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Wheatbelt NRM quarterly newsletter

Issue 25, 2016

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Scholarship winner brings youth perspective

Australian Government

National Landcare Programme

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wheatbelt natural resource management

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Scholarship winner brings youth perspective

By Kate Raston

> **"I understand the pressure on landholders and the need to work to improve the balance within the environment."**

Karla Hooper at Yorkrakine Rock

A background in the oil and gas industry, sustainability and a strong desire to connect communities in the Wheatbelt has won Karla Hooper a $10,000 Youth Board Scholarship.

The grant was designed by natural resource management group Wheatbelt NRM to encourage people under the age of 40 to join the board of directors.

The scholarship provides training and mentorship to help them improve their leadership skills.

The 35-year-old with a background in health and environmental science now resides in Toodyay, after spending a large part of her career working off shore in the Northern Territory.

At the age of 29, she travelled outback Australia and developed a love for camels and their use as a sustainable means of travel.

"I love the concept of living sustainably and I'm currently working on a plan called CONNECTED, which focuses on leaving a lighter foot print on the earth while at the same time connecting the community - adding value to both people and the environment," Karla Hooper said.

Ms Hooper hopes the model can be used in other communities and is also working on developing a community garden and promoting food tourism within the Toodyay shire.

"We have just had council approval for the Incredible Edible project, a community garden, opposite the old goal museum," Karla Hooper said.

Karla also successfully implemented the Toodyay Farmers Market in 2015, which is a thriving monthly community event.

"Projects like these incorporate farmers, the wider community and tourists which helps people to reconnect to food, the environment and each other."

Karla Hooper admits she won't be able to make big changes during her 9 month stint on the board of Wheatbelt NRM, but is keen to learn the structure and provide input from a young persons perspective.

"I want to develop a good understanding of how boards work," she said.

"I understand the pressure on landholders and the need to work to improve the balance within the environment, which needs to be done through people.

"Since joining Wheatbelt NRM, I've already put my hand up to be on the local Bendigo Bank board."

Part of the scholarship is to undertake professional director training. Karla has attended Australian Institute of Company Directors course in April.

"After attending my first Wheatbelt NRM board meeting I can really see the benefit of being part of such a structure and look forward to many more years to come."

Soil organic carbon in Wheatbelt cropping systems

By Jo Wheeler

Why manage soil organic carbon?

Soil organic carbon is important for:

- **Cation Exchange Capacity (CEC):** CEC indicates the potential capacity of soil to store nutrients. The three main cations essential for plant growth are potassium, calcium and magnesium. These influence soil structure, colour and aggregate stability.
- **soil structure:** soil organic carbon interacts with and influences the formation of soil structure, helping the formation of soil aggregates.
- **water holding capacity in soils:** carbon acts like a sponge for soil water... more carbon = more plant available water holding capacity. Although these increases may be small, they may be valuable in below average rainfall years.

What are the forms for soil organic carbon?

Types of soil organic carbon and their role in agricultural soils:

- **crop residues:** above and below ground plant residues (leaves, stalks, roots) less than 2 mm long or wide
  - break down quickly
  - source of energy for soil biological processes
- **particulate organic carbon**: plant residues that are smaller than 2 mm but larger than 0.053 mm
  - breaks down relatively quickly but more slowly than crop residues
  - important for soil structure
  - source of energy for biological processes source of nutrients
- **humus decomposed materials**: less than 0.053 mm that are dominated by molecules stuck to soil minerals
  - important for all key soil functions
  - provides nutrients - for example the majority of available soil nitrogen derived from soil organic matter comes from the humus fraction
- **recalcitrant organic carbon**: biologically stable carbon, most common form is charcoal
  - decomposes very slowly and is therefore unavailable for use by micro-organisms
  - carbon that will not be readily-emitted to the atmosphere as CO_2

> **“ more carbon = more plant available water holding capacity.“**

How can we sequester soil organic carbon?

Plant photosynthesis is the only process by which carbon is taken from the atmosphere and a fraction deposited in the soil through inputs of plant organic matter.

- Soil organic carbon input rates are determined by the root biomass of a plant, but also include stubble and leaf litter deposited from above-ground plant material.
- Practices that improve plant water use and growth (e.g. early sowing) are desirable because they also increase organic inputs into soil.

The capacity of a soil to store soil carbon over a long period of time is largely determined by the characteristics of that soil and climatic factors (this is referred to as ‘attainable’ soil carbon). Soils that have more clay content and occur in higher rainfall environments have been found to be able to store more carbon, while sandier soils in drier environments tend to be lower in soil carbon. Increasing the rate of organic inputs on coarse sandy soils may therefore not result in stable increases in soil organic carbon but may help to maintain the current soil carbon stock.

Soil management activities can be used to move soil carbon stocks towards their attainable levels. For example, in the Avon Arc region, maximum attainable carbon levels in cropping systems on sandy soils have been estimated to be approximately 40t-C/ha, while studies have measured an average actual carbon level of 19t-C/ha in this area.

Limiting gaseous emissions (respiration) of carbon from soils is a sequestration process. There are a number of ways to do this, the easiest to achieve are below:

- Limit soil disturbance to ensure the carbon protected from decomposition by soil microbes by clay or soil aggregates continues to be protected.
- Increase plant cover to ensure there is an input of carbon to the soil from root and above-ground biomass. Soil left fallow is a net source of carbon to the atmosphere because there is no addition of carbon to counterbalance the loss of carbon from erosion or microbial respiration

Respiration rates are highest when conditions are warm and moist, meaning that summer rainfall can cause the rapid release of soil carbon, particularly if there are no active plants to replace the lost carbon. A recent Wheatbelt study by UWA suggested that soil organic carbon levels had, on average, dropped.

