

# Guidelines for Managing Special Environmental Areas in Transport Corridors



David Lamont and Ken Atkins

**Roadside  
Conservation  
Committee**



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Direct enquiries to the Executive Officer, Roadside Conservation Committee Western Australia, Locked Bag 104, Bentley Delivery, Bentley 6983 Western Australia.

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Conservation  
Committee**



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# The Roadside Conservation Committee

## 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.

## Policies

The Roadside Conservation Committee will:

- Encourage rail and road management authorities to conserve rail and roadside vegetation where possible.
- Encourage public utilities to conserve rail and roadside vegetation when constructing or maintaining services within rail and roadsides.
- Provide information on the importance of rail and roadside vegetation for nature conservation, for landscape protection, and as an amenity.
- Develop rail and roadside management practices that conserve the native vegetation while achieving rail and road management objectives.
- Promote model by-laws, codes of practice and roadside management plans for rail and road management authorities to use for conserving and managing roadside vegetation.
- Encourage the rehabilitation of degraded rail and roadsides to local native vegetation.
- Encourage community groups to be involved in all aspects of conserving and regenerating rail and roadside vegetation.
- Promote specific research programs directed toward the management of rail and roadside vegetation.
- Promote the training of road managers, contractors and workers in techniques for conserving rail and roadside vegetation.
- Encourage the integration of rail and roadside vegetation into regional management strategies by community groups, local government and government agencies.

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To implement its Terms of Reference and policies, the Roadside Conservation Committee promotes a number of strategies. They suggest what people and organisations should do to protect and enhance rail and roadside vegetation. One set of strategies relates to areas of roadsides with special values; viz:

- Designate roads with high quality roadside vegetation as Flora Roads if they meet certain criteria, and manage such roads so as to maximise the roadside vegetation values.
- Increase public recognition of Flora Roads by erecting signs that publicise them, and encourage their promotion in tourist literature.
- Identify areas of roadside with special environmental values as Special Environmental Areas (SEA), and get advice about their management from the relevant authority.
- Mark SEAs with standard roadside markers, to prevent them being disturbed accidentally, and inform relevant personnel of the function of such markers.
- Establish a register of SEAs, and consult it as part of planning roadside management activities.

It is the implementation of these strategies that is the objective of this booklet.

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## Dial before you dig

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The current membership of Dial Before You Dig in Western Australia is given below.

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## Foreword

When flying over the south-west of Western Australian, one of the features of the landscape is the spider web of vegetation strips that criss-cross the largely cleared agricultural region, linking islands of remnant vegetation. These strips of vegetation are, of course, the uncleared sections of the road and rail reserves, termed here 'roadsides'.

Roadside vegetation is a visible link to the natural heritage of this State, representing a transect across the landscape of the original diversity of vegetation, certain types of which have generally been cleared on adjacent lands. In this regard, the roadsides also provides local communities with a 'sense of place' regarding their natural environment. Aboriginal and European heritage sites are also known from roadside locations and these need to be protected for future generations to comprehend and appreciate.

Roadsides often contain remnant native vegetation that has an important role in the conservation of native flora. This is particularly the case with rare flora, as in some cases it is their only remaining habitat. Many of the native fauna species known from these areas are also dependent on these roadsides for habitat and as routes between more substantial areas of vegetation.

The sustainability of roadside remnants for preserving this range of values depends on the ability of road managers and other agencies that work in the roadside environment to treat the road reserves in a manner sensitive to their special environmental values. As well as the physical nature of the works being conducted in the roadside, other factors such as weed infestation and the introduction of soil borne pathogens, herbicide and fertilizer drift, and inappropriate fire regimes can result in the degradation of special environmental areas.

It is recognised that in some instances it can be a challenge to maintain these sites in a viable condition, whilst still managing a safe and effective road transport and/or utility network. However, in most instances commonsense and planning, and perhaps a little extra effort, can achieve the dual outcome of best management practice in road and environmental management.

Roadsides are a vital link and a priceless community asset. In many cases, we only have one chance of preserving our natural and heritage assets, because one mistake can lose them forever from our society. The Roadside Conservation Committee seeks to work cooperatively to achieve sound management of roadsides, and the conservation of the roadside values.

It is hoped that the information in this book will provide roadside managers and operators with a basic understanding of the values associated with special environmental areas, and with the necessary techniques to help protect these areas.

**Dr Ken Atkins**

Chairman

Roadside Conservation Committee

December 2000

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# Part 1

## SPECIAL ENVIRONMENTAL AREAS



## The values of roadsides

Often the focus of road and rail reserves is limited to their prime purpose of transport, but there are other values that should be borne in mind when working in the roadside environment and these include:

- Biodiversity: remnant vegetation, flora and fauna habitat, corridors for fauna movement, rare flora habitat and scientific data for soil and flora.
- Aesthetics: landscape and visual resources, recreation and amenity values, wildflowers and ecotourism.
- Cultural: historical areas, archaeological and Aboriginal sites.
- Landcare: shelter belts for adjoining properties, erosion and salinity mitigation and drainage. All native vegetation along roadsides is of crucial importance and should be retained and protected wherever possible.

In many areas of Western Australia transport corridor remnants have special environmental significance especially where they are the only remaining example of original vegetation within a cleared area. In these areas, the rail or roadside environment provides an opportunity for local communities and travellers to gain some appreciation of what the natural landscape looked like prior to settlement. In many instances they also provide the only available habitat for specialised ecological communities and the local flora and fauna found in them.

Vegetated roadsides are a legacy of the past and our responsibility for the future.



*Vegetation in transport corridors has many values (Photo courtesy of Westrail)*

## Special environmental areas

Western Australia supports an extensive network of roads that traverse all areas of this State, with often an accompanying network of telecommunications, gas, water and power lines. The construction and maintenance of these transport and utility networks often means that areas of heritage or conservation significance found within the rail and road verges are at risk and unfortunately are sometimes lost. In many instances these heritage or cultural assets are afforded legal protection by law, which provides for heavy penalties if they are infringed.

In an endeavour to prevent this unwitting disturbance and/or loss of these priceless assets, a system of marking special values within 'Special Environmental Areas' (SEA) has been developed by local governments and government agencies. The marking of these sites is generally at the discretion of the agency concerned. However, it is strongly recommended that there will be some uniformity in marking sites, so that all those working in the road or rail environment will know that they are in the vicinity of a 'Special Environmental Area'.

So what is a 'Special Environmental Area'? Simply put, it is a designated section of a roadside, which is of special significance and should be treated with care during road or utility construction or maintenance projects within these areas. The most common reason for designating an area as a SEA is for the protection of Declared Rare Flora. However, a section of road or railside could be designated as a SEA if it contains significant sites of other values, such as:

- threatened ecological communities;
- threatened fauna habitat;
- Flora Roads; or
- heritage and historical sites (Aboriginal and European).

Your legal responsibilities in protecting these sites and the method of marking sites, is detailed in Parts 2 and 3 of this publication.



*SEA markers identify areas of special significance (Photo by David Lamont)*

## Declared rare flora

Roadsides form linear transects through the landscape, and hence provide a representative sample of the native vegetation of the landscape through which they pass. In areas where extensive clearing of the landscape has occurred, certain vegetation types tend to be preferentially cleared because they are on lands more suited to the types of land use intended. In such areas, the roadside vegetation may represent a significant proportion of those vegetation types remaining in the region.

Within the south-west of Western Australia, extensive clearing has occurred outside the forest region for a number of land uses, but especially for intensive agriculture, horticulture and urbanisation on the coastal plain, and for broadscale agriculture within the wheat-sheep region to the east and north of the forests. These regions also occur in one of the most biologically diverse regions of the world. The native flora of the south-west is internationally renowned for its diversity and uniqueness, with an estimated 8000 species of native flora. Of these about 70% are endemic, or not known outside that region.

The high diversity of flora and the scale of landscape clearing combine to give a large number of flora in the south-west that are rare. Some of these may have been naturally rare, while others have been made rare by the destruction of their habitat. Flora that is rare or threatened, that is, likely to become extinct, may be declared by the Minister for the Environment to be 'rare flora', and are given special protection under the Wildlife Conservation Act. Such flora may be referred to as Declared Rare Flora (DRF) or nationally as Threatened Flora. Western Australia has some 30% of the nation's Threatened Flora (over 300 species), with most of these being found in the south-west region.

In addition to those flora declared as rare flora, nearly 2000 species of flora are listed as Priority Flora, that are either poorly known and need further information to determine if they should be declared as rare, or are rare but not currently threatened and are being regularly monitored to ensure their conservation. When added to the number of Threatened Flora, the Western Australian total represents over half of the national total of listed species.

