



**Site preparation for revegetation**

**Climate change in south-west WA**

**How the community influences what we do**

## Contents

<i>Autumn in the Wheatbelt</i> .....	1
<i>How the community influences what we do at Wheatbelt NRM</i> .....	2
<i>Climate change in south-west WA</i> .....	4
<i>Rhagodia</i> .....	6
<i>Chicken Manure to boost Wheatbelt crops</i> .....	7
<i>What's happening in carbon farming</i> .....	8
<i>Site preparation for revegetation</i> .....	10
<i>Fat-tailed dunnart</i> .....	12
<i>The Quandong</i> .....	14
<i>Qweerk and the Feral Fox</i> .....	16
<i>Djeran - Makuru</i> .....	18



**wheatbelt**  
natural resource  
management

269 Fitzgerald Street  
Northam Western Australia  
PO Box 311 Northam WA 6401  
Phone: (08) 9670 3100  
Fax: (08) 9670 3140  
Email: info@wheatbeltnrm.org.au

Copyright © 2015 Wheatbelt NRM Incorporated  
ABN 61 661 518 664

www.wheatbeltnrm.org.au

This document is printed on 100% post production recycled paper using vegetable-based inks.

Written and designed by Wheatbelt NRM.

Printed by the Environmental Printing Company, Malaga.

This publication is produced by Wheatbelt NRM through funding from the Australian Government.



National  
Landcare  
Programme



# Autumn in the Wheatbelt



Wheatbelt NRM's Noongar Elders Advisory Group with Her Excellency the Honourable Kerry Sanderson AO

**2015 is shaping up to be a solid year of getting on-ground work done. It is also the final year of our current organisational strategic plan. We have spent the last few months reflecting on what we have achieved, before we launch into developing our next strategic plan.**

The exciting thing is that because our NRM Regional Strategy was published last year, we have a firm message from the community on the direction we should be taking. Our 2015–2018 Organisational Strategic Plan will be the road map for the work Wheatbelt NRM intends to deliver to contribute to the NRM Regional Strategy.

The NRM Regional Strategy is bigger than us, so we will continue talking with the other players to create alignment with what work should be done for the Wheatbelt environment. These other players include: Australian Government, Wheatbelt Development Commission, State Government Agencies, Greening Australia, World Wildlife Fund, Water Corporation, Friends of Groups, Grower Groups, Landcare Groups, all local business and everyone who is managing land in the Wheatbelt.

### Green Army funding

Wheatbelt NRM was pleased to announce its success in securing Green Army funding for work to improve the Avon River habitat through the removal of weeds of national significance over six priority sites.

The project focuses on the Avon River and seeks to protect and enhance its significant ecological and cultural values. Weed infestations will be destroyed to prevent further degradation of the ecosystem.

Wheatbelt NRM are looking forward to working with Conservation Volunteers Australia during this important project.

### Sustainable farming trials

More than a hundred farmers from nearly all of WA's agricultural regions have become part of a new website promoting sustainable farming research work undertaken on their farms.

The [www.agtrialsites.com](http://www.agtrialsites.com) website features 123 trials and on-site demonstrations coordinated by the state's seven natural resource management groups.

The scale of investment into sustainable farming practices by the Australian Government through WA's seven NRM groups has been estimated to reach \$27 million between 2013–2018.

### WA Governor visits the Wheatbelt

Wheatbelt NRM had the very great pleasure of welcoming Her Excellency the Honourable Kerry Sanderson AO, Governor of Western Australia to Burlong Pool, Northam in March. The Governor met with Wheatbelt NRM's Noongar Elders Advisory Group who spoke with her about their role in guiding the cultural aspects of our natural resource management work. Her Excellency was on the homeward leg of her first official, four-day visit to the Wheatbelt region.

Kind regards,



**wheatbelt**  
natural resource  
management

## 5. Day to Day Process

- **27** Staff working locally
- Annual General Meeting is a community event\*  
\*120 attendees in 2014
- Workshops and training
- Field days
- Short Survey at community events
- In the Paddock discussion
- Annual Community Survey
- During project delivery:
- **90%** of staff volunteer in the community

We are very proud of this

## 4. Project Delivery



# How the Community influences what we do at Wheatbelt NRM

By Natarsha Woods, CEO

## 3. Seeking Funding



## 1. Membership



## 2. Strategic Planning



One of the key policy objectives for the National Landcare Program (NLP) is that it be 'local'. To achieve this each regional group was asked to:

1. show that 20% of its funding was used to directly support Landcare Groups\*
2. use a regional strategy to decide what work to do
3. demonstrate 'how the community influences the decisions of the organisation'.

\* for Wheatbelt NRM this means catchment groups, grower groups, 'friends of' groups, individual landholders, etc.

The first two points are easy for us to tick off, but when we considered the third point it seemed odd. We are the community – we are a community group. How do we influence ourselves, and how do we show it?

We knew that the NLP policy change was targeted at Eastern State Regional Groups, particularly where those groups are part of state governments. However, we still needed to answer the question, and since community is core to all our processes the answer is complicated. Rather than write an essay, we developed an 'infographic'. See opposite.

This 'Community Engagement' infographic shows that Wheatbelt NRM has multiple layers of community influence – from the core structure of our governance, through to the day-to-day processes. We have been working in this field for 20 years and experience shows that our best traction with the broader community occurs when the likelihood of 'payback' is highest for them. Seems pretty logical.

The highest payback for the community is when they apply to us for funding.

As much as possible, we ask funding applicants what they would like to do. Then we assess this against the project requirements, and fund the most competitive community projects. We try to keep the forms as simple as possible and work logically within the farming calendar.

Our funding rounds tend to be oversubscribed!