Nutrient Use Efficiency

By Dr Guy Boggs

> **"Inefficient use of farm nutrients is causing lost profitability and poor river health."**

Nutrient use efficiency is becoming increasing important as the cost of fertilisers continue to rise. Additional, Swan-Avon River Catchment modelling has identified the importance of addressing nutrient management on farms for healthy waterways

An integrated approach to nutrient management supports landholders through soil analysis, development of nutrient management plans and better practices, improving crop performance through soil health while reducing nutrient export to waterways. This is a joint initiative between Perth NRM, Wheatbelt NRM and the Department of Parks and Wildlife.

The Nutrient Management Use Effieciency program is to developing soil monitoring, management and nutrient planning demonstration sites across the Avon River Basin which will then be used to develop a series of extension activities and materials to encourage neighbouring farmers to prioritise soil health and nutrient management.

This extension will build an understanding of the soil health factors limiting production amongst the farming community (Soil pH, compaction, salinity, toxicity, pests and diseases), and provide training in the use of decision support tools and technological advances that will enable farmers to manage nutrients better and to independently interpret soil testing results to guide soil management.

Farm nutrient-use inefficiencies are caused by:

The major cause of nutrient pollution in the Avon Basin is the inefficient use of farm nutrients*. Farm nutrient-use inefficiencies are caused by:

- Drought
- Livestock (animal farming is inherently less nutrient efficient than cropping)
- Excessive nutrient applications relative to seasonal fertiliser requirement
- Soil acidity
- Poor timing of nutrient application and the loss of nutrients during intense weather events
- Poor soil structure
- Low soil biological activity.

The Nutrient Use Efficency project process:

Paddock analysis and planning → **Soils sampled to depth** → **Crop tissue testing** → **Final assessment**

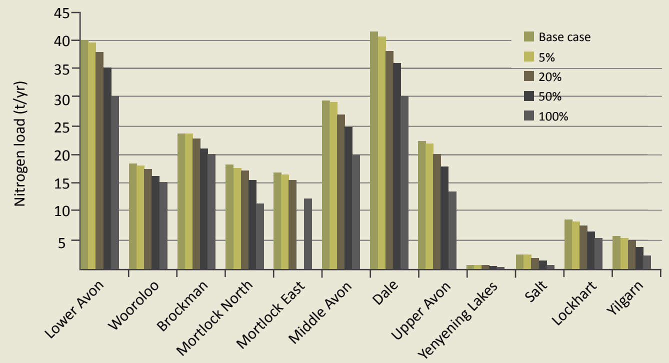
- **Paddock analysis and planning**: Paddocks will be mapped into zones using available data, growers knowledge and paddock visual assessment
- **Soils sampled to depth**: Sample results compared using industry standards for critical values and mapped using traffic lighting
- **Crop tissue testing**: Tissue testing will be utilised to assess limiting factors to the crop
- **Final assessment**: Nutrient balance is used to determine the efficiency of the fertiliser budget

The table below explores the nutrient inputs and outputs for an average Wheatbelt wheat & sheep and mixed grazing farm based on current farming practices ('base case'), liming to address soil acidity and implementing on farm nutrient management. The table demonstrates that nutrient use efficiency (NUE) for nitrogen currently sits at about 41% and phosphorous at 48% in wheat & sheep farming. However, this can be improved to 48% (nitrogen) and 56% (phosphorous) by addressing soil acidity, or 56% (nitrogen) and 75% (phosphorous) through the adoption of relatively simple nutrient management practices. This equates to an average of almost 15 kg/ha/yr of nitrogen and 2.6 kg/ha/yr of phosphorous not being 'wasted' (surplus) on farm simply by liming and incorporating nutrient management practices such as soil testing for nutrient sufficiency to depth, plant tissue testing and better timing of fertiliser application. If all farmers in the Avon Basin were to adopt these improved nutrient management practices, the modelling suggests nitrogen loads would decrease by 153 t/yr and phosphorous loads by 2.4 t/yr at the catchment outlet, with the Mortlock, Dale and Middle/Upper Avon catchments providing the greatest decrease in nutrient out flows.

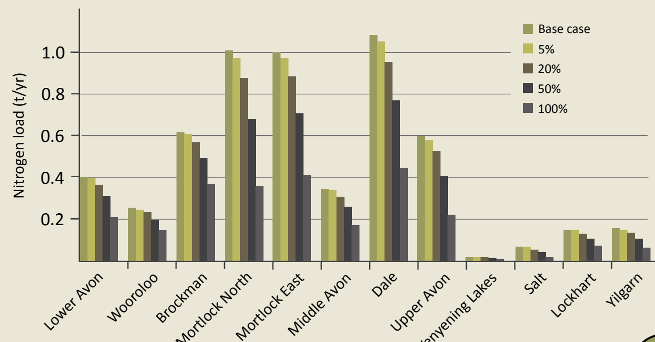
Average annual nitrogen loads for the modelling catchments for the farm nutrient management scenarios*