Given the large number of Western Australian Threatened and Priority Flora, especially in the south-west, and the role that roadsides play in conserving remnant vegetation in this region, roadsides have a special value as flora habitat as shown in Table 1.

Table 1. Proportion of Declared Rare (Threatened) Flora populations and plants occurring in transport corridors in Western Australia		
	Percentage of Threatened Flora populations	Percentage of Threatened Flora Plants
Local Authority Roads	19.4	5.9
Main Roads	4.5	4.8
Rail Reserves	3.5	1.2
TOTAL	27.4	11.9

In total there are over 800 known Threatened Flora populations on road or rail reserves. This places a great onus on the managers of these lands and other persons seeking to operate on or near these sites to ensure that their activities do not impact on these flora, so as to maintain this State’s natural heritage for all the community. A number of Threatened Flora are either only found on road or rail reserves, or have most of their plants on these lands.

It is also evident from Table 1 that local authorities have a large number of relatively small Threatened Flora populations to manage. This reflects the large network of road reserves under their management, and the generally smaller width of roadside vegetation in these narrow road reserves, which limits the size of the available habitat for the Threatened Flora. The management of these small populations is vitally important to the conservation of many of these species. These roadsides need to be protected from further deterioration, and managed to enhance their habitat value.

By comparison, main roads tend to have fewer populations due to the smaller road/rail networks, but these populations are larger due to the generally wider width of vegetation available as habitat. Such populations are also important for the conservation of the species, and need to be managed to maintain their viability.

The management of flora on roadsides is based on firstly, not further damaging or degrading the flora habitat, and secondly, encouraging regeneration and expansion of the habitat to allow Threatened Flora populations to grow and be sustainable.

Because of the number of Threatened Flora, and also Priority Flora, populations on roadsides, accidental disturbance during roadside maintenance or other activities in the road reserve is a real risk. It is therefore recommended that road managers mark these populations along roadsides as Special Environmental Areas, so that such accidental disturbance is minimised. Linked to this is the need to raise awareness of the need to protect these areas with maintenance workers, roadside contractors, utility providers and the adjacent land managers, so that their activities do not degrade the vegetation.

Advice on the location and management of Threatened and Priority Flora populations is available from the Department of Conservation and Land Management.



*(Above) Roadside habitat of Caladenia busselliana (Photo by Diana Papenfus)*

*(Right) Caladenia busselliana (Photo by Andrew Brown)*



## Threatened ecological communities

Traditionally, flora and fauna conservation has focused on the conservation of species. Conservation is now seen as operating at several levels, namely genetic, species and ecosystem diversity, with increasing emphasis now being placed on conserving the biological diversity within whole ecosystems.

Ecosystem diversity is much more than just the sum of the species within that system. It incorporates the non-biological features (such as soil type, position in the landscape, behaviour and quality of water), the interactions between those factors and the biological species, and between the species themselves.

However, the identification and conservation of whole assemblages of plants that are unusual, even though the individual species may be quite widespread, is relatively new. In most cases these unusual assemblages will live in specific habitats which may also be unusual.

CALM has a program to identify specific ecosystems, or assemblages of plants and other organisms, that are restricted in distribution and under threat, and to establish procedures for their conservation. Such ecosystems are listed as 'threatened ecological communities' (TECs). Within Western Australia, 48 TECs have currently been identified, of which 20 are regarded as being Critically Endangered, 10 Endangered, 17 Vulnerable and one Totally Destroyed. Many other possible TECs are also being assessed.

Such 'threatened ecological communities' are not yet recognised in Western Australian legislation. However, the new Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* provides wide powers to the Commonwealth for conserving threatened ecological communities. Sixteen Critically Endangered Western Australian TECs are currently listed, and protected, under the Commonwealth Act.

Many TECs occur within road or rail reserves, or alongside them. The following table shows the occurrence of TECs on road and rail reserves on the Swan Coastal Plain, where ecological communities have been much better described than elsewhere in the State, and where clearing has been intense and widespread.

Table 2. Occurrences of TECs on road and rail reserves on the Swan Coastal Plain, Western Australia			
Category of TEC	No of different TECs represented on road and rail reserves	No of different occurrences on road and rail reserves	Area of TECs on road and rail reserves (ha)
Critically Endangered	4	10	17.9
Endangered	3	16	10.2
Vulnerable	3	4	21.2
TOTALS	10	30	49.3

In any case, although the actual areas of TECS on road or rail reserves may be quite small, they can still represent significant proportions of particular TECS, which by definition are usually very limited in area of occurrence.

In addition, there are many situations where a transport corridor with different vegetation runs alongside a threatened ecological community. In these cases, the vegetation on the road or rail verge may provide an important protective buffer to the adjacent threatened ecological community.

Conserving threatened ecological communities is an important part of protecting Western Australia’s biological diversity heritage. All occurrences on road or rail verges, and other remnant vegetation providing a buffer to TECs, should be marked as ‘significant environmental areas’, and protected against disturbance.

**Want more information?**

*CALM's Threatened Species and communities Unit at Woodvale, phone 9405 5100 for further details and information of distribution of TECs along transport corridors*



## Threatened fauna

The remnant vegetation of roadsides can provide important habitat for fauna, as breeding or feeding areas or as corridors that link one area of habitat to another, and permit the fauna to move between these areas.

Both of these uses are essential to the maintenance of local fauna populations, and the management of healthy and diverse vegetation on roadsides is encouraged for this reason.

While it is recognised that fauna may move from site to site, specific site protection or management may be appropriate where fauna is relatively immobile, or where specific habitat requirements exist, such as nesting sites. This is especially important for fauna that is Rare or Threatened, and therefore in danger of becoming extinct.

Under the Wildlife Conservation Act, the Minister for the Environment may declare fauna species to be specially protected where they are deemed to be Threatened. The habitat of such fauna needs to be protected, including on roadsides.

Specific Threatened Fauna sites on

roadsides may be identified and marked as Special Environmental Areas where they are at risk of accidental disturbance by roadside activities. Examples are specific stands of nesting trees, mallee fowl nests and populations of less mobile Threatened Fauna such as some species of Trapdoor Spider.



*Corridors along roads enable mallee fowl access to larger remnants (Photo by B & B Wells /CALM)*

Information on the occurrence or likely occurrence and management of Threatened Fauna on roadsides can be obtained from the Department of Conservation and Land Management.

### Carnaby's Cockatoo

Carnaby's Cockatoo (*Calyptrorhynchus latirostris*) breeds in the Wheatbelt region of Western Australia. In recent years the population of this raucous, gregarious bird has declined significantly. This decline can be directly attributed to the loss of more than 30% of its habitat in the last forty years, that is, salmon gum (*Eucalyptus salmonophloia*) country, which was considered to be the most suitable for agriculture. Most salmon gums now exist on road reserves in many areas where the Carnaby's Cockatoo occurs.

In April 1996 Carnaby's Cockatoo was listed as rare or likely to become extinct due to the declining population and continued loss of habitat. Surveys by CALM staff several years ago in the northern Wheatbelt indicated that Carnaby's Cockatoo will always nest in salmon gums when available. Of seventy nest trees monitored, 34% were on private property, nine% on Shire reserves and 56% on road and rail reserves.

Clearly the retention of these nest trees in the road and rail reserves is critical for the long-term survival of Carnaby's Cockatoo.



*Carnaby's Cockatoo depend on tree hollows in mature trees for nest sites. (Photo by Denis Saunders)*

## Caught Between a Road and a Bare Place

In 1956 a new species of trapdoor spider (the Yorkrakine trapdoor spider *Kwonkan eboracum*) was discovered in the central Wheatbelt, not far from Tammin. This spider was found living in remnant native vegetation on a farm, but within a few years the remnant was cleared for crops. This population of trapdoor spiders was lost with the native vegetation.

It was thirteen years before the Yorkrakine trapdoor spider was found again, this time in Yorkrakine Nature Reserve. Unfortunately the spider effectively vanished and was subsequently listed as 'rare or likely to become extinct' and afforded special protection under the Wildlife Conservation Act.

For approximately 30 years the spider was considered to be extinct but in 1999 it was found once more, on a road verge directly opposite the original 1956 collection site. Despite several intensive searches by experts it has not been found in Yorkrakine Nature Reserve again. So these trapdoor spiders' entire existence is now totally dependent on how we manage the very narrow road verge it lives on. Any action that might lead to the loss of the native vegetation, increased weed presence, increased fires or changes to the surface drainage due to modifications to the road or drain system could mean the end of this unique Western Australian spider.

