

# Roadside Vegetation Management Plan

Local Government Area: Kyogle Council



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# Executive Summary

In June 2002, GeoLINK was engaged to prepare a Roadside Vegetation Management Plan for all formed roads in which Kyogle Council is the road authority.

Kyogle Shire is within a region possessing a diverse range of floral and faunal species. Human activities have lead to the clearing of vast areas of native vegetation within the Kyogle Local Government Area. As such, roadside vegetation is becoming increasingly important to provide habitat links and areas for conservation. In addition, roadside vegetation is an important community asset providing landscape character and aesthetic quality. Kyogle Council implemented this plan in recognition of the need to provide ongoing strategies to protect and enhance this asset. Council wishes to improve management of these areas through improved knowledge, co-ordination with stakeholders and development of suitable strategies.

This plan has the following sections:

Section 1 Introduction – Outlines the purpose of the plan, the methods used in undertaking the project and guidance on the structure and use of the plan.

Section 2 Key Influencing Processes – Outlines the main factors which affect native vegetation in the roadside.

Section 3 Roadside Vegetation Management Categories – Provides and outline of rationale of assigning roadsides into management categories and the criteria used to do so.

Section 4 Roadside Vegetation Management Strategies – Provides an easy look up table/matrix to determine the recommended action strategies which apply in each category of roadside.

Section 5 Road Construction and Maintenance Guidelines – General guidelines for road design, construction and maintenance activities.

Section 6 Infrastructure Installation and Maintenance Guidelines – General guidelines for infrastructure installation and maintenance.

Section 7 Bush Fire Management and Guidelines for Landholder and Landcare Groups – General guidelines for the landholders and fire management agencies.

Section 8 Legislation and other considerations – Provides general guidelines of legislation that may restrict roadside activities.

Section 9 Recommendations – Provides initiatives for Council and the community to adopt.

Roadside vegetation within Kyogle Local Government Area was categorised into three broad categories according to various environmental and vegetation features:

- A Conservation Zone
- B High Recovery Potential Zone;
- C Highly Modified Zone.

Roadside areas within 20m of a waterway or major drainage line were categorised under the Conservation Zone due to the additional issues of erosion and water quality in these localities.

Vegetation within urban areas were not classified into these categories as this vegetation often possesses special characteristics which would be best dealt with individually with the community.

This plan provides general guidelines for the management of vegetation in each of the three categories. Proposed roadside activities should be examined individually to ensure that each proposal will achieve Best Management Practice. This may entail detailed assessments for each site to protect existing vegetation and to ensure appropriate regeneration actions.

# How to use this Plan

This Plan will assist Council and community members in the management of vegetation on roadsides within the Council's district. The plan sets out guidelines relating to the clearing of roadside vegetation through to the protection, enhancement and management of significant sites.

When an activity is proposed to occur within the roadside there are five (5) general steps in which the plan will provide guidelines for the proposal:

## Step 1

Go to the Roadside Vegetation Management Category Map (page 18)

Find the relevant section of road and determine the Roadside Category for the site.

Categories:

- A Conservation Zone
- B High Recovery Potential Zone
- C Highly Disturbed Zone

Reference should be made firstly to the Roadside Vegetation Management Category Map (Illustration 3.1; a large A3 version is attached in Appendix C; a digital GIS (MapInfo) file is provided on the attached CD along with a series of Excel files detailing assessment outcomes).

## Step 2

To determine appropriate Roadside Management Strategies go to Section 4 (page 19)

The Strategy Matrix (Section 4.2) should be reviewed to determine which specific roadside management strategies should be adopted for the specific locality.

## Step 3

Undertake a Site/Proposal Specific Assessment

Assessment of the site and/or proposal is essential to determine any specific characteristics for the locality (for example, the presence of a threatened species). This allows for the appropriate management techniques to be determined and implemented.

Outline the proposal and determine if any legislative requirements are triggered. Section 8 (page 32) outlines legislation that may relate to the proposed activity.

## Step 4

Liase with Appropriate Authorities or Representatives



Appendices B and F lists a number of contacts who will be able to provide essential information for individual sites (or proposals) which will assist in the development of management strategies.

## Step 5

### Develop a Management Plan for the Proposal

An Environmental or Management Plan will assist in the mitigation of any adverse impacts on the environment. This Roadside Vegetation Management Plan provides guidelines to assist in the development of appropriate mitigation measures for the protection and management of roadside vegetation in the Shire.

