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Avian Models for 3D Applications Characters and Procedural Maps by Ken Gilliland

Songbird ReMix Australia Volume I

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Songbird ReMix Australia Volume I Manual

Introduction

Songbird ReMix Australia Volume 1 contains the first half of Australian game birds, parrots, and songbirds from endemic "Doves and Pigeons" to "Whipbirds and Babblers". Featured are such common Australian birds as the Common Bronzewing, the Australian Ringneck Parrot and the Weebil. As with all Songbird Remix volumes, more unusual and endangered birds are also included such as the tiny Mallee Emu-wren that is more tail than bird and the colorful and vivid Rainbow Bee-eater.

Overview and Use

The set is located within the **Animals : Songbird ReMix** folder. Here is where you will find a number of folders, such as **Bird Library**, **Manuals** and **Resources**. Let's look at what is contained in these folders:

- Bird Library: This folder holds the actual species and poses for the "premade" birds. Birds are placed into a "type" folder (such as "Birds of Prey (Order Falconiformes)" which for example would hold falcons, hawks and eagles). The birds for this set can be found in the following folder(s):
 - Cuckoos and relatives (Order Cuculiformes)
 - Kingfishers (Order Coraciiformes)
 - Parrots and Cockatoos (Order Psittaciformes)
 - Perching Birds (Order Passerines)
 - Pigeons and Doves (Order Columbiformes)
- Manuals: Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- Resources: Items in this folder are for creating and customizing your birds
 - Bird Base Models: This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own species of bird. When using physical renderers such as Iray and Superfly, SubD should be turned to at least "3". For DAZ Studios 3Delight renders, the SubD must be turned from the "High Resolution" setting to the "Base" setting (otherwise some areas will render incorrectly transparent).

Poser Use

Select **Figures** in the **Runtime** Folder and go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer *Firefly or Superfly*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the

attached part to access those controls. Associated poses can be found in the same folder- **Bird** Library : (Type) : Poses.

DAZ Studio Use

Go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer (*3Delight or Iray*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**. <u>Note:</u> Using the "Apply this Character to the currently selected Figure(s)" option **will not** properly apply the correct scaling to the bird selected. It is better to delete the existing character first and load the one you want to use.

One Folder to Rule Them All

When I reworked the entire Songbird ReMix library starting in 2018, I decided to abandon the way the birds were sorted (by product name) and choose an Ornithological approach. All birds are found in the Bird Library folder and are arranged by type of bird. This approach is hopefully easier for most to find what bird they are looking for. Admittedly, it will take some getting use to for some longtime users, but I've always approached the Songbird ReMix series as a learning tool as well as a graphics tool, so hopefully some knowledge will rub off by seeing how birds are grouped.

Probably the most deceiving subfolder in the **Bird Library** is **"Perching Birds (Order Passeriformes)".** This is folder you probably will end up "favoriting" because this one folder (Passeriformes) **holds more than 50% of all birds.** Perching birds range from cardinals and jays to chickadees, crow and swallows.



Finding the bird you want within the **"Perching Birds (Order Passeriformes)**" folder can be daunting, even for an experienced birder (such as myself), so I've included an online reference tool within this folder that helps to make your search easier. Click the **"Perching Birds Finder**" icon and when loaded, look at the first column and search for the type of bird you want. For example, I want a "manakin" (a bird

common to Central and South America). Scroll down the first column alphabetically and stop on "manakin". Looking across to the second column, you will now know that manakins can be found in the "Tyrant Flycatchers & their Allies" subfolder.

Physical-based Rendering

Iray and **Superfly** requires more CPU and memory horsepower than the legacy renderers because of ray-trace bounces and higher resolution meshes needed for displacement. Poser's **Superfly** renderer will require that the "Min Transparent Bounces" be set to **at least 16** and that the "Max Transparent Bounces" be set to **at least 32** in render settings. Superfly renders may show artifacts in the head area. This is a known Poser issue and may be addressed in the future. Increasing the SubD may minimize this issue.

Posing & Shaping Considerations

This volume has various species, so when using generic poses not every pose will work perfectly with every bird. You may find that some minor alteration on the stock poses may be warranted.

Here are some of the most common alterations you may need to make:

- Birds will not be flat on the zero plane due to leg size and overall scale.
- Because of the numerous beak shapes, closing the beak may range from 0.5 to 1. Usually 0.8 is about right.
- **Raise Upper Beak** (*in Action Controls*): This morph is a "one size fits all" control. Because of the variety of beak shapes. It may not work with all birds.

IK Concerns

Some poses may go askew when IK is turned on. By default, Poser's IK feature is turned off when loading a bird. To turn it on, select the "Figure" category from the main tool bar and "Use Inverse Kinematics" from the submenu.

By default, DAZ Studio's IK feature is turned on when loading a bird. This will cause the thigh and shin rotations change when the character is moved. The **CTRL K** keypress will turn IK on and off in DAZ Studio. IK doesn't work that well in Studio, so I suggest selecting the character in the **Scene tab** and simply deleting the two IK body parts to remove IK.

Where to Find Your Birds & Poses

Type Folder	Bird Species
Cuckoos and relatives (Order Cuculiformes)	Pallid Cuckoo Pheasant Coucal
Kingfishers (Order Coraciiformes)	Azure Kingfisher Rainbow Bee-eater
Parrots and Cockatoos (Order Psittaciformes)	Australian Ringneck Bourke's Parrots Princess Parrot
Perching Birds (Order Passeriformes) Fairywrens, Scrubwrens & their Allies (Poses for all Passerines can be found in "Universal Poses" & "type" folders)	Gray-crowned Babbler Mallee Emu-wren Splendid Fairy-wren Yellow-rumped Thornbill Weebill White-fronted Honey-eater
Perching Birds (Order Passeriformes) Cuckoo-shrikes & their Allies	Varied Sittella
Perching Birds (Order Passeriformes) Lyrebirds, Bowerbirds & their Allies	Rufous Scrub-bird
Perching Birds (Order Passeriformes) Vireos, Whipbirds & their Allies	Eastern Whipbird
Pigeons and Doves (Order Columbiformes)	Common Bronzewing Diamond Dove

Songbird ReMix Australia Volume One FIELD GUIDE 2711

Australian Birds from Pigeons and Doves to Whipbirds and Babblers and their eco-regions

Australia

Edited from Wikipedia and other sources by Ken Gilliland

In approaching Songbird ReMix Australia, I knew a very little about Australia other than that's the place where Kangaroos, Kookaburras and Koalas come from. As I started the project and writing the manual it came apparent that I needed a crash course in Australian geography and environmental science to accurately create images using my Australian birds. I decided to include this information in the field guides so you too can have an instant reference source when using Songbird ReMix Australia.

The field guide refers to various regions within Australia, so here's a topographical map to help pin point the regions mentioned in the Field Guide.



Environment History

The world is also split into 14 terrestrial habitats of which eight are shared by Australia. The Australian land mass is divided into 85 bioregions and 403 subregions. Each region is a land area made up of a group of interacting ecosystems that are repeated in similar form across the landscape.

Although most of Australia is semi-arid or desert, it includes a diverse range of habitats from alpine heaths to tropical rainforests, and is recognized as a megadiverse country. Because of the continent's great age, extremely variable weather patterns, and long-term geographic isolation, much of Australia's flora and fauna is unique and diverse. About 85% of flowering plants, 84% of mammals, more than 45% of birds, and 89% of in-shore, temperate-zone fish are endemic. Australia has the greatest number of reptiles of any country, with 755 species.

Australian forests often contain a wide variety of eucalyptus trees and are mostly located in higher rainfall regions. Most Australian woody plant species are evergreen and many are adapted to fire and drought, including many eucalypts and acacias. Australia has a rich variety of endemic legume species that thrive in nutrient-poor soils because of their symbiosis with rhizobia bacteria and mycorrhizal fungi. Among wellknown Australian fauna are the monotremes (the platypus and echidna); a host of marsupials, including the kangaroo, koala, and wombat; the saltwater and freshwater crocodiles; and birds such as the emu and the kookaburra. Australia is home to many dangerous animals including some of the most venomous snakes in the world. The dingo was introduced by Austronesian people who traded with Indigenous Australians around 3000 BCE. Many plant and animal species became extinct soon after first human settlement, including the Australian megafauna; others have become extinct since European settlement, among them the Tasmanian tiger (thylacine).

Many of Australia's ecoregions, and the species within those regions, are threatened by human activities and introduced plant and animal species. The federal Environment Protection and Biodiversity Conservation Act 1999 is a legal framework for the protection of threatened species. Numerous protected areas have been created under the national Biodiversity Action Plan to protect and preserve unique ecosystems; 64 wetlands are registered under the Ramsar Convention, and 15 natural World Heritage Sites have been established. Australia was ranked 46th of 149 countries in the world on the 2008 Environmental Performance Index.

Climate change has become an increasing concern in Australia in recent years, with many Australians considering protection of the environment to be the most important issue facing the country. The Australian Government initiated several emission reduction activities. This new awareness led Prime Minister Rudd to his first official act, on his first day in office, ratifying of the Kyoto Environmental Treaty in December 2007. Nevertheless, Australia's carbon dioxide emissions per capita are among the highest in the world, lower than those of only a few other industrialized nations. Rainfall in

Australia has slightly decreased over the past century, both nationwide and for two quadrants of the nation, while annual mean temperatures increased significantly over the past decades. Water restrictions are currently in place in many regions and cities of Australia in response to chronic shortages due to urban population increases and localized drought.

Ecoregions of Australia

Ecoregions in Australia are geographically distinct plant and animal communities, defined by the World Wide Fund for Nature based on geology, soils, climate, and predominant vegetation. They are based heavily upon the Interim Biogeographic Regionalization for Australia (IBRA) regionalization. Like the IBRA, it was developed for use as a planning tool for conservation science, with the goal of establishing a system of nature reserves in each of the ecoregions or bioregions sufficient to preserve biodiversity.

Tropical and subtropical moist broadleaf forests

- Lord Howe Island subtropical forests
- Norfolk Island subtropical forests
- Queensland tropical rain forests

Temperate broadleaf and mixed forests

- Eastern Australian temperate forests
- Southeast Australia temperate forests
- Tasmanian Central Highland forests
- Tasmanian temperate forests
- Tasmanian temperate rain forests

Tropical and subtropical grasslands, savannas, and shrublands

- Arnhem Land tropical savanna
- Brigalow tropical savanna
- Cape York tropical savanna
- Carpentaria tropical savanna
- Einasleigh upland savanna
- Kimberly tropical savanna
- Mitchell grass downs
- Victoria Plains tropical savanna

Temperate grasslands, savannas, and shrublands

- Eastern Australia mulga shrublands
- Southeast Australia temperate savanna

Montane grasslands and shrublands

Australian Alps montane grasslands

Tundra

• Antipodes Subantarctic Islands tundra (Australia, New Zealand)

Mediterranean forests, woodlands, and scrub

- Coolgardie woodlands
- Esperance mallee
- Eyre and York mallee
- Jarrah-Karri forest and shrublands
- Kwongan heathlands
- Mount Lofty woodlands
- Murray-Darling woodlands and mallee
- Naracoorte woodlands
- Southwest Australia savanna
- Southwest Australia woodlands

Deserts and xeric shrublands

- Carnarvon xeric shrublands
- Central Ranges xeric scrub
- Gibson Desert
- Great Sandy-Tanami Desert
- Great Victoria Desert
- Nullarbor Plain xeric shrublands
- Pilbara shrublands
- Simpson Desert
- Tirari-Sturt Stony Desert
- Western Australian mulga shrublands

Victoria Plains Tropical Savanna

This is an area of large plains of dry grassland lying between the Tanami Desert to the south and the wetter, greener grassland to the north towards the coast. Sandstone outcrops rise from the grassland, the most famous of which is the Bungle Bungle Range in Purnululu National Park. The grasslands have long been used for cattle grazing. The climate is wetter in the north (average annual rainfall 1200mm) which receives some coastal monsoonal rain, and drier in the south (average 600mm). The rainy season is between November and March and the whole area is almost completely dry for the rest of the year and the climate is hot with maximum temperatures between 25°C and 35°C year round.

The plain is largely covered with Mitchell Grass scattered with bloodwood eucalyptus trees and large patches of lancewood acacia *(Acacia shirleyi)* woodland. The sandstone outcrops have thinner cover of eucalyptus over hummock grass or heathland scattered with Grevillea and Acacia trees.