Each year we are able to fund a stack of projects, but there is always another pile of projects that we can't yet fund. This other pile tells us exactly what work the community wants to do. It's our GOLD and we use this information to direct other areas of our work.

For example, the 'Feral Animal Control' workshops being run by the Biodiversity team this June were set up in response to requests for funding for this type of work.

We have also been able to work with landowners who unsuccessfully applied for our Bushcare Grants, by reconfiguring their projects so they can apply for funding through the Australian Government's 20 Million Trees program.

So, let's tick off point 3:

- ✓ Our board is composed of community members.
- ✓ Our work is directed by a Regional Strategy, which began with face-to-face interviews with more than 150 community members.
- ✓ We seek joint projects with local project partners (e.g. DAFWA, Greening Australia).
- ✓ We deliver projects in partnership (currently we have 22 partnerships in place).
- ✓ We favour local supply (e.g. we currently have 17 contracts with local CRCs to do our annual community survey).
- ✓ Over 20% of regional funding goes 'out our door' to Landcare.
- ✓ We deliver projects that ask the community what they want to do.
- ✓ The way we work gets us out there, talking and listening to community.

# Climate change in south-west WA

The NRM Planning for Climate Change project aims to bring an essential spatial context to planning within Wheatbelt NRM. By using an interactive, computer-based system we will be able to adaptively manage strategic carbon investment across the region.

This project fits in with our 2014 Regional NRM Strategy for the Avon River Basin, which lists planning for carbon sequestration as one of our priorities for adapting to climate change. Developing a spatial tool is another priority for assisting Wheatbelt NRM to develop a strategic adaptive management approach to NRM.

To begin with we have looked at some of the projected impacts from climate change on the South-West and the Avon River Basin in particular.

## CSIRO 2080 and 2050 projections for the southern and south-western flatlands NRM region:

More hot days and warm spells are projected in the CSIRO modelling with very high confidence. Fewer frosts are also projected with high confidence.

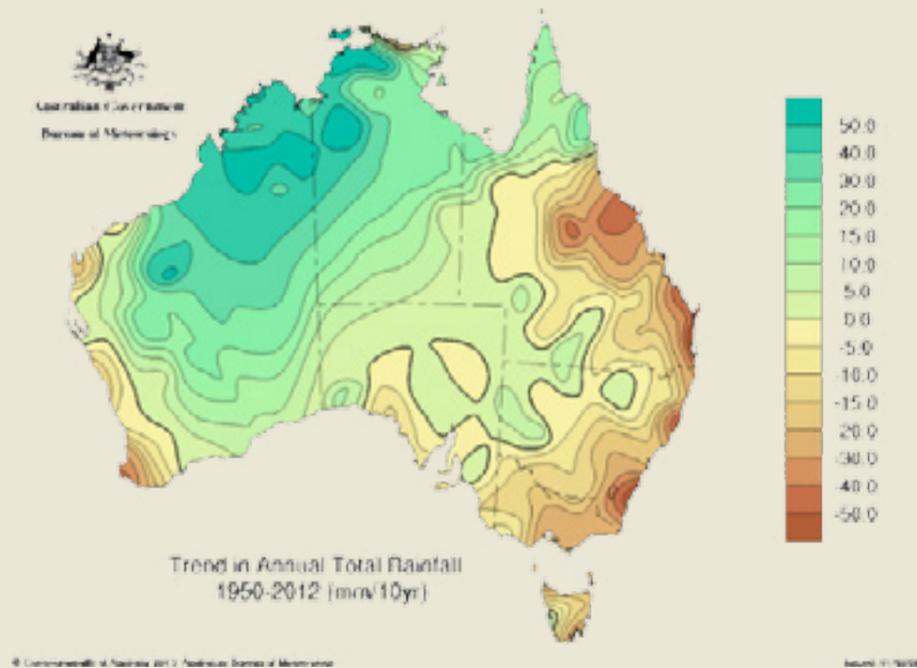
Extreme temperatures are projected to increase at a similar rate to mean temperature, with a substantial increase in the temperature reached on hot days, the frequency of hot days, and the duration of warm spells (projected in the CSIRO modelling very high confidence).

Frost risk days (minimum temperatures under 2°C) are expected to decrease across the cluster (projected in the CSIRO modelling high confidence).

A continuation of the trend of decreasing winter and spring rainfall is projected in the CSIRO modelling with high confidence. Changes in other seasons are unclear, although downscaling suggests a continuation of the observed autumn declines.

## Decreasing yields

Overall, this modelling found that 45% of the agricultural zone may experience a decrease in yield potential greater than 10% as a result of climate change. The actual reduction will be less as farmers adapt their planting strategies and canola cultivars.



The greenhouse gas emissions scenarios described in the ICC Report have been used to make projections of possible future climate change.