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# Glossary of Terms and Abbreviations

Aesthetic quality	The value placed on a tree because of its visual significance in the landscape.
Archaeological significance	Sites of Aboriginal importance (e.g. scar trees, camp site, midden, relics).
Best Management Practice	The practices that result from decisions made on the best available information.
BFMC	Bush Fire Management Committee
Biodiversity	The variety of all lifeforms; plants, animals, micro-organisms, the genes they contain and the ecosystems of which they form a part.
Biogeographical province	or Biogeographic regions – depict the patterns of ecological characteristics in the landscape and provide a meaningful natural framework to address landscape management and biodiversity issues. Bioregions reflect underlying environmental features such as topography, soil type and rainfall and so they often reflect patterns of land use and natural resource-based activities (including conservation).
Corridor	or Wildlife corridor – Continuous or semi-continuous patches of vegetation forming liked habitat, especially between larger or more critical habitat areas for wildlife species (links local and/or regional areas).
Degradation	Any human-induced decline in the quality of natural resources or the viability of ecosystems.
DLWC	Department of Land and Water Conservation
Drip Line	The outer extent of a trees canopy
Ecosystem	Community of organisms, interacting with one another, plus the environment in which they live and with which they interact.
Edge Effects	Describes the change in environmental conditions such as light, drainage, and wind effects which occurs when a new edge is created at the boundary of a vegetated area.
Endangered	Species in danger of extinction whose survival is not likely in the absence of threat abatement.
Enhancement	Introduction of flora species to a place where those species already exist.
Environmental weed	Plants that invade natural vegetation and threatens conservation values. These weeds may be exotic or native plants not indigenous to the area. Their presence is in some way detrimental to the natural environment.
European historical sites	Sites of European significance (e.g. avenue of honour, monuments, structures such as buildings or fences).
Genetic diversity	Occurrence of genetic differences between individuals.

Grazing	Confinement of stock for extended periods for the purpose of depasturing the road reserve.
Habitat	Place or environment in which specified organisms live.
Indigenous	Indicating an organism native to a particular locality or habitat.
LALC	Local Aboriginal Land Council
Landscape character	The quality image or feel of a landscape that is created by a particular mix of elements.
Landuse	Activity occurring on parcels of land (e.g. farming, grazing, residential, forestry).
LGA	Local Government Area
Near-natural	Vegetation possessing qualities (e.g. species, stratum) that is similar to that which was originally present.
Noxious weed	A weed that is declared as being noxious under legislation ( <i>Noxious Weeds Act 1993</i> )
Open forest	As used by Specht <i>et al.</i> (1970) for Australian plant communities where the projective foliage cover of the vegetation is mid-dense (30-70%).
Rare	A species that characteristically has a limited distribution and/or abundance due to the specificity of their habitat requirements or that has a limited distribution and abundance because habitat resources have been modified or lost.
Regeneration	New growth of indigenous flora species where the dominant species of the pre-existing vegetation type is re-established.
Roadside Vegetation Categories	<b>Conservation Zone</b> Vegetation near to its natural condition. Few introduced species. All storeys of vegetation are well represented. Good wildlife habitat and/or provides corridor lineages <b>High Recovery Zone</b> Vegetation in a semi-natural condition. Mostly native vegetation but with moderate invasion of introduced species. One or more storeys of vegetation may be missing. Wildlife habitat could be enhanced. <b>Highly Modified Zone</b> Degraded or substantially modified areas. Minimal indigenous vegetation. Dominated by introduced species. Little habitat value.
Sedimentation	The consolidation of materials carried by wind or water.
Seed bank	Volume of seed contained in the soil that is still viable and ungerminated.
Stratum	Indicates the vertical layer of a community. Includes the dominant overstorey of trees, the understorey of shrubs and the lower groundcover or grasses.
Threatened	The generic term used to describe taxa that are rare, vulnerable, endangered or insufficiently known and are subject to threatening processes.
Vegetation association	A plant community dominated by a particular species and named according to them. The association is an

	assemblage of species that recurs under comparable ecological conditions in different places.
Vegetation community	Describes an assemblage of flora populations living in a prescribed area or physical habitat, inhabiting some common environment.
Vulnerable	Species likely to become endangered in the short term if threatening processes continue.
Weed	A plant that is growing where it is not wanted (can be native or non-native).
Windbreak	Line of trees or vegetation which provides wind protection.

