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Roadside Handbook

An Environmental Guide for Road Construction and Maintenance

Mowing and Slashing

Mowing is not recommended in areas of natural native vegetation. Regular mowing removes young plants and prevents natural regeneration. When young trees and shrubs become established, they will shade out grasses and reduce the need for mowing. Mowing should be undertaken in accordance with advice from the Regional Environment Officer and in accordance with the Roadside Conservation Management Plan, e.g. mow after weed spraying has occurred within the roadside.

- Mowing is only necessary in areas with suitable landscaping (e.g. urban roads) and for road and fire safety.
- Where mowing is essential use stakes to protect groups of young trees and shrubs.

Native grasses and wildflowers can only be mown in accordance with the Roadside Conservation Management Plan, or following advice from the Regional Environmental Officer. Mowing will only usually be allowed after seeding or flowering. In most cases this is in the Autumn.

CHECK: Is there a Roadside Conservation Management Plan describing mowing requirements for the section of road?

Mowing in the road reserve.

Pruning Trees

Trees and other plants on roadsides should be preserved wherever possible. Careful pruning of overhanging branches can often reduce the need for complete tree removal.

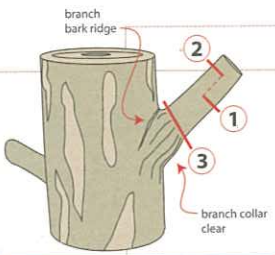
Consider the following points before any action is taken:

- safety of staff, property and road users
- the effect of the tree removal on the appearance of the roadside
- the historical significance of the tree (check with the Regional Environment Officer)

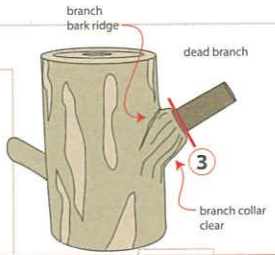
CHECK: Have required approvals been obtained prior to removing or pruning native vegetation?

Retention of stumps and logs for animal shelter is encouraged wherever possible. Lighter material can be chipped for mulch.

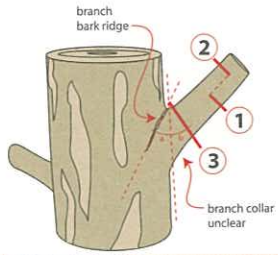
To protect the long term health of the tree, any branch thicker than 1 cm should be carefully pruned by a qualified Arborist as shown.



Example 1 - Pruning when the branch collar is clear.



Example 2 - Pruning a dead branch when the branch collar is clear.



Example 3 - Pruning when the branch collar is not clear.

Cuts 1 and 2 involve an under cut and upper cut for larger branches to stop bark being stripped below the final cut.

The final pruning cut (3) is located just outside a natural protection zone that is found within the branch collar (example 1 and 2). If the collar is not clearly visible, the branch bark is reflected through an imaginary line parallel to the main trunk or branch to estimate the branch collar (example 3).

This is called natural target pruning and matches the Australian Standard for Pruning Amenity Trees (AS 4373-1996).

Avoid 'tidying up' Vegetation

Grading the roadside, spreading topsoil into vegetation and thinning out plants causes unnecessary disturbance to the soil and vegetation and encourages weed spread.

Leaving vegetation undisturbed wherever possible during construction means there is less need for costly and destructive ground repairs after construction.

Shrubs, logs, old or dead trees and small native plants are valuable for wildlife and should be retained wherever possible unless they are a threat to safety or utility services.

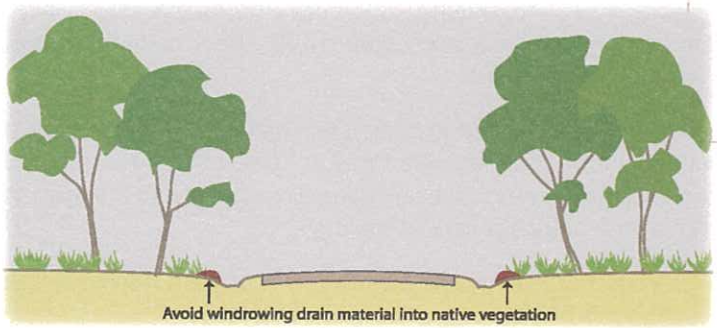
Logs, old or dead trees are valuable for wildlife and should be retained.