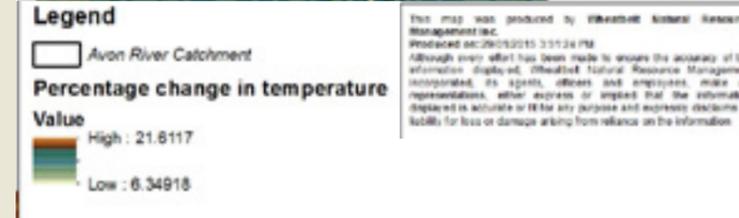
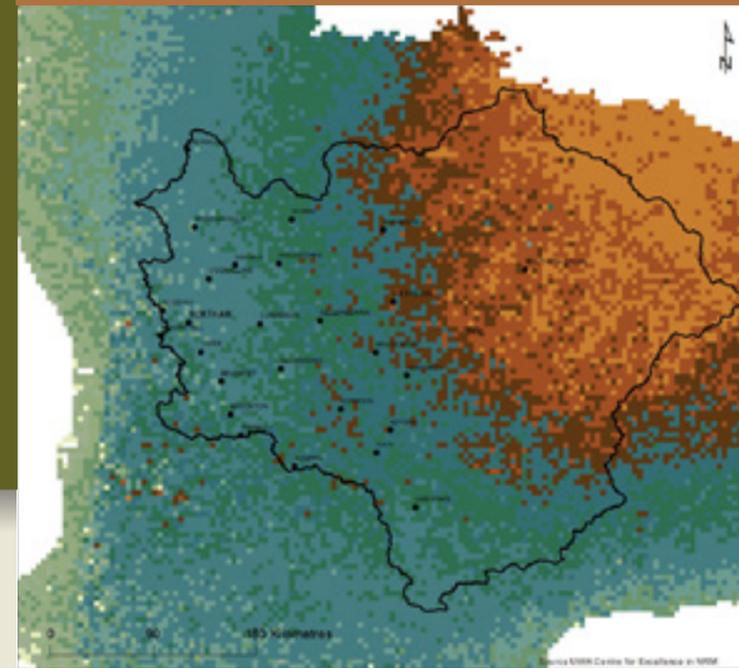
### \*The A1B scenario is characterized by:

- rapid economic growth
- a global population that reaches 9 billion in 2050 before gradually declining
- the quick spread of new and efficient technologies
- a convergent world
- a balanced emphasis on all energy sources.

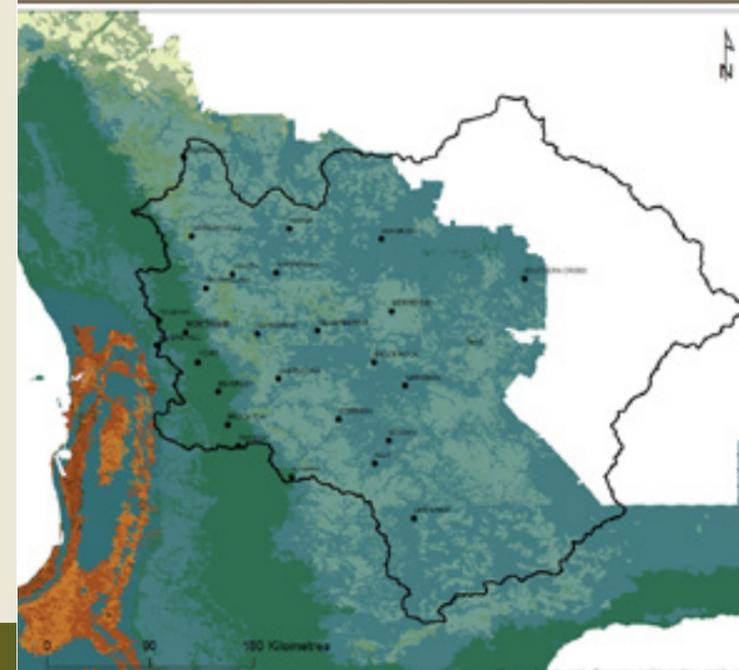
### \*The A2 family of scenarios is characterized by:

- a world of independently operating, self-reliant nations
- a continuously increasing population
- regionally oriented economic development.

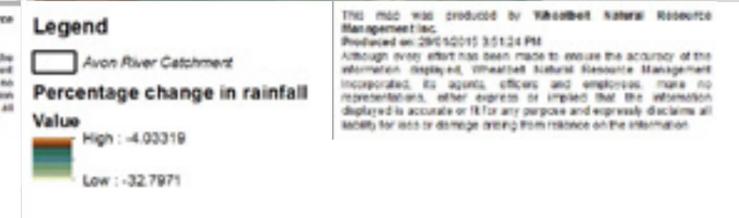
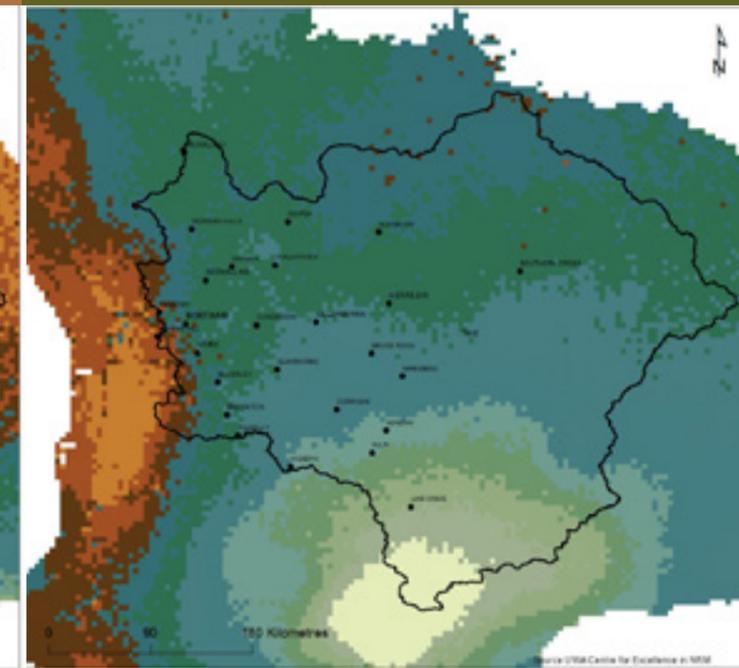
Percentage change in temperature by 2080 under A1B\* scenario



