

Living with the Land Guidelines for the Fitz-Stirling



Compiled by Angela Sanders
for
Greening Australia WA and Bush Heritage Australia



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These guidelines have been compiled to help raise community awareness of the Gondwana Link vision and ways of managing the land in the Fitz-Stirling that complements the vision. Greening Australia WA and Bush Heritage Australia recommends that readers exercise their own skill and care with respect to their use of these guidelines and that users carefully evaluate the accuracy, currency, completeness and relevance of the material for their purposes.

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Front cover—Keith Bradby and Fred Powell plan revegetation on National Tree Day. Photo Amanda Keesing

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What is the Gondwana Link vision?

Australia is one of the biologically richest parts of the world. Much of this biological richness is concentrated in south-western Australia, one of the world's 34 'biodiversity hotspots'¹. This area has an estimated 8,000 plant species, more than one-third of Australia's known flowering plants, and of these more than 50% are endemic to the south-west and around 20% are yet to be scientifically described.

The post-World War II government policy to clear "a million acres a year" has transformed the South West into an agricultural area. The clearing policies were such that only small patches of the bush remain on farms. Now as we recognise the value of these natural areas, not only in their own right but for the ecosystem services they provide (eg pollinators for our crops), many are working to care for these bush fragments as well as link them together to strengthen their viability and value as habitat.

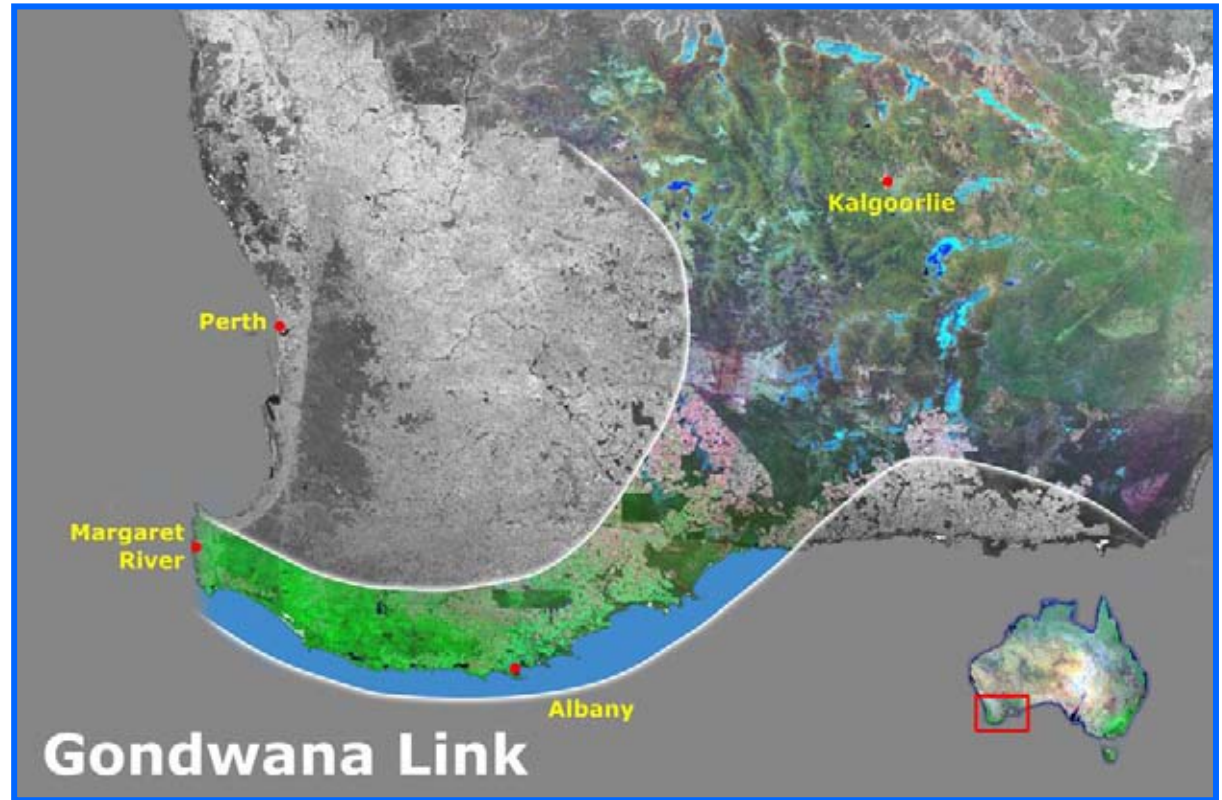
Leading national and global conservation groups, local communities and many other organisations and private enterprises are working together to achieve the Gondwana Link vision.

The Gondwana Link vision is simple: **reconnecting the bushland across 1000 km of country from the tall wet forest in the far south western corner of Australia to the semi arid woodlands on the edge of the Nullarbor Plain.**

Our vision is both audacious and achievable but it needs your help!

More information on Gondwana Link can be found at www.gondwana.org.au

¹These are areas of outstanding biodiversity that also have a high level of threat.



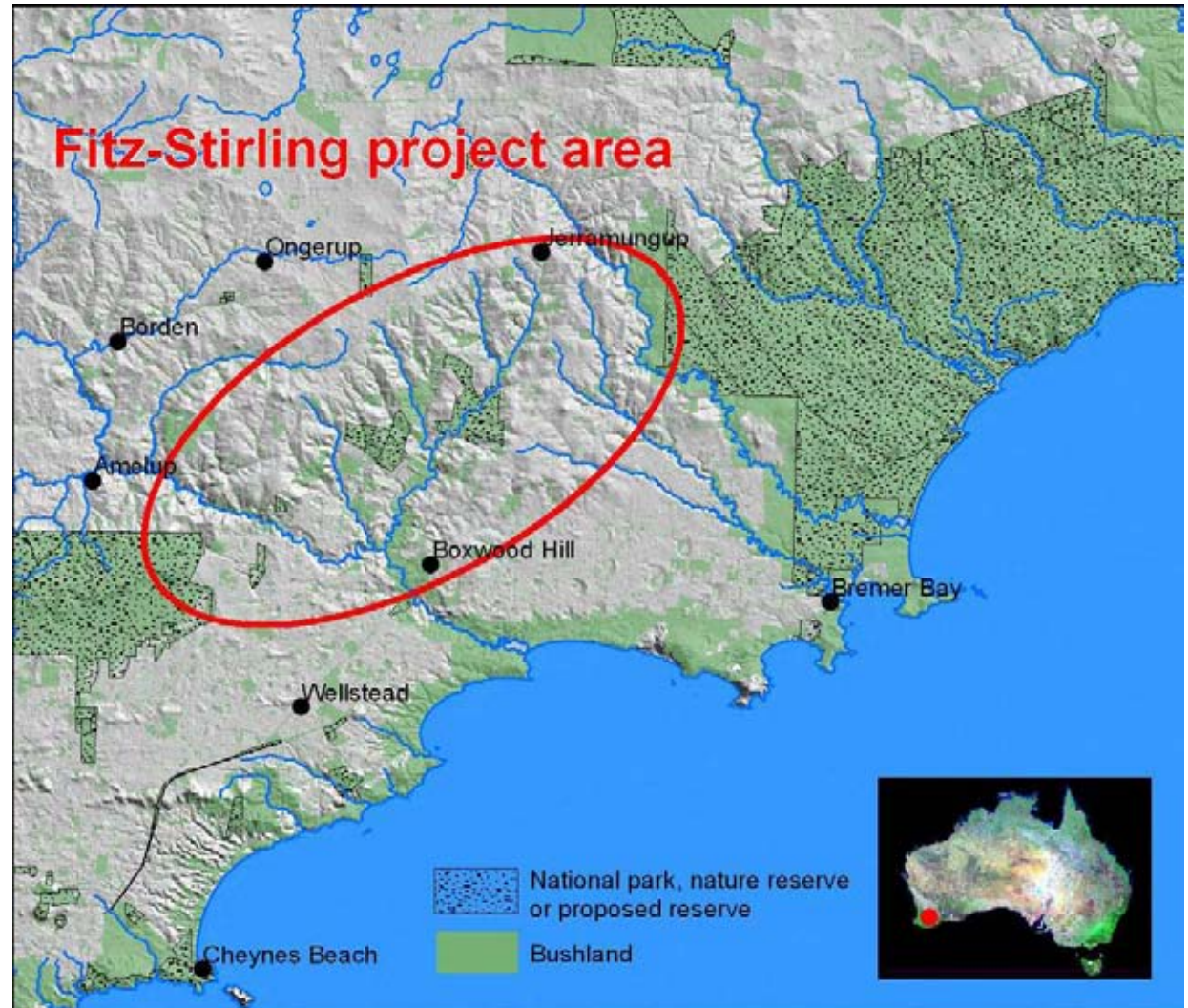
The Gondwana Link vision is simple: **reconnecting the bushland across 1000 km of country from the tall wet forest in the far south western corner of Australia to the semi arid woodlands on the edge of the Nullarbor Plain.**

Where is the Fitz-Stirling area?

The Fitz-Stirling is the name given to the broad area between the Stirling Range and Fitzgerald River national parks and is one of eight areas that make up the Gondwana Link pathway that stretches from the south western corner of WA to the woodlands and mallee bordering the Nullarbor Plain (see Map Page 3). The Fitz-Stirling includes the central Pallinup Valley, Corackerup Creek, Peniup Creek and parts of the Bremer and Gairdner River catchments. The aim in the Fitz-Stirling is to “reconnect”² the parks using a range of strategies including:

- ◇ strategic land purchase with the emphasis on purchasing bushland with high conservation value;
- ◇ restoration of cleared land to re-establish lost linkages;
- ◇ working with other land managers across the link who want to contribute, and
- ◇ provision of practical information on complementary land management across the link.

² Here “reconnect” includes the creation of vegetated links and stepping stones and the protection of existing bushland from degradation.



What are Conservation Targets?

To assist with planning in the Fitz-Stirling we have used a tool that we call the “Functional Landscape Plan” (FLP)³, an example of the planning process is given in the table opposite. This process has been used to carefully select six conservation targets that enable efforts to be focussed where they will be most effective.

We recognise that the current reserve system, made up of isolated habitat fragments (between the national parks), is not likely to be capable of ensuring the survival and continued evolution of plants and animals into the future. In the Fitz-Stirling, therefore, we are aiming to achieve a landscape in which the natural processes favour the continued evolution and resilience of the region’s native species to climate change.

By focussing our attention on the suite of six conservation targets we will be addressing most of the threats to biodiversity in this area and will be working towards the ongoing health of the Fitz-Stirling landscape. In other words looking after these six targets will benefit the whole landscape. These targets are:

1. Creeks
2. Proteaceous rich plant communities
3. Black-gloved and tammar wallabies
4. Mallet and moort woodlands
5. Yate woodlands
6. Freshwater systems

³This tool was developed by the US based Nature Conservancy and they call it the Conservation Action Planning process (CAP).

