomatta Station (Boolcoomatta and Kalkaroo pastoral leases, 116,000 ha) and neighbouring properties areas where he had seen Plains-wanderers over the years. On inspection, his description of the structure of the habitat in these areas tallied closely with that where Plains-wanderers are found elsewhere in the semi-arid and arid zone (Baker-Gabb *et. al.* 1990, NPWS 2002). We traveled around Boolcoomatta Station and marked additional sparsely vegetated tree-less areas onto the map (Figure 2) that had vegetation with a structure that could support Plains-wanderers, particularly once the areas recover from the current drought's impact. The structure of the vegetation at these sites was described with reference to the photographic guide for Plains-wanderer habitat in the Riverina (NPWS 2002). It cannot be overemphasized that it is the structure of the vegetation, rather than the plant species present, that determines whether or not it will be occupied by Plains-wanderers (Baker-Gabb *et. al.* 1990). For example, Plains-wanderers have temporarily occupied fallow cultivated paddocks and even bred in sparse, struggling cereal crops that structurally mimicked the sparse native grasslands that they are usually found in (Marchant and Higgins 1993). The sites where Plains-wanderers were located on Boolcoomatta Station were marked using a GPS unit, and the vegetation sampled along a 50m transect the next day.

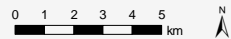
Surveys were conducted for Plains-wanderers over four nights from three slow-moving (less than 5km/hr) vehicles using hand-held search-lights and the vehicles' headlights to locate any birds present. Plains-wanderers are usually disturbed if a vehicle comes within 20m of them, and characteristically respond by walking a short distance or by standing on 'tip-toes' and craning their necks, which allows them to be detected in the sparsely vegetated tree-less plains they inhabit (Harrington *et. al.* 1988, Baker-Gabb *et. al.* 1990). Plains-wanderers, other species of bird, and

Figure 2:
 Distribution of habitat supporting previous observations of Plains-wanderer and areas of potential habitat of Plains-wanderer on Boolcoomata and Kalkaroo.

Legend

- ★ Plains-wanderer sighting - this survey
- ▨ Plains-wanderer sighting areas - Absalom observations
- ▧ Plains-wanderer habitat - this survey
- Spotlight transect route

- ▭ Pastoral Lease
- Major Road
- Minor Road
- Vehicular Track
- Drainage
- Railway
- Homestead
- ▲ Hill



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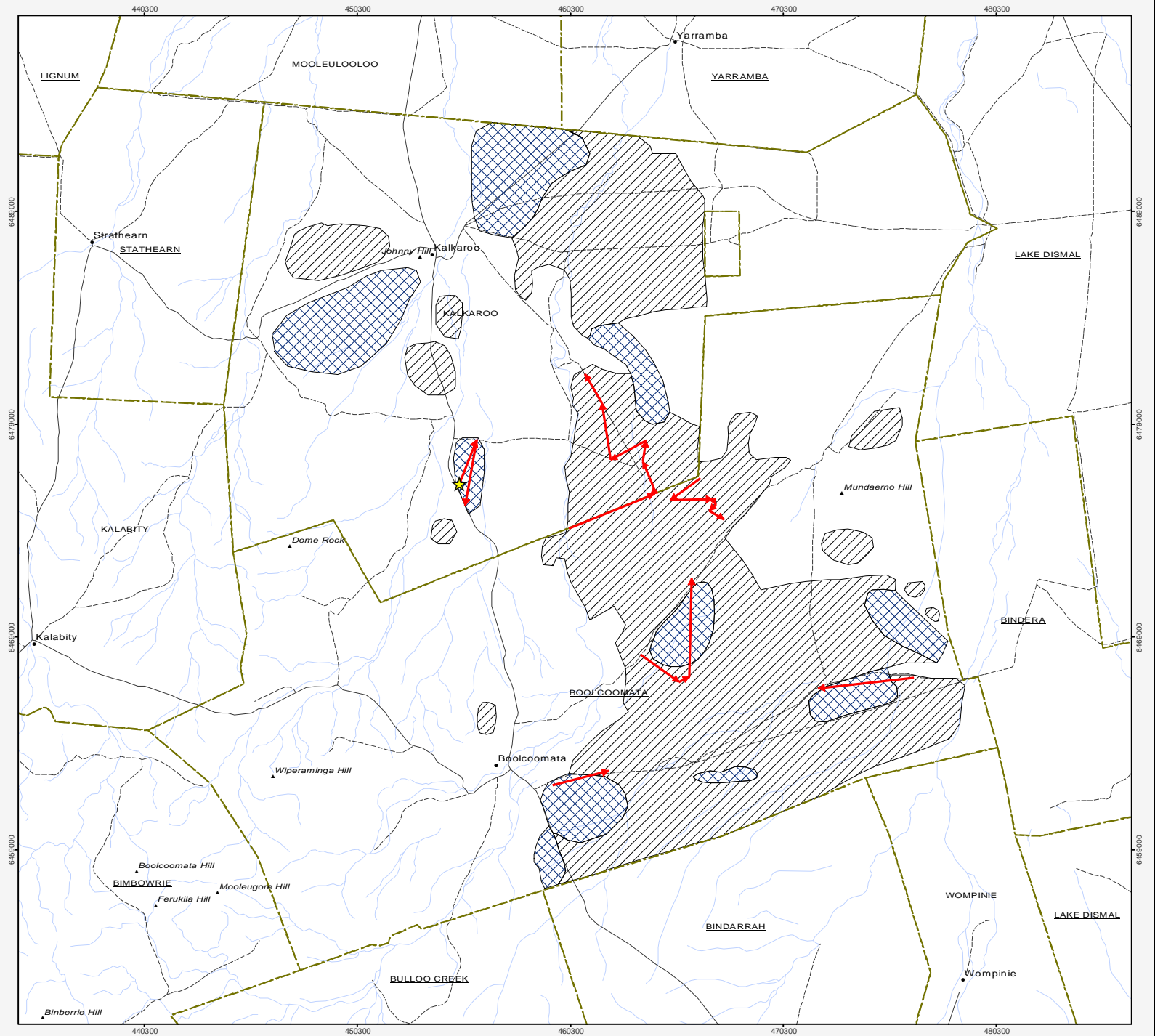
Data source: Birds records from Keith Bellchambers.
 All topographic data supplied by Environmental Information, DEH.
 Projection/Datum: Lambert Conformal Conic / GDA94.
 Compiled: May 2006.

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mammals such as Fat-tailed Dunnarts *Sminthopsis crassicaudata* and Foxes were recorded onto standard survey sheets by the occupants of each vehicle.

3.4 RESULTS

3.4.1 Encounter rates

One male Plains-wanderer was located during 70km of transects. Four other species of bird were recorded, including seven Australian Pipits *Anthus australis*, five Inland Dotterels *Charadrius australis*, four Orange Chats *Epthianura aurifrons*, and two Emus *Dromaius novaehollandiae*. Five Foxes and four Fat-tailed Dunnarts were also seen.

3.4.2 Vegetation mapped

Nearly all of the vegetation in the areas where Peter Absolom had seen Plains-wanderers in previous years was currently “Too Sparse” (NPWS 2002) to be suitable for the birds. Less than 10% of these areas were “Slightly Too Sparse” and none were “Ideal” or “Slightly Too Dense” (NPWS 2002). No area on Boolcoomatta Station nor on the surrounding properties contained vegetation that was “Ideal” in structure for Plains-wanderers. The area where the Plains-wanderer was located on Boolcoomatta Station was classified as “Too Sparse” (NPWS 2002) for the species.

The habitat where the male Plains-wanderer was located during this survey was a very low open chenopod shrub-land less than 25cm in height on heavy red clay soil with surface quartzite gravel. Mapping produced by Playfair and Robinson (1997) supports this classification. The vegetation grew as small patches and around small depressions in the soil. The dominant species were *Sclerolaena tricuspis* (Bindyi), *S. patenticuspis* (Spear-fruit Bindyi), *Atriplex stipitata* (Bitter Saltbush), *A. vesicaria* (Bladder Saltbush) and *Eriochiton sclerolaenoides* (Woolly-fruit Bluebush). Other species at the site were *Euphorbia tannensis ssp. eremophila* (Desert Spurge), *Austrostipa sp* (Spear Grass), *Eragrostis sp* (Love Grass) and *Astrebla pectinata* (Curly Mitchell Grass). The last three species were grazed back to butts.

Measurements from a 100m transect through this habitat indicated that 62% was bare ground, 11% was quartzite gravel (a total of 73% without cover), 9% was vegetation litter (dead Saltbush and Wards Weed), 8% was perennial vegetation and 10% was seedlings (Saltbush and Wards Weed). This indicates that while this site may be currently “Too Sparse” it may improve given the germination of seedlings at the site.

Photographs taken during the site inspection are shown as Plates 1 and 2.

3.5 DISCUSSION

3.5.1 Encounter rates

The encounter rate of one Plains-wanderer in 70 km (1.4/100 km) was much lower than recorded in 1,636 km of surveys in the more mesic Riverina (12.8/100 km), but slightly higher than the encounter rate (1/100 km) from 311 km of surveys in more arid south-western Queensland. The encounter rates for Australian Pipits, the only other species commonly recorded on all three surveys, followed the same trend with 10/100 km at Boolcoomatta, 33/100 km in the Riverina, and 6/100 km in south-western Queensland. Reflecting the same trend in vegetation structure, Inland Dotterels are commonly seen on the very sparse plains at Boolcoomatta and in south-western



Plate 1: Vegetation structure and landscape of site where Plains-wanderer was located during this survey.



Plate 2: Ground cover of site where Plains-wanderer was located during this survey.

Queensland, but only occur in the Riverina following prolonged dry spells or droughts when overgrazing makes the Riverina's native grasslands much sparser than usual. The encounter rates for Plains-wanderers that we recorded at Boolcoomatta Station after several years of prolonged dry spells and drought were substantially lower than those Peter Absalom *pers. comm.* indicated were possible in wetter years.

Plains-wanderers are cryptic species that occur at low densities, making them difficult to find at the best of times (Harrington *et. al.* 1988, Marchant and Higgins 1993). In arid areas such as Boolcoomatta and south-western Queensland, the Plains-wanderer's much lower densities, particularly during prolonged dry periods, coupled with much larger areas of potentially suitable habitat (see below), makes the task of finding birds an order of magnitude harder.

3.5.2 Habitat suitability and population numbers

In the higher rainfall Riverina, most grasslands are too dense for Plains-wanderers, with only 2.3% of 2.8 million hectares mapped by Roberts and Roberts (2001) being "Ideal" for the species. A hypothetical 100,000 ha property in the Riverina comprised mostly of native grasslands would hold about 400 Plains-wanderers, based on known population densities in the Riverina of one pair per 12 ha (Baker-Gabb *et. al.* 1990). However, the conclusion that many more Plains-wanderers would occur on such a 100,000 ha Riverina property than on Boolcoomatta Station might not be correct. While the areas where Plains-wanderers have been recorded and may occur on Boolcoomatta are currently too sparse and hold relatively low densities of birds, the total area available to the species there is much greater, covering about one-third of the property (Figure 2). Hence the number of Plains-wanderers on Boolcoomatta Station (116,000 ha) is likely to be similar to the approximately 400 birds occurring on a hypothetical Riverina property of a similar size, even during dry periods. In wetter years when grass and other native vegetation recovers, Plains-wanderer numbers are likely to be substantially higher on Boolcoomatta Station.

Playfair and Robinson (1997) mapped the area on Kalkaroo where the Plains-wanderer was observed during this survey as a low very open shrubland dominated by *Sclerolaena divaricata* (Tangled Bindyi). Within the study area they mapped extensive areas of this habitat type on Kalkaroo and Boolcoomatta stations as well as on Wompinie and Bindarra stations south and south-east of Boolcoomatta. Playfair and Robinson (1997) thought that this habitat type may indicate severe historical degradation of the original vegetation communities such as *Maireana aphylla* (Cotton-bush) low open shrubland and *Astrebla pectinata* (Barley Mitchell Grass) open grassland where the more palatable species had been depleted by grazing or extended drought conditions. This habitat has low perennial vegetation diversity but may support flushes of annual herbs, forbs and grasses such as *Atriplex holocarpa* (Pop Saltbush), *Calotis hispidula* (Bogan Flea) and *Rhodanthe floribunda* (White Everlasting).

A number of foxes were encountered while conducting spotlight transects on Boolcoomatta and Kalkaroo. The animals were quite fearless, associating the presence of a spotlight-equipped vehicle with kangaroo shooters from which an easy meal of offal might usually be obtained. While predation by foxes of Plains-wanderers is of indeterminate magnitude, fox predation has been demonstrated in a number of other ground-dwelling and ground-nesting species and fox predation has been identified as a key threatening process (Environment Australia 1999, NSW National Parks and Wildlife Service 2001).

3.6 RECOMMENDATIONS

The results of this survey provide an initial baseline of information on the distribution, abundance and habitat characteristics of the Plains-wanderer in the north-east pastoral region. This information will provide a basis for the conservation and management of the species in the region with the following issues to be considered.

Grazing

- Low densities of Sheep *Ovis aries* are used from time to time on Terrick Terick and Oolambeyan National Parks in the Riverina to ensure that the “islands” of native grasslands there with ideal structure do not become too dense for Plains-wanderers following major winter rainfall events. In arid regions such as on Boolcoomatta Station where the potential Plains-wanderer habitat is either too sparse or much too sparse for them and the rainfall is less, grazing by domestic stock would be detrimental now, and is unlikely to be ever needed in the future.