Scenario	Nitrogen Input (kg/ha/yr)	Nitrogen Output (kg/ha/yr)	Nitrogen Surplus (kg/ha/yr)	Nitrogen NUE (%)	Phosphorus Input (kg/ha/yr)	Phosphorus Output (kg/ha/yr)	Phosphorus Surplus (kg/ha/yr)	Phosphorus NUE (%)
Wheat & sheep								
Base case	60.7	25.0	35.7	41	7.7	3.7	4.0	48
Soil acidity management								
Liming	60.7	29.3	31.4	48	7.7	4.3	3.3	56
% difference			-12	17			-16	17
Farm nutrient management								
Efficient nutrient use	48.8	29.3	19.5	60	5.4	4.3	1.1	80
Drought year	48.8	9.8	39.0	20	5.4	1.4	4.0	27
10 year average	48.8	27.3	21.5	56	5.4	4.0	1.4	75
%difference			-40	36			-65	55
Mixed Grazing								
Base case	79.6	18.2	61.4	23	7.8	2.8	5.0	36
Soil acidity management								
Liming	79.6	21.3	58.3	27	7.8	3.2	4.5	42%
%difference								
No action	79.6	17.3	62.3	22	7.8	2.6	5.1	34
% difference								
Farm nutrient management								
Efficient nutrient use	70.9	21.3	49.7	30	5.4	3.2	2.2	60
Drought year	70.9	7.1	63.8	10	5.4	1.1	4.3	20
10 year average	70.9	19.9	51.1	28	5.4	3.0	2.4	56
% difference			-17	22			-52	57

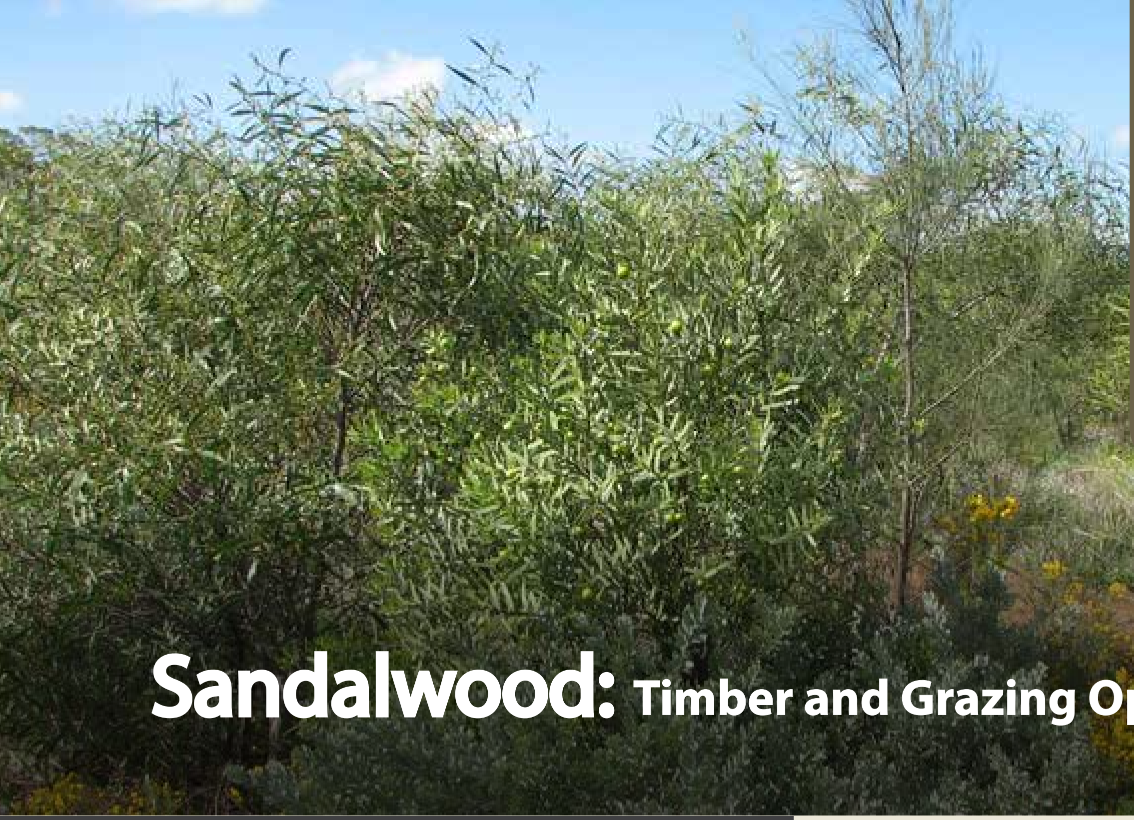
Average annual nitrogen reporting catchment loads for the farm nutrient management scenarios*



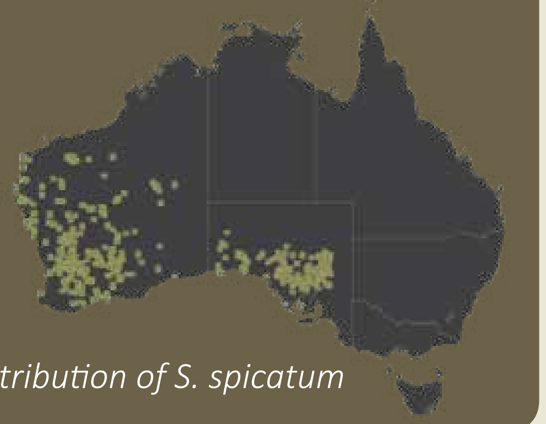
Average annual phorphorus reporting catchment loads for the farm nutrient management scenarios*



*This article and the associated tables and graphs are based on information from: Hennig, K & Kelsey, P 2015, Avon Basin hydrological and nutrient modelling, Water Science Technical Series, report no. 74, Water Science Branch, Department of Water, Perth, Western Australia.



