SVL

# Expedition briefing

LANDSCOPE EXPEDITIONS
Working at the Frontier of Discovery

## EXPLORING BARLEE!

### WILDLIFE OF THE BARLEE RANGE NATURE RESERVE

July 22 - August 1, 2002

- Dr Stephen van Leeuwen, Research Scientist, Conservation and Land Management, Karratha
- Dr Peter Kendrick, Regional Ecologist, Conservation and Land Management, Karratha
- Mr Bob Bromilow, Technical Officer, Conservation and Land Management, Karratha
- Mr Michael Hughes, Technical Officer, Conservation and Land Management, Karratha

This expedition is offered by *LANDSCOPE*, a quarterly magazine devoted to wildlife, conservation and environmental issues in Western Australia. It is run in association with UWA Extension, The University of Western Australia.

*LANDSCOPE* Expeditions - Working at the Frontiers of Discovery

Department of Conservation and Land Management *in association with* UWA Extension, the University of Western Australia.

# Exploring Barlee!

## WILDLIFE OF THE BARLEE RANGE NATURE RESERVE

July 22 – August 1, 2002

### TABLE OF CONTENTS

# RESEARCH PROJECT

## THE PROJECT

The *LANDSCOPE* Expedition, *Exploring Barlee! Wildlife of the Barlee Range Nature Reserve* is being undertaken as an auxiliary sampling trip to the Biological Survey of the Barlee Range Nature Reserve, undertaken by the Department of Conservation and Land Management (the Department) between 1992 and 1996. This biological survey was funded by the Australian Heritage Commission under the auspices of the National Estates Grants Program and was undertaken by staff from the Department's Science Division and Pilbara Regional office. The principal aim of the survey was to provide a comprehensive inventory of the biological values of the Nature Reserve, thereby facilitating an assessment of the nature conservation values of the reserve and providing justification for the implementation of management regimes, and actions that are designed to protect valuable and/or vulnerable assets.

The aim of this *LANDSCOPE* Expedition is to collect additional information on the flora and fauna of the nature reserve. It has been six years since the last formal visit to the reserve to collect flora and fauna information. The Expedition will attempt to visit several localities that have not previously been sampled in detail, particularly sites on the plateau of the Fitzgerald Range and to the east of the precipitous Kookhabinna Gorge. At these localities the flora and fauna will be sampled using opportunistic collecting and recording techniques. The opportunity will also exist to open and operate several of the permanent sampling sites close to the supply depot. Biota to be sampled includes vascular plants, birds, mammals, reptiles and amphibians. Information collected during the Expedition will contribute to the inventory of biota recorded from the Nature Reserve and enhance the Department's understanding of how this biota is partitioned into communities across the landscape. It will also provide valuable information on the distribution of species within the Nature Reserve and hopefully result in the recording and collection of species not previously recorded.

## BACKGROUND TO THE STUDY AREA

A conservation reserve proposal for the Barlee Range area was first documented in the Government record in May 1960, when the Chief Warden for Fauna in the Fisheries Department sought permission from the Under Secretary for Lands and Relevant Roads Board (Gascoyne-Minilya and Ashburton) for the creation of a national park. The original intent of the proposal was for a national park centred on the gorges of Kookhabinna Creek. The majority of the area under consideration was vacant Crown land before this proposal was mooted, although the entire area was allocated to pastoral lease blocks earlier in the century. By 1929, most of these pastoral lease blocks were cancelled and the area had reverted to vacant Crown land.

Although somewhat obscure in the public record, it appears that the impetus for this reserve proposal originated with Messrs J. B. Higham and A. H. Robinson, who were members of the Department of Fisheries Fauna Protection Advisory Board. Both men had extensive knowledge of the Barlee Range having resided and/or visited Ullawarra and Glen Florrie Stations in the 1920s and 1930s. The reserve proposal was also endorsed by the managers of Ullawarra and Maroonah Stations (the Glen Florrie lease was part of the Maroonah Pastoral Company at the time) who noted that the area of vacant Crown land was generally inaccessible and contained no improvements (fences or mills). The manager of Ullawarra Station, a Mr M. W. Donovan, went so far as to suggest that the gorge country along Kookhabinna Creek rivalled that of the Wittenoom area in the Hamersley Range, and that for the intrepid tourist the proposed national park would have no peer.

In accordance with a recommendation from the Director of Fisheries, and following representation from Mr C. A. Gardner and Dr D. Serventy, both respected natural history scientists from the National Parks Board of Western Australia, the Chief Warden for Wildlife organised a survey of the area identified for inclusion in the proposed national park.

This survey was undertaken in August 1961 and comprised a party of seven personnel:

- Four from the Fauna Protection Advisory Committee (Mr A. H. Robinson, Mr J. B. Higham, Dr A. R. Main, and committee secretary Mr H. B. Shugg);
- The Officer-in-Charge of the State Herbarium, Mr R. D. Royce; and
- Two representatives from the Department of Lands and Surveys, Staff Surveyor Mr. B. McNamara, and Mr W. Ridley).

Mr Joe Butler from Ullawarra Station accompanied the inspection party and acted as a local guide.

The party made copious observations and collections during their survey to the proposed national park including:

- The collection of 200 plant specimens;
- The observation of 43 bird species; and
- The documentation of Rock-wallabies inhabiting the cliffs flanking Kookhabinna Gorge, Pebble-mound Mouse on the plateau of the Fitzgerald Range and the collection of a new species of frog (*Pseudophryne douglasi*).

Upon their return to Perth the survey party made a number of recommendations to Government, which were supported by the Chief Warden for Wildlife and Under Secretary for Lands. Paramount among these recommendations were:

- All the vacant Crown land be set aside as a wildlife reserve; and
- That, due to the rugged nature of the country and the absence of existing roads, no recommendation be made for the development of the area as a national park.

All the recommendations of the survey party were accepted by Government and on 31 May 1963 the area was declared an unvested reserve for the purposes of Conservation of Flora and Fauna. The reserve was designated the Kookhabinna Creek Reserve. Subsequently, on 29 August 1969 and after protracted negotiations, the reserve was vested as Class "A" with the Western Australian Wildlife Authority. The purpose of the reserve remained Conservation of Flora and Fauna. On this vesting date, following a June 1969 recommendation from the Western Australian Wildlife Authority, a notice was also published in the Government Gazette classifying the reserve as a Prohibited Area under the Fauna Conservation Act. This designation implied that no person could enter upon the reserve for any purpose unless they were the holder of a permit issued pursuant to the provisions of Fauna Conservation Act 1950-69.

In January 1972 the name of the Kookhabinna Creek Reserve was changed to the Barlee Range Wildlife Sanctuary and, subsequently in May 1979, became the Barlee Range Nature Reserve.

## BARLEE RANGE NATURE RESERVE

The Barlee Range Nature Reserve (26808) is a Class "A" reserve vested with the Western Australian Wildlife Authority for the purpose of conservation of flora and fauna. The Nature Reserve covers an area of 104 543.8 ha and has a boundary perimeter of 166.6 km. The Nature Reserve is located in north-west Western Australia (23° 09' 48" S, 115° 53' 02" E) some 980 km north of Perth (Figure 1A). The Nature Reserve is 180 km south-east of the coastal town of Onslow and 180 km west of the mining town of Paraburdoo (Figure 1B). The closest settlement of any significance to the Nature Reserve is the Nanutarra Roadhouse on the North West Coastal Highway which is some 80 km north-north-west. The Nature Reserve is generally inaccessible and isolated with access typically being obtained from the North West Coastal Highway via station tracks on Glen Florrie, Maroonah and Ullawarra Stations. Created in 1963, the Nature Reserve is located within the Shire of Ashburton and in the Department's Pilbara Region. The reserve is predominantly unfenced and surrounded on all sides by pastoral leases

(Glen Florrie, Maroonah, Ullawarra). The reserve is listed on the Register of the National Estate and contains two wetlands cited in the Directory of Important Wetlands in Australia. The reserve also falls within the bounds of a Native Title Claim by the Thudgari People.

The reserve is situated along the north-western boundary of the Gascoyne Biogeographical Region. It has significant conservation value because of its juxtaposition with reference to the Pilbara Biogeographical Region - sitting within a major phytogeographical transitional zone (*Acacia/Triodia* line), and its undisturbed predicament. Inadequacy with respect to comprehensiveness, adequacy and representativeness of the existing reserve system in the Gascoyne and Pilbara Biogeographical Regions also affirm the conservation value of the Nature Reserve.

