Roadside Conservation Committee

NATURAL RESOURCE MANAGEMENT IN TRANSPORT CORRIDORS: REVEGETATION TRAINING WORKSHOP FOR SHIRE STAFF

Start	Duration	Presenter	Subject
8:00	10 min	Peter Vlahov, Works Supervisor, Wickepin	Welcome & Introduction to the day
8:10	20 min	Cressida Wilson	The Values of Roadside Vegetation in Transport Corridors
8:30	40 min	Cressida Wilson	Managing Linear Remnants Video and discussion
9:10	30 min	Peter Denton	Rehabilitation of Gravel Pits
9:40	20 mins	All	SMOKO
10:00	30 mins	Rebecca Hayes	Identification of Local Roadside Weeds and Controlling Them
10:30	30 min	Peter Denton	Collection of Native Seed
11:00	30 min	DEC Flora officer	DRF in Transport Corridors
11:30	30 min	Cressida Wilson	Legislation in the Transport Corridor
12:00	15 min	All	Questions, Review of morning, Feedback forms
12:15	45 min		LUNCH
1:00	30 min	Peter Denton	Direct Seeding & Tree Planting Techniques
1:30	1 hour 30 min	All	Site Visits
3:00	15 min	All	Questions, Review of afternoon, Feedback forms
3:15	Close		

Overview

- Intro to the RCC
- Services offered by the RCC
- Values of roadside vegetation

Roadside Conservation Committee

An introduction

Terms of Reference

"… to coordinate and promote the conservation and effective management of rail and roadside vegetation for the benefit of the environment and the people of Western Australia"

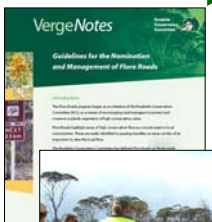
Organisations represented

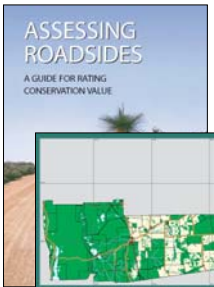
- Main Roads
- DEC
- Dept. Agriculture
- FESA
- Local Government
- Alinta
- Telecommunications
- Western Power
- WestNet Rail
- Greening Australia
- Wildflower Society
- Conservation Council

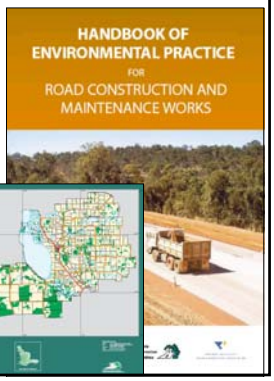
A short history

- 1969 - 1971 Road Verge Conservation Committee (RVCC)
- 1973 - 1983 RVCC reformed
- 1984 - present Roadside Conservation Committee
- Formed due to community concern

Services offered by the RCC







Services

- Works with managers and uses of road and rail reserves to maintain and enhance reserve values
- Advice on management issues
- Training
- Vegetation management plans
- Roadside conservation value mapping
- Recognition of high conservation value roads through the Flora Roads program

Assistance/advice on management issues

- Maintenance issues
- Fence set backs
- Weed management programs
- Revegetation

- WHAT DO YOU NEED?

Training

- Supervisors and works crews
- General training:
  - Values of roadside vegetation
  - Construction zones
  - Weed control
  - Fire
  - DRF
- Specific training:
  - Above topics
  - Revegetation
  - …. Whatever you need

Vegetation Management Plans

- Guidelines on best practice for your Shire
- Prescriptions for different road types with different values of vegetation
- Will help with your next clearing purpose permit
- Based on the roadside conservation mapping

RCC mapping program

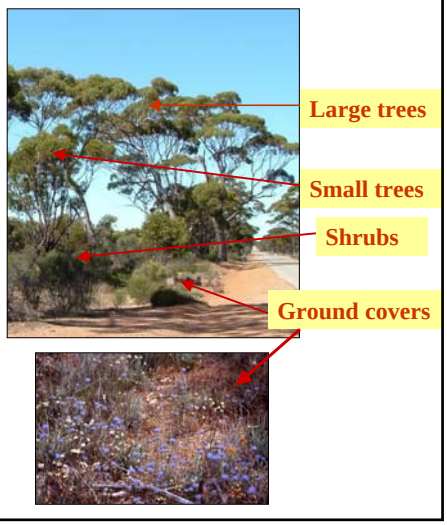
- Roadside vegetation conservation values
- Weeds nominated by the Shire and/or community
- Other mappable issues eg salinity
- Management tool for
  - Road maintenance and construction
  - Weed control
  - Revegetation
- Mapped: Corrigin (1999), Cuballing (1998), Wickepin (1992), Wagin (2005), West Arthur (1994)

Attributes

- Extent of native vegetation
  - <20%, 20-80%, >80%
- Degree of weed infestation
  - <20%, 20-80%, >80%
- Number native plant species
  - 0-6, 7-19, >20
- Value as biological corridor
  - Flowering shrubs
  - Trees with hollows
  - Hollow logs
  - Connects remnants

Attributes continued

- Structure of native vegetation
  - Trees
  - Shrubs
  - Ground covers
- Adjoining land use
  - Cleared
  - Scattered
  - Plantation
  - Urban/industrial
  - Railway
  - Drain
  - Other…



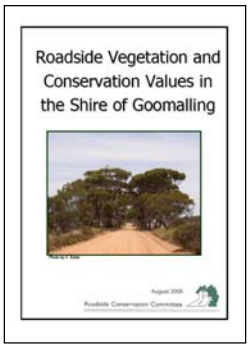
Weeds/wildcard

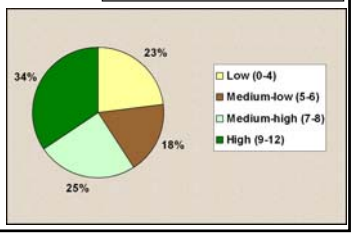
- 6 nominated weeds
  - Love grass
  - Saffron thistle
  - Fountain grass….
- Wildcard
  - Salinity impacted road/roadside
  - Habitat trees
  - Old fences
- Produced as overlays