Remove Drain Spoil

Avoid extra reshaping of table drains and windrowing drain material into roadside vegetation.

Exposed earth and drain spoils are ideal for weed establishment.

- Direct the spoil from drains towards the road pavement (for collection).
- Remove spoil and dispose in an area that will not cause a weed problem.



Protect Natural Regeneration

Natural regeneration is the natural establishment of native plants from seed-fall or suckering. It costs nothing and ensures that local roadside vegetation continues to survive by being replaced over time by young plants.

- Disturbance of regrowth encourages weeds, which compete with young plants.
- Regenerating areas may not be obvious. Mark these areas with stakes where mowing or other activities are likely to occur.

Native grasses should be allowed to naturally regenerate. These areas should not be mowed during flowering and seed dispersal seasons.

CHECK: Where are native grasses located? This information should be available in the Roadside Conservation Management Plan or can be provided by the Regional Environment Officer

Natural regeneration improves the roadsides.

Ground Flora

Fencing creates a 'no go zone' to protect native vegetation near Merri Creek on the Craigieburn Bypass.

Most of Victoria's rarest plants are less then 1 metre tall. Ground flora may not always appear to be significant, however these plants are equally as important as trees and require the same level of protection.

Shrubs and ground cover (or ground flora) can be protected by identifying "no go zones". These are sometimes specified in contracts and/or permit conditions but can also be agreed on site with relevant parties. It is equally important to avoid dumping of spoil in areas of remnant vegetation within roadsides; rather it is preferred to direct spoil onto areas that have been previously disturbed.

CHECK: Have you fenced off all areas of high environmental value? If you're not sure what you're looking at seek advice from your Environment Officer.

Minimise Disturbance to Native Fauna

Roadside vegetation provides habitat for native fauna and provides corridors for the movement of animals. Efforts for protection of fauna habitat tend to focus on tree protection; however for approximately every species that lives in the canopy, 30 species live at ground level.

It is important to note, native fauna includes soil organisms, ground dwelling insects, small mammals, birds, reptiles and larger native animals.

Disturbance to wildlife habitat should be limited where possible.

- Machinery movement in vegetated areas should be kept to a minimum.
- Site staff should be made aware of the potential presence of fauna.
- Where practical, trees with hollows should be retained, including dead trees.
- Tree felling should not occur during the nesting season (generally spring), unless they pose an immediate risk to safety.

Wildlife crossings should be considered for all new roads. More than 100 different species use the Slaty Creek fauna underpass on the Woodend Bypass.

Hollow log - these are an important wildlife habitat.

Minimise Disturbance to Cultural Heritage

Where activities involve ground disturbance and/or tree removal, cultural heritage objects and places may be impacted.

In Victoria, VicRoads has legal obligations to protect both Indigenous and non-Indigenous cultural heritage sites.

It is important to note that not all cultural heritage sites are identified on official registers.

CHECK: Have required approvals been obtained? If you are not sure what needs protecting on site, seek advice from the contract manager or the Regional Environment Officer.

Scarred tree on roadside.

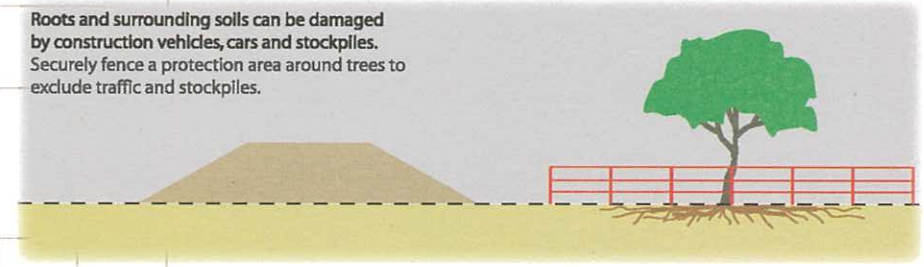
In many areas across the state VicRoads has developed agreements and protocols for managing Indigenous cultural heritage matters associated with road management. There may be requirements identified within these agreements that go beyond the permission to disturb, such as the erection of interpretive signage.

