

**Habitat connectivity**

**Controlled Traffic Farming**

**Soil Health and  
Agroforestry downloads**



*Harvesting near Holt Rock, Eastern Wheatbelt  
Photo: Kate Raston*



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# Welcome to 2014!



*Welcome to the first Newsletter for 2014, and what we anticipate being an exciting year for NRM in the Wheatbelt. We have recently finished wrapping up our 2010 – 2013 CFOC1 projects and our successes and learnings have us looking forward with anticipation to our projects over the next 5 years.*

#### Some key achievements have included:

- **2279 farmers** adopting improved management practices to improve soil health
- **5113 farmers** with knowledge and skills in improving soil health
- Over **450,000 ha** with improved soil management practices
- Agreements with over **100 landholders** around the wheatbelt which encompass **15 conservation covenants**, over **200 km** of exclusion fencing and more than 20 site specific revegetation projects.
- Over **12,000 hectares** of priority assets now under improved management.
- Surveyed **117km** of the Avon river for Weeds of National Significance
- Successful engagement of the regional Aboriginal community in natural resource management on **6 sites of cultural and Biological Significance** and **4 Aboriginal held properties**.

These achievements have set a solid foundation for Wheatbelt NRM to hit the ground running with our

Projects in 2014. We will be rolling out these initiatives over the next few months and are already seeking involvement from our Community to take part in some of these exciting initiatives.

#### A brief overview of our projects for 2013 -18 include:

**The Coordinated Predator Control project** is developed to provide tailored threat mitigation options for Black Flank Rock Wallaby (BFRW) populations in the Central Wheatbelt and to engage the wider WA community in coordinated feral animal control through the Red Card program. There are two broad components to this project. The first is the coordination of the Rec Card program. The second is the increased security of habitat for the Central Wheatbelt BFRW populations.

**The Mortlock Connections project** will clearly define geographic areas of operation within the East and South Mortlock catchments within which on ground management will seek to address key threatening processes. In conjunction with fencing to control grazing, weed control and revegetation, vertebrate pest species will be controlled so as to reduce pressures on native vertebrate populations utilising the corridors.

**The Biodiversity Conservation project** has been developed to build on the success of the previous Healthy Bushland program that has delivered conservation management improvement across the region. We will identify and prioritise key biodiversity assets of the region and implement management activities that will improve conservation and enhance key habitat, contribute to improved connectivity and support improvement to asset condition.

**The Carbon Farming Issues Program** will deliver the carbon farming awareness raising activities in the Avon

# Bush Tucker Workshops coming soon to the Wheatbelt!

By Dr David Grasby

NRM region. The project will work with information primarily generated by the Department of Agriculture and Food, WA specifically for the project on carbon farming issues and opportunities in WA.

**Regional NRM Planning for Climate Change in the Avon NRM region** will bring an essential spatial context to planning within Wheatbelt NRM through an integrated spatial decision support system that will enable an adaptive management approach to strategic carbon investment within the region.

**Trialling & demonstrating innovation in sustainable farming practices 2013-2018 project** is required to work with the community to trial and demonstrate innovative practices that protect the resource base and contribute to environmental management. The type of activity will be driven by farmers need and interest and will be informed and supported by current scientific knowledge and understanding with a process implemented for annual review and adaptive management.

**Optimising nutrient management for soil health and agricultural production 2013-2018 project** will provide farmers with the skills and knowledge to optimise their nutrient management for soil health and agricultural production using innovative agricultural solutions to achieve greater NRM benefits.

**Regional Landcare Facilitator** will engage with land managers, local and regional Landcare groups, farming systems or grower groups and related community organisations to support the community within their region to achieve the Caring for our Country (Sustainable Agriculture stream) outcomes. The RLF role will focus predominantly on working with community members and groups which have a sustainable agriculture focus.

**Biodiverse Agroforestry Trial & Demonstration Project 2014** aims to run trial programs looking at agroforestry projects that deliver biodiversity benefits. The trials will consider landscape connectivity improvements, biodiversity conservation outcomes and better use of low productivity land.

**Building Aboriginal Community Capacity for Nature Conservation in the Avon Region 2013-2018 project** is required to deliver a program that aims to engage and build the capacity of the Aboriginal people in NRM in the Avon River Basin. This project aims to increase The Aboriginal community knowledge, skills and capacity to continue to engage in NRM.

Some smaller projects covered under this program

include:

- Management of culturally significant sites for cultural and biodiversity outcomes aims continue to be a major tool to actively involve the Aboriginal community.
- The Noongar Budjar trainee program aims to continue to provide training and employment for young Aboriginal people seeking a future in NRM.
- Community Education
- Aboriginal Land Managers BUSH TUCKER project will build Aboriginal Land Manager NRM capacity in the Avon Region through the establishment of a 'Bush Tucker' industry enterprise initiative with which Aboriginal Land Managers can engage.
- In addition the Wheatbelt NRM Noongar Elders Advisory Group aims to support these projects by providing strategy and cultural advice.

Community feedback for the Regional NRM Strategy has also wrapped up recently and we thank those of you who have responded. This Strategy identifies areas where investment is likely to have the most significant and long-lasting influence in achieving NRM outcomes. This Strategy reflects our community's values and understanding of the environment they live in and know. As such, we reiterate that the Wheatbelt community is fundamental to our future, and that we want to do what it takes to get them (you) to be active in NRM.

In 2014 we plan on working even closer with you in assisting achieve our objectives for maintaining the health and prosperity of the natural environment. If you would like to discuss our new projects or any other matter please contact the Wheatbelt NRM team on 9670 3100 or email [info@wheatbeltnrm.org.au](mailto:info@wheatbeltnrm.org.au)

Kind regards,

The Wheatbelt NRM Team



The Wheatbelt NRM Team

Have you ever wondered what 'Quandong Orange Trifle topped with Wattleseed Icecream' tastes like?