There are few endemic species as these grasslands are typical of much of northern Australia at this latitude but the grasslands are nonetheless largely intact and rich in wildlife. Mammals include the large Eastern Wallaroo, Northern Nail-tail Wallaby *(Onychogalea unguifera),* and the Long-tailed Planigale which is the smallest marsupial in the world. The lancewoods are home to the Spectacled Hare-wallaby *(Lagorchestes conspicillatus)*, while the Bungle Bungle has some unique plants and an endemic Lerista skink lizard.

Birds include Australian Bustards, Singing Bushlark, and Red-backed Fairy-wren while there are important populations of Purple-crowned Fairywren *(Malurus coronatus)* along the rivers especially the Victoria. The eucalyptus trees are habitat for Lorikeets, Friarbirds, and Honeyeaters. Termites are a source of food for many of these birds and animals.

Southeast Temperate Forests

Comprising the lowland temperate forests around the Great Dividing Range, the Southeast Australian Temperate Forests comprise a wide variety of vegetation. Unlike the rest of mainland Australia, this region is well-watered with a temperate climate. Wet forest grows along the coast and dry forest and woodland is found inland of the Dividing Range. Avian and mammalian richness is high in this ecoregion, but human impact has been severe. Logging operations and pine plantations dot the wet forests, and farming and grazing has modified the drier vegetation. The major urban centers of Canberra and Melbourne are also located in this ecoregion.

The quintessential Australian genus, Eucalyptus dominates in all better-watered regions of Australia, including the Southeast Australia Temperate Forests. There are approximately 700 species of Eucalyptus, and only seven are found outside Australia. Unlike the rest of mainland Australia, soils here are moderately fertile with a cool temperate climate. Australian temperate eucalyptus forests exhibit a long evolutionary history compared with other continents where glaciation was repeated and extensive. Plant diversity is exceptionally high in the sandstone Grampians Ranges in Victoria, where approximately 1,100 plants, or one-third of Victoria's flora are found in the 1,700 km2 Grampians National Park. Temperate woodlands also contain a high number of endangered plant species, including the button winklewort (*Rutidosis leptorrynchoides*).

Warm-temperate rainforest replaces subtropical rainforest on poorer soils or with increasing altitude and latitude in NSW and Victoria. Cool-temperate rainforests are widespread in Tasmania (Tasmanian temperate rain forests ecoregion) and they can be found scattered from the World Heritage listed Border Ranges National Park and Lamington National Park on the NSW/Queensland border to Otway Ranges, Strzelecki Ranges, Dandenong Ranges and Tarra Bulga in Victoria. In the northern NSW they are usually dominated by Antarctic Beech (Nothofagus moorei), in the southern NSW by Pinkwood (*Eucryphia moorei*) and Coachwood (*Ceratopetalum apetalum*) and in Victoria and Tasmania by Myrtle Beech (*Nothofagus cunninghamii*), Southern Sassafras (*Atherosperma moschatum*) and Mountain Ash (*Eucalyptus regnans*). The montane rainforests of Tasmania are dominated by Tasmanian endemic conifers (mainly

Athrotaxis spp.).They are dominated by ferns such as *Cyathea cooperi, Cyathea australis, Dicksonia Antarctica, Cyathea cunninghamii* and *Cyathea leichhardtiana*

Mallee Woodlands and Shrublands

Mallee is an Aboriginal name for a group of eucalypts which grow to a height of 2 - 9 m and have many stems arising from a swollen woody base known as a lignotuber. They have an umbrella-like leaf canopy and the trees shade 30-70% of the ground.

Several layers of vegetation grow in association with Mallee eucalypts, from large shrubs up to 3 m high to very small grasses and forbs, and ephemerals. There is a lot of bare ground and any leaf litter decomposes slowly in the dry conditions.

Mallee is also a name given to the type of vegetation community in which the Mallee eucalypts grow. Mallee areas are generally very flat, and without hills or tall trees it is very easy to become lost. Some areas of Mallee have expanses of vegetated sand dunes. This probably accounts for the fear of the Mallee felt by many early explorers and settlers.

The Mallee is a complex and sensitive environment. It contains a great diversity of organisms many of which are under threat. Since European settlement one third of all mammal species have disappeared from the Mallee of south-eastern Australia more than a dozen plant species are now considered threatened or rare as a result of clearing and grazing.



Distribution of Mallee Shrublands

Mallee soil is generally sandy and in some areas contains a high proportion of lime. In other areas the soil is quite salty and/or very shallow. It is often covered by a 'crust' of lichens and algae.

In 2001, the area covered by this vegetation group was estimated to be 65% of its pre-1788 coverage. The most extensive extant area of this group in Australia today is found in the Great Victoria Desert. Prior to 1788, the largest area occurred in the Murray-Darling Basin.

Plants of the Murray-Darling woodlands and mallee

Trees		
Eucalyptus gracilis	Yorrel. A mallee eucalypt.	
Eucalyptus oleosa	Giant Mallee. One of the larger mallee trees.	
Eucalyptus socialis	Pointed Mallee. Very common species.	
Eucalyptus anceps	Kangaroo Island Mallee. Somewhat uncommon.	
Myoporum platycarpum	Sugarwood. Common leafy tree to about 6m with small white flowers often quite prolific and long lasting.	
Santalum acuminatum	Quandong. Small tree with edible fruits.	
	Large Shrubs	
Acacia nyssophilla	Wait-a-while. Prickly wattle shrub with attractive globular golden-yellow flowers	
Exocarpus aphylla	Leafless Ballart. Very shady but leafless large shrub.	
Melaleuca lanceolata	Moonah. Dryland bottlebrush flowering plant.	
	Small Shrubs	
<u>Dodonaea attenuata</u>	Narrow-leaf hopbush. While not a true hop, the early settlers nevertheless did make beer from the fruits.	
<u>Eremophila glabra</u>	Common Emu Bush. Very common attractive small shrub with red sigmoidal flowers.	
<u>Eremophila alternifolia</u>	Poverty Bush. Uncommon attractive small shrub with mauve spotted or white sigmoidal flowers.	
<u>Scaevola spinescens</u>	Spiny Fan-Flower. Unusual one-sided fan shaped flowers.	
<u>Senna eremophila</u>	Cassia. Very common small shrub, very attractive when flowering. Yellow pea-like flowers very profuse in good years.	
<u>Westringia rigida</u>	Very common low shrub to about 0.5m with small cylindrical leaves and small white spotted long lasting flowers.	
Beyeria leschenaultii	Felted Wallaby-Bush.	
Smaller Plants		
Atriplex stipitata	Kidney Saltbush. Small dome-shaped shrub with gray green leaves.	
Maireana erioclada	Rosy Bluebush. Attractive wheel-shaped fruits green to pink when fresh.	
Maireana brevifolia	Yanga Bush. Another bluebush with wheel-shaped fruits.	
Olearia magniflora	Mangificent Daisy. Attractive, large purple daisy-like flowering bush	
Rhagodia gaudichaudiana	Cottony Saltbush. Unusual spade shaped leaves.	
Rhagodia nutans	Climbing Saltbush. Unusual lobed leaves but otherwise rather forgettable.	
Teucreum racemosum	Gray Germander. Small plant with distinctive and prolific white flowers.	
Thysanotus baueri	Mallee Fringe-lily. Small, short lived, mauve flowers with long fringes on the petal margins.	
Zygophyllum apiculatum	Gall Weed. Very common low ground cover, large, brilliant green leaves with attractive yellow flowers and unusual ridged fruits. Doesn't deserve the name.	
Zygophyllum aurantiacum	Shrubby Twinleaf. Very common small woody shrub, small twinned leaves with attractive yellow flowers and four-winged fruits.	



The Australian bustards and endangered black-eared miners live within the Mallee forests.

Western Mallee

Western Mallee is roughly defined as the western half of the Mallee biogeographic region. It has an area of 47,636 square kilometres, which is only lightly populated. The main towns are Hyden, Gnowangerup and Lake Grace; lesser towns include Kulin, Ongerup, Duggan, Newdegate, Lake King and Kondinin.

The subregion contains many endemic plant species in the Eucalyptus, Acacia, Proteaceae such as Grevillea, Hakea and Banksia; and various Asteraceae.

It also supports a number of rare or endangered fauna, including some that fall within the critical weight range for predation by foxes. The Pig-footed Bandicoot (*Chaeropus ecaudatus*) and Crescent Nailtail Wallaby (*Onychogalea lunata*) previously occurred in the subregion, but both are now extinct. The Rufous Hare-wallaby (*Lagorchestes hirsutus*) is now extinct in the wild, and a further ten species of mammal are extinct in the subregion. The endangered Red-tailed Phascogale (*Phascogale calura*) still occurs in the region, as do the vulnerable Black-flanked Rock-wallaby (*Petrogale lateralis*) and Heath Rat (*Pseudomys shortridgei*), and the Western Brush Wallaby (*Macropus irma*).

More information of Mallee plants is available from the Australian government.

Mangroves

Mangroves are trees and shrubs that grow in saline coastal habitats in the tropics and subtropics – mainly between latitudes 25° N and 25° S. The saline conditions tolerated by various species range from brackish water, through pure seawater (30 to 40%), to water of over twice the salinity of ocean seawater, where the salt becomes concentrated by evaporation (up to 90%).

There are many species of trees and shrubs adapted to saline conditions. Not all are closely related, and the term "mangrove" may be used for all of them, or more narrowly only for the mangrove family of plants, the Rhizophoraceae, or even more specifically just for mangrove trees of the genus Rhizophora.

Mangroves form a characteristic saline woodland or shrubland habitat, called mangrove swamp, mangrove forest, mangrove or mangal. Mangals are found in depositional coastal environments where fine sediments (often with high organic content) collect in areas protected from high energy wave action. They occur both in estuaries and along open coastlines. Mangroves dominate three quarters of tropical coastlines.

More than fifty species of Rhizophoraceae (Red Mangrove) grow in Australasia with particularly high biodiversity on the island of New Guinea and northern Australia.

Australia has approximately 11,500 km2 of mangroves primarily on the northern and eastern coasts of the continent, with occurrences as far south as Miller's Landing in Wilson's Promontory, Victoria (38°54'S) and Barker Inlet in Adelaide, South Australia.

The Great Victoria Desert

The Great Victoria is the biggest desert in Australia and consists of many small sandhills, grassland plains, areas with a closely packed surface of pebbles (called desert pavement or gibber plains) and salt lakes. It is over 700 km (430 mi) wide (from west to east) and covers an area of 424,400 square km (163,900 sq mi) from the Eastern Goldfields region of Western Australia to the Gawler Ranges in South Australia. The Western Australia Mallee shrub ecoregion lies to the west, the Little Sandy Desert to the northwest, the Gibson Desert and the Central Ranges xeric shrublands to the north, the Tirari and Sturt Stony deserts to the east, while the Nullarbor Plain to the south separates it from the Southern Ocean. Average annual rainfall is low and irregular, ranging from 200 to 250 mm (7.9 to 9.8 in) per year. Thunderstorms are relatively common in the Great Victoria Desert, with an average of 15 - 20 thunderstorms per annum. Summer daytime temperatures range from 32 to 40 °C (90 to 104 °F) while in winter, this falls to 18 to 23 °C (64 to 73 °F).

As this area has never been used for agriculture habitats remain largely undisturbed while parts of the desert are protected areas including Mamungari Conservation Park (formerly known as Unnamed Conservation Park) in South Australia, a large area of pristine arid zone wilderness which possesses cultural significance and is one of the fourteen World Biosphere Reserves in Australia. Habitat is also preserved in the large Aboriginal local government area of Anangu Pitjantjatjara Yankunytjatjara in South Australia and in the Great Victoria Desert Nature Reserve of Western Australia.

Only the hardiest of plants can survive in much of this environment. Between the sand ridges there are areas of wooded steppe consisting of *Eucalyptus gongylocarpa*, *eucalyptus youngiana* and mulga (*Acacia aneura*) shrubs scattered over areas of resilient spinifex grasses particularly *Triodia basedownii*.

Wildlife adapted to these harsh conditions includes few large birds or mammals but the desert does sustain many types of lizard including the vulnerable great desert skink *(Egernia kintorei)* and a number of small marsupials including the Sandhill Dunnart *(Sminthopsis psammophila)* and the vulnerable Crest-tailed Mulgara *(Dasycercus cristicauda)*. One way to survive here is to bury into the sands and there are a number of animals doing that including the endangered Southern Marsupial *Mole (Notoryctes typhlops)*, and the Water-holding Frog. Birds include the Chestnut-breasted Whiteface *(Aphelocephala pectoralis)* found on the eastern edge of the desert and the malleefowl of Mamungari Conservation Park. Predators of the desert include the dingo (as the desert is north of the Dingo Fence) and two large monitor lizards, the perentie *(Varanus giganteus)* and the sand goanna *(Varanus gouldii)*.