Sandalwood: Timber and Grazing Opportunities



Distribution of S. spicatum

Wheatbelt NRM are supporting the following trials:	Location
Native grasses and grazing within a sandalwood plantation Native grasses have been planted along the eastern boundary of an existing sandalwood plantation to allow for dispersal of seed with dominant easterly wind. The system created is an attempt to become a self-sustaining grazing system within a sandalwood production system with low costs and inputs.	Koorda
Creating a dual purpose biodiverse sandalwood and forage grazing shrub ecosystem A 10ha site will be established to trial the incorporation of forage shrubs in a sandalwood plantation to achieve a multifunction agroforestry system for both sandalwood growth and grazing. This site has a carefully selected mix of legume and non-legume hosts, cultivated to achieve forage and sandalwood production. This novel system contains Enrich forage shrubs which will be bench marked against standard industry practice.	Bencubbin

Sandalwood (*Santalum spicatum*) is a native species of Western Australia and South Australia. It was once very common in the Avon region, but it is now rare due to over exploitation and clearing.

The heartwood contains valuable oils and wood harvested from the wild is worth $3,000- 12,000/t depending on the oil content and quality.

Sandalwood is a root hemi-parasite and extracts water and nutrients from host plants. Legumes (mostly *Acacia spp.*) are the principal hosts of sandalwood, however, sandalwood can parasitise (and grow well on) a wide range of plants.

In the Avon region *Acacia acuminata* (Jam) is the principal host for sandalwood on most soil types, however, other legumes and non-leguminous plants can also be important hosts.

Presently Sandalwood plantations have very little secondary uses while the sandalwood is growing. There is potential to combine Sandalwood systems with grazing systems if feed on offer can be increased without reducing the growth and quality of the sandalwood. Consequently, there is interest and trials on increasing inter row pasture production values and the use of forage shrubs and other native tree species as alternative hosts that can also act as livestock feed. A landholder on the Eyre Peninsula in South Australia has been growing sandalwood primarily on chenopods (saltbushes etc). Additionally, Dr Geoff Woodall has been able to cultivate saltbushes (at low densities) with legume host in the Great Southern region with minimal impact of sandalwood growth.

Site Selection

Sandalwoods prefer non-saline, light to medium textured, well drained soils. Therefore, large areas of the Avon River Basin are amenable to sandalwood cultivation.

To reduce costs it is best to grow sandalwood on parts of your farm that have a low opportunity cost:

- Around granite outcrops
- Other small, hard to crop areas
- Wodjil soils or other unproductive soils
- Areas of Acacia regrowth

Layout Options

The layout of your sandalwood system will depend on the area you are planting. There are a number of options:

1. **Monoculture host plantations (typically Jam) established from nursery raised seedlings**
2. **Simple mixed species plantations (2-5 host species) established with nursery raised seedlings and or direct sown host seed**
3. **Biodiverse host plantations (typically 10-30 spp). Usually established by direct sown host seed and some host seedlings**
4. **As per 2 or 3 but with added perennial fodder shrub species**
5. **Standard biodiverse revegetation with a few sandalwood added (not usually referred to as a “plantation”)**

Planting Methods

There are a variety of ways to create a sandalwood system. All establishment methods must provide an adequate number of healthy hosts capable of sustaining the sandalwood for 20-35 years. It is currently understood that there needs to be 3 times the number of host trees : sandalwood trees.

Here are a few of the methods that can be used:

- Planting host seedlings at about 800-1200 per ha and then direct seeding 2 sandalwood seeds around every third host, one or two years later
- Field planting of host and sandalwood established together in a pot
- Direct seeding a dense stand of mixed species hosts then direct seeding 2 sandalwood nuts every 5m
- Planting seedling hosts with partially germinated sandalwood seeds. Additional hosts to be direct seeded

Economic considerations

Establishment costs vary between $500 - $1500 depending on:

- Using seedlings or direct seeding to establish plantation
- Cost of host seedlings - 35-75c each
- Sandalwood nuts - $/kg
- Site preparation – fencing, water points, ripping, weed control

- Planting – labour, hire of tree planter
- Lost production while hosts and sandalwood are growing – 5 years minimum depending on seasonal conditions

Returns:

Production is highly dependent on annual rainfall and soil type but can be lucrative.

Example: 400mL annual rainfall

2-6t of merchantable wood per hectare over 30 years. Sale of thinnings @year 10 onwards.

Seed production is variable, on average = 0.3t/ha/pa at year 4 onwards. In some years nut production can exceed 1t/ha.

Value of plantation grown wood = $2,000/t (low oil content) $8,000 (high oil content)

Sandalwood thinnings $500 – $3,000/t

Sandalwood nuts $3-5/kg (cleaned and graded)

Other products

- host wood products
- livestock production
- host seed for bush food or nursery industry

The Current Industry

- Approximately 20,000ha of Sandalwood have been planted in recent years, over 95% of which has been established in southern Western Australia.
- Large volumes of cultivated sandalwood (all species) will hit the market in coming years which will change the market and may cause downward pressure on timber price in the future
- It is important that the cost (establishment/maintenance and opportunity costs) of new plantations is kept to a minimum to maximize profit

Conclusion

Sandalwood systems can be a great way to turn unproductive land into something more valuable and at the same time increase the biodiversity and sustainability of the land.