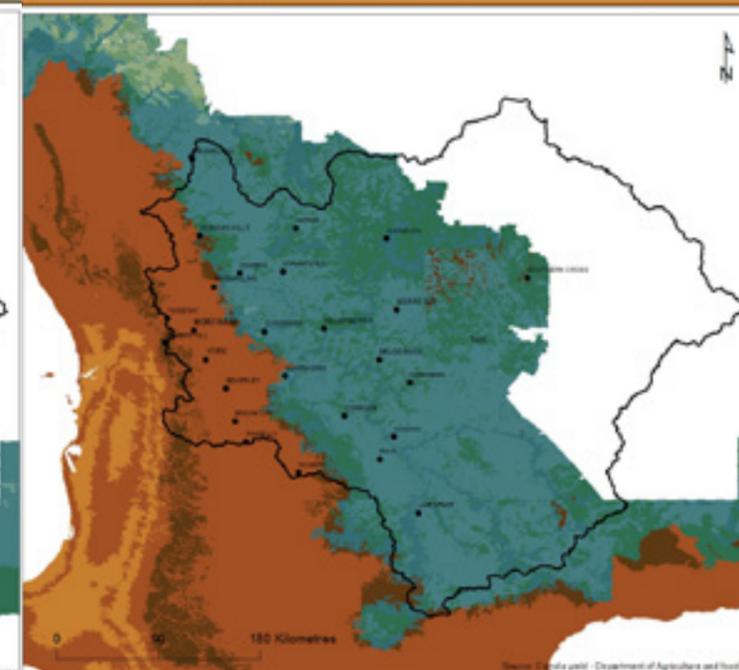
Projected change in yield from 2005 - 2050 under climate change scenario A2\* by timeframe 2080



Percentage change in rainfall by 2080 under A1B\* scenario



Projected change in yield from 2005 - 2050 under climate change scenario A2\* by timeframe 2080



# Rhagodia

Extract from case study by Elise Bowen & Natalie Hogg, Department of Agriculture and Food, Western Australia

By Kate Raston

## Chicken manure to boost Wheatbelt crops



*Rhagodia preissii* Courtesy of Florabase by G. Byrne

<b>Description:</b>	a compact green shrub. About 1.5m high and 2m wide with bright red berries. Native to southern WA.
<b>Soil types:</b>	grows naturally on a range of soils. It does appear to be significantly tolerant to salinity or waterlogging.
<b>Agricultural use:</b>	<i>rhagodia</i> is currently included in forage shrub trials with interest in its anthelmintic (reducing gut parasites) properties.



Wheatbelt NRM Project Officer Tracey Hobbs with Living Farm's Richard Devlin

**The opportunity for farmers in marginal areas to include perennials in their production systems is brightening, with new plant species belonging to the genus *Rhagodia* being trialled for their suitability as alternative perennial fodder shrubs in the lower rainfall agricultural regions of WA.**

The persistence of perennials in many WA agricultural regions is constrained by low rainfall and poor soils, with viable options being limited. However, the inclusion of perennials in farming systems has several benefits:

- it reduces supplementary feeding during the summer/autumn feed gap
- it allows deferred grazing of break-of-season pastures
- it provides options for tackling salinity, wind erosion and biodiversity.

In some instances, (as seen in the Enrich Project) devoting 10-20% of the farm area to perennial forage shrubs on a typical central wheatbelt farm can increase total farm profits by 15-20%.

*Rhagodia spp.* are perennials of which some are native to WA. They are commonly found in salt-affected areas. *Rhagodia* species offer high value green feed during the summer-autumn feed gap,

and have demonstrated high resilience to drought.

In some instances, species of *rhagodia* such as *R. drummondii* has been seen to contain 23% crude protein. It has also met animal requirements for phosphorus and copper and exceeded dietary requirements for calcium, magnesium, sulphur and zinc. In general, *rhagodia*

demonstrated high biomass production and good regrowth following grazing. Variation in palatability has been observed between different species.

So where can *rhagodia* potentially fit into your farming system? As a salt-tolerant shrub, *rhagodia spp.* can be included in fodder shrub mixes for salt-affected areas, or alternatively planted in rows between annual pasture to provide year-round green fodder for livestock, manage salinity

and combat wind erosion

**For more information on *rhagodia* please visit: [www.wheatbeltnrm.org.au/our-information/knowledge-hub](http://www.wheatbeltnrm.org.au/our-information/knowledge-hub)**

**“*Rhagodia* species offer high value green feed during the summer-autumn feed gap, and have demonstrated high resilience to drought.”**

**Poultry farmers have spent years trying to find a market for their chicken manure, and a solution may now be in sight with help from the forestry and broad acre cropping industries.**

A trial near York is using a combination of left over thinnings or prunings from pine plantations, mixed with chicken manure and spread on wheat crops.

The product contains high levels of organic nitrogen, and useful levels of phosphorous and potassium and has already recorded a healthy visual response, although October rain has delayed harvest with the initial yield data not expected for another month.

The three-year trial is being funded by Wheatbelt NRM, and coordinated by York consultants Living Farm.

Adding another element to the project is the involvement of WA Biofuels, which has found a use for the forestry thinnings that would otherwise be left on the plantation floor to decompose.

The manager of biofuels and forestry Darryl Outhwaite said his company had developed a process to turn these thinnings into bedding material for chicken farms.

Darryl said the entire poultry industry in WA used roughly 100,000 cubic metres of bedding each year, with poultry sheds needing to be cleaned out eight times a year. Since their introduction two years ago, Darryl said about 10 per cent of poultry farms were now using the forestry thinnings as bedding.

WA Biofuels was also investigating converting the thinnings into Biochar, carbonized in a purpose built furnace and then crushed and screened and mixed with the poultry manure in pellet form.

In order to test the quality of the chicken manure, a trial site was established using 11 treatments replicated four times.

The treatments included varying applications of sulphate of ammonia, chicken manure and bedding, and Biochar.

Apart from the untreated treatment, all plots received adequate levels of phosphorous and potassium at sowing, so a more realistic impact from nitrogen could be assessed.