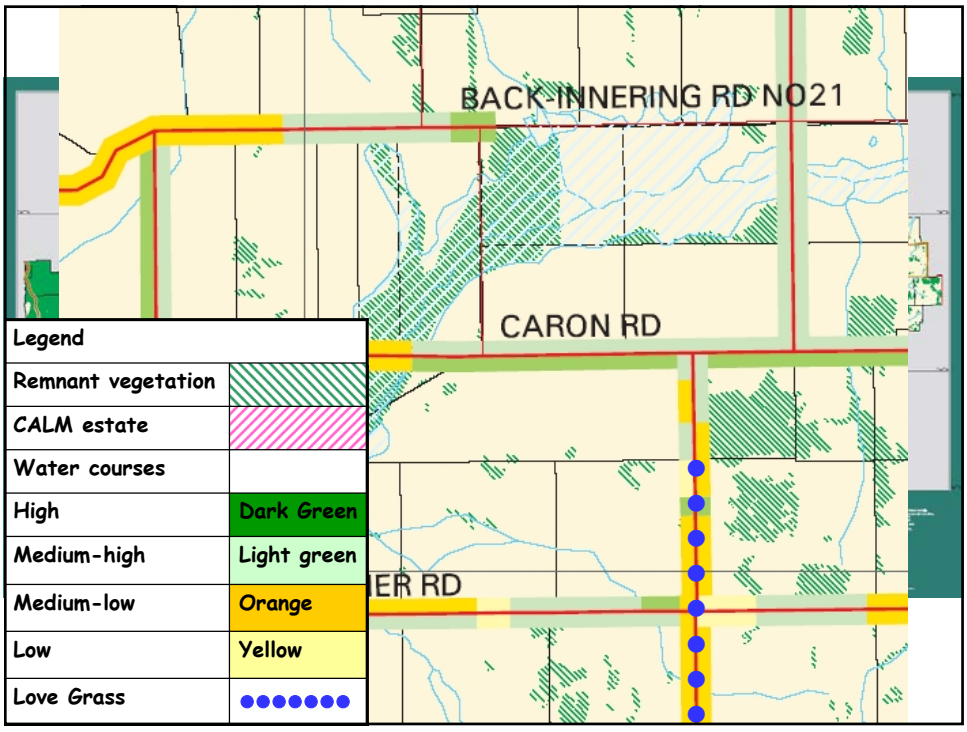
The end product

- Report
  - Analysis of data
- Map
- Overlays
  - Weeds
  - Wildcard
- Presentation to council

- Cost….? ***FREE*** !!







What does this mean for you?

- Management tool
  - Kms of weeds
    - Basis for funding/budget
  - Strategic attack
  - Strategic choice
- Long term monitoring
  - Success of the program
  - Demonstrates aggressiveness

Flora Roads

- The very best, representative vegetation
- Only 30 in the State
- Three steps:

1. Nominated by community member or Shire
2. Assessed by RCC
3. Declared by Shire on RCC recommendation
4. Signs provided by the RCC

- In this area:
  - Dents and Fairheads Roads (Cuballing)
  - Cordering North Road (West Arthur)
  - Collie-Lake Grace Road (Main Roads)

Staff members

Executive Officer

Cressida Wilson

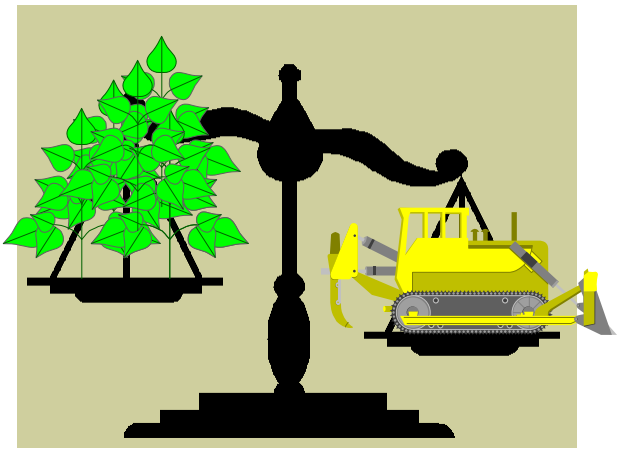
Ph: 9334 0423

Technical Officer (Mapping)

Rebecca Hayes

Ph: 9334 0174

Legislation in Road Reserves



Roadside Conservation Committee

Waiver

The advice given in this presentation on Legislation pertaining to roadsides is believed to be correct, however the Roadside Conservation Committee accepts no responsibility for advice given should it prove to be incorrect

Origins of Western Australian Law

- Adversarial law based on the English system
- Consists of international law, common law, subsidiary legislation, policies and administrative guidelines
- Interrelation of Aboriginal law with English based Australian law

All of these areas of law contribute to the legal framework embracing clearing and taking native vegetation in WA

Legislation

- Legislation relating to roadsides is:
  - complex
  - varied
- It includes:
  - Common law
  - Agriculture & Related Resources Protection Act 1976
  - Aboriginal Heritage Act 1972
  - Heritage of Western Australia 1990
  - Main Roads Act 1930
  - Bushfires Act 1954
  - Conservation and Land Management Act 1984
  - Wildlife Conservation Act 1950
  - Environmental Protection and Biodiversity Conservation Act 1990
  - Environmental Protection (Clearing of Native Vegetation) Regulations 2004
  - Soils and Land Conservation Act 1945
  - Town Planning and Development Act 1928
  - Local Government Act 1995
  - Energy Operators (Powers) Act 1979 …..etc

Common Law

- Applies to everyone (including the Crown) unless expressly excluded by an Act of Parliament
- Is often referred to as judge-made law
- Is generally made through the absence of written law, such that a court will determine a matter by looking at the established principles of
  - Common law
  - Custom
  - Tradition
  - Modern convention

Agriculture & Related Resources Protection Act 1976

"To eradicate or control the spread of noxious species of fauna and flora"

- Animals and plants may be declared to require control under this Act
- DEC or DAFWA shall control declared plants and declared animals on land under the control of the Crown
- Local government shall control declared plants and animals on land which is under its control eg. road reserves

Aboriginal Heritage Act 1972

"To make provision for the preservation on behalf of the community of places and objects customarily used by or traditional to the original inhabitants of Australia or their descendants, or associated therewith, and for other purposes incidental thereto"

Road managers must:

- Check if there are any Aboriginal sites within proposed road works and the associated works area
  - Register of Aboriginal Sites
  - With local Aboriginal people

It has the potential to impact road maintenance and construction operations, especially in rural areas.

Heritage of Western Australia Act 1990

"To provide for, and encourage, the conservation of places which have significance to the cultural heritage in the State, to establish the Heritage Council of Western Australia, and for related purposes".

Road managers must:

- Check if there are any European sites within proposed road works and the associated works area prior to realignment operations
  - Register of Heritage Sites
  - The National Trust
  - Local records to ascertain whether places have historic significance

Main Roads Act 1930

The Main Roads Act 1930 Section 15 part 3a vests all vegetation, both living and dead, on roads under the control of the Commissioner of Main Roads.