The nuclear weapons trials carried out by the United Kingdom at Maralinga and Emu Field in the 1950s and early 1960s has left areas contaminated with plutonium-239 and other radioactive material.

Billabongs

While not an eco-region, billabongs are important areas and are a term familiar even to those outside Australia. Billabong is an Australian word meaning a small lake, specifically an oxbow lake. An oxbow lake or billabong, is a section of still water adjacent to a river, cut off by a change in the watercourse. Billabongs are usually formed when the path of a creek or river changes, leaving the former branch with a dead end. The word, *Billabong*, most likely from the Wiradjuri term "*bilabaŋ*".

Billabongs appear relatively often in Australian literature. One of the most prominent references is in the opening line of Banjo Paterson's famous folk song "Waltzing Matilda".

Plant life in billabongs varying from region to region but certain plants types are usually found there such as Eucalypts, Salix, Typhia, Grevilleas and Banksias.

Songbird ReMix Australia Volume One List of Bird Species

Doves & Pigeons

Diamond Dove Common Bronzewing

Cockatoos and Parrots

Bourke's Parrot Australian Ringneck Princess Parrot

Cuckoos and Coucals

Pallid Cuckoo Pheasant Coucal

Kingfishers & Kookaburras

Azure Kingfisher

Bee-eaters, Rollers and Pittas Rainbow Bee-eater

Lyrebirds and Scrub-birds Rufous Scrub-bird

Sittellas and Treecreepers Varied Sittella

Fairy-wrens and their allies

Splendid Fairy-wren Mallee Emu-wren

Pardalotes, Bristlebirds, Scrubwrens, Gerygones and Thornbills

Weebill Yellow-rumped Thornbill

Honeyeaters and Australian Chats

White-fronted Honeyeater

Whipbirds, Wedgebills, Quail-thrushes and Babblers

Eastern Whipbird Gray-crowned Babbler

Common Name: Diamond Dove **Scientific Name:** *Geopelia cuneata*

Size: 7.5-9.4 inches (19-24 cm)

Habitat: Australia; endemic to the arid interior of Australia. It largely absent from southwestern Western Australia and coastal eastern Queensland south to Victoria and west to South Australia. There are occasional irruptions into the coastal areas..

Diamond Doves gather in small parties or flocks in dry open savanna in mulga areas often among spinifex or grasses. They are also often in open riparian woodland (beside waterways).

Status: Least Concern to threatened. **Global population**: 7,860,000 mature individuals with a stable population trend. The Diamond Dove was listed as threatened on the Victorian Flora and Fauna Guarantee Act (1988).



Diet: Mostly granivorous, although small amounts of leaves and insects are taken. Grasses are the most important component of diet, followed by legumes (*Fabaceae*) and a variety of other herbs.

Feeding is entirely on the ground, typically in flocks of 20–30 birds. They walk sedately when feeding but can run quickly, with tail raised, if disturbed.

Nesting: The males head, neck, breast and flanks are a pale blue-gray, with paler gray chin. The gray gently shifts to a darker gray-brown on upper body and central upper tail; the scapulars and secondary-coverts covered with many small white spots (narrowly edged black), forming a diagnostic spotted patch in an otherwise plain plumage. The rest of its upper wing is a dark gray-brown with large chestnut panel in primaries which is prominent in flight. The outer rectrices(tail feathers) are black with broad white tips which form prominent white sides or corners when the tail is spread. The under tail is white when closed, shows black strip down center when spread. The belly, vent, and under tail-coverts are white. The bill is dark gray, grading to black at its tip. The iris is scarlet and it has an orbital ring that is dark pink to bright red. The legs and feet are pink. The female is similar but generally browner above and the orbital ring is a duller pink. Juveniles differ from the adult male by extensive fine barring on neck, breast and upper parts. There are few or no white spots on coverts and the blue-gray areas of the plumage are duller and light gray. The chin is more white than gray. The bill light is gray-brown with a dark tip. The iris is light brown and the orbital ring is light gray or brown to pale orange. The legs and feet are gray to brown.

Diamond Doves breed throughout their range, at any time after heavy rainfall. The nest is small flimsy platform of fine twigs or grass stems in low shrub or a scrubby tree. The eggs may be visible through the nest material. Both birds incubate and the eggs are never left unattended. Both also feed the young.

Cool Facts: Doves need water as they have a dry seed diet and they can suck up water without lifting their heads; Only Doves and Pigeons can drink without raising their heads to swallow.

Diamond doves can be kept and bred well in captivity and some lines have been bred for so many generations as to be considered domesticated. They spend a considerable amount of time on the ground and require a wide area to walk around. Wire-bottomed cages are not desirable; also, the floor of the cage should be kept clean since they will be walking on it. The cage should also contain perches spaced widely enough for the bird to fly safely.

Diamond doves should be encouraged to eat a variety of greens and vegetables in addition to their seed diets. They swallow seeds whole and should be given access to grit to help digest the seeds. In winter, the birds suffer in cold and should not be placed near drafts; a heating pad or basking rock (such as those sold in pet stores for lizards) can be used as a supplemental heat source, and is greatly enjoyed by many diamond doves.

Diamond doves build nests in open scoops, and will appreciate open-topped nest baskets. They will nest in whatever they find, however, including the seed dish. The mating behavior begins with a repeated call, usually by the male but sometimes by a female if kept singly. The male will display his tail feathers by dipping his head low and raising his tail, spreading the long feathers like a fan towards a desired female while uttering a two-note coo. The pair will stay together for long periods, greeting each other with low coos and vibrating their wings, or symbolically preening each other with rapid light pecks.

Generally, they must live in pairs or flocks, as their need for companionship is high. Single diamond doves can bond to humans if acquired when relatively young, but this requires a commitment of time and attention from the owner because they require months or years to tame and will then require significant companionship time with their owner, much like a parrot. Once tamed, the dove is a sweet and gentle pet, who greets its owner with happy coos and will perch on the finger or shoulder. They will also preen their owner with rapid light pecks, and accept being stroked gently in return. Care must be taken to avoid the bird thinking of its owner as a mate, as this leads to egg-laying and excessive dependence on its owner's companionship, and is stressful to the bird. This can be avoided by not being affectionate with the bird while it is engaging in nesting or display behaviors.

Common Name: Common Bronzewing **Scientific Name:** *Phaps chalcoptera*

Size: 11.8-14.2 inches (30-36 cm)

Habitat: Australia; found throughout Australia and Tasmania.

It is found in almost all wooded habitats, except the densest and wettest rain forests. It is common in coastal heaths, various types of arid scrub, including mulga, mallee and others, and all varieties of schlerophyll forests. It is also found in salt-bush plains and open grasslands where some shrubs and trees persist. It is often seen in modified habitats, including farmlands, gardens and along roadsides.



Status: Least Concern. **Global population**: 10,300,000 mature individuals with a stable population trend.

Diet: Seeds and all varieties of vegetables.

It searches for food in small groups. The search can sometimes last for days, and, since the pigeon must drink frequently, it utilizes watering holes or any other available source of water **Nesting:** The forehead is buff, bordered by a dark purple stripe across front of midcrown which curves back at the sides of the crown and extends to the nape. The rest of the crown, nape and hind neck is brown. There is a short white line extends from the bill to rear of the eye. The lores are dark brown, bordered below by white cheek-stripe from the base of the bill, curving around the gray ear-coverts. The chin and upper throat are white. There is a blue-gray band along the sides of neck, grading into the pink-brown of the lower throat and under parts. The upper parts are olive-brown, broadly scaled buff. The under tail is dull brown in center, spanning blue-gray outward, with broad blackish subterminal band and broad pale tips. The upper wings are dark olive-brown with varying green, yellow, bronze or purple iridescent spots, and buff or blue-gray barring and fringing to the inner secondaries and most secondary-coverts. Iridescence can appear black in poor lighting. The breast and flanks are pink-brown, while the rest of the under parts are blue-gray. The bill is blackish brown. The legs and feet are dull pink-red to red. The female similar but duller and is lacking the buff forehead patch. Also, there is less iridescence on the upper wings and the breast is a dull red-brown.

The juvenile male is similar to adult male, but duller and the forehead has buff mixed with gray. There is no blue-gray on the sides of the neck, the upper parts are a paler brown scaled paler buff, and there is little or no iridescence on the upper wings. The juvenile female is similar to the juvenile male but the forehead is gray as in the female adult.

Common Bronzewings construct a rough nest of twigs and sticks, which is placed low down in a tree or bush. The eggs hatch after a period of roughly 14 to 16 days, after being incubated by both the male and the female. Both parents share the responsibility of caring for the young. Bronzewings, like other pigeons, secrete a special milk-like substance from their crop, which is fed to the young chicks.

Cool Facts: Bronzewings are endemic to Australia and one of the country's most common pigeons. Rarely found far from a source of water, Common Bronzewings either travel alone or in pairs or in flocks, and are usually cautious, making approach by humans or other animals difficult

Common Name: Bourke's Parrot Scientific Name: Neophema bourkii

Size: 7.5-9 inches (19-23 cm)

Habitat: Australia; widespread across arid and semi-arid areas of the inland, from northwestern New South Wales and south-western Queensland to the mid-coast of Western Australia, and from the Devil's Marbles in Northern Territory south to Port Augusta, South Australia. Found in mulga and other acacia scrubs, and in native cypress and other open eucalypt woodlands.

Status: Least Concern. **Global population**: Unknown. In eastern Australia, Bourke's Parrot appears to have been adversely affected by overstocking and rabbit plagues, both of which remove understory plants. In some areas of Western Australia,



populations of Bourke's Parrots have expanded since grazing was scaled down, allowing vegetation to regenerate.

Diet: Seeds of grasses and herbs. Feeding mainly on the ground, and only occasionally in trees. Pairs, or small groups of four to six. They need to be near a source of water, which they visit usually at dawn and dusk.

Nesting: Brown with dark edgings on crown, nape and cheeks; slight blue tinging on forehead ; area around eyes and base of bill whitish , shading pink on chin; breast brown broadly edged pink, belly rose-pink; flanks, thighs, vent , undertail-coverts and sides of rump pale blue; wing-coverts dark brown edged buff, primaries slate-brown with dull blue outer webs; tail above rust brown, darker distally, with outer feathers pale blue and edged whitish; below whitish. Female has little blue on forehead or pink on belly; has wing stripe.

The Bourke's Parrot has a clutch of 3 to 6 eggs, which are incubated by the female for 18–19 days, with the chicks fledging at about 4 weeks of age. The female also feeds and tends to the chicks by herself. While the female Bourke's Parrot is incubating the eggs, and also while she is feeding the chicks in the nest, she is fed by the male Bourke's Parrot

Cool Facts: This parrot is also known as the Bourke's Parakeet or "Bourkie" and the only species in its genus *Neopsephotus*. It is named after General Sir Richard Bourke, Governor of New South Wales from 1831 to 1837.

Another name for Bourke's Parrot is 'Night Parrot', as it will fly into watering places at night. However it is not to be confused with the real, and extremely rare *and probably extinct*, Night Parrot, *Pezoporus occidentalis*.

Common Name: Australian Ringneck **Scientific Name:** *Barnardius zonarius*

Size: 12.6-13.4 inches (32-34 cm)

Habitat: Australia; found throughout Australia with the exception of extreme tropical and highland areas.



Wide variety used, including dense coastal forests, wheatbelt farmlands, mallee and semi-arid Eucalyptus woodlands, arid Acacia or Casuarina interior scrublands and even sparsely vegetated country as long as tree-lined watercourses penetrate them to provide nestsites. Race barnardi inhabits mallee (low Eucalyptus scrubland), open woodland and trees along watercourses, Callitris woodland and Acacia scrub ; race macgillivrayi prefers woodland savanna and riverside forest, especially in hilly country.

Status: Least Concern. Global population: 100,000+ mature individuals are a stable population trend. A fairly common species throughout one-third of Australian continent, and abundant in Western Australian wheat belt where in two shires an open season has existed to control crop depredations. The creation of reservoirs for livestock has benefited populations in pasturelands. However, poor regeneration of nest-trees. which are many hundreds of years old, is a long-term cause for concern. Race barnardi is apparently intolerant of human settlement of range, declining in

face of mallee and woodland clearance for grazing and cultivation. Race *macgillivrayi*, often judged uncommon, is fairly plentiful and widespread. Total population of *barnardi* group is at least 500,000 birds. Moderate numbers of species are held in captivity, especially in Australia.

Diet: Omnivorous; In forest areas, fruits, sometimes nectar of Eucalyptus (especially *marri*), seeds of grasses and herbaceous plants (birds seen digging up corms of onion grass) and some insect larva.