Do you dream of sitting around a campfire with your family and friends with the smell of 'Johnny-Cakes' wafting in the evening breeze?

Well, with the benefit of knowledge that will be gained through a project developed by Wheatbelt NRM and funded by the Australian Government, you could be doing just that.

Wheatbelt NRM has received funding from the Australian Government to develop a project to trial Bush Tucker species in the WA Wheatbelt and determine their feasibility for production at a commercial scale.

With an increasing interest in Australian 'Bush Foods' at local, national and international levels, farmers in the Wheatbelt are well-placed to take advantage of the small, though developing, demand for Australian native foods.

Even now, researchers such as Dr Geoff Woodall from the University of Western Australia's Centre of Excellence in Natural Resource Management (CENRM) are actively seeking to domesticate some native food species to satisfy the growing demand for these unique, niche crops.

Over the next 3-4 years, workshops will be held across the Wheatbelt to identify endemic native food species with the potential for production at a reasonable large-scale. Trials of native food will take place on selected properties throughout the WA Wheatbelt during this time.

Stay tuned for workshops, trials and demonstrations near you!

Roots of a Bush Potato



Quandong



Sandalwood



# Habitat connectivity

By Anika Dent

Many species in Australia and the world rely on habitat connections across the landscape to survive. In fact, habitat loss and fragmentation are identified as the main threats to many plants, animals and other organisms in Australia. With the expansion of human activity, particularly agriculture, urbanisation, logging and mining, natural areas across the Wheatbelt are shrinking to "islands" surrounded by modified landscapes, as seen in Figure 1. As people of the Wheatbelt, we often see these patches of bush as fully functioning habitats supporting all of the animals we've grown up with. In these islands, however, many animals are unable to find adequate

food, water, mates or refuge from predators. Most small patches of bush are likely to house only a small number of species with small home ranges, unless they are able to travel long distances across open land – like kangaroos. Plant communities can be very complex, and some native Australian plants require fire to regenerate, while others may not be able to regenerate after fire and may require nearby populations to recolonise an area after fire. If species in both groups occur together on one of these isolated islands then it is likely we will lose one group or the other, depending on how the land is managed.