# 1

## Introduction

### 1.1 Background

The Kyogle Council Local Government Area is approximately 3,589 square kilometres in area (Illustration 1.1). The region in which Kyogle Shire is found has an extremely diverse range of floral and faunal species. This is attributed to a number of factors favouring plant and animal growth including the area being classified as humid and sub-tropical. Average rainfall is in the range of 1025 to 2050 mm per annum and temperatures range from 11 to 32 °C (BOM 2002). In addition, the Kyogle area belongs to the biogeographic province known as the McPherson-MacLeay overlap zone (Landmark *et al.* 1999). Thus, both climatic and geographic conditions in this area are favourable for many species with tropical or temperate origins reaching their southern or northern limits respectively.

### 1.2. The Importance of Roadsides



*Urban trees*

Road reserves were initially established to provide legal property access and for the movement of people and goods. While, this primary function remains unchanged, a number of other functions for road reserves have evolved. Today, road corridors have become major service corridors for electricity, water supply, gas, sewerage, telecommunications and drainage. In rural areas, road corridors are used for the movement of stock and for grazing (the long paddock). Roads have also provided valuable fire breaks and stockpile sites for road maintenance works. Roadsides are an important recreational resource for activities such as walking, jogging, horseriding and birdwatching.

In addition to the above functions, roadsides are important as they may contain sites of archaeological significance (e.g. Aboriginal scar trees) and European historical sites or monuments (e.g. avenues of honour).



*Roadside vegetation can be valuable wildlife corridors*

Vegetation alongside roadsides have been widely recognised as valuable due to the contributions to native flora and fauna habitat and conservation, landscape character, aesthetic quality, windbreaks and shelter.

In Kyogle Shire, the main uses of road reserves include the movement of wildlife, people and goods, corridors for electricity and telecommunications, grazing (especially during drought) and provision of stockpiling sites and fire breaks.

Human activities (e.g. farming, logging, urban development) have resulted in the loss of a large area of native vegetation within the Kyogle Local Government Area. Vegetation alongside roads potentially provides high



N  
1  
0

10km

## LEGEND

**STUDY AREA BOUNDARY**

Illustration

1.1

L0292

Source: LIC

Date: January 2003

quality solutions sustainable future

**Study Area**

quality habitat for flora and fauna species, including species listed under the *Threatened Species Conservation Act 1995*.

Protection and rehabilitation of roadside vegetation has potential to enhance the value of individual roadside communities within the Shire's boundaries and would allow for the preservation of a number of flora and fauna species. In addition, protection and rehabilitation of this vegetation would increase the connectivity of surrounding vegetation and aid in limiting edge effects.

The Council is the Road Authority for over 1,000 kilometres of sealed and unsealed roads in the Shire. The National Parks and Wildlife Service, Country Energy, Telstra and Far North Coast Weeds are other authorities within the Shire's boundaries that are key stakeholders with interests in the roadside environments. As the major authority controlling roads within the Shire, Kyogle Council wishes to ensure that correct practices are followed to ensure that high quality vegetation communities are protected and enhanced, where possible, for the benefit of the whole community.

### 1.3 The Value of Roadside Vegetation

The values associated with roadside vegetation relate to a number of key components, including providing a food source, providing structural habitat, providing links or corridors to other more extensive habitat areas, supporting the genetic diversity of plant species in the area, providing historical or cultural significance to an area and enhancing the aesthetic value of the landscape.

There are a number of ways to classify vegetation patterns within an area. For example, different vegetation types are grouped according to the plants they contain (e.g. eucalypts etc) or grouped according to the plants that they contain combined with their physical structure (e.g. eucalypt forest etc). This vegetation classification system describes the most abundant species in the tallest stratum, the height of the tallest stratum and the forest type (e.g. crown separation).



*Roadside trees with Hollows can have significant Habitat value*

For example, an association dominated by *Eucalyptus tereticornis* (Forest red gum) and *Eucalyptus siderphiloia* (grey ironbark) with trees 15 metres tall, possessing tree crowns which are separated and a ground cover dominated by *Themeda australis* (kangaroo grass) would be described as:

*Eucalyptus tereticornis*, *Eucalyptus siderphiloia*, *Themeda australis* tall open forest.

Much native vegetation with open forest associations, common to the Kyogle area, is characterised by providing a complex of structural habitats. This 'structure' consists of layered vegetation, often composed of a canopy, shrub layer and ground-layer. Different food and shelter resources occur in each of these 'layers', thereby satisfying the habitat requirements of a range of native species. Other habitat components of these areas include leaf and twig litter, dead standing trees, rocks and crevices and fallen timber.