Acknowledgements

This information is based on the Perennials for Profit Masterclass Sandalwood module which was written by Geoff Woodall.

> **“Production is highly dependent on annual rainfall and soil type but can be lucrative.“**

Installation of nest boxes at Beverley.

Building homes for endangered Wheatbelt critters

By Kelly Thorburn

Sheds across the Wheatbelt are rumbling to the sounds of woodwork and sweat as specialised nest boxes are being prepared for threatened species to shelter in.

There are 20 Men’s Sheds in the Wheatbelt – unique and inclusive places where blokes can work side by side on meaningful projects in a safe, friendly and welcoming environment.

Five of these sheds are now working with Wheatbelt NRM, to build nest boxes of various shapes and sizes that appeal to a mixture of native bird and mammal species.

Men’s Sheds taking part in the project so far include Beverley, Kondinin, Wongan Hills, Wyalkatchem and Goomalling.

“The Men’s Sheds are invaluable to this project – bringing practical skills and local on-ground knowledge,” said Terri Jones, biodiversity project delivery officer with Wheatbelt NRM.

“They are helping build nest boxes, plus they are providing advice on which species are around, and where to place the boxes for easy-to-access monitoring by community.

> **“One of the greatest things about the project is the collaboration ... and the sharing of knowledge between the generations.“**

Endangered species such as Carnaby's White-tailed Black Cockatoos and Red-tailed Phascogales will benefit from the boxes, along with several species of parrots, owls, pardalotes, microbats, and possums.

The biggest boxes are for the Carnaby’s at over one metre in length, while the smallest are for phascogales with an entrance hole less than four centimetres wide.

All boxes are being made from natural materials such as untreated wood and marine ply and will be installed in nature reserves by professional aborists, tree surgeons and local shires.

Ongoing monitoring will be done by local school students and community members who will help provide monthly observations over the next two years.

Monitoring will take place from ground level by listening for sounds in the boxes, watching for movement in and around the site, and using sensor cameras and Go Pro cameras.

“One of the greatest things about the project is the collaboration between the Men’s Sheds and local schools and the sharing of knowledge between the generations”, said Terri Jones.

Why are our eucalypts dying?

By Jacquie Lucas

> **"Approximately 85% of natural vegetation in Western Australia's Wheatbelt has been cleared over the last century."**

Wheatbelt NRM staff are often asked a recurring question out in the field, by landholders wanting to know why eucalypt trees on their property are dying.

The answer involves several factors – including human intervention – that are impacting these iconic and valuable trees and resulting their weakened health. Our eucalypts are unable to fight diseases and pests, have a lack of genetic variation & new seedlings, and struggle to fight against any added pressures on their systems.

VEGETATION CLEARING

Approximately 85% of natural vegetation in Western Australia's Wheatbelt has been cleared over the last century. This has placed a great deal of pressure on the remaining vegetation as it tries to support populations of plants, animals and organisms who have lost their homes. For instance some individual birds may have once relied on a 1000 plus different plants to survive, but as vegetation has been cleared they have had to become reliant on much smaller numbers of plants, resulting in animals using more resources from individual trees and shrubs than can be sustainably reproduced.

With fewer plants around there is greater pressure on them as food sources for native invertebrates (stick insects, beetles and lerps) and introduced insects. With fewer plants there are fewer homes and resources for the predatory animals and birds that usually keep insect numbers in check. As a result, the remaining plants suffer from increased insect damage and fewer leaves with which to create food via photosynthesis, affecting their overall health.

Vegetation clearing has also altered the water table. With water no longer being pumped into the atmosphere by trees and plants, water is staying in the soil longer and adding to the water table. As the water rises, it dissolves salt stored in the soil and brings it to the surface as salinity in the landscape. Salinity impacts the health of a mature tree in two ways. Firstly, when the water in the soil is more saline than normal it can lead to osmotic stress in the roots of the plant. This means that the roots are not able to take up as much water or nutrients from the soil, resulting in under-hydrated trees with limited nutrition. Secondly, when excess salt is drawn up by the tree it accumulates in the leaves and will eventually kill the leaves. If a tree's leaves are dying at a faster rate than new leaves are growing this can significantly impact on the plant's ability to produce energy through photosynthesis. These process can take many years to kill a mature tree, especially if salinity is slowly building up in soil around the tree.

FIREWOOD HARVESTING

More than 4.5 million tonnes of firewood is harvested annually in Australia for domestic use.

Although the firewood industry relies mainly on removing dead trees that are standing or fallen and therefore not directly causing the stress or death of live trees these dead trees provide important homes for animals and insects and their removal further decreases animal habitat and puts even more pressure on remaining living trees to provide these lost resources.

OVERGRAZING

Increased grazing pressure promotes exotic weed growth, resulting in decreased plant diversity and fewer home and food sources for native animals. This places further pressure on the few remaining plants in the region.

Overgrazing is also responsible for soil compaction from heavy animal traffic and over fertilisation from animal manure. This compaction of the soil results in a reduction of the size and number of pores in the soil that allow movement of water and nutrients through the soil profile. Thereby reducing the access the trees have to water and nutrients.

FERTILISATION & NUTRIENT ENRICHMENT

Topsoils in Western Australia are typically low in available nutrients like nitrogen and phosphorous. Native plants have evolved and adapted to these soils with many species developing mechanisms to concentrate available nutrients to useful levels. Excessive nutrients disrupt the chemical processes of the plants and often kill them.