Birds pull back eucalypt bark to obtain lerps, and eat sawfly from eucalypt seedlings and Macrobathra moth larvae from galls on Cassia.

Nesting: The nominate races head is a dull blue-black, sometimes with a red frontal band. The yellow collar is broken at the throat. The breast, mantle, back and wings are a green hazed pale blue with fuller pale blue edging on median and outer secondary-coverts, primaries blackish; belly yellow shading to yellowish green on the vent and under tail-coverts. The rump and tail are blue-green, with the latter being darker distally and with the outer feathers being a pale blue shading to white at tips. The female is similar but generally greener with the head browner and a slightly smaller bill and head, and may show an under wing bar. The immature is duller with adult plumage achieved in 12–15 months.

The nominate subspecies breeds August through February in the central and southern portions of its range, sometimes with two broods. It breeds June through September in the north of its range. The *barnardi* subspecies breeds August through January, if it is not delayed or even prevented by drought.

They nest in a hole in a tree, commonly in salmon gum (*Eucalyptus salmonophloia*) and wandoo (*Eucalyptus wandoo*), with a lining of wood chips. The *macgillivrayi* race selects *Eucalyptus camaldulensis*. Uusually five eggs are laid and incubation lasts 19–20 days, which is performed by the female alone. Once hatched, the young are intially fed solely by female for first week, then by both adults. The nestling period last for about 5 weeks and young may remain with adults for a short period of time thereafter.

Cool Facts: The calls of the Mallee Ringneck and Cloncurry Parrot have been described as "ringing", and the calls of the Port Lincoln Ringneck and Twenty-eight have been described as "strident". The name of the Twenty-eight Parrot is an onomatopoeic derived from its distinctive 'twentee-eight' call.

The Australian Ringneck is active during the day and can be found in eucalypt woodlands and eucalypt-lined watercourses. The species is gregarious and depending on the conditions can be resident or nomadic.

Currently, four subspecies are recognized, each with a distinct range.

- B. z. semitorquatus. The "Twenty-eight" Australian Ringneck is found in extreme southwestern Western Australia. It is larger than the nominate with a strong red frontal band (that can be absent in female), a green belly and most birds (both sexes) show wingbars.
- *B. z. zonarius.* The nominate or "Port Lincoln" Australian Ringneck is found in western and south-central Western Australia eastward to south-central Northern Territory and western and central South Australia.
- B. z. barnardi. The "Mallee" Australian Ringneck is found in southeastern Australia. Iti has its head and under sides mainly green, with red frontal band, a dark green hind crown joining the post-ocular stripe and with apale blue tinge at base of bill. There is a yellow half-collar across the nape and the mantle and back are a blackish blue. The scapulars and secondaries are dark green, the lesser wing-coverts dark blue, the primary and outer-most secondary-coverts are pale blue, the median and other secondary-coverts are green and the primaries are blackis. The rump is mid-green, and the tail dark green with blue outer feathers that shade to white at the tips. The female is duller with a paler mantle and evidence of a wing stripe. The immature is like the female with a brownish-green head.
- *B. z. macgillivrayi.* The "Cloncurry" Australian Ringneck is found in eastern Northern Territory and northwestern Queensland. Race *macgillivrayi* lacks the red forehead and replaces the dark green of crown, mantle and tail with a paler green, as well as it having more blue on the face and the belly being yellow.

Common Name: Princess Parrot Scientific Name: Polytelis alexandrae

Size: 13.4 -18.1 inches (34-46 cm)

spotty in most of its range, Q ð blue forehead longer tail

Habitat: Australia; Found through the Interior of western and central Australia. It is

with the probable core areas around Lake Tobin (north-central Western Australia) and Great Victoria Desert.

It inhabits sandy deserts with hummock grassland of Triodia and Plectrachne, usually with a shrub layer, stands of Casuarina in sandy country, Acacia scrublands and eucalypts (notably Eucalyptus camaldulensis), bordering watercourses, this last commonly used for nesting.

Status: Near Threatened. Global population: 5,000 mature individuals with a stable population trend. The population size is very difficult to assess in a very scarce, apparently nomadic species with a large range. It possibly has had no maior decline but the decline and extinction of other similar non-avian taxa and absence of records of large numbers since 1963 does cause concern. In July of 1993, almost 300 were counted in one part of the Lake Tobin area. It is possible that man-made changes to its habitat may

have favored more water-dependent competitors. No fewer than 2,500 birds are held in captivity in Australia.

Diet: Seeds of grasses and herbaceous plants, notably spinifex.

Nesting: The bill is pinkish red with yellow at its tip. The crown to nape is a soft pale blue, merging on the neck into light olive brown of the mantle, back and scapulars. The area from upper mandible to behind eye is buffy green. The chin, lower cheeks, throat and upper breast are pink. The lower breast to belly is an olive yellow tinged with grayish blue between thighs. There is often some pink on the thighs. The wing-coverts are green except primary coverts which are purplish-green. The flight-feathers are olive green with yellow outer edges to the primaries. The lower back and rump are mauve. The tail is light gray-green with yellow, red, gray and black in outer edging of the feathers. The female has a grayish crown and rump, a smaller area of pink on the breast and is somewhat duller. It also has a shorter tail than the male. Immatures are similar.

Four to six white eggs are laid which are incubated for 19 days. The chicks leave the nest about 35 days after hatching. These parakeets are truly opportunistic breeders, with pairs choosing to nest when food is plentiful. They nest in a hollow in a eucalypt or desert oak.

Cool Facts: This species is nomadic, arriving in small groups to breed and then disappearing. It is one of Australia's least known parakeets although it is spread across the interior of Australia. Its name was given in honour of Princess Alexandra of Denmark, who in 1863 married the Prince of Wales Edward VII and eventually became Queen of the United Kingdom.

They are unusual among parrots in engaging in mobbing behavior against predators.

There are three common color mutations of this parakeet. These colors are Lutino, Blue, and Albino (combination of Blue and Lutino). The natural, or 'normal' color is green. There are two types of blue, one blue winged and the second is bright blue wings and bright blue head.

Common Name: Pallid Cuckoo **Scientific Name:** *Cacomantis pallidus*

Size: 11 -13 inches (28-33 cm)

Habitat: Australia; found in Australia and Tasmania, Christmas Island, Indonesia, New Zealand, and Papua New Guinea. It winters northward to Wallacea .Its natural habitats are subtropical or tropical dry forests and subtropical or tropical mangrove forests.



Status: Least Concern. **Global population**: 10,100,000 mature individuals with an increasing population trend. It is widespread and common, at least locally, though some variation in numbers. This species seems reasonably adaptable, since it occurs in residential and suburban areas where honeyeater hosts are attracted to flowering gardens, as well as in less inhabited areas of scrub and open woodland.

Diet: Hairy caterpillars, other insects and their larvae.

Prey is spotted from low perch and is pounced on, usually on the ground. Some insects are taken from foliage.

Nesting: Sexes are alike. Adults are gray above with a broad pale supercilium, a darker gray line through eye and a pale nape patch. The outer tail is barred white. It is pale gray below and not barred. The eye-ring is yellow, the iris dark brown, the bill black and the feet gray-pink. Some birds are mottled brown and rufous above, with their breasts barred black and rufous. It is believed that they are sub-adults. Juveniles are white with black streaks above. The throat and breast are blackish while the lower breast and belly are white with dark gray streaks.

The Pallid Cuckoo is a parasitic nester. It lays its eggs in the nests of honeyeaters, wood swallows, whistlers and flycatchers. The most common host species include the Willie Wagtail and the Hooded Robin. The female cuckoo removes one of the host's eggs and replaces it with one of her own. The cuckoo egg usually closely resembles the host egg, and the unsuspecting host hatches it along with its own. The cuckoo egg usually hatches more quickly and the young cuckoo instinctively forces the other eggs (or chicks) out of the nest. The cuckoo rapidly outgrows its 'foster' parents, who frantically search for sufficient food to satisfy the demanding young bird.

Cool Facts: All cuckoos have Zygodactyl feet (two toes forward, two back as like parrots and woodpeckers). The Pallid cuckoo is unmistakable upon sighting, no other Australian cuckoo has this coloration.

The male's song an 8-note whistle on ascending scale (second note lower); female song is a hoarse whistle.

Common Name: Pheasant Coucal **Scientific Name:** *Centropus phasianinus*

Size: 19.7-27.6 inches (50-70 cm)

Habitat: Australia; endemic in northern and eastern Australia, as well as New Guinea and East Timor. It is found from the Pilbara, Western Australia, to south-eastern New South Wales. In New South Wales it is mainly found east of the Great Dividing Range from the Queensland border to the southern Hunter region, with some around Sydney and further south to Illawarra.

The Pheasant Coucal prefers dense riverine vegetation, long grass, rank herbage, coastal heathlands, margins of swamps, canefields, lantana and pandanus thickets, mangroves, secondary forests, spinifex in sandstone country. It frequents the lowlands, and is not found in New Guinea highlands.



Status: Least Concern to Near Threatened. **Global population**: 9,680,000 mature individuals with a stable population. Pheasant Coucals have benefited from land clearing where weedy thickets have grown up, especially of blackberry or lantana. However have been adversely affected by widening urban development and where overgrazing by livestock has occurred.

The Kai Pheasant Coucal is considered near-threatened due to its very restricted range.

Diet: Arthropods, especially insects (such as grasshoppers, stink-bugs, mantids, stick insects, caterpillars), mangrove mud crabs, snails, frogs, lizards, nestling birds, small mammals including rodents and bandicoots.

Skulking, spends much time on ground, clambers in thick vegetation; searches for food by walking in low dense vegetation and ground cover, then runs down its prey.

Nesting: It is a long-tailed pheasant-like bird. The adult male is all black, streaked and barred brown above. The wing with inner webs are rufous while the outer webs are barred buff, black and rufous-brown. The iris is red, the bill is black and feet dark gray to black. The female, while similar, is significantly larger and has an orange to yellow colored iris.

Non-breeding plumage (in Australia) is rufous above with straw-colored streaks. The head and under parts are buff. The iris pale brown in the male and whitish with the female. The bill is a pale horn color. Juveniles are more fawn, paler below, with brown irises and bills and brown to pale below.

Pheasant Coucals form lasting pairs and, unlike other Australian cuckoos, build their own nests and raise their young themselves. The nest is usually hidden in thick grass or sugar cane or in weedy thickets and is a platform of sticks, grass or rushes, lined with leaves and grasses. The male usually incubates the eggs and feeds the young, with the female helping with feeding. More than one clutch can be laid in one season.

Cool Facts: The Pheasant Coucal is the only Australian cuckoo to build its own nest. It also lives and nests on the ground, unlike other cuckoos.

The Pheasant Coucal's summer voice is a low descending 'boop boop'. Its winter voice is a sharp hissing.

Subspecies:

- *C. p. spilopterus.* The "Kai" coucal is found on the Kai Islands in southeastern Moluccas.
- C. p. phasianinus. The nominate subspecies is found in Eastern Australia.
- *C. p. mui.* The "Mui" coucal is found in Timor on the Fuiloro Plateau. It is extensively white, replacing the solid black areas on the nominate with white.
- *C. p. propinquus.* It is found in northern New Guinea. It is similar to *nigricans* but smaller.
- *C. p. nigricans.* It is found in southeastern New Guinea and on Yule Island. It has yellowish under wing bars than are narrower than black bars
- *C. p. thierfelderi.* It is found in southern New Guinea and on the islands of the northwestern Torres Strait. It has rufous bars on the under wing that are as wide as or wider than black bars.
- *C. p. melanurus.* It is found in northern and northwestern Australia. It is larger than phasianinus with wider black bars on rectrices.

Common Name: Azure Kingfisher **Scientific Name:** *Ceyx azurea*

Size: 6.7-7.5 inches (17-19 cm)

Habitat: Australia; found in Northern and Eastern Australia and Tasmania, as well as in the Moluccas and Lesser Sundas (Indonesia), New Guinea and surrounding islands. In Australia, it is found from the Kimberley region, Western Australia, across the Top End to Queensland, and is widespread east of the Great Dividing Range to the Victorian border and south into Victoria.

Their habitat includes the banks of vegetated rivers and creeks as well as billabongs, lakes, swamps and dams, usually in shady overhanging vegetation. It is sometimes seen in parks on rivers, as well as duck or goldfish ponds in urban areas.

Status: Least Concern. **Global population**: 12,000,000 mature individuals with a declining population trend. Livestock trampling vegetation around waterholes affects the Azure Kingfisher. Human activities that cause artificial flooding of waterways can drown nests. Water that is turbid (not clear) and the introduction of European Carp (which competes for food resources) can also adversely affect local populations.