Artificial water points

- Decommissioning artificial water points in the rangelands should be a central biodiversity conservation strategy for reserves (Landsberg *et. al.* 1997). With the removal of all domestic stock from Boolcoomatta Station, artificial water points are no longer needed and their decommissioning would mitigate against an undesirable, excessive build-up of kangaroo (*Macropus* spp.) numbers.

Incidental encounters

- Peter Absolom and others should be assisted to record at least the date of their sightings of Plains-wanderers, their sex and age, and a GPS locality.

Structured surveys

- Additional structured surveys for Plains-wanderers in the areas marked on Figure 2 are desirable to give a clearer picture of relative abundance on Boolcoomatta Station. The forms used routinely in the Riverina and during this survey (Appendix 1) should be used.

Locust spraying

- There is a possibility that some of the insecticides used by the Australian Plague Locust Commission and others to control locusts might also harm Plains-wanderers (Pearce 1971, Story and Cox 2001). Therefore, only the locust-specific fungus marketed as “Green Guard” should be permitted in any locust control operations on Boolcoomatta Station.

Fox control

- Consideration should be given to implementing a 1080 fox control program on Boolcoomatta Station to reduce the impact of fox predation on local wildlife. This program could link in with the current DEH baiting program on the neighbouring proposed Bimbowrie Conservation Park.

4.0 THICK-BILLED GRASSWRENS IN THE NORTH-EAST PASTORAL ZONE OF SOUTH AUSTRALIA

4.1 INTRODUCTION

4.1.1 Status

The Thick-billed Grasswren *Amytornis textilis* is a complex species with three sub-species recognised based on distributional data and plumage characteristics. The three sub-species are *A.t.textilis* (western), *A.t.myall* (Gawler Ranges) and *A.t.modestus* (eastern). Both the Gawler Ranges and eastern sub-species of the Thick-billed Grasswren are listed as Rare in South Australia under the *National Parks and Wildlife Act 1972* and as Vulnerable nationally under the *Environment Protection and Biodiversity Conservation Act 1999*. The western sub-species is considered to be endangered in Western Australia and is also listed as Vulnerable nationally under the *Environment Protection and Biodiversity Conservation Act 1999*.

4.1.2 Distribution and threats

The Thick-billed Grasswren species complex was formerly much more widespread than present where it was recorded from a variety of arid shrub-lands throughout inland Australia. These shrub-lands may have been dominated by chenopod species or have chenopod species as an understorey with taller shrubs dominated by acacia and eucalypt or occasionally be associated with open woodlands (Higgins, Peter and Steele 2001).

The known range of each of the three sub-species has declined since European settlement leading to a significant decline in the distribution of the species as a whole. *A.t.textilis* (western sub-species), which was formerly found from the Nullabour Plain through much of southern arid and semi-arid areas of Western Australia to the coast around Shark Bay, is now extinct over much of its former range and is largely restricted to disjunct populations around Shark Bay (Higgins, Peter and Steele 2001). Garnett and Crowley (2000) estimate that 21,500 birds occupy an area of approximately 1,200km² across an area of about 40,000 km² and that population numbers and distribution is now stable. *A.t.myall* (Gawler Ranges sub-species) is still found in its previously known distribution from the Gawler Ranges and nearby areas in the north of the Eyre Peninsula and on the east coast of Eyre Peninsula at the top of Spencer Gulf (Garnett and Crowley 2000, Black and Baxter 2003). Garnett and Crowley (2000) estimate that 10,000 birds occupy an area of approximately 5,000km² across an area of about 40,000 km² and that population numbers and distribution is stable. *A.t.modestus* (eastern sub-species), which was formerly found from north-west New South Wales through the basins of Lakes Frome, Eyre and Torrens in central South Australia to MacDonnell Ranges in southern Northern Territory, is now thought to be extinct in NSW and the northern extent of its distribution is now thought to be close to the SA/NT border with the core of its current distribution now being in the lake basins in central SA (Garnett and Crowley 2000, Higgins, Peter and Steele 2001, Black and Baxter 2003). Garnett and Crowley (2000) estimate that 20,000 birds occupy an area of approximately 10,000km² across an area of about 40,000 km² and that population numbers and distribution is now stable.

The major reason for the decline in the species, particularly in the western and eastern sub-species, appears to have been the widespread loss or severe alteration of the chenopod shrub-land habitat it prefers due to excessive over-grazing by livestock combined with drought conditions in parts of the late 19th and early 20th centuries. In many areas this was followed by an increase in the numbers of rabbits and goats preventing the chenopod shrub-lands from recovering from the initial grazing pressure or to recruit seedlings into the population (Higgins, Peter and Steele 2001, Black and

Baxter 2003). While now much reduced, the threat of ongoing loss and alteration of chenopod shrub-land habitat in general, and some species in particular, continues with livestock, goats and rabbits grazing on adult bushes and reducing their vigour while also preventing the recruitment of seedlings into the population structure to replace senescing adults. The primary land-use type found in the current range of the species is broad-scale extensive livestock grazing and the apparent stability of distribution and abundance in all sub-species (Garnett and Crowley 2000) may indicate that some level of grazing is tolerable.

In common with many other small bird species that feed on or near the ground and nest near the ground it is probable that introduced predators have some impact on numbers, particularly where the chenopod shrub-land habitat is marginal. The loss of the western sub-species from off-shore islands has been blamed on the introduction of cats but these islands were also heavily grazed by livestock, which may have been of greater significance (Garnett and Crowley 2000). Carpenter and Bellchambers (2003) determined that the Short-tailed Grasswren *Amytornis merrotsyi* in the *Triodia* hummock grasslands of the Flinders Ranges was more common in areas that had predator (fox) control programs compared to those with limited or no predator control programs. This work also showed that Short-tailed Grasswren was able to occupy habitat with lower *Triodia* cover in fox baited areas compared with unbaited areas where they were only found in areas with greater *Triodia* cover.

4.1.3 South Australian records

A total of 380 South Australian records for Thick-billed Grasswren were recovered from South Australian Museum, Birds Australia, South Australian Ornithologists Association and DEH Biological Survey databases. These records date back to 1896 and include both specimens and sighting observations. There may be some additional South Australian records of Thick-billed Grasswren in other museum collections and there are also likely to be a number of additional sighting records for Thick-billed Grasswren that are not recorded on either the Birds Australia, South Australian Ornithologists Association or DEH Biological Survey databases.

The information that has been collated during the database searches includes records for all three sub-species of Thick-billed Grasswren. *A.t.textilis* (western sub-species) is considered to have become extinct in South Australia some time ago (Garnett and Crowley 2000, Higgins, Peter and Steele 2001, Black and Baxter 2003) so the more recent observations attributed to this sub-species may have been misidentified. Records of *A.t.myall* (Gawler Ranges sub-species) are from throughout its previously known distribution and it is thought that the population numbers and distribution are stable (Garnett and Crowley 2000). The majority of the Thick-billed Grasswren records collated during the database searches are for *A.t.modestus* (eastern sub-species) with most of these records concentrated in the chenopod shrub-lands located in the basins of Lakes Frome, Eyre and Torrens in central South Australia indicating that these areas form the species' stronghold in the state.

Until the mid 1970's, the presence of *A.t.modestus* in the chenopod shrub-lands south and east of Lake Frome was unknown as was whether there might have been a continuous distribution from the core area in central South Australia to the formerly known population found in north-west New South Wales. Between 1975 and 1979 several observations were made of small numbers of Thick-billed Grasswren at widely dispersed locations south of Lake Frome on Curnamona Station and north of Yunta on Plumbago Station. These observations extended the distribution of the species to the south and east towards the NSW/SA border. Additional observations of the species from the north-east pastoral district were obtained between 1996 and 2001 from Bimbowrie, Plumbago, Mt. Victor and Kalkaroo Stations that confirmed the species presence in the district and further extended the distribution of the species to the east (Black and Baxter 2003).

4.2 PURPOSE OF THE SURVEY

The Thick-billed Grasswren is relatively common in the chenopod shrub-lands located in the basins of Lakes Frome, Eyre and Torrens in central South Australia but only a small number of observations of the species have been made on the eastern extent of its known range and there has been little systematic searching for the species in this part of its range to improve our knowledge of its distribution, abundance and habitat requirements.

A systematic search can be used to determine the current distribution of the eastern sub-species of the Thick-billed Grasswren in part of the north-east pastoral zone and to attempt to identify characters that determine habitat preferences and suitability there while identifying any issues affecting their conservation and management in the region. The major parameters to consider when collecting baseline information for such a relatively unknown species are what are the habitat characteristics, where is the habitat located and the extent of that habitat, how suitable is the habitat and what population density it may support, what and how much management is needed to maintain or improve the available habitat and what other on-ground works are required to manage the species into the future.

4.3 METHODS

Records for Thick-billed Grasswren from the region using relevant databases and published literature sources were collated to provide location data and some historical perspective to the records. The locations identified in Black and Baxter (2003) were re-assessed during this survey to determine if Grasswrens still occurred there and what habitat characteristics could be measured. These location data were combined with vegetation mapping from DEH databases (Playfair and Robinson 1997) to provide additional search sites in the district. The properties on which site assessments were conducted were the proposed Bimbowrie Conservation Park (Bimbowrie) and Plumbago, Kalabity, Boolcoomatta and Kalkaroo Stations.

Property access tracks were used to traverse the surveyed properties and enabled access to a range of potential habitat areas identified by the literature and mapping. Once a suitable area was located it was searched on foot in an effort to determine if Thick-billed Grasswrens were present. Thick-billed Grasswrens are difficult to detect as they are a very cryptic species spending most of their time on the ground in and among shrubs, flit away quickly and quietly once disturbed and are not generally very vocal.

If Thick-billed Grasswrens were located at a site the number of birds in the group was counted, their activity briefly described and the habitat at the site assessed and recorded. Little effort was made to follow birds as it was difficult to remain close enough to maintain contact with the birds to make meaningful observations and yet not so close as to not continue flushing them away from the observer. To maximise the area covered in this initial survey, it was felt that time spent searching additional potential habitat in an effort to locate more birds was more valuable than detailed behavioural observations at a particular site.

If Thick-billed Grasswrens were located in an area of habitat searching continued until either more birds were located, or, no more birds were located, or, the habitat altered. During this initial survey habitat assessments were not conducted in areas where Thick-billed Grasswrens were not detected.

The habitat characteristics that were assessed at sites where Thick-billed Grasswrens were located were amount of bare ground, amount of ground litter cover, vegetation cover, vegetation structure and species composition. These characteristics were determined at 1m intervals along a 100m tape

measure that was run out where the birds were located. Soil surface substrate, land-use type and grazing impacts in the general area were also assessed.

All sites that were searched, regardless of whether Thick-billed Grasswrens were located or not, were located with a GPS (WGS 84) for mapping purposes and future reference. Site photographs were also taken.

4.4 RESULTS

4.4.1 Encounter rates

A total of 65 sites were searched over 6 days in the survey area. Thick-billed Grasswrens were confirmed at 20 of these sites and there were 2 additional unconfirmed sites. Table 1 provides a breakdown of the number of searches conducted on each property and a brief summary of each survey site is included as Appendix 2. The locations where Thick-billed Grasswrens were recorded during this survey and locations of Thick-billed Grasswrens reported by Black and Baxter (2003) are shown in Figure 3.

The data shown in Figure 3 and Table 1 indicate that while 50% of the total number of survey sites were located on Bimbowrie, 80% of the sites where Thick-billed Grasswrens were recorded during this survey were on Bimbowrie. These sites were concentrated in several patches of suitable habitat in the north of the property adjacent to the Kalabity Station boundary.

Table 1: Number of sites searched for Thick-billed Grasswrens per property in survey area.

Property Name	No. sites searched	No. sites recorded
Bimbowrie Cons. Reserve	32	16
Plumbago Station	15	0
Boolcoomatta Station	7	1 *
Kalabity Station	11	4(+1*)
Total	65	20 + 2*

* unconfirmed observation

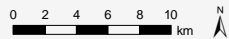
Group sizes when encountered ranged from 1-4 birds with the most commonly observed group size being 2 birds. Two groups consisted of 3 birds and one group consisted of 4 birds. The age and sex of birds in these groups was not determined. In habitat patches where more than 1 group was recorded the closest that a group was to its nearest known neighbour was 250m and the furthest was over 500m.

Most of the locations in the district where Thick-billed Grasswrens were reported by Black and Baxter (2003) were re-visited during this survey. This information is summarised in Table 2.