CHECK: Is a protocol or agreement in place? If so, what are your responsibilities?

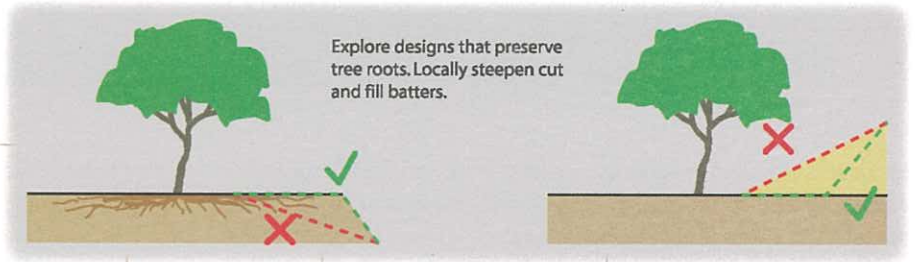
Aboriginal heritage monitoring by Indigenous monitors may be required where works involve the stripping or excavation of soil.

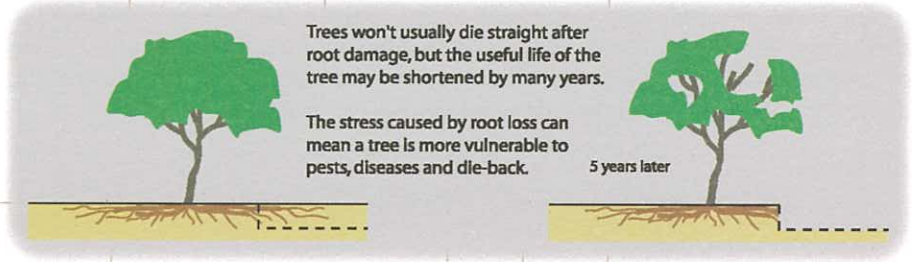
Should an Indigenous site or artefacts be found, work should stop.

Mark trees and other vegetation to be protected on construction plans. Include tree protection measures in the Environmental Management Plan and staff inductions.



If in doubt about tree protection, seek help from your local Environmental Officer. For a fast opinion, email a photo. In some cases, you may need help from a qualified Arborist.

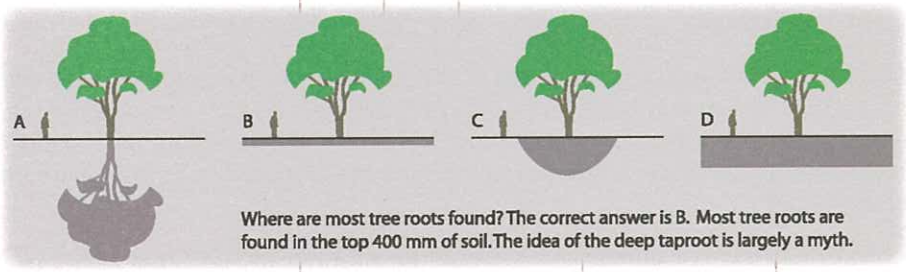




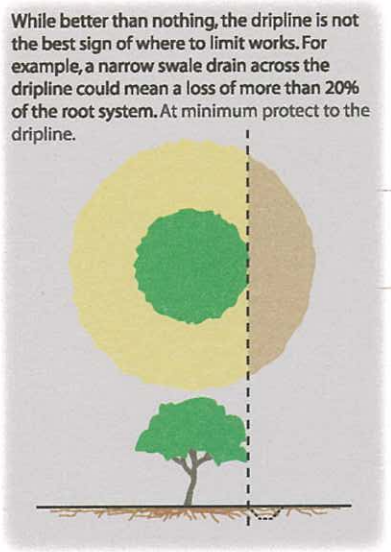
Where roots must be cut, leave a clean edge to the cut. See page 17 for advice on pruning trees.