An example of planning using the Functional Landscape Planning tool

STEP	EXAMPLE
Select target	Tammar
Assess the current viability (baseline data)	Present mostly in dense bushland in central Fitz-Stirling area
Identify the stresses on the target	Predation, bush fragmentation
Identify the sources or causes of the stress	Foxes, cats?, clearing (historic)
Develop conservation strategies	Fix baiting program, reconnecting tammar habitat, replanting tammar habitat
Monitor for success	Community reporting of tammar sightings, infrared cameras, spotlighting surveys



Amanda Keesing

Black-gloved wallabies still occur in the Fitz-Stirling



Chinch Grynewicz

Moort trees grow in dense stands with very little understorey

More information on the conservation targets can be found later in this document and on the Gondwana Link website www.gondwanalink.org.au

How to use these guidelines

These guidelines have been provided to assist land managers to plan and implement actions that will contribute to the restoration and improved health of the Fitz-Stirling landscape by focussing efforts on the six **Conservation Targets**. Many of these actions will also contribute to a healthier agricultural landscape such as protecting pollinators of crops and restoring a healthy hydrology to reduce the risk of salinity. The guidelines can be used to:

- ◇ complement existing farm or catchment scale plans
- ◇ carry out land management that is complementary to the Gondwana Link vision
- ◇ manage bushland patches
- ◇ restore/protect bushland

Step 1. Identify which Conservation Targets you have on your property (information sheets for each target are available from our website). Mark them on your farm or catchment plan if you have one.

Step 2. Assess the issues that are affecting each conservation target that occurs on your property. These are given later in this document.

Step 3. Read through the appropriate action/s and decide which you are able to take.

Step 4. Plan your actions using the detail contained in the many information sources that are available (some are given at the end of this document). Seek expert advice if you are unsure.

Step 5. Take action and record your methods (taking regular photographs from the same place is a good way to document your work).

Step 6. Evaluate your work – what has worked and what hasn't worked and why. We may be able to incorporate your work into our long-term monitoring program (contact the Gondwana Link office for advice).

These are guidelines only and as such are not designed to provide detailed methods. There are many publications and other resources available that provide more detail on how to go about the actions listed in this document. Some references and web sites have been provided in the appendices at the end to help you access this information. If you are in doubt about any of the actions given please seek expert advice. It is also a good idea to link with your local catchment group for advice.



Amanda Keesing

Large scale revegetation at Wesfarmers Yarrabee



Chinch Gryniewicz

Hugh Pringle evaluating the success of revegetation at Chereninup

We know that nature responds to opportunity and it may be that, by removing the threats, providing opportunities and enhancing natural resilience through restoration efforts, we may see some welcome ecological surprises!

How are you helping by carrying out these actions?

By carrying out the above actions you will be contributing to a restored Fitz-Stirling landscape that will allow:

- ◇ **connections between bushland areas to keep fauna populations healthy and migratory and nomadic species will be able to continue their life cycles;**
- ◇ **a supply of seasonal food sources for fauna;**
- ◇ **habitat protection so that existing fauna survives and also eventually permits the restoration of locally extinct fauna;**
- ◇ **freedom from increased sedimentation and stream pollution;**
- ◇ **the provision of freshwater in the landscape needed for dependant species;**
- ◇ **continued evolution of the area's diverse plant communities;**
- ◇ **introduced predator management that favours indigenous species and systems over introduced species, and**
- ◇ **fire regimes that do not degrade the ecological processes and natural values of the landscape.**

Conservation Targets

Creeks⁴

If your property is within the Fitz-Stirling area you are part of a river catchment. Water from on-farm creeks eventually runs into the Pallinup, Bremer or Gairdner Rivers (see Map page 4).

Creeks are a target because they:

- ◇ are important natural corridors for fauna movement
- ◇ have distinctive plant communities not found elsewhere in the landscape
- ◇ are at risk because of altered hydrology and surface erosion

The river pools in particular are important habitats and they are a drought refuge for fauna, but very little else is known of their ecological values. Most creeks in the area have disrupted flow patterns and are subject to loads of silt, sand, salt, nutrients and chemicals that are carried in runoff from agricultural land. In places these impacts extend a considerable distance into bushland areas.

Sand slugs (large deposits of sand in a river or creek) are present in most systems and phytoplankton blooms can occur. Sand slugs change the dynamics of creeks by altering channels, filling pools and smothering vegetation growing in the stream channel. In severely degraded catchments sand slugs have filled many of the once permanent pools and in many cases mechanical removal, in conjunction with stopping the sediment at its source, are the only options available to restore the pools. Phytoplankton blooms deplete oxygen from the water and can become toxic. If severe, these blooms can cause the death of fish and other aquatic animals and plants.



Chinch Grynievicz

A creekline in excellent condition with healthy fringing vegetation

Issues affecting creeks:

- ◇ Increased surface erosion and sediment, salt and nutrient transport into creeks
- ◇ Declining health of creekline habitat

Causes:

- ◇ Over clearing
- ◇ Cropping and grazing practices
- ◇ Development of roads, tracks, creek crossings and utilities
- ◇ Invasive species (diseases, weeds and feral animals)
- ◇ Inappropriate fire management

⁴The term Creeks here means the channel where water flows, pools, floodplains and the distinctive vegetation that lines creeks and grows in floodplains.



Amanda Keesing

Degraded creekline

Important note: when talking about creeks, waterways and rivers, we often use the word “**riparian**”. The “**Riparian zone**” of a waterway, is that part of the land that is directly influenced by the river or creek and includes the channel, banks, floodplain and even other bodies of water that are connected to the river. Riparian vegetation is the term we use to refer to all the plants (from tall trees and shrubs to grasses, rushes and sedges) that grow along, or near, a waterway.

Conservation Targets (continued)



Isopogon



Persoonia

Proteaceous rich plant communities

Proteaceous rich communities are those that have a high proportion of the familiar plants in the genus *Banksia* (now includes all *Dryandra* species), *Grevillea* and *Hakea* and also those less familiar, *Adenanthos*, *Conospermum*, *Franklandia*, *Isopogon*, *Lambertia*, *Persoonia*, *Petrophile*, *Stirlingia* and *Synaphea*. These communities are of special significance as part of the vegetation mosaic across the Fitz-Stirling. They often occur on the ancient land surfaces and the plants have evolved over millions of years to cope with fire and very low nutrient soils. Their nectar and pollen production provides an important food source for birds, mammals and insects throughout the year, particularly during summer and autumn.

These communities were the easiest to clear during agricultural development and consequently only small areas remain and these remnants may be subjected to on-going disturbances. They are found on deep sand and gravelly sand and are particularly susceptible to the introduced root rot fungus *Phytophthora cinnamomi* (and others).

Issues affecting proteaceous rich communities:

- ◇ Loss, fragmentation and declining health of proteaceous rich plant communities
- ◇ Loss or decline of pollinator species

Causes:

- ◇ Over clearing
- ◇ Cropping and grazing practices
- ◇ Development of roads, tracks, creek crossings and utilities
- ◇ Diseases, particularly *Phytophthora* species
- ◇ Weed invasion
- ◇ Predation on pollinators by feral animals (e.g. honeyeaters and honey possums)
- ◇ Inappropriate fire management



Lambertia



Banksia



Hakea



Stirlingia



Petrophile



Banksia (was Dryandra)



Grevillea

Photos Greg Harold



Synaphea



Franklandia



Adenanthos

Conservation Targets (continued)

Black-gloved and tammar wallabies



Anne Storrie

Black-gloved wallaby (*Macropus irma*)

In the past the Fitz-Stirling had a much wider variety of mammals than live there now. Sub-fossil remains of the banded hare-wallaby, kultarr, bilby and western barred bandicoot have been found the Fitzgerald River National Park⁵ but they are now locally extinct. Others are in a precarious position such as the black-gloved wallaby, tammar and woylie. Many of these animals were once widespread and they played important ecological roles such as carriers of seed and diggers (aerators) of soil.



Sandra Gilfillen

A black-gloved wallaby is captured by remote camera

Tammar have been chosen as a conservation target because they were recently abundant and widespread and are dependant on both suitable habitat and relative freedom from introduced predators like the fox and feral cat. The brush wallaby was chosen as it appears to be in decline. We believe that if we can achieve strong tammar and brush wallaby populations we will also benefit species such as common brush-tailed possums and many others.

Issue affecting wallabies:

- ◇ Decline in numbers of tammar and black-gloved wallabies

Causes:

- ◇ Predation by foxes and cats
- ◇ Habitat degradation and fragmentation
- ◇ Inappropriate fire management (loss of shelter/refuge)



Anne Storrie

Tammar Wallaby (*Macropus eugenii derbianus*)

⁵ Mammal sub-fossil records A. Baynes WA Museum

Conservation Targets (continued)

Mallet and moort woodlands

The terms mallet and moort (or Marlock) apply to certain Eucalypts that have no lignotuber (mallee root) and therefore, unlike mallee species, have a single stemmed growth habit. Within the Fitz-Stirling moorts include *Eucalyptus platypus* subsp *platypus*, and the very restricted *E. vesiculosa* (Corackerup moort). All have round shaped leaves. Moort woodlands are generally found on hard, clayey soil. These woodlands usually grow in single species stands and rarely have many other species growing within them.

Mallets are also single stemmed and occur in more or less pure stands but generally differ from moorts in having steeply angled branches rather than the densely leafy spreading branches of the moorts. Mallet woodlands in the Fitz-Stirling consist mainly of *Eucalyptus astringens* subsp *redacta* and occur on a variety of soils but are mostly found in association with the slopes of breakaways, hills and valley floors. They usually have a more diverse understory than moort woodlands. The endemic mallets *E. melanophitra* and *E. arborella* are also found within the Fitz-Stirling area.



EUCLID

Eucalyptus platypus



Amanda Keesing



EUCLID

Eucalyptus vesiculosa



Amanda Keesing

These trees are obligate seeders, (they need fire to set seed) and are therefore particularly vulnerable to inappropriate fire regimes. These woodlands, once lost, may be very difficult to restore although *E. platypus* and *E. astringens* have grown well in revegetation projects in the area. They are also a very distinctive part of the landscapes within the Fitz-Stirling area and include endemic species with restricted ranges that warrant special protection. They may also have particular invertebrate fauna communities associated with them.

Issues affecting mallet and moort woodlands:

- ◇ Loss and fragmentation and declining health of mallet and moort woodlands

Causes:

- ◇ Cropping and grazing practices
- ◇ Over clearing
- ◇ Inappropriate fire management



EUCLID

Eucalyptus astringens redacta



EUCLID

Eucalyptus melanophitra

Conservation Targets (continued)

Flat-topped yate woodlands

Flat-topped yate, sometimes called swamp yate or mo, or *Eucalyptus occidentalis* is the only common large tree across the Fitz-Stirling and is a major component of a number of distinct woodland plant communities. Yates occur in three very different parts of the landscape; along creek lines (most common), in and around wetlands (swamps), and in the upland granite country. The yate woodland communities that occur in these three landscape sites have many species in common and others that are exclusive to each community.

Yate woodlands were chosen as a target as they are all suffering significant stresses. Around the Jerramungup and Needilup townsites the extensive yate woodlands that once occurred high in the landscape have mostly been cleared. The yate woodlands that grow along every significant watercourse north and east of the Pallinup River in the Fitz-Stirling appear to be stressed. The exact cause hasn't been identified but is thought to be a complex interaction between changes to runoff and water table levels, increasing salinity, insect attack, climate change and, possibly, disease. Yates are also the main hollow providing trees in this landscape and have a vital function in supporting the continued presence of species such as Carnaby's cockatoo.