Roadside vegetation often provides habitat linkages, which allow for the movement of fauna species between larger areas of habitat such as National Parks, State Forests and those on private property. Maintaining these linkages is important for maintaining the genetic diversity and flow between what would otherwise be isolated animal populations.

Areas of roadside vegetation also contain important genetic resources. These 'resources' aid in maintaining the overall integrity and resilience of native species and provide a valuable 'seed bank' for regeneration projects. Such areas may also contain individuals of rare or threatened plant species.

Maintaining and conserving roadside vegetation has a number of other important potential benefits, including:

- Reducing soil erosion;
- Providing water quality buffers to streams and rivers;
- Providing scientific evidence for the distribution of former vegetation communities;
- Improving public awareness of nature conservation;
- Providing opportunities for education;
- Helping to prevent rising water tables and salinity;
- Assisting in fire control;
- Easier maintenance as natives are easier to maintain than exotics;
- Enhancing the aesthetic value of roadsides; and
- Providing windbreaks for adjoining properties.

#### 1.4 The Need for a Management Plan

Given the many functions of roadside areas it is not surprising that conflicts do occur. However, this is often due to a lack of understanding or communication between the various 'road users' who approach roadside management without being aware of the other functions the roadside fulfils. A good example of this is the 'tidying up' of fallen timber in the roadside to lower fuel for fires for the protection of property and infrastructure. Such action inadvertently removes key habitat components, which while unintentional, will gradually erode the habitat value of roadside areas. For the functional and conservation roles of roadside areas to be maintained there is a clear need to take a strategic approach that considers the full range of roadside functions and issues.

The development and implementation of a management plan has a number of important advantages, including:

- Improving knowledge and understanding of the issues involved in roadside management by all stakeholders and the community;
- Savings in time and effort through the co-ordination of information and resources, and streamlining of procedures;
- Avoidance of conflicts and/or developing processes for conflict resolution;
- Tourism and amenity benefits from the recognition of landscape and cultural heritage issues;

- Improved communication and co-ordination between the various stakeholders in roadside management.

### 1.5 Area to Which this Plan Applies

This plan covers all of the roads in the Kyogle Local Government Area, for which Kyogle Council is the road authority. This includes Roads and Traffic Authority (RTA) roads for which the Council is responsible for maintenance works but does not include roads controlled by NSW National Parks and Wildlife or State Forests of NSW.

### 1.6 Purpose of this Plan

The overall aim of this Management Plan is to identify and evaluate existing roadside vegetation within Kyogle Local Government Area and to liaise with community stakeholders to develop management strategies that seek to restore and/or protect roadside vegetation.

Objectives of the plan as identified by Council are to:

- Identify and rank issues relating to the management of the roadside environment in the Kyogle LGA;
- Identify the locations within the Council area where these issues are of immediate or potential concern;
- Provide strategies to address the identified issues;
- Provide operational plans to address the identified issues; and,
- Put in place an agreed framework for groups and agencies to address these roadside environmental issues, either individually or in partnership.