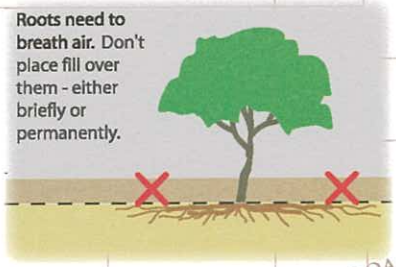
Tree Protection

Tree roots need access to water and nutrients and space to grow. Tree roots must be able to breath oxygen too, just like people.



Storing fill and driving even small vehicles around trees can damage fine roots and cause soil compaction. The resulting root loss, lack of oxygen or changes to the water regime can damage and kill trees.





Control Soil Erosion

Erosion removes valuable topsoil and produces sediment, which silts drains, creeks and rivers.

Erosion can be reduced by adopting the following principles:

- minimise the amount of exposed erodable surfaces and areas being actively worked at any one time
- disturb the soil as little as possible, minimise the timing between clearing and stripping of the site and covering of erodable surfaces
- prompt temporary and/or permanent progressive revegetation of the site as work proceeds
- install and maintain catch drains to adequately control and route runoff to the appropriate sediment control
- treatment of open drains to prevent erosion before adjacent ground is disturbed and commencing excavation
- prompt covering of exposed surfaces (including batters and stockpiles) that would otherwise remain bare for more than 28 days; cover may include mulch, erosion control mat or seeding with sterile grass
- limit soil shift and wherever possible replace soil exactly where it was removed from
- avoid concentration of runoff by making drains as wide as possible, up to two metres where practical; shape the drainage surface so water sheets across the surface rather than being channelled
- plant constructed drainage lines (may require some ripping and topsoiling); drainage lines should not be heavily compacted
- avoid excessive or unnecessary rock beaching, ensuring it can be easily planted or seeded; beaching should only be used to dissipate fast high energy water

Where it is not possible to revegetate an area or avoid disturbance, utilise appropriate erosion preventative devices, e.g. silt fences, jute matting, water diversion, or a combination, to maximise erosion control.

Weeds

Noxious and environmental weeds can be spread during road construction, maintenance and operation. VicRoads has obligations under the Catchment and Land Protection (CaLP) Act to prevent the spread of noxious weeds.

- Noxious weeds are plants which are declared to be a serious regional threat to agriculture and the environment by the Catchment Management Authority.
- Environmental weeds are not listed under the CaLP Act but are recognised as having potential to threaten natural ecosystems. They may be non-Australian plants, or native plants that did not originally grow in the area.

It is important to ensure you are aware where weeds are located, how they can be best controlled and what your responsibilities are.

CHECK: Have you asked the Regional Environmental Officer, the Department of Primary Industries or the Catchment Management Authority for lists of regional weed management priorities, including lists of declared noxious weeds?

Spanish Heath, an environmental weed, often found on roadsides.

Minimise Disturbance To Vegetation

Remnant native vegetation includes more than just trees. Trees, shrubs and groundcovers (creepers, grasses and herbs) combine to provide valuable food and shelter for different types of wildlife. It is important to note that some significant patches of native vegetation are naturally devoid of trees, such as grasslands and heathlands. Generally, less maintenance is required if good quality native vegetation is left undisturbed.

By clearly identifying vegetation that is to be removed or protected during a site inspection, vegetation removal can be programmed, so that site disturbance, exposure to weed invasion and erosion can be minimised. Where disturbance/removal is unavoidable, it is important to limit the disturbance to the minimum area needed.

Unless unavoidable, all machinery should be kept out of areas that have been identified as environmentally or culturally significant. In Victoria, most vegetation removal on public land requires some approval. If there is doubt it is important to check with the Regional Environment Officer. Accidental or deliberate clearance/disturbance without appropriate approvals may lead to an investigation by the Local Council, the Department of Sustainability and Environment and/or the Australian Government Department of Environment and Heritage (for matters related to the EPBC Act).