Amanda Keesing

The distinctive flat-topped yate

Issues affecting yate woodland:

- ◇ Increased surface erosion and sediment, salt and nutrient transport into riparian yate woodland
- ◇ Loss, fragmentation and declining health of yate woodland (riparian, swamp and upland)

Causes:

- ◇ Over clearing
- ◇ Cropping and grazing practices
- ◇ Development of roads, tracks, creek crossings and utilities
- ◇ Weed invasion
- ◇ Inappropriate fire management



Chinch Gryniewicz

Along creeklines flat-topped yate occurs as an open woodland

Conservation Targets (continued)



Angela Sanders

Carlwillup Rock Hole near Jerramungup

Freshwater systems

The creeks in the Fitz-Stirling area are saline for most or all of the year but many animals need fresh drinking water to survive. The Fitz-Stirling appears to have had a significant number of widespread small occurrences of freshwater, either adjacent to creeks, in granite areas or clay pans. These are believed to play a critical role in the survival of many species, including some dragonflies, mammals, frogs and seed eating birds. They are also expected to support communities (including aquatic plants and invertebrates) that do not tolerate salinity. While surveys have been limited, it appears that many of the freshwater systems that may have occurred have been lost due to clearing and subsequent land uses.

Issue affecting freshwater systems:

- ◇ Loss of and declining health of freshwater sources

Causes:

- ◇ Over clearing
- ◇ Cropping and grazing practices
- ◇ Development of roads, tracks, creek crossings and utilities
- ◇ Weed invasion
- ◇ Inappropriate fire management



Greg Harold

Like most frogs the spotted-thighed tree frogs need freshwater for breeding



Greg Harold

Nardoo is a native fresh water plant



Mark Donnellan

Fresh water sources are scarce in the Fitz-Stirling

Summary of causes of issues affecting the conservation targets

Target	Over clearing	Cropping & grazing practices	Development roads & utilities	Invasive species	Inappropriate fire management	Diseases	Predation	Degradation of habitat
Creeks	✓	✓	✓	✓	✓			
Proteaceous communities	✓	✓	✓	✓	✓	✓	✓	
Wallabies	✓				✓		✓	✓
Mallet/Moort woodland	✓	✓			✓			
Yate woodland	✓	✓	✓	✓	✓			
Freshwater sources	✓	✓	✓	✓	✓			

What you can do—in a nutshell

To address increased surface erosion and sediment, salt and nutrient transport into creeks	To address loss, fragmentation and declining health of native bushland and freshwater sources	To address the decline in numbers of black-gloved and tammar wallabies
<p>Retain topsoil on farm</p> <ul style="list-style-type: none"> • Contour cultivation • Surface water management • Minimum tillage • Stubble retention 	<p>Reduce disturbance to bushland</p> <ul style="list-style-type: none"> • Minimise vehicle access • Exclude stock • Control invasive weeds and rabbits • Avoid soil disturbance • Prevent fertilizer drift into bushland • Take care with fire • Take care during fire protection/control activities • Protect mallet, moort, proteaceous rich communities and yate from fire wherever possible • Use appropriate hygiene measures if root rot fungus (<i>Phytophthora</i>) is present • Reduce and stabilise water tables 	<p>Control introduced predators</p> <ul style="list-style-type: none"> • Support area-wide fox baiting programs • Control fox and cat numbers locally where wallabies are known to occur • Reduce disturbance to bushland (see previous column) • Restore native vegetation (see previous column)
<p>Restore erosion prone surfaces</p> <ul style="list-style-type: none"> • Exclude or carefully manage stock • Site stock and vehicle crossings carefully • Improve pasture management in catchment • Strategic catchment revegetation • Stabilise eroding surfaces • Protect and repair creek banks 	<p>Restore native vegetation</p> <ul style="list-style-type: none"> • Encourage natural regeneration • Include plants from the Proteaceae family when revegetating, especially in sandy soils • Include mallet and moort species in suitable sites • Plant yate woodland species in suitable sites 	
<p>Minimise fertilizer use</p> <ul style="list-style-type: none"> • Test soil to determine fertilizer requirements • Use soil amendment • Replace annual pasture with perennial pasture 		
<p>Establish/retain/restore vegetation buffers</p> <ul style="list-style-type: none"> • Exclude stock • Stabilise eroding surfaces before planting • Control weeds and rabbits • Revegetate using local native species • Establish filter strips of grasses or rushes/sedges • Encourage natural regeneration 		

Actions you can take to protect the conservation targets

Increased surface erosion and sediment, salt and nutrient transport into creeks Conservation Targets helped: Creeks, Riparian Yate Woodland

1. Retain topsoil on farm by practising:

Contour cultivation

By planting across the slope, rather than up and down a hill, the contour ridges slow or stop the downhill flow of water. This can reduce soil loss by as much as 50%. Water is held in between the contours where it soaks into the soil, thus reducing water erosion and increasing soil moisture.

Surface water management

These earthen structures are constructed across cultivated slopes, at intervals down the slope and they intercept run-off and **safely** channel it into natural depressions or grassed areas (e.g. contour banks). They also trap much of the sediment from overland flow especially from rills and old gully lines. If crops or stubble are incorporated they can filter runoff as it moves slowly along the structure.

Minimum tillage

This conservation farming practice may encompass reduced tillage, direct drilling and zero tillage, all of which minimise soil disturbance. Soil degradation is prevented by protecting the soil with plant residues and improving soil structure by retaining organic matter to promote growth of soil organisms.

Stubble retention

Standing stubble helps to stabilise soils by providing cover (what is left on top of the ground) and organic matter (remains of the plant roots) in the soil. This helps to maintain soil structure and minimise erosion caused by wind and water.

A note of caution - stubble retention means more material is left to wash into creeks where its decay can lead to oxygen depletion. Plant material can also build up on the edges of remnant vegetation smothering native plants. This can be managed by using short high density grazing after the opening rains to allow the stubble to be flattened. This not only hastens the process of decomposition that minimises the likelihood of material being blown or washed into the creek but it also improves soil health. An alternative management action is to establish vegetation buffers (see below) to trap this material before it can enter the waterway.

2. Restore erosion prone surfaces:

Exclude or carefully manage stock

Ideally, protect the erosion prone surface from grazing either permanently or at least until it has recovered.

Site stock and vehicle crossings carefully

Crossings that are sited correctly can decrease erosion and prevent sedimentation of creeks and waterways. They also last longer and are easier to maintain.

Improve pasture management in catchment

Allowing pastures to become overgrazed by livestock not only exposes the soil to wind and water, but also destroys soil structure as their hard hoofs can either compact the soil or loosen it (even just by walking on it).

Strategic catchment revegetation

The aim is to accelerate the natural process of recovery which is achieved by stabilising the erosion prone surfaces. Growth of vegetation in erosion channels will help to accelerate stability by slowing down water flows and stabilising the soil by root growth.

Increased surface erosion and sediment, salt and nutrient transport into creeks (continued)

Stabilise eroding surfaces

There are many methods of stabilisation e.g. rock chutes to control the advance of a head-cut. Details of how to construct the various structures can be found in Rutherford *et al* 2000 (see documents list). You can also make “riffles” or small barriers of rock at intervals down the gully to slow the water, reduce erosion and allow native plants to establish in the gully.

A note of caution: placing rock, stone or large wood in the wrong place can make the erosion even worse so be sure to seek technical advice!

Protect and repair creek bank

Protecting and repairing an eroding embankment will deflect or dissipate the erosive water flow. Steep banks that are susceptible to collapse can be reformed by using methods that improve their structural integrity.

A note of caution: placing rock, stone or large wood in the wrong place can make the erosion even worse so be sure to seek technical advice!

3. Minimise fertilizer use:

Test soil to determine fertilizer requirements

By testing soil to determine fertilizer requirements we can avoid excess nutrients, especially phosphorous, finding their way into creeks. This can save you a lot of money too because you are not paying for fertiliser that just gets washed down the creek!

Use soil amendment

Artificially increasing the ability of soils to retain nutrients can dramatically reduce the amount of nutrients lost from the soil which improves farm productivity.

Replace annual pastures with perennial pastures

Consider the use of perennial pastures as they can provide green feed all year round, increase soil organic matter content, enhance soil structure and maximise water use, thus reducing groundwater recharge. They can also act to reduce nutrient loss into creeks.

4. Establish/retain/restore vegetation buffers:

Exclude stock

Fences should be placed at or above the highest water mark of the biggest flood to enable vegetation to establish in this zone. This may also have the benefit of reducing the need for repeated and costly fence replacement.

Stabilise eroding sites before planting

Before planting use appropriate bed or bank stabilisation techniques as there is no point planting out the foreshore or other areas which are eroding or unstable.

Control weeds and rabbits

Weeds are a major threat to the successful establishment of plants and careful removal or herbicide spraying may be needed. Use only herbicides that have a low toxicity to aquatic life, are surfactant free where frogs occur and also have a short residual life.

Revegetate using local native species

Vegetation can act as a filter that helps protect creeks from turbidity, nutrient-enriched run-off and waterborne spread of weed species. It can support creek ecology by shading water and

providing food and shelter for aquatic fauna (e.g. leaf litter is a natural source of food). Vegetation can also provide a home and movement corridor for native fauna.

Establish filter strips of grasses or rushes and sedges

Native grass or sedge filter strips provide physical barriers for trapping, organic matter and sediment and act to filter nutrients.

Rushes and sedges are commonly referred to as “reeds”. They have excellent soil binding properties and growth habits that make them very effective at slowing the rate of water flow and trapping sediment within waterways. Dense stands of rushes and sedges planted along the foreshore or buffer areas also trap soil and water run-off from adjacent land, which in turn limits the export of nutrients and sediment into creeks. Many species further improve water quality by acting as ‘nutrient-strippers’, accumulating significant amounts of nutrients in stems and rhizomes (underground stems), and supporting bacterial transformation of nutrients and other pollutants on their extensive root and rhizome mass. A list of suitable species is given in Appendices 1 & 2.

Encourage natural regeneration

Excluding stock and controlling weeds and rabbits will encourage natural regeneration, which can be the cheapest way of restoring creek buffers.

Loss, fragmentation and declining health of native bushland and freshwater sources

Conservation Targets helped: Yate Woodland, Mallet and Moort Woodland, Proteaceous Rich Communities, Wallabies, Freshwater Sources

1. Reduce disturbance to bushland:

Exclude stock

Stock severely damages target communities and they should be excluded. Both species of wallaby will graze in paddocks but they are dependant on bushland for shelter and protection from predators so fencing stock out of remnant bushland will enhance its value for wallabies.

Minimise vehicle access

Vehicles in bushland can destroy plants, kill animals and introduce weeds and disease such as the root rot fungus *Phytophthora cinnamomi*.

Control invasive weeds and rabbits

Disturbance to these communities can leave them vulnerable to weed invasion, especially annual grasses that invade from the paddock edges, especially after fire. Rabbits graze on young plants and carry weed seeds into bushland.

Avoid soil disturbance

Soil disturbance can encourage weed invasion and also destroys fauna habitat.

Prevent fertilizer drift into bushland

Fertilizer can be toxic to many native plants, especially proteaceous⁷ species. Take care when spraying and do so in calm conditions and don't direct nutrient carrying water into these patches.

⁷ Proteaceous species include the genera *Banksia*, *Grevillea*, *Hakea*, *Adenanthos*, *Conospermum*, *Franklandia*, *Isopogon*, *Lambertia*, *Persoonia*, *Petrophile*, *Stirlingia* and *Synaphea*.

Take care with fire

The plant communities in the Fitz-Stirling have evolved with fire but evidence suggests that it was a different regime to the current one. Many of the species take a decade or longer to set seed after a fire and too frequent fires eliminate them from the community.⁸

Take care during fire protection/ control activities

Avoid the use of heavy machinery within stands of yate, mallet, moort and proteaceous rich communities during fire suppression activities (find an alternative whenever possible).