Figure 3: Thick-billed Grasswren records from the study area

Legend

- Thick-billed Grasswren sightings - May 2006
- Thick-billed Grasswren sightings - Black & Baxter 2003
- Bimbowrie Station DCDB (future legal park boundary)
- Pastoral Lease
- Major Road
- Minor Road
- - - Vehicular Track
- Drainage
- Railway
- Locality
- ▲ Hill



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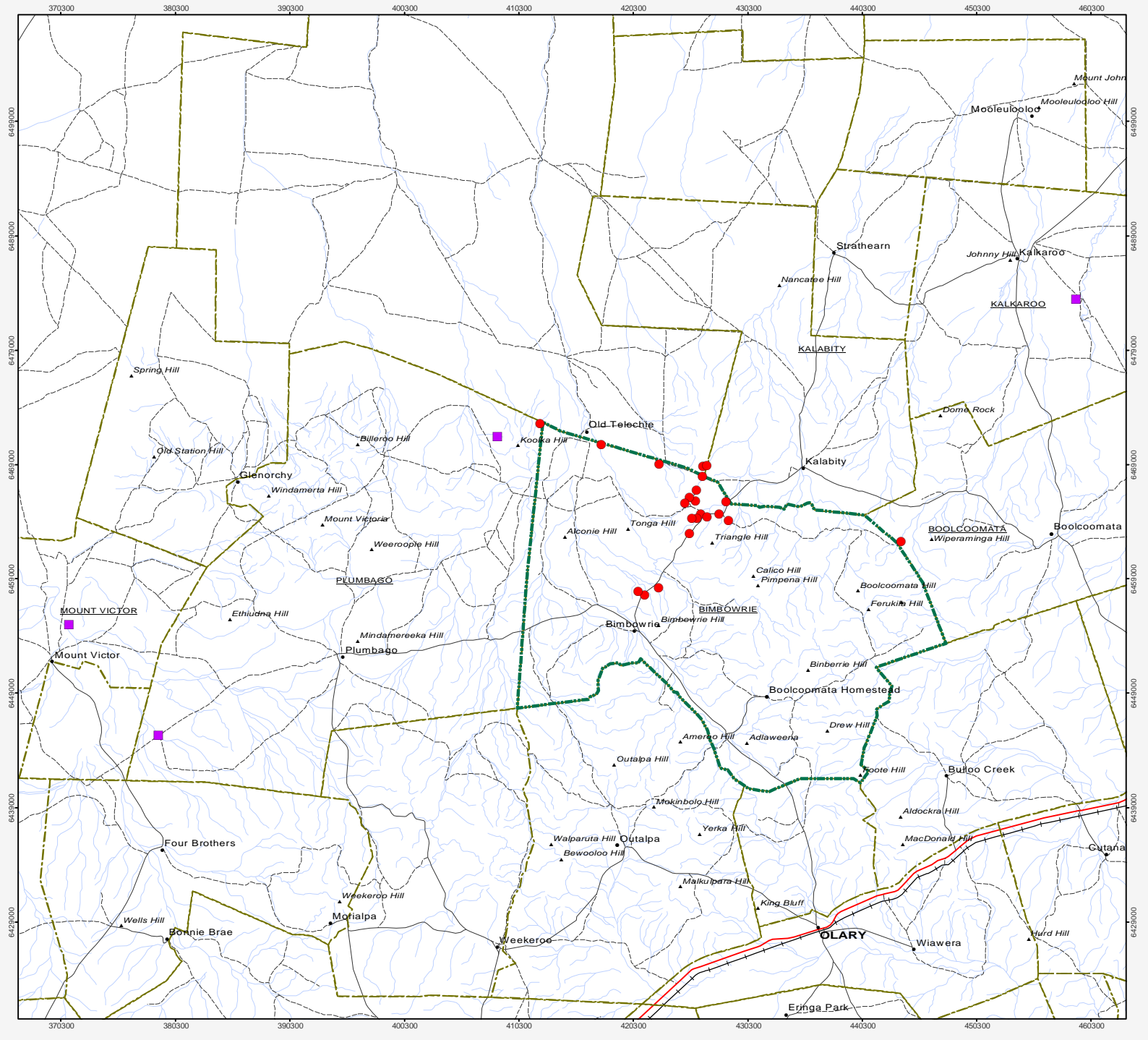


Table 2: Current status of regional Thick-billed Grasswren sites reported in Black and Baxter (2003).

Year	Source	Location	Habitat	Status this survey
1977	Gloster <i>pers.comm.</i>	Gums Well, Plumbago St.	Chenopod and Lignum shrubland in swampy area	No birds located
1976, 1979	Gloster <i>pers.comm.</i>	Vicinity of Koolka Hill, Plumbago St.	Low open chenopod shrubland	No birds located
1996	Baxter	Near Triangle Hill, Bimbowrie St.	Chenopod shrubland	Birds relocated in general area
1999	Baxter	Vicinity of Koolka Hill, Plumbago St.	Low open chenopod shrubland	No birds located
1999	Baxter	Near Poodla Dam, Bimbowrie St.	Low open chenopod shrubland	Birds relocated in general area
2001	Black	Oonatra Ck, Kalkaroo St	Chenopod and Acacia shrubland	No birds located
2001	Black	Near homestead, Mt Victor St.	Chenopod shrubland	Status unknown, site not surveyed

4.4.2 Habitat characteristics

Habitat characteristics measured at most of the 20 sites (and 2 unconfirmed sites) where Thick-billed Grasswren were recorded during this survey are shown in Appendix 3 and are summarised in Table 3.

Sites where Thick-billed Grasswren were recorded during this survey were dominated by *Maireana pyramidata* (Blackbush) low open shrubland with other chenopod species being sub-dominant. A list of plant species recorded at these sites is included in Appendix 4. These sites had from 20-70% bare ground (bare ground plus stone) and 30-80% vegetation (live vegetation plus litter). Stone consisted of quartzite pebbles and was observed at or close to all sites even if not actually recorded there during site assessments. Most litter measured during the site assessments was dead Saltbush that provided some ground cover and would have some habitat value when combined with the live vegetation. The vegetation structure recorded at most of these sites was less than 75cm tall. Too few observations were made on Kalabity to make meaningful comparisons with the Bimbowrie sites.

Plates 3-8 show examples of the vegetation structure found at a number of sites where Thick-billed Grasswren were recorded during this survey.

Table 3: Summary of habitat characteristics (percent cover) at surveyed sites (see Appendix 3 for height class categories).

Site Code	Bare (%)	Litter (%)	Stone (%)	Total (%)	HC1 (%)	HC2 (%)	HC3 (%)	HC4 (%)	HC5 (%)	Total (%)
Bim 1										
Bim 2	61	10.5	1.5	73	5	15	6	1	0	27
Bim 3	63	9	0	72	11.5	10.5	4	2	0	28
Bim 4	52	2	4	58	12	22	6	2	0	42
Bim 5										
Bim 6	20	8	0	28	4	24	14	22	8	72
Bim 7	61	13	1	75	10	11	4	0	0	25
Bim 8										
Bim 9	50	5	14	69	21	4	4	2	0	31
Bim10	61	8	8	77	10	12	1	0	0	23
Bim11	64	8	6	78	10	6	3	3	0	22
Bim12	66	4	0	70	10	8	7	5	0	30
Bim13	60	13	0	73	5	10	11	1	0	27
Bim14	50	10	0	60	4	5	18	8	5	40
Bim15	62	4	5	71	13	10	5	1	0	29
Bim16	58	6	0	64	0	6	23	6	1	36
Bim Avg	56	7.7	3	66.8	8.9	11	8.2	4.1	1.1	33.2
Bool 1										
Kal 1	61	8	10	79	9	8	2	2	0	21
Kal 2										
Kal 3										
Kal 4										
Kal 5	55	5	7	67	15	9	9	0	0	33
Kal Avg	58	6.5	8.5	73	12	8.5	5.5	1	0	27



Plate 3: Vegetation structure found at Site BIM 2 where Thick-billed Grasswrens were recorded during this survey.



Plate 4: Vegetation structure found at Site BIM 5 where Thick-billed Grasswrens were recorded during this survey.



Plate 5: Vegetation structure found at Site BIM 6 where Thick-billed Grasswrens were recorded during this survey.



Plate 6: Vegetation structure found at Site BIM 14 where Thick-billed Grasswrens were recorded during this survey.



Plate 7: Vegetation structure found at Site BIM 15 where Thick-billed Grasswrens were recorded during this survey.



Plate 8: Vegetation structure found at Site KAL 1 where Thick-billed Grasswrens were recorded during this survey.

4.5 DISCUSSION

4.5.1 Encounter rates

The majority of observations of Thick-billed Grasswren during this survey were made on Bimbowrie and these, combined with observations on pastoral properties nearby, have confirmed and extended the known range of the species in the north-east pastoral region. Thick-billed Grasswrens were recorded in sufficient numbers during this survey to indicate that the population in this region is probably adequate to maintain long-term viability. It is of some concern though that most records were from one paddock on Bimbowrie and adjacent to it just through the Kalabity boundary fence. This makes the majority of the known population susceptible to a single catastrophic event such as fire, disease, gross habitat alteration or predation. The currently known distribution in the region may be a natural phenomena resulting from a specific habitat requirement or it may be an artificial phenomena resulting from insufficient survey work.

Also of concern is that while Thick-billed Grasswrens could still be located in the same general area at the 2 sites on the old Bimbowrie Station (now Bimbowrie Conservation Reserve) reported by Black and Baxter (2003) they could not be found from searches in the general area of the other sites they reported from neighbouring pastoral properties. The species is very secretive most of the year so it may be that they remain in these areas but we could not detect them during our survey. The fact that the source of some Black and Baxter (2003) records were working on Plumbago Station for more than 10 years and were skilled bird observers and yet recorded only 4 sightings in that time may indicate that the birds were always in low numbers there.

The species is thought to be sedentary, occupying home ranges of 4-5ha throughout the year with minimal dispersal (Higgins, Peter and Steele (2001). Schodde in Higgins, Peter and Steele (2001) suggests that breeding pairs stay in the same 4-5ha patch of vegetation throughout the year and that other neighbouring pairs occupy territories within discrete pockets of habitat that may be separated from other pockets of occupied habitat by extensive areas of unoccupied but apparently suitable habitat. This scattered pattern of habitat use seemed to be evident during this survey with a number of groups being located relatively close to each other in an area and then no other groups being located in nearby areas that appeared to be similar to occupied habitat.

4.5.2 Habitat characteristics and suitability

The apparently disjointed and clumped distribution of the species in the region evident from this survey cannot be explained by the vegetation assessment conducted here. Much apparently structurally and floristically similar vegetation to that known to support Thick-billed Grasswrens was searched without locating birds.

Playfair and Robinson (1997) mapped the area around the Bimbowrie and Kalabity boundary where most of the Thick-billed Grasswrens were located in this survey as *Maireana pyramidata* (Blackbush) low open shrubland. This community is generally found in drainage depressions and low lying areas in the region and is often thought to be an indicator of preferential grazing by livestock because other more palatable perennial species are only found at low densities within this community having largely been selectively grazed out. In terms of a pure vegetation community it is only found in relatively confined areas on the northern boundary of Bimbowrie and the south-west and west of Kalabity, however, there are extensive areas on Plumbago where this vegetation community is found with *Senna/Eremophila/Rhagodia spinescens* (Spiny Saltbush) open shrubland as mapped by Playfair and Robinson (1997). No Thick-billed Grasswrens were located in this area during this survey. While no Thick-billed Grasswrens were located during this survey away from *M. pyramidata* low open shrubland, Playfair and Robinson (1997) mapped extensive areas of other

types of chenopod shrublands in the north-east pastoral region and the observations reported by Black and Baxter (2003) from Plumbago were from areas of *Atriplex vesicaria* (Bladder Saltbush)/*Maireana astrotricha* (Low Bluebush) low open shrubland.

If the species is largely dependent upon, and is restricted to, *M. pyramidata* low open shrubland then its distribution and abundance in the north-east pastoral region will take the form of a series of small populations in discrete pockets of habitat separated from other small populations by areas of unoccupied habitat. This type of distribution and abundance of populations across the regional landscape would have implications on how the species is managed and conserved compared with if the species can be found to utilise other chenopod shrubland habitat types in the region.

The continued presence of this species in the region indicates that it is able to tolerate some level of grazing pressure and habitat alteration given the widespread and historical land use practices in the district combined with feral herbivores, however this is not a clear-cut relationship. There is no real idea of where the native vegetation started from before the effects of livestock, goat and rabbit grazing produced what we observe today and what changes – positive, negative or neutral - have occurred in the distribution and abundance of the Thick-billed Grasswrens due to those changes.

The observations from Plumbago Station in the mid to late 1970's were made before the introduction of more conservative stocking rates and the intensive effort to eradicate feral goats on property (Wilson *pers.comm.*) both of which should have benefited the vegetation (and presumably the birds). These observations were also made before stock water was piped to the area around Koolka Hill (Wilson *pers.comm.*) resulting in increased grazing impact on the chenopod shrubland vegetation in a piosphere around the water-point and may have affected the suitability of the habitat for Thick-billed Grasswrens. The records from Kalabity Station during this survey were either from areas on the Bimbowrie boundary fence adjacent to much better vegetated areas on Bimbowrie or in a small well vegetated paddock that had much less grazing pressure than surrounding paddocks because of its size, lack of water and good fencing. The continued presence of the species on Bimbowrie, primarily in one paddock, may be because when the property was operating as Bimbowrie Station these areas were relatively remote from artificial water-points or that livestock did not utilise these areas because the perennial vegetation there was largely unpalatable.

The effect of releasing Bimbowrie (and Boolcoomatta) from livestock grazing pressure, combined with the intensive feral goat control program now in place, should benefit the perennial vegetation by greater productivity, increased cover and improved recruitment and survival of seedlings. Such changes in the perennial vegetation would be expected to improve habitat for Thick-billed Grasswrens but the actual effects and timeframe for such responses are not certain and are dependent on good seasonal conditions. For example, *M. pyramidata* is a known “increaser” species as it is not palatable to stock compared with most other chenopods and it is not known if it will respond to a lack of grazing by colonising additional areas or by being gradually out-competed by other chenopods released from grazing pressure. Either response may have an impact on Thick-billed Grasswren distribution and abundance in the district.