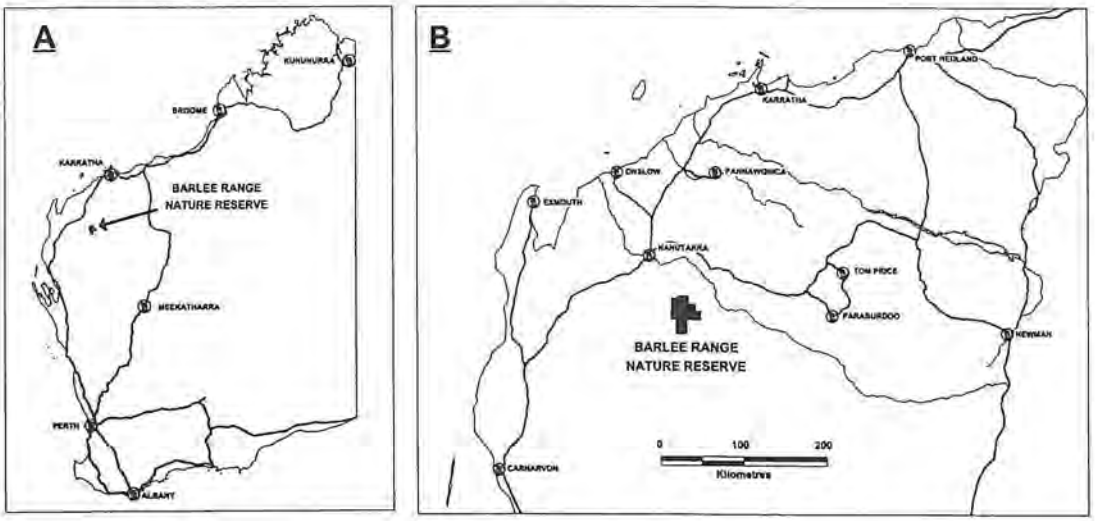


**Figure 1 Locality plans of the Barlee Range Nature Reserve.**

The Nature Reserve is located on the north western margin of the Barlee Range, which is a series of very rugged hills trending west-north-west for approximately 90 km from Wanna in the south to Mt Padbury and Mt Maitland in the north. At the northern extremity, the Barlee Range coalesces with the Fitzgerald Range, the most pronounced landscape feature on the Nature Reserve. The Fitzgerald Range runs through the central portion of the Nature Reserve for the entire latitudinal extent of the reserve and forms a very steep and abrupt escarpment toward the central and northern ends. The highest summit in this range country, Mt Palgrave (695 m), is located outside the reserve. Other peaks of note include Mt Florry, Mt Maitland and Mt Padbury, all of which occur outside the reserve. The highest point on the reserve (579 m) is located towards the north end of the Fitzgerald Range, while the lowest point (approximately 180 m) occurs where Wongida Creek leaves the reserve.

The Nature Reserve is very rugged, containing highly dissected and abrupt range country, and precipitous gorges although some extensive gently undulating terrain and gibber plains are present, especially adjacent to Wongida Creek. Dominant landscape features include the Fitzgerald Range, Barlee Range, Kookhabinna Creek, Kookhabinna Gorge and Yadjiyugga Claypan. Numerous wetlands in the form of pools and springs are present on the Nature Reserve, particularly along Kookhabinna Creek and in Kookhabinna Gorge. Within the highly dissected and incised central portion of the reserve, east of the Fitzgerald Range escarpment, lies Kookhabinna Gorge (Figure 2). This gorge, formed by the passage of Kookhabinna Creek through sandstone of the Kiangi Creek Formation, is deeply incised and flanked by precipitous cliffs. At some sites, such as near Kohblin Karrung Pool the cliffs are over 100 m deep. These precipitous cliffs are continually repeated along the creek and its tributaries from Goordeman Pool in the north to Wadgawaranna Pool in the south. Several gorges also exist in the highly dissected area where the Fitzgerald and Barlee Ranges merge. The most impressive of these gorges is Butler's Gorge.

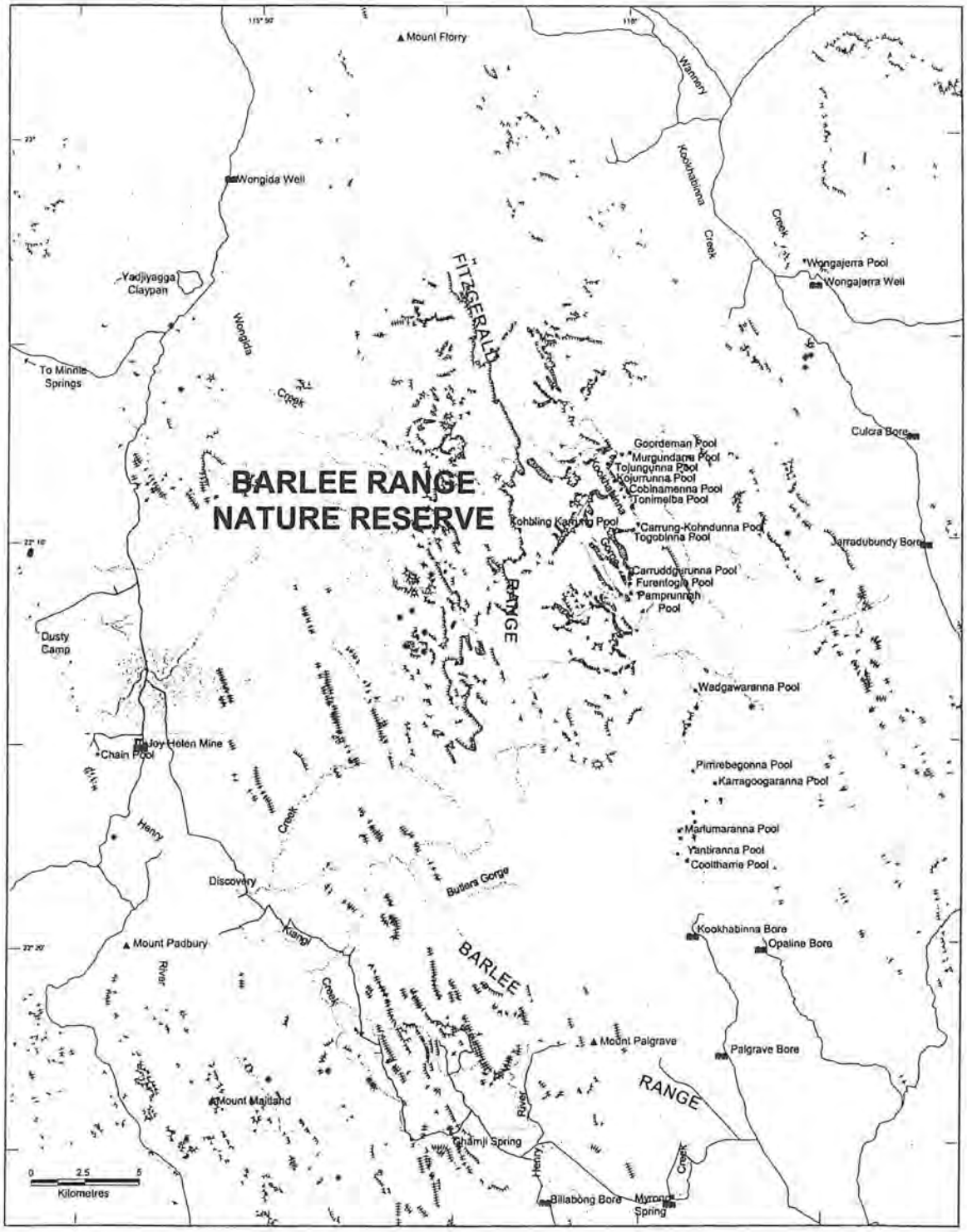


**Figure 2 Simplified topographic map of the Barlee Range Nature Reserve.**

The Nature Reserve occurs in an eremaean climatic setting and inherently experiences high temperatures (>40°C) during summer. The mean monthly minimum of 11°C occurs in July. Rainfall, which averages about 250 mm per annum, falls predominantly during summer although winter falls occur most years. Unfortunately, rainfall this year has been very low, which will undoubtedly have an influence on the presence of annual and ephemeral plants, many small mammals and birds, and the volume of water present in pools and other drainage features.

Four broad vegetation communities have been mapped on the Nature Reserve. *Acacia* shrub and low woodlands, in which Mulga is the principal species, dominate these communities. Hard spinifex grasslands are also present, which reflects the transitional nature of the Nature

Reserve with respect to the *Acacia/Triodia* line. Extensive woodlands and forests dominated by Red River Gum (*Eucalyptus camaldulensis*) and Cadjeput (*Melaleuca leucadendra*) fringe the margins of the large drainage lines, in particular Kookhabinna Creek.

During the biological survey undertaken by the Department, 33 mammal, 65 reptile, six amphibian, seven fish, 125 bird and 515 plant species were recorded from the Nature Reserve. The appendices provide lists of these species. Highlights amongst these species inventory lists are briefly detailed below.

- Significant mammal records included the Long-tailed Dunnart (*Sminthopsis longicaudata*), Orange Leafnosed-bat (*Rhinonicteris aurantius*), Ghost bat (*Macroderma gigas*), Northern Brushtail Possum (*Trichosurus vulpecula arnhemensis*) and Western Pebble-mound Mouse (*Pseudomys chapmani*).
- Significant reptile records included the Pilbara Olive Python (*Morelia olivacea barroni)* and large extensions of range for *Egernia formosa*, *Lerista macropisthopus fusciceps* and *Proablepharus reginae*.
- The recording of the Fortescue grunter (*Leipotherapon aheneus*) from Kookhabinna Creek confirms that this species still persists in the Ashburton catchment, while the large number of fish species present in Kookhabinna Creek demonstrates that it is an important wetland resource and is in good ecological condition.
- The 125 bird species recorded from the Nature Reserve are predominantly representative of an Eyrean assemblage although elements of Torresian and Bassian assemblages were present. The importance of Eyrean birds was highlighted by the large number of species typical of Mulga communities.
- Three bird species of conservation significance have been recorded on the reserve. These were the Grey Falcon (*Falco hypoleucos*), Peregrine Falcon (*Falco peregrinus*) and Grey Honeyeater (*Conopophila whitei*).
- The flora of the Nature Reserve was dominated by species typical of arid inland Australia as demonstrated by the preponderance of *Acacia* and *Eremophila* species.
- Records of botanical conservation significance were made for a number of plant species that were not known from herbarium records, or the scientific literature, prior to the commencement of the biological survey by the Department, including *Wurmbea saccata* and *Sida* sp. Barlee Range (S. van Leeuwen 1642). Other significant flora records were made for *Stylidium weeliwolli*, *Goodenia berringbinensis*, *Pilbara trudgenii* (ms) and *Rhodanthe frenchii*.