Protect mallet, moort and proteaceous rich communities from fire wherever possible

The fire regime needed to support healthy mallet, moort and yate woodlands and proteaceous communities is currently unknown therefore no planned burns should be carried out until further studies are carried out.

Use appropriate hygiene measures if root rot fungus (*Phytophthora*) is present

The root rot fungus *Phytophthora cinnamomi* has been nominated as amongst 100 of the "World's Worst" invaders and it extends from Eneabba to Esperance.

⁸ Sandalwood requires areas to be fire free for 100+ years for successful natural establishment. In the Fitz-Stirling it is known to occur at the

GLink Wesfarmers Yarrabee and Chereninup properties and it is causing devastation to the flora in the Stirling Range National Park.

Sources of information on hygiene measures are given at the end of this document.

Reduce and stabilise water tables:

Restoring native perennial vegetation and planting high water use crops and pasture will help to decrease infiltration of rainfall into water tables thus decreasing the risk of salinity.



Permanent bait stations help to control rabbits in revegetation

Loss, fragmentation and declining health of native bushland and freshwater sources (continued)

2. Restore native vegetation:

Encourage natural regeneration:

This is the least expensive method of restoring and protecting creeklines once they have been disturbed and can be encouraged by excluding livestock and controlling invasive weeds and rabbits.

Include plants from the Proteaceae⁹ family when revegetating, especially in sandy soils

When planning your species list for revegetation projects relevant plants from the Proteaceae family should be included. A list of species for the Fitz-Stirling is included in Appendix 1.

Note that the reestablishment of these total plant communities can be difficult and expensive and research is ongoing as to the best methods to achieve this.

Include mallet and moort species in suitable sites

When planning your species list for revegetation projects relevant mallet and moort species should be included. A list of species for the Fitz-Stirling is included in Appendix 1.

Note that the reestablishment of both these total plant communities can be difficult and further research is needed on the best methods to achieve this.

Plant yate woodland species in suitable sites

When planning your species list for revegetation projects that include riparian zones, swamp/wetland margins or upland yate areas the relevant species for each site should be included. A list of species suitable for these sites in the Fitz-Stirling is included in Appendix 1.

⁹ The Proteaceae family includes plants of the genus *Banksia*, *Grevillea* and *Hakea*, *Adenanthos*, *Conospermum*, *Franklandia*, *Isopogon*, *Lambertia*, *Persoonia*, *Petrophile*, *Stirlingia* and *Synaphea*.



Barry Heydenrych

Direct seeding is an effective method used for revegetating larger areas

Decline in numbers of black-gloved and tamar wallabies

1. Control introduced predators:

Support area-wide fox baiting control programs

Fox baiting has been established as an effective means of increasing the numbers of some of the mammals that occur in the Fitz-Stirling. A broad scale fox control program is being developed and will be widely publicised.

Feral cat control is more problematic as they do not take the dried meat baits readily. Alternative baiting methods are currently being trialled. When they become available to landholders it is important that cats be controlled in conjunction with foxes and rabbits in a coordinated way.

Control fox and cat numbers locally where wallabies are known to occur

Fox and cat shoots and baiting at a local level can also be an effective way of protecting habitat that you know wallabies are living in.

How can you help us further to protect and enhance the Fitz-Stirling landscape?

In order to plan, prioritise and carry out the best management of the Fitz-Stirling landscape, we need to know where the Conservation Targets are and are especially interested in receiving information on the following:

- ◇ Location details of any of the conservation targets (to help update our maps)
- ◇ Sightings of black-gloved and tammar wallabies
- ◇ Information on frogs that are calling from pools other than roadside drains or farm dams (This can tell us where the freshwater is)
- ◇ Sightings of other fauna – long-necked tortoise, carpet python, bustard, bush stone-curlew, Carnaby's black-cockatoo, southern brown bandicoot, red-tailed phascogale, chuditch, water rat and malleefowl
- ◇ The fire history of bushland remnants in the region (year, season, intensity)
- ◇ Projects that involve conservation targets on your property

Check our website www.gondwanalink.org.au or contact the Gondwana Link office for further information



Amanda Keesing

Carnaby's Black Cockatoo are threatened with extinction



Greg Harold

The harmless carpet python is also threatened with extinction

What about restoring other communities?

Habitat restoration includes bushland protection and revegetation with the purpose of improving or providing flora and fauna habitat for everything from microscopic organisms to wallabies and yate trees. All the remaining bushland in the Fitz-Stirling is precious as only about 30% of the original vegetation remains and not all of it is in good condition. The diversity of the Fitz-Stirling bushland is so great that each and every patch of bush, no matter how large or small, is different and ecologically valuable.

The following guidelines are provided for land managers wanting to improve or create habitat for wildlife.

Remove the cause of degradation in existing bushland patches - *rule of thumb* - it is far easier to keep what you have in good condition than let it become degraded then attempt to restore it.

If you want to revegetate areas the steps to consider are given below:

Decide on the purpose of the restoration effort (e.g. to provide a fauna movement corridor between two remnants). Your objective will help you to form the best plan of action.

Establish soil types of the area to be planted and then match to it the type of vegetation that is to be restored (examples given in Appendix 1).

Plan the revegetation process taking into consideration ground preparation, weed and pest insect control, list of plants needed, seed collection or seedling purchase, direct seeding/planting methods, protection from stock, rabbits and kangaroos.

Incorporate the following in the list of plants overstorey trees, understorey shrubs AND ground covers.

Check that you include plants with a range of flowering times that will provide nectar and pollen all year round (Appendix 1).

Collect local seed from healthy bushland where possible.

Plant as many species from the appropriate vegetation type as possible using direct seeding or seedling planting methods (Appendix 1).

Leave mallee root, log or rock piles where they are, work around them, as they provide valuable small scale habitat for many of the smaller animals. Do not burn logs or mallee roots as they store a lot of carbon which would be released into the atmosphere as greenhouse gases if burnt.

Monitor the growth of the revegetation and if necessary control weeds, rabbit and kangaroo grazing and pest insects.

Include Dieback Hygiene in your plans. *Phytophthora* species and other pathogens, e.g. *Armillaria*, can also adversely affect some agricultural and horticultural crops.



Barry Heydenrych

A range of native seed is mixed ready for direct seeding



Amanda Keesing

Include a range of plants that provide nectar for honeyeaters in the revegetation

Useful Websites

Organisation	Web Address	Information Available
Australian Plants Online	http://asgap.org.au/apol.html	<ul style="list-style-type: none"> • Growing Australian Plants
CSIRO Land & Water	http://www.clw.csiro.au	<ul style="list-style-type: none"> • Plant Industry newsletter • Riparian Land Management Technical Guidelines
Department of Agriculture and Food, Western Australia	http://www.agric.wa.gov.au	<ul style="list-style-type: none"> • Bulletins • Farm Notes
Department of Environment and Conservation, Western Australia	http://www.dec.wa.gov.au or http://waterways.environment.wa.gov.au http://www.naturebase.net/content/view/118/451/	<ul style="list-style-type: none"> • Water Notes • Water Facts • Water Quality Protection Notes • River Restoration Manuals • Florabase plant info • Land for Wildlife Scheme • Western Wildlife Magazine • Wildlife Notes
Department Environment & Heritage	http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/index.html http://www.environment.gov.au/biodiversity/abrs/online-resources/abif/flora/main/index.html	<ul style="list-style-type: none"> • Database of Australian Fauna (AFD) • Database of Flora of Australia
Department Water	http://portal.water.wa.gov.au	<ul style="list-style-type: none"> • Salinity Management • Water Management • Water Notes • Water Facts • Water Quality Protection Notes • River Restoration Manuals
Fitzgerald Biosphere Group	http://www.fbg.org.au	<ul style="list-style-type: none"> • Local projects that support sustainable practices
Land and Water Australia	http://www.rivers.gov.au	<ul style="list-style-type: none"> • Rip Rap Newsletter • Thinking Bush Newsletter • Rehabilitation manuals for Australian Streams • River & stream crossings in WA (booklet)
Landcare Australia	http://www.landcareonline.com	<ul style="list-style-type: none"> • Landcare Farming
Rivers of Western Australia	http://www.rowa.org.au	<ul style="list-style-type: none"> • Educational information for students on everything to do with rivers
Weeds Australia	http://www.weeds.org.au	<ul style="list-style-type: none"> • Weeds of national significance

Useful documents

* available as a download online

Farm Management

*Leonard, L. 1993. *Managing for stubble retention*. Department of Agriculture, Western Australia. Bulletin 4271. (<http://www.agric.wa.gov.au>)

Kondinin Group (2000). *Min till drill – A guide to minimum tillage cropping systems*. Scott Printing.

Creeks

*Department of Water. 2008. *Crossing Creeks – Stream crossings on farms*. Dept. Water, Western Australia. (<http://portal.water.wa.gov.au>)

Meney, K. A. and Pate, J. S. 1999. *Australian Rushes*. UWA Press, Perth, Western Australia.

*Ochtman, M. and Holt, C. 2000. *Vegetation buffer zones*. Department Agriculture and Food, Western Australia. Farm Note 38/2000. (<http://www.agric.wa.gov.au>)

Pen, L. 1999. *Managing Our Rivers: A guide to the nature and management of streams in south-west Western Australia*. Water and Rivers Commission, Perth, Western Australia.

*Price, P. & Lovett, S. (eds) 1999. *Riparian Land Management Technical Guidelines, Volume Two: On-ground Management Tools and Techniques*. LWRRDC, Canberra. (<http://www.clw.csiro.au>)

*Prosser, I. and Karssies, L. 2001. *Designing filter strips to trap sediment and attached nutrient*. CSIRO Land & Water. Riparian Land Management Technical Guidelines Update No.1 May 2001. (<http://www.clw.csiro.au>)

Regeneration Technology Pty Ltd. 1999. *Best Management Practices for Rural Drains*. Water & Rivers Commission, Perth, Western Australia.

Sainty, G. R. and Jacobs, S. W. L. 1994. *Waterplants in Australia: A Field Guide*. Sainty and Associates, Darlinghurst, Australia.

SCEP. 1992. *Reducing the nutrient load from rural sources to Albany's Harbours*. South Coast Estuaries Project Group. Department of Agriculture Western Australia.

*Taman, L. 2002. *Using rushes and sedges in revegetation of wetland areas in the south west of Western Australia*. Water and Rivers Commission Report No. RR8, Feb 2001. (<http://portal.water.wa.gov.au>)

Water and Rivers Commission 1997. *Native vegetation of freshwater rivers & creeks in south Western Australia*, Water and Rivers Commission & Department of Conservation and Land Management, Perth, Western Australia.

Water and Rivers Commission 1997. *Native vegetation of estuaries and saline waterways in south Western Australia*, Water and Rivers Commission & Department of Conservation and Land Management, Perth, Western Australia.

*Water and Rivers Commission 2000. *Rushes and Sedges*, Water Notes WN20. (<http://portal.water.wa.gov.au>)

Bushland

Greening Australia. (2004). *Bush Tracks: shortcuts to vegetation information for natural resource management*. Greening Australia, ACT.

Hussey, B.J.M. & Wallace, K.J. 1993. *Managing Your Bushland*. Department of Conservation and Land Management, Perth, Western Australia.