Diet: Mainly small fish and crustaceans; also water beetles, Hemiptera, dragonflies and occasionally locusts, spiders, small frogs and tadpoles.

It sits on a perch 1–10 m above water, occasionally bobbing head or cocking tail, or moving whole body up and down; then plunges into water for prey and returns with it to perch, where the prey is battered before being swallowed head first. Sometimes, it hovers briefly above its prey before diving into the water. In a deep dive, the whole body is streamlined, but in a shallow one the wings are half-open. It occasionally takes insects in flight, or terrestrial beetles from the ground. It will follow a foraging platypus (*Ornithorhynchus anatinus*) to catch fish and shrimps disturbed by it.

Nesting: The male of the nominate race has a rufous loral spot, a large white neck patch and vibrant ultramarine-blue upper parts extending as patch on the sides of breasts. The chin and throat are buff-white, the breast and belly are orange-rufous with a violet wash on the flanks. The bill is black with the tip light gray to white. The iris is a dark brown and the legs and feet are an orange-red. The female is slightly duller than male with less violet on the flanks. The juvenile is duller and paler than the female. The bill has a larger white tip than the adults. Races show minor differences in size and color compared with nominate.

Breeding season occurs from September through April in northern Australia, from August though February in southern Australia and kingfishers often double-brood in southeastern Australia (Victoria). They are territorial with a pair occupying 200–1600 m of suitable river or shoreline. The nest is excavated by the pair on the bank of the stream or river, lake or billabong, sometimes in mangroves, or occasionally in soil around roots of an uprooted tree. The egg clutch is usually 5-6 with both parents incubating for about 20–22 days. Both adults chicks and they fledge after 21–35 days.

Cool Facts: It is often difficult to see until it quickly darts from a perch above water. Voice is a high-pitched, shrill, 'pseet-pseet'.

This species was previously placed in genus *Alcedo (Common Kingfisher),* or sometimes in *Alcyone*. A recent molecular study, however, found that this species formed a clade with the Little Kingfisher (*Ceyx pusillus*) and Bismark Kingfisher (*Ceyx websteri*) and that this clade was a sister to the Oriental dwarf kingfisher (*C. erithaca*) species-group.

On a side note, both genus *Alcyone* and *Ceyx* names are borrowed from Greek Mythology. Alcyone was the daughter of King Aeolus of Aeolia. She was a Thessalian princess and later queen of Trachis. Ceyx was the son of Eosphorus (often translated as Lucifer). Alcyone and Ceyx married and were very happy together in Trachis. They often sacrilegiously called each other "Zeus" and "Hera". This angered Zeus, so while Ceyx was at sea (going to consult an oracle, according to Ovid), the god threw a thunderbolt at his ship. Soon after, Morpheus, the god of dreams, disguised as Ceyx, appeared to Alcyone as an apparition to tell her of his fate, and she threw herself into the sea in her grief. Out of compassion, the gods changed them both into common kingfishers, or "halcyon birds", named after her. Several subspecies of the Azure Kingfisher were regrouped after the genus name change. Race *ruficollaris* was erroneously listed under the Sacred Kingfisher (*Todiramphus sanctus*). It was moved to its correct location as a subspecies of the Azure Kingfisher. Race *yamdenae* was often included in Race *ruficollaris*. It was moved to a separate subspecies. Race *mixtus* (from northeastern Queensland) apparently is an intergrade between the nominate and *ruficollaris*, and has been removed from the subspecies list. Birds from the Aru Islands were formerly separated from Race *lessonii* as "Race *wallaceanus*". Seven subspecies currently recognized.

- *C. a. affinis*. It is found on Morotai, Halmahera and Bacan (in the northern Moluccas). It has the brighter blues, the bill tip is reddish and its wings are longer..
- C. a. wallaceanus. It is found on the Aru Islands
- *C. a. lessonii.* It is found in the lowlands of New Guinea, western Papuan islands and Fergusson Island. It has slightly darker upper parts, paler under parts, and less violet flanks.
- *C. a. ochrogaster.* It is found on the islands in Geelvink Bay, and northern New Guinea from the Mamberamo River east to Astrolabe Bay, south to the Wahgi Valley, also on Karkar Island and Admiralty Islands. It even paler below than *lessonii.*
- *C. a. yamdenae*. It is found on Romang (eastern Lesser Sundas) and Tanimbar Islands. It is similar to *affinis*, but smaller
- C. a. ruficollaris. It is endemic to northern Australia, from Kimberley east to Cooktown. It has richer colors than the nominate, shorter wings and tail with a longer bill
- C. a. azureus. The nominate race is found in eastern and southeastern Australia, from Cooktown southward to Victoria.
- *C. a. diemenensis.* It is endemic to Tasmania. It is larger than the nominate. Its crown and rump are darker and more violet-blue.

Common Name: Rainbow Bee-eater Scientific Name: Merops ornatus

Size: 7-8 inches (19–21 cm (with streamers, up to 7 cm more))

Habitat: Australia; Breeds in Australia, including Rottnest Island (southwestern Western Australia) and spouthwestern islands in Torres Strait, and in eastern New Guinea (Port Moresby area and Ramu Valley) and in the eastern Lesser Sundas. Southern populations winter in the northern part of their breeding range, mainly in and around New Guinea, westward throughout Wallacea.

It prefers sandy pastures, farmlands, lightly wooded savanna, wooded environs of creeks and lakes, parks, gardens and green suburban areas. In non-breeding season,



in New Guinea and New Britain, inhabits open suburbs, clearings in recently logged forest and airspace over forest canopy, seedling oil palm plantations, secondary growth at forest edge, giant bamboos by cattle paddocks, and waterways in undisturbed lowland rainforest.

Status: Least Concern. **Global population:** 17,200,000 mature individuals with a stable population trend. It is widespread in eastern New Guinea and Australia except in deserts and heavily forested regions, and is seasonally common and locally abundant in nearly all areas.

Diet: Flying insects, but, as their name implies, they have a real taste for bees. also eats beetles, bugs, flies, moths, butterflies, orthopterans, dragonflies and damselflies, all captured on the wing in forays from a leafy or leafless tree or telephone wire. Takes a few spiders, but whether from vegetation or airborne on silk is not known.

Rainbow bee-eaters are always watching for flying insects, and can spot a potential meal up to 150 feet

away. Once it spots an insect a bee-eater will swoop down from its perch and catch it in its long, slender, black bill and fly back to its perch. Bee-eaters will then knock their prey against their perch to subdue it. Even though rainbow bee-eaters are actually immune to the stings of bees and wasps, upon capturing a bee they will rub the insect's stinger against their perch to remove it, closing their eyes to avoid being squirted with poison from the ruptured poison sac. Bee-eaters can eat several hundred bees a day, so they are obviously resented by beekeepers, but their damage is generally balanced by their role in keeping pest insects such as locusts, hornets, and wasps under control

Breeding: The male is mainly green, very glossy, with a burnished crown and nape, rufous primaries with green outer edges and dusky tips, a brilliant azure rump, and uniquely black tail. The tail-streamers very narrow, with spatulate tips measuring 1.5 mm wide. There is a thin green supercilium above broad black eyestripe, latter bordered below by pale blue band. The chin and cheeks are yellow, the throat is a bright rufous with a triangular black gorget. A third of adult males have hint of blue at lower border of the gorget. The iris is red. The female similar, but the hindcrown is less bronzy, the iris is red-brown and the streamers wider but one third the length long. The juvenile lacks the streamers, has upper parts olive, a narrow russet nuchal collar, no gorget, the chin and upper throat are pale yellow, the lower throat is a dull rufous-brown, merging into obscurely streaked light olivaceous breast.

Breeding season is before and after the rainy season in the north, and from November to January in the south. Rainbow bee-eaters are believed to mate for life. The male will bring the female insects while she digs the burrow that will be their nest. The bee-eater digs its burrow by balancing on its wings and feet, and digs with its bill, then pushing loose soil backwards with its feet while balancing on its bill. The female bee-eater can dig about three inches down every day. The nest tunnel is very narrow, and the birds' bodies press so tightly against the tunnel walls that when the birds enter and exit their movement acts like a piston, pumping in fresh air and pushing out stale air. Rainbow bee-eaters have also been known to share their nest tunnels with other bee-eaters and sometimes even other species of birds. The female lays between 3 and 7 glossy white eggs, which are incubated for about 24 days until hatching. The young bee-eaters fledge after about 30 days and are fed by both parents, as well as any older bee-eaters that may not have paired off or have lost their mate. Cane Toads are known to prey on nestlings.

Cool Facts: The rainbow bee-eater's two central tail feathers are longer than the other tail feathers, and are longer in the female rainbow bee-eaters than in the males. Like all bee-eaters, rainbow bee-eaters are very social birds. When they are not breeding they roost together in large groups in dense undergrowth or large trees.

Common Name: Rufous Scrub-bird Scientific Name: Atrichornis rufescens

Size: 6.7-7.2 inches (17-18.5 cm)

Habitat: Australia; found in southeastern Queensland and in northeastern New South Wales.

It prefers subtropical and temperate rainforess, including beech forests, and adjacent moist and wet eucalypt forests with rainforest understory. It occurs in wet gullies, along watercourses, on ridges and on escarpments of mountain ranges, in treefall areas. It requires dense ground cover which is usually restricted to ecotones, forested watercourses and wetlands, areas regenerating from fires and storms, and roadsides. It is confined to highland forests between 600 m and 1300 m.



Status: Endangered. **Global population**: 4,900 mature individuals with a declining population trend. It was considered "Near Threatened" until 2008, the conservation status of this species has deteriorated rapidly, culminating in its uplisting to "Endangered" in 2012, because of its very small and severely fragmented area of occupancy, combined with habitat destruction and a continuing population decline. It is a restricted-range species, occurring in scattered populations along the Great Dividing Range. From a population of about 12,000 pairs in the early 19th century, only 2,500 pairs were estimated in surveys in 1979–1983, 730 of which were of nominate race. Since then, the sub-populations of the nominate race have been lost from lowland habitats of the Richmond and Tweed River basins, while declines in Race *ferrieri* are inferred.

Most recent estimates indicate that 1,500 mature individuals of the nominate race fragmented into four sub-populations, and 3,400 mature individuals of Race *ferrieri* in at least three sub-populations. Most of the lowland forest previously occupied by this species was cleared soon after European settlement, and it became confined to higher

areas, mostly above 600 m and the total area of occupancy has been reduced to about 410 km2. The remaining habitat is not subject to clearance, but inappropriate burning and logging practices, coupled with the drying caused by climate change, could potentially render it unsuitable. Although many of the surviving individuals are in national parks, and are reasonably secure, the fragmentation and division into small sub-populations compounds the threats of habitat loss and climate change.

There is a need to determine the type of burning regime most favorable to the survival of the species, and for thorough surveys, using methodology comparable with original methods.

Diet: Mainly beetles, scrub-snails and snail eggs. Probably some plant seeds are also eaten.

It forages on the ground for small invertebrates, lifting leaves with its bill. It scurries beneath leaf litter, using head as a shovel and scratches the ground to reveal prey.

Nesting: The nominate race male has head and neck dark brown with indistinct fine dark barring. The rest of the upper parts are dark brown, also with fine dark barring, grading to dark rufous-brown on the rump. The tail and folded wing are finely barred. There is a blackish triangle (broadly tipped white in fresh plumage) from center of the chin to the throat and breast, and to the sides of the upper belly, which is bordered by a white malar stripe that extends as broken, narrower and much less conspicuous pale line to the sides of belly. The sides of the neck, breast and flanks are buff-brown with fine barring. The rest of the belly and vent is a rich buff, becoming rich rufous-brown with fine barring on under tail-coverts. The eye is black to dark brown and large. The bill is very short, wedge-shaped, merging with the flat head. The upper mandible is dusky to blackish with a creamy tip, while the lower mandible is cream-colored. The legs are light grayish-pink. The female is smaller than the male, with the dark throat patch smaller and sometimes indistinct. The juvenile is more reddish-brown below and the rear flanks faintly barred.

Breeding season goes from September to November. The male is possibly polygynous and takes no part in nest-building, incubation or brood-rearing. It occupies a permanent territory of about 1 ha. The nest is a dome with a side entrance, constructed from dead grasses such as *Xerotes, Gahnia* and *Carex*. Sometimes some pieces of dead tree-fern are incorporated. It is lined with a cardboard-like substance made from wood fibers and placed close to the ground in clump of sedges or tussock or small tree-fern. The clutch is 2 eggs and the incubation period is thought to be 36–38 days with a nestling period of 3–4 weeks. The young are fed by mother for at least 3 weeks after leaving nest.