Sadly, there are several more examples of native invertebrates whose distribution is wholly or largely restricted to roadsides. Roadside verges may not look like much but they are the only known habitat to some of our threatened native species.

## Flora roads

A Flora Road is a road which has roadside vegetation of special conservation or scenic value. These roads provide attractive roadside drives and can form a tourist route within a Shire or region. A road manager may identify a Flora Road on the basis of:

- a consultants report;
- recommendations from local interest groups; or
- on the basis of an Roadside Conservation Committee (RCC) survey of roadside conservation value.

Anyone interested in learning more about RCC surveys of roadside conservation value should contact the RCC. The survey has been developed to enable community volunteers to survey local roadsides using a form provided by the RCC. On the basis of the survey a score is allocated to the roadside vegetation based on a number of attributes present. Roadsides that attain a high score are considered as being high quality vegetation, and are very suitable for declaration as a Flora Road.

To delineate Flora Roads, a sign has been developed for this purpose and this can be seen in the illustration opposite.



*Flora Road sign alert travellers and workers to high conservation value vegetation along roadsides (Photo by David Lamont).*

## Cultural and historical sites

It is not uncommon to find sites of significant cultural value on roadsides. These sites can be broadly considered as either Aboriginal or European sites, but the 'sense of place' or local identity emphasised by roadside flora should also be recognised and protected.

### Aboriginal Heritage Sites

Roadsides may contain sites of Aboriginal significance, such as artefact sites, burial sites, sites of Dreamtime or ceremonial significance, or scarred trees that have been used for various purposes. Thus, the significance of an Aboriginal site may relate to non-living or living features, or cultural beliefs, and the management of the site may vary accordingly.

Activities such as grading of unsealed roads and shoulders can at times uncover evidence of Aboriginal sites. If burial or artefact sites are uncovered, work should cease immediately and the matter reported to supervisory staff.

There are severe penalties for damage to these sites, no matter for what reason. Anyone working in an area where Aboriginal sites are suspected or known to be present should contact the Aboriginal Affairs Department (AAD) / Aboriginal Cultural Materials Committee (ACMC) prior to the commencement of any work to ensure that known sites are not disturbed. It is suggested that road managers also contact local Aboriginal elders to determine the location of sites before undertaking major roadworks in their area.

There are strong confidentiality restrictions on these sites and it is unlikely that any form of site marking would be permitted. Where sites are known, road managers should consult with the Aboriginal custodians to determine if, and in what manner, the site might be marked to avoid accidental impacts.

To impact Aboriginal Heritage sites, developers/land users require written consent from the Hon Minister for Aboriginal Affairs (WA).

- Land use proponents are required to lodge Section 18 Applications (see p ??) with the Aboriginal Affairs Department (AAD) / Aboriginal Cultural Materials Committee (ACMC) in compliance with the Aboriginal Heritage Act 1972 (WA) when proposing to impact places of Aboriginal heritage and cultural significance.
- Main Roads WA are responsible for managing the protection of places and items of Aboriginal heritage and cultural significance which are located within their road reserves.

It is highly recommended that land managers consult the AAD Heritage and Cultural Division and conduct a search of the Aboriginal Heritage Sites Register at the AAD to identify if heritage sites are recorded in the proposed area to be developed. Land managers are encouraged to employ heritage consultants (archaeologist /anthropologists) to conduct an Aboriginal heritage study over the proposed project area prior to commencement of development. Consultants are able to identify heritage issues and make recommendation as to management and protection of heritage places, should heritage issues be identified during initial heritage investigations. Aboriginal heritage sites/items of significance should be protected by being sectioned-off (fenced in some way), their position identified by signage and also access to sites controlled. How sites are managed is subject to approval of the Aboriginal community/ACMC or the Hon Minister for Aboriginal Affairs.

The *Aboriginal Torres Strait Islander Heritage Protection Act 1984* (Commonwealth) also assists in the management of Aboriginal heritage issues. The Aboriginal Torres Strait Islander Commission and the Hon Minister for Aboriginal Affairs (Commonwealth) is responsible for administrating the *Aboriginal Torres Strait Islander Heritage Protection Act 1984* (Commonwealth).

The Aboriginal Affairs Department (WA) is responsible for administrating the *Aboriginal Heritage Act 1972* (WA). The Aboriginal Cultural Materials Committee and the Hon Minister for Aboriginal Affairs (WA) are responsible for the management and protection of Aboriginal heritage and cultural items in Western Australia.

## European Historical Sites

European cultural and heritage sites of significance include such sites as trees, pioneer graves, old school sites, wells, troughs or ruins, and are usually associated with the early European settlement of Western Australia. The National Trust or the WA Heritage Committee classifies these into groups of importance.

These sites are unlikely to have confidentiality restrictions and may, indeed, be prominently marked as tourist attractions or with information signs or plaques. However, if they are not marked and in danger of being damaged, their location should be brought to the attention of the local government authority and/or local historical group. Using appropriate signs or markers to prevent accidental damage should protect the site. Where marked as tourist attractions, care should be taken to ensure that it is safe for persons to stop and view the site.

The W.A. Historical Society, local historical group or tourist association can often provide information on the location of European cultural heritage sites.



*A roadside war memorial (Photo: David Lamont)*





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# Part 2

## LEGISLATION

# 2



## Legislation

There is a great diversity of legislation influencing the management of roadsides, and it is not surprising that uncertainty often arises amongst those working in the roadside environment. This section is not intended to be a definitive work on road/roadside legislation, but rather an indication of the scope of legislation that has a direct bearing on what can or cannot be done whilst working within a road reserve, particularly in relation to special environmental areas.

When a road (street) is dedicated to a public use, it becomes Crown land under the *Land Act 1933*. Dedication places care, control and management of the road (street) in the relevant local government authority, unless the road is declared a highway, main road or secondary road under the *Main Roads Act 1930*, in which case the care, control and management vests in the Commissioner of Main Roads WA. In both situations, land within the road remains the property of the Crown.

The local government authority or Main Roads WA, in managing a road (reserve), may undertake reasonable management of the roadside to facilitate the roadway, including making the road safe and convenient to use.

Thus, while local government authorities and Main Roads WA have clear management responsibilities for maintaining public roads, this management responsibility is limited to only those actions that can reasonably be considered necessary to maintain the roadway in good order.

Under the *Wildlife Conservation Act 1950-1979*, all native flora is protected flora and subject to the flora provisions of the Act, and that growing on Crown land is the property of the Crown. Thus, native flora growing on road reserves is not the property of the road management authority. Whilst road management authorities remove flora as necessary for road construction, road improvement or road safety, this is done without a licence under the provision of section 23B(2). In technical terms the road manager has not legally ‘taken’ the flora, but has moved or removed the flora within its rights from a legal ‘obligation’ or ‘duty’ viewpoint. The flora still remains the property of the Crown and a valid licence under section 23C(1) is required before any other party may legally take the flora.

The Wildlife Conservation Act makes no differentiation between ‘living’ or ‘dead’ flora. Thus all flora on roadsides, whether live or dead or piled there by road workers, remains the property of the Crown. Persons wishing to take such flora for whatever purpose should therefore be licensed by CALM to do so. In the case of the removal of cut firewood as salvage material, however, CALM does not currently enforce this licensing requirement. Persons wishing to take living flora material, including flowers, seeds and stems, however, must be licensed by CALM.

It should be recognised that CALM and the Minister for the Environment are under no obligation to allow flora harvesting from roadsides and that they can refuse to issue licences for such activities if such harvesting is contrary to nature conservation objectives, even if a road manager supports such harvesting.

In addition to the general provisions relating to protected flora under the Wildlife Conservation Act as described above, special protection is afforded flora that is declared to be rare or threatened under section 23F of the Wildlife Conservation Act. Other legislation also applies to the activities on roadsides which may affect the clearing of vegetation or other disturbance to the roadside.

The legislation pertaining to the management of road reserves is complex and includes those listed below.

#### *State legislation*

- *\*Aboriginal Heritage Act 1972*
- *Agriculture and Related Resources Protection Act 1976*
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Environmental Protection Act 1986*
- *\*Heritage of WA Act 1990*
- *Land Act 1933*
- *Local Government Act 1995*
- *Main Roads Act 1930*
- *Mining Act 1978*
- *Soil and Land Conservation Act 1945*
- *State Energy Commission Supply Act 1979*
- *Water Authority Act 1987*
- *\*Wildlife Conservation Act 1950-1979*

#### *Commonwealth legislation*

- *\*Environment Protection and Biodiversity Conservation Act 1999*

The Acts marked \* make specific reference to living or non-living things, and areas of roadsides where these are present may be required by the legislation to be protected from disturbance during maintenance or construction in the vicinity of these sites, unless specific authorisation is obtained.