Appendix 1: List of plant species suitable for restoration projects in the Fitz-Stirling area

* Proteaceous species + species for upper drainage lines # Priority Species

Function: A = autumn flowering; C = coloniser/pioneer; F = significant nectar or food source; HS = high salt tolerance;

N = nitrogen fixer; S = salt tolerant; W = windbreak; O = ornamental

Note: The availability of some of these species may vary from season to season and orders for seeds/plants should be placed well in advantage to ensure that you are supplied with the plants you need. Plant species names are current as at June 2008 (DEC FloraBase website).

CONSERVATION TARGETS: Creeks and Flat-topped Yate Riparian Woodland						
Species	Common Name	Flowering Time				Function
Trees		Summer	Autumn	Winter	Spring	
<i>Eucalyptus occidentalis</i>	Flat-topped Yate					A,S
<i>Casuarina obesa</i>	Swamp Sheoak					A,N,S
<i>Allocasuarina huegeliana</i>	Rock Sheoak					A,C,N
<i>Melaleuca cuticularis</i>	Saltwater Paperbark					C,HS
Mallee		Summer	Autumn	Winter	Spring	
<i>Eucalyptus conglobata</i>	Cong Mallee					A
<i>Eucalyptus cornuta</i>	Yate					S
<i>Eucalyptus loxophleba</i> <i>subsp. loxophleba</i>	York Gum					S,W
<i>Eucalyptus sporadica+</i>	Mallee Yate					A
<i>Eucalyptus xanthonema+</i>	Yellow-flowered Mallee					A,S
Shrubs		Summer	Autumn	Winter	Spring	
<i>Acacia acanthoclada</i>	Harrow Wattle					N
<i>Acacia acuminata</i>	Jam Wattle					C,N,S
<i>Acacia assimilis</i>						A,N,W,O
<i>Acacia cyclops</i>	Coastal Wattle					A,C,N,S,W
<i>Acacia lasiocalyx</i> var. <i>sedifolia</i>	Wilyurwur					N,S,W,O
<i>Acacia leioderma</i>	Porongorup Wattle					N
<i>Acacia microbotrya</i>	Manna Wattle					A,C,N,S
<i>Acacia pulchella</i> var. <i>goadbyi+</i>	Dainty Prickly Moses					A,N

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Acacia pulviniformis</i>						N
<i>Acacia redolens</i>	Vanilla Wattle					N,HS
<i>Acacia saligna</i>	Golden Wreath Wattle					C,N,HS,W
<i>Acacia tetragonocarpa</i>						A,N
<i>Acacia willdenowiana</i>	Grass Wattle					A,N
<i>Alyogyne hakeifolia+</i>						A
<i>Alyogyne huegelii</i>	Lilac Hibiscus					S
<i>Callistemon phoeniceus</i>	Lesser Bottlebrush					F,HS,O
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush					A,F,O
<i>Dodonaea ptarmicaefolia</i>						
<i>Dodonaea stenozyga</i>						
<i>Dodonaea viscosa</i>	Sticky Hopbush					
<i>Goodia medicaginea+</i>	Clover-leaved Poison					N
<i>Hakea corymbosa*</i>	Cauliflower Hakea					S
<i>Hakea prostrata*</i>	Harsh Hakea					
<i>Halosarcia pergranulata subsp. pergranulata</i>	Blackseed Samphire					HS
<i>Jacksonia sternbergiana</i>	Kapur, Grey Stinkwood					A,C,N
<i>Labichea lanceolata</i>	Tall Labichea					
<i>Leptospermum oligandrum</i>						
<i>Melaleuca acuminata+</i>	Scented Honey Myrtle					C,HS,W
<i>Melaleuca cardiophylla</i>	Tangling Melaleuca					
<i>Melaleuca cuticularis</i>	Saltwater Paperbark					C,HS
<i>Melaleuca elliptica</i>	Granite Honey Myrtle					O
<i>Melaleuca glaberrima</i>	Mauve Honey Myrtle					
<i>Melaleuca hamata+</i>	Broombush					S,W
<i>Melaleuca laxiflora</i>						
<i>Melaleuca preissiana</i>	Moonah					
<i>Melaleuca viminea</i>	Mohan					

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Pimelea argentea</i>						
<i>Regelia inops</i>						A,S,O
<i>Sarcocornia quinqueflora</i>	Beaded Samphire				Fruiting	HS
<i>Templetonia retusa</i>	Cockies Tongues					A,F,N,O
Herbs						
<i>Lomandra effusa</i>	Scented Mat Rush					
<i>Samolus junceus</i>						S
<i>Samolus repens</i>	Creeping Brookweed					S
Climbers/Creepers						
<i>Kennedia prostrata</i>	Running Postman					N
<i>Muhlenbeckia adpressa</i>						
Ground cover						
<i>Kennedia eximia</i>						N
Sedges and Rushes						
<i>Baumea juncea</i>	Bare Twig Rush					A,S
<i>Carex inversa</i>	Knob Sedge					S
<i>Gahnia trifida+</i>	Coast Saw Sedge					S
<i>Isolepis nodosa</i>	Knotted Club Rush					A,S
<i>Juncus pallidus</i>	Pale Rush					S
Grasses						
<i>Sporobolus virginicus</i>	Marine Couch					A,S

CONSERVATION TARGET: Proteaceous rich communities on sands

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Mallee						
<i>Eucalyptus decipiens</i> subsp. <i>adesmophloia</i>						
<i>Eucalyptus eremophila</i> subs. <i>eremophila</i>	Tall Sand Mallee					W
<i>Eucalyptus incrassata</i>	Lerp, Yellow Mallee					A
<i>Eucalyptus pleurocarpa</i>						
Small Trees/Large Shrubs		Summer	Autumn	Winter	Spring	
<i>Allocasuarina huegeliana</i>	Rock Sheoak					A,C,N
<i>Allocasuarina lehmanniana</i>	Dune Sheoak					N
<i>Lambertia inermis</i> *	Chittick					A,O
<i>Nuytsia floribunda</i>	Mudja, Christmas Tree					
<i>Santalum acuminatum</i>	Quandong					C,F,S
Shrubs		Summer	Autumn	Winter	Spring	
<i>Acacia bidentata</i>						N
<i>Acacia cyclops</i>	Coastal Wattle					A,C,N,S,W
<i>Acacia gonophylla</i>						A
<i>Acacia hemiteles</i>						A,N,W
<i>Acacia heteroclita</i>						N
<i>Acacia incurva</i>						H,N
<i>Acacia lasiocalyx</i> var. <i>sedifolia</i>	Wilyurwur					N,S,W,O
<i>Acacia saligna</i>	Golden Wreath Wattle					N, HS,W
<i>Acacia ligulata</i>	Sandhill Wattle					N,S,W
<i>Acacia subcaerulea</i>						A
<i>Acacia verricula</i>						N
<i>Adenanthos argyreus</i> *	Little Woollybush					A,F

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Adenanthos cuneatus</i> *	Coastal Jugflower					F
<i>Agonis spathulata</i>						
<i>Allocasuarina humilis</i>	Dwarf Sheoak					A
<i>Allocasuarina thuyoides</i>	Horned Sheoak					
<i>Banksia attenuata</i> *	Piara, Slender Banksia					A,F
<i>Banksia baueri</i> *	Woolly Banksia					A,F,O
<i>Banksia baxteri</i> *	Baxter's Banksia					A,F
<i>Banksia caleyi</i> *	Caley's Banksia					F,O
<i>Banksia falcata</i> *						
<i>Banksia mucronulata</i> *						A
<i>Banksia repens</i> *	Creeping Banksia					
<i>Banksia media</i> *	Southern Plains Banksia					A,F
<i>Banksia pteridifolia</i> *						
<i>Callistemon phoeniceus</i>	Lesser Bottlebrush					F,HS,O
<i>Calothamnus gibbosus</i>						A,F,O
<i>Calothamnus gracilis</i>	One-sided Bottlebrush					A,F,O
<i>Hakea nitida</i> *	Frog Hakea					
<i>Hakea pandanycarpa</i> subs. <i>Crassifolia</i> *	Bumnut Hakea					
<i>Hakea prostrata</i> *	Harsh Hakea					
<i>Isopogon trilobus</i> *	Barrel Coneflower					F,O
<i>Jacksonia furcellata</i>	Grey Stinkwood					C,N
<i>Lambertia inermis</i> *	Chittick					A,C,H
<i>Leptospermum erubescens</i>	Pink Tea-tree					C
<i>Xanthorrhoea platyphylla</i>	Grass Tree					F

Species	Common Name	Flowering Time				Function
Herbs		Summer	Autumn	Winter	Spring	
<i>Anigozanthos rufus</i>	Red Kangaroo Paw					O
<i>Haemodorum spicatum</i>	Mardja					
<i>Lomandra hastilis</i>						
Climbers/Creepers		Summer	Autumn	Winter	Spring	
<i>Kennedia prostrata</i>	Running Postman					
<i>Sollya heterophylla</i>	Australian Bluebell					A
Ground cover		Summer	Autumn	Winter	Spring	
<i>Kennedia eximia</i>						N
Sedges and Rushes		Summer	Autumn	Winter	Spring	
<i>Caustis dioica</i>						
<i>Mesomelaena pseudostygia</i>						A
<i>Mesomelaena tetragona</i>	Semaphore Sedge					A
Grasses		Summer	Autumn	Winter	Spring	
<i>Austrostipa elegantissima</i>	Feather Speargrass					
<i>Neurachne alopecuroidea</i>	Foxtail Mulga Grass					
* = Proteaceae family						

CONSERVATION TARGET: Flat topped yate woodland - upland granite country

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Trees						
<i>Allocasuarina huegeliana</i>	Rock Sheoak					A,C,N
<i>Eucalyptus loxophleba</i> subs. <i>loxophleba</i>	York Gum					S,W
<i>Eucalyptus occidentalis</i>	Flat-topped Yate					A,S
Mallees						
<i>Eucalyptus annulata</i>	Open-fruited Mallee					A,W
<i>Eucalyptus conglobata</i>	Cong Mallee					A
<i>Eucalyptus cornuta</i>	Yate					S
<i>Eucalyptus densa</i> subs. <i>densa</i>				?		W
<i>Eucalyptus flocktoniae</i>	Merrit					W
<i>Eucalyptus gardneri</i>	Blue Mallee					A
<i>Eucalyptus sporadica</i>	Mallee Yate					A
<i>Eucalyptus uncinata</i>	Hook-leaved Mallee					A,S
<i>Eucalyptus vegrandis</i> subs. <i>recondita</i>	Clay Mallee	?				S
<i>Eucalyptus xanthonema</i>	Yellow-flowered Mallee					A
Shrubs						
<i>Acacia acuminata</i>	Jam Wattle					C,N,S
<i>Acacia amputata</i>	Prickly Moses					N
<i>Acacia chrysocephala</i>						A,N
<i>Acacia cochlearis</i>	Rigid Wattle					N
<i>Acacia colletiodes</i>	Wait-a-while					N
<i>Acacia cyclops</i>	Coastal Wattle					A,C
<i>Acacia ferocior</i>						N
<i>Acacia glaucoptera</i>	Clay, Flat Wattle					N,S