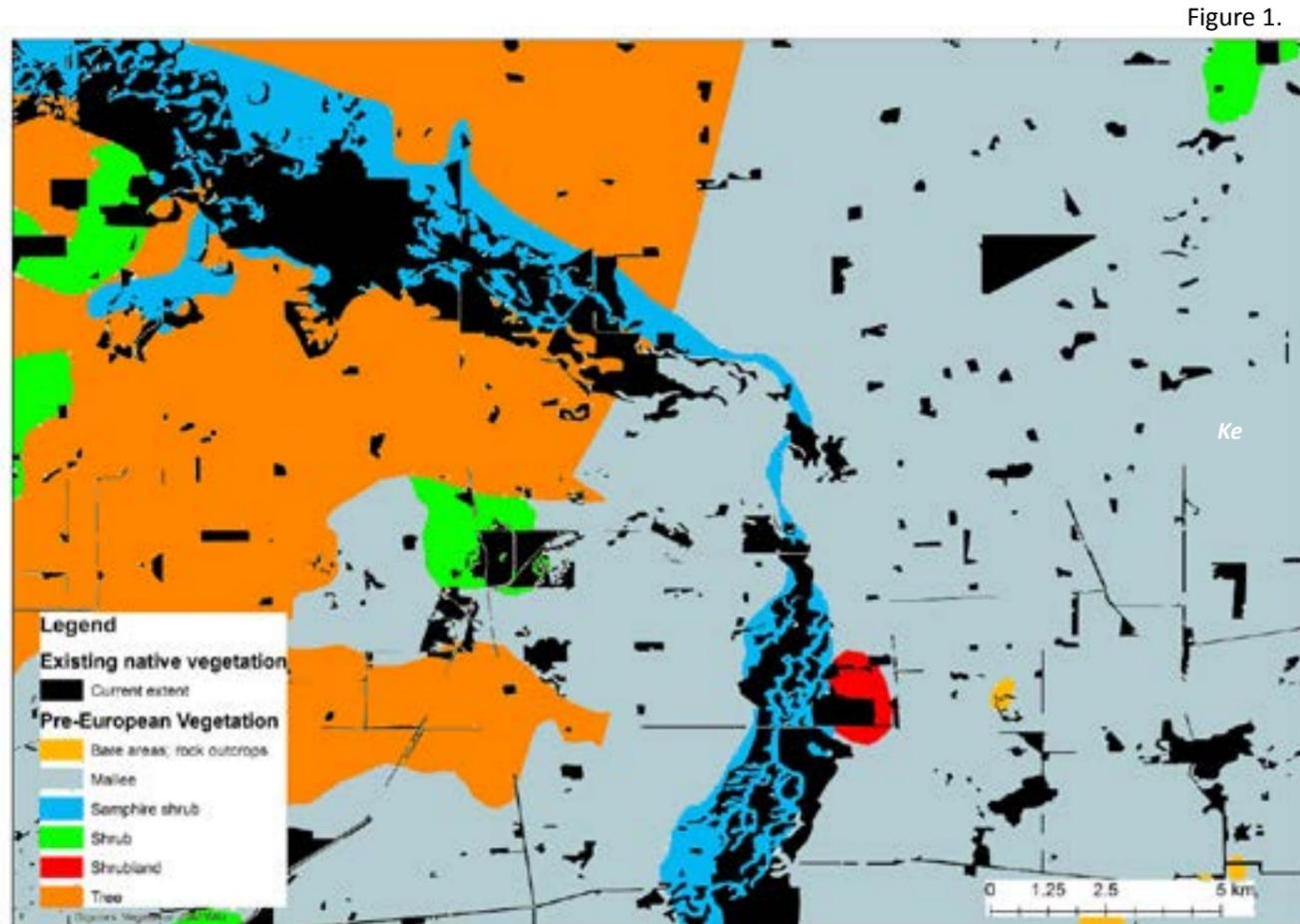


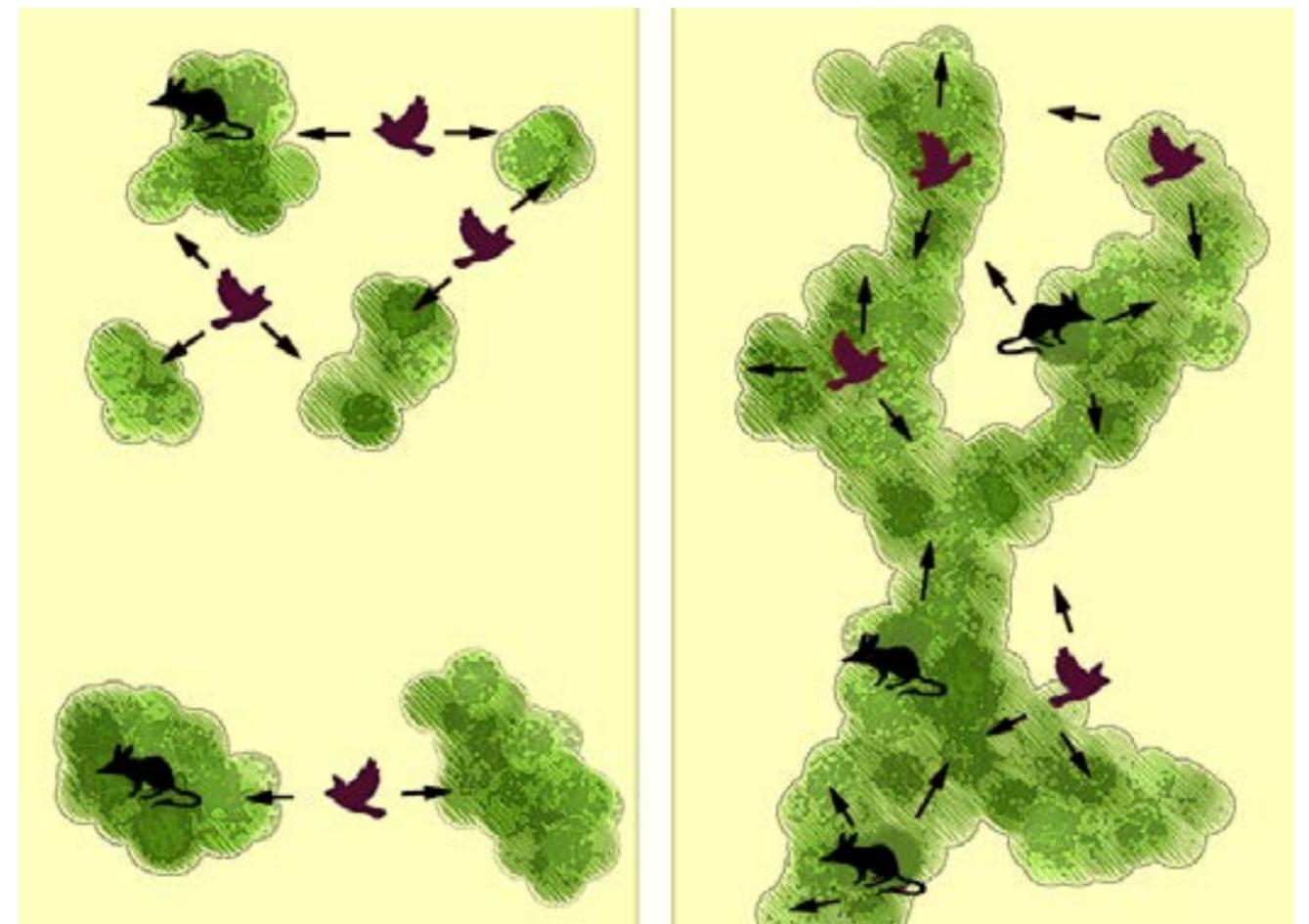
Figure 1.

**Figure 1:** This is an area of the Wheatbelt showing, in black, the extent of current remnant vegetation. The areas with significant connectivity are primarily samphire shrubland along the river, which offers habitat to a limited range of plant and animal species. Across the remaining area it's possible to see the vegetation restricted to habitat islands with limited connectivity.

The population fluctuations of many Australian animal species are commonly believed to be a natural occurrence due to several environmental factors, particularly the drought cycle of the Australian climate. Many rock-wallaby species across Australia are known to have significant population crashes in drought years. Prior to habitat fragmentation these fluctuations rarely had a catastrophic impact on the species survival as the survivors were able to cross country and breed with other

survivors. As habitat continues to degrade, fragment and become more isolated the possibility of extinction due to catastrophic events and inbreeding increase. Climate change is accelerating habitat fragmentation and the vulnerability of both floral and faunal communities. The Black-flanked Rock-wallaby, found on granite outcrops in the Wheatbelt are currently struggling to recover from a crash in their populations, with some sites sustaining as few as two individuals.

Figure 2.



**Figure 2:** the image above on the depicts an area with habitat islands, showing that birds may be able to move short distances between patches of habitat but will not be able to move between habitat patches that are a long distance apart. It also shows small animals being unable to move between the habitat islands. The image on the right depicts a connected landscape, and shows the ability of birds and small animals to move easily between locations.