Relevant sections of these Acts are further detailed below.

## State Legislation

### *Aboriginal Heritage Act 1972*

The *Aboriginal Heritage Act 1972* makes provision for the preservation, on behalf of the community, 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. The Aboriginal Affairs Department administers the *Aboriginal Heritage Act 1972* and it ensures that Aboriginals are responsible for the administration of the Act.

For our purposes here, pertinent Sections of this Act are as follows.

#### *Section 15*

Any person who has knowledge of any Aboriginal site or artefact, or landscape element must report it to the Aboriginal Sites Registrar.

#### *Section 16*

No one may disturb an Aboriginal site without permission from the Registrar of the Aboriginal Cultural Materials Committee.

#### *Section 17*

It is an offence to disturb any site without permission.

#### *Section 18*

In order to disturb any Aboriginal site, clearance must be sought from the ACMC, which then makes a recommendation to the Minister.

The ACMC may recommend to the Minister that an area of outstanding importance be declared a “protected area”.

### *Heritage of Western Australia Act 1990*

The Heritage of *Western Australia Act 1990* provides for and encourages the conservation of places which have significance to the cultural heritage in the State, establishes the Heritage Council of Western Australia, and covers related purposes.

#### *Section 4*

- 4 (1) This Act binds the Crown.
- (2) The Council (Heritage) shall be an instrumentality of the Crown in right of the State.
- (3) The objects of this Act, with due regard to the rights of property ownership, are:
- (a) to identify, conserve and where appropriate enhance those places within Western Australia which are of significance to the cultural heritage;
  - (b) in relation to any area, to facilitate development that is in harmony with the cultural heritage values of that area; and
  - (c) to promote public awareness as to the cultural heritage, generally.

#### *Section 61*

##### Contravention of Orders

- 61(1) Where a copy of a Stop Work Order,
- (a) is affixed in a prominent position on the place to which it relates; or
  - (b) is served on a person carrying out, or causing to be carried out, at that place any works or other activity,
- a person who carries out, or authorises, causes or permits to be carried out, in relation to that place any works or activity of a kind prohibited by that Order, commits an offence.
- (2) A person who in, or in relation to, a place to which a Conservation Order applies
- (a) damages or despoils that place or any part of, or thing in, that place;
  - (b) removes any thing; or

- (c) contravenes any prohibition contained in the Order, whereby the cultural heritage characteristics of that place are detrimentally affected, or who authorizes, causes or permits any other person to do any of those things, commits an offence.

The penalty for an offence against section 61(1) or (2) is \$10 000 and imprisonment for two years, and a daily penalty of \$1 000.

### *Main Roads Act 1930*

The *Main Roads Act 1930* Section 15(3)(a) vests all vegetation on roads under the control of Main Roads, both living and dead, in the Commissioner of Main Roads. However, where conflict or inconsistency occurs with the Wildlife Conservation Act (see below) the Wildlife Conservation Act prevails as it is more recent legislation.

15(3) The property in

- (a) the materials of all highways and main roads, and all live and dead timber and vegetation thereon, and all matters and things appurtenant thereto; .....

Shall vest in the Commissioner.

Section 15A of this Act also makes it an offence to damage or remove vegetation from roads vested in 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.

### *Wildlife Conservation Act 1950-1979*

The *Wildlife Conservation Act 1950-1979* and its associated regulations make provision for the conservation of Western Australian flora and fauna. The Act applies to any indigenous flora and fauna, and migratory fauna occurring in the State. This is regardless as to whether it is located on Crown or private land.

Under the *Conservation and Land Management Act 1984* the Department of Conservation and Land Management (CALM) is responsible for administering the Wildlife Conservation Act, and hence is the agency responsible for the conservation of flora and fauna in the State. As a consequence CALM has the authority to exert controls on the taking of protected wildlife in Western Australia from both Crown and private lands.

Several sections of this Act are of particular interest with regard to flora. Section 6 defines flora that is protected under this Act. Section 9 confirms that the provisions of this Act bind the Crown; and Section 23 outlines licensing requirements and the special protection of rare flora.

### *Section 6*

Interpretation of terms:

“flora” means any plant (including any wildflower, palm, shrub, tree, fern, creeper or vine) which is either native to Western Australia or declared to be flora under the Act, and includes any part of flora and all seeds and spores thereof.

“protected flora” means any flora for the time being declared to be protected flora for the purposes of this Act.

“to take” in relation to any flora includes to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or permit the same to be done by any means

In the Government Gazette, 9 October 1987, the following classes of flora were declared to be protected flora for the purposes of the Wildlife Conservation Act throughout the whole of the State:

- Spermatophyta (flowering plants, conifers and cycads)
- Pteridophyta (ferns and fern allies)
- Bryophyta (mosses and liverworts)
- Thallophyta (algae, fungi and lichens).

### *Section 9*

9(1) The provisions of this Act relating to flora bind the Crown.

Sections 9(2) and 9(3) outline procedures for the resolution of matters relating to the flora provisions of the Act with regard to the activities of local authorities, Government agencies and Government corporations in undertaking actions which arise with respect to any right, power or authority of, or discharge of any duty.

### *Section 23*

23A(1) The property in protected flora on Crown land, until lawfully taken, is, by virtue of this Act, vested in the Crown.

23B(1) A person shall not on Crown land wilfully take any protected flora unless the taking of the protected flora is authorised by, and carried out in accordance with the terms and conditions of, a licence issued to him under section 23C of this Act.

- 23B(2) In any proceedings for an offence against subsection (1) of this section it is a defence for the person charged to prove that the taking occurred as an unavoidable incident or consequence in the performance of any right, power or authority conferred upon, or in the discharge of any duty or obligation imposed upon, the person by or under any Act or agreement to which the State is a party and which is ratified or approved by an Act or notwithstanding the fact that the performance of that right, power or authority, or the discharge of the duty or obligation, was exercised in a reasonable manner.
- 23C(1) Any person may apply to the Minister for the issue to him of a licence to take protected flora on Crown land -
- (a) for commercial purposes; or
  - (b) for scientific purposes or any prescribed purpose,
- and the Minister may issue or refuse to issue such a licence.
- 23F(1) In this section “rare flora” means flora for the time being declared to be rare flora for the purposes of this section.
- (2) Where the Minister is of opinion that any class or description of protected flora is likely to become extinct or is rare or otherwise in need of special protection, he may, by notice published in the Government Gazette declare that class or description of flora to be rare flora for the purposes of this section throughout the State.
  - (3) The Minister may vary or revoke a notice published under subsection (2) of this section by subsequent notice or notices published in the Government Gazette.
  - (4) A person shall not, whether or not he is
    - (a) the holder of a licence issued under this Act to take protected flora;
    - (b) the owner or occupier of private land on which rare flora exists; or
    - (c) authorized by the owner or occupier of land on which rare flora exists,take any rare flora unless
    - (d) where he is not the holder of a licence issued under this Act, he first obtains the consent thereto in writing of the Minister;
    - (e) where he is the holder of a licence issued under this Act, he first obtains the further consent thereto in writing of the Minister.



- (6) A person who takes any rare flora contrary to the provisions of this section is liable on conviction to a penalty not exceeding \$10 000.

### *Section 14*

Section 14 of the Wildlife Conservation Act provides for the protection of fauna.

- 14(1) Except to the extent which the Minister declares by notice published in the Government Gazette pursuant to the provisions of this section all fauna is wholly protected throughout the whole of the State at all times.
  - (2)(ba) The Minister may, from time to time by notice published in the Government Gazette, declare that any fauna specified in the notice is for the purposes of this Act fauna which is likely to become extinct, or is rare, or otherwise in need of special protection and while such declaration is in operation
    - (i) such fauna is wholly protected throughout the whole of the State at all times; and
    - (ii) a person who commits an offence under section 16 or section 16A of this Act with respect to or in relation to such fauna is liable, notwithstanding any other provision of this Act, to a penalty of \$10 000.

## Commonwealth Legislation

### *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) recognises that nationally threatened species and ecological communities are matters of national environmental significance, and provides for their listing and impact assessment.

Generally, flora, fauna and ecological communities that are recognised as being threatened within the State are recommended for listed under this legislation. Hence, actions on roadsides that may impact on these entities may need to be referred to the Commonwealth for assessment, in addition to any compliance with State legislation.

This Act, which took effect on 16 July 2000, replaces five Acts:

- *Environment Protection Act 1974*;
- *Endangered Species Act 1992*;
- *National Parks and Wildlife Conservation Act 1975*;
- *World Heritage Properties Conservation Act 1983*; and
- *Whale Protection Act 1980*.