## VOLUNTEER ASSIGNMENT

*LANDSCOPE* Expedition Volunteers will be engaged to assist with all aspects of fauna and flora survey work. This will include:

- Pitfall trapping of small mammals and reptiles, including the installation of trapping grids;
- Hand searching and foraging for reptiles, amphibians and terrestrial molluscs;
- Head-torching for nocturnal reptiles;
- Spotlight and acoustic surveys for bats;
- Collection and processing of plants;
- Identification of flora and fauna specimens;
- Maintenance of field notes and logs; and
- Maintaining a photographic record of the Expedition.

Expedition participants will also be expected to assist with general camp duties, including:

- Camp establishment and decommissioning;
- Meal preparation and clean up; and
- Vehicle and generator maintenance.

## FIELD TRAINING

The identification of wildlife in the field is a skilled trade, requiring patience, a good eye, and aids such as field guides and a microscope. Many of our native flora and fauna species look very similar and telling them apart can be a humbling process for even the most experienced biologists. However, identification is a basic skill in field biology and by the end of the Expedition, Volunteers should have a good grasp of the basics. Members will be trained in the use of keys and guides, as well as the use of microscopes and other field equipment. Team leaders will be happy to discuss any aspect of their work.

In addition to identifying plants and animals, Expeditioners will be shown how to set and maintain pit and Elliott traps efficiently, how to handle animals without harming or stressing them, and how to search for those species which are difficult or impossible to trap. This will include some spotlight and head-torch searches at night and searching through leaf litter and other hiding places during the day. Expedition members will also learn how to survey for plants, and the intricacies of processing and pressing specimens to ensure a useable voucher for incorporation into herbaria.

Apart from the team induction undertaken at the commencement of the Expedition, familiarisation of activities and research procedures will be conducted daily. These familiarisation sessions will cover issues such as camp procedures, emergency and first aid injury reporting protocols, safety awareness, daily work schedules, and the outlook for the coming days. At the conclusion of each day an informal synopsis of the activities of the day will be presented, highlighting outcomes and achievements. There will undoubtedly also be numerous informal discussions and information exchange around the campfire before retiring at the end of the day.

## APPLICATION OF RESULTS

Information collected during this *LANDSCOPE* Expedition will augment the body of scientific, especially biological knowledge, now available on the Barlee Range Nature Reserve. Results of the research undertaken during this Expedition will contribute to our knowledge of the biota of the reserve, how this biota is arranged into communities and how these communities are positioned across the landscape. Results from the Expedition will also increase our understanding of the ecology and the processes that influence the biota within the Barlee Range. Information from the Expedition will assist with natural resource management, particularly with respect to the implementation of management actions designed to protect significant flora and fauna and the communities in which they occur. Such management action may include the need for feral animal control programs and fuel reduction burning.

Without the involvement of *LANDSCOPE* Expeditions this re-examination of the Barlee Range Nature Reserve would not be feasible due to practical and logistical considerations. Assistance provided by participants will address these inhibiting considerations, and funds generated through the Expeditions' program will help pay for essential research and future management prescriptions, especially in this remote and logistically challenging region.

## EXPEDITION LEADERS

The leaders participating in this Expedition were part of the core team that undertook the Barlee Range Biological Survey in the early to mid 1990s. The leaders have a long association with biological surveys, ecological research and the management of arid zone ecosystems, particularly in the Pilbara where they have all lived and worked for more than 10 years. A brief résumé of the leaders is as follows:

- **Dr Stephen van Leeuwen** Project Leader and Research Scientist with a strong interest in botanical matters; rare plant conservation, arid zone biogeography and ecological associations, especially in relation to pollination and fire ecology; and an inherent interest in Aboriginal heritage.

- **Dr Peter Kendrick** Leader, Nature Conservation for the Pilbara Region and chief zoologist for the Expedition, has a special interest in the taxonomy, ecology and biogeography of *Lerista*, land snails, small mammals and bats, together with a passion for Aboriginal heritage.
- **Bob Bromilow** Technical Officer with interests in flora and fauna sampling and identification, especially of plants, ants and scorpions together with equipment, vehicle and camp maintenance.
- **Michael Hughes** Technical Officer with interests in flora and the natural history of the Pilbara, particularly from an Aboriginal perspective as Michael has traditional ties to the Hamersley Ranges, which are north of Barlee Range.

## EXPEDITION REPORT AND REUNION

A report on the outcomes of the Expedition will be provided to all participants shortly after the trip. A reunion for all 2002 Expeditions will be held on the evening of Friday 22 November 2002. You will be reminded closer to the date and advised of venue and other arrangements. This will be a great opportunity to see other participants' photographs and review the results of the 2002 *LANDSCOPE* Expeditions' program.

# FIELD LOGISTICS

## RENDEZVOUS

The Expedition will begin in Karratha at 8.30 am on Monday July 22, 2002 and travel to Barlee Range via Nanutarra on the North West Coastal Highway. Volunteers are expected to arrange their own transport to the rendezvous point, the Department's Karratha office. The office is situated on Mardie Road in the Karratha Industrial Estate (located on the main spur road connecting the Karratha townsite to the North West Coastal Highway). There are directional signs indicating the location of the Department's office from the spur road. The phone number for the Karratha office is (08) 9143 1488.

Arrangements will be made to collect those Volunteers arriving at the Karratha airport by commercial flights. If you experience any problems or delays in getting to Karratha on time, or to advise details of flight arrangements if you are travelling to Karratha by air, please contact one of the following people:

- Kevin Kenneally (0407 986 227)
- Jean Paton (0411 029 045)
- Stephen van Leeuwen (08 9185 3173 a/h)

Volunteers driving north are welcome to meet the Expedition at Nanutarra where arrangements can be made to leave non-4WD vehicles, although we recommend travelling on to Karratha where your vehicle can be left in the Department's secure compound.

Participants with 4WD vehicles are welcome to bring them along on the trip and either leave them at the supply depot or use them throughout the Expedition. However, please be aware that the tracks that exist are very rough, and we plan to do extensive overland trips through challenging terrain. These 4WD vehicles must be mechanically sound and suitably equipped, especially with spare tyres and puncture repair kits. (A copy of the *Requirements and Guidelines for LANDSCOPE Expeditions Tag-Alongs* is enclosed for your information.) Use of Volunteers' vehicles throughout the Expedition will be at the owner/s' discretion and any costs, including fuel, will not be covered by *LANDSCOPE* Expeditions. An indication of the willingness and commitment of Volunteers to use their own 4WD vehicles was required at the time of booking for logistical planning purposes.

The main Expedition party plans to arrive at Nanutarra by 1.00 pm on Monday July 22.

## ITINERARY

**Day 1 22/07/02 Monday** **Karratha to Barlee Range Nature Reserve via Nanutarra:**

Depart Karratha and travel via the North West Coastal Highway to Nanutarra for lunch. Have lunch on the banks of the Ashburton River and avail ourselves of the last flushing toilet and primitive shopping facilities for the next 11 days.

After lunch travel east of station track to the Barlee Range and enter the northern part of the Nature Reserve via Kookhabinna Creek. Establish a supply depot on the outwash area of Kookhabinna Gorge.

| | | | |
|---|---|---|---|
| **Day 2** | **23/07/02** | **Tuesday** | **Kookhabinna Creek Supply Depot:**<br>Continue establishing the supply depot and open several trapping grids in the vicinity of Kookhabinna Creek.<br>In the afternoon travel to Goodman Pool and explore the beginnings of Kookhabinna Gorge. |
| **Day 3** | **24/07/02** | **Wednesday** | **Kookhabinna Creek Supply Depot:**<br>Service trapping grids on our way to Goodman Pool before crossing Kookhabinna Creek and travelling up onto the eastern parts of the Fitzgerald Range plateau above Kookhabinna Gorge. Visit the swamp in Kookhabinna Gorge and explore range country to the east.<br>Return to supply depot in the late afternoon. |
| **Day 4** | **25/07/02** | **Thursday** | **Kookhabinna Creek Supply Depot to Top of Range:**<br>Pack vehicles and equipment for a two-night camp-out on top of the western part of the Fitzgerald Range plateau. Close trapping grids on way to the top of the range. |
| **Day 5** | **26/07/02** | **Friday** | **Top of the Range:**<br>Pack up camp and visit new sites and waterholes along Kookhabinna Gorge from the top of the range. |
| **Day 6** | **27/07/02** | **Saturday** | **Top of the Range to Supply Depot:**<br>Pack up camp and return to supply depot arriving mid-afternoon to swim in refreshing waterholes. Re-open trapping grid if time permits. |
| **Day 7** | **28/07/02** | **Sunday** | **Supply Depot:**<br>Resupply, refuel and repair vehicles in the morning and service opened trapping grids before visiting a magnificent woodland of Creekline mini-ritchie (*Acacia cyperophylla*) and Aboriginal stone arrangement sites in the afternoon. A visit to Old Ullawarra may also be possible. |
| **Day 8** | **29/07/02** | **Monday** | **Supply Depot to Emu Spring:**<br>Pack vehicles with supplies for a two-night camp-out on the western side of the Nature Reserve.<br>Depart supply depot and travel via Wongida Creek to Emu Spring. View a magnificent petroglyph gallery and experience some very rough terrain. |

**Day 9 30/07/02 Tuesday** **Emu Spring to Yadjiyugga Claypan:**

Depart Emu Spring and backtrack to the Yadjiyugga Claypan with its sentinel coolibahs and impressive Fitzgerald Range backdrop. Take the opportunity to visit the abandoned Joy Helen Mine and tranquil Dusty Camp on the Henry River.