Cool Facts: There are two species in the *Atrichornis* family; which is closely related to the Lyrebird (*Menura*) family.

There are two subspecies:

- *A. r. rufescens.* The nominate race is endemic to the eastern side of the Great Divide from extreme southeastern Queensland (Mistake Range) southward to extreme northern New South Wales (south to the Gibraltar Range).
- *A. r. ferrieri.* It is found in northeastern New South Wales (from the Dorrigo Plateau south to the Barrington Tops). It is slightly paler than the nominate race with the dark area at the sides of the lower breast being smaller. The belly is slightly yellower and the tarsus, shorter.

Common Name: Varied Sittella **Scientific Name:** *Daphoenositta chrysoptera*

Size: 3.9-5.5 inches (10-14 cm)

Habitat: Australia; endemic to Australia (widespread in mainland Australia) and New Guinea.

It is found in eucalypt woodlands and forests throughout their range. They prefer roughbarked trees like stringybarks and ironbarks or mature trees with hollows or dead branches.

Status: Least Concern. **Global population**: 9,170,000 mature individuals with a declining population trend. Varied sittellas have declined in some areas following the clearing of habitat and removal of woodland.



Diet: Insects by gleaning on tree trunks or branches, moving downwards or along branches, searching for insects.

They land at the top of a tree and work downwards, searching and poking into cracks and under things, chattering noisily.

Nesting: The male's forehead and short diffuse supercilium is pale gray from crown to nape. The lores and ear-coverts are gray-brown (sometimes they are darker, forming mask), The hind and sides of the neck are more gray with darker shaft-streaks. The upper parts of the body are gray to gray-brown, and streaked with dark brown. The upper tail-coverts are white to buff with the tail being black with prominent white tips. The upper wing is black with a prominent broad orange-rufous band across primaries and secondaries (mostly concealed when wing folded). The chin, throat and malar region are white to light gray (the malar area often has some indistinct dark mottling). The under parts are white with the breast sides streaked finely in dark brown. The under tail-coverts are white with broken black bars. The iris and prominent eye ring are an orange-yellow. The bill is thin and slightly upcurved. It is brownish black with yellowish or orange-brown base; legs orange-yellow. The female is very like the male, and sometimes indistinguishable, but it often has a darker face mask and has heavier markings on throat and malar region. The juvenile differs from the adults in having its upper parts brown and boldly streaked white. The under parts are white as are the eyebrow and ear-coverts. There is a dark eye stripe (indistinct on lores), orange-buff tips of greater and median secondary wing-coverts, narrow orange-buff tips to greater primary coverts and remiges. The iris is a dark-brown or gray. The subspecies races differ slightly in size, and more so in the color of the head and wing band, the amount of dark streaking on body, and degree of sexual dimorphism in head plumage.

The varied sittella's nest is a deep open cup, like a cone, of bark and spider web, decorated on the outside with long pieces of bark, camouflaged to look like the fork or branch where it is placed. This species usually breeds cooperatively, with the breeding pair having several helpers. They will sometimes also breed in single pairs. Only the breeding female incubates the eggs and broods the young. All help to feed the young and remove faecal sacs. Breeding season occurs June to April. 3 eggs are laid and incubation lasts 13 days.

Cool Facts: The feet of the Varied Sittella are small but with very long toes for clinging onto branches. They move in spirals down trees, searching for food, and even hang below branches.

- *D. c. leucoptera.* The "White-winged Sittella" is found in central-north Australia from northeastern Western Australia (Kimberley region) eastward to the southeastern head of the Gulf of Carpentaria, southward to Great Sandy Desert (in the west) and about the Tropic of Capricorn (in the east). It is similar in size to the nominate, has a cap black, the lower forehead and eyebrow are white, otherwise as it is the same as race striata, but with a wing band that is slightly larger and the under parts are unstreaked. The female's cap is more extensive than male's, reaching below eye and onto chin, and lacking the white eyebrow.
- *D. c. striata.* The "Striated Sittella" is found in northeastern Australia from Cape York south to the Burdekin river, in north-central Queensland. It is smaller than the nominate, with its bill straighter and yellow with black tip. The cap is black, the mask dusky-streaked and the upper parts streaking is coarser. The wing band white and

restricted to the primaries. The under parts are more boldly streaked. The female's head and neck are completely black.

- *D. c. leucocephala*. The "White-headed Sittella" is found in central-eastern Australia from the Burdekin river south to the Queensland–New South Wales border, and inland to the Great Dividing Range. It is like the nominate race but he head and nape are completely white.
- *D. c. chrysoptera.* The nominate race, the "Orange-winged Sittella" is found in southeastern Australia from south-central Queensland southward through eastern New South Wales and eastern Victoria. It is distinctive with its head, neck and throat all white (sometimes pale grayish or with narrow gray streaks). It is well demarcated from its streaked breast. The rest of plumage much as the nominate but the streaking above and below is somewhat broader and more diffuse. The sexes are alike.
- *D. c. pileata.* The "Black-capped Sittella" is found central and southern Western Australia (north to the southern portion of the Great Sandy Desert) eastward through southern Northern Territory and South Australia to far southwestern Queensland, western New South Wales and northwestern Victoria. It is the largest race with the plumage similar to race *leucoptera*, but the upper parts slightly browner and with little or no dark streaking. The wing band is rufous and extends to the secondaries (as in the nominate). The bill is slightly upcurved and blackish with the basal third being yellow. The female has a larger black cap.

Common Name: Splendid Fairywren **Scientific Name:** *Malurus splendens*

Size: 4.5-5.3 inches (11.5-13.5 cm)

Habitat: Australia; found across much of the Australian continent from central-western New South Wales and southwestern Queensland over to coastal Western Australia.

It inhabits typically shrubland and other dense vegetation, varying from eucalypt woodland-heath in the southwestern portion of its range to mulga-mallee in the central and eastern semi-arid and arid portions. The nominate race in the southwestern portion of its range is replaced by the Red-winged Fairywren (*M. elegans*) in the forest and by the Blue-breasted Fairywren (*M. pulcherrimus*) in heathland. Forestry plantations of pine



and eucalypts are unsuitable as they lack undergrowth and Splendid Fairywrens avoid human populations.

Status: Least Concern. **Global population**: 5,350,000 mature individuals with a stable population trend. Unlike the eastern Superb Fairywren, the Splendid Fairywren has not adapted well to human occupation of the landscape and has disappeared from some urbanized areas.

Diet: Primarily insects, mainly ants, small beetles, grasshoppers and crickets, Hemiptera, spiders and centipedes. Some plant material taken occasionally.

Insects are gathered by hop and search, with occasional "tower flight" in pursuit of swarming termites. It will sometimes forage for insects in canopy of flowering eucalypts. It is often seen in groups of 2–8 adults.

Nesting: The male of the nominate race in "bright" (breeding) plumage has its crown, back, scapulars, throat and most of the ventral surface a rich violet-blue, the ear-tufts are sky-blue, the lores and stripe through eye are black to a blackish hindcollar. The tail is cobalt-blue. The primaries are edged turquoise. There is a black pectoral band 3–5 mm deep. The iris is dark brown. The bill is black and the legs are slaty-brown to black.

The female has its crown, back and wings a gray-brown, the lores and feathers around eye gray-rufous to orange-brown. The tail is distinctively dark bluish-turquoise and the throat and under parts are whitish to cream in color. The eyes are dark brown, the bill orange-brown and the legs pinkish-brown to dark brownish-gray.

Males in "Dull" (non-breeding) plumage is like female, but have a tail that is cobalt-blue, the primaries are edged turquoise and the bill and legs black. Immatures resemble the female, but only in the first winter; the male acquires turquoise primaries ehile the bill, and lores darken with age. The races differ mainly in darkness of blue and depth of pectoral band on the breeding males.

The Splendid Fairy-wren is notable for several peculiar behavioral characteristics; birds are socially monogamous and sexually promiscuous, meaning that although they form pairs between one male and one female, each partner will mate with other individuals and even assist in raising the young from such trysts. Male wrens pluck pink or purple petals and display them to females as part of a courtship display.

Several courtship displays by Splendid Fairy-wren males have been recorded; the 'Sea Horse Flight', so named for the similarity of movements to those by a seahorse, is an exaggerated undulating flight where the male, with his neck extended and his head feathers erect, flies and tilts his body from horizontal to vertical and by rapidly beating wings is able to descend slowly and spring upwards after alighting on the ground. The 'Face fan' display may be seen as a part of aggressive or sexual display behaviors; it involves the flaring of the blue ear tufts by erecting the feathers.

Another interesting habit of males of this and other fairy-wren species during the reproductive season is to pluck petals (in this species, predominantly pink and purple ones which contrast with their plumage) and show them to female fairy-wrens. Petals often form part of a courtship display and are presented to a female in the male fairy-wren's own or another territory. Outside the breeding season males may sometimes still show petals to females in other territories, presumably to promote themselves. It is notable that fairy-wrens are socially monogamous and sexually promiscuous: pairs will bond for life, but regularly mate with other individuals; a proportion of young will have been fathered by males from outside the group. Young are often raised not by the pair alone, but with other males who also mated with the pair's female assisting. Thus, petal-carrying might be a behavior that strengthens the pair-bond. Petal carrying might also be a way for extra males to gain matings with the female. In either case, the data does not strongly link petal-carrying and presenting to a copulation soon thereafter.

Breeding occurs from late August through to January, though heavy rain in August may delay this. The nest is built by the female; it is a round or domed structure made of loosely woven grasses and spider webs, with an entrance in one side close to the ground and well-concealed in thick and often thorny vegetation, such as Acacia pulchella or a species of Hakea. One or two broods may be laid during the breeding season. A clutch of two to four dull white eggs with reddish-brown splotches and spots, measuring $12 \times 16 \text{ mm} (\frac{1}{2} \times \frac{5}{6} \text{ in})$, are laid. Incubation takes about two weeks. The female incubates the eggs for 14 or 15 days; after hatching, nestlings are fed and their fecal sacs removed by all group members for 10-13 days, by which time they are fledged. Young birds remain in the family group as helpers for a year or more before moving to another group, usually an adjacent one, or assuming a dominant position in the original group. In this role they feed and care for subsequent broods

Cool Facts: Also known simply as the Splendid Wren or more colloquially in Western Australia as the Blue Wren.

Major nest predators include Australian Magpies, butcherbirds, Laughing Kookaburra currawongs, crows and ravens, shrike-thrushes as well as introduced mammals such as the Red Fox, domestic cats and the Black Rat. Like other species of fairy wrens, Splendid Fairy-wrens may use a 'Rodent-run' display to distract predators from nests with young birds. While doing this, the head, neck and tail of the bird are lowered, the wings are held out and the feathers are fluffed as the bird runs rapidly and voices a continuous alarm call.

Current taxonomy recognizes four subspecies: *M. s. splendens* in Western Australia, *M. s. musgravei* in central, *M. s. melanotus* in inland eastern Australia and *M. s. emmottorum* in southwestern Queensland. Initially, the three were considered separate species as they were described far from their borders with other subspecies. However, as the interior of Australia was explored, it became apparent there were areas of hybridization where subspecies overlapped. Thus in 1975, the first three forms below were reclassified as subspecies of *Malurus splendens*.

- *M. s. splendens*. First reported by Quoy and Gaimard in 1830. The nominate race is known as the "Splendid" or "Banded Fairywren", is found in much of central and southern Western Australia.
- *M. s. melanotus*. First reported by John Gould in 1841. It is known as the "Blackbacked Fairywren". It is found in the mallee country of South Australia (Sedan area northeast of Adelaide) through western Victoria, western New South Wales and into south western Queensland. It differs from the nominate subspecies in having a black back and whitish lower belly.
- *M. s. musgravei.* First reported by amateur ornithologist Gregory Mathews in 1922. It is found in mulga and mallee country across much of South Australia and the southern Northern Territory. It has lighter blue or turquoise upper parts than the Splendid Fairy-wren, as well as a black rump. This is largely synonymous with what was known as *M. callainus* or the Turquoise Fairywren which had been collected by ornithologist Samuel White and named by John Gould in 1867. The original collection bearing the name *callainus* was deemed a hybrid between what is now called *musgravei* and *melanotus*, and hence *musgravei* was resurrected as the name for the Turquoise Fairy-wren.
- *M. s. emmottorum.* First reported by Schodde and Mason in 1999. It is found in southwestern Queensland. It was named after Angus Emmott, a farmer and amateur biologist in western Queensland. It is smaller and shorter-tailed than others. The "Bright" male has a throat that is pale sky-blue, a black breastband 2–4 mm deep and a white mid-belly.