Increased soil nutrients from fertiliser drift and livestock grazing contribute to widespread degradation of groundcover plants. With less competition, the weeds thrive and push out native plants, which results in habitat loss for native animals and decreased food sources, placing increased pressure on remaining vegetation.

EXOTIC PEST SPECIES

Introduced predators, herbivores and weeds can all negatively affect eucalypt woodlands and prevent them from thriving.

Predators such as feral foxes and cats are responsible for the extinction and near-extinction of many small mammals found in eucalypt woodlands. These small mammals are vital to the woodlands as their digging allows for water penetration into the soil. This water penetration helps to ensure trees have access to fresh rainwater, while also allowing the rain to pick up salts in the upper layers of the soil and take them back down through the soil profile during larger rainfall events. Woylies, once found throughout much of WA, are particularly important for promoting woodland health, with their diet of underground fungi (native truffles), bulbs and tubers they cultivate the soil in a way that is very beneficial to the survival of native plants.

Herbivores include rabbits, which have become a feral

pest in Australia. They eat native plant seedlings and groundcovers, which increases weed growth, promotes soil erosion and impacts on the survival of trees. Herbivores also compete with native animals for diminishing food sources and homes and add extra nutrients to the soil with their manure.

High numbers of weeds in a system prevent native plants from thriving and change the available food sources and shelter for native animals. They will also change the accessibility of certain nutrients in the soil, for instance legumes are well known for their nitrogen fixing in the soil. In areas where trees might rely on this accessible nitrogen if the legumes are removed and replaced with non-nitrogen fixing plants the remaining plant species will miss out on nitrogen they may have been relying on. This may also work in reverse, for example if the weed species is a nitrogen fixing plant and it is replacing plants that do not fix nitrogen in the soil there is the potential for remaining vegetation to affected by the presence of too much nitrogen. These examples are purely for ease of explanation, rather than being based on any known nutrient exchanges between species in the Wheatbelt.

CLIMATE CHANGE

Estimates predict that with less winter and spring rain, the drying, warming climate will result in the loss of half, if not nearly all, eucalypt woodlands by 2070. Already, Australia has warmed by an average of 1°C over the last 100 years and Western Australia's rainfall has dropped by 15% since the 1970s.

Climate change is expected to have a significant and negative impact on the extraordinary diversity of Australia's South-West.

Rainfall is predicted to drop, and hotter and drier conditions are likely to shift towards the south and west. Less groundwater will also severely impact native plants and animals.

Clearing vegetation contributes directly to climate change with bulldozed bushland rotting and burning and emitting greenhouse gases into the atmosphere. On a smaller scale, clearing woodlands leads to local temperature variation and decreased rainfall patterns.

OTHER THREATS

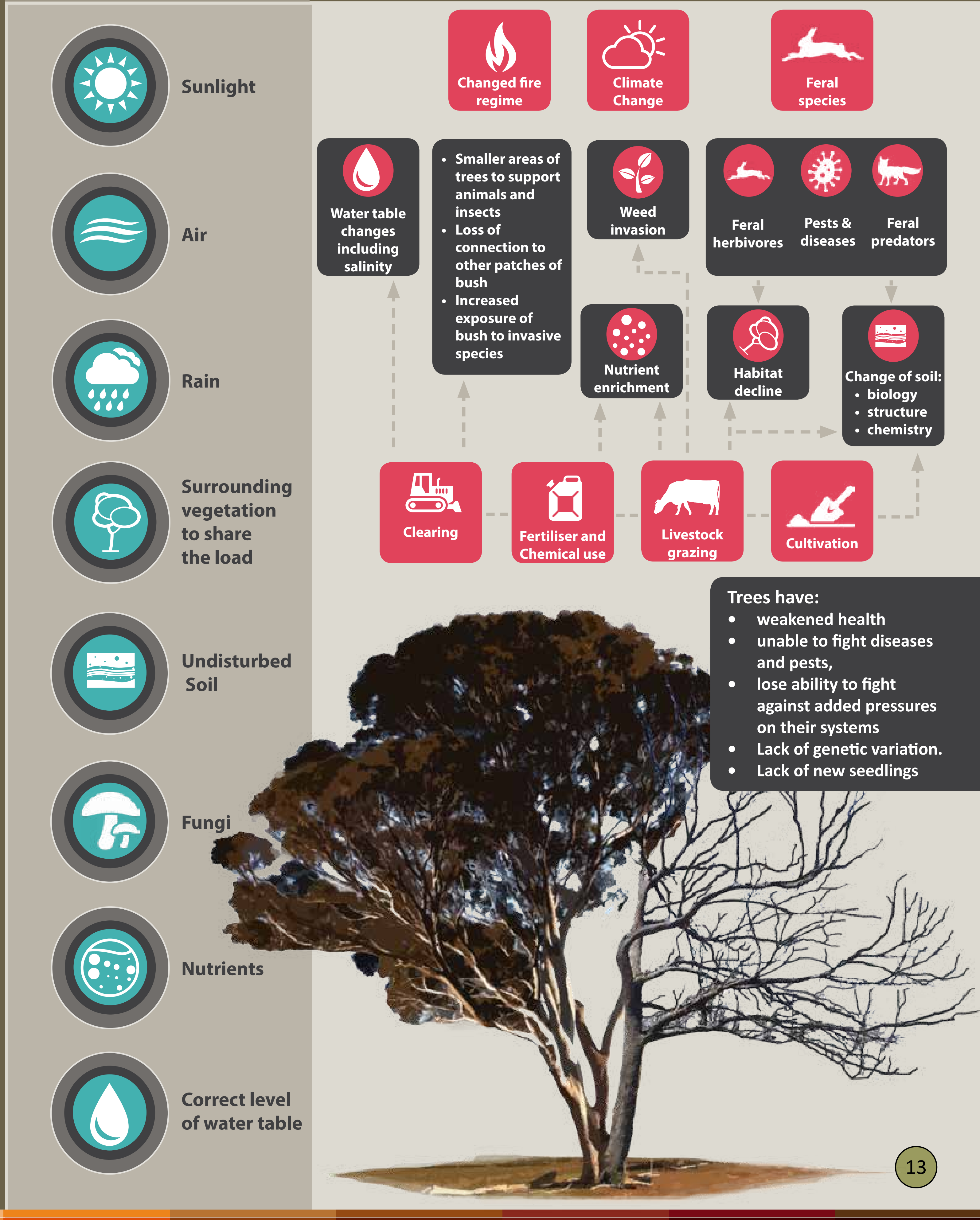
Further threats to eucalypts include, but are not limited to, removal of bush rocks, deterioration of soil structure, damage from livestock and farm machinery, and an increased number of parasitic mistletoes.