As has been previously stated this section is only intended as a guide to legislation with regard to SEAs. It is recommended that a cautionary approach be taken when working in SEAs and that the relevant authority be contacted if there is any doubt about the management or protection of heritage or conservation values that are present in the roadsides.

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# Part 3

## MANAGEMENT GUIDELINES



## Identification of Special Environmental Areas

Before significant roadside disturbance occurs, a site survey should be undertaken to determine if any Aboriginal, heritage or biological values of significance occur, and need to be protected or managed.

Road managers may also undertake a systematic program of roadside surveys to identify such values. In this way, road construction and maintenance programs can be planned to minimise disturbance to these values, thereby reducing costs of late redesign work, or rehabilitation of these sites if accidentally disturbed.

Land managers may also be notified of the occurrence of special environmental areas, such as cultural sites by the local historical society or the National Trust, Aboriginal sites by local Aboriginal communities, or sites of rare or threatened flora or fauna by CALM.

The most common notifications that local managers are likely to receive are those for declared rare flora. CALM has a system in place for surveying for rare flora and provides a standard letter of advice to land managers, plus a description of the plant and a map of its occurrence where such populations are found. CALM staff are also made available to show the road manager the plants in the field and to discuss management options.

### Nominated Officers

It is recommended that road management authorities nominate one individual/position to undertake the role of ‘nominated officer’ to receive any notifications about the occurrence or management of SEAs. In this way all matters relating to the protection of SEAs on road reserves can be dealt with on a consistent basis. The nominated officer may be the District Engineer, Environmental Officer or some other officer who has been given the responsibility of ensuring that the Shire’s records on SEAs are updated, and that road maintenance gangs are made aware of their existence.

## Special Environmental Area Register

Main Roads WA has devised a system to designate SEAs. This includes maintaining a register to record site details for planning purposes, flora recognition and management requirements such as the application of herbicides and burning controls. This system is endorsed by CALM and Westrail also utilises this method. A number of local government authorities already use this system and others are encouraged to do so also.

To ensure that knowledge of rare flora and other sites does not get lost, due perhaps to staff changes, a Road Management Authority should establish a Special Environmental Area Register. This will outline the location, the special values to be protected and any special treatment that the site should receive. The register should also contain contact details for authorities that should be referred to on issues regarding SEAs (for example, the local CALM office for declared rare flora).

The nominated person should consult the Special Environmental Area Register prior to starting work on any particular road, to ensure that inadvertent damage does not occur.

## Shire Plans

All Special Environment Area sites should be marked on a Shire map, such as one that records Roadside Conservation Value.

When advised of a SEA, the nominated officer should arrange to have the Shire plans (and Register) endorsed to include the location of the special environmental areas.

Operational staff should then be required to check the plans prior to the commencement of any works on road reserves to identify the presence or otherwise of any special environmental areas.

Where special environmental areas are located in an area where works are planned, the nominated officer should consult the Register if unsure of the management requirements of the site, and must contact the relevant authority for advice if the proposed works are liable to affect the site.

Please note that the work plans should not be made available to the public, as certain special environmental areas should remain confidential to protect their location.

This is especially important for specially protected values such as declared rare flora or Aboriginal sites.

## Roadside Markers

To avoid accidental disturbance or destruction of assets within a SEA, it is recommended that the road management authority install roadside markers at the site to warn workers of the SEA occurrence.



Main Roads WA has developed a system of roadside markers which has been largely adopted by local authorities and public service utilities. This system uses markers of a uniform shape and colour that make recognition easier for other authorities using road reserves while being inconspicuous and not readily identified by the general public. It is recommended that this system be used generally to provide a consistent approach which will assist workers and contractors to protect SEAs when moving from one Shire to another, whilst not disclosing the specific values of the site. The Shire's nominated officer should arrange to have SEA markers installed in the field once advised of the location of an SEA.

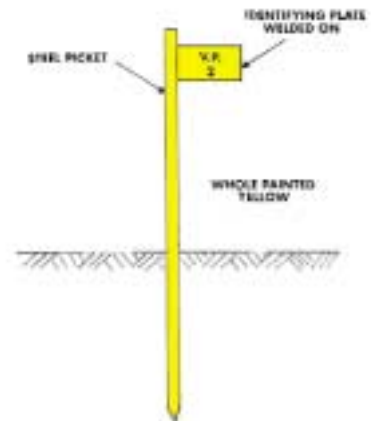
Where rare flora is located on a roadside, CALM district staff are available to assist, where necessary, and undertake a joint onsite inspection to identify the rare plants in the field. CALM will also provide advice to ensure that site markers are positioned at strategic locations within the road reserve.

In the case of wide road reserves or where the rare flora is close to an adjoining landowners fenceline, SEA markers are also placed along the fenceline to alert the adjoining property owner of the presence of the rare flora population.

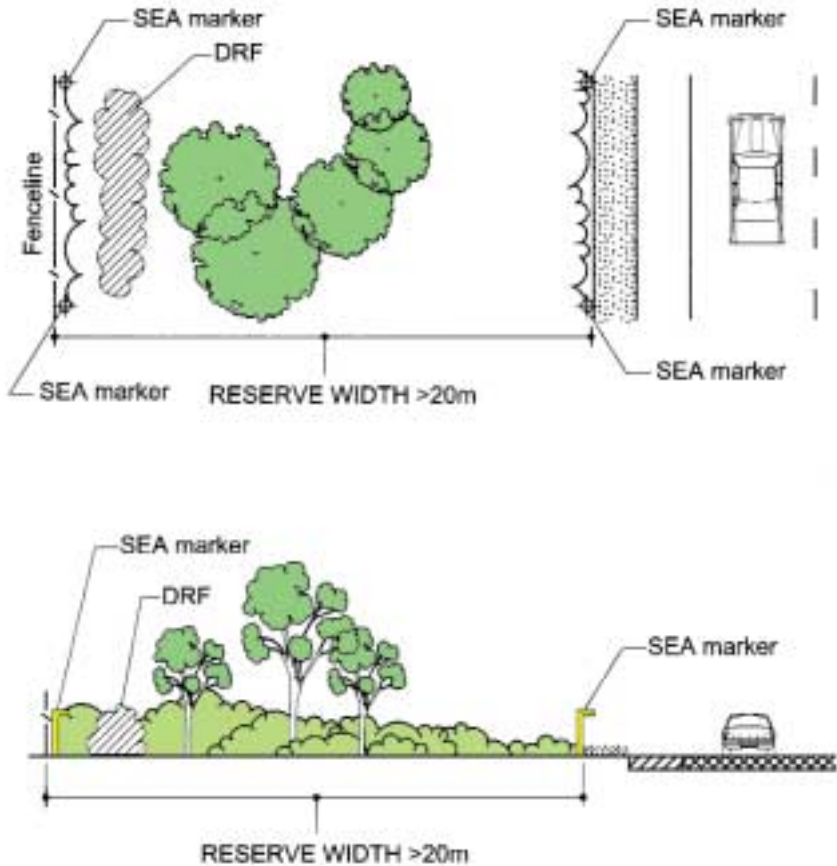
There is no doubt that threatened flora sites can be protected from accidental damage or destruction through the installation of site markers, but training and vigilance on the part of the field workers is also essential.

Operational staff or contractors working on behalf of the Shire should be advised that no vegetation clearing can be undertaken between roadside markers without first seeking advice from the nominated officer or the relevant authority. Such works include any maintenance activity within the table drain area of the road reserve.

The standard marker made from a star picket is shown opposite.



## Marking SEAs in wide road reserves



In case of DRF being located in a wide road reserve ie >20m, the SEA should be located adjacent to fence line as well as on roadside if the DRF is within 5m of the fence.