CHECK: Have required approvals been obtained? If you are not sure what needs protecting on site, seek advice from the contract manager or the Regional Environment Officer.

Undisturbed bushland on roadsides.

Inspect Site Prior To Works

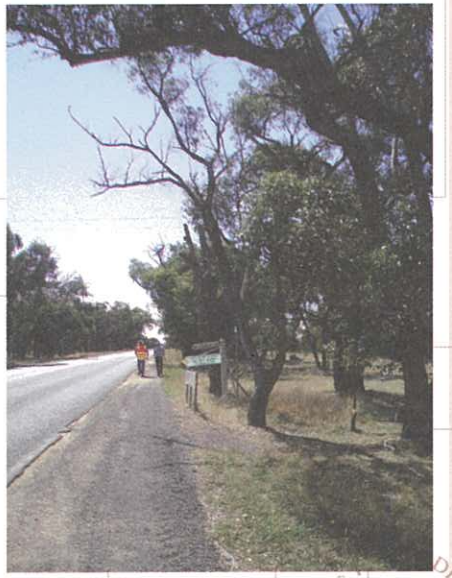
Inspecting the site is recommended so that areas of environmental or cultural heritage significance can be identified and managed appropriately during works. Depending on the works being undertaken this might be a quick check of the site prior to commencing works, or a more thorough walk through, which is suitable for more complex works or works within sensitive areas.

The initial site inspection should involve the contract manager and site supervisor and/or senior site staff.

In areas that are culturally or environmentally sensitive, inclusion of staff from the Department of Sustainability and Environment, environmental staff from the Local Council, representatives from the local Indigenous group and the VicRoads Regional Environment Officer can add value to a site inspection.

To minimise the impact of works, the site inspection should identify:

- limits of stripping and where all vegetation removal should start and finish, this can be done by using paint or tape to mark trees to be removed and to show the direction of felling (it is recommended that painting and marking of trees be away from the road and as inconspicuous as possible)
- significant or protected vegetation and sensitive areas, which are to be protected from disturbance
- cultural heritage sites that are required to be protected
- exact location of sites for stockpiles, no-go zones, plant compounds and access roads etc



Potential environmental issues can be identified during the site inspection.

Weed Control Activities

The spread of weeds can be controlled by:

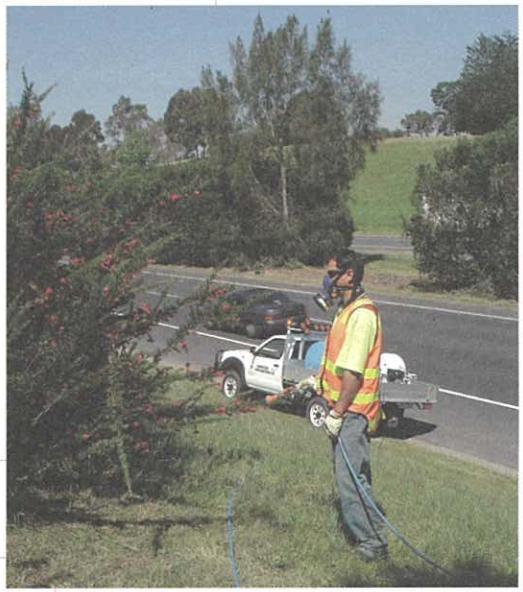
- washing down machinery before leaving areas of weed infestation
- washing down machinery before entering areas which have low weed infestation or are in a near natural condition
- beginning work in areas of high quality then moving to areas of lower quality
- mowing areas infested with weeds during the appropriate season (i.e. before they go to seed)

Damaging plants other than weeds can cause greater weed problems due to larger areas of disturbance. This can be reduced by:

- knowing your weeds and making sure you can distinguish between vegetation to be controlled and vegetation to be protected
- spraying weeds from a close distance
- using low pressure and large droplet size to minimize drift
- spraying in the right weather, calm and dry conditions
- spraying weeds within the right season (e.g. when weedy grasses are distinguishable from native species)

In instances where weeds sit among native vegetation, make sure weed control techniques are specific. These can include:

- drilling and filling, or cutting and painting
- using specific herbicides
- using spray hoods where possible
- hand pulling (for occasional plants)



Weed control activity using targeted spraying.