The use of conservation corridors between areas of remnant bushland offers a way of improving access between habitat islands. Conservation corridors are areas of natural habitat that provide pathways, allowing plants and animals to disperse and migrate between populations and to adapt to the pressures of changing climate and habitat conditions. This allows the complex interrelated processes of ecological communities to be maintained and continue to provide the ecosystem services –like nutrient cycling, watershed management, and erosion control—that sustain productivity.

It is important to remember when connecting patches of bushland with conservation corridors that the corridors not only allow the movement of valuable species it can also encourage the dispersal of pest plants and animals. With this in mind it is important to carefully plan any connectivity project before you begin. For example, if a conservation corridor is planned to connect two patches of bushland the first step should be to assess both patches for the presence of pest species and to ensure there is a management plan in place to effectively control plant and animal pests.

Groups of landholders across the south west of Western Australia are currently preparing to participate in the Red Card for Rabbits and Foxes program. Although many of Australia’s native species are restricted to habitat islands many introduced species are easily able to cross modified landscapes.

This is so for foxes, rabbits and cats. The program assists landholders to coordinate their feral control activities with others across the region at the most appropriate time in the life cycles of the target species.

**Figure 3:** The image on the right shows a group of landholders working together to control feral animals. It also shows the difficulty the feral animals will face in reinvading the property in the centre if all surrounding properties are effectively managing their feral animals. The image on the left shows the relative ease with which a feral animals may invade the property controlling ferals if the surrounding properties are not controlling the feral pests.

Figure 3.



The program works off the principle that if everyone in the community works together to manage introduced species it will have the greatest impact. There is less chance of a feral animal reinvading a property if all neighbouring properties carry out effective feral control activities at the same time. It is important for the success of the program that the fox shoots are combined with baiting activities.

If you grew up in the Wheatbelt it’s likely you have fond memories of spending time in your local patch of bush, amidst the amazing creatures that made the experience so special. Sadly, many of these animals are becoming rare and their distributions are drastically decreasing. Carnaby’s Cockatoo, also known as the white-tailed black-cockatoo, is one iconic species, once common throughout much of the Wheatbelt, that is now restricted to a very small region.

Even small changes in land management activities can have a big impact on the plants and animals we share the Wheatbelt with, and careful property management planning can benefit not only the long-term productivity of farmland but also the health of the bushland in the region.

Every small step we each take to look after our patch results in the change needed for the bush we all love.

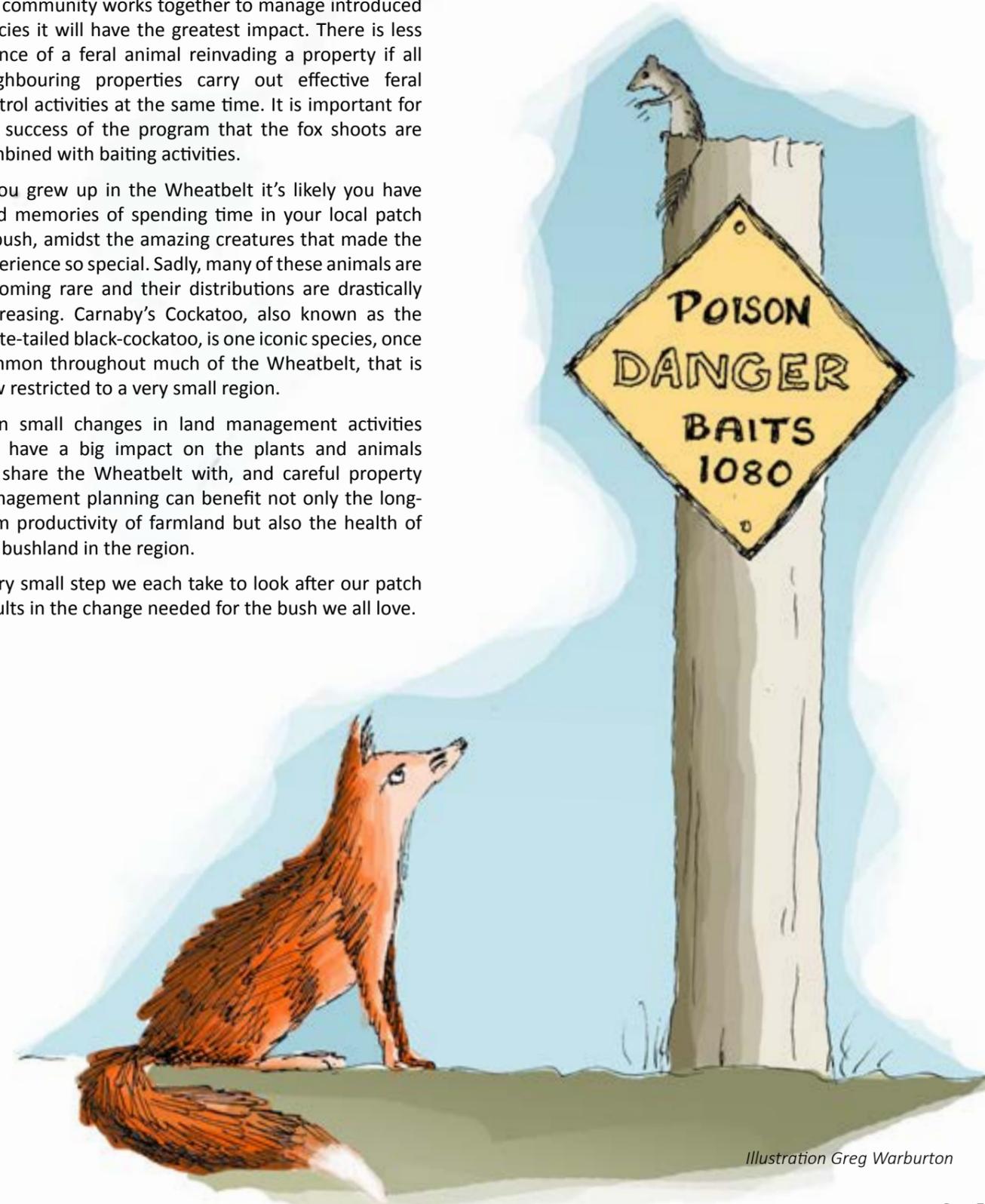


Illustration Greg Warburton

# Pathways into CTF for better profit and resource management

By Paul Blackwell, DAFWA Geraldton Office

## Red-tailed Phascogale *Phascogale calura*



Past and present distribution of *Phascogale calura*. Green indicates recent fossil records, light orange indicates distribution at time of European settlement and dark orange indicates current distribution.