15A. (1) No person shall cut, break, bark, root up or otherwise damage, destroy or remove the whole or any part of any timber, tree, sapling, shrub, undergrowth, or wildflower in or upon any highway or main road without the prior consent in writing of the Commissioner except when such action is taken to remove a hazard.

Bush Fires Act 1954

- Firebreaks not to be burned or cleared without the managing authority's permission
- There are two circumstance in which this could be done:
  - Road reserve can be burnt if crops are at risk from fire
  - For the purpose of preventing the occurrence or spread of fire

Conservation & Land Management Act 1984

"To make better provision for the use, protection and management of certain public lands and waters and the flora and fauna thereof, to establish authorities to be responsible therefore, and for incidental or connected purposes".

- Minister for Environment and the Department of Environment and Conservation (DEC) administers the Act
- DEC controls the commercial harvesting of native flora and fauna in Western Australia from both Crown and private lands

Wildlife Conservation Act 1950

This is the primary statute protecting fauna and native vegetation on Crown land (which includes all public roads)
For the purposes of the Act:

Fauna means:

- Any animal native to any part of Australia
- Any animal that migrates to Australia
- Includes eggs, larvae, skin, fur, plumage and carcass

Flora means:

- Any plant, including wildflower, palm, shrub, tree, fern, creeper or vine, which is native to Western Australia
- Includes any part of flora and all seeds and spores

Under this Act, protected flora on Crown land is deemed to be the property of the Crown, until legally **taken**.

Wildlife Conservation Act 1950

To **take** fauna includes:

to kill, capture, disturb or molest any fauna by any means or to use any method whatsoever to hunt or kill any fauna whether this results in killing or capturing any fauna or not; and also includes every attempt to take fauna and every act of assistance to another person to take fauna and derivatives and inflections have corresponding meaning

To **take** flora includes:

to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means

Wildlife Conservation Act 1950

Flora and Fauna protection laws and the Crown:

- The fauna protection provisions of this Act do not bind the Crown
- Local government is bound by the fauna provisions of this Act because it is not part of the Crown
- In contrast to the fauna provisions, the flora provisions of this Act bind everyone, including the Crown

BUT!

- Under section 23B, flora can be taken if a person is acting under a licence or statutory power
  - –Local government can take what flora they need to in order to undertake their statutory responsibilities
  - –This does NOT extend to DRF

The Environmental Protection and Biodiversity Conservation Act 1999

Commonwealth legislation

The EPBC Act promotes the the conservation of biodiversity through:

- The identification of and preparation of threat abatement plans for key threatening processes
- Creation and management of protected areas
- Identifying and monitoring biodiversity, and by the preparation of bioregional plans

The EPBC Act regulates the assessment and approval of activities:

- Which have a significant effect on matters of national environmental significance
- By Commonwealth government agencies anywhere in the world
- By any person on Commonwealth land

The Environmental Protection and Biodiversity Conservation Act 1999

Matters of National Environmental Significance are:

- World Heritage properties
- National Heritage places
- Ramsar wetlands
- Nationally listed threatened species and ecological communities
- Migratory species
- Activities relating to nuclear energy
- The Commonwealth marine environment

Environmental Protection (Clearing of Native Vegetation) Regulations 2004

A strategy for the new process

- To regulate clearing under the Environmental Protection Act
- To deter illegal clearing by increasing penalties
- Extensive illegal clearing will be considered as an environmental harm offence
- To provide a more equitable assessment process
- To encourage sustainability

Definition of Clearing

(a) the killing or destruction of;

(b) the removal of;

(c) the severing or ringbarking of trunks or stems of; or

(d) the doing of any other substantial damage to;

some or all of the native vegetation in an area, and includes:

- draining or flooding of land
- burning of vegetation
- grazing by stock
- or any other act or activity, that causes - (a), (b), (c) or (d)

Definition of Native Vegetation

- Native vegetation is defined as:
  - Indigenous aquatic or terrestrial vegetation
  - Including dead vegetation
- This does not include vegetation in a plantation
  - i.e. vegetation intentionally sown, planted or propagated

How do the Regulations operate?

Clearing native vegetation is prohibited unless:

- Clearing is exempt
- A permit has been granted

What are the exemptions?

There are 2 classes of exemptions:

- Clearing required by law under a specific Act
  - E.g. Energy Operators (Powers) Act 1979 Section 54
- Regulations exempting clearing for a specific purpose
  - E.g. Road maintenance work

Exemptions for Urban Activities

- Bush Fires Act 1954
  - Clearing for erection of a lawful building
  - Clearing within 20 metres of a residence
- Town Planning & Development Act 1928
  - Clearing for fire prevention (i.e. Fire breaks)
- Local Government Act 1995 Schedule 3.1
- Energy Operators (Powers) Act 1979 Section 54
  - Removal of vegetation that endangers a power supply

Agricultural/ Pastoral Exemptions

- Pastoral Leases (Land Administration Act 1997)
  - Grazing of native vegetation by stock, as approved by the lease
- Erection and maintenance of a fence line (1.5m) or cutting of fence posts (4 tonnes)
- Establishment or maintenance of an access track (5m, walking track 1m)
- Construction of a firebreak (5m)
- Harvesting domestic firewood (4 tonnes)

Re-growth Maintenance

- Clearing of re-growth is exempt where:
  - the land on which the vegetation is situated was used for cultivation, pasture or forestry 5 years immediately before clearing occurs
  - the clearance is necessary to maintain the land for continued cultivation, pasture or forestry
  - the vegetation consists only of plants that have grown or re-grown within the preceding 5 years

Exemptions for Roads

- Maintenance:
  - Vegetation that has previously legally been cleared for maintenance works can continue to be cleared for maintenance (Schedule 2)
- ~~Widening and realignments~~:
  - ~~NOT EXEMPT~~

Schedule 2

- Clearing for:
  - Crossovers, sightlines, roadside furniture, lateral clearance areas
  - Maintenance of the infrastructure

  can continue to be cleared if previously legally cleared
- Previously cleared = within the last 10 years to width and height previously cleared
- Anything outside this requires a permit
  - New crossover, extend sightlines, the odd tree

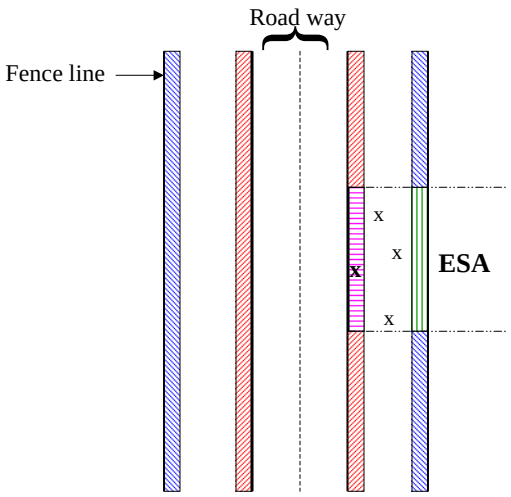
Environmentally Sensitive Areas

- Exemptions do not apply in ESAs
  - Fence line clearing
- An ESA is not an ESA in the maintenance areas of roads

BUT!