The recruitment of perennial vegetation is also affected by rabbit grazing – particularly of seedlings. Rabbits are patchily distributed throughout the survey area and were observed near some sites where Thick-billed Grasswrens were recorded.

Bimbowrie and Plumbago Station both have an intensive property-wide 1080 fox baiting program to help in the recovery of the local population of Yellow-footed Rock-wallaby (*Petrogale xanthopus*). This program should also be benefiting many other species in the district including Thick-billed Grasswrens given the results of such programs on similar species elsewhere (Carpenter and Bellchambers (2003)).

4.6 RECOMMENDATIONS

The results of this survey provide an initial baseline of information on the distribution, abundance and habitat characteristics of the Thick-billed Grasswren in the north-east pastoral region. This information will provide a basis for the conservation and management of the species in the region with the following issues to be considered.

Management of Total Grazing Pressure.

- The de-stocking of both Bimbowrie Conservation Reserve and Boolcoomatta Station removes the primary grazing impact from these 2 properties and provides an opportunity for the habitat to recover somewhat. It also provides an opportunity to monitor the habitat recovery and whether this has any benefit to the local fauna.
- Additional grazing pressure can be removed from these 2 properties plus neighbouring pastoral properties by continuing with the integrated goat control program operated by DEH as part of the Bounceback program in the Olary Ranges.
- Consideration should be given to adopting a rabbit control program, if not on a broad scale at least strategically on Bimbowrie Conservation Reserve and Boolcoomatta Station around known populations of Thick-billed Grasswren.
- Consideration should be given to encouraging Kalabity Station to manage the portion of the property identified as Thick-billed Grasswren habitat for conservation purposes rather than grazing purposes.

Artificial water points.

- Decommissioning artificial water points in the rangelands should be a central biodiversity conservation strategy for reserves (Landsberg *et. al.* 1997). With the removal of all domestic stock from Bimbowrie Conservation Reserve and Boolcoomatta Station, artificial water points are no longer needed and their decommissioning would mitigate an undesirable, excessive build-up of kangaroo (*Macropus* spp.) numbers.

Predator control.

- The current 1080 fox-baiting program in operation on Plumbago Station and Bimbowrie Conservation Reserve should be maintained and consideration should be given to extending the fox-baiting program to Boolcoomatta Station to reduce the impact of fox predation on local wildlife.
- Consideration should be given to extending the regional predator control program to include shooting programs for foxes and cats.

Structured surveys.

- Additional structured surveys for Thick-billed Grasswrens in the region are desirable to give a clearer picture of its' distribution and abundance, connectedness to other known populations in the Lake Frome area, habitat preferences and to identify management issues that may be present. (These surveys should also include searches for Slender-billed Thornbill, see Section 5.0).
- Consideration should be given to undertaking a population monitoring program for those areas identified in this survey, particularly on Bimbowrie Conservation Reserve, as the species may be a sensitive indicator of habitat management practices.

Taxonomic status

- There is some debate regarding the genetic and morphological differences in the Thick-billed Grasswren species complex regarding the number of species and sub-species involved. Reasonable numbers of birds were encountered on Bimbowrie Conservation Reserve to enable consideration being given to catching birds to assist in solving this issue.

5.0 OPPORTUNE OBSERVATIONS

A number of other bird species were observed as this survey was being conducted. These observations are included as Appendix 5. All observations have been forwarded to Birds Australia Atlas database and to DEH Opportune database. Observations made on Boolcoomatta Station have been forwarded direct to Australian Bush Heritage.

Apart from Thick-billed Grasswren and Plains-wanderer an additional three bird species with conservation significance were recorded during this survey. National conservation ratings are listed in *Environment Protection and Biodiversity Conservation Act 1999* while state conservation ratings are listed in *National Parks and Wildlife Act 1972*.

- Blue-billed Duck (*Oxyura australis*) rated as Rare in South Australia. A single bird was recorded on a small dam near the Barrier Highway. This is a nomadic species with individuals dispersing away from the preferred habitat of deep wetlands in the eastern states.
- Redthroat (*Pyrholaemus brunneus*) rated as Rare in South Australia. A number of records of this species were obtained from throughout the study area. This species is found in arid and semi-arid chenopod dominated shrublands. The range and population density of the species have declined due to habitat loss and habitat degradation due primarily to clearance and grazing (Garnett and Crowley 2000). The results of this survey show that the distribution and abundance of the species in the north-east pastoral region would appear to make the population relatively secure there and it should benefit from the de-stocking of Bimbowrie Conservation Reserve and Boolcoomatta Station.
- Slender-billed Thornbill (*Acanthiza iredalei*) rated as Vulnerable nationally and in South Australia. Several records of pairs and small flocks from boundary of Bimbowrie Conservation Reserve and Boolcoomatta Station. This species is found in arid and semi-arid chenopod dominated shrublands. The range and population density of the species have declined due to habitat loss and habitat degradation due primarily to clearance and grazing (Garnett and Crowley 2000). There are a number of sub-populations within the known distribution with no records from this eastern sub-population for a number of years until this survey. The results of this survey show that the distribution and abundance of the species in the north-east pastoral region would appear to indicate a very small and restricted population. It is possible that the local population will benefit from the de-stocking of Bimbowrie Conservation Reserve and Boolcoomatta Station but further survey work is needed to improve knowledge of local sub-population.

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7.0 APPENDICES

Appendix 1:Plains-wanderer monitoring datasheet.

PLAINS-WANDERER MONITORING DATASHEET

Observer's name:

Number of Observer's:

Site Details

Property:

Location:

Date/Time

Day Month Year

Start time

Finish time

1 = Summer time
2 = Winter time

Run

Distance

Start odometer

End odometer

Total distance (km)

Weather

Temperature

1 Cold < 15° 2 Mild 15-25° 3 Warm > 25°

Rain

1 None 2 Mist 3 Showers

Wind

1 Calm 2 Light

Cloud

1 No cloud 2 Traces 3 50% cloud 4 Overcast

Moon

1 No moon 2 Quarter 3 Half 4 Full

Plains-wanderer Observation Details

No.	Sex	Age	AMG Reference		Habitat Structure
			Easting	Northing	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Transect: A - Z **Sex:** M (male) F (female) **Age:** A (adult) J (juvenile) C (chick)

Habitat Structure: Refer to "Plains-wanderer Habitat Management Guide" for structure levels

1 too sparse 2 slightly too sparse 3 ideal 4 slightly too dense 5 much too dense

SPECIES	TOTAL	TALLY SCORES	SPECIES	TOTAL	TALLY SCORES
Plains-wanderer			Richard's Pipit		
Stubble Quail			Rufous Songlark		
Little Button-quail			Brown Songlark		
Inland Dotterel					
Banded Lapwing			Fat-tailed Dunnart		
			Fox		
Total species					

Details to record on the back of this sheet

1. Other species observed and interesting behavioural observations

Appendix 2: Thick-billed Grasswren survey sites summary information.

Property Name	Location data	TBGW observed	Habitat description and comments
Bimbowrie Cons. Reserve	425232E 6463010N (BIM 1)	2	Low open chenopod shrubland on stony rise, taller shrubs in gutter
	426195E 6464704N (BIM 2)	2	Low chenopod shrubland, loamy soil with stony patches
	425861E 6464294N (BIM 3)	2	Taller chenopod shrubland with many dead bushes, loamy soil
	425430E 6464330N (BIM 4)	1	Narrow band of low chenopod shrubland along drainage gutter
	427873E 6465111N	No	Tall dense chenopod shrubland, loamy soil
	425740E 6465840N (BIM 5)	1	Low sparse chenopod shrubland, grassy understorey, along drainage gutter
	425835E 6466793N (BIM 6)	2	Tall dense shrubland in ponded drainage area above dam
	425220E 6466180N (BIM 7)	1	Medium chenopod shrubland, clay/loam soil with stony patches
	424800E 6465625N (BIM 8)	1	Medium chenopod shrubland, clay/loam soil with stony patches
	424073E 6464893N	No	Medium chenopod shrubland, grassy understorey, clay/loam soil
	425180E 6465340N	No	Low sparse chenopod shrubland on stony rise
	410872E 6454261N	No	Medium chenopod shrubland, grassy understorey, clay/loam soil
	420730E 6457930N (BIM 9)	1	Low open chenopod shrubland, loamy soil with stony patches, TBGW previously recorded in area
	436354E 6462647N	No	Medium chenopod shrubland, clay/loam soil
	441995E 6462612N	No	Medium chenopod shrubland, clay/loam soil
	432475E 6464680N	No	Medium chenopod shrubland, clay/loam soil, heavily grazed in past
	429654E 6464196N	No	Medium chenopod shrubland, clay/loam soil
	426772E 6464482N (BIM 10)	2	Medium chenopod shrubland, clay/loam soil with stony patches
	426472E 6463438N	No	Medium chenopod shrubland, clay/loam soil with stony patches
	427810E 6464670N (BIM 11)	3	Medium chenopod shrubland, clay/loam soil with stony patches
428620E 6464140N (BIM 12)	2	Medium chenopod shrubland, clay/loam soil with stony patches	
441450E 6463620N	No	Medium chenopod shrubland, clay/loam soil with stony patches	
424945E 6468031N	No	Low chenopod shrubland, clay/loamy soil with stony patches	
422565E 6469065N (BIM 13)	3	Medium chenopod shrubland, clay/loamy soil, drainage depression	
413050E 6471250N	No	Low open chenopod shrubland, loamy soil with stony patches	
428741E 6465392N	No	Medium chenopod shrubland, clay/loam soil with stony patches	
428432E 6465783N (BIM 14)	4	Tall dense chenopod shrubland, loamy soil, drainage depression	
420962E 6458511N	No	Low open chenopod shrubland, clay/loam soil with stony patches	
421851E 6457547N	No	Medium chenopod shrubland, clay/loam soil with stony patches	
421298E 6457593N (BIM 15)	1	Low open chenopod shrubland, clay/loam soil with stony patches	
421187E 6458652N	No	Medium chenopod shrubland, grassy understorey, sandy loam soil	
422513E 6458274N (BIM 16)	1	Tall dense chenopod shrubland, loamy soil, drainage depression	
Plumbago Station	407600E 6454650N	No	Low chenopod shrubland, patches of Black Oak nearby, loamy soil
	408601E 6458403N	No	Medium chenopod shrubland, clay/loam soil, 500m to water-point
	408409E 6458403N	No	Low open chenopod shrubland, loamy soil with stony patches, TBGW previously recorded in area
	405880E 6474211N	No	Tall dense shrubland in ponded drainage area above dam
	408881E 6464537N	No	Low open chenopod shrubland, clay/loam soil with stony patches
	407514E 6461924N	No	Low open chenopod shrubland, clay/loam soil with stony patches
	406855E 6460428N	No	Low open chenopod shrubland, clay/loam soil with stony patches

Property Name	Location data	TBGW observed	Habitat description and comments
Plumbago Station	391387E 6448197N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
	390875E 6446897N	No	Medium chenopod shrubland, clay/loamy soil with stony patches
	389269E 6444917N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
	387936E 6445066N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
	378781E 6445358N	No	Tall dense chenopod shrubland, loamy soil, along drainage channel, TBGW previously recorded in area
	379699E 6445768N	No	Low open chenopod shrubland, clay/loam soil with stony patches
	383837E 6447893N	No	Medium chenopod shrubland, clay/loam soil with stony patches
	405190E 6452890N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
Boolcoomatta Station	442356E 6463660N	No	Medium chenopod shrubland, clay/loam soil with stony patches
	442758E 6463907N	No	Medium chenopod shrubland, clay/loam soil with stony patches
	443685E 6462267N (BOOL 1)	1?	Tall dense chenopod shrubland, loamy soil, drainage depression, unconfirmed sighting
	456785E 6464881N	No	Low open chenopod shrubland, clay/loam soil with stony patches, grazing impact
	457918E 6473179N	No	Medium chenopod shrubland, sandy/loam soil, grazing impact
	462718E 6467296N	No	Medium chenopod shrubland, sandy/loam soil, grazing impact
	461392E 6466413N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
Kalabity Station	409750E 6473745N	No	Low open chenopod shrubland, loamy soil with stony patches
	429125E 6467709N	No	Medium chenopod shrubland, clay/loam soil, grazing impact
	426338E 6467982N (KAL 1)	2	Low open chenopod shrubland, clay/loam soil with stony patches, grazing impact
	417507E 6470738N (KAL 2)	1	Low sparse chenopod shrubland, grassy understorey, along drainage gutter, grazing impact
	412160E 6472620N (KAL 3)	1?	Low open chenopod shrubland, loamy soil with stony patches
	412860E 6472901N	No	Low open chenopod shrubland, loamy soil with stony patches, grazing impact
	426775E 6469294N	No	Medium chenopod shrubland, clay/loam soil with stony patches
	426380E 6468890N (KAL 4)	2	Medium chenopod shrubland, clay/loam soil with stony patches
	426713E 6468919N (KAL 5)	1	Medium chenopod shrubland, clay/loam soil with stony patches
	430593E 6470302N	No	Tall dense chenopod shrubland, loamy soil, drainage depression
	436135E 6477639N	No	Medium chenopod shrubland, clay/loam soil with stony patches

Appendix 3: Habitat characteristics of sites where Thick-billed Grasswren were recorded during this survey.