When European people first arrived in Australia the Red-tailed Phascogale was found throughout much of Western Australia and the Northern Territory. Today, however they are primarily restricted to remnant vegetation in the central and southern Wheatbelt. Habitat destruction and fragmentation are identified as primary causes of decline of the Red-tailed Phascogales. These small animals require vegetation communities that have been unburnt for at least 20 years. Known to be an arboreal species – primarily living in trees – they also move between trees, hunting and foraging on the ground. While on the ground, Red-tailed Phascogales need the protection of old logs and other ground cover in case of predators and sometimes as nest sites. They eat a wide range of insects, spiders, small birds and small mammals, including the house mouse and baby rabbits.

If you live in the Pingelly/Kondinin/Lake Grace area you might just be lucky enough to spot a Red-tailed Phascogale in remnant bushland near you.

## What can you do?

Having bushland on or near your property can bring with it great benefits to your farmland, including ensuring the presence of beneficial invertebrates and birds that prey on agricultural pests, such as caterpillars, as well as providing windbreaks and maintaining the fungi associated with a healthy soil. Bushland can, however, also provide habitat for introduced pests, like foxes, cats and some weeds. Getting involved in the upcoming Red Card for Rabbits and Foxes program is a great way to improve the health of your bushland and increase the ability for native species to move between habitat islands safely. The program includes a hot-baiting period from February 15th to April 15th and the Stockbrands Community Fox Shoot weekends on the 21st-23rd of February and the 28th-30th of March.

There are also many other control activities you can implement on your property to help manage the threat of feral animals. When deciding to begin feral control activities it is important to consider the impact the control may have on other undesirable animals. For instance if you remove foxes from your property without managing rabbits you are likely to end up with an explosion of rabbits, while if you manage to get rabbit numbers under control without controlling the foxes you run the risk of foxes switching to lambs or native species as their preferred prey. Alongside working with your neighbours, the best thing you can do is target feral species with a mix of control methods at the same time. Use of guard animals, like alpacas or donkeys, is also a very effective way of excluding foxes from your stock.

If you have a patch of bush on your property that you'd like to undertake coordinated control of feral animals in please contact Rowan Heggulun from Wheatbelt NRM on 96703101 for technical advice.

There are a number of other activities that you can do to help your bushland and landscape connectivity, including:

- Avoid further fragmenting bushland on your property,
- Avoid spray drift impacting on remnant vegetation,
- Carefully planning your property management to take in to account surrounding properties and reserves as well as bushland on your property,
- Planning management activities in conjunction with neighbouring landholders,
- Joining or starting a community conservation group in your area.



Progressively bigger and heavier cropping machinery defends the profitability of grain farms, but soils find difficulty supporting heavy machines and growing crops and pastures well.

Controlled traffic farming (CTF) systems and soil decompaction offers more farm profit and better farm resource condition, but rarely can be quickly established.

More than ten years of experience by WA growers and DAFWA have helped clarify various pathways to a CTF system and better management of soil compaction.

The general pattern of choices seem driven by rainfall regime and capacity to invest.

Lower rainfall farms with limited investment capacity have often used partial CTF (without the header) and some deeper digging points at seeding. Higher rainfall farms with more investment capacity usually match the system to the header and incorporate deep soil cultivation and lime mixing.

More information and technical detail can be found on the DAFWA CTF web page at the link below.

<http://bit.ly/1fgnURF>

You may also find this video of grower opinion useful

<http://bit.ly/1c63jJN>

This video explains more technical detail

<http://bit.ly/1mg76KY>

A CTF system on the Northern sandplains using 12m wide seeders, 36m wide sprayers and 40' headers. The tramlines are sown and the tractors and headers have tracks.

A CTF system in the Central Wheatbelt using an 18m seeder, 36m boom on wing tramlines and 9m headers. The tramlines are sown with disc units and the crop is sown on 15" spaced twin rows.