**Day 10 31/07/02 Wednesday** **Yadjiyugga Claypan to Supply Depot:**

Depart the Yadjiyugga Claypan and backtrack to the supply depot in Kookhabinna Gorge visiting Wongida Creek on the way.

**Day 11 01/08/02 Thursday** **Supply Depot to Karratha:**

Pack up our gear and depart for Karratha. We will endeavour to return to Karratha in the late afternoon so that people can arrive at their accommodation in daylight.

**THIS ITINERARY IS PROVISIONAL AND MAY BE VARIED AT THE DISCRETION OF THE EXPEDITION LEADERS**

## DAILY SCHEDULE (DEPENDENT ON WEATHER)

By its very nature, biological surveying is a repetitive business, especially with respect to fauna sampling. Traps are set and checked each day to retrieve the live animals that have been caught. The captured animals are identified and recorded, then returned to their point of capture if they are not required as specimens. This pattern will be repeated each morning throughout the trip when pitfall and Elliott traps are in use. Likewise, searching for creatures by hand constantly tests the ingenuity of the survey team, with many a memorable pursuit through the spinifex in the wake of some sly reptile to liven up the day.

Botanical collecting requires a keen eye and some patience, especially with respect to the processing of specimens. Collecting will occur opportunistically throughout the trip. Collecting of plants is a great excuse to visit many interesting areas. However, the collections need to be processed for pressing and this is an activity we will share among the team.

The daily routine will demand a reasonably early start each morning. Traps will need to be checked before the heat of the sun threatens any captured animals, and bird watching is best early in the morning. An early breakfast, then on the road by 0700 hours should leave people with enough energy to do some nocturnal fauna work in the evenings.

## TEAM DEVELOPMENT

Team members will have the opportunity to meet each other and the Expedition leaders during the journey from Karratha. We will stop regularly and mix people between vehicles so that we get to know each other. There will be time for members to concentrate upon whatever aspect of the survey they wish (for example, bird watching), as well as working in small groups on other tasks. A rotation of members will be developed so that participants have an opportunity to work with each of the leaders. Once established at a campsite, the team will have to work closely together to ensure that the camp and specimen preparation areas operate cleanly and efficiently.

## ACCOMMODATION

Camping will be outdoors under the magnificent southern skies in bush camps. The bush camps are attractive and close to where we will be working. Swags and groundsheets will be provided, as will mosquito nets. Large tarpaulins will be available should the weather turn inclement and protection from the elements be required. The tarpaulin will provide shade and a storage area for equipment during the day. Power will be supplied by a generator and water refills will be collected from permanent pools in the creek.

## FOOD AND DRINK

Food will be provided. Participants and leaders will share in the preparation of daily meals on a rotational basis. If you have any special dietary requirements, you must contact Jean Paton by Monday July 1, 2002 (08 9334 0401; 0411 029 045) to ascertain whether they can be accommodated. Tea, coffee, hot chocolate and cordial will be provided.

Remember to drink plenty of water during the day. All water will be purified. Do not drink water from unpurified sources. Always have your water bottle in your daypack—fill it the night before from the containers in camp containing already purified water. It is a good idea to put some Staminade powder in your water bottle for the first few days, particularly if you suffer from heat stress or are coming from cool southerly regions. You don't have to bring the jar—just measure some out into a zip top plastic bag.

Any alcoholic drinks other than a limited supply of table wine will be at your own expense. Such alcoholic drinks need to be brought with you or ordered from Stephen van Leeuwen (08 9143 1628) prior to departure on the trip. There will be **NO OPPORTUNITY** to purchase drinks prior to our departure from Karratha on Monday morning.

## PHYSICAL CONDITION

The Expedition will not demand an elite level of fitness, although some long walks are planned. Some level of physical fitness is also required to set up the trapping grids and service them each day. Expeditioners should be prepared to cope with warm days (24 to 38°C) and cool nights (5 to15°C).

Spinifex is a dominant vegetation type, so long pants and boots that protect your ankles are recommended. If you prefer shorts, bring some canvas gaiters to protect your shins. Remember that spinifex spines are very hard and sharp and can easily penetrate all but the strongest materials. The open fabric of many jogging shoes is no barrier to these spines, hence leather boots are recommended. There will be as much walking, exploring and searching as you want, so ensure that you have comfortable, solid shoes or boots. Comfortable light shoes to wear in camp or in the evenings are a must.

## MEDICAL ADVICE

The greatest danger to your health will be sunburn, so protect yourself with loose, long-sleeved shirts and long pants, a wide brimmed hat, sunglasses, at least 15+ sunscreen and lip-screen sunblock. Insect repellent is also recommended, as mosquitoes and flies can be a nuisance. These pests are not usually in evidence during our northern winters, but unseasonal conditions can sometimes lead to their unexpected presence. The Expedition will carry a comprehensive first aid kit.

## FIELD COMMUNICATIONS

Expedition leaders will be in daily contact with the Department's Karratha Regional Office as a safety precaution, and for the transfer of messages. The Department's Pilbara office telephone number is (08) 9143 1488; in an emergency situation messages may be relayed through this office during normal office hours (Monday to Friday, 0800 - 1700). Outside office hours please contact Kevin Kenneally (0407 986 227), Jean Paton (0411 029 045) or Peter Moore (08) 9185 1812.

For use in emergency situations only Expedition leaders will carry a satellite telephone.

All *LANDSCOPE* Expedition vehicles will also be equipped with VHF radios to facilitate communications between drivers, especially while working away from camp and negotiating rough terrain.

# ADVANCE PREPARATION

## FIELD SUPPLIES

Bring at least two changes of bush clothes, including a warm jacket for the evenings and a light raincoat. Laundry facilities will be a bucket, so bring enough clothes to get you through in comfort. There will be no opportunity for purchasing last minute items once we depart from Karratha. Make sure you have everything you need before we arrive at Barlee Range. Don't forget to bring plenty of film. Binoculars and field guides are recommended for those with an interest in birdlife. You may wish to include a large, sturdy plastic garbage bag with ties to protect your bag from dust during transport.

| | CHECK LIST - CHECK EACH ITEM CAREFULLY |
|---|---|
| ☐ | Sturdy, comfortable, worn-in walking boots with good tread |
| ☐ | Light shoes for around camp |
| ☐ | Underwear; include thick walking socks |
| ☐ | Long trousers, loose and tough |
| ☐ | Shorts |
| ☐ | Cool, long-sleeved and loose-fitting shirts |
| ☐ | Casual clothing for around camp and for travelling |
| ☐ | T-shirt to wear, and a spare for night |
| ☐ | Jumper, jacket or track suit |
| ☐ | Warm beanie or cap for night work |
| ☐ | If bringing own hat, also bring a cord or scarf to anchor it |
| ☐ | Fly net to drop over hat (essential) |
| ☐ | Leggings (gaiters or spats-optional) - essential if wearing shorts |
| ☐ | Canvas garden gloves |
| ☐ | Sleeping bag (loan bags available if required) |
| ☐ | Sleeping bag sheet, protects the bag and adds warmth |
| ☐ | Small pillow |
| ☐ | 1 litre leak proof water bottle |
| ☐ | Toiletries, including tissues |
| ☐ | Towel and hand towel; Chux or Wet Ones |
| ☐ | Self-closing (zip-lock) small plastic bags |
| ☐ | Insect repellent and sunscreen |
| ☐ | Personal first aid, including bandaids for tender feet |
| ☐ | Prescription medicine, spectacles, etc. |
| ☐ | Matches or lighter |
| ☐ | Torch and batteries, small and light-weight (spare batteries and globes are essential). A **head-torch** is preferable (Petzl brand or similar) as it leaves both hands free. |
| ☐ | Daypack to carry camera, water bottle, etc during the day and for use on the vehicle |
| ☐ | Camera and film |
| ☐ | Sunglasses and binoculars |
| ☐ | Notebook and pen |
| ☐ | Small compass, whistle |
| ☐ | Pocket knife |
| ☐ | Lots of enthusiasm and smiles |

*LANDSCOPE* Expeditions will supply a canvas bag for your gear, a Conservation and Land Management Volunteer hat, a stubby holder and a thermal mug.

## READING AND REFERENCE LIST

A reference library will be carried in one of the support vehicles to assist with flora and fauna identifications during the Expedition.

The books and articles listed below are suggested reading to provide participants with an introduction to the study area and survey.

Beard, J.S. (1980). A new phytogeographic map for Western Australia. *Western Australian Herbarium Research Notes*, 3: 37-58.

Beard, J.S. (1990). *Plant Life of Western Australia*. Kangaroo Press, New South Wales.

Cogger, H.G. (1996). *Reptiles and Amphibians of Australia*. Reed International, Melbourne.

Jessop, J. (ed). (1985). *Flora of Central Australia*. Reed Publishing.

Mitchell, A.A. and Wilcox, D.G. (1994). *Arid Shrubland Plants of Western Australia*. University of Western Australia Press, Perth.

Storr, G.M., Smith, L. and Johnstone, R.E. (1981). *Lizards of Western Australia I: Skinks*. University of Western Australia Press, Perth.

Storr, G.M., Smith, L. and Johnstone, R.E. (1983). *Lizards of Western Australia II: Dragons and Monitors*. Western Australian Museum, Perth.

Storr, G.M., Smith, L. and Johnstone, R.E. (1986). *Snakes of Western Australia*. Western Australian Museum, Perth.

Storr, G.M., Smith, L. and Johnstone, R.E. (1990). *Lizards of Western Australia III: Geckos and Pygopods.* Western Australian Museum, Perth.