- Other legislation must still be adhered to
  - E.g. the Shire must still obtain a permit to take DRF where DRF occurs

Exemptions and ESAs



Key:

x DRF

Road maintenance work

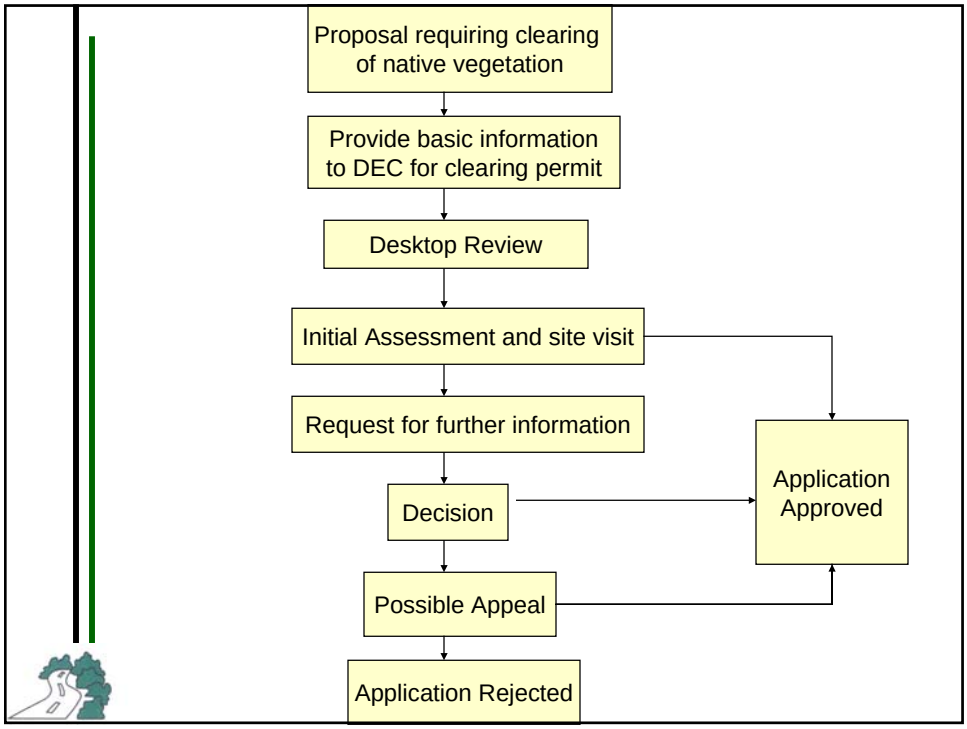
Permit to take DRF required

Fence line clearing

Permit to clear required

Assessment Principles

- Applications will be assessed for effects on:
  - biodiversity
  - neighboring or other local native vegetation areas
  - land and water resources, i.e. land degradation
  - associated watercourses or wetlands
  - surface or underground water sources, including water tables and salinity



Types of permits

- Area permit
  - Issued for clearing a specific area of land
  - Valid for 2 years
- Purpose permit
  - Issued for a program of clearing for a specified purpose
  - Valid for specified period

Decision

- Director General of DEC has the authority to issue a permit, with binding conditions
- Information will be provided on why a permit was refused
- The decision may appeal to the Minister for the Environment, through the Office of the Appeals Convener

Audit & Enforcement

- Clearing of native vegetation is monitored with satellite imagery and aerial photography
- Persons undertaking unauthorised clearing can receive a maximum $250 000 fine or 3 years jail
- A body corporate responsible for unauthorised clearing could receive a maximum $500 000 fine

For more information...

- Purpose permits and requirements: Liesl Rohl at the Perth DEC office on 9219 8708 (Tues to Thurs)
- Other clearing issues: DEC Bunbury Office on 9725 4300
- Visit the website at:

www.dec.wa.gov.au

And follow the links through Environment to Native Vegetation Protection

Summary

- Highly complex
- Control weeds and pests
- Apply for a purpose permit for clearing
- Check for Aboriginal and European history
- Check for declared and protected flora and fauna
- *Ask questions*

The Value of Roadside Vegetation

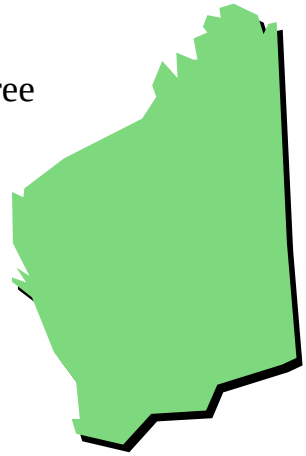
Roadside Conservation Committee

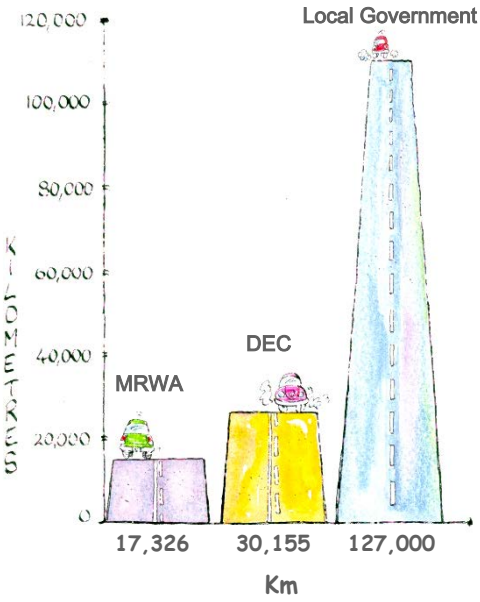
The Roads of Australia

40 laps!

The Roads of Australia

- 19 % located in WA
- Management shared by three main groups…





Roadside Values

What are they?

Some people see....