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Acacia gonophylla</i>						N
<i>Acacia harveyi</i>						A,N,S
<i>Acacia hemiteles</i>						A,N,W
<i>Acacia intricata</i>						N
<i>Acacia lasiocalyx</i> var. <i>sedifolia</i>	Silver Wattle					C,N,O,S,W
<i>Acacia leioderma</i>	Porongorup Wattle					N
<i>Acacia microbotrya</i>	Manna Wattle					A,C,N,S
<i>Acacia patagiata</i>	Salt Gully Wattle					N,S
<i>Acacia pulchella</i> var. <i>goadbyi</i>	Dainty Prickly Moses					A,C,N
<i>Acacia pulviniformis</i>						N
<i>Acacia redolens</i>	Vanilla Wattle					N,HS
<i>Acacia rostellifera</i>	Summer-scented Wattle					C,N
<i>Acacia saligna</i>	Golden Wreath Wattle					N, HS,W
<i>Acacia tetragonocarpa</i>						A,N
<i>Acacia willdenowiana</i>	Grass Wattle					A,N
<i>Allocasuarina lehmanniana</i>	Dune Sheoak					N
<i>Alyogyne huegelii</i>	Lilac Hibiscus					S
<i>Callistemon phoeniceus</i>	Lesser Bottlebrush					F,HS,O
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush					A,C,F,O
<i>Daviesia benthamii</i>						N
<i>Dodonaea ptarmicaefolia</i>						
<i>Exocarpos sparteus</i>	Dyuk, Broom Ballart					A,O
<i>Gastrolobium parvifolium</i>	Berry Poison					C,N
<i>Gastrolobium spinosum</i>	Prickly Poison					N
<i>Hakea corymbosa</i> *	Cauliflower Hakea					S
<i>Hakea laurina</i> *	Pin-cushion Hakea					A,C,F,O
<i>Hakea lissocarpa</i> *	Honeybush					A,C,F

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Hakea pandanica</i> subs. <i>crassifolia</i> *	Bumnut Hakea					
<i>Hakea preissii</i> *	Needle Tree					S
<i>Hakea varia</i> *	Variable-leaved Hakea					A,S
<i>Jacksonia sternbergiana</i>	Kapur, Grey Stinkwood					A,C,N
<i>Leptomeria pauciflora</i>	Sparse-flowered Currant Bush					
<i>Melaleuca acuminata</i>	Scented Honey Myrtle					C,HS,W
<i>Melaleuca brevifolia</i>	Mallee Myrtle					S
<i>Melaleuca calycina</i>						S
<i>Gastrolobium parvifolium</i>	Berry Poison					C,N
<i>Melaleuca cardiophylla</i>	Tangling Melaleuca					
<i>Melaleuca cucullata</i>						C,S
<i>Melaleuca cuticularis</i>	Saltwater Paperbark					C, HS
<i>Melaleuca depauperata</i>						
<i>Melaleuca eleuterostachya</i>						A
<i>Melaleuca hamata</i>	Broombush					S
<i>Melaleuca hamulosa</i>	Creecline Myrtle					HS
<i>Melaleuca lateriflora</i>	Gorada					HS
<i>Melaleuca pauperiflora</i>	Boree					S
<i>Melaleuca pentagona</i>						
<i>Melaleuca pungens</i>	Spiny Myrtle					S
<i>Melaleuca spathulata</i>	Purple Honey Myrtle					A,S,O
<i>Melaleuca subfalcata</i>						
<i>Melaleuca subtrigona</i>						
<i>Melaleuca thyoides</i>	Salt Lake Honey Myrtle					C,HS
<i>Pimelea argentea</i>	Silvery-leaved Pimelea					C
<i>Santalum acuminatum</i>	Quandong					C,F,S
<i>Santalum murrayanum</i>	Bitter Quandong					

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Santalum spicatum</i>	Sandalwood					A,C,A
<i>Senna artemisioides</i> subsp. <i>filifolia</i>						A,C,A
<i>Templetonia retusa</i>	Cockies Tongue					A,F,N
<i>Templetonia sulcata</i>	Centipede Bush					N,S
Herbs						
<i>Dianella revoluta</i>	Blueberry Lily					A
Ground Cover						
<i>Kennedia prostrata</i>	Running Postman					C,N
<i>Austrostipa elegantissima</i>	Feather Speargrass					

CONSERVATION TARGET: Flat topped yate woodland - swamp/wetland

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Trees						
<i>Eucalyptus occidentalis</i>	Flat-topped Yate					A,S
<i>Eucalyptus loxophleba</i> subs. <i>loxophleba</i>	York Gum					S,W
<i>Melaleuca acuminata</i>	Jam Wattle					C,N,S
<i>Melaleuca cuticularis</i>	Salt Water Paperbark					
<i>Melaleuca preissiana</i>	Moonah					
Mallee						
<i>Eucalyptus uncinata</i>	Hook-leaved Mallee					A,S
<i>Eucalyptus vegrandis</i> subs. <i>recondita</i>	Clay Mallee	?				S
<i>Eucalyptus xanthonema</i>	Yellow-flowered Mallee					A
Shrubs						
<i>Acacia acuminata</i>	Jam Wattle					C,N,S
<i>Acacia cyclops</i>	Coastal Wattle					A,C,N,S,W
<i>Acacia glaucoptera</i>	Clay, Flat Wattle					
<i>Acacia gonophylla</i>						N
<i>Acacia harveyi</i>						A,N,S
<i>Acacia lasiocalyx</i> var. <i>sedifolia</i>	Silver Wattle					N,S,W,O
<i>Acacia microbotrya</i>	Manna Wattle					A,C,N,S
<i>Acacia pulchella</i> var. <i>glabberima</i>	Western Prickly Moses					A,N
<i>Acacia pulviniformis</i>						N
<i>Acacia redolens</i>	Vanilla Wattle					N,HS
<i>Acacia saligna</i>	Golden Wreath Wattle					N, HS,W
<i>Actinostrobos pyramidalis</i>	Swamp Cypress					C,S

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Alyogyne huegelii</i>	Lilac Hibiscus					S
<i>Banksia littoralis</i> *	Swamp Banksia					A,F
<i>Callistemon phoeniceus</i>	Lesser Bottlebrush					F,HS,O
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush					A,F,O
<i>Daviesia benthamii</i>						N
<i>Exocarpos sparteus</i>	Dyuk, Broom Ballart					A,O
<i>Hakea corymbosa</i> *	Cauliflower Hakea					S
<i>Hakea laurina</i> *	Pin-cushion Hakea					A,F,O
<i>Hakea lissocarpha</i> *	Honeybush					A,F
<i>Hakea preissii</i> *	Needle Tree					S
<i>Hakea varia</i> *	Variable-leaved Hakea					A,S
<i>Jacksonia sternbergiana</i>	Kapur, Grey Stinkwood					A,C,N
<i>Leptomeria pauciflora</i>	Sparse-flowered Currant Bush					
<i>Leptospermum erubescens</i>	Pink Tea-tree					C
<i>Melaleuca acuminata</i>	Scented Honey Myrtle					C,HS,W
<i>Melaleuca brevifolia</i>	Mallee Myrtle					S
<i>Melaleuca calycina</i>						S
<i>Melaleuca cuticularis</i>	Saltwater Paperbark					C, HS
<i>Melaleuca depauperata</i>						
<i>Melaleuca hamata</i>	Broombush					S
<i>Melaleuca hamulosa</i>	Creecline Myrtle					HS
<i>Melaleuca lateriflora</i>						HS
<i>Melaleuca pauperiflora</i>	Boree					S
<i>Melaleuca pungens</i>	Spiny Myrtle					S
<i>Melaleuca thymoides</i>						
<i>Melaleuca thyoides</i>	Salt Lake Honey Myrtle					C,HS
<i>Melaleuca undulata</i>	Hidden Honey Myrtle					HS
<i>Melaleuca urceolaris</i>	Glowing Honey Myrtle					

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Melaleuca viminea</i>	Mohan					
<i>Santalum acuminatum</i>	Quandong					C,F,S
<i>Regelia inops</i>						A,S,O
<i>Templetonia sulcata</i>	Centipede Bush					N,S
Climbers/Creepers						
<i>Kennedia prostrata</i>						A
Sedges and Rushes						
<i>Baumea juncea</i>	Bare Twig Rush					A,S
<i>Bolboschoenus caldwellii</i>	Marsh Club-rush					

CONSERVATION TARGET: Moort Woodland

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Trees						
<i>Eucalyptus loxophleba</i> subs. <i>loxophleba</i>	York Gum					S,W
<i>Eucalyptus platypus</i> subs. <i>platypus</i>	Moort					A,HS,W
Mallee						
<i>Eucalyptus annulata</i>	Open-fruited Mallee					A,W
<i>Eucalyptus densa</i> subs. <i>densa</i>				?		W
<i>Eucalyptus flocktoniae</i>	Merrit					W
<i>Eucalyptus uncinata</i>	Hook-leaved Mallee					A,S
<i>Eucalyptus vegrandis</i> subs. <i>recondita</i>	Clay Mallee	?				S
<i>Eucalyptus xanthonema</i>	Yellow-flowered Mallee					A
Shrubs						
<i>Acacia acuminata</i>	Jam Wattle					C,N,S
<i>Acacia amputata</i>	Prickly Moses					N
<i>Acacia dictyoneura</i>						
<i>Acacia chrysocephala</i>						A,N
<i>Acacia glaucoptera</i>	Clay, Flat Wattle					
<i>Acacia harveyi</i>						A,N,S
<i>Acacia patagiata</i>	Salt Gully Wattle					N,S
<i>Acacia redolens</i>	Vanilla Wattle					N,HS
<i>Acacia saligna</i>	Golden Wreath Wattle					N, HS,W
<i>Acacia spongolitica</i>						
<i>Actinostrobos pyramidalis</i>	Swamp Cypress					C,S
<i>Alyogyne huegelii</i>	Lilac Hibiscus					S

Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
Shrubs (cont)						
<i>Callistemon phoeniceus</i>	Lesser Bottlebrush					F,HS,O
<i>Daviesia benthamii</i>						N
<i>Exocarpos sparteus</i>	Dyuk, Broom Ballart					A,O
<i>Gastrolobium parvifolium</i>	Berry Poison					C,N
<i>Hakea picatum</i> *	Cauliflower Hakea					S
<i>Hakea laurina</i> *	Pin-cushion Hakea					A,F,O
<i>Hakea preissii</i> *	Needle Tree					S
<i>Hakea varia</i> *	Variable-leaved Hakea					A,S
<i>Leptomeria pauciflora</i>	Sparse-flowered Currant Bush					
<i>Melaleuca acuminata</i>	Scented Honey Myrtle					C,HS,W
<i>Melaleuca brevifolia</i>	Mallee Myrtle					S
<i>Melaleuca calycina</i>						S
<i>Melaleuca cardiophylla</i>	Tangling Melaleuca					
<i>Melaleuca cucullata</i>						C,S
<i>Melaleuca cuticularis</i>	Saltwater Paperbark					C, HS
<i>Melaleuca eleuterostachya</i>						A
<i>Melaleuca hamata</i>	Broombush					S
<i>Melaleuca hamulosa</i>	Creekline Myrtle					HS
<i>Melaleuca lateriflora</i>						HS
<i>Melaleuca pentagona</i>						
<i>Melaleuca spathulata</i>	Purple Honey Myrtle					A,S,O
<i>Melaleuca thyoides</i>	Salt Lake Honey Myrtle					C,HS
<i>Melaleuca undulata</i>	Hidden Honey Myrtle					HS
<i>Pittosporum phylliraeoides</i>	Weeping Pittosporum					C
<i>Santalum acuminatum</i>	Quandong					C,F,S
<i>Santalum picatum</i>	Sandalwood					A
<i>Templetonia sulcata</i>	Centipede Bush					N,S