Site Code	Species Name	Bare Ground (%)	Litter (%)	Stone (%)	Total (%)	Height Class 1* (%)	Height Class 2* (%)	Height Class 3* (%)	Height Class 4* (%)	Height Class 5* (%)	Total (%)
BIM 1	Not surveyed										
BIM 2		61	10.5	1.5	73						
	<i>Maireana pyramidata</i>					0.5	7	2.5	0	0	10
	<i>Atriplex vesicaria</i>					1	6	1.5	0	0	8.5
	<i>Sclerolaena patenticuspis</i>					3	0	0	0	0	3
	<i>Olearia pimeleoides</i>					0	1.5	2	1	0	4.5
	<i>Maireana apressa</i>					0.5	0	0	0	0	0.5
	<i>Cymbopogon ambiguus</i>					0	0.5	0	0	0	0.5
	Total					5	15	6	1	0	27
BIM 3		63	9	0	72						
	<i>Maireana pyramidata</i>					0	10	4	2	0	16
	<i>Atriplex vesicaria</i>					0	0.5	0	0	0	0.5
	<i>Sclerolaena patenticuspis</i>					11	0	0	0	0	11
	Unidentified Grass					0.5	0	0	0	0	0.5
	Total					11.5	10.5	4	2	0	28
BIM 4		52	2	4	58						
	<i>Maireana pyramidata</i>					4	18	2	2	0	26
	<i>Atriplex vesicaria</i>					0	4	0	0	0	4
	<i>Sclerolaena patenticuspis</i>					8	0	0	0	0	8
	<i>Rhagodia spinescens</i>					0	0	4	0	0	4
	Total					12	22	6	2	0	42
BIM 5	Not surveyed										
BIM 6		20	8	0	28						
	<i>Maireana pyramidata</i>					2	10	0	2	0	14
	<i>Senecio magnificus</i>					0	2	6	20	8	36
	<i>Marrubium vulgare</i>					2	12	8	0	0	22
	Total					4	24	14	22	8	72
BIM 7		61	13	1	75						
	<i>Maireana pyramidata</i>					4	10	3	0	0	17
	<i>Atriplex vesicaria</i>					1	0	0	0	0	1
	<i>Sclerolaena species</i>					2	0	0	0	0	2
	<i>Olearia pimeleoides</i>					0	0	1	0	0	1
	<i>Maireana astrotricha</i>					0	1	0	0	0	1
	<i>Atriplex species</i>					3	0	0	0	0	3
	Total					10	11	4	0	0	25
BIM 8	Not surveyed										

Site Code	Species Name	Bare Ground (%)	Litter (%)	Stone (%)	Total (%)	Height Class 1* (%)	Height Class 2* (%)	Height Class 3* (%)	Height Class 4* (%)	Height Class 5* (%)	Total (%)
BIM 9	<i>Maireana pyramidata</i>	50	5	14	69	1	0	1	0	0	2
	<i>Rhagodia spinescens</i>					3	2	3	0	0	8
	<i>Sclerolaena species</i>					17	0	0	0	0	17
	<i>Olearia pimeleoides</i>					0	1	0	0	0	1
	<i>Acacia victoriae</i>					0	1	0	2	0	3
	Total					21	4	4	2	0	31
BIM 10	<i>Maireana pyramidata</i>	61	8	8	77	0	4	0	0	0	4
	<i>Atriplex vesicaria</i>					4	6	0	0	0	10
	<i>Sclerolaena patenticuspis</i>					6	0	0	0	0	6
	<i>Olearia pimeleoides</i>					0	0	1	0	0	1
	<i>Maireana apressa</i>					0	2	0	0	0	2
	Total					10	12	1	0	0	23
BIM 11	<i>Maireana pyramidata</i>	64	8	6	78	2	1	3	3	0	9
	<i>Atriplex vesicaria</i>					4	5	0	0	0	9
	<i>Sclerolaena patenticuspis</i>					4	0	0	0	0	4
	Total					10	6	3	3	0	22
BIM 12	<i>Maireana pyramidata</i>	66	4	0	70	0	4	7	5	0	16
	<i>Atriplex vesicaria</i>					4	3	0	0	0	7
	<i>Sclerolaena patenticuspis</i>					3	0	0	0	0	3
	<i>Olearia pimeleoides</i>					0	1	0	0	0	1
	<i>Maireana astrotricha</i>					1	0	0	0	0	1
	<i>Solanum ellipticum</i>					2	0	0	0	0	2
	Total					10	8	7	5	0	30
BIM 13	<i>Maireana pyramidata</i>	60	13	0	73	0	4	11	1	0	16
	<i>Atriplex vesicaria</i>					0	3	0	0	0	3
	<i>Sclerolaena patenticuspis</i>					5	0	0	0	0	5
	<i>Olearia pimeleoides</i>					0	1	0	0	0	1
	<i>Maireana astrotricha</i>					0	2	0	0	0	2
	Total					5	10	11	1	0	27
BIM 14	<i>Maireana pyramidata</i>	50	10	0	60	0	5	16	7	5	33
	<i>Rhagodia spinescens</i>					0	0	2	1	0	3
	<i>Sclerolaena patenticuspis</i>					4	0	0	0	0	4
	Total					4	5	18	8	5	40

Site Code	Species Name	Bare Ground (%)	Litter (%)	Stone (%)	Total (%)	Height Class 1* (%)	Height Class 2* (%)	Height Class 3* (%)	Height Class 4* (%)	Height Class 5* (%)	Total (%)
BIM 15	<i>Maireana pyramidata</i>	62	4	5	71	0	10	5	1	0	16
	<i>Rhagodia spinescens</i>					1	0	0	0	0	1
	<i>Sclerolaena patenticuspis</i>					12	0	0	0	0	12
	Total					13	10	5	1	0	29
BIM 16	<i>Maireana pyramidata</i>	58	6	0	64	0	6	13	6	0	25
	<i>Rhagodia spinescens</i>					0	0	7	0	0	7
	<i>Maireana aphylla</i>					0	0	3	0	0	3
	<i>Acacia victoriae</i>					0	0	0	0	1	1
	Total					0	6	23	6	1	36
BOOL 1	Not surveyed										
KAL 1	<i>Maireana pyramidata</i>	61	8	10	79	0	5	2	2	0	9
	<i>Atriplex vesicaria</i>					3	1	0	0	0	4
	<i>Sclerolaena patenticuspis</i>					4	0	0	0	0	4
	<i>Maireana astrotricha</i>					2	2	0	0	0	4
	Total					9	8	2	2	0	21
KAL 2	Not surveyed										
KAL 3	Not surveyed										
KAL 4	Not surveyed										
KAL 5	<i>Maireana pyramidata</i>	55	5	7	67	0	2	8	0	0	10
	<i>Atriplex vesicaria</i>					5	5	0	0	0	10
	<i>Sclerolaena patenticuspis</i>					9	0	0	0	0	9
	<i>Maireana astrotricha</i>					1	2	1	0	0	4
	Total					15	9	9	0	0	33

* Note:

Height Class 1: 0-25cm

Height Class 2: 25-50cm

Height Class 3: 50-75cm

Height Class 4: 75cm-1m

Height Class 5: >1m

Appendix 4: Plant species recorded from sites where Thick-billed Grasswren were recorded during this survey.

Site Code	Scientific Name	Common Name
BIM 1	<i>Maireana pyramidata</i> <i>Acacia victoriae</i> <i>Acacia tetragonaphylla</i>	Blackbush Elegant Wattle Dead Finish
BIM 2	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Sclerolaena limbata</i> <i>Olearia pimeleoides</i> <i>Maireana apressa</i> <i>Cymbopogon ambiguus</i> <i>Osteocarpum species</i> <i>Austrostipa species</i> <i>Danthonia caespitosa</i> <i>Centaurea melitensis</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Pearl Bindyi Pimelea Daisy-bush Pale-fruit Bluebush Lemon-grass Bonefruit Spear-grass Common Wallaby-grass Malta Thistle
BIM 3	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> Unidentified Grass <i>Acacia aneura</i> <i>Santalum lanceolatum</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Grass Mulga Plumbush
BIM 4	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Rhagodia spinescens</i> <i>Olearia pimeleoides</i> <i>Acacia victoriae</i> <i>Sida species</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Spiny Saltbush Pimelea Daisy-bush Elegant Wattle Sida
BIM 5	<i>Maireana pyramidata</i>	Blackbush
BIM 6	<i>Maireana pyramidata</i> <i>Senecio magnificus</i> <i>Marrubium vulgare</i> * <i>Sida species</i> <i>Enchylaena tomentosa</i> <i>Rhagodia spinescens</i> <i>Lycium ferocissimum</i> *	Blackbush Showy Groundsel Horehound Sida Ruby Saltbush Spiny Saltbush Boxthorn
BIM 7	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena species</i> <i>Olearia pimeleoides</i> <i>Maireana astrotricha</i> <i>Atriplex species</i> <i>Acacia victoriae</i>	Blackbush Bladder Saltbush Bindyi Pimelea Daisy-bush Low Bluebush Saltbush Elegant Wattle
BIM 8	<i>Maireana pyramidata</i> <i>Acacia victoriae</i>	Blackbush Elegant Wattle
BIM 9	<i>Maireana pyramidata</i> <i>Rhagodia spinescens</i> <i>Sclerolaena species</i> <i>Olearia pimeleoides</i> <i>Acacia victoriae</i> <i>Austrostipa species</i>	Blackbush Spiny Saltbush Bindyi Pimelea Daisy-bush Elegant Wattle Spear-grass
BIM 10	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Olearia pimeleoides</i> <i>Maireana apressa</i> <i>Acacia victoriae</i> <i>Cymbopogon ambiguus</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Pimelea Daisy-bush Pale-fruit Bluebush Elegant Wattle Lemon-grass
BIM 11	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Centaurea melitensis</i> * <i>Acacia victoriae</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Malta Thistle Elegant Wattle

Site Code	Scientific Name	Common Name
BIM 12	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Olearia pimeleoides</i> <i>Maireana astrotricha</i> <i>Solanum ellipticum</i> <i>Acacia victoriae</i> <i>Dodonaea species</i> <i>Austrostipa species</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Pimelea Daisy-bush Low Bluebush Velvet Potato-bush Elegant Wattle Hopbush Spear-grass
BIM 13	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Olearia pimeleoides</i> <i>Maireana astrotricha</i> <i>Austrostipa species</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Pimelea Daisy-bush Low Bluebush Spear-grass
BIM 14	<i>Maireana pyramidata</i> <i>Rhagodia spinescens</i> <i>Sclerolaena patenticuspis</i> <i>Alectryon oleifolius</i> <i>Santalum lanceolatum</i> <i>Lycium ferocissimum*</i> <i>Eremophila sturtii</i> <i>Marrubium vulgare*</i> <i>Centaurea melitensis*</i>	Blackbush Spiny Saltbush Spear-fruit Bindyi Bullock Bush Plum Bush Boxthorn Turpentine Bush Horehound Malta Thistle
BIM 15	<i>Maireana pyramidata</i> <i>Rhagodia spinescens</i> <i>Sclerolaena patenticuspis</i> <i>Atriplex vesicaria</i> <i>Acacia victoriae</i>	Blackbush Spiny Saltbush Spear-fruit Bindyi Bladder Saltbush Elegant Wattle
BIM 16	<i>Maireana pyramidata</i> <i>Rhagodia spinescens</i> <i>Maireana aphylla</i> <i>Acacia victoriae</i> <i>Olearia pimeleoides</i> <i>Acacia tetragonaphylla</i> <i>Santalum lanceolatum</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i>	Blackbush Spiny Saltbush Cotton Bush Elegant Wattle Pimelea Daisy-bush Dead Finish Plum Bush Bladder Saltbush Spear-fruit Bindyi
BOOL 1	<i>Maireana pyramidata</i> <i>Acacia victoriae</i> <i>Atriplex vesicaria</i> <i>Maireana astrotricha</i>	Blackbush Elegant Wattle Bladder Saltbush Low Bluebush
KAL 1	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Maireana astrotricha</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Low Bluebush
KAL 2	<i>Maireana pyramidata</i> <i>Maireana aphylla</i> <i>Acacia victoriae</i>	Blackbush Cotton Bush Elegant Wattle
KAL 3	<i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i>	Bladder Saltbush Spear-fruit Bindyi
KAL 4	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Maireana astrotricha</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Low Bluebush
KAL 5	<i>Maireana pyramidata</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Maireana astrotricha</i>	Blackbush Bladder Saltbush Spear-fruit Bindyi Low Bluebush

* Note: an introduced species.

Appendix 5: Opportune bird observations during survey.