- Feral animals
- Fire
- Weeds
- Unsightly
- Safety

Positive Views of Roadside Values

1. Environmental Values
2. Landcare Values
3. Cultural Values
4. Aesthetic Values

1. Environmental Values

- Flora and Fauna

1. Environmental Values continued

- Flora and Fauna
  - –Wildlife habitat
  - –DRF

Declared Rare Flora Conservation

- More than 378 species of flora declared rare
- Over 200 have at least one roadside population (53%)
- 3 species are known only from roadsides

Banksia cuneata

Shire	% Native Vegetation
Brookton	15.6
Corrigin	4.9
Cuballing	19.9
Kondinin	13.1
Quairading	3.6
Wickepin	7.5
Woodanilling	12.9

Vegetation types represented by less than 30% = ecologically endangered

National Objectives and Targets for Biodiversity Conservation 2001-2005 (Environment Australia)

* Keep in mind coastal and pastoral country

1. Environmental Values continued

Flora and Fauna

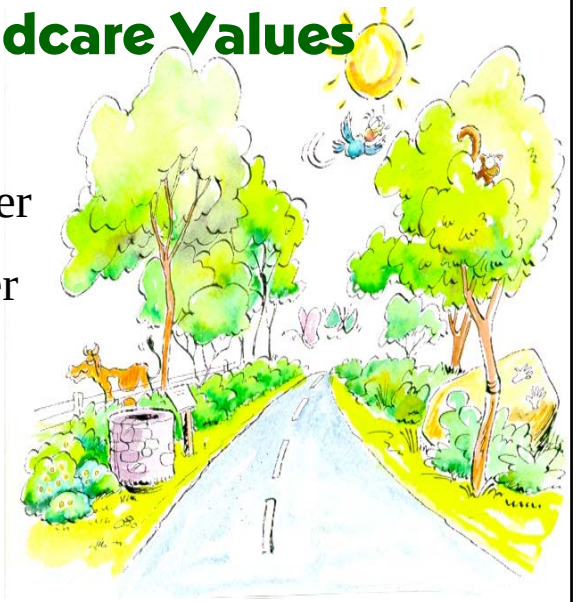
- –Wildlife habitat
- –DRF
- –Corridors

1. Environmental Values continued

- Flora and Fauna
- Remnant Vegetation
- Biodiversity
- Revegetation
- Scientific/Education

2. Landcare Values

- Stock shelter
- Crop shelter
- Erosion
- Salinity



Roadside Vegetation and Salinity

- The effect of salinity is serious on rural townsites and the rural road network
- More than 3,000km of WA roads are being degraded by the effects of rising water tables/salinity
- The annual cost of repairing Western Australian roads in the year 2000 was $505 m and this will have risen by an extra $91 m by 2020
- Shire of Dumbleyung:

  4.3% moderate salt damage (20-80%)

  5.2% major salt damage (>80%)

3. Cultural Values

- Indigenous sites
- European Historical areas

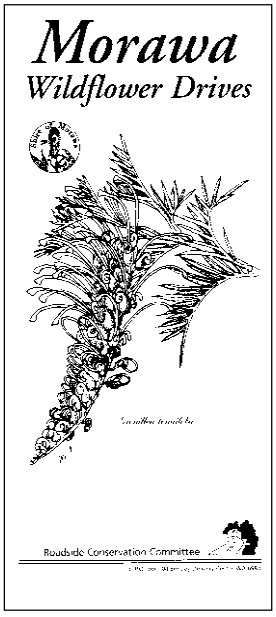
4. Aesthetic Values

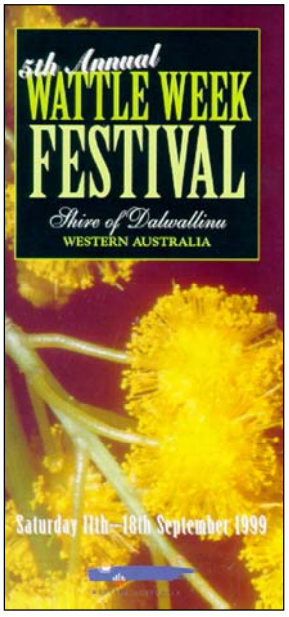
➢ Tourism

Spending by international visitors who have listed wildflower viewing as a reason for visiting WA.

Country	$ in Millions Spent
1 UK	133
2 Indonesia	112
3 Singapore	112
4 New Zealand	72
5 Malaysia	70
6 Japan	69
7 Germany	46
8 USA	41

Tourism





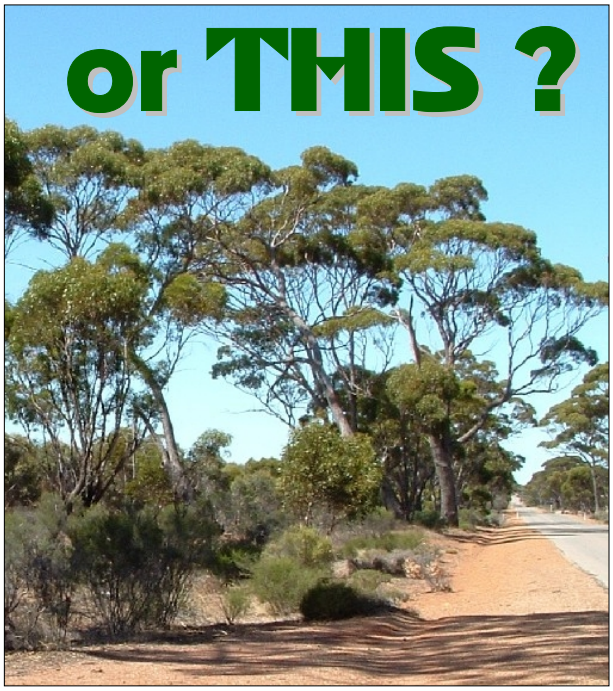
4. Aesthetic Values continued

- Tourism
- Scenic
- Beauty

What sort of roadside do YOU want ?

THIS

or THIS ?