The trial was sown in June using Corack wheat at a rate of 75kg/ha.

Soil testing was done for micro and macro nutrients through CSBP and tissue testing undertaken in August.

**“The product contains high levels of organic nitrogen, and useful levels of phosphorous and potassium and has already recorded a healthy visual response ...”**

# What's Happening in Carbon Farming?

Keeping you up-to-date with Royalties for Regions carbon farming projects across WA

By Jo Wheeler, Project Manager Sustainable Agriculture



Rows of oil mallees

**From July 1 2015, the Carbon Farming Initiative (CFI) will transform into the Emissions Reduction Fund (ERF) and that means that there will be some changes.**

The ERF has been changed to increase emission reduction opportunities in other sectors including land, waste and energy efficiency. Some of the major changes are listed on page 9.

## Existing CFI Projects

If you already have a project registered under the CFI these changes will be minimal and you won't need to re-register. You will still be recognised as a 'Fit and Proper Person' but you will no longer require 'Recognised Offsets Entity' status. The CFI methodology that your project was approved under can remain the same, or it can change when a new method is released with the ERF.

## 25 year obligation

A key change in the ERF that is of interest to WA farmers is the introduction of a 25 year permanence obligation option, a major reduction from the previous 100 year obligation. This is available to both CFI and ERF projects, but will incur a 20% reduction in Australian Carbon Credit Units (ACCU) attributed to the project.

## Established trees change in eligibility

Until 30 June, trees that were planted post July 2007 may still be eligible to participate in the CFI, but after 30 June these projects will not be eligible. Under the ERF all projects will need to involve new plantings. These tree planting projects must comply with a relevant CFI methodology.

To participate, an expression of interest will need to be lodged with the Clean Energy Regulator prior to **30 June 2015**.

## New auction process

The first auction was held on 15-16 April 2015. If you wish to participate in the auction process your project will need to be qualified by the Clean Energy Regulator 20 days prior to the auction and registered at least five days prior to auction.

The other mechanism for selling ACCUs will be within an evolving secondary market. To participate in this market projects must be registered with the Clean Energy Regulator. ACCUs will be claimed against the carbon sequestered or emission avoided. These ACCUs can then be sold into an auction or a secondary market.

## Legal obligations

As with the CFI, the ERF has legal obligations. Before preparing your ERF project, it would pay to get legal advice on the contract and look into the whole process further. A good start is the Clean Energy Regulator website:

[www.cleanenergyregulator.gov.au](http://www.cleanenergyregulator.gov.au)

## For more information

Please contact Wheatbelt NRM Project Manager - Sustainable Agriculture, Jo Wheeler:

[jwheeler@wheatbeltnrm.org.au](mailto:jwheeler@wheatbeltnrm.org.au)

9670 3100

## Major changes from CFI TO ERF

Requirements	CFI	ERF
Eligible project with approved methodology (name change to method in ERF)	Yes	CFI registered projects are automatically eligible
Crediting Period (apply for ACCUs)	New crediting period from 1 July 2015	7 years for emission reduction projects 25 years for sequestration projects No change for avoided deforestation or savannah burning projects
Reporting periods	As registered or can change if new method applied	As frequently as every 6 months or Every 2 years for emissions avoidance projects (changed from 5 years) and Every 5 years for sequestration projects
Participate in the auction	CFI registered projects are automatically eligible	New projects must be eligible projects and qualify for auction Offer to enter into Carbon Abatement Contract Prepare ACCU delivery schedule Register for auction Successfully bid into Auction
Permanence obligations	100 year obligation to maintain carbon levels	Sequestration projects can choose to maintain carbon rates for either 100 years or change to 25 years (with the number of ACCUs reduced by 20%)
Auditing requirements	Held over land where project is run	Majority of projects will only need 3 audits, this is based on the number of tonnes of CO2equivalent the project will produce.
Carbon Sequestration Right	Projects registered under CFI can change to 25 year permanence within 2 years of ERF starting (with the number of ACCUs reduced by 20%)	Demonstrate permission from landowner to run project on their property and receive ACCUs

# Site preparation for revegetation

By Rachael Major, Biodiversity Project Manager



Fenced wandoo woodland, by Mike Griffiths

**If you're planning on planting trees on your property in the next couple of years, its good to start preparing your site early to boost the survival rates of the seedlings. And with the first rains of the season, now is the time to get started.**

It is disheartening and expensive when your tree planting efforts die the following summer. By following some basic site preparation techniques you will ensure the survival of your newly planted seedlings and promote good germination of your direct seeded revegetation.

## Fencing

If sheep and other livestock can access newly established revegetation the consequences can be devastating as they will eat and trample seedlings and bring weeds onto the site, putting further pressure on the young and fragile seedlings.

The fencing installed will depend on the purpose of your revegetation. For agroforestry plantings that will eventually form part of a farm grazing system, stock should be excluded for at least three years to ensure adequate time for good establishment. While installing conventional fencing in this instance may be cost prohibitive, a cheaper alternative is electric fencing. If the

fencing purpose is for biodiversity and habitat, stock exclusion should be long term with permanent stock proof fencing installed.

## Rabbit control

On sandy sites and those adjacent to bushland, rabbits should be controlled to keep them from devouring newly established seeding. Reducing rabbit numbers during summer and autumn is highly recommended. Good rabbit control can be achieved with a coordinated baiting and warren destruction control program in the year of planting.

## Weed control

A heavy weed burden on a planting site will greatly reduce your chances of success, with the weeds competing for light, moisture and nutrients. Studies have shown a decrease in early seedling growth by up to 70% when compared with weed free sites, and a decrease in expected survival rates from 90% to as low as 10%. Pre-planting weed control is essential.