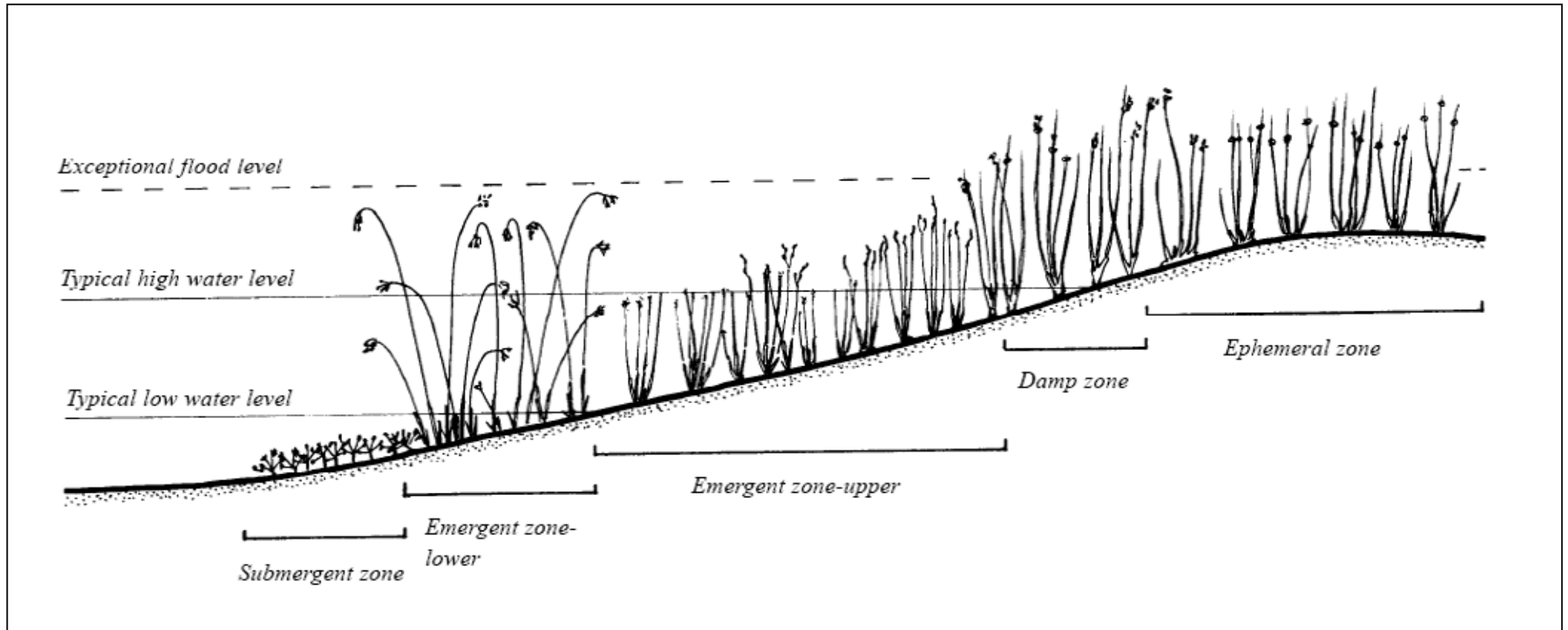
Species	Common Name	Flowering Time				Function
		Summer	Autumn	Winter	Spring	
<i>Glischrocaryon aureum</i>	Common Pop Plant					A

CONSERVATION TARGET: Mallet Woodland						
Trees		Summer	Autumn	Winter	Spring	
<i>Eucalyptus astringens subs. redacta</i>	Brown Mallet					
<i>Eucalyptus melanophittra#</i>						
<i>Eucalyptus platypus subs. platypus</i>	Moort					A,HS,W
Shrubs		Summer	Autumn	Winter	Spring	
<i>Acacia harveyi</i>						A,N,S
<i>Acacia spongolitica</i>						
<i>Gastrolobium parvifolium</i>	Berry Poison					C,N
<i>Gastrolobium racemosum</i>						
Herbs		Summer	Autumn	Winter	Spring	
<i>Goodenia scapigera</i>						A
Climbers/Creepers		Summer	Autumn	Winter	Spring	
<i>Kennedia prostrata</i>						A

This list has been compiled from the following documents:

1. Draft version of "In place of seed lists, the systems approach to revegetation design and implementation: A process for species selection for site types for the Fitzgerald Biosphere Area of Western Australia". N. McQuoid, W. Bradshaw and J. Jonson, Greening Australia WA South Coast Natural Resource Management Ecosystem Support Project. Available from Fitzgerald Biosphere Group, Jerramungup.
2. *Revegetation for Biodiversity in the Western Fitzgerald Biosphere* - A report to the Jerramungup LCDC on techniques, monitoring and assessment to address biodiversity for revegetation. J. Mercer (1999)
3. Dept. Environment and Conservation **Florabase** website
4. *The Western Australian Flora: A descriptive catalogue* (Paczkowska, G. and Chapman, A.)
5. *Rushes and Sedges*. Water & Rivers Commission Water Notes 20
6. Native vegetation of estuaries and saline waterways in south Western Australia. Water & Rivers Commission.

Appendix 2: Where to plant sedges and rushes in riparian* zones



Zones of the riparian area of creeks

From Water and Rivers Commission, River Restoration Report 8

* When talking about creeks, waterways and rivers, we often use the word “**riparian**”. The “**Riparian zone**” of a waterway, is that part of the land that is directly influenced by the river or creek and includes the channel, banks, floodplain and even other bodies of water that are connected to the river. Riparian vegetation is the term we use to refer to all the plants (from tall trees and shrubs to grasses, rushes and sedges) that grow along, or near, a waterway.

Sedges, Rushes and Grasses suitable for planting in the riparian zones of Fitz-Stirling area

Name	Zone	Soil Type	Water Depth	Salt tolerance ¹	Availability ²	Description
		C=Clay P=Peat S=Sand	SW=Shallow water PWe=Permanently wet SWe=Seasonally wet	F=Fresh B=Brackish S=Saline	S=Seed P=Plants C=Contract grown	
Sedges (Cyperaceae family)						
<i>Baumea juncea</i> (Bare Twig Rush)	Ephemeral zone to 30cm into the emergent zone	C,P,S	SW, PWe, SWe	F, B	P (Tissue culture or transplant)	Rhizome ³ spreading sedge with thin blue stems to 1m which forms dense meadows. Excellent for bank stabilisation of dry banks and weed control.
<i>Bolboschoenus caldwellii</i>	Damp to ephemeral zone		SWe	F	S	Rhizome ⁴ spreading sedge with bright green stems to 1.2m which forms dense colonies.
<i>Carex inversa</i> (Knob Sedge)	Damp zone	C,S	SWe	F,B,S	S (collect Dec-Jan)	Rhizome spreading sedge to 0.5m, excellent for weed control, fire resistance and good for bank stabilisation. Fast growing. Easily confused with the weed species <i>Carex divisa</i> .
<i>Gahnia trifida</i> (Coast Saw Sedge)	Damp zone	C,P,S	PWe, SWe	F,B,S	P (Transplant) , S	Large grassy tussock to 1.5m which is very useful in habitat creation and weed control in saline areas.
<i>Isolepis nodosa</i> (Knotted Club Rush)	Ephemeral zone	S	SWe	F, B	?	Rhizome spreading, tufted, perennial sedge
Rushes (Juncaceae family)						
<i>Juncus pallidus</i> (Pale Rush)	Ephemeral to Damp zone	C,P,S	PWe, SWe	F,B	S (collect Dec-Jan), P	Clumping rush to 1.5m, used to increase biodiversity and stabilise floodplain.
Grasses (Poaceae family)						
<i>Sporobolus virginicus</i> (Marine Couch)	Ephemeral to Damp zone	C,P,S	PWe, SWe, SW	F,B,S	C	Rhizomatous, soliniferous ⁵ , tussocky perennial, grass-like or herb, 0.1–0.5 m high

Adapted from Water & Rivers Commission Water Notes 20.

For details on propagating and growing these species see Water and Rivers Commission, River Restoration Report 8

¹ Fresh < 1000mg/L TDS; Brackish/subhaline = 1000-3000 mg/L TDS; Saline = 3000-20 000 mg/L TDS

² Seed = available from commercial seed collectors & easy to propagate from seed; Plant = tubestock &/or barerooted plants available for commercial wetland nurseries, Contract grown = available on a 6-12 month pre-order basis from selected nurseries.

³ Horizontal underground stem or rootstock

⁴ Horizontal underground stem or rootstock

⁵ Elongate, horizontal stem that creeps along the ground, forms a new plant at the nodes or tip (like strawberry plants)

Appendix 3: Vertebrate fauna species of the Fitz-Stirling Link

Species that are threatened and are protected under the Wildlife Conservation (Specially Protected Fauna) Notice 2008

☒ Species are of priority interest and may become threatened in the future (DEC Priority Fauna list May 2007)

Common Name	Scientific Name
BIRDS	
Large Flightless Birds	
Emu	<i>Dromaius novaehollandiae</i>
Mound Builders	
Malleefowl #	<i>Leipoa ocellata</i>
True Quail	
Stubble Quail	<i>Coturnix pectoralis</i>
Ducks	
Australian Shelduck	<i>Tadorna tadornoides</i>
Australian Wood Duck	<i>Chenonetta jubata</i>
Grey Teal	<i>Anas gracilis</i>
Chestnut Teal	<i>Anas castanea</i>
Pacific Black Duck	<i>Anas superciliosa</i>
Grebes	
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>
Hoary-headed Grebe	<i>Poliiocephalus poliocephalus</i>
Cormorants	
Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>
Herons, Egrets & Bitterns	
White-necked Heron	<i>Ardea pacifica</i>
White-faced Heron	<i>Ardea novaehollandiae</i>
Ibises & Spoonbills	
Australian White Ibis	<i>Threskiornis molucca</i>
Yellow-billed Spoonbill	<i>Platalea flavipes</i>
Kites, Eagles & Hawks	
Black-shouldered Kite	<i>Elanus caeruleus</i>
Square-tailed Kite	<i>Hamirostra isura</i>
Whistling Kite	<i>Haliastur sphenurus</i>
Brown Goshawk	<i>Accipiter fasciatus</i>
Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>
Little Eagle	<i>Aquila morphnoides</i>
Wedge-tailed Eagle	<i>Aquila audax</i>
Spotted Harrier	<i>Circus assimilis</i>
Swamp Harrier	<i>Circus approximans</i>
Falcons	
Brown Falcon	<i>Falco berigora</i>
Australian Kestrel	<i>Falco cenchroides</i>
Australian Hobby	<i>Falco longipennis</i>
Peregrine Falcon #	<i>Falco peregrinus</i>
Rails & Crakes	
Black-tailed Native-hen	<i>Gallinula ventralis</i>
Eurasian Coot	<i>Fulica atra</i>
Bustard	
Australian Bustard ☒	<i>Ardeotis australis</i>
Button-quail	
Painted Button-quail	<i>Turnix varia</i>