SUGGESTED SOLUTIONS

- fence remaining eucalypt woodlands to exclude livestock
- Plant deep rooted salt-tolerant trees – along with undergrowth species – around salinity prone areas to help lower the water table and pump water in to the atmosphere
- revegetate understory around remaining trees
- regenerate woodland areas to lessen pressure on remaining trees
- control feral animals to protect native animals
- limit spread of introduced weeds
- control prevalence of sap sucking insects
- ensure resources are available for insect eating birds – this may include nest boxes
- protect remnant vegetation with covenants
- buffer remaining woodlands with revegetation
- connect remaining primary woodlands
- educate public about importance of remnant vegetation
- Ensure livestock have enough shelter so they do not have to rely so heavily on isolated remnant trees
- take part in incentive programs such as Wheatbelt NRM's Mortlock Connections, Bushcare Grants, and Community Feral Control Program

What a eucalypt needs

Why our eucalypts dying



Black-flanked rock-wallaby

Extracted from 'Mammals of the Avon Region'
www.wheatbeltnrm.org.au/mammals

> "Black-flanked rock-wallabies were originally found close to Perth and occurred throughout the Avon"

Petrogale lateralis

Family: Macropodidae

Conservation status: Vulnerable

Size (head and body length)
497 – 529 mm (males)
446 – 486 mm (females)

Size (tail)
483 – 605 mm (males)
407 – 516 mm (females)

Weight
4.1 – 5.0 kg (males)
3.1 – 3.8 kg (females)

Habitat
Rock outcrops that are sufficiently fractured.

Diet
Feeds on grasses, leaves and even the bark of trees. Will drink water if available.

Reproduction
Will breed all year round when conditions are favourable. Young are weaned after 11 months.

Identification

The black-flanked rock-wallaby (otherwise known as the 'warru') has dark to pale grey-brown fur on the back and shoulders, with paler fur on the chest, and dark brown fur on the abdomen. There is a distinct black eye-stripe and white cheekstripe, with white at the base of the ears.

A white stripe and a dark stripe run along the side of the body. A dark brown to black dorsal stripe runs from between the ears to below the shoulders. The coat is thick and woolly, particularly around the rump, flanks and base of the tail. The tail has a slight brush on the end. The coat often becomes lighter and browner in summer.

Habitat and distribution

As the name suggests, black-flanked rock-wallabies live on rocky outcrops which are suitably fractured and provide adequate caves for them to rest in during the day. These outcrops help protect rock-wallabies from their natural predators (birds of prey) and also keep them cool during the summer months. When agricultural land lies behind their granite home, they have been seen to move onto machinery such as tractors, treating the equipment like a rock outcrop and sheltering under the engine and mudguards. Black-flanked rock wallabies were originally found close to Perth and occurred throughout the Avon where there were suitable rocks. Their range extended to the Pilbara, Kimberley and desert.

Diet

At dawn and dusk, they will venture out from the rock outcrops to feed on vegetative matter including grasses, leaves and even the bark of trees. Rock-wallabies will drink water when it is available but for most of the year they will gain moisture from the food they eat and licking dew on rocks.

Reproduction

Rock-wallabies can breed all year round when conditions are favourable. A feature of this species' reproduction is embryonic diapause, where the developing embryo can become dormant until conditions are more suitable. When the young are too big for the pouch, they are deposited in a sheltered location while the mother searches for food. Young are eventually weaned after 11 months.

> "A feature of this species' reproduction is embryonic diapause, where the developing embryo can become dormant until conditions are more suitable."

Threats

Like most other species of rockwallaby, black-flanked rock-wallaby populations have declined dramatically during the twentieth century and their distribution is now highly fragmented. It is believed that predation from the red fox is most responsible for this decline, and Department of Environment and Conservation research on the species in the Wheatbelt in the 1980s demonstrated for the first time that fox control was very effective in assisting declining native mammals. Land clearing between rocky outcrops has also deterred rock-wallabies from dispersing to other outcrops when food and shelter cannot be found.