Confine Activities within the 'Work Zone'

The 'work zone' is the area marked out with pegs where all work activities take place (such as the area stripped for road construction, stockpile areas, compounds etc.).

A single machine can cause extensive damage to native vegetation.

- Use the appropriate type and minimum size of machine for the job.
- Stay within the marked 'work zone'.
- Confine machinery to well-defined access tracks.

Activities confined within 'work zone'.

Locate stockpiles, site compounds, vehicle turning areas etc. on previously cleared land

Stockpiles, construction compounds, vehicle turning areas and the like should be located on land already cleared of native trees, shrubs and grasses. If there is no suitable land on site, it may be permitted on nearby private land with approval from the land owner.

Stockpile areas should be clearly identified with a temporary fence or large logs to prevent the stockpile from encroaching into areas of native vegetation.

Storage of equipment and materials, should not occur close to vegetation as it can damage important feeder roots of trees as well as damage ground flora.

PART 2:

Environmental Guidance for

Maintenance and Construction

The Value of Roadsides

Remnant roadside vegetation on the Timboon-Port Campbell Road.

Roadsides have many environmental, historic and cultural values, because unlike private land, they have been protected from agriculture and development. Consequently, they often contain:

- the last area of remnant vegetation in a landscape including endangered flora species
- habitat and movement corridors for native fauna including endangered species
- significant Aboriginal cultural heritage sites (e.g. scarred trees)
- historic reminders of colonial times and significant historical events (e.g. stone walls and avenues of honour)

Roadsides can also contain strategic fire prevention measures (e.g. fire breaks) and, if wide enough, provide a barrier to road traffic noise for the local community.

Stripping and stockpiling

Stockpiling topsoil that has been stripped from areas that contained good quality native vegetation is recommended. Topsoil contains organic matter and is potentially a local seed bank. Weed infested material (e.g. drain spoil containing pasture grasses) should not be stockpiled on, or next to land which has native vegetation.

Stripping and stockpiling should be carried out as follows:

- strip the top 100-200 mm of topsoil before starting any major works, making sure that topsoil is not mixed with poor subsoil
- locate soil stockpiles in cleared areas away from existing drainage lines, trees, shrubs and native grasses, removing any weeds before stockpiling by spraying or scalping
- stockpile for less than 12 months, if possible, to ensure that the seed in the soil remains viable
- stockpile to a maximum height of 2 metres, so as to preserve seed viability

Road work programs should be vigilant in treating any weed outbreaks or infestations in any stack-sites or stockpiles.

Site topsoil should be kept on site for revegetation purposes. It should only be buried or sold where it is not required on site or on another nearby VicRoads project.

Topsoil stockpile, surrounded by a silt fence.

Fire Prevention

Strategic firebreaks or fire prevention methods are the most effective way of protecting the countryside and the safety of road users from wild fire. However, not all roadsides need to be cleared, cleaned up or mown to provide reasonable fire precautions.

In most situations, mowing behind the guidepost is not required, unless there are specific contract requirements (e.g. for freeways).

Removing fine grass, leaf litter and twigs to form strategic firebreaks may be warranted. Material greater than the diameter of a pencil (such as stumps, dead trees and shrubs) does not contribute significantly to the spread of fire and may not need to be removed.

In native grasslands, controlled burning may reduce the fuel load and encourage a better balance of plant species. The Regional Environmental Officer can provide further advice on environmental management burning.

All roadside fire prevention works must be in accordance with the Municipal Fire Prevention Planning and the CFA Roadside Fire Management guidelines.

Wherever possible, firebreaks should be placed on neighbouring land which has already been cleared or where the road reserve is already cleared and weedy.

Where this is not possible, identify and avoid any rare or significant plants before starting firebreak construction. Firebreaks on roadsides can destroy ground plants, introduce weeds, disrupt drainage and cause soil erosion. This may increase long-term maintenance costs.

Construct firebreaks on neighbouring land.