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	425232E 6463010N (BIM 1)	Low open chenopod shrubland on stony rise	<i>Malurus leucopterus</i>	White-winged Fairy-wren	10
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2, with WWF
			<i>Calamanthus campestris</i>	Rufous Fieldwren	1
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Cinclosoma cinnamomeum</i>	Cinnamon Quail-thrush	2
			<i>Oreoica gutturalis</i>	Crested Bellbird	1
			<i>Rhipidura leucophrys</i>	Willie Wagtail	1
			<i>Artamus cinereus</i>	Black-faced Woodswallow	8, overhead
			<i>Gymnorhina tibicen</i>	Australian Magpie	3
<i>Corvus bennetti</i>	Little Crow	1			
<i>Anthus novaeseelandiae</i>	Richard's Pipit	2			
Bimbowrie Cons. Reserve	426195E 6464704N (BIM 2)	Low chenopod shrubland, loamy soil with stony patches	<i>Dromaius novaehollandiae</i>	Emu	Egg
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	3
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2
			<i>Calamanthus campestris</i>	Rufous Fieldwren	3
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	1
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
<i>Cheramoeca leucosternus</i>	White-backed Swallow	2, overhead			
Bimbowrie Cons. Reserve	425861E 6464294N (BIM 3)	Taller chenopod shrubland with many dead bushes, loamy soil	<i>Aquila audax</i>	Wedge-tailed Eagle	2, overhead
			<i>Cacatua sanguinea</i>	Little Corella	20, fly over
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	8
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	2
<i>Psophodes cristatus</i>	Chirruping Wedgebill	2			
Bimbowrie Cons. Reserve	425430E 6464330N (BIM 4)	Narrow band of low chenopod shrubland along drainage gutter	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
			<i>Taeniopygia guttata</i>	Zebra Finch	2, with nest and eggs in <i>A.victoriae</i>
Bimbowrie Cons. Reserve	427873E 6465111N	Tall dense chenopod shrubland, loamy soil	<i>Malurus lamberti</i>	Variegated Fairy-wren	2
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	6
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	3
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler	2			
Bimbowrie Cons. Reserve	425740E 6465840N (BIM 5)	Low sparse chenopod shrubland, grassy understorey, along drainage gutter	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Anthus novaeseelandiae</i>	Richard's Pipit	2

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	425835E 6466793N (BIM 6)	Tall dense shrubland in ponded drainage area above dam. Some water in dam.	<i>Anas gracilis</i>	Grey Teal	2, on dam
			<i>Ocyphaps lophotes</i>	Crested Pigeon	3
			<i>Northiella haematogaster</i>	Blue Bonnet	4
			<i>Malurus lamberti</i>	Variegated Fairy-wren	4
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	1
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	6
			<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler	2
			<i>Petroica goodenovii</i>	Red-capped Robin	1
<i>Hirundo neoxena</i>	Welcome Swallow	2, overhead			
Bimbowrie Cons. Reserve	425220E 6466180N (BIM 7)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Malurus leucopterus</i>	White-winged Fairy-wren	8
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
Bimbowrie Cons. Reserve	424800E 6465625N (BIM 8)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Malurus leucopterus</i>	White-winged Fairy-wren	10
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Artamus cinereus</i>	Black-faced Woodswallow	2, overhead
Bimbowrie Cons. Reserve	424073E 6464893N	Medium chenopod shrubland, grassy understorey, clay/loam soil	<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Melanodryas cucullata</i>	Hooded Robin	2, a pair
Bimbowrie Cons. Reserve	425180E 6465340N	Low sparse chenopod shrubland on stony rise	<i>Cinclosoma cinnamomeum</i>	Cinnamon Quail-thrush	2
Bimbowrie Cons. Reserve	410872E 6454261N	Medium chenopod shrubland, grassy understorey, clay/loam soil	<i>Dromaius novaehollandiae</i>	Emu	10 (1A & 9SA)
			<i>Cacatua roseicapilla</i>	Galah	6
			<i>Psephotus haematonotus</i>	Mulga Parrot	20
			<i>Malurus lamberti</i>	Variegated Fairy-wren	5
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	4
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	4
			<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	4
			<i>Manorina flavigula</i>	Yellow-throated Miner	6
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler	2
			<i>Petroica goodenovii</i>	Red-capped Robin	1
			<i>Oreoica gutturalis</i>	Crested Bellbird	1
			<i>Artamus cinereus</i>	Black-faced Woodswallow	4
<i>Dicaeum hirundinaceum</i>	Mistletoebird	2			
Bimbowrie Cons. Reserve	441450E 6463620N	Medium chenopod shrubland, clay/loam soil	<i>Dromaius novaehollandiae</i>	Emu	1, male on nest
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	8
			<i>Acanthiza iredalei</i>	Slender-billed Thornbill (A:V, SA:V)	2
			<i>Cinclosoma cinnamomeum</i>	Cinnamon Quail-thrush	2

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	439166E 6463436N	Redgum creekline	<i>Smicromis brevirostris</i> <i>Coracina novaehollandiae</i>	Weebill	2
				Black-faced Cuckoo-shrike	1
Bimbowrie Cons. Reserve	420730E 6457930N (BIM 9)	Low open chenopod shrubland, loamy soil with stony patches, TBGW previously recorded in area	<i>Vanellus tricolor</i> <i>Phaps chalcoptera</i> <i>Ocyphaps lophotes</i> <i>Cacatua sanguinea</i> <i>Barnardius zonarius</i> <i>Malurus leucopterus</i> <i>Amytornis textilis</i> <i>Pyrrholaemus brunneus</i> <i>Epthianura albifrons</i> <i>Acanthagenys rufogularis</i> <i>Lichenostomus virescens</i> <i>Psophodes cristatus</i> <i>Corvus bennetti</i> <i>Taeniopygia guttata</i>	Banded Lapwing	2
				Common Bronzewing	1
				Crested Pigeon	3
				Little Corella	6
				Australian Ringneck	2
				White-winged Fairy-wren	20, several families
				Thick-billed Grasswren (A:V, SA:R)	1, with WWF
				Redthroat (SA:R)	2
				White-fronted Chat	10, 1 flock
				Spiny-cheeked Honeyeater	4
				Singing Honeyeater	2
				Chirruping Wedgebill	20
				Little Crow	5
Zebra Finch	10, 1 flock				
Bimbowrie Cons. Reserve	436354E 6462647N	Medium chenopod shrubland, clay/loam soil	<i>Malurus leucopterus</i> <i>Pyrrholaemus brunneus</i> <i>Lichenostomus virescens</i> <i>Epthianura albifrons</i> <i>Psophodes cristatus</i> <i>Corvus bennetti</i> <i>Cheramoeca leucosternus</i> <i>Dicaeum hirundinaceum</i>	White-winged Fairy-wren	20, several families
				Redthroat (SA:R)	2
				Singing Honeyeater	2
				White-fronted Chat	1
				Chirruping Wedgebill	20
				Little Crow	2
				White-backed Swallow	2, overhead
Mistletoebird	1				
Bimbowrie Cons. Reserve	441995E 6462612N	Medium chenopod shrubland, clay/loam soil	<i>Aquila audax</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Pyrrholaemus brunneus</i> <i>Acanthiza iredalei</i> <i>Acanthiza chrysorrhoa</i> <i>Psophodes cristatus</i> <i>Cinclosoma cinnamomeum</i> <i>Petroica goodenovii</i> <i>Corvus bennetti</i> <i>Hirundo neoxena</i> <i>Anthus novaeseelandiae</i> <i>Taeniopygia guttata</i>	Wedge-tailed Eagle	2, overhead
				White-winged Fairy-wren	8
				Rufous Fieldwren	4
				Redthroat (SA:R)	2
				Slender-billed Thornbill (A:V, SA:V)	1
				Yellow-rumped Thornbill	2
				Chirruping Wedgebill	5
				Cinnamon Quail-thrush	2
				Red-capped Robin	1
				Little Crow	2
				Welcome Swallow	2, overhead
Richard's Pipit	1				
Zebra Finch	4				
Bimbowrie Cons. Reserve	426772E 6464482N (BIM 10)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Dromaius novaehollandiae</i> <i>Amytornis textilis</i> <i>Calamanthus campestris</i>	Emu	1, track only
				Thick-billed Grasswren (A:V, SA:R)	2
				Rufous Fieldwren	2
Bimbowrie Cons. Reserve	427810E 6464670N (BIM 11)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Malurus leucopterus</i> <i>Amytornis textilis</i> <i>Calamanthus campestris</i>	White-winged Fairy-wren	5
				Thick-billed Grasswren (A:V, SA:R)	3
				Rufous Fieldwren	2

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	434299E 6462410	Mulga woodland on rocky range	<i>Psephotus haematonotus</i>	Mulga Parrot	2
			<i>Struthidea cinerea</i>	Apostlebird	30, 1 flock
Bimbowrie Cons. Reserve	432475E 6464680N	Medium chenopod shrubland, clay/loam soil, heavily grazed in past	<i>Malurus leucopterus</i>	White-winged Fairy-wren	6
			<i>Calamanthus campestris</i>	Rufous Fieldwren	1
Bimbowrie Cons. Reserve	429654E 6464196N	Medium chenopod shrubland, clay/loam soil	<i>Ocyphaps lophotes</i>	Crested Pigeon	1
			<i>Cacatua roseicapilla</i>	Galah	4
			<i>Psephotus haematonotus</i>	Mulga Parrot	2
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	8
			<i>Calamanthus campestris</i>	Rufous Fieldwren	1
			<i>Lichenostomus virescens</i>	Singing Honeyeater	2
			<i>Epthianura albifrons</i>	White-fronted Chat	3
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	8
			<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler	14, several families
			<i>Melanodryas cucullata</i>	Hooded Robin	2, a pair
Bimbowrie Cons. Reserve	426472E 6463438N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Aquila audax</i>	Wedge-tailed Eagle	1, overhead
			<i>Psephotus haematonotus</i>	Mulga Parrot	2
			<i>Malurus lamberti</i>	Variegated Fairy-wren	4
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	6
			<i>Calamanthus campestris</i>	Rufous Fieldwren	6
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	4
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Petroica goodenovii</i>	Red-capped Robin	1
			<i>Melanodryas cucullata</i>	Hooded Robin	2, a pair
			<i>Cracticus torquatus</i>	Grey Butcherbird	1
			<i>Corvus bennetti</i>	Little Crow	4
			<i>Cheramoeca leucosternus</i>	White-backed Swallow	2, overhead
<i>Hirundo neoxena</i>	Welcome Swallow	2, overhead			
<i>Taeniopygia guttata</i>	Zebra Finch	4			
Bimbowrie Cons. Reserve	428620E 6464140N (BIM 12)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2
			<i>Epthianura aurifrons</i>	Orange Chat	6
			<i>Cinlosoma cinnamomeum</i>	Cinnamon Quail-thrush	1
Bimbowrie Cons. Reserve	422565E 6469065N (BIM 13)	Medium chenopod shrubland, clay/loamy soil, drainage depression	<i>Coturnix pectoralis</i>	Stubble Quail	1
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	3
Bimbowrie Cons. Reserve	413540E 6471970N	Low open chenopod shrubland, loamy soil with stony patches	<i>Malurus leucopterus</i>	White-winged Fairy-wren	1
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Epthianura aurifrons</i>	Orange Chat	2
			<i>Rhipidura leucophrys</i>	Willie Wagtail	1
			<i>Artamus cinereus</i>	Black-faced Woodswallow	5, overhead