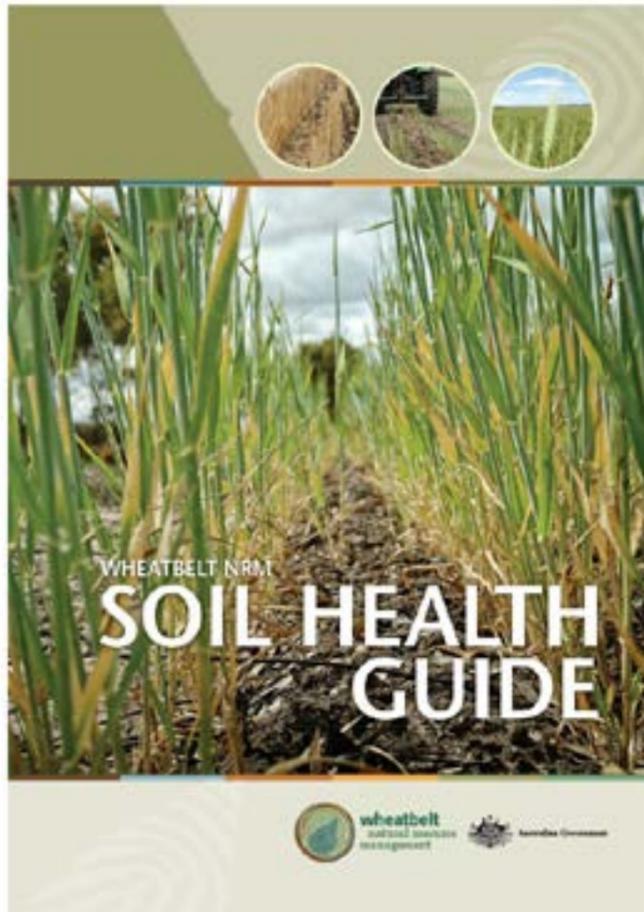
The environmental benefits of such systems are less runoff and water erosion and less nitrous oxide emissions from soil through less waterlogging if compaction has been ameliorated. There are also less carbon dioxide emissions through better running on firm permanent tramlines.

Economic benefits are about 10% more yield and less screenings as well as potential for less fertiliser use.

Care must be taken to explore the option of not changing the cropping method and matching inputs to potential in low rainfall regimes and tight financial constraints when the priority may be to sow as much crop as possible in the best opportunities to seed.

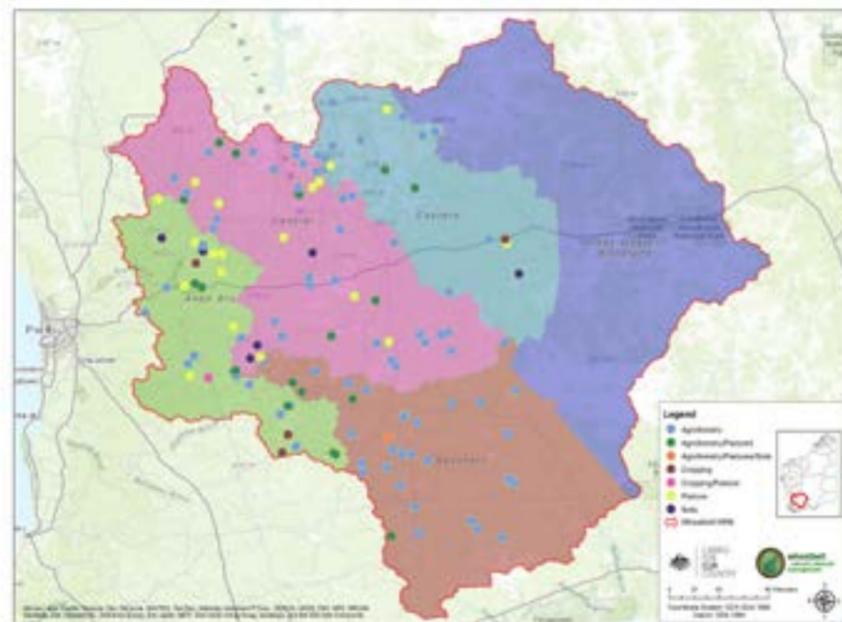
DAFWA are starting a new five year GRDC supported project to help growers manage soil compaction more profitably. If you would like to be kept informed about the developments and be involved in activities please send me an email [Paul.Blackwell@agric.wa.gov.au](mailto:Paul.Blackwell@agric.wa.gov.au)

Wheatbelt NRM would also like to hear from you if you are interested in developing a trial or demonstration project linked to technology that both improves our natural resource base and production. See [www.wheatbeltnrm.org.au](http://www.wheatbeltnrm.org.au) for funding opportunities or contact the Wheatbelt NRM Sustainable Agriculture program for more general information at [gtroupe@wheatbeltnrm.org.au](mailto:gtroupe@wheatbeltnrm.org.au)



This guide has been developed to present some of the approaches Wheatbelt farmers are taking to address soil health issues in the region. More specifically, the guide presents the outcomes from a 5 year program that has worked with farmers and industry to explore innovative farming practices that address soil health issues in the Wheatbelt. The Soil Conservation Incentives Program (SCIP) invested over \$4 million of funding from the Australian Government's Caring for our Country program between 2009-2013 in projects undertaken by Wheatbelt farmers that demonstrate management practices that address soil health issues in the region, including soil acidification, soil loss through wind and water erosion, dryland salinity, soil biology and the carbon content of soils. There are now over 150 SCIP demonstration sites across the Avon River Basin (Figure 1).

The guide includes 24 case studies and fact sheets that discuss different grazing, cropping, agroforestry and soil management practices that Wheatbelt farmers have explored through the program. This booklet is not intended to be an exhaustive guide to addressing soil health issues in the Wheatbelt, but provides a snap shot of innovative agricultural practices that are currently being trialled in the region.