Common Name	Scientific Name
Birds (cont)	
Stone-curlews	
Bush Stone-curlew ♂	<i>Burhinus grallarius</i>
Wading Birds	
Banded Lapwing	<i>Vanellus tricolor</i>
Black-fronted Dotterel	<i>Charadrius melanops</i>
Pigeons & Doves	
Common Bronzewing	<i>Phaps chalcoptera</i>
Brush Bronzewing	<i>Phaps elegans</i>
Crested Pigeon	<i>Ocyphaps lophotes</i>
Parrots	
Carnaby's Cockatoo #	<i>Calyptorhynchus latirostris</i>
Baudin's Cockatoo #	<i>Calyptorhynchus baudinii</i>
Galah	<i>Cacatua roseicapilla</i>
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>
Regent Parrot	<i>Polytelis anthopeplus</i>
Australian Ringneck	<i>Barnardius zonarius</i>
Red-capped Parrot	<i>Purpureicephalus spurius</i>
Western Rosella (Mallee) #	<i>Platycercus icterotis xanthogenys</i>
Elegant Parrot	<i>Neophema elegans</i>
Cuckoos	
Pallid Cuckoo	<i>Cuculus pallidus</i>
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>
Horsfield's Bronze Cuckoo	<i>Chrysococcyx basalis</i>
Shining Bronze Cuckoo	<i>Chrysococcyx lucidus</i>
Owls	
Boobook Owl	<i>Ninox novaeseelandiae</i>
Owls	
Barn Owl	<i>Tyto alba</i>
Frogmouths	
Tawny Frogmouth	<i>Podargus strigoides</i>
Nightjars	
Spotted Nightjar	<i>Eurostopodus argus</i>
Owlet Nightjars	
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>
Swifts	
Fork-tailed Swift	<i>Apus pacificus</i>
Kingfishers	
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Sacred Kingfisher	<i>Todiramphus sanctus</i>
Bee-eaters	
Rainbow Bee-eater	<i>Merops ornatus</i>
Wrens	
Splendid Fairy-wren	<i>Malurus splendens</i>
Blue-breasted Fairy-wren	<i>Malurus pulcherrimus</i>
Southern Emu-wren	<i>Stipiturus malachurus</i>
Small Bush Birds	
Spotted Pardalote	<i>Pardalotus punctatus</i>
Striated Pardalote	<i>Pardalotus striatus</i>
White-browed Scrubwren	<i>Sericornis frontalis</i>
Shy Groundwren (Shy Heathwren) ♂	<i>Hylacola cauta whitlocki</i> ^P4
Rufous Fieldwren	<i>Calamanthus campestris</i>
Redthroat	<i>Pyrrholaemus brunneus</i>
Weebill	<i>Smicromnis brevirostris</i>

Common Name	Scientific Name
Birds (cont)	
Western Gerygone	<i>Gerygone fusca</i>
Broad-tailed Thornbill (Inland Thornbill)	<i>Acanthiza apicalis</i>
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>
Honeyeaters	
Brown Honeyeater	<i>Lichmera indistincta</i>
Singing Honeyeater	<i>Lichenostomus virescens</i>
Yellow-plumed Honeyeater	<i>Lichenostomus ornatus</i>
Purple-gaped Honeyeater	<i>Lichenostomus cratitius</i>
White-eared Honeyeater	<i>Lichenostomus leucotis</i>
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>
Western White-naped Honeyeater	<i>Melithreptus chloropsis</i>
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>
White-cheeked Honeyeater	<i>Phylidonyris nigra</i>
Tawny-crowned Honeyeater	<i>Phylidonyris melanops</i>
Western Spinebill	<i>Acanthorhynchus superciliosus</i>
Yellow-throated Miner	<i>Manorina flavigula</i>
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>
Western Little Wattlebird	<i>Anthochaera hamulata</i>
Red Wattlebird	<i>Anthochaera carunculata</i>
White-fronted Chat	<i>Ephthianura albifrons</i>
Robins	
Scarlet Robin	<i>Petroica multicolor</i>
Red-capped Robin	<i>Petroica goodenovii</i>
Hooded Robin	<i>Petroica cucullata</i>
Southern Scrub-robin	<i>Drymodes brunneopygia</i>
Babblers	
White-browed Babbler	<i>Pomatostomus superciliosus</i>
Whipbirds & Quail-thrushes	
Western Whipbird ♂	<i>Psophodes nigrogularis oberon</i>
Sittellas	
Varied Sittella	<i>Daphoenositta chrysoptera</i>
Whistlers & Shrike-thrushes	
Crested Bellbird ♂	<i>Oreoica gutturalis</i>
Golden Whistler	<i>Pachycephala pectoralis</i>
Rufous Whistler	<i>Pachycephala rufiventris</i>
Grey Shrike-thrush	<i>Colluricincla harmonica</i>
Flycatchers	
Restless Flycatcher	<i>Myiagra inquieta</i>
Grey Fantail	<i>Rhipidura fuliginosa</i>
Willie Wagtail	<i>Rhipidura leucophrys</i>
Magpie-lark	<i>Grallina cyanoleuca</i>
Cuckoo-shrikes & Trillers	
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>
White-winged Triller	<i>Lalage tricolor</i>
Woodswallows, Butcherbirds, Magpie & Currawongs	
Black-faced Woodswallow	<i>Artamus cinereus</i>
Dusky Woodswallow	<i>Artamus cyanopterus</i>
Grey Butcherbird	<i>Cracticus torquatus</i>
Australian Magpie	<i>Cracticus tibicen</i>
Grey Currawong	<i>Strepera versicolor</i>

Common Name	Scientific Name
Birds (cont)	
Ravens & Crows	
Australian Raven	<i>Corvus coronoides</i>
Swallows & Martins	
White-backed Swallow	<i>Cheramoeca leucosternum</i>
Welcome Swallow	<i>Hirundo neoxena</i>
Tree Martin	<i>Hirundo nigricans</i>
Fairy Martin	<i>Hirundo ariel</i>
White-eyes	
Silvereye	<i>Zosterops lateralis</i>
Songlarks	
Rufous Songlark	<i>Cinclorhamphus mathewsi</i>
Brown Songlark	<i>Cinclorhamphus cruralis</i>
Finches	
Red-eared Firetail	<i>Stagnopleura oculata</i>
Pipits & Wagtails	
Australian Pipit	<i>Anthus australis</i>
MAMMALS	
Egg-laying Mammals	
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>
Carnivorous Marsupials	
Chuditch #	<i>Dasyurus geoffroii</i>
Dibbler #	<i>Parantechinus apicalis</i>
Red-tailed Phascogale #	<i>Phascogale calura</i>
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>
Grey-bellied Dunnart	<i>Sminthopsis g. griseoventer</i>
Bandicoots & Bilby	
Southern Brown Bandicoot ☞	<i>Isodon obesulus fusciventer</i>
Bettongs & Potoroos	
Brush-tailed Bettong, Woylie ☞	<i>Bettongia penicillata ogilbyi</i>
Kangaroos & Wallabies	
Tammar ☞	<i>Macropus eugenii derbianus</i>
Western Grey Kangaroo	<i>Macropus fuliginosus</i>
Western Brush Wallaby ☞	<i>Macropus irma</i>
Possums	
Common Brushtail Possum	<i>Trichosurus v. vulpecula</i>
Pygmy-possum	
Western Pygmy-possum	<i>Cercartetus concinnus</i>
Honey-possum	
Honey-possum	<i>Tarsipes rostratus</i>
Evening Bats	
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>
Chocolate Wattled Bat	<i>Chalinolobus morio</i>
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>
Greater Long-eared Bat	<i>Nyctophilus t. timoriensis</i>
Southern Forest Bat	<i>Vespadelus regulus</i>
Freetail Bats	
Western Freetail-bat	<i>Mormopterus species undescribed</i>
White-striped Freetail-bat	<i>Tadarida australis</i>
Rats & Mice	
Water-rat ☞	<i>Hydromys chrysogaster</i>
House Mouse	<i>Mus musculus</i>
Mitchell's Hopping-mouse	<i>Notomys mitchelli</i>

Common Name	Scientific Name
MAMMALS (cont)	
Western Mouse α	<i>Pseudomys occidentalis</i>
Bush Rat	<i>Rattus fuscipes</i>
Rabbit	
Rabbit	<i>Oryctolagus cuniculus</i>
Fox	
Fox	<i>Vulpes vulpes</i>
Cat	
Feral Cat	<i>Felis catus</i>
FROGS	
Tree Frogs	
Slender Tree Frog	<i>Litoria adelaidensis</i>
Spotted-thighed Frog	<i>Litoria cyclorhyncha</i>
Ground Frogs	
Spotted Burrowing Frog	<i>Heleioporus albopunctatus</i>
Moaning Frog	<i>Heleioporus eyrei</i>
Western Banjo Frog	<i>Limnodynastes dorsalis</i>
White-footed Frog	<i>Neobatrachus albipes</i>
Kunapalari Frog	<i>Neobatrachus kunapalari</i>
Humming Frog	<i>Neobatrachus pelobatoides</i>
Quacking Froglet	<i>Crinia georgiana</i>
Granite Froglet	<i>Crinia pseudinsignifera</i>
Turtle Frog	<i>Myobatrachus gouldii</i>
Guenther's Toadlet	<i>Pseudophryne guentheri</i>
REPTILES	
Tortoises	
Oblong Snake-necked Turtle	<i>Chelodina oblonga</i>
Dragon Lizards	
Grey Spotted Dragon	<i>Ctenophorus maculatus griseus</i>
Ornate Rock Dragon	<i>Ctenophorus ornatus</i>
Western Bearded Dragon	<i>Pogona m. minor</i>
Geckos	
Ocellated Clawless Gecko	<i>Crenadactylus o. ocellatus</i>
Wheatbelt Gecko	<i>Diplodactylus g. granariensis</i>
Southwest Spiny-tailed Gecko	<i>Strophurus spinigerus inornatus</i>
Barking Gecko	<i>Underwoodisaurus milii</i>
Marbled Gecko	<i>Christinus marmoratus</i>
Legless Lizards	
Yellow-chinned Worm-Lizard	<i>Aprasia repens</i>
Southern Delma	<i>Delma australis</i>
Fraser's Delma	<i>Delma fraseri</i>
Southern Scaly-foot	<i>Pygopus lepidopodus</i>
Skinks	
Western Cool Skink	<i>Acritoscincus trilineatum</i>
Bight Crypto	<i>Cryptoblepharus virgatus clarus</i>
Eleven-striped Ctenotus	<i>Ctenotus impar</i>
Red-legged Ctenotus	<i>Ctenotus labillardieri</i>
King's Skink	<i>Egernia kingii</i>
Southern Crevice Skink	<i>Egernia napoleonis</i>
Southwestern Earless Skink	<i>Hemiergis i. initialis</i>
Peron's Earless Skink	<i>Hemiergis p. peronii</i>
Southwestern Four-toed Lerista	<i>Lerista distinguenda</i>
Grey's Menetia	<i>Menetia greyii</i>
Dark Morethia	<i>Morethia obscura</i>

Common Name	Scientific Name
Reptiles (cont)	
Western Bluetongue	<i>Tiliqua occipitalis</i>
Western Bobtail	<i>Tiliqua r. rugosa</i>
Goannas	
Rosenberg's Monitor	<i>Varanus rosenbergi</i>
Blind Snakes	
Southern Blind Snake	<i>Ramphotyphlops australis</i>
Stout Blind Snake	<i>Ramphotyphlops pinguis</i>
Pythons	
Southwest Carpet Python #	<i>Morelia spilota imbricata</i>
Venomous Snakes	
Bardick	<i>Echiopsis curta</i>
Crowned Snake	<i>Elapognathus coronatus</i>
Western Tiger Snake	<i>Notechis scutatus</i>
Gould's Snake	<i>Parasuta gouldii</i>
Black-backed Snake	<i>Parasuta nigriceps</i>
Dugite	<i>Pseudonaja a. affinis</i>
Square-nosed Snake	<i>Rhinoplocephalus bicolor</i>