Strahan, R. (ed). (1995). *The Mammals of Australia*. Australian Museum / Reed Books.

Triggs, B. (1997). *Tracks, Scats and Other Traces: A field guide to Australian mammals.* Oxford University Press.

Tyler, M.J., Smith, L.A. and Johnstone, R.E. (1984). *Frogs of Western Australia*. Western Australian Museum, Perth.

Wells, B. and Wells, B. (1982). *The Wild Pilbara, Iron Country and its Natural Wonders.* Jaycees Community Foundation.

Wilson, S.K. and Knowles, D.G. (1988). *Australia's Reptiles: A photographic reference to the terrestrial reptiles of Australia*. Collins Australia, Sydney.

# APPENDICES: FLORA AND FAUNA LISTS

# APPENDIX 1 FLORA LIST

| Taxon |
|---|
| **ADIANTACEAE** |
| *Cheilanthes austrotenuifolia* |
| *Cheilanthes brownii* |
| *Cheilanthes sieberi* subsp. *sieberi* |
| **MARSILEACEAE** |
| *Marsilea hirsuta* |
| *Marsilea mutica* |
| **TYPHACEAE** |
| *Typha domingensis* |
| **POTAMOGETONACEAE** |
| *Potamogeton tricarinatus* |
| *Ruppia polycarpa* |
| **NAJADACEAE** |
| *Najas marina* |
| *Najas tenuifolia* |
| *Najas* sp. (R.D. Royce 6582) |
| **HYDROCHARITACEAE** |
| *Vallisneria nana* |
| **POACEAE** |
| *Aristida burbidgeae* |
| *Aristida contorta* |
| *Brachyachne prostrata* |
| * *Cenchrus ciliaris* |
| *Cymbopogon ambiguus* |
| *Cymbopogon bombycinus* |
| *Cymbopogon obtectus* |
| *Dactyloctenium radulans* |
| *Dichanthium sericeum* subsp. *humilius* |
| *Digitaria brownii* |
| *Digitaria ctenantha* |
| *Elytrophorus spicatus* |
| *Enneapogon caerulescens* |
| *Enneapogon polyphyllus* |
| *Enneapogon* sp. (SVL 1382) |
| *Enteropogon acicularis* |
| *Eragrostis cumingii* |
| *Eragrostis dielsii* |
| *Eragrostis eriopoda* |
| *Eragrostis setifolia* |
| *Eragrostis tenellula* |
| *Eragrostis xerophila* |
| *Eriachne aristidea* |
| *Eriachne benthamii* |
| *Eriachne flaccida* |
| *Eriachne mucronata* |
| *Eriachne pulchella* subsp. *dominii* |
| *Eulalia aurea* |
| *Leptochloa fusca* |
| *Panicum laevinode* |
| *Paraneurachne muelleri* |
| *Paspalidium rarum* |
| *Perotis rara* |
| *Psammagrostis wiseana* |
| *Setaria dielsii* |
| * *Setaria verticillata* |
| *Sporobolus australasicus* |
| *Tragus australianus* |
| *Triodia epactia* |
| *Triodia longiceps* |
| *Triodia* aff. *plurinervata* (SVL 2227) |
| *Triodia wiseana* |
| *Triodia* sp. (SVL 1384) |
| *Triodia* sp. (SVL 556) |
| *Triraphis mollis* |
| *Yakirra australiensis* |
| **CYPERACEAE** |
| *Bulbostylis barbata* |
| *Cyperus bifax* |
| *Cyperus cunninghamii* subsp. *cunninghamii* |
| *Cyperus difformis* |
| *Cyperus hesperius* |
| *Cyperus iria* |
| *Cyperus squarrosus* |
| *Cyperus vaginatus* |
| *Cyperus* sp. (SVL 2145) |
| *Eleocharis atropurpurea* |
| *Eleocharis geniculata* |
| *Fimbristylis* aff. *microcarya* |
| *Fimbristylis* sp. (SVL 1803) |
| *Lipocarpha microcephala* |
| *Schoenoplectus laevis* |
| *Schoenoplectus subulatus* |
| **COMMELINACEAE** |
| *Commelina ensifolia* |
| **ASPHODELACEAE** |
| * *Asphodelus fistulosus* |
| *Bulbine semibarbata* |
| **COLCHICACEAE** |
| *Wurmbea saccata* |
| **MORACEAE** |
| *Ficus platypoda* var. *lachnocaulos* |
| *Ficus platypoda* var. *minor* |
| **URTICACEAE** |
| *Parietaria debilis* |
| **PROTEACEAE** |
| *Grevillea stenobotrya* |
| *Hakea lorea* |
| *Hakea preissii* |
| **SANTALACEAE** |
| *Santalum lanceolatum* |
| **LORANTHACEAE** |
| *Amyema fitzgeraldii* |
| *Amyema gibberula* var. *gibberula* |
| *Amyema hilliana* |
| *Amyema preissii* |
| *Lysiana* aff. *casuarinae* (green berry) (SVL 1857) |
| **POLYGONACEAE** |
| * *Acetosa vesicaria* |
| *Persicaria attenuata* subsp. *Attenuata* |
| **CHENOPODIACEAE** |
| *Atriplex codonocarpa* |
| *Atriplex semilunaris* |
| *Chenopodium cristatum* |

| Taxon |
|---|
| *Chenopodium melanocarpum* forma *melanocarpum* |
| *Chenopodium melanocarpum* forma *leucocarpum* |
| *Dissocarpus paradoxus* |
| *Dysphania glomulifera* subsp. *eremaea* |
| *Dysphania kalpari* |
| *Dysphania rhadinostachya* subsp. *inflata* |
| *Dysphania rhadinostachya* subsp. *rhadinostachya* |
| *Enchylaena tomentosa* |
| *Maireana carnosa* |
| *Maireana georgei* |
| *Maireana melanocoma* |
| *Maireana planifolia* |
| *Maireana thesioides* |
| *Maireana tomentosa* |
| *Maireana triptera* |
| *Maireana ? villosa* (SVL 1409) |
| *Rhagodia eremaea* |
| *Salsola tragus* |
| *Sclerolaena beaugleholei* |
| *Sclerolaena costata* |
| *Sclerolaena cuneata* |
| *Sclerolaena densiflora* |
| *Sclerolaena eriacantha* |
| *Sclerolaena medicaginoides* |
| *Sclerostegia disarticulata* |
| *Tecticornia verrucosa* |
| **AMARANTHACEAE** |
| * *Aerva javanica* |
| *Alternanthera nodiflora* |
| *Amaranthus mitchellii* |
| *Amaranthus pallidiflorus* |
| *Gomphrena affinis* subsp. *pilbarensis* |
| *Gomphrena canescens* subsp. *canescens* |
| *Gomphrena cunninghamii* |
| *Ptilotus aervoides* |
| *Ptilotus astrolasius* |
| *Ptilotus auriculifolius* |
| *Ptilotus axillaris* |
| *Ptilotus calostachyus* |
| *Ptilotus carinatus* |
| *Ptilotus clementii* |
| *Ptilotus drummondii* |
| *Ptilotus exaltatus* |
| *Ptilotus fusiformis* |
| *Ptilotus gaudichaudii* |
| *Ptilotus gomphrenoides* var. *gomphrenoides* |
| *Ptilotus helipteroides* |
| *Ptilotus macrocephalus* |
| *Ptilotus murrayi* |
| *Ptilotus obovatus* |
| *Ptilotus polakii* |
| *Ptilotus polystachyus* |
| *Ptilotus schwartzii* |
| **NYCTAGINACEAE** |
| *Boerhavia coccinea* |
| *Boerhavia schomburgkiana* |
| *Commicarpus australis* |
| **GYROSTEMONACEAE** |
| *Codonocarpus cotinifolius* |
| **AIZOACEAE** |
| *Trianthema glossostigma* |
| *Trianthema pilosa* |
| *Trianthema triquetra* |
| *Trianthema turgidifolia* |
| *Zaleya galericulata* |
| **MOLLUGINACEAE** |
| *Glinus lotoides* |
| *Glinus oppositifolius* |
| *Mollugo molluginis* |
| **PORTULACACEAE** |
| *Calandrinia polyandra* |
| *Calandrinia ptychosperma* |
| *Calandrinia schistorhiza* |
| *Calandrinia* sp. (SVL 2134) |
| *Portulaca conspicua* |
| *Portulaca oleracea* |
| **CARYOPHYLLACEAE** |
| *Polycarpaea corymbosa* |
| *Polycarpaea holtzei* |
| *Polycarpaea longiflora* |
| **LAURACEAE** |
| *Cassytha filiformis* |
| **PAPAVERACEAE** |
| * *Argemone ochroleuca* |
| **CAPPARACEAE** |
| *Capparis lasiantha* |
| *Capparis spinosa* var. *nummularia* |
| *Cleome viscosa* |
| **BRASSICACEAE** |
| *Lepidium muelleri-ferdinandii* |
| *Lepidium oxytrichum* |
| *Lepidium pedicellosum* |
| *Lepidium phlebopetalum* |
| *Lepidium pholidogynum* |
| *Lepidium platypetalum* |
| *Stenopetalum anfractum* |
| **DROSERACEAE** |
| *Drosera indica* |
| **SURIANACEAE** |
| *Stylobasium spathulatum* |
| **MIMOSACEAE** |
| *Acacia acradenia* |
| *Acacia adoxa* var. *adoxa* |
| *Acacia ampliceps* |
| *Acacia ancistrocarpa* |
| *Acacia aneura* var. *aneura* |
| *Acacia* aff. *arida* 'Type 1 – linear-narrowly oblong' (SVL 2280) |
| *Acacia* aff. *arida* 'Type 2 – broad oblanceolate' (SVL 2554) |
| *Acacia bivenosa* |
| *Acacia bivenosa* x *sclerosperma* |
| *Acacia citrinoviridis* |
| *Acacia ? coolgardiensis* subsp. *effusa* (SVL 1353) |
| *Acacia coriacea* subsp. *pendens* |
| *Acacia cowleana* |
| *Acacia cyperophylla* |
| *Acacia demissa* |
| *Acacia* aff. *eriopoda* 'Type 1 - linear narrow' (SVL 1767) |
| *Acacia* aff. *eriopoda* 'Type 2 - linear broad' (SVL 1768) |
| *Acacia farnesiana* |
| *Acacia kempeana* |
| *Acacia ligulata* |
| *Acacia maitlandii* |
| *Acacia marramamba* |
| *Acacia pruinocarpa* |
| *Acacia pyrifolia* |
| *Acacia quadrimarginea* |
| *Acacia retivenea* subsp. *clandestina* |
| *Acacia rhodophloia* |
| *Acacia* aff. *rhodophloia* (SVL 1759) |
| *Acacia sclerosperma* |
| *Acacia stowardii* |
| *Acacia subtessarogona* |