Ideally, weed control will start the year before planting. However, if you have already missed this window of opportunity its not too late to start now.

For a direct seeding site, weed control should take place over several seasons to increase the success of seedling establishment. Realistically this is not usually possible. A one metre diameter area around the seedling should remain

**“Studies have shown a decrease in early growth by up to 70% when compared with weed free sites”**

weed free for at least two years post planting, so follow-up weed control is essential. Listed below is a range of possible weed control activities:

- pasture topping and close grazing in spring and early summer
- mechanical methods such as scalping and cultivation
- herbicide application.

Your planting site should be sprayed at least twice before planting. If using a residual chemical during final spray, the 25:25 rule should be followed – wait 25 days after application, or wait for 25mm of rain before planting or seeding. Control of insect pests such as red-legged earth mites or lucerne fleas can also be carried out during the final spray using an appropriate pesticide.

## Deep ripping

Deep ripping to half a metre is advisable on most soil types, except deep sand and cracking clays where there is probably little advantage in ripping deep sands, as water will readily penetrate to the roots of the mseedlings. Deep cracking clay sites are not suitable either as they will crack along the rip lines in summer, exposing the plant roots to the drying air and pests.

Deep ripping assists in strong root development by breaking up impenetrable layers in the soil profile that results in improved aeration and infiltration of rainwater. Ripping along contour lines has the added benefit of harvesting water moving down slope. Roots will grow faster and penetrate deeper into the soil allowing them to access subsurface soil moisture.

The one-pass tree planter is a commonly used method in the Wheatbelt that can be hired from many local shires. The one-pass tree planter scalps, rips and mounds in a single operation at the time of planting, eliminating the need for mechanical site preparation prior to planting.

## Mounding

Where sites are saline or waterlogged, it is necessary to mound tree planting rows. Even salt and waterlogging plants are sensitive to these conditions during establishment. Mounding assists by burying weed seed, reducing root rot, leaching away salt and concentrating residual fertiliser, to help promote initial growth. By planting on mounds the root zone of young seedlings is kept above adverse soil conditions, which substantially improves their establishment.



Rabbit bait station (as sold by Wheatbelt NRM online)



Don Woodcock ready for revegetation



One-pass tree planter at Chatfields nursery

# Fat-tailed dunnart

*Sminthopsis crassicaudata* Family: *Dasyuridae* Conservation status: Not listed

Extract from: Mammals of the Avon Region, by Mandy Bamford, Rowan Inglis and Katie Watson



Fat-tailed dunnart, courtesy of Department of Parks and Wildlife

## Identification

The distinctive swollen tail of the fat-tailed dunnart is used as a food store, a useful tool in an unpredictable environment. All dunnarts have pointed snouts, but the fat-tailed dunnart's large ears and eyes, and dark eye-rings help to separate it from other dunnarts. The soles of the hind feet are another of the characteristics used to distinguish different species of dunnarts. This species has three fused pads underneath its toes and the soles of its hind feet are not haired. The fur on a fat-tailed dunnart's back is fawn while the underparts are whitish.

## Habitat and distribution

Clearing for farmland has probably favoured the fat-tailed dunnart as it has increased grassland habitat and low shrublands in south-western and southeastern Australia. Fat-tailed dunnarts are common in rough pasture, on the edges of harvested paddocks, in bluebush, saltbush and gibber plain, claypans, tussock and hummock grasslands.

To protect itself from extremes of temperature, the dunnart shelters in nests of grasses and other plant matter under rocks, fallen logs or in deep cracks in soil. It is a solitary animal with a large, flexible home range, however, when conditions are very cold, groups of animals sometimes shelter together during the day to conserve body heat and save energy. On farms in the Avon region, this species shelters in piles of mallee roots in paddocks and becomes less common if the roots are removed.

## Diet

The fat-tailed dunnart is nocturnal and forages in sparse, open areas for a variety of invertebrates adjusting their diet according to the season. They do not need to drink free water as they use their diet of invertebrates to provide them with enough water. During drought, they seek out spiders and cockroaches for extra moisture, while they prefer beetles, which are high in energy, at other times. When food is scarce, animals become torpid (deeply asleep, like a short-term form of hibernation) and use the fat store in their tail as an energy source. This usually occurs in winter.



Fat-tailed dunnart by Alan Couch  
CC BY 2.0 (<http://creativecommons.org/licenses/by/2.0>), via Wikimedia Commons

## Reproduction

The breeding season is July to February. The female has eight to 10 teats in her pouch and after a pregnancy of 12 days, eight to 10 hairless young are born. Usually, only five young survive to be weaned at about 10 weeks old. In captivity, sexual maturity is reached at five months of age, however, it is not known if animals breed in the wild at this age. In moist environments, the numbers of fat-tailed dunnarts in a population are fairly stable but in arid environments, populations can fluctuate dramatically with rainfall and the supply of invertebrates.

## Threats

Although clearing for farmland has assisted this species, some intensive farming practices which involve removal of remnant wood piles can reduce populations.

## Management actions

No specific management actions are required for the conservation of this species. However, its persistence in the Avon region will be greatly assisted by the control of feral animals, the management of conservation reserves, and the preservation of remnant vegetation on farms and road verges.

## Fat-tailed dunnart facts

**Size (head and body length)**  
60 – 90 mm

**Size (tail)**  
40 – 70 mm

**Weight**  
10 – 20 g

### Habitat

Open habitats including grassland, saltbush, bluebush, gibber plain, claypan, shrubland, rough pasture and the edges of harvested paddocks.

### Diet

A range of invertebrates, depending on the season and including beetles, spiders and cockroaches.

### Reproduction

Breeding begins May – June, gestation is 12 days. 8 – 10 young born, only 5 survive to weaning at 10 weeks of age. Populations fluctuate with supply of invertebrates.