Figure 1

# Location of SEA markers in relationship to DRF

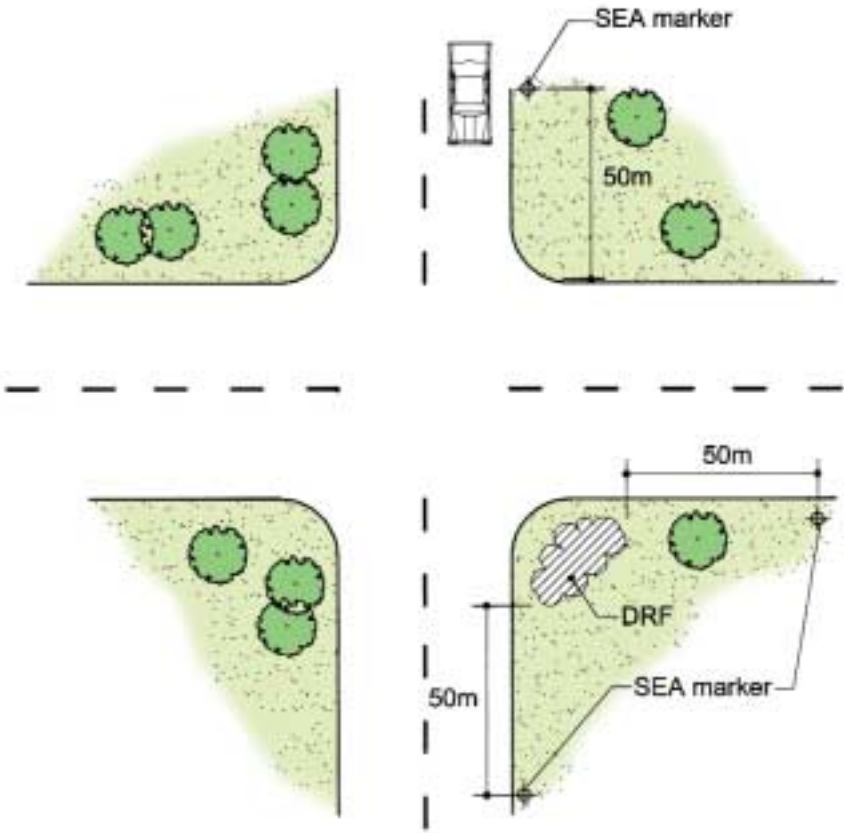


SEA markers should be located approximately 50m beyond the DRF.

Figure 2



## Marking SEAs near intersections



When DRF is located near an intersection SEA markers should be located 50m beyond DRF and on approaching roads.

Figure 3

# Suggested communication plan for Local Government with regard to rare flora sites

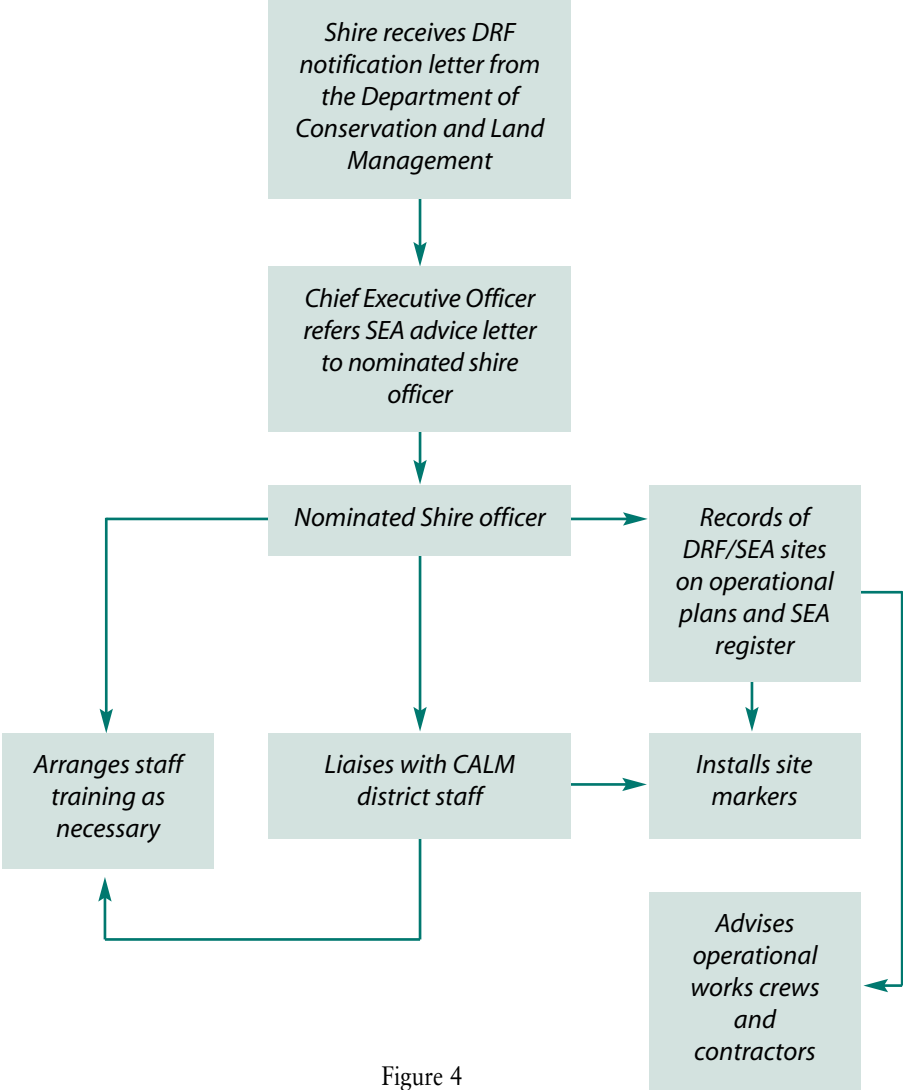


Figure 4

## Applications to Take Declared Rare Flora

There may be occasions where programmed road works will damage or destroy a population of rare flora. In such situations the Shire will need to apply for a permit to take declared rare flora prior to the commencement of the road works. Applications to take DRF are available from the local CALM Office nearest to where the road works are to be undertaken. CALM staff will assist with the preparation of the submission if required.



*Thelymitra stellarta* (Photo by Andrew Brown)



*Roadsides of high conservation value can be nominated as flora roads* (Photo by David Lamont)

## Flora Roads

The Roadside Conservation Committee has also developed special signs to designate Flora Roads, as a special category of special environmental areas whereby public knowledge of the roadside values is encouraged. The RCC will be pleased to provide details of the process of nominating a Flora Road.

## Aboriginal Heritage Sites

Most of the local Aboriginal community groups of the Southern/Southwest Regions of Western Australia strongly support the preservation and protection of all archaeological sites that are identified. These places demonstrate the fact that Aboriginal people have occupied the land areas long before non-Aboriginal people settled in the area. The Aboriginal community have demanded that these archaeological and ethnographic sites be protected from damage or total destruction. Community consultation is required as to how sites should be protected and the local area managed appropriately.

Signage for identifying heritage sites that are located within road reserves managed by Main Roads WA require the approval of the local Aboriginal community and Main Roads WA. Travelling public safety issues have to be taken in account in relation to signage size and position when located within the road reserve.

A number of Aboriginal communities have experienced damage to heritage site signage and vandalism/destruction to heritage sites. These types of actions cause serious problems for particular Aboriginal community members. As a consequence Aboriginal communities want to be consulted in the future regarding all matters pertaining to their heritage sites, i.e. signage, site identification, site access and heritage site management issues.

### ***For further information -***

*The WA Museum or Aboriginal Sites Department no longer manage Western Australian Aboriginal heritage issues. For assistance in this area, contact the Heritage Officer, Aboriginal Heritage and Culture, Aboriginal Affairs Department.*

## Training

The importance of the assets found within Special Environmental Areas places extra responsibility on all those working in the vicinity these sites. If the worker is not aware of SEAs or of any special care required whilst in these locations, damage will invariably occur. In many instances Aboriginal sites or declared flora populations may not be obvious to the uninformed and so it is important that the general vicinity of these assets are marked. In the case of flora and fauna sites the protection of road and railside remnants should apply to whole plant communities, that is, groundcovers, shrubs and trees. All are important and should be retained if the plant community is to remain as a healthy viable functioning entity.

It is essential that any workers involved in road maintenance activities are adequately briefed concerning the importance of SEAs. An annual training day would be one way to ensure that all staff, including new employees, are made aware of their responsibilities. Local CALM staff can be made available to brief Shire staff as necessary on aspects of rare flora protection and management.

The prime purpose of the Roadside Conservation Committee (RCC) in developing this publication has been to provide education and communication opportunities for roadside managers and workers with regard to special environmental areas in transport corridors. This publication should be made available to all road markers. CALM and the RCC have produced stickers to affix to vehicles working in transport corridors. It is hoped that these will remind workers to take care, especially when working near SEAs.



*Onsite briefing for shire workers (Photo by David Lamont)*

## Remember

- **Identify** areas of roadside with special environmental values as Special Environmental Areas (SEAs), and get advice about their management from the relevant authority.
- **Mark** SEAs with standard roadside markers to prevent them being disturbed accidentally, and inform relevant personnel within government agencies, local government and the community of the function of such markers.
- **Establish** a register of SEAs, and consult it as part of planning roadside management activities.
- **Designate** roads with high quality roadside vegetation as Flora Roads if they meet certain criteria, and manage such roads so as to maximise the roadside vegetation values.
- **Recognition** - increase public recognition of Flora Roads by erecting signs that publicise them, and encourage their promotion in tourist literature.
- **Educate** employees and contractors whose work may impact on roadsides about the importance of SEAs, the need to protect them and the procedures to be followed in preparing works programs and in the event SEA markers are encountered.