| Taxon | Taxon |
|---|---|

*Acacia synchronicia*
*Acacia tetragonophylla*
*Acacia trachycarpa*
*Acacia victoriae*
*Acacia wanyu*
*Acacia xiphophylla*
*Acacia* aff. *xiphophylla* (SVL 2167)
*Acacia* sp. nov. "Barlee Range 1" (SVL 1671)
*Acacia* sp. nov. "Barlee Range 2 (Section Juliflorae)" (SVL 1672)
*Neptunia dimorphantha*

**CAESALPINIACEAE**

*Petalostylis labicheoides*
*Senna artemisioides* subsp. *helmsii*
*Senna artemisioides* subsp. *oligophylla*
*Senna artemisioides* subsp. aff. *oligophylla* (SVL 1382)
*Senna artemisioides* subsp. x *sturtii*
*Senna glutinosa* subsp. *chatelainiana*
*Senna glutinosa* subsp. *glutinosa*
*Senna glutinosa* subsp. x *luerssenii*
*Senna glutinosa* subsp. *pruinosa*
*Senna notabilis*
*Senna pilocarina*
*Senna stricta*
*Senna symonii*
*Senna ? symonii* (SVL 1520)
*Senna venusta*

**PAPILIONACEAE**

*Aeschynomene indica*
*Crotalaria cunninghamii*
*Crotalaria medicaginea*
*Crotalaria novae-hollandiae*
*Cullen cinereum*
*Cullen leucanthum*
*Cullen leucochaites*
*Cullen martinii*
*Cullen patens*
*Cullen lachnostachys*
*Gastrolobium grandiflorum*
*Glycine canescens*
*Gompholobium polyzygum*
*Indigofera colutea*
*Indigofera decipiens* ms
*Indigofera fractiflexa* ms
*Indigofera* cf. *fractiflexa* (ms) (SVL 1630)
*Indigofera georgei*
*Indigofera monophylla*
*Indigofera* sp. (R.D. Royce 6539)
*Indigofera* sp. nov. (SVL 2190)
*Isotropis atropurpurea*
*Lotus cruentus*
*Rhynchosia minima*
*Rhynchosia* sp. Bungaroo Creek (M.E. Trudgen 12402)
*Sesbania cannabina*
*Sesbania formosa*
*Swainsona complanata*
*Swainsona decurrens*
*Swainsona forrestii*
*Swainsona incei*
*Swainsona kingii*
*Swainsona leeana*
*Swainsona maccullochiana*
*Templetonia egena*
*Tephrosia clementii*
*Tephrosia densa* ms
*Tephrosia rosea* var. *clementii*
*Tephrosia rosea* var. *glabrior* ms
*Tephrosia uniovulata*
*Tephrosia* sp. Hamersley Range (SVL 1820)
*Tephrosia* sp. nov. (SVL 2205)
*Tephrosia* sp. nov. (SVL 2292)
*Vigna lanceolata*

**GERANIACEAE**

* *Erodium aureum*

**ZYGOPHYLLACEAE**

*Tribulus astrocarpus*
*Tribulus hirsutus*
*Tribulus macrocarpus*
*Tribulus occidentalis*
*Tribulus platypterus*
*Tribulus suberosus*
*Tribulus terrestris*
*Tribulus* aff. *terrestris* (R.D. Royce 6525)
*Zygophyllum iodocarpum*
*Zygophyllum* aff. *kochii* (SVL 2160)
*Zygophyllum retivalve*
*Zygophyllum simile*

**POLYGALACEAE**

*Polygala isingii*

**EUPHORBIACEAE**

*Adriana tomentosa*
*Euphorbia australis*
*Euphorbia boophthona*
*Euphorbia drummondii*
*Euphorbia schultzii*
*Euphorbia tannensis* subsp. *eremophila*
*Leptopus decaisnei*
*Phyllanthus lacunellus*
*Phyllanthus maderaspatensis*
*Phyllanthus* sp. (R.D. Royce 6521)
*Sauropus* sp. nov. Dairy Creek (R.J. Cranfield 9716)

**STACKHOUSIACEAE**

*Stackhousia intermedia*
*Stackhousia muricata* subsp. annual (W.R. Barker 2172)
*Stackhousia* sp. swollen-gynophore (W.R. Barker 2041)

**SAPINDACEAE**

*Diplopeltis stuartii* var. *stuartii*
*Dodonaea lanceolata*
*Dodonaea pachyneura*
*Dodonaea petiolaris*
*Dodonaea viscosa* subsp. *spatulata*

**TILIACEAE**

*Corchorus crozophorifolius*
*Corchorus laniflorus*
*Corchorus sidoides*
*Corchorus tridens*
*Triumfetta chaetocarpa*
*Triumfetta clementii*
*Triumfetta maconochieana*

**MALVACEAE**

*Abutilon amplum*
*Abutilon cunninghamii*
*Abutilon dioicum* ms
*Abutilon fraseri*
*Abutilon lepidum*
*Abutilon otocarpum*
*Abutilon oxycarpum*
*Abutilon* sp. nov. (lepidum group) (SVL 1721)
*Gossypium robinsonii*
*Hibiscus* aff. *leptocladus* (SVL 1713)
*Hibiscus* aff. *leptocladus* (SVL 2089)
*Hibiscus gardneri* ms
*Hibiscus goldsworthii*
*Hibiscus sturtii* var. *platychlamys*
*Hibiscus sturtii* var. *campylochlamys*
*Hibiscus sturtii* var. *truncatus*

| Taxon |
|---|
| *Lawrencia densiflora* |
| * *Malvastrum americanum* |
| *Sida atrovirens* ms |
| *Sida echinocarpa* |
| *Sida fibulifera* |
| *Sida kingii* |
| *Sida rhombifolia* |
| *Sida rohlenae* |
| *Sida* sp. Barlee Range (S. van Leeuwen 1642) |
| *Sida* sp. spiciform panicles (E. Leyland s.n. 14/8/90) |
| *Sida* sp. nov. (dark green fruit) (SVL 2260) |
| *Sida* sp. nov. (SVL 725) |
| **STERCULIACEAE** |
| *Keraudrenia nephrosperma* |
| *Melhania oblongifolia* |
| *Rulingia kempeana* |
| *Rulingia* sp. (SVL 1658) |
| *Waltheria indica* |
| *Waltheria virgata* |
| **ELATINACEAE** |
| *Bergia pedicellaris* |
| **FRANKENIACEAE** |
| *Frankenia cordata* |
| **VIOLACEAE** |
| *Hybanthus aurantiacus* |
| **LYTHRACEAE** |
| *Ammannia baccifera* |
| *Ammannia multiflora* |
| *Rotala diandra* |
| **MYRTACEAE** |
| *Corymbia candida* subsp. *candida* |
| *Corymbia deserticola* |
| *Corymbia ferriticola* |
| *Corymbia hamersleyana* |
| *Corymbia* aff. *lenziana* (SVL 1828) |
| *Eucalyptus camaldulensis* |
| *Eucalyptus leucophloia* |
| *Eucalyptus victrix* |
| *Eucalyptus xerothermica* |
| *Eucalyptus* sp. (R.D. Royce 6562) |
| *Melaleuca argentea* |
| *Melaleuca cardiophylla* |
| *Melaleuca eleuterostachya* |
| *Melaleuca lasiandra* |
| *Melaleuca linophylla* |
| **HALORAGACEAE** |
| *Haloragis gossei* |
| *Myriophyllum verrucosum* |
| **APIACEAE** |
| *Daucus glochidiatus* |
| *Trachymene oleracea* |
| *Trachymene pilbarensis* |
| **PLUMBAGINACEAE** |
| *Plumbago zeylanica* |
| **OLEACEAE** |
| *Jasminum didymum* subsp. *lineare* |
| **GENTIANACEAE** |
| *Centaurium clementii* |
| *Centaurium spicatum* |