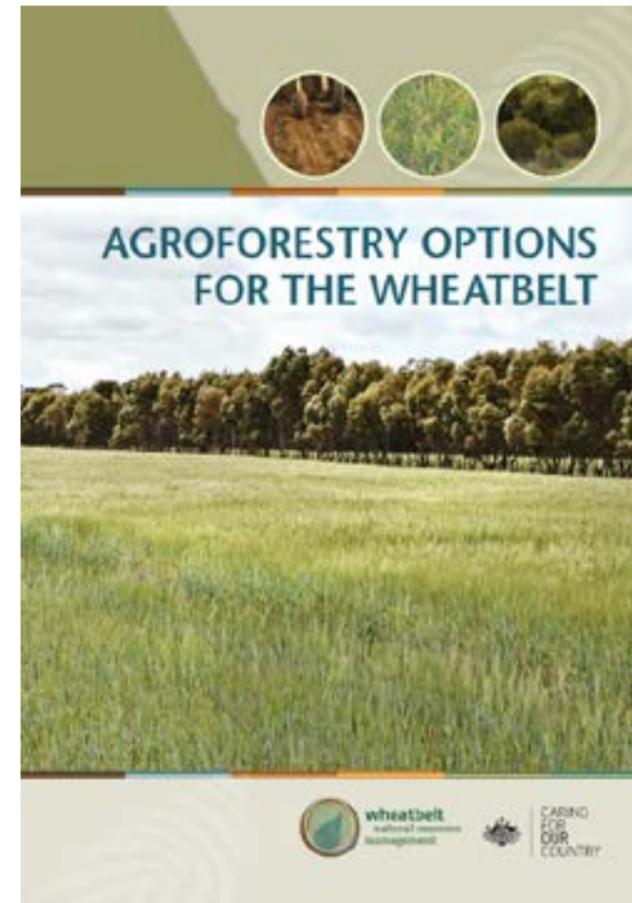


To download the publication please type the link below or use your smart phone to scan the qr code:

<http://bit.ly/1c6iVx4>



Figure 1: Soil Conservation Incentive Program trial/demonstration sites and their relevant farm practice theme



Revegetation is for everyone. Whether you are a broad acre farmer or a hobby farmer, at some point you are likely to want or need to do some revegetation on your property. The Western Australian Wheatbelt has been extensively cleared since European settlement resulting in the range of environmental problems we face today; salinity, wind and water erosion and loss of habitat. Owners of properties both large and small are doing what they can to address these environmental challenges while meeting their own aspirations and financial needs.

This revegetation guide is for land managers, farmers, and communities interested in revegetation in the Wheatbelt region of Western Australia. The aim of this guide is to provide information, tips and tricks for successful revegetation and how to gain additional benefit for biodiversity outcomes from on-farm revegetation. It also supports those wishing to establish plantings for the purpose of carbon, forestry, and fodder using best practise methods.

Whether you have experience in revegetation or are just starting out, this guide contains information to ensure every planting you do has the best possible outcome, good survival rates and provides benefits to you and the environment far into the future.

If you require any additional information, contact Wheatbelt Natural Resource Management on: (08) 9670 3100

To download the publication please type the link below or use your smart phone to scan the qr code:

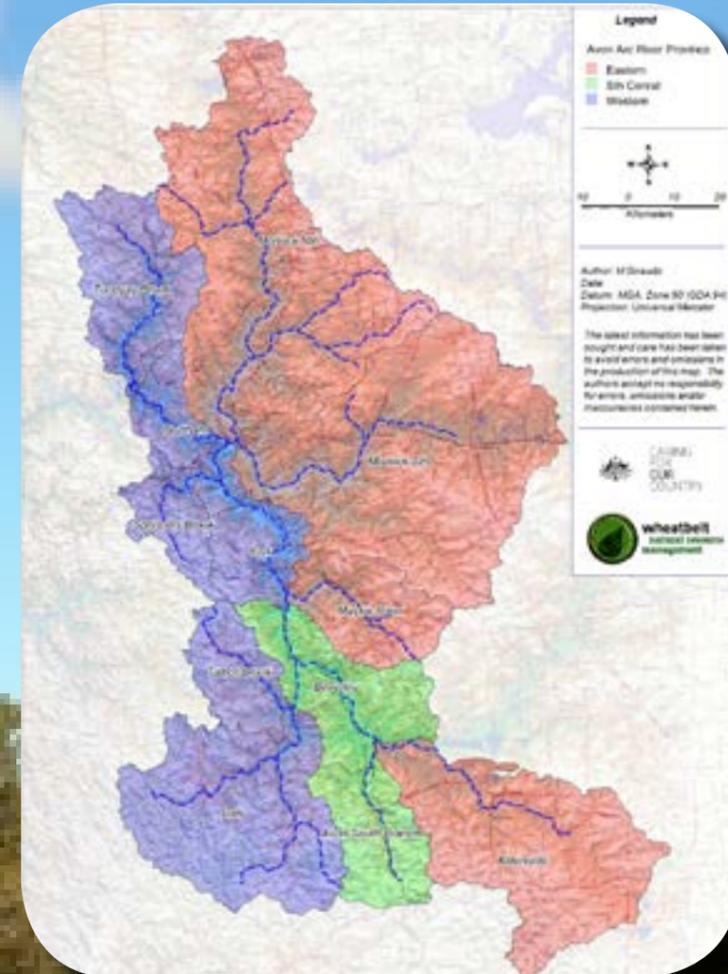
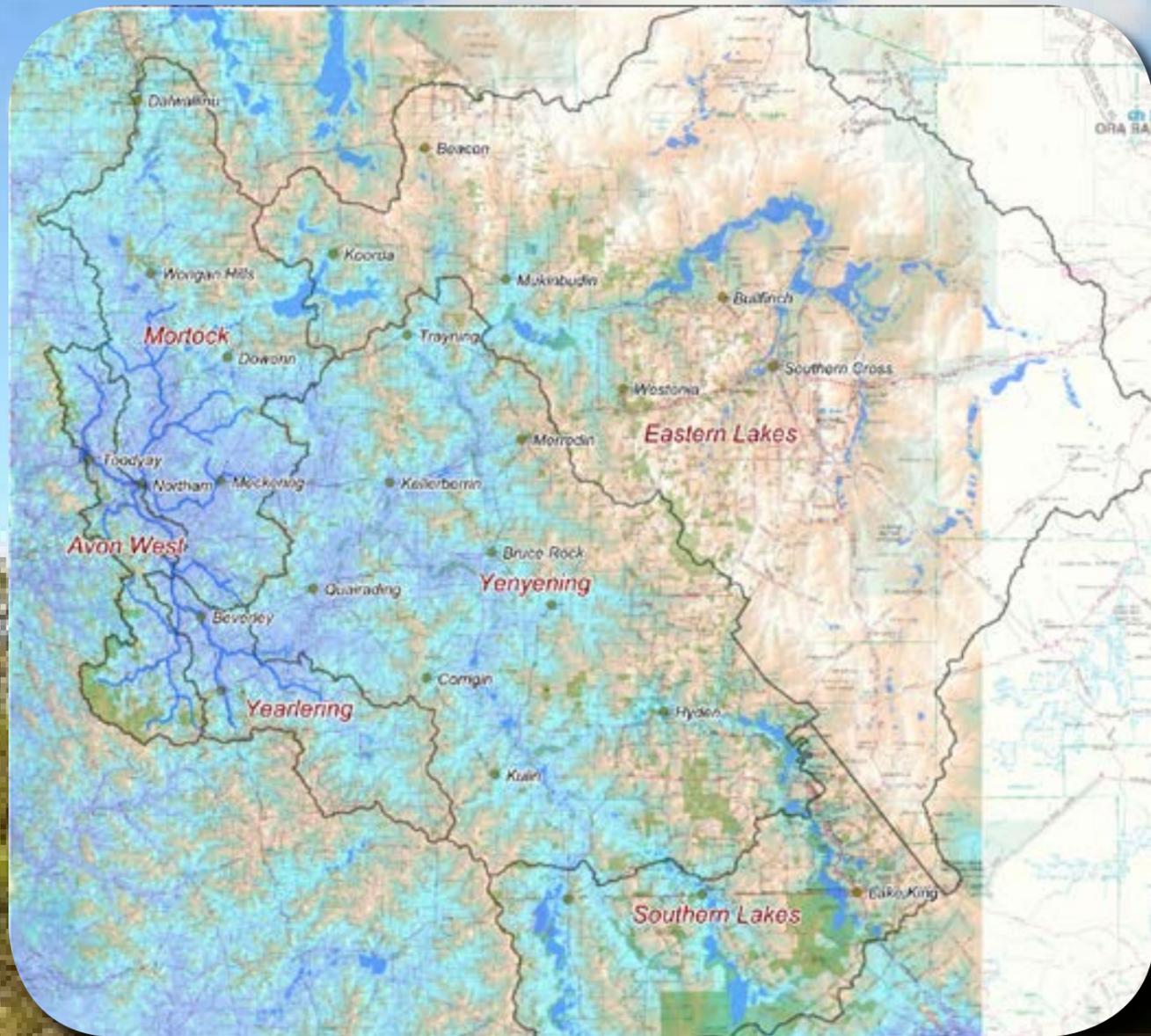
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# The Avon River