Weed Management and Control

Roadside Conservation Committee

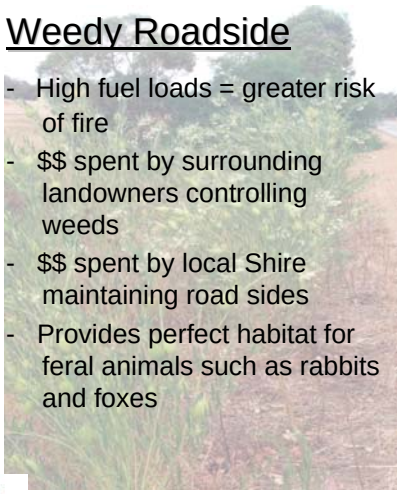
The Weed Menace

- Over the last 200 years, over 28,000 foreign plants imported
- Costs to Australian Agriculture alone now exceeds $4 billion per year!!
- Over 2,500 weed species are now established in the wild, with many more to come

The Weed Menace

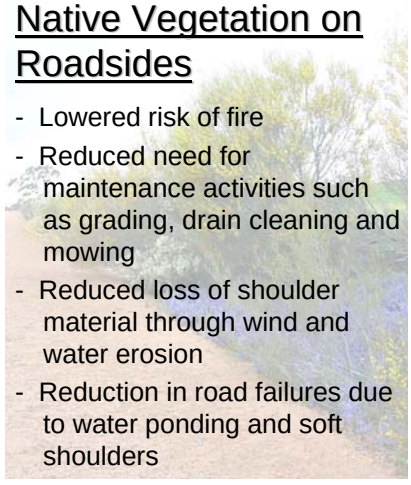
- Not only look terrible, but also
  - Can be toxic eg. St John's Wort
  - Can be spiny eg. Saffron Thistle
  - May cause respiratory problems
    eg. Rye Grass
  - Most displace nutritious native and crop plants
  - Aquatic weeds may also entangle swimmers

To Weed, or Not To Weed?



Weedy Roadside

- High fuel loads = greater risk of fire
- $$ spent by surrounding landowners controlling weeds
- $$ spent by local Shire maintaining road sides
- Provides perfect habitat for feral animals such as rabbits and foxes



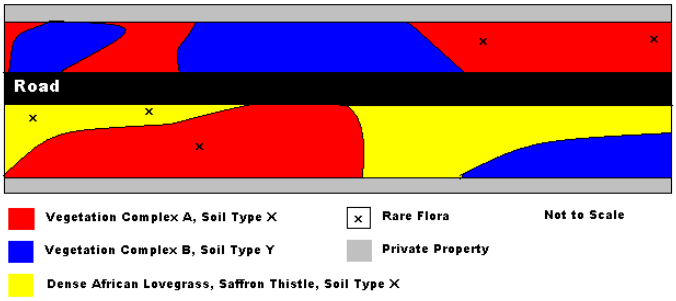
Native Vegetation on Roadsides

- Lowered risk of fire
- Reduced need for maintenance activities such as grading, drain cleaning and mowing
- Reduced loss of shoulder material through wind and water erosion
- Reduction in road failures due to water ponding and soft shoulders

Effective Weed Management:
Use Native Vegetation to Ensure Weeds CAN'T COME BACK!

Gathering Area Specific Information

- Vegetation Maps
  - Info on structure and patterns of native vegetation in different landscapes
  - Guide to what particular native species would survive well in the available conditions



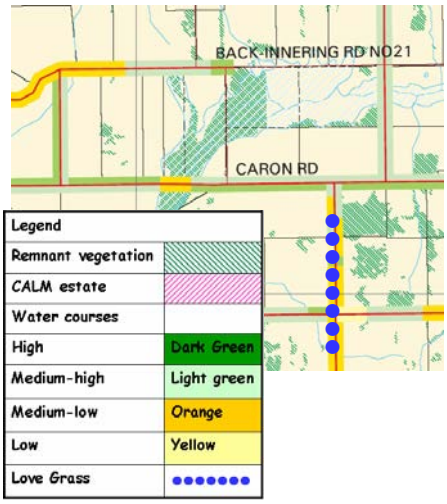
Effective Weed Management:
Use Native Vegetation to Ensure Weeds CAN'T COME BACK!

- Flora List
  - Record all plants known to occur at the site
  - Record rare and threatened flora
  - Also include weeds, so you can recognise new weeds as soon as they arrive
  - Forms a vital reference to ensure no new plants are introduced

→ More Weeds!!

Effective Weed Management:
Use Native Vegetation to Ensure Weeds CAN'T COME BACK!

- Vegetation Condition Maps
  - Reflects the effects that disturbances have had on the roadside vegetation
  - When combined with maps of weed distribution, provide useful tools for targeted weed control
  - RCC's mapping program can provide these free of charge.



Effective Weed Management:
Use Native Vegetation to Ensure Weeds CAN'T COME BACK!

- Fauna Information
  - Weeds can provide habitat or an opportunistic food source for native animals
  - A list of known fauna in the area may help determine if this is occurring in your site
  - If it is, then gradual removal of said weeds and replacement with native habitat and food sources will be required

Develop a Weed Management Program

- Get the most value for your dollar
- Main objectives must include:
  - Contain the spread of serious weeds
  - Protect intact, good bushland
  - Consider the impacts of serious weeds on the rare flora and threatened plant communities
  - Prevent new weeds establishing
  - Consider restoration of degraded edges to reduce edge-effects

Implementing your Weed Management Program

- Prevent new weeds from establishing
  - Vehicle hygiene
    - Clean down your machinery and equipment
  - Soil hygiene
    - Avoid bringing soil or mulch in from elsewhere
  - Know your plants
    - Remove new infestations early to prevent spread

Implementing your Weed Management Program

- Limit the spread of established weeds
  - Target small populations in good quality bush and the outliers of dense infestations
  - Keep soil disturbance to a minimum
  - Avoid working in areas where weeds are actively shedding seed
  - Take advantage of fire
    - Plants are more vulnerable
    - Weeds are often the first to appear after the fire
      E.g. African Lovegrass

Implementing your Weed Management Program

- Understand the biology of the particular weed you are trying to control
  - Use references such as www.weeds.crc.org.au, or *BUSHLAND WEEDS A Practical Guide to their Management* by Kate Brown and Kris Brooks
  - Information to collect includes:
    - When is it actively growing?
    - What time of the year does it flower and seed?
    - How long do seed and other reproduction mechanisms remain viable in the soil?
    - How will it respond to fire?
    - When is it most vulnerable?
    - Is there a preferred time for physical control?
    - What is the best time for chemical control?

Implementing your Weed Management Program

- Consider all options carefully
  - Physical, chemical and biological methods are all useful under certain circumstances
  - Impacts on nearby native flora and fauna
  - Important to adapt control methods to site-specific conditions and available resources
  - Timing is VERY important – there is no point spraying annual weeds after they've set seed
  - Revegetation should be thought about seriously – bare ground equals more weeds and more $$ spent.

Throughout your weed management program…

- Keep a record of works programs over time
- A logbook should record:
  - Date
  - Time
  - Type of works carried out
  - Details of methods used
  - Hours worked
  - Site conditions
- Work with your neighbours
  - In most cases it will take a team effort to control an infestation
  - Working together will make it a lot easier and cheaper for all parties.