| Taxon |
|---|
| **ASCLEPIADACEAE** |
| *Cynanchum* sp. Hamersley (M.E. Trudgen 2302) |
| *Marsdenia australis* |
| *Rhyncharrhena linearis* |
| *Sarcostemma viminale* subsp. *australe* |
| *Tylophora flexuosa* |
| Genus sp. inedit (SVL 1826) |
| **CONVOLVULACEAE** |
| *Bonamia rosea* |
| *Convolvulus erubescens* |
| *Evolvulus alsinoides* |
| *Ipomoea diamantinensis* |
| *Ipomoea lonchophylla* |
| *Ipomoea muelleri* |
| *Operculina aequisepala* |
| *Polymeria ambigua* |
| *Porana commixta* |
| **CUSCUTACEAE** |
| *Cuscuta victoriana* |
| **BORAGINACEAE** |
| *Halgania* aff. *solanacea* (SVL 1664) |
| *Heliotropium ammophilum* |
| *Heliotropium chrysocarpum* |
| *Heliotropium crispatum* |
| *Heliotropium curassavicum* |
| *Heliotropium heteranthum* |
| *Trichodesma zeylanicum* |
| **VERBENACEAE** |
| *Clerodendrum floribundum* var. *angustifolium* |
| **LAMIACEAE** |
| *Plectranthus intraterraneus* |
| *Prostanthera albiflora* |
| **SOLANACEAE** |
| * *Datura leichhardtii* |
| *Nicotiana benthamiana* |
| *Nicotiana occidentalis* subsp. *obliqua* |
| *Nicotiana occidentalis* subsp. *occidentalis* |
| *Solanum ashbyae* |
| *Solanum diversiflorum* |
| *Solanum gabrielae* |
| *Solanum horridum* |
| *Solanum lasiophyllum* |
| *Solanum phlomoides* |
| *Solanum sturtianum* |
| **SCROPHULARIACEAE** |
| *Mimulus gracilis* |
| *Peplidium* sp. (SVL 1874) |
| *Stemodia grossa* |
| *Striga curviflora* |
| Genus sp. inedit (R.D. Royce 6581) |
| **ACANTHACEAE** |
| *Dicladanthera forrestii* |
| *Dipteracanthus australasicus* subsp. *australasicus* |
| *Harnieria kempeana* subsp. *muelleri* |
| **MYOPORACEAE** |
| *Eremophila accrescens* ms |
| *Eremophila compacta* |
| *Eremophila conferta* ms |
| *Eremophila cryptothrix* ms |
| *Eremophila cuneifolia* |
| *Eremophila exilifolia* |

| Taxon |
|---|
| *Eremophila falcata* |
| *Eremophila forrestii* |
| *Eremophila fraseri* subsp. *fraseri* ms |
| *Eremophila lachnocalyx* |
| *Eremophila latrobei* subsp. *glabra* ms |
| *Eremophila latrobei* subsp. *latrobei* ms |
| *Eremophila longifolia* |
| *Eremophila oppositifolia* subsp. *angustifolia* |
| *Eremophila phyllopoda* subsp. *phyllopoda* ms |
| *Eremophila phyllopoda* subsp. *obliqua* ms |
| *Eremophila platycalyx* |
| *Eremophila reticulata* ms |
| *Eremophila* sp. nov. (SVL 2306) |
| **RUBIACEAE** |
| *Oldenlandia crouchiana* |
| *Psydrax latifolia* ms |
| *Psydrax suaveolens* ms |
| *Synaptantha tillaeacea* |
| **CUCURBITACEAE** |
| *Cucumis* sp. (SVL 1777) |
| *Mukia maderaspatana* |
| **CAMPANULACEAE** |
| *Wahlenbergia tumidifructa* |
| **LOBELIACEAE** |
| *Lobelia heterophylla* |
| **GOODENIACEAE** |
| *Dampiera candicans* |
| *Goodenia berringbinensis* |
| *Goodenia forrestii* |
| *Goodenia microptera* |
| *Goodenia nuda* |
| *Goodenia stobbsiana* |
| *Goodenia tenuiloba* |
| *Scaevola acacioides* |
| *Scaevola* sp. nov. Barlee Range (SVL 2192) |
| *Scaevola spinescens* |
| **STYLIDIACEAE** |
| *Stylidium fluminense* |
| *Stylidium weeliwolli* |

| Taxon |
|---|
| **ASTERACEAE** |
| *Actinobole oldfieldiana* |
| *Actinobole uliginosum* |
| *Angianthus acrohyalinus* |
| *Angianthus milnei* |
| *Angianthus ? milnei* (SVL 1534) |
| * *Bidens bipinnata* |
| *Blumea tenella* |
| *Brachyscome ciliocarpa* |
| *Brachyscome* aff. *iberidifolia* (SVL 2202) |
| *Calocephalus knappii* |
| *Calocephalus* sp. Pilbara-Desert (M.E. Trudgen 11454) |
| *Calotis hispidula* |
| *Calotis multicaulis* |
| *Calotis plumulifera* |
| *Calotis* sp. (R.D. Royce 6606) |
| *Centipeda minima* |
| *Decazesia hecatocephala* |
| *Dichromochlamys dentatifolia* |
| *Erymophyllum compactum* |
| *Flaveria australasica* |
| *Gnephosis arachnoidea* |
| *Gnephosis brevifolia* |
| *Haptotrichion conicum* |
| *Ixiochlamys cuneifolia* |
| *Olearia xerophila* |
| *Pilbara trudgenii* ms |
| *Pluchea dentex* |
| *Pluchea rubelliflora* |
| *Pterocaulon sphacelatum* |
| *Rhodanthe floribunda* |
| *Rhodanthe forrestii* |
| *Rhodanthe frenchii* |
| *Rhodanthe margarethae* |
| *Rhodanthe maryonii* |
| *Rhodanthe propinqua* |
| *Rhodanthe stricta* |
| *Schoenia ayersii* |
| *Senecio glossanthus* |
| * *Sonchus oleraceus* |
| *Streptoglossa adscendens* |
| *Streptoglossa bubakii* |
| *Streptoglossa cylindriceps* |
| *Streptoglossa decurrens* |
| *Streptoglossa liatroides* |
| *Streptoglossa odora* |

* Introduced and/or naturalised

# APPENDIX 2 MAMMAL LIST

| Taxon | Taxon |
|---|---|
| **TACHYGLOSSIDAE** | **HIPPOSIDERIDAE** |
| Echidna<br>*Tachyglossus aculeatus* | Orange Leafnosed-bat<br>*Rhinonicteris aurantius* |
| **DASYURIDAE** | **VESPERTILIONIDAE** |
| Little Red Kaluta<br>*Dasykaluta rosamondae*<br>Pilbara Ningaui<br>*Ningaui timealeyi*<br>Common Planigale<br>*Planigale maculata*<br>Woolley's Pseudatechinus<br>*Pseudantechinus woolleyae*<br>Long-tailed Dunnart<br>*Sminthopsis longicaudata*<br>Stripe-faced Dunnart<br>*Sminthopsis macroura* | Gould's Wattled bat<br>*Chalinolobus gouldii*<br>Northwestern Long-eared bat<br>*Nyctophilus bifax daedalus*<br>Little Broad-nosed bat<br>*Scotorepens greyii*<br>Finlayson's Cave bat<br>*Vespadelus finlaysoni* |
| **PHALANGERIDAE** | **MURIDAE** |
| Northern Brushtail Possum<br>*Trichosurus vulpecula arnhemensis* | House mouse<br>*Mus domesticus*<br>Spinifex Hopping mouse<br>*Notomys alexis*<br>Western Pebble-mound mouse<br>*Pseudomys chapmani*<br>Delicate mouse<br>*Pseudomys delicatulus*<br>Sandy Inland mouse<br>*Pseudomys hermannsburgensis*<br>Common Rock rat<br>*Zyzomys argurus* |
| **MACROPODIDAE** | **CANIDAE** |
| Euro<br>*Macropus robustus*<br>Red Kangaroo<br>*Macropus rufus*<br>Rothschild's Rock-wallaby<br>*Petrogale rothschildi* | Dingo<br>*Canis lupus dingo* |
| **PTEROPODIDAE** | **FELIDAE** |
| Black Flying-fox<br>*Pteropus alecto* | Cat<br>*Felis catus* |
| **EMBALLONURIDAE** | **LEPORIDAE** |
| Yellow-bellied Sheathtail-bat<br>*Saccolaimus flaviventris*<br>Common Sheathtail-bat<br>*Taphozous georgianus* | Rabbit<br>*Oryctolagus cuniculus* |
| **MEGADERMATIDAE** | **EQUIDAE** |
| Ghost bat<br>*Macroderma gigas* | Donkey<br>*Equus asinus* |
| **MOLOSSIDAE** | **BOVIDAE** |
| Northern Freetail-bat<br>*Chaerephon jobensis*<br>Beccari's Freetail-bat<br>*Mormopterus beccarii* | European cattle<br>*Bos taurus* |