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	424945E 6468031N	Low chenopod shrubland, clay/loamy soil with stony patches	<i>Falco cenchroides</i> <i>Ocyphaps lophotes</i> <i>Northiella haematogaster</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Lichenostomus virescens</i> <i>Psophodes cristatus</i> <i>Cinclosoma cinnamomeum</i> <i>Cheramoeca leucosternus</i> <i>Hirundo neoxena</i> <i>Anthus novaeseelandiae</i>	Australian Kestrel Crested Pigeon Blue Bonnet White-winged Fairy-wren Rufous Fieldwren Singing Honeyeater Chirruping Wedgebill Cinnamon Quail-thrush White-backed Swallow Welcome Swallow Richard's Pipit	1, overhead 2 2 5 2 1 2 1 2, overhead 2, overhead 1
Bimbowrie Cons. Reserve	416568E 6471005N	Open grassland with scattered emergent shrubs	<i>Northiella haematogaster</i> <i>Pomatostomus ruficeps</i>	Blue Bonnet Chestnut-crowned Babbler	2 20, several families
Bimbowrie Cons. Reserve	412430E 6462610N	Open shrubland near creekline	<i>Dromaius novaehollandiae</i> <i>Ocyphaps lophotes</i> <i>Gymnorhina tibicen</i>	Emu Crested Pigeon Australian Magpie	35 2 2
Bimbowrie Cons. Reserve	413545E 6470702N	Low open chenopod shrubland in drainage line above shallow dam. Dam with water.	<i>Anas gracilis</i> <i>Elsyornis melanops</i> <i>Ocyphaps lophotes</i> <i>Northiella haematogaster</i> <i>Neophema elegans</i> <i>Malurus leucopterus</i> <i>Aphelocephala leucopsis</i> <i>Psophodes cristatus</i> <i>Artamus cinereus</i> <i>Hirundo neoxena</i>	Grey Teal Black-fronted Dotterel Crested Pigeon Blue Bonnet Elegant Parrot White-winged Fairy-wren Southern Whiteface Chirruping Wedgebill Black-faced Woodswallow Welcome Swallow	2 2 10 4 1 4 4 2 5, overhead 5, overhead
Bimbowrie Cons. Reserve	413050E 6471250N	Low open chenopod shrubland, loamy soil with stony patches	<i>Elsyornis melanops</i> <i>Neophema elegans</i> <i>Malurus leucopterus</i> <i>Psophodes cristatus</i> <i>Cinclosoma cinnamomeum</i> <i>Taeniopygia guttata</i>	Black-fronted Dotterel Elegant Parrot White-winged Fairy-wren Chirruping Wedgebill Cinnamon Quail-thrush Zebra Finch	2 3 15, several families 4 1 3
Bimbowrie Cons. Reserve	428432E 6465783N (BIM 14)	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Dromaius novaehollandiae</i> <i>Ocyphaps lophotes</i> <i>Malurus lamberti</i> <i>Malurus leucopterus</i> <i>Amytornis textilis</i> <i>Pyrholaemus brunneus</i> <i>Acanthagenys rufogularis</i> <i>Psophodes cristatus</i>	Emu Crested Pigeon Variegated Fairy-wren White-winged Fairy-wren Thick-billed Grasswren (A:V, SA:R) Redthroat (SA:R) Spiny-cheeked Honeyeater Chirruping Wedgebill	1, tracks only 6 4 4 4 2 4 2
Bimbowrie Cons. Reserve	422513E 6458274N (BIM 16)	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	421298E 6457593N (BIM 15)	Low open chenopod shrubland, clay/loam soil with stony patches	<i>Aquila audax</i>	Wedge-tailed Eagle	1, overhead
			<i>Cacatua roseicapilla</i>	Galah	6
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	4, 1 pair mating
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	4
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
Bimbowrie Cons. Reserve	421187E 6458652N	Medium chenopod shrubland, grassy understorey, sandy loam soil	<i>Cheramoeca leucosternus</i>	White-backed Swallow	2, overhead
			<i>Dicaeum hirundinaceum</i>	Mistletoebird	1
			<i>Ocyphaps lophotes</i>	Crested Pigeon	6
			<i>Neophema elegans</i>	Elegant Parrot	1
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	10, several families
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
Bimbowrie Cons. Reserve	420846E 6453836N	Redgum creekline around homestead	<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Gymnorhina tibicen</i>	Australian Magpie	2
			<i>Dicaeum hirundinaceum</i>	Mistletoebird	1
			<i>Elseyornis melanops</i>	Black-fronted Dotterel	1, near dam
			<i>Geopelia striata</i>	Peaceful Dove	1
			<i>Cacatua roseicapilla</i>	Galah	20
			<i>Cacatua sanguinea</i>	Little Corella	20
			<i>Barnardius zonarius</i>	Australian Ringneck	2
			<i>Neophema elegans</i>	Elegant Parrot	2
			<i>Ninox novaeseelandiae</i>	Southern Boobook	1, heard
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
			<i>Manorina flavigula</i>	Yellow-throated Miner	10
			<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	2
			<i>Rhipidura leucophrys</i>	Willie Wagtail	1
			<i>Grallina cyanoleuca</i>	Magpie-lark	2
			<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	15
			<i>Cracticus torquatus</i>	Grey Butcherbird	1
<i>Gymnorhina tibicen</i>	Australian Magpie	2			
<i>Corvus bennetti</i>	Little Crow	6			
<i>Hirundo neoxena</i>	Welcome Swallow	2, overhead			
<i>Passer domesticus</i>	House Sparrow	1			
			<i>Carduelis carduelis</i>	European Goldfinch	1

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Bimbowrie Cons. Reserve	422756E 6459244N	Redgum creekline	<i>Cacatua roseicapilla</i>	Galah	2
			<i>Pardalotus striatus</i>	Striated Pardalote	1
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	4
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	5
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Cracticus torquatus</i>	Grey Butcherbird	1
		<i>Dicaeum hirundinaceum</i>	Mistletoebird	2	
Plumbago Station	407600E 6454650N	Low chenopod shrubland, patches of Black Oak nearby, loamy soil	<i>Dromaius novaehollandiae</i>	Emu	2, tracks only
			<i>Ocyphaps lophotes</i>	Crested Pigeon	4
			<i>Psephotus haematonotus</i>	Mulga Parrot	6
			<i>Northiella haematogaster</i>	Blue Bonnet	2
			<i>Pyrrholaemus brunneus</i>	Redthroat	2
			<i>Gymnorhina tibicen</i>	Australian Magpie	2
Plumbago Station	408601E 6458403N	Medium chenopod shrubland, clay/loam soil, 500m to water-point	<i>Malurus lamberti</i>	Variigated Fairy-wren	5
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	30, several families
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
Plumbago Station	408409E 6458403N	Low open chenopod shrubland, loamy soil with stony patches, TBGW previously recorded in area	<i>Aquila audax</i>	Wedge-tailed Eagle	1, overhead
			<i>Ocyphaps lophotes</i>	Crested Pigeon	6
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	5
			<i>Calamanthus campestris</i>	Rufous Fieldwren	4
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	2
			<i>Lichenostomus virescens</i>	Singing Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	4
			<i>Cinclsoma cinnamomeum</i>	Cinnamon Quail-thrush	4
			<i>Melanodryas cucullata</i>	Hooded Robin	1, female
			<i>Rhipidura leucophrys</i>	Willie Wagtail	1
			<i>Artamus cinereus</i>	Black-faced Woodswallow	3
			<i>Anthus novaeseelandiae</i>	Richard's Pipit	2
			<i>Taeniopygia guttata</i>	Zebra Finch	4
			Plumbago Station	408881E 6464537N	Low open chenopod shrubland, clay/loam soil with stony patches
<i>Malurus leucopterus</i>	White-winged Fairy-wren	10, several families			
<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2			
<i>Aphelocephala leucopsis</i>	Southern Whiteface	4			
Plumbago Station	406855E 6460428N	Low open chenopod shrubland, clay/loam soil with stony patches	<i>Dromaius novaehollandiae</i>	Emu	1, track only
			<i>Falco cenchroides</i>	Australian Kestrel	1
			<i>Ocyphaps lophotes</i>	Crested Pigeon	8
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	10, several families
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	3
			<i>Cinclsoma cinnamomeum</i>	Cinnamon Quail-thrush	3

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Plumbago Station	405880E 6474211N	Tall dense shrubland in ponded drainage area above dam. Some water in dam.	<i>Dromaius novaehollandiae</i> <i>Poliocephalus poliocephalus</i> <i>Anas gracilis</i> <i>Ocyphaps lophotes</i> <i>Cacatua roseicapilla</i> <i>Malurus lamberti</i> <i>Malurus leucopterus</i> <i>Pyrholaemus brunneus</i> <i>Aphelocephala leucopsis</i> <i>Lichenostomus virescens</i> <i>Psophodes cristatus</i> <i>Pomatostomus ruficeps</i> <i>Petroica goodenovii</i> <i>Artamus cinereus</i> <i>Corvus coronoides</i> <i>Corvus bennetti</i> <i>Cheramoeca leucosternus</i> <i>Taeniopygia guttata</i>	Emu Hoary-headed Grebe Grey Teal Crested Pigeon Galah Variegated Fairy-wren White-winged Fairy-wren Redthroat (SA:R) Southern Whiteface Singing Honeyeater Chirruping Wedgebill Chestnut-crowned Babbler Red-capped Robin Black-faced Woodswallow Australian Raven Little Crow White-backed Swallow Zebra Finch	2 2, on dam 9, on dam 2 1 6 20, several families 4 6 1 6 12, several families 1 4 1 2 2, overhead 14
Plumbago Station	407514E 6461924N	Low open chenopod shrubland, clay/loam soil with stony patches	<i>Northiella haematogaster</i> <i>Psophodes cristatus</i> <i>Pomatostomus ruficeps</i> <i>Gymnorhina tibicen</i>	Blue Bonnet Chirruping Wedgebill Chestnut-crowned Babbler Australian Magpie	6 10 10, several families 2
Plumbago Station	391387E 6448197N	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Dromaius novaehollandiae</i> <i>Falco cenchroides</i> <i>Ocyphaps lophotes</i> <i>Northiella haematogaster</i> <i>Neophema elegans</i> <i>Malurus leucopterus</i> <i>Pyrholaemus brunneus</i> <i>Aphelocephala leucopsis</i> <i>Acanthagenys rufogularis</i> <i>Psophodes cristatus</i> <i>Cinclosoma cinnamomeum</i> <i>Pomatostomus ruficeps</i> <i>Cracticus torquatus</i> <i>Anthus novaeseelandiae</i> <i>Dicaeum hirundinaceum</i>	Emu Australian Kestrel Crested Pigeon Blue Bonnet Elegant Parrot White-winged Fairy-wren Redthroat (SA:R) Southern Whiteface Spiny-cheeked Honeyeater Chirruping Wedgebill Cinnamon Quail-thrush Chestnut-crowned Babbler Grey Butcherbird Richard's Pipit Mistletoebird	1 1 2 2 1 16, several families 4 4 4 8 2 6 2 2 2 1
Plumbago Station	390875E 6446897N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Calamanthus campestris</i> <i>Pyrholaemus brunneus</i> <i>Cinclosoma cinnamomeum</i> <i>Hirundo neoxena</i>	Rufous Fieldwren Redthroat (SA:R) Cinnamon Quail-thrush Welcome Swallow	5 1 2 2, overhead
Plumbago Station	387936E 6445066N	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Malurus leucopterus</i> <i>Pyrholaemus brunneus</i>	White-winged Fairy-wren Redthroat (SA:R)	4 2

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Plumbago Station	389269E 6444917N	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Dromaius novaehollandiae</i> <i>Malurus leucopterus</i> <i>Pyrrholaemus brunneus</i> <i>Lichenostomus virescens</i> <i>Artamus cinereus</i> <i>Hirundo neoxena</i> <i>Dicaeum hirundinaceum</i>	Emu White-winged Fairy-wren Redthroat (SA:R) Singing Honeyeater Black-faced Woodswallow Welcome Swallow Mistletoebird	1, tracks only 10 6 2 2, overhead 1, overhead 1
Plumbago Station	378781E 6445358N	Tall dense chenopod shrubland, loamy soil, along drainage channel, TBGW previously recorded in area	<i>Ocyphaps lophotes</i> <i>Northiella haematogaster</i> <i>Malurus leucopterus</i> <i>Pyrrholaemus brunneus</i> <i>Acanthagenys rufogularis</i> <i>Pomatostomus ruficeps</i>	Crested Pigeon Blue Bonnet White-winged Fairy-wren Redthroat (SA:R) Spiny-cheeked Honeyeater Chestnut-crowned Babbler	2 2 6 1 2 12, several families
Plumbago Station	379699E 6445768N	Low open chenopod shrubland, clay/loam soil with stony patches	<i>Dromaius novaehollandiae</i> <i>Malurus leucopterus</i> <i>Psophodes cristatus</i> <i>Cinclosoma cinnamomeum</i> <i>Artamus cinereus</i>	Emu White-winged Fairy-wren Chirruping Wedgebill Cinnamon Quail-thrush Black-faced Woodswallow	3 5 100 2 2, overhead
Plumbago Station	405190E 6452890N	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Dromaius novaehollandiae</i> <i>Phaps chalcoptera</i> <i>Malurus leucopterus</i> <i>Pyrrholaemus brunneus</i> <i>Psophodes cristatus</i>	Emu Common Bronzewing White-winged Fairy-wren Redthroat (SA:R) Chirruping Wedgebill	1 1 6 2 4
Plumbago Station	410285E 6454339N	Tall dense chenopod shrubland, loamy soil, drainage depression	<i>Phaps chalcoptera</i> <i>Neophema elegans</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Pyrrholaemus brunneus</i>	Common Bronzewing Elegant Parrot White-winged Fairy-wren Rufous Fieldwren Redthroat (SA:R)	2 2 7 1 2
Boolcoomatta Station	442356E 6463660N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Aquila audax</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Pyrrholaemus brunneus</i> <i>Acanthiza iredalei</i> <i>Psophodes cristatus</i>	Wedge-tailed Eagle White-winged Fairy-wren Rufous Fieldwren Redthroat (SA:R) Slender-billed Thornbill (A:V, SA:V) Chirruping Wedgebill	1, overhead 10, several families 2 2 4 4
Boolcoomatta Station	459450E 6462030N	Low open chenopod shrubland, clay/loam soil.	<i>Charadrius australis</i>	Inland Dotterel	2, spotlighted
Boolcoomatta Station	443840E 6465480N	Medium chenopod shrubland, sandy/loam soil, grazing impact	<i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Acanthiza iredalei</i> <i>Cinclosoma cinnamomeum</i>	White-winged Fairy-wren Rufous Fieldwren Slender-billed Thornbill (A:V, SA:V) Cinnamon Quail-thrush	4 2 2 2
Boolcoomatta Station	474062E 6467254N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Dromaius novaehollandiae</i> <i>Charadrius australis</i>	Emu Inland Dotterel	11 2