### Need Further Advice?

No operational activities should be undertaken within the boundaries of the roadside markers without receiving clearance from CALM or the relevant authorities. Shire staff or contractors operating on behalf of the road authority should contact their local work supervisor or, failing that, CALM District Staff for advice regarding SEAs.

## Fire

Few issues are as contentious as the use of prescribed fire in managing natural ecosystems. Although many of the native plants and plant communities found within Australia have evolved in a regime of periodic fires, simply burning transport corridors is **NOT** emulating past fire regimes. This is because these generally narrow remnants now have a multitude of other factors that bias and exaggerate the impact of fire.

Fire in these situations will inevitably alter the native vegetation but the extent of changes are dependent on a number of factors such as:

- species present;
- intensity of fire;
- frequency of fire; and
- season of fire.

The effect of roadside burning on native vegetation generally falls within three broad categories:

- **Destruction** - too frequent burning disrupts the natural seeding and succession cycles of plant communities. This has the effect of delaying or preventing complete regeneration.
- **Invasion** - repetitive burning encourages the intrusion of vigorous and aggressive annual weed species that in time out-compete the native vegetation, and in time replace it with highly flammable weeds.
- **Regeneration** - periodic prescribed burning can play an important part in the management of native flora where fire stimulation of seed is required.

Each situation must be assessed on its own merits and it is imperative that all fire applications should incorporate a balance between biological and property/life values. This is often difficult to achieve in the roadside environment where the extremes of choice will oscillate between an increase in weediness with the use of fire or senescence of the native vegetation with the exclusion of fire.

If a decision is made to use fire, only one side of a road should be burnt at a time as this will ensure retention of some of the scenic values associated with the road as well as providing habitat for associated fauna. Many roadside fires occur from escaping stubble fires and land owners should take every effort to ensure that stubble fires are confined to their properties.



*Regeneration burn at Banksia cuneata site (Photo by Penny Hussey)*

Fire can be particularly destructive to heritage sites, whether they are of Aboriginal or European origin. This is because these sites often incorporate a built structure or may in some way incorporate the native vegetation. As such these sites are at risk from the fire itself as well as fire suppression activities, particularly if earthmoving equipment is being used or trees are being felled.

Before any decision is made to burn a road verge, particularly if threatened flora are present, the proponent should be aware of all values present and the impact that the fire will have. It is illegal to burn roadsides where DRF is present without the written permission of the Minister for the Environment. In some instances fire may be prescribed in approved recovery plans as part of the recovery process of some DRF.

***Want to know more? Contact:***

*Environmental Officer  
Fire and Emergency Services Authority  
GPO Box P1174, Perth WA 6844*

*Operations Officer, District CALM Office  
see page 47 for details*



# Is that fire necessary?

## Fire Threat Analysis Test

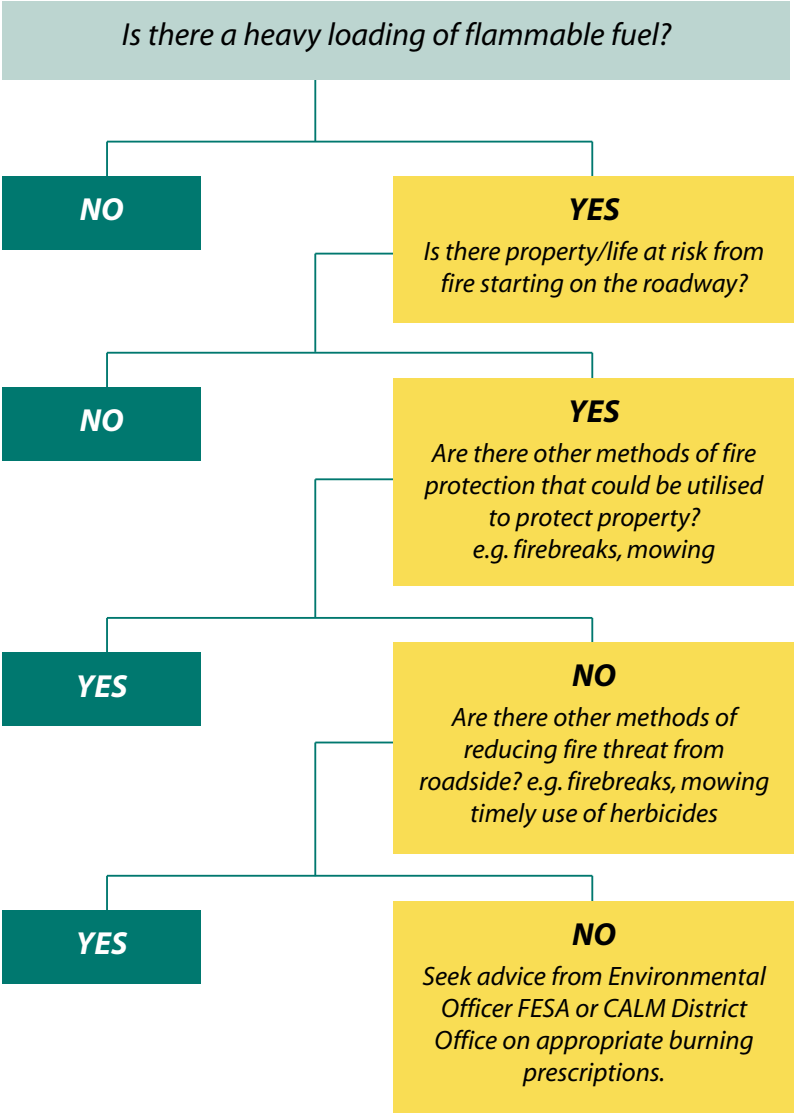


Figure 5

## Earthworks

The construction and more particularly maintenance of roads, associated works (drains, shoulders) and utilities (telecommunications, water, power and gas lines) within the road reserve are often of a re-occurring nature and have the potential to be an ongoing threat to SEAs. It is important that all those working in transport corridors are aware of all values and assets in their designated work area.

It is of the utmost importance that these sites are well marked with SEA markers and the location of all sites recorded in a local SEA register. The register should be consulted prior to commencing any onsite work and all staff or contractors working in these areas should be briefed as to the location of SEAs and the appropriate action to be taken.



*Earthworks have the potential to severely impact SEA sites (Photo courtesy MRWA)*

## Drainage

Drainage is an important feature of all roads. The construction of these structures needs to be considered from a biological perspective as well as an engineering one. The impact on biological and heritage assets should be considered on two levels, that is, the initial effect of the construction or maintenance, and the longer term effects which could be well away from the road run off point.

- Will the maintenance/construction impact on heritage or biological assets?
- Will there be any smothering of vegetation by drainage silt?
- Will the increase of drainage flow have any other impacts?
- Will there be any erosion impacts due to concentrated water flow?

## Water Erosion

Poorly installed drainage can lead to water erosion and this will result in loss of soil and soil borne nutrients, as well as plants and seeds. Due consideration must be given to landform gradient, soil type, ground cover and projected flow rates.

## Rabbit Control

The regeneration and growth of rare flora can be jeopardised by grazing rabbits. However, ripping of warrens within a road verge should not be considered without consulting the local CALM office. The use of 1080 baits is the preferred method of rabbit control in road verges and the local Agriculture WA officer should be consulted for expert advice on baiting.

# Phytophthora Dieback

About 25% of the 8 000 species of the native vegetation known from the south-west of Western Australia are susceptible to the effects of *Phytophthora cinnamomi*, commonly known as *Phytophthora* dieback. This includes common plants such as jarrah, grass trees, hakeas, banksias and grevilleas. Many of the declared rare flora species are known from these groups of plants so it is very important to ensure that maintenance and construction activities within the rail or roadside environment do not assist in the spread of this water borne pathogen.

A number of activities, undertaken within the road reserve, such as drain maintenance/construction, road maintenance/construction, soil disturbance and fire fighting activities have a medium to high risk of spreading *Phytophthora cinnamomi*. This can have a deleterious effect on roadside vegetation per se but declared rare flora are particularly threatened.