# The Quandong (*Santalum acuminatum*)

By Judd Stead, Noongar Boodja Carer Trainee

*Santalum acuminatum*, the desert quandong, is a hemiparasitic plant in the Sandalwood family *Santalaceae*, widely dispersed throughout the central deserts and southern areas of Australia. The species, especially its fruit, is also referred to as quandong or native peach. The use of the fruit as an exotic flavouring, one of the best known bushfoods, has led to the attempted domestication of the species. (Wikipedia)

## How they grow:

### Hosting

The quandong tree is a type of hemiparasite, meaning it uses the roots of another plant to gather the water and nutrient it needs to grow. The best host plants are surface rooted, water storing, nutrient hungry plants.

### Growing conditions

The quandong generally grows in nutrient poor, free draining soils. It is also drought, frost and salt tolerant. Being a parasite plant you will generally find quandong trees growing well near other trees, using the root system of the host plant to obtain the required nutrients and water. Quandong trees also grow well in managed plantations with irrigation. Soil type and water quality is less important to the quandong tree than other plants due to its parasitic nature. The quandong prefers full sun.

## Plant growth

### The seed

After obtaining mature seed it is important that it is dry so you can have a successful germination rate. Either whole seed or kernels may be used. Cracking open the seed, you will find the kernels which you can plant to grow the quandong tree or you can plant the whole seed. Germination of the kernels is usually complete after two months, but the whole seed may take a year or more.



## How to use:

To prepare quandongs, you'll need to remove the large seed from the middle and peel off the skin by hand.

### Jam Recipe:

#### Recipe:

Makes 8 cups

- 1kg fresh Quandong flesh
- 1kg caster sugar
- 100ml water

#### Method:

Chop up the fruit and combine with sugar and water in a large saucepan. Put it over medium heat, stirring constantly as it comes to the boil. Lower the heat so it simmers. Cook until it reaches setting point (45mins). Test by dropping a teaspoonful onto a cold saucer. Let it cool, and when you push it with your finger, it should wrinkle.

Be careful not to overcook and caramelize the sugar as this will alter the colour and flavour of the jam.

Once it's ready, pour into sterilized jars and seal. Should keep about a year unopened in the pantry, refrigerate once opened.

### Quandong Pie Recipe:

#### Recipe:

- 1 x cup of quandong flesh
- 2 x cups of water
- 1 x peeled and finely diced apple
- 1/4 teaspoon of cinnamon,
- squeeze of lemon
- 1/2 x cup of sugar,
- 2 x sheets of short crust pastry
- egg wash + extra sugar

#### Method:

Boil quandongs, apple, water, cinnamon and lemon in saucepan until soft (around 30 minutes). Add sugar and stir until dissolved. Let mixture cool. Line greased pie dish with pastry, brushing with egg wash on edges. Pour cooled mixture into pie dish and cover with pastry. Brush with egg wash and sprinkle with sugar. Bake in a moderate oven until golden brown. Serve with cream and ice cream...enjoy!

### Quandong Chutney Recipe:

#### Ingredients:

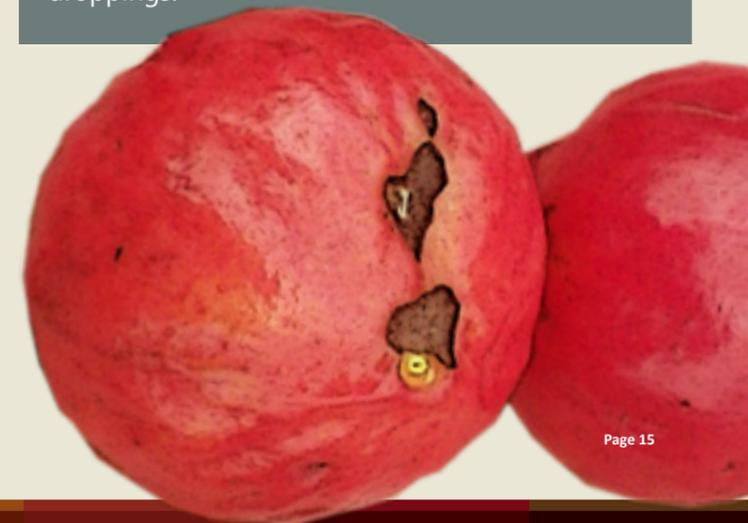
- 250g quandong flesh (quarters)
- 100ml mirin
- 500g cranberry sauce
- 50g brown sugar
- 100ml vegetable oil
- 20ml rice vinegar
- juice from 2 large wild limes
- chili to taste

#### Method:

Boil up all ingredients for 45 minutes adding quandong for the last five minutes only.

### Medicinal uses of the Quandong:

Amongst Aboriginal people quandongs were much valued for their medicinal properties. Specialised uses of the quandong included a form of tea which was drunk as a purgative. Quandong tree roots were also ground down and used as an infusion for the treatment of rheumatism. Typically, quandong leaves were crushed and mixed with saliva to produce a topical ointment for skin sores and boils. Encased within each quandong seed is an oil rich kernel which was also processed in a similar fashion to treat skin disorders. Quandong kernels could also be eaten and some tribal groups were known to employ crushed kernels as a form of 'hair conditioning oil'. Ingeniously, Aboriginal people appeared to be aware that quandongs were a preferred food source of emus, and that a ready supply of quandong seeds could be found in their droppings.