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Boolcoomatta Station	443685E 6462267N (BOOL 1)	Tall dense chenopod shrubland, loamy soil, drainage depression, unconfirmed sighting	<i>Ocyphaps lophotes</i> <i>Malurus leucopterus</i> <i>Amytornis textilis</i> <i>Calamanthus campestris</i> <i>Pyrrholaemus brunneus</i> <i>Aphelocephala leucopsis</i> <i>Acanthagenys rufogularis</i> <i>Lichenostomus virescens</i> <i>Psophodes cristatus</i> <i>Cinlosoma cinnamomeum</i> <i>Corvus coronoides</i> <i>Hirundo neoxena</i> <i>Taeniopygia guttata</i>	Crested Pigeon White-winged Fairy-wren Thick-billed Grasswren (A:V, SA:R) Rufous Fieldwren Redthroat (SA:R) Southern Whiteface Spiny-cheeked Honeyeater Singing Honeyeater Chirruping Wedgebill Cinnamon Quail-thrush Australian Raven Welcome Swallow Zebra Finch	2 20, several families 1, unconfirmed 2 2 4 2 1 30 1 2 1, overhead 2
Boolcoomatta Station	455550E 6462550N	Redgum creekline, Oonatra Creek	<i>Cacatua roseicapilla</i> <i>Cacatua sanguinea</i> <i>Barnardius zonarius</i> <i>Acanthagenys rufogularis</i> <i>Manorina flavigula</i> <i>Lichenostomus virescens</i> <i>Rhipidura leucophrys</i> <i>Grallina cyanoleuca</i> <i>Coracina novaehollandiae</i> <i>Artamus leucorhynchus</i> <i>Cracticus torquatus</i> <i>Corvus coronoides</i> <i>Corvus mellori</i> <i>Dicaeum hirundinaceum</i>	Galah Little Corella Australian Ringneck Spiny-cheeked Honeyeater Yellow-throated Miner Singing Honeyeater Willie Wagtail Magpie-lark Black-faced Cuckoo-shrike White-breasted Woodswallow Grey Butcherbird Australian Raven Little Raven Mistletoebird	50 50 1 2 10 2 2 5 5 20, overhead 1 6 2 2
Boolcoomatta Station	456845E 6473031	Ephemeral water on low open chenopod shrubland.	<i>Anas gracilis</i> <i>Vanellus tricolor</i> <i>Charadrius australis</i>	Grey Teal Banded Lapwing Inland Dotterel	4 6 2
Boolcoomatta Station	466004E 6462222N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i> <i>Falco cenchroides</i> <i>Epthianura aurifrons</i> <i>Anthus novaeseelandiae</i>	Inland Dotterel Australian Kestrel Orange Chat Richard's Pipit	3 1 2 1
Boolcoomatta Station	467690E 6464058N	Medium chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i> <i>Calamanthus campestris</i> <i>Anthus novaeseelandiae</i>	Inland Dotterel Rufous Fieldwren Richard's Pipit	8 2 1
Boolcoomatta Station	475689E 6480677N	Tall dense chenopod shrubland, loamy soil, drainage depression. Water in dam	<i>Poliiocephalus poliocephalus</i> <i>Anas gracilis</i> <i>Malacorhynchus membranaceus</i> <i>Aquila audax</i> <i>Malurus leucopterus</i> <i>Gymnorhina tibicen</i>	Hoary-headed Grebe Grey Teal Pink-eared Duck Wedge-tailed Eagle White-winged Fairy-wren Australian Magpie	1, on water 2, on water 2, on water 1 3 10

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Boolcoomatta Station	478854E 6466930N	Redgums along Mingary Creek	<i>Falco cenchroides</i>	Australian Kestrel	1
			<i>Barnardius zonarius</i>	Australian Ringneck	2
			<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	6
			<i>Pardalotus striatus</i>	Striated Pardalote	2
			<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	2
			<i>Gymnorhina tibicen</i>	Australian Magpie	3
			<i>Corvus mellori</i>	Little Raven	3
Boolcoomatta Station	472020E 6477386N	Tall dense chenopod shrubland, loamy soil, drainage depression. Water in dam	<i>Petrochelidon nigricans</i>	Tree Martin	4, overhead
			<i>Dromaius novaehollandiae</i>	Emu	1
			<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe	2, on water
			<i>Fulica atra</i>	Eurasian Coot	8, on water
			<i>Charadrius australis</i>	Inland Dotterel	2
			<i>Aquila audax</i>	Wedge-tailed Eagle	nest
			<i>Ocyphaps lophotes</i>	Crested Pigeon	8
			<i>Cacatua roseicapilla</i>	Galah	20
			<i>Barnardius zonarius</i>	Australian Ringneck	2
			<i>Neophema elegans</i>	Elegant Parrot	1
			<i>Cuculus pallidus</i>	Pallid Cuckoo	1
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	8
			<i>Manorina flavigula</i>	Yellow-throated Miner	6
			<i>Lichenostomus virescens</i>	Singing Honeyeater	2
			<i>Rhipidura leucophrys</i>	Willie Wagtail	2
			<i>Grallina cyanoleuca</i>	Magpie-lark	1
			<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	1
<i>Cracticus torquatus</i>	Grey Butcherbird	1			
<i>Gymnorhina tibicen</i>	Australian Magpie	5			
Boolcoomatta Station	456785E 6464881N	Low open chenopod shrubland, clay/loam soil with stony patches, grazing impact	<i>Malurus leucopterus</i>	White-winged Fairy-wren	10
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Epthianura aurifrons</i>	Orange Chat	2
Boolcoomatta Station	461562E 6466668N	Tall dense chenopod shrubland, loamy soil, drainage depression. Water in dam.	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe	2, on water
			<i>Anas gracilis</i>	Grey Teal	14, on water
			<i>Ocyphaps lophotes</i>	Crested Pigeon	6
			<i>Cacatua sanguinea</i>	Little Corella	2
			<i>Barnardius zonarius</i>	Australian Ringneck	2
			<i>Northiella haematogaster</i>	Blue Bonnet	8
			<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	2
			<i>Grallina cyanoleuca</i>	Magpie-lark	2
<i>Corvus coronoides</i>	Australian Raven	2			
Boolcoomatta Station	465884E 6467114N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i>	Inland Dotterel	1, spotlighted
			<i>Eurostopodus argus</i>	Spotted Nightjar	1, spotlighted
Boolcoomatta Station	459745E 6465208N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Podargus strigoides</i>	Tawny Frogmouth	1, spotlighted

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Boolcoomatta Station	457918E 6473179N	Medium chenopod shrubland, sandy/loam soil, grazing impact	<i>Dromaius novaehollandiae</i>	Emu	4
			<i>Aquila audax</i>	Wedge-tailed Eagle	1
			<i>Northiella haematogaster</i>	Blue Bonnet	2
			<i>Malurus leucopterus</i>	White-winged Fairy-wren	10, several families
			<i>Calamanthus campestris</i>	Rufous Fieldwren	2
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	2
			<i>Aphelocephala leucopsis</i>	Southern Whiteface	2
			<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	1
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Gymnorhina tibicen</i>	Australian Magpie	4
Boolcoomatta Station	462932E 6467723N	Blackbox and tall dense chenopod shrubland, loamy soil, drainage depression	<i>Ocyphaps lophotes</i>	Crested Pigeon	30
			<i>Cacatua roseicapilla</i>	Galah	6
			<i>Barnardius zonarius</i>	Australian Ringneck	6
			<i>Northiella haematogaster</i>	Blue Bonnet	20checkinghollows
			<i>Podargus strigoides</i>	Tawny Frogmouth	2
			<i>Pardalotus striatus</i>	Striated Pardalote	2
			<i>Smicromnis brevirostris</i>	Weebill	2
			<i>Manorina flavigula</i>	Yellow-throated Miner	8
			<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler	15
			<i>Cracticus nigrogularis</i>	Pied Butcherbird	1
<i>Gymnorhina tibicen</i>	Australian Magpie	2			
Kalabity Station	429125E 6467709N	Medium chenopod shrubland, clay/loam soil, grazing impact	<i>Malurus leucopterus</i>	White-winged Fairy-wren	10
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	4
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	10
			<i>Cheramoeca leucosternus</i>	White-backed Swallow	2, overhead
Kalabity Station	426338E 6467982N (KAL 1)	Low open chenopod shrubland, clay/loam soil with stony patches, grazing impact	<i>Malurus leucopterus</i>	White-winged Fairy-wren	4
			<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	2
			<i>Epthianura albifrons</i>	White-fronted Chat	4
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	6
Kalabity Station	417507E 6470738N (KAL 2)	Low sparse chenopod shrubland, grassy understorey, along drainage gutter, grazing impact	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
Kalabity Station	412160E 6472620N (KAL 3)	Low open chenopod shrubland, loamy soil with stony patches	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1, unconfirmed
Kalabity Station	412860E 6472901N	Low open chenopod shrubland, loamy soil with stony patches, grazing impact	<i>Calamanthus campestris</i>	Rufous Fieldwren	2
Kalabity Station	421391E 6469619N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Epthianura albifrons</i>	White-fronted Chat	200
			<i>Artamus cinereus</i>	Black-faced Woodswallow	10, overhead
			<i>Anthus novaeseelandiae</i>	Richard's Pipit	5
Kalabity Station	426380E 6468890N (KAL 4)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Malurus leucopterus</i> <i>Amytornis textilis</i>	White-winged Fairy-wren Thick-billed Grasswren (A:V, SA:R)	3 2, with WWFV

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Kalabity Station	426775E 6469294N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Aquila audax</i> <i>Falco cenchroides</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Psophodes cristatus</i> <i>Cinlosoma cinnamomeum</i>	Wedge-tailed Eagle Australian Kestrel White-winged Fairy-wren Rufous Fieldwren Chirruping Wedgebill Cinnamon Quail-thrush	1, overhead 1, overhead 10, several families 2 2 3
Kalabity Station	426713E 6468919N (KAL 5)	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Amytornis textilis</i>	Thick-billed Grasswren (A:V, SA:R)	1
Kalabity Station	430593E 6470302N	Tall dense chenopod shrubland, loamy soil, drainage depression. Some water in depression.	<i>Dromaius novaehollandiae</i> <i>Cacatua sanguinea</i> <i>Ocyphaps lophotes</i> <i>Barnardius zonarius</i> <i>Northiella haematogaster</i> <i>Malurus leucopterus</i> <i>Acanthagenys rufogularis</i> <i>Manorina flavigula</i> <i>Psophodes cristatus</i> <i>Pomatostomus ruficeps</i> <i>Petroica goodenovii</i> <i>Cracticus torquatus</i> <i>Gymnorhina tibicen</i>	Emu Little Corella Crested Pigeon Australian Ringneck Blue Bonnet White-winged Fairy-wren Spiny-cheeked Honeyeater Yellow-throated Miner Chirruping Wedgebill Chestnut-crowned Babbler Red-capped Robin Grey Butcherbird Australian Magpie	1 2 50 4 2 4 6 10 2 4 2, a pair 2 4
Kalabity Station	436135E 6477639N	Medium chenopod shrubland, clay/loam soil with stony patches	<i>Ocyphaps lophotes</i> <i>Malurus leucopterus</i> <i>Calamanthus campestris</i> <i>Cinlosoma cinnamomeum</i>	Crested Pigeon White-winged Fairy-wren Rufous Fieldwren Cinnamon Quail-thrush	15 8 2 3
Kalkaroo Station	450800E 6486351N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i> <i>Neophema elegans</i> <i>Anthus novaeseelandiae</i>	Inland Dotterel Elegant Parrot Richard's Pipit	5 12 2
Kalkaroo Station	455093E 6476212	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Coturnix pectoralis</i> <i>Pedionomus torquatus</i>	Stubble Quail Plains-wanderer (A:V, SA:EN)	1 1, male
Kalkaroo Station	460979E 6481346N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i> <i>Epthianura aurifrons</i> <i>Anthus novaeseelandiae</i>	Inland Dotterel Orange Chat Richard's Pipit	4, spotlighted 2, spotlighted 2, spotlighted
Kalkaroo Station	459177E 6491301N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Dromaius novaehollandiae</i> <i>Aquila audax</i> <i>Charadrius australis</i> <i>Anthus novaeseelandiae</i>	Emu Wedge-tailed Eagle Inland Dotterel Richard's Pipit	4 2 8 1
Kalkaroo Station	460979E 6481346N	Low open chenopod shrubland, clay/loam soil, grazing impact	<i>Charadrius australis</i> <i>Epthianura aurifrons</i> <i>Anthus novaeseelandiae</i>	Inland Dotterel Orange Chat Richard's Pipit	4, spotlighted 2, spotlighted 2, spotlighted

Property Name	Location	Habitat	Scientific Name	Common Name (and conservation rating)*	Comment
Kalkaroo Station	460166E 6482034N	Redgums around dam containing water.	<i>Dromaius novaehollandiae</i>	Emu	1
			<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	2, on water
			<i>Anas gracilis</i>	Grey Teal	25, on water
			<i>Chenonetta jubata</i>	Australian Wood Duck	25, on banks
			<i>Gallinula ventralis</i>	Black-tailed Native-hen	2, on banks
			<i>Fulica atra</i>	Eurasian Coot	1, on banks
			<i>Vanellus tricolor</i>	Banded Lapwing	2
			<i>Geopelia striata</i>	Peaceful Dove	2
			<i>Psophodes cristatus</i>	Chirruping Wedgebill	2
			<i>Rhipidura leucophrys</i>	Willie Wagtail	2
		<i>Gymnorhina tibicen</i>	Australian Magpie	2	
Wompinie Station	475040E 6445710N	Redgums around dam containing water.	<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	3, on water
			<i>Oxyura australis</i>	Blue-billed Duck (SA:R)	1, on water
			<i>Pyrrholaemus brunneus</i>	Redthroat (SA:R)	1
			<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	6
			<i>Myiagra inquieta</i>	Restless Flycatcher	1
			<i>Cracticus torquatus</i>	Grey Butcherbird	1
			<i>Corvus mellori</i>	Little Raven	3

A: National conservation rating under *Environment Protection and Biodiversity Conservation Act 1999*.

SA: State conservation rating under *National Parks and Wildlife Act 1972*.

R: Rare, **V:** Vulnerable, **EN:** Endangered