Roadside Conservation Management Plans

Roadside Conservation Management Plans contain useful information on the known environmental and cultural heritage assets within a particular section of roadside and identify specific management activities for best maintaining these assets (where necessary). Processes for fire protection, vegetation management, heritage management, water quality, environmental protection should be included in the plan.

CHECK: Is there is a Roadside Conservation Management Plan or environmental/ cultural heritage survey covering the section of road where works are planned? Contact the Regional Environment Officer for more information.

Environmental Management Plans

Contractors are required to prepare Environmental Management Plans (EMPs) for all construction and maintenance projects. The EMP should be site specific and appropriate to the sensitivity of the environment and the complexity of the project.

Special Environmental Areas

VicRoads, contractors and local councils sometimes use signs or markers to alert travellers, local people and workers of the special value of roadsides (including significant areas of vegetation). Work should not start on these sites or between these markers without seeking approval of the VicRoads Region, contractor or local council shown on the sign and quoting the code number. It should be noted that not all significant roadside areas are marked.

Significant Roadside sign.

Environmental sign at Calder Corridor projects.

Legislation and General Information

Environmental Obligations and Legislative Controls

The environment is governed by a wide range of State and Commonwealth legislation to ensure its protection. The following legislation is considered to be relevant to works within the roadside:

- Wildlife Act, 1975 (Vic)
- Heritage Act, 1995 (Vic)
- Road Management Act, 2005 (Vic)
- Country Fire Authority Act, 1994 (Vic) (CFA Act)
- Environment Protection Act, 1970 (Vic)
- Planning & Environment Act, 1987 (Vic)
- Flora & Fauna Guarantee Act, 1988 (Vic) (FFG Act)
- Catchment & Land Protection Act, 1994 (Vic) (CaLP Act)
- Aboriginal Heritage Act 2006 (Vic)
- Environment Protection & Biodiversity Conservation Act, 1999 (Cth) (EPBC Act)

It should be noted that this list is not exhaustive and was current when this handbook was printed. If you are unsure of your legal obligations, it is recommended you seek expert environmental or legal advice.

VicRoads has an Environment Strategy and Roadside Management Strategy. These documents describe the strategic direction in managing environmental assets within roadsides and consideration needs to be given to these values when working in roadsides.

Consent under the Road Management Act

Consent from the coordinating road authority is required for all works that are to be undertaken within the road reserve, under Section 63 – Interference with a road, of the Road Management Act. Works may include any kind of activity conducted on or in the vicinity of a road or proposed road in connection with the construction, maintenance or repair of the road or the installation, maintenance or repair of any infrastructure in, on, under or over a road reserve. This may include the planting or removal of trees or other vegetation.

Manage Waste and Reuse Where Possible

Road materials can lead to soil and water contamination.

Road and roadside activities should aim to eliminate or minimise the production of wastes. This can be achieved by the separation of products for recycling and reusing. Where possible do not take material wrappings and packaging into the field.

Remove waste, including weed infested spoil from site.

Hazardous materials, such as bitumen, sprays, paints and oils should be handled with extreme care. Recycling facilities for these materials should be utilised wherever possible.

Storage, use and disposal of hazardous wastes should be in accordance with the manufacturer's guidelines and relevant legislation. Inappropriate storage, use and disposal of hazardous materials (e.g. in un-bunded areas on the roadside) can lead to soil and water contamination. This not only harms the environment but also leads to the need for future remediation and associated costs. Inappropriate transport and disposal of hazardous waste can also lead to prosecution by the EPA.

Reuse material such as topsoil, mulch, large logs (for habitat) on site where possible.

Clean Down Machinery Prior to Moving to Another Site

Dirty machinery can spread weeds and soil diseases. Before transporting any earth-moving machinery and vehicles to a new site, remove all seed and soil from machinery by:

- scraping and brushing off soil
- washing down with high pressure hoses

Machinery should be washed down well away from creeks and good quality vegetation sites, preferably in previously disturbed areas, which already have weed problems.

Machinery wash-down unit.