Common Name: Mallee Emu-wren Scientific Name: Stipiturus mallee

Size: 5.1-5.7 inches (13-14.5 cm); tail (8-9.5 cm)

Habitat: Australia; Endemic. It has a severely fragmented distribution in the Mallee region of southeastern South Australia (south of Murray River) and northeastern Victoria.

It occupies habitats containing hummock grassland, usually within low woodland dominated by mallee eucalypts. Eucalyptus and cypress pine. It also occurs in heath



containing banksias or casuarinas. In Ngarkat, it can disperse at least 6 km into vegetation recovering from fire, 3-4 years after it has been burnt. Highest densities occur 8-10 years after fire, although it persists in vegetation 50 years old. Much apparently suitable habitat is unoccupied. Throughout its range it appears to be confined to relatively small discontinuous fragments of habitat

Status: Endangered. Global population: 1,500-2,000 with a decreasing population trend. Past clearance for agriculture and livestock grazing has fragmented habitat, and

the greatest current threat is large-scale wildfires within remnants, such as occurred in Billiatt Conservation Park. Recent declines in South Australia coincided with droughts and a sequence of extensive fires. This population may not be able to persist or reclaim its former distribution because it is surrounded by large areas of recently burnt heath. Following fires, mallee-heath requires 5-10 years of regeneration before it is suitable for the species. Relatively small changes in habitat quality could cause sudden local declines, and the loss of, or changes to peripheral habitat may affect core habitat. Mallee-heath is used in the east of this birds' range, and may mean that the strongholds of the species are at most risk from loss to single fire events.

This birds' habitat is now so fragmented that any single fire event could be catastrophic. The use of strategic fire-breaks has been unsuccessful in protecting subpopulations of this species. Drought also puts pressure on the species, especially in the west of its range, where populations may be thinly distributed as a result, and a long term drought could result in a crash in local populations. Habitat fragmentation has taken place within the area of Hattah-Kulkyne National Park and adjacent Crown land. The area is bisected by the Calder Highway and a railway line, and a swathe of habitat has been removed beneath power lines. Other developments threatening further fragmentation include plans submitted for an industrial toxic waste facility at Nowingi in an area of densely occupied habitat3, in a location which is key to the species's long-term survival, and the Mildura fire plan has proposed to burn a 250 m wide strip down the west side of the Calder Highway. If suitable habitat does not become available to replace current habitat that deteriorates through old age, as compounded by drought and fires, then numbers of this species have the potential to decline sharply within decades

Diet: Insects (mostly arthropods such as ants, grasshoppers, crickets, spiders and bugs) and supplements with seeds

Nesting: The male has its crown an unstreaked pale rufous, the ear-coverts are blue with black streaking, the hindneck and upper parts are mid olive-brown and streaked black. The upper wing and tail are gray-brown. The tail is shorter than that of the Southern Emu-wrem (*S. malachurus*) and consists of six loosely webbed feathers with the central two feathers 1.5 times the length of outer feathers. The lores, eyebrows, throat and breast are a mid sky-blue while the rest of theunder surface is rufous/yellow with white at the center of its belly. The iris is dark brown, the bill black and the legs pinkish-brown. The female resembles male, but without blue on the throat, and with rufous confined to its forehead. The lores are white, the ear-coverts gray, the throat and breast tawny. Juveniles are plainer than adults, the olive-brown is with only faint streaks above, there is no rufous on crown and it is grayish-white below. Young females are more tawny below.

Emu-wrens breed in pairs, with the male defending a small territory with regular bursts of song. The female builds a oval-shaped dome nest with a round entrance at the side. It is made from and lined with grasses and placed near the ground in a grass tussock or dense shrubbery. The female incubates the eggs and both parents feed the young, which remain with them for up to two months after fledging.

Cool Facts: This bird is often confused with other wrens; the Southern Emu-wren has longer tail and is darker with more extensive streaking on crown. Fairy-wrens are larger, unstreaked, with non-filamentous tails. The Mallee Emu-wren's voice trills and twitters like *Malurus spp.*, but higher-pitched. The emu-wrens are named for their six wispy, emu-like tail feathers.

It is very secretive and often cocks its' tail straight up. Look and listen for on calm days in dense spinifex Triodia.

Common Name: Weebill Scientific Name: Smicrornis brevirostris

Size: 3.2-3.5 inches (8-9 cm)

Habitat: Australia; it is a resident with some local movements reported in northern Queensland and southern Western Australia. Around Canberra, individuals are sometimes seen in marginal habitat or high up in Great Dividing Range, well outside usual range.

It is found in woodlands and forests throughout mainland Australia. The Weebill inhabits almost any wooded area, with the exception of the wettest forests, but favors open eucalypt forests. It spends most of its time in the canopy, in pairs or small groups. The birds stay in the same area throughout the year.

Status: Least Concern. **Global population**: 9,560,000 mature individuals with a declining population trend. It is common and widespread over much of Australia. Local declines have been noted (as with many other woodland birds), these being consequent upon habitat clearance and degradation. The resultant fragmentation encourages spread of feral predators such as domestic cats, and makes it easier for avian predators



such as currawongs to raid nests. Its population is probably secure in the medium term, but numbers may have dwindled as, unlike in earlier years, there appear no longer to be reports of large flocks.

Diet: Arthropods with some seeds. Prey items include spiders, beetles, flies, *Hemiptera*, (including *Lygaeida*e), wasps, grasshoppers, ants, caterpillars, and various homopteran bugs (cicadellids, lanternflies, cercopids, lerp insects, and aphids).

It is usually seen alone, in pairs or in small groups (up to ten individuals). It forages in canopy and subcanopy, sometimes descending to middle and lower levels, and occasionally on ground. Food is obtained by gleaning among foliage. It will occasionally hover-sallying or sally-striking flying insects. It is a core member of mixed feeding flocks, including those with *Acanthiza* species, Gray Fantail (*Rhipidura albiscapa*), Rufous Whistler (*Pachycephala rufiventris*), Spotted Pardalote (*Pardalotus punctatus*) and Striated Pardalote (*Pardalotus striatus*), and in Western Australia, Western Spinebill (*Acanthorhynchus superciliosus*).

Nesting: Sexes are alike. The nominate race has the top of its head gravish-brown, merging into gravish-olive on the sides of neck. Most of the lores are white with a diffuse dark brown loral spot and a conspicuous off-white supercilium tapering behind the eye. The ear-coverts are light brown. The upper parts are olive to gravish-olive (contrasting with crown) turning to pale olive-yellow at the base of upper tail-coverts. The upper tail is a dark brownish-gray with a broad black subterminal band. The upper wing is dark brown with narrow pale yellowish fringes on the secondary coverts and tertials. There are finer yellowish edges on the remiges. The chin and throat are off-white with variable fine short dusky streaking. The breast is creamy to very pale yellow (sometimes brownish at side), grading to richer yellow on belly and vent and brighter yellow on the flanks. The under tail-coverts are creamy and the under tail is dark gray with broad white tips. The iris is white to pale yellow. The bill is gray-brown to dark brown, often with a paler pinky-brown lower mandible. The legs are dark gray to a pinkish-gray to dark brown. The juvenile has a duller head and upper body with a brownish cast. The yellow fringes are richer on the tertials. The under side is paler and the throat lacks the streaking. The iris islight gray to a lime-green. Races differ mainly in color tone.

Breeding season starts in July and May, with some variations throughout range. The Weebill's nest is a neatly woven dome, made from grasses and other fine vegetation. It has a narrow spout-like entrance towards the top. The interior of the nest is lined with feathers and soft vegetable matter. The female alone incubates the eggs, but both parents care for the young birds. 2 to 3 eggs are laid, incubating for 12 days.

Cool Facts: Weebills are some of Australia's smallest birds, with northern Australian Weebills even smaller than those in the south.

• *S. b. flavescens.* It is found in northern Australia from Kimberley Divide (Western Australia) east, including the Tiwi Islands (Bathurst Island and Melville Island), to north and western Queensland (Cape York Peninsula, including dry forest in the northeast) and southward to the northern Great Sandy and Tanami Deserts, central Australian ranges, the northern Simpson Desert and central Thomson drainage. It is much paler and yellower than the other subspecies. It is yellow-olive above (top of the head contrasting less with the upper parts) and the supercilium and lores are off-white to pale yellow. There is no dusky loral spot and the ear-coverts are only faintly washed brown. The chin, throat and under tail-coverts are unstreaked pale yellow, merging into brighter yellow rest of the under parts. The bill is very pale, flesh-brown or horn-colored with the lower mandible sometimes being a pale pink.

- *S. b. brevirostris.* The nominate race is found in eastern Australia from central and eastern Queensland (in the Burdekin drainage) south to Victoria and southeastern South Australia.
- *S. b. occidentalis.* It is found in southwestern Western Australia (southward from the lower Murchison river and Kalgoorlie region) eastward around the southern rim of the Nullarbor Plain to South Australia (south from the central Flinders Ranges, Lake Frome Basin and the Murray Mallee). It is very much like the nominate subspecies, but the top of the head is usually slightly darker. It has the sides or all of the breast suffused with gray and the center of the breast is usually streaked.
- *S. b. ochrogaster.* It is found in western and central Western Australia (south from Pilbara). It is smaller, more short-tailed and paler than the other subspecies. It resembles a washed-out version of the nominate; having pale olive upper parts contrasting less with the top of the head and the loral spot and ear-coverts being a paler brown. The chin to breast off-white with little or no yellow tinge and the streaking faint or absent. The bill slightly paler.

Common Name: Yellow-rumped Thornbill **Scientific Name:** *Acanthiza chrysorrhoa*

Size: 3.7-4.7 inches (9.5-12 cm)

Habitat: Australia; wide distribution across western, southern and eastern Australia as well as Tasmania; it is absent from the north coast of Western Australia, parts of central Australia, northern Queensland and central and northern Northern Territory.

The species inhabits a wide range of habitats, including open forest and woodland, grasslands, savanna as scrubland.

Status: Least Concern. **Global population**: 7,440,000 mature individuals with a declining population trend. Widespread and common over large area of mainland Australia and Tasmania. Has adapted to modified habitats. Declines noted around major cities, such as Adelaide, Sydney and Melbourne, presumably correlated with loss and degradation of habitat and increased levels of predation; similarly, populations in wheatbelt of SW Western Australia have declined. In general, however, this species' future seems to be secure, at least in the medium term.

Diet: Insectivorous; major prey items include ants, beetles, bugs and lerps. Other items eaten include spiders, flies and seeds.

It usually forages in small groups of between 3-12 individuals, and may join mixed species-flocks with other small insectivorous passerines such as the Speckled Warbler



(Chthonicola sagittatus), Weebill (Smicrornis brevirostris), and other species of thornbill.

Nesting: Sexes are alike. It is a large distinct thornbill with a short tail and long slender bill. It is the largest member of its genus. The nominate race has a forehead that is blackish, boldly dotted with white feathers with the crown to the hindneck being graybrown, becoming paler on the neck sides, merging into cream on the throat. The whitish supercilium is broader in the front of the eye, extending in narrow pale band just above bill and tapering behind the eye, offset by a narrow dark eye stripe. The earcoverts are off-white and mottled dusky. The upper parts are gray-brown, the upper tailcoverts and the upper-most base of the tail is yellow, contrasting strongly with mainly black tail with its narrow off-white tips. The upper wing is gray-brown, with a blackish alula, dark brown primary coverts and tertial centers, The tertials narrowly fringed offwhite, with fine off-white fringes of the emiges (which may form diffuse narrow wing panel, fading with wear). It is off-white below, with a variable buff diffusion on the breast, and a richer yellow-brown on the flanks. Sometimes, there is a faint yellowish tinge on the under tail-coverts. The under tail is gray-black with broad pale grayish-white tips. The plumage tends to become paler farther inland. The iris can be variable, from a yellow-brown to gray-brown to even a creamy or whitish color. The bill and legs are black. The juvenile is less well marked than the adult, with its head spotting duller, the light brown fringes of the greater coverts may form a narrow wingbar. Races differ mainly in plumage tone.

Breeding takes place from July to December, with one, two or even more broods a year. Nesting usually occurs as a pair, but sometimes one to three helpers will assist the breeding pair. The nest is a messy dome-shaped structure made of dried grass and other vegetation hidden low down among dense foliage or shrubs, or sometimes in vines or mistletoe. Atop the dome is a cup-shaped depression which serves as a false nest, while the real nest is inside with a concealed entrance. Three or four white oval eggs which are sometimes marked with pale red-brown. The female incubates the clutch, and the clutch takes around 16–18 days to hatch. On hatching both parents help feed the brood. The nestling period is around 19 days. The species is parasitized by the Shining Bronze-Cuckoo and the Fan-tailed Cuckoo. Many species of bird take eggs and chicks from the nest, including Red Wattlebirds, currawongs, Australian Magpies and ravens, and many honeyeaters will destroy their nests in order to steal nesting material. Ringing studies have found that the species can live for up to nine years.