This information is extracted from the Draft NRM Regional Strategy for more information please visit [www.wheatbeltnrm.org.au](http://www.wheatbeltnrm.org.au)

The Avon River is central to the character of the Avon Region. The Avon River had a profound spiritual relevance to the Noongar people, and is still part of their songline dreaming trail.



## The Avon and the Swan

The Avon River drains into the Swan Canning estuary. The Avon and Swan Rivers are in fact a single river, with no confluence; the naming of the rivers is an historical anomaly. The Avon River is estimated to contribute approximately 69% of total Nitrogen (TN) and 43% of total Phosphorous (TP) loads to the Swan Estuary. Eutrophication is considered a primary ecological threat to the aquatic health of the river and projected urban and prei-urban growth within the Avon Arc is likely to place additional stress on river health.

Projected climate change is likely to result in degreased river flows, potentially resulting in increased concentration of nutrients and other solutes including salinity as a result of reduced dilution.

### The annual flow cycle within the Avon River is characterised by three specific phases:

- Bank flow phase: medium to high flows, including bank flows and those inundating associated floodplains
- Wet connected phase: River pools are connected by flows allowing flora and fauna to recolonise broader river areas from refuge pools
- Wet isolated pool phase: pools contain water but are separated due to insufficient base flow.

Several pools maintain permanent water over the summer months when the Avon River ceases to flow (isolated pool phase). These pools are important summer refuges for the aquatic and terrestrial fauna of the Avon, and the long-term sustainability of these habitats is an important consideration for future water management planning within the Avon Arc catchment

### What is a Stressor?

Resilience theory can only be sensibly considered in relation to a stressor or shock; in other words, what is the system resilient to? Systems may rely entirely upon shocks or stressors for regeneration. An example of this is the scrubland heath within the Avon River Basin: this complex and diverse ecosystem can only regenerate in the presence of the stressor fire, as a result of an evolutionary history of frequent wildfire.

### Stressors inmpacting the River

The river is impacted by a range of stressors and threats, including potential changes in land management with the catchment. These changes in land management practice include:

- Agricultural and stormwater drainage.
- Increased water harvesting for dams and water resources.
- Management of tributaries, including agricultural impacts.
- Agricultural management practice, including fertiliser and grazing management.
- Changes in land use and in particular further urban and peri-urban development.

# Birak - Bunuru

*The Noongar people recognised six seasons in their year, Bunuru, Djeran, Makuru, Djilba, Kambarang and Birak, and managed the budjar (land) accordingly. The climate of this country ranged from mild to temperate and was divided into these six seasons, during which, land management practices and hunting & gathering patterns were guided.*

## **Birak - December to January**

*Hot and dry with easterly winds during the day*

At this time fires were lit to clear the understorey, flush game out and promote growth in later seasons.

## **Bunuru - February to March**

*Hot easterly and north winds*

The fruits of the zamia (*Macrozamia riedlei*) were collected and treated for toxins by a process of burying, soaking and roasting.

*Illustration Greg Warburton*