# Qweerk and the Feral Fox

By Kelly Thorburn, Communications Officer

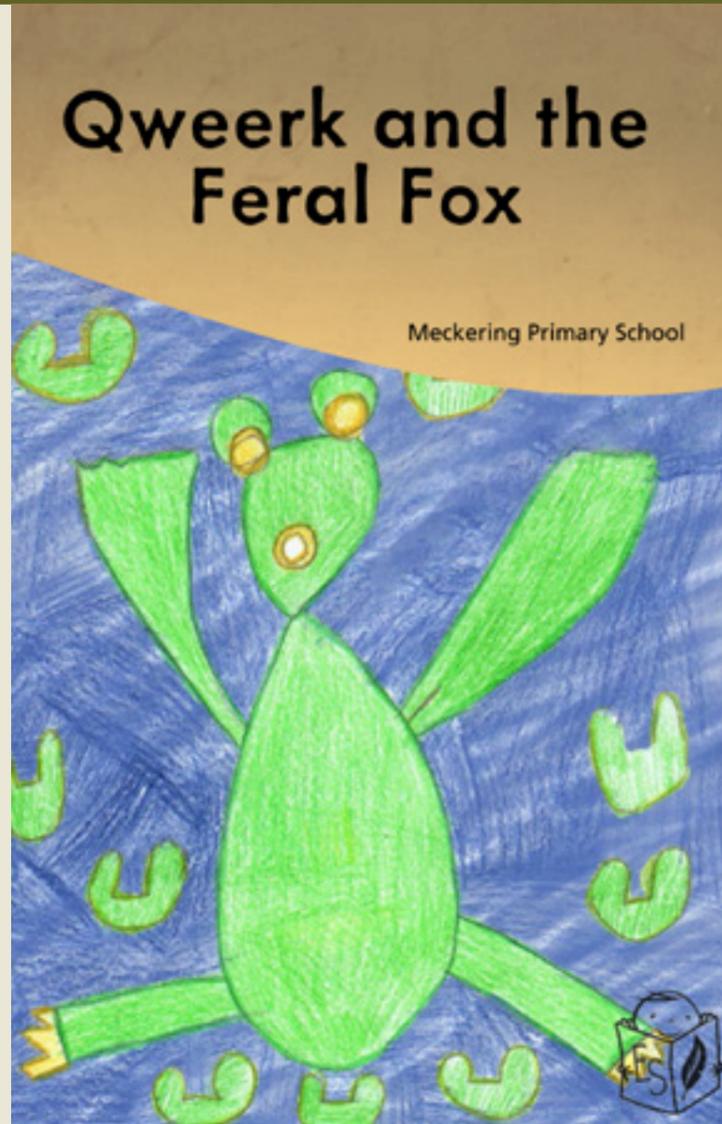
Wheatbelt NRM recently supported the 'Feral Animals' Enviro-Stories program, which provided students from five schools around Australia with the opportunity to create a storybook about a feral animal and the impact it has on biodiversity and agriculture.

Wheatbelt NRM worked with Years 1 – 7 from Meckering Primary School students to identify feral foxes as a pest species in the Wheatbelt, and explored the issues that feral foxes bring to the area.

'Qweerk and the Feral Fox' is written and illustrated by the students and incorporates local Noongar words throughout. The book explores the impact of feral foxes in the Wheatbelt environment, through the adventures of Qweerk the frog and his native animal friends, who become upset when a feral fox moves into their neighbourhood and causes trouble.

The Enviro-Stories 'Feral Animals' program is an education initiative of the Invasive Animal Cooperative Research Centre (CRC). The program aims to:

- raise community awareness of the environmental impact of pest and feral animals
- develop information packs about feral animals for primary education
- strengthen partnerships with NRM, Landcare and schools
- promote and address feral animal issues affecting biodiversity and agricultural production.



"Feral Fox has eaten so many of my brothers and sisters," said Woylie. "There are too few of me left and now I am endangered!"

Woylie - Brush-tailed bettong



"Stop," said Qweerk. "This will never do. We cannot solve a problem by fighting. We need to work together to find a solution. No one individual or one strategy will work. We must all work together with lots of strategies."

Qweerk - Frog

"There are too many of them. We must get Man to help us," said Qweerk. "Man is the only predator that the Feral Fox has!"

Qweerk - Frog



The books are produced by Enviro-Stories, which is an innovative literacy education program that inspires learning about natural resource and catchment management issues.

Wheatbelt schools who may be interested in taking part in similar books should contact Rowan Heggulun at Wheatbelt NRM on 9670 3101 or email: rheggulun@wheatbeltnrm.org.au

[www.invasiveanimals.com](http://www.invasiveanimals.com) and [www.pestsmart.org.au](http://www.pestsmart.org.au)

[www.envirostories.com.au/portfolio-category/feral-animals/](http://www.envirostories.com.au/portfolio-category/feral-animals/)

All of the animals started to get angry at Man.

# Djeran - Makuru



Powderbark Tree in Toodyay, by Mike Griffiths

In autumn, the magnificent eucalypts are shedding their bark and exposing shiny new trunks.

Australia's eucalypts are famous around the world for the way they change the colour of their bark, especially in the Wheatbelt.

*Eucalyptus accedens* the Powderbark Wandoo (left) is a eucalypt found in the western parts of the Wheatbelt. The Powderbark Wandoo reaches around 15–25 metres in height with branches high up the trunk.

Its smooth bark is known for being covered in a talc-like powder. It is pale-white when fresh, turning a shade of orange before being shed again. Its white flowers occur in autumn.

The Noongar people recognised six seasons in their year, Bunuru, Djeran, Makuru, Djilba, Kamarang and Birak, and managed the budjar (land/country) accordingly. Land management practices and hunting and gathering patterns were guided by these seasons.

## Djeran

Becoming cooler, with winds from the south-west from April to May

Bulbs and seeds were collected for food.

## Makuru

Cold and wet, with westerly gales from June to July

Tubers and native potatoes were dug. Noongars travelled with a smouldering branch of bull banksia for warmth and other uses.