Part 1:

General Environmental Guidance

Introduction

This Roadside Handbook provides a general introduction to the protection of the natural and cultural environment of roadsides. It will be a useful guide to those working in roadsides. The handbook is based on best practice in roadside management but, given its generic nature, should not be used as a contract reference.

This Handbook is divided into two parts.

- Part 1 contains general guidance on environmental legislation, management plans and the value of roadsides.
- Part 2 contains specific guidance on the management of environmental issues arising from various construction and maintenance activities.

Typical roadside vegetation.

Emergency Procedure

Should an environmental incident occur within the road reserve, you are responsible for following the environmental management procedures associated with your works, and ensuring that the site supervisor and relevant Regional VicRoads staff are aware of the incident. In some cases, the relevant agency, (e.g. the Local Council, Heritage Victoria, local Aboriginal Group, EPA, or Department of Sustainability and Environment) should also be informed.

All polluting incidents (e.g. water pollution or soil contamination) must be reported to the EPA though the 24hr Pollution Watch Line as soon as practicable:

- Melbourne: 03 9695 2777
- Regional Victoria: 1800 444 004

All environmental incidents on VicRoads managed land should be reported in VicRoads Environmental Incident Reporting System.

Appendix 1

Environmental Best Practice for Construction Works

1. Inspect site for potential environmental issues
2. Clearly mark the limits of stripping and all other construction zones
3. Keep machinery and stockpiles on cleared land
4. Always stay within the 'construction zone'
5. Use the appropriate type and minimum size of machine for the job
6. Protect cultural heritage
7. Plan vegetation removal
8. When disturbing areas of good native vegetation, topsoil should be stripped, stockpiled and reused as soon as possible
9. Control soil erosion
10. Chip material left over from tree removal into mulch (except weed parts capable of regenerating and habitat logs)
11. Avoid 'tidying up' roadsides after construction
12. Clean down machinery before moving to another site

Contents

FURTHER GUIDELINES & INFORMATION

VicRoads produces a series of Guidelines to assist staff and contractors with environmental management issues during road maintenance and construction. Guidelines include:

- Environmental Management
- Cultural Heritage
- Biodiversity

Guidelines are available through VicRoads website: www.vicroads.vic.gov.au/environment

Alternatively you can contact the VicRoads Bookshop:

60 Denmark Street, Kew VIC 3101
T. 03 9854 2782 / 2049 F. 03 9854 2468
E. bookshop@roads.vic.gov.au W. www.vicroads.vic.gov.au/bookshop

The Environmental Management Toolkit contains all VicRoads key environmental policies, guidelines, procedures and support tools. The Toolkit is available to all VicRoads staff through the VicRoads Intranet.

VicRoads produces documents in hard copy and electronic copy. This document is an uncontrolled copy. Updates will be made to these Handbooks as required and listed in an amendments page at the front of the controlled electronic version in the Environmental Management Toolkit

Acknowledgments:

The content of these handbooks is based on original text developed by Graham Stone and Stephen Wallbrink, updated by VicRoads Environmental Services Department.

Contributors included VicRoads Regional Environmental Officers and VicRoads Design. Line drawings by Scott Watson. Layout design by Leanne Bithell.

Appendix 2

Environmental Best Practice for Maintenance Works

1. Inspect site for potential environmental issues
2. Protect natural regeneration
3. Protect cultural heritage
4. Avoid mowing in native vegetation
5. Avoid 'cleaning up' vegetation. Retain stumps, dead trees and understorey wherever possible
6. Avoid windrowing drain material into vegetation
7. Locate firebreaks on cleared land, preferably outside of the road reserve
8. Locate stockpiles on cleared or previously disturbed land
9. Remove drain spoil and dispose in a weed disposal site
10. Avoid damaging plants other than weeds
11. Spray herbicides in calm and dry conditions
12. Remove or prune trees carefully using appropriate equipment
13. Use the appropriate type and minimum size of machine for the job
14. Use soil or gravel from a weed free site
15. Control soil erosion
16. Clean down machinery before moving to another site

Notes

Roadside Handbook

An Environmental Guide for Road Construction and Maintenance 2006