Table 3. <i>Phytophthora</i> Dieback Management Procedures	
Materials	Soil/sand/gravel brought on site should be obtained from accredited supplier or source.
Vehicles, equipment, machinery	All vehicles, machinery and equipment entering and leaving the site should be free of mud and soil (particularly on the tyres, mud flaps and under body).
Timing	Schedule the maintenance/construction to occur in dry soil conditions. This will reduce the prospect of vehicles and equipment transporting infected mud/soil and reduce the need to clean vehicles and machinery.
Soil movement	All material (soil/gravel/plant) should not be disposed of in localities adjacent to bushland or horticultural crops.
Water	Minimise water usage at sites and prevent water run off draining to bushland.

Adapted from *Managing Phytophthora Dieback: Guidelines for Local Government*

**Further Reading**

Managing *Phytophthora* Dieback Guidelines for Local Government, Dieback Working Group 2000

## Weeds

Many of the State's ecosystems are now under serious threat from weeds, particularly in transport corridors. This can be attributed to the extent and ongoing nature of disturbance (fire, earthworks) that occurs within the road reserve. However, just removing the weeds is not the answer, and weed control/eradication should only be considered as the first stage of a multi stage program. The use of herbicides or some other method of weed control should not be viewed as the final solution, because removal of existing weed growth will provide a vacant ecological niche that is more often than not filled by another weed that may not be as easy to control.



*Weed infestation at DRF sites increases the difficulty of management  
(Photo by Dianna Papenfus)*

All weed control programs should include follow up revegetation programs and ongoing weed control until the revegetation is well established and able to out compete any weed species present. If rare flora sites are marked, inadvertent damage to them can be prevented during weed control programs. Weedy sites, particularly annual grasses, are much more flammable which greatly increases the risk of fire damage to rare flora.

If a decision is made to use herbicides in transport corridors, the following section will provide some guidance.

## Herbicides

The objective of herbicide spraying is to deliver the prescribed rate of herbicide consistently to the **target area only**. Supervisory staff should ensure that the spray operator understands the importance of this.

Prior to any spraying operation, a field inspection of the site(s) to be sprayed should be made. This inspection should ensure that a note is made of all vegetation growing in the areas proposed for treatment. Adjoining land uses should also be recorded, with particular note made of crops or orchards on adjoining land or SEAs in the transport corridor.

Non-target vegetation within and adjoining intended target areas must be protected from herbicide spray drift and the effects of leaching.



## Spray Drift

Spray particle drift occurs when wind carries the finer particles of spray mixture outside the intended spraying area. Drift control can be achieved and damage to non-target vegetation minimised by observing the following guidelines.

- Keep the spray pressure as low as possible.
- Select the correct nozzle orifice that gives the desired droplet size.
- Limit the spraying travel speed according to droplet size
- Do not spray when wind speed and direction adversely affect spray pattern uniformity and/or spray drift to neighbouring vegetation.
- Avoid spraying when the apparent wind speed exceeds 10 knots.

Avoid spraying during hot, low humidity periods. The high evaporation rate reduces droplet size and increases drift potential.

## Contacts

**Main Roads WA**

<http://www.mrwa.wa.gov.au>

Don Aitken Centre

East Perth WA

08 9323 4111

**National Trust of Australia (WA)**

Old Observatory

4 Havelock Street

West Perth WA

08 93216088

**Fire and Emergency Services**

**Authority Environmental Officer**

GPO Box P1174

Perth WA 6844

08 9323 9573

**Aboriginal Affairs Department**

**Registrar of Aboriginal Sites**

197 St Georges Terrace,

Perth WA 6000

08 9325 8000

**Department of Conservation and**

**Land Management**

<http://calmweb.calm.wa.gov.au>

Wildlife Branch

17 Dick Perry Ave

Western Precinct

Technology Park

Kensington WA 6151

Locked Bag 104

Bentley Delivery Centre WA 6983

**Administrative Officer Flora**

08 9334 0422

**Executive Officer**

**Roadside Conservation Committee**

08 9334 0423

**WA Threatened Species**

**& Communities Unit**

Woodvale Research Centre

9405 5128

## Local CALM Offices

Location	Address	Postal address	Phone
ALBANY	120 Albany Highway ALBANY WA 6330		(08) 9842 4500
BROOME	Herbert Street BROOME WA 6725	PO Box 65 BROOME WA 6725	(08) 9192 1036
BUNBURY	South West Highway BUNBURY WA 6230	PO Box 1693 BUNBURY WA 6230	(08) 9725 4300
BUSSELTON	14 Queen Street BUSSELTON WA 6280		(08) 9752 1677
CARNARVON	Small Boat Harbour CARNARVON WA 6701	PO Box 500 CARNARVON WA 6701	(08) 9941 1801
COLLIE	COLLIE WA 6225 147 Wittenoom Street	PO Box 809 COLLIE WA 6225	(08) 9734 1988
DENHAM	67 Knight Terrace DENHAM WA 6537		(08) 9948 1208
DWELLINGUP	Banksiadale Road DWELLINGUP WA 6213		(08) 9538 1078
ESPERANCE	92 Dempster Street ESPERANCE WA 6450	PO Box 234 ESPERANCE WA 6450	(08) 9071 3733
EXMOUTH	Payne Street EXMOUTH WA 6707		(08) 9949 1676
GERALDTON	193 Marine Terrace GERALDTON WA 6530	PO Box 72 GERALDTON WA 6532	(08) 9921 5955
HARVEY	64 Weir Road HARVEY WA 6220	PO Box 505 HARVEY WA 6220	(08) 9729 1505
JURIEN	Lot 96 Bashford Street JURIEN BAY WA 6516	PO Box 208 JURIEN BAY WA 6516	(08) 9652 1911
KALGOORLIE	Post Office Public Building Hannan Street KALGOORLIE WA 6430	PO Box 10173 KALGOORLIE WA 6430	(08) 9021 2677
KARRATHA	Mardie Road Karratha Industrial Estate KARRATHA WA 6714	PO Box 835 KARRATHA WA 6714	(08) 9143 1488
KATANNING	56 Clive Street KATANNING WA 6317	PO Box 811 KATANNING WA 6317	(08) 9821 1296
KIRUP	South Western Highway KIRUP WA 6261		(08) 9731 6232
KUNUNURRA	Messmate Way KUNUNURRA WA 6743	PO Box 942 KUNUNURRA WA 6743	(08) 9168 0200



Location	Address	Postal address	Phone
MANDURAH	Lot 31 Pinjarra Road MANDURAH WA 6210	PO Box 1266 MANDURAH WA 6210	(08) 9582 9333
MANJIMUP (DISTRICT)	Brain Street MANJIMUP WA 6258	Brain Street MANJIMUP WA 6258	(08) 9771 7988
MANJIMUP (REGION)	Brain Street MANJIMUP WA 6258	Brain Street MANJIMUP WA 6258	(08) 9771 7948
MARGARET RIVER	Bussell Highway MARGARET RIVER WA 6285	Post Office MARGARET RIVER WA 6285	(08) 9757 2322
MERREDIN	1st Floor, 13 Bates Street MERREDIN WA 6415	PO Box 332 MERREDIN WA 6415	(08) 9041 2488
MOORA	The Arcade Dandaragan Street MOORA WA 6510	PO Box 328 MOORA WA 6510	(08) 9651 1424
MUNDARING	Mundaring Weir Road MUNDARING WA 6073		(08) 9295 1955
NANNUP	Warren Road NANNUP WA 6275		(08) 97561101
NARROGIN (DISTRICT)	Hough Street NARROGIN WA 6312	PO Box 100 NARROGIN WA 6312	(08) 9881 1113
NARROGIN (REGION)	7 Wald Street NARROGIN WA 6312	PO Box 100 NARROGIN WA 6312	(08) 9881 1444
PEMBERTON	Kennedy Street PEMBERTON WA 6260	PO Box 20 PEMBERTON WA 6260	(08) 9776 1207
PERTH	5 Dundee Road WANNEROO WA 6065		(08) 9405 1222
SWAN REGION	20 Dick Perry Avenue KENSINGTON WA 6151		(08) 9368 4399
WALPOLE	South Western Highway WALPOLE WA 6398		(08) 9840 1027
WOODVALE RESEARCH	Wildlife Place WOODVALE WA 6026	PO Box 51 WANNEROO WA 6946	(08) 9405 5100

## Environment Australia

GPO Box 787, CANBERRA ACT 2601  
Phone 6274 1111

Copies of the *Environment Protection and Biodiversity Conservation Act 1999* are available at the Government Bookshop or on the Internet at <http://SCALEplus.law.gov.au/html/comact/browse/TOC25.htm>.

Alternatively, a brochure on the Act is available on Environment Australia's Internet site, <http://www.environment.gov.au/epbc>