Cool Facts: The Yellow-rumped Thornbill is the largest species of thornbill.

- *A. c. normantoni.* It is found in central and inland northeastern Australia. It is like race *leigh* but the tarsus is longer, the nape is light gray with darker mottling, the upper parts are paler, the rump is a brighter olive and the upper tail-coverts are a brighter yellow. The under parts are mostly bright pale yellow and sometimes there are dark flecks on the upper breast.
- *A. c. leigh*. It is found in southern and southeastern Australia. It has a shorter tarsus than the nominate, the plumage darker, more olive above, the upper tail-coverts are

a brighter yellow. The under parts are more buffy, the flanks are deep buff to yellowish-brown.

- *A. c. leachi.* It is found in northern and eastern Tasmania. It is the largest race and being darker olive-brown above than the others. The under side is similar to the nominate.
- *A. c. chrysorrhoa.* The nominate race is found in central-west, southwest and southern Western Australia.

Common Name: White-fronted Honeyeater **Scientific Name:** *Purnella albifrons*

Size: 5.1–7.3 inches (13-18.5 cm)

Habitat: Australia; found throughout western New South Wales, western Victoria, South Australia and Western Australia, mainly in the arid and semi-arid zones. It may also be found at scattered sites in the Northern Territory and is a rare visitor to the western arid zone of Queensland.

It is typically found in arid and semi-arid shrublands and woodlands, especially mallee and acacia scrubs. May be found in semi-arid coastal areas, such as the Great Australian Bight. Is occasionally found in dry open forests and woodlands, and may be found along roadsides and occasionally in gardens.



Status: Least Concern. Global population: 5,130,000 mature individuals with a stable population trend.

Diet: Nectar, but also on insects and sometimes honeydew.

It forages mainly at flowers in trees and shrubs, and may be seen feeding in mixed flocks with other honeyeaters such as the Brown, Singing or Spinycheeked Honeyeaters.

Nesting: Sexes look alike, however the male is larger than female. The plumage is mostly black-brown above, with fine white scaling on the crown and nape merging into heavy white streaking on the hindneck and most of the upper body, and with pale rufous streaking on the dark brown rump;. The sides of the long sloping forehead, lores, eye ring and submoustachial stripe are white, dissected by a thin black-brown moustachial stripe. The ear-coverts are silvery gray, merging into an uneven white patch extending

broadly down side of neck. The upper-wing is dark brown with white to yellow-olive margins on the wing-coverts and tertials. The yellow-olive edges on rest of the remiges from a broad panel when the wing is folded. The upper tail is dark brown with fine yellow-olive edges and white tips. There is a stark black-brown bib from chin to upper breast (in fresh plumage chin and throat sparsely and finely speckled white), this merges into white with diffuse black streaking on the flanks. The rest of under body is whitish. The under tail is brownish-gray, the under wings pale are an orange-buff with a brownish-gray trailing edge and tip. The iris is reddish-brown with asmall area of bare pink-red skin behind eye that stands out prominently. The bill and gape are black and the legs are gray-black. The juvenile is paler than the adult and without the bold facial markings. Its forehead, lores and submoustachial stripe are gray-brown and contrasting little with the dark brown of rest of head and neck, but with the white stripe on the sides of neck are as the adult. It has a paler and browner upper wing, a brown upper breast, a gape cream or yellow and swollen. The iris is brown and the bare patch behind eye smaller and less intensely coloured.

Breeding season goes from August to November. The females lays 1-3 eggs and incubates them for about 12 days. The fledging period is about 11 days.

Cool Facts: While adult White-fronted Honeyeaters are hard to confuse with other species, the young may be confused with female or young Crescent Honeyeaters (*P. pyrrhoptera*). However, they tend to be darker, with a prominent dark 'bib' and more streaking on the under-body, and have very different calls.

In hot weather, adult White-fronted Honeyeaters may straddle nests to shade their young.

Common Name: Eastern Whipbird **Scientific Name:** *Psophodes olivaceus*

Size: 9.8 -11.8 inches (25-30 cm)

Habitat: Australia; range is from northern Queensland to Victoria along the coastal band of eastern Australia.

Eastern Whipbirds live in dense undergrowth in rainforests, wet eucalypt forests and riverine vegetation, particularly in gullies and other low, dense vegetated areas. They occasionally are seen in other forest types, such as exotic pine plantations, if there is sufficient thick undergrowth. They range from sea-level to 1500 m.



Status: Least Concern. **Global population**: 1,590,000 mature individuals with a decreasing population trend. In the north, the Eastern Whipbird's distribution has become patchy where its habitat has been cleared. It needs thick undergrowth to survive.

Diet: Insects and other small invertebrates, which are caught on the ground by bill.

Feeding takes place alone, in pairs or in small family groups, recovering insects from leaf litter on the forest floor

Nesting: Sexes are similar. The nominate race has its head and triangular erectile crest jet black, grading to olive-brown on its nape. There is a broad white patch from base of bill through the malar region and on to sides of the chin, throat and neck. The upper parts are dark olive-green, turning somewhat brighter on upper tail-coverts. The remiges and most upper wing-coverts are a medium olive-green on the outer web, brown on the inner web. The primary coverts and alula are brown-gray. The tail dark olive-green basally, grading to dark brown distally, all except central pair of rectrices with pale tips (tip diffusely white or buff inwards, becoming larger and better--defined white outwards). The chin, throat and upper breast are black with the sides washed olive,. The remaining under parts are olive-brown with the center of belly a mottled off-white. The iris is dull reddish-brown, the bill black and the legs a rufous-brown to black.

The juvenile has a slight crest and is dull olive-brown. The wings and tail are washed with olive-green. The immature is similar to the adult, but the black areas of plumage are replaced with a dull olive-green and the cheek patch is paler and smaller. The under parts are paler and more mottled. The iris is brown and the bill is a dark gray.

Whipbirds are monogamous. A breeding pair of Eastern Whipbirds occupies a territory, which is defended year round, with the mates staying together for many years. Breeding occurs form late winter through spring; a loosely built bowl of twigs and sticks lined with softer material such as grasses, located in shrubs or trees less than 3-4 m (10-12 ft) above the ground. Several broods may be laid the an extended breeding season. A clutch of 2-3 eggs, pale blue with blackish splotches and spots. Female incubate and brood the eggs and nestlings, though males help feed and take a more active role in looking after fledglings for 6 weeks after leaving the nest. Sometimes two broods are raised in a single season.

Cool Facts: These birds are secretive, but can be curious, and will be seen if the observer remains patient. The Eastern Whipbird is famous for its call which sounds like the crack of a whip. The call is actually made by two birds, the male beginning the call with a long whistle, and the female ending it with the whip crack sound. The sound is heard at the beginning of the theme song to "Skippy the Bush Kangaroo".

There are two subspecies:

- *P. o. lateralis.* It is found in northeastern Queensland (the Cairns and Atherton Tableland region) in northeastern Australia. It is somewhat brighter on the upper parts than the nominate race and has a shorter wing and tail.
- *P. o. olivaceus.* The nominate race is found in central-eastern Queensland (from the Clarke Range) south to southeastern Victoria.

Common Name: Gray-crowned Babbler **Scientific Name:** *Pomatostomus temporalis*

Size: 9-10.6 inches (23-27 cm)

Habitat: Australasia; Australia, Indonesia, and Papua New Guinea. The Gray-crowned Babbler is found in open forests and woodlands, favoring inland plains with an open shrub layer, little ground cover and plenty of fallen timber and leaf litter. May be seen along roadsides and around farms. In south-east Melbourne, small populations survive on golf courses.



Status: Least Concern to Threatened. **Global population**: 8,510,000 mature individuals with a decreasing population trend. Gray-crowned Babbler populations have declined throughout their range as a result of land-clearing practices that leave habitats fragmented. When groups become isolated, numbers decline to a level where they cannot continue to successfully breed. Habitat degradation is also a factor in declines, with fuel-reduction burning, grazing, weed invasions and removal of timber decreasing leaf litter build-up, which then reduces the amount of invertebrate food available. Eastern populations are near threatened, while they are classified as endangered in Victoria and South Australia. It is locally extinct in the south-eastern region of South Australia. Overall populations have declined by 95% since European settlement. The nominate race is considered "threatened".

Diet: Gray-crowned Babblers feed on insects and other invertebrates, and sometimes eat seeds.

They forage in groups of two to fifteen birds on the ground among leaf litter, around fallen trees and from the bark of shrubs and trees (they tend to use trees more than other babblers).

Nesting: It is a distinctive large Pseudo-Babbler. Sexes are similar. The nominate race has narrow gray stripe down centre of crown and nape and broadening on the hind neck. It has a very broad white supercilium which can give appearance of white cap. The blackish-brown mask extends from the bill through the eye to the ear-coverts and sides of the neck. The upper parts are mostly gray, grading to dark brown on rump and upper tail-coverts. The lesser and median upper wing-coverts are gray-brown, the greater coverts, primaries and secondaries are dark brown. There is a prominent rufous patch across the primaries (visible in flight). The tail blackish-brown with white tips which are broadest on the outer rectrices (and obvious in flight). The chin, throat and upper breast are white, grading to brownish-gray on breast side, to rufous-brown on flanks and upper belly, and to dark brown on rest of under body. The under wing-coverts and axillaries are light gravish-brown. The iris is pale yellow, the bill black and there is a narrow pinkish strip along lower mandible and along base of the culmen. The legs are dark gray. The juvenile is similar to the adult, but the bill is shorter and less decurved. The iris is dark brown, the gape yellowish, the ear-coverts paler, and it has narrow rufous tips on upper wing-coverts and the alula. Immatures are identical to the adults in plumage, but their irises are browner (not pure yellow until at least 3 years old).

Gray-crowned Babblers live and breed in co-operative territorial groups of two to fifteen birds (usually four to twelve). Groups normally consist of a primary breeding pair along with several non-breeding birds (sometimes groups may contain two breeding pairs or two females that both breed). Most members of the group help to build nests, with the primary female contributing the most effort. Two types of nest are built: roost-nests (usually larger and used by the whole group) and brood-nests (for the breeding females), and often old nest sites are renovated and re-used from year to year. The large domed nests are placed in a tree fork 4 m - 7 m high and are made of thick sticks with projections that make a hood and landing platform for the entrance tunnel. The nest chamber is lined with soft grass, bark, wool and feathers. The brooding female (sometimes more than one) is fed by the other group members and all help to feed the nestlings. Larger groups tend to raise more young, and two broods are usually raised per season. Breeding season is July to February and usually 2-3 eggs are laid.

Cool Facts: The Babbler has several other common names such as the Yahoo, Graycrowned Chatterer, Dog-bird, Barker, Barking bird and Happy-Jack. The Gray-crowned Babbler lacks the dark crown of other babblers and has a yellow rather than a dark eye.

The old nests of Gray-crowned Babblers are used by a variety of other birds: Blue-faced Honeyeaters sometimes nest on top of the dome. Yellow-rumped Thornbills may nest underneath and are even tolerated in active nests.

• *P. t. temporalis.* The nominate race occurs within Australia in the states of Victoria, eastern Queensland (including Cape York), New South Wales and

south-eastern South Australia It is a vagrant or accidental visitor to the Australian Capital Territory. It is also the subspecies believed to occur within New Guinea

- *P. t. rubeculus.* This subspecies occurs in Australia within the states of Western Australia, Northern Territory, western Queensland and a small area of northern South Australia. Race *rubeculus* differs from nominate mainly in slightly darker brown upper parts and upper wing, and rufous breast.
- *P. t. strepitans.* It is found in southern New Guinea (from the Orimo River to the Digul River).

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Species Accuracy and Reference Materials

Many birds of the same species do vary considerably in color. This package tries to emulate the colors and markings in the most commonly found variants.

The author-artist has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique bird species, some give and take is bound to occur. The texture maps were created in Painter with as much accuracy as possible. Photographic references from photographs from various Internet searches and several field guides were used.

Field Guide Sources:

Wikipedia Birds in the Backyard <u>http://birdsinbackyards.net</u> OZ Animals <u>http://www.ozanimals.com</u> Jigger Juice: Plants of the Murray Mallee <u>http://www.jiggerjuice.net/plants/index.html</u> FloraBase: Western Australian Flora <u>http://florabase.calm.wa.gov.au/</u> WWF <u>http://www.worldwildlife.org</u> Birds of the World <u>https://birdsoftheworld.org/bow/home</u>