# APPENDIX 3 REPTILE LIST

| Taxon | Taxon |
|---|---|
| **AGAMIDAE** | *Egernia formosa* |
| *Ctenophorus caudicinctus caudicinctus* | *Lerista bipes* |
| *Ctenophorus isolepis* | *Lerista flammicauda* |
| *Ctenophorus maculatus badius* | *Lerista macropisthopus fusciceps* |
| *Ctenophorus reticulatus* | *Lerista muelleri* |
| *Gemmatophora longirostris* | *Lerista petersoni* |
| *Pogona minor minor* | *Menetia greyii* |
| **GEKKONIDAE** | *Menetia surda* |
| *Diplodactylus conspicillatus* | *Morethia ruficauda exquisita* |
| *Diplodactylus elderi* | *Notoscincus ornatus* |
| *Diplodactylus jeanae* | *Proablepharus reginae* |
| *Diplodactylus savagei* | *Teliqua multifasciata* |
| *Diplodactylus stenodactylus* | **VARANIDAE** |
| *Diplodactylus wombeyi* | *Varanus acanthurus* |
| *Gehyra punctata* | *Varanus brevicauda* |
| *Gehyra variegata* | *Varanus caudolineatus* |
| *Heteronotia binoei* | *Varanus eremius* |
| *Heteronotia spelea* | *Varanus giganteus* |
| *Oedura marmorata* | *Varanus gouldii* |
| *Rhynchoedura ornata* | *Varanus panoptes rubidis* |
| **PYGOPODIDAE** | *Varanus tristis* |
| *Delma butleri* | **BOIDAE** |
| *Delma pax* | *Aspidites melanocephala* |
| *Lialis burtonis* | *Morelia olivacea barroni* |
| **SCINCIDAE** | **ELAPIDAE** |
| *Carlia munda* | *Demansia psammophis cupreiceps* |
| *Cryptoblepharus plagiocephalus* | *Furina ornata* |
| *Ctenotus duricola* | *Pseudechis australis* |
| *Ctenotus grandis titan* | *Pseudonaja nuchalis* |
| *Ctenotus hanloni* | *Vermicella approximans* |
| *Ctenotus helenae* | *Vermicella bertholdi* |
| *Ctenotus leonhardii* | **TYPHLOPIDAE** |
| *Ctenotus pantherinus ocellifera* | *Ramphotyphlops ammodytes* |
| *Ctenotus rubicundus* | *Ramphotyphlops grypus* |
| *Ctenotus rutilans* | *Ramphotyphlops hamatus* |
| *Ctenotus saxatilis* | |
| *Ctenotus schomburgkii* | |
| *Cyclodomorphus melanops* | |

# APPENDIX 4 AMPHIBIAN LIST

| Taxon |
|---|
| **HYLIDAE AGAMIDAE** |
| *Cyclorana maini* |
| *Litoria rubella* |
| **LEPTODACTYLIDAE** |
| *Neobatrachus aquilonius* |
| *Neobatrachus centralis* |
| *Neobatrachus sutor* |
| *Pseudophryne douglasi* |

# APPENDIX 5 FISH LIST

| Taxon |
|---|
| **CLUPERIDAE** |
| *Nematalosa erebi* |
| **PLOTOSIDAE** |
| *Neosilurus hyrtlii* |
| **MELANOTAENIIDAE** |
| *Melanotaenia splendida australis* |
| **TERAPONIDAE** |
| *Amniataba percoides* |
| *Leipotherapon aheneus* |
| *Leipotherapon unicolor* |
| **GOBIIDAE** |
| *Glossogobius aureus* |

# APPENDIX 6 BIRD LIST

**NON-PASSERINES**

Emu (*Dromaius novaehollandiae*)
Black Swan (*Cygnus atratus*)
Australian Wood Duck (*Chenonetta jubata*)
Pacific Black Duck (*Anas superciliosa*)
Grey Teal (*Anas gracilis*)
Australasian Grebe (*Tachybaptus novaehollandiae*)
Hoary-headed Grebe (*Podiceps cristatus*)
Darter (*Anhinga melanogaster*)
Little Pied Cormorant (*Phalacrocorax melanoleucos*)
Little Black Cormorant (Phalacrocorax sulcirostris)
White-faced Heron (*Egretta novaehollandiae*)
Little Egret (*Egretta garzetta*)
White-necked Heron (*Ardea pacifica*)
Great Egret (*Ardea alba*)
Nankeen Night Heron (*Nycticorax caledonicus*)
Black-shouldered Kite (*Elanus axillaris*)
Black-breasted Buzzard (*Hamirostra melanosternon*)
Spotted Harrier (*Circus assimilis*)
Brown Goshawk (*Accipeter fasciatus*)
Collared Sparrowhawk (*Accipiter cirrhocephalus*)
Wedge-tailed Eagle (*Aquila audax*)
Little Eagle (*Hieraaetus morphnoides*)
Brown Falcon (*Falco berigora*)
Australian Hobby (*Falco longipennis*)
Grey Falcon (*Falco hypoleucos*)
Peregrine Falcon (*Falco peregrinus*)
Nankeen Kestrel (*Falco cenchroides*)
Black-tailed Native-hen (*Gallinula ventralis*)
Eurasian Coot (*Fulica atra*)
Australian Bustard (*Ardeotis australis*)
Little Button-quail (*Turnix velox*)
Bush Stone curlew (*Burhinus grallarinus*)
Black-winged Stilt (*Himantopus himantopus*)
Banded Stilt (*Cladorhynchus leucocephalus*)
Black-fronted Dotterel (*Elseyornis melanops*)
Red-kneed Dotterel (*Erythrogonys cinctus*)
Banded Lapwing (*Vanellus tricolor*)
Whiskered Tern (*Chlidonias hybridus*)
Common Bronzewing (*Phaps chalcoptera*)
Crested Pigeon (*Ocyphaps lophotes*)
Spinifex Pigeon (*Geophaps plumifera*)
Diamond Dove (*Geopelia cuneata*)
Peaceful Dove (*Geopelia striata*)
Galah (*Cacatua roseicapilla*)
Little Corella (*Cacatua sanguinea*)
Cockatiel (*Nymphicus hollandicus*)
Australian Ringneck (*Barnardius zonarius*)
Mulga Parrot (*Psephotus varius*)
Budgerigar (*Melopsittacus undulatus*)
Bourke's Parrot (*Neopsphotus bourkii*)
Elegant Parrot (*Neophema elegans*)
Pallid Cuckoo (*Cuculus pallidus*)
Black-eared Cuckoo (*Chrysococcyx osculans*)
Horsfield's Bronze cuckoo (*Chrysococcyx basalis*)
Pheasant Coucal (*Centropus phasianinus*)
Southern Boobook (*Ninox novaeseelandiae*)
Barn Owl (*Tyto alba*)
Tawny Frogmouth (*Podargus strigoides*)
Spotted Nightjar (*Eurostopodus argus*)
Australian Owlet-nightjar (*Aegotheles cristatus*)
Blue-winged Kookaburra (*Dacelo leachii*)
Red-backed Kingfisher (*Todiramphus pyrrhopygia*)
Sacred Kingfisher (*Todiramphus sanctus*)
Rainbow Bee-Eater (*Merops ornatus*)
Dollarbird (*Eurystomus orientalis*)

**PASSERINES**

Variegated Fairy-wren (*Malurus lamberti*)
White-winged Fairy-wren (*Malurus leucopterus*)
Rufous-crowned Emu-wren (*Stipiturus ruficeps*)
Striated Grasswren (*Amytornis striatus*)
Red-browed Pardalote (*Pardalotus rubricatus*)
Striated Pardalote (*Pardalotus striatus*)
Redthroat (*Pyrrholaemus brunneus*)
Weebill (*Smicrornis brevirostris*)
Western Gerygone (*Gerygone fusca*)
Chestnut-rumped Thornbill (*Acanthiza uropygialis*)
Slaty-backed Thornbill (*Acanthiza robustirostris*)
Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*)
Thornbill sp. (*Acanthiza sp.*)
Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*)
Yellow-throated Miner (*Manorina flavigula*)
Singing Honeyeater (*Lichenostomus virescens*)
Grey-headed Honeyeater (*Lichenostomus keartlandi*)
White-plumed Honeyeater (*Ardea pacifica*)
Brown Honeyeater (*Lichmera indistincta*)
White-fronted Honeyeater (*Phylidonyris albifrons*)
Grey Honeyeater (*Conopophila whitei*)
Black Honeyeater (*Certhionyx niger*)
Pied Honeyeater (*Certhionyx variegatus*)
Crimson Chat (*Ephthianura tricolor*)
Jacky Winter (*Microeca fascinans*)
Red-capped Robin (*Petroica goodenovii*)
Hooded Robin (*Melanodryas cucullata*)
Grey-crowned Babbler (*Pomatostomus temporalis*)
White-browed Babbler (*Pomatostomus superciliosus*)
Cinnamon Quail-thrush (*Cinclosoma cinnamomeum*)
Chestnut-breasted Quail-thrush (*Cinclosoma castaneothorax*)
Varied Sittella (*Daphoenositta chrysoptera*)
Crested Bellbird (*Oreoica gutturalis*)
Rufous Whistler (*Pachycephala rufiventris*)
Grey Shrike-thrush (*Colluricincla harmonica*)
Magpie-lark (*Grallina cyanoleuca*)

Grey Fantail (*Rhipidura fuliginosa*)
Willie Wagtail (*Rhipidura leucophrys*)
Black-faced Cuckoo-shrike (*Coracina novaehollandiae*)
White-winged Triller (*Lalage sueurii*)
Masked Woodswallow (*Artamus personatus*)
Black-faced Woodswallow (*Artamus cinereus*)
Little Woodswallow (*Artamus minor*)
Grey Butcherbird (*Cracticus torquatus*)
Pied Butcherbird (*Cracticus nigrogularis*)
Australian Magpie (*Gymnorhina tibicen*)
Little Crow (*Corvus bennetti*)
Torresian Crow (*Corvus orru*)
Spotted Bowerbird (*Chlamydera maculata*)
Richard's Pipit (*Anthus novaeseelandiae*)
Zebra Finch (*Taeniopygia guttata*)
Painted Finch (*Emblema picta*)
Mistletoebird (*Dicaeum hirundinaceum*)
Tree Martin (*Hirundo nigricans*)
Fairy Martin (*Hirundo ariel*)
Clamorous Reed-Warbler (*Acrocephalus stentoreus*)
Spinifexbird (*Eremiornis carteri*)
Rufous Songlark (*Cincloramphus mathewsi*)
Brown Songlark (*Cincloramphus cruralis*)
Yellow White-eye (*Zosterops luteus*)