Some weeds you may come across…



Victorian Ti Tree (*Leptospermum laevigatum)*

- Large shrub up to 5m
- Leathery leaves, 15-30mm long and 4-9mm wide
- Numerous stamens look like they are in a ring
- Domed woody fruit opens by 7-10 valves to release its tiny seeds
- Wind dispersed

Victorian Ti Tree (*Leptospermum laevigatum)*

- Target small infestations first
- Best to cut plant off at ground level
- Mulch plant material on site
- Seeds remain viable for 2-3 years, so monitor site every 6-12 months for 3 years to remove any seedlings
- Alternative:
  - 100mL of Grazon® and 25mL Pulse® in 10L of water can be applied until just wet.

  Or
  - Overall spraying with 100mL glyphosate (450g/L) plus 25mL Pulse® in 10L of water is also effective.

Bridal Creeper (*Asparagus asparagoides*)

- Spread by birds, running water and earth moving machinery
- Climber with wiry stems arising from tuberous roots and sprawling aggressively for several metres, even climbing quite high into trees
- Leaves up to 7cm long and small white flowers appear all along the stems in spring
- Small green berries (6-10mm) containing seed develop in October, ripening to red in November
- Plant dies back in summer and then shoots away in autumn.

Bridal Creeper (*Asparagus asparagoides*)

- Locate all infestations – RCC mapping can do this for roadsides, but other bushland areas will need to be checked also
- When choosing your control method, consider
  - Size and density of the infestation
  - Accessibility
  - Time and resources available
  - Type of environment invaded
  - Growth stage of the plant
  - Features of the landscape i.e. waterways, cliffs

Bridal Creeper (*Asparagus asparagoides*)

- Physical removal is recommended for smaller infestations, but ensure you remove the tuberous root mass, and that removal is done before the plant flowers.
- Once removed, all plant material must be collected and left to bake in a plastic bag in the sun for 2-3 months to kill the tubers and rhizomes, then burnt or taken to the rubbish tip for deep burial
- Follow up monitoring will be required for several years following initial removal, to ensure no new seedlings get the chance to grow to seed production stage

Bridal Creeper (*Asparagus asparagoides*)

- Chemical removal is effective over time
- Spraying can be conducted during winter to the early spring flowering period
- Do not spray if plant is under stress
- When the infestation is within native bush, use a hand sprayer or wipe the herbicide directly on to the leaves to avoid off-target damage
- Weather conditions should be calm, and no immediate rain expected.
- 0.02g metsulfuron plus 25mL Pulse® per 10L of water with a mister or hand spray. No effect will be seen till next season when only a few stems emerge. Repeat the process every season till no new growth appears

Following fire, Bridal Creeper is often one of the first plants to emerge.

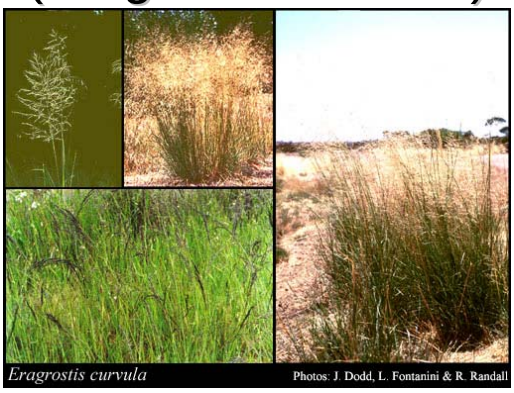
Bridal Creeper (*Asparagus asparagoides*)

- Three options available for biological control
  - Leaf Hopper
  - Leaf Beatle
  - Rust Fungus (most successful)
- More information available in the *Asparagus Weeds Best Practice Management Manual*, which you can download from www.weeds.org.au/WoNS/bridalcreeper

Bridal Creeper (*Asparagus asparagoides*)

- Rust Fungus (*Puccinea myrsiphylli)*
  - First appears as yellow spots on the leaves
  - Completes entire lifecycle on the plant
  - Destroys leaf tissue, retards development of stem, fruit, rhizome and tuber material
  - Spreads easily all over plant and nearby infestations through spores
  - Will not kill the plant, though it will severely weaken it over several years
  - Can be collected from numerous sites in WA
  - A map of the sites is available at www.ento.csiro.au/weeds/bridalcreeper/project.html
  - Two methods of transferring it to new sites, see the *Asparagus Weeds Best Practice Management Manual*

African Lovegrass (*Eragrostis curvula*)

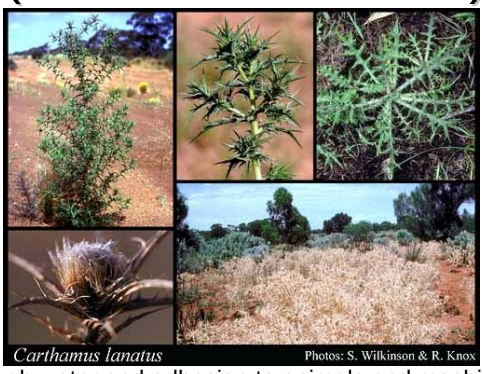


- Spread by seed through slashing, attaching to machinery, motor vehicles, animals, and as a soil and grain contaminant
- Tufted grass to 2m high
- Flowers most of the year

African Lovegrass (*Eragrostis curvula*)

- Control
  - On roadsides, spray shoulders with 3-4L/ha glyphosate (450g/L) annually in winter to reduce spread
  - Small infestations can be sprayed any time of year with 100mL glyphosate in 10L water
  - Repeat applications required to control seedlings
  - Following fire, will be one of the first plants to emerge. When it reaches 5-10cm high, zap it with the glyphosate
  - Follow slashing with spraying is effective, but slashing alone will only make the problem worse
  - Revegetate any bare ground – bare ground forms a perfect seed bed for new weed infestations

Saffron Thistle (*Carthamus lanatus*)



- Spread through water and adhesion to animals and machinery
- Grows to 70cm
- Leaves are rigid and prominently veined, have cobwebby hairs, are spine-tipped and the margins are spiny-toothed
- Cream to yellow flower heads are single and appear in spring and summer
- Fruits are topped by slender scales

Saffron Thistle (*Carthamus lanatus*)

- Control
  - Seedlings usually emerge in bare open ground – establish your native plants to avoid this
  - Prevent it seeding for several years in a row by killing or removing the plant during winter or early spring
  - Options include manual removal, or with blanket wipers or wick applicators
  - Use 1 part glyphosate (450g/L) to 2 parts water
  - In high conservation areas, use Lontrel® at 10mL per 10L water on young plants