Management actions

Baiting for foxes using 1080 baits has resulted in an increase in rock-wallaby numbers in the Avon region. This has resulted in some rock-wallabies being translocated to other parts of the State in a bid to improve the survival of this species. Population health monitoring of rock-wallaby populations in the central wheatbelt is undertaken. Habitat restoration near rock outcrops is required in some areas to assist the species, as agricultural clearing has removed foraging habitat.

“This listing is a wake up call that should prompt a whole of community response.“

Threats to the Wheatbelt Woodlands

By Kate Raston

Landholders needed to step up their efforts to protect native bush land following the listing of WA’s Wheatbelt woodlands as critically endangered under the Federal EPBC Act.

The Eucalypt woodlands occur in the Wheatbelt region between the Darling Range and the western edge of the Goldfields.

The listing refers to patches of remnant vegetation including woodland with a minimum crown cover of 10 per cent.

The Wheatbelt NRM CEO Natarsha Woods said there were only scattered patches of this remnant vegetation now left.

“Some Shires in the central Wheatbelt have less than six per cent of native vegetation and are on a downward trajectory when it comes to losing native species,” Natarsha Woods said.

“This listing is a wake up call that should prompt a whole of community response.

“We need communities to help carry out feral animal control, fence remnant vegetation, manage fertiliser and soil health issues and prevent land clearing.”

Cunderdin farmer Alan Carter has been actively fencing off patches of woodland on his property and carrying out feral animal control over the past 40 years.

He said the listing was a timely reminder that unless landholders, councils and governments act, more native bush land would be lost.

“I knew the woodlands were degraded, because in many cases the understory is disappearing and new trees are not regenerating.

“I’m concerned that the landholders that actively preserve remnant vegetation could themselves become an endangered species.”

Wheatbelt NRM’s Natarsha Woods said the group was currently working with landholders repairing more than 100 sites throughout the region.

She hoped the listing would help groups’ access more funding to carry out environmental work.

“Now that we know we’ve reached the tipping point when it comes to preserving native vegetation, we’re hoping the WA Wheatbelt will become a priority in sourcing funding,” Natarsha Woods said.

There are several major threats to the Western Australian Woodlands. These mostly come from human intervention, and include:

- climate change
- vegetation clearing
- livestock grazing
- exotic species introduction
- disruption of natural fire regimes
- firewood harvesting
- bush rock removal
- soil fertilisation

Other factors which can cause issues are:

- deterioration in the structure of the soil
- damage caused by livestock and farm machinery
- increased number of parasitic mistletoes.

Going batty in Merredin

By Kelly Thorburn

Did you know that not all bats live in caves? Or that some don’t even sleep upside down?

In fact, some bats live in tree hollows and sleep lying down – right here in the Wheatbelt. Amazing!

For those that like bats (and even those who don’t), Wheatbelt NRM’s Merredin Bat Night was a great chance to learn about bat conservation and ecology, and their importance to the environment and agriculture.

Fifty participants took part in the workshop on making nest boxes for bats with Joe Tonga, one of Western Australia’s eminent bat experts.

Completed nest boxes were then raffled off to six lucky participants at the end of the night.

Large numbers of bats were seen and heard during the bat night walk around the Merredin Railway Dam where Joe helped participants spot and identify local bats.

“Bats are amazing creatures but not many people realise they are here in the Wheatbelt, right under our noses”, according to Wheatbelt NRM’s Regional Landcare Facilitator Leigh Whisson.

“They are delicate creatures who are directly impacted by the removal of trees”, Leigh said.

“By learning more about bats and how to build homes for them, the community can join us in helping give them a better chance of survival in the future”, Leigh said.

Thanks to the Merredin Men’s Shed who provided the evening’s wonderful venue and the Australian Government’s National Landcare Programme which funded the event.

“They are delicate creatures who are directly impacted by the removal of trees“

White Striped mastif bat courtesy Jo Tonga

Bush potatoes

By Judd Stead

Noongar people would often harvest tubers and bulbs of certain native plants that would be included in their routine meals; often compared to western cultivars some can be quite pleasant in taste.

Warrine

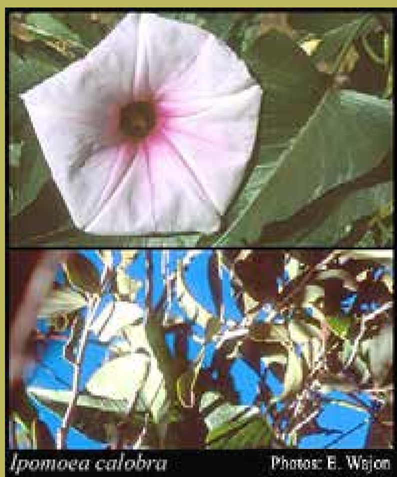
Dioscorea hastifolia

Photos: D. & B. Bellairs & I.R. Dixon

A native tuberous climber it can often be identified by its distinct yellow flowers, it is sweet in taste and is similar to a potato.

Kulyu

Ipomoea calobra



Ipomoea calobra Photos: E. Wajon

A native climbing plant found inland of WA that produces large starchy tubers, Regularly baked and eaten by aboriginal people, it is similar to sweet potatoes.

Youlk

Platysace deflexa

Platysace deflexa Photos: T.J. Alford

A native shrub that produces fleshy yellow tubers found on the South coast of WA, Routinely eaten by Noongar people, it is broadly similar to carrots.

Boxed images appear courtesy Flora Base and the Department of Parks and Wildlife Western Australia