St John's Wort (*Hypericum perforatum*)

- Spread through water, soil, machinery, animals
- Small herbaceous plant up to 70cm tall
- Numerous star shaped yellow flowers, to 2cm across, produced in clusters during spring and early summer
- Toxic to stock if grazed, all populations should be controlled to avoid this occuring

St John's Wort (*Hypericum perforatum*)

- Control
  - Restrict seed establishment by maintaining soil cover, litter and native plants for competition
  - Spot spray at flowering
    - Wait until 50% bud, 50% open flowering – do not spray after 50% green bud
  - Use Grazon® (triclopyr + picloram) at label rates

Perennial Veldt Grass (*Ehrharta calycina*)

- Spreads through water, wind, animals and slashing
- Tufted perennial to 80cm
- Inflorescence is a drooping erect panicle of reddish-purple flowers, 7-22cm long
- Flowers in spring and autumn

Perennial Veldt Grass (*Ehrharta calycina*)

- Control
  - For dense infestations, use 4L/ha Fusilade® to spray plants just before flowering in mid-July – this is crucial
  - Exercise caution around native plants
    - Sedges, rushes, orchids and native lillies are susceptible to Fusilade®
  - Fire is known to enhance germination
    - Following fire, use the opportunity to spray it out before it grows to seed bearing stage (usually 4-6 weeks)

Wild Radish (*Raphanus raphanistrum*)

- Spread by water, wind and machinery
- Characterised by a base rosette of stalked leaves which are lobed or toothed and often bristly
- Stem leaves are smaller
- White, yellow, mauve or pink flowers appear from autumn to spring
- Seed pods are 2-9cm long, ribbed and distinctly constricted between the seeds, and break up into single seeded pieces upon maturity
- Narrow conical tip lacks seeds

Wild Radish (*Raphanus raphanistrum*)

- Control
  - Soil disturbance often leads to a flush of seedlings
  - Spot spray with 1% glyphosate before flowering, OR
  - Spot spray with 500mL/ha glyphosate at flowering to reduce seed set
  - Has dormant seeds that will continue to germinate over the season and for several years
  - Plants mature and set seed very quickly
  - Hand remove isolated plants several times over the year, or every 8-10 weeks, and burn all plant material
  - Once seed pods are formed, seed often matures even when the plant has been uprooted

Essential Weed Management Practices

- Many new infestations could be avoided through better management practices
  - Work from high conservation value to low conservation value wherever possible
  - ALWAYS clean down equipment when moving from an infested to a non-infested area – it takes 10minutes, rather than years and $1000's later on
- Carefully consider fire
  - May make weed problems worse

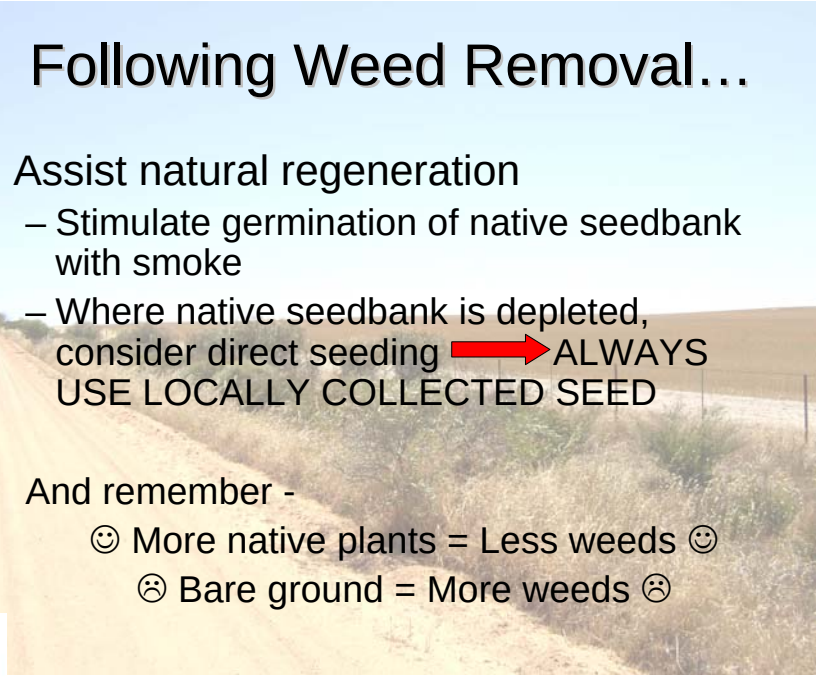
Following Weed Removal…

- Assist natural regeneration
  - Stimulate germination of native seedbank with smoke
  - Where native seedbank is depleted, consider direct seeding → ALWAYS USE LOCALLY COLLECTED SEED

And remember -

☺ More native plants = Less weeds ☺

☹ Bare ground = More weeds ☹



Monitor Your Outcomes

- Detailed monitoring provides:
  - Quantitative record of the effectiveness of your weed management program
  - Measures the impact of control programs on native plants
  - Measures the regeneration of the native plant community over time
  - Ensures the management practices were successful
  - Opportunity to remove any germinating weed seedlings from the remaining seed store
  - Feedback provided can be used to adapt future weed management practices, and to justify spending on weed management works
- For ideas on how to put together an effective monitoring system, refer to the *Introductory Weed Management Manual*, which you can download for free from www.weeds.crc.org.au

Handy References

- ***Bushland Weeds A Practical Guide To Their Management***, Brown K & Brooks K, Environmental Weeds Action Network 2002
  - On ground examples, and tables of specific weed control information, including biology information
- ***Southern Weeds And Their Control,*** Moore J & Wheeler J, Government of Western Australia
  - Identification, control information, easy to use, including what to do and what time of year to do it in
- ***Western Weeds A Guide To The Weeds Of Western Australia***, Hussey B, Keighery G, Cousens R, Dodd J & Lloyd S, Plant Protection Society of Western Australia 1997
  - Identification and control information. Currently being updated, info available online at **http://members.iinet.net.au/~weeds/western_weeds.htm**
- **www.weeds.crc.org.au**
  - All kinds of weed information, includes many free downloads on a number of weeds, control ideas, info sheets, case studies etc.
- **www.weeds.org.au/WoNS/bridalcreeper**
  - All information about Bridal Creeper, including free downloads
- **www.ento.csiro.au/weeds/bridalcreeper/project.html**
  - Map of release sites for Bridal Creeper Rust Fungus

http://florabase.dec.wa.gov.au/
  - Information and photos of all plant species in W.A., including weeds