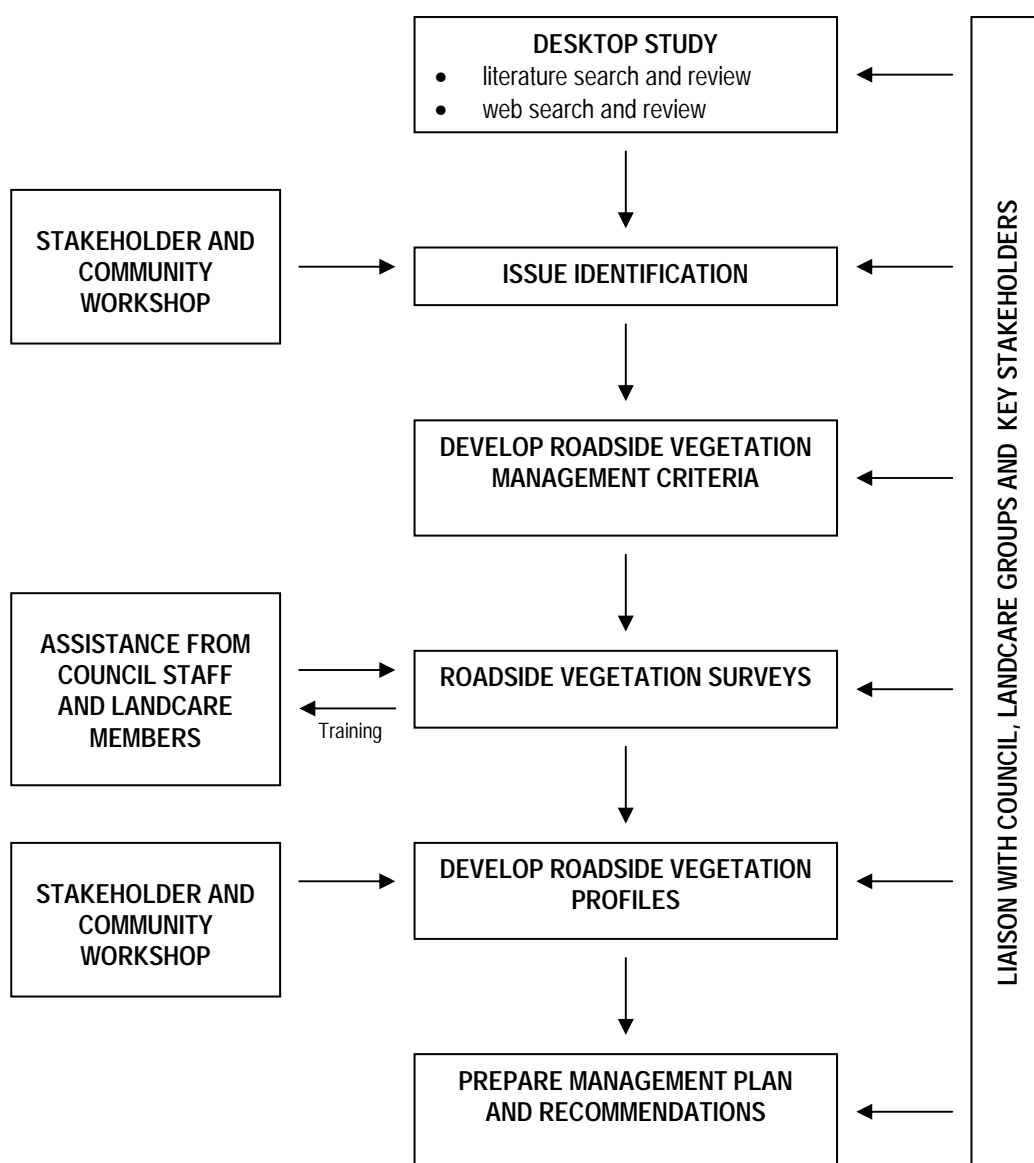
As part of the methodology for this project, liaison with the community was sought to raise the awareness of the value of roadside vegetation within the community and encourage the community to be proactive in the preservation of this resource.

### 1.7 Methodology

The procedure undertaken in preparing the Roadside Vegetation Management Plan involved a number of steps (refer to Illustration 1.2). These included:

- Undertaking a desktop study;
- Issue identification;
- Developing Roadside Vegetation Management Criteria;
- Undertaking roadside surveys;
- Consulting with stakeholders and the community;
- Preparing Roadside Vegetation Category Profiles; and
- Preparing Management Options.

**Illustration 1.2** Roadside Vegetation Management Plan methodology



### **1.7.1 Undertaking a Desktop Study**

Initial preparation for the project involved research of current best practice in roadside management. This included extensive searches of available literature and internet sources.

### **1.7.2 Issue Identification**

Several Roadside Vegetation Management Plans produced by Local Governments across Australia were reviewed. The review of these documents, in combination with discussions held with stakeholders (workshop on 31<sup>st</sup> July 2002), assisted in the identification of issues relevant to the Kyogle Local Government Area.

### **1.7.3 Developing Roadside Vegetation Management Criteria**

Developing the criteria for assigning roadsides into categories involved initial scoping surveys with reference to current best practise. Categories were developed to assign roadsides into three broad categories based on such matters as: the level of disturbance; the level of weed infestation; the presence of items of cultural heritage; and broader ecological considerations, such as habitat corridors. Roadsides within urban boundaries were identified as being unique due to the presence of vegetation of aesthetic or historical value.

### **1.7.4 Undertaking Roadside Surveys**

Roadside surveys were undertaken from 15<sup>th</sup> August to 18<sup>th</sup> October 2002, by teams consisting of one GeoLINK staff member, one Kyogle Council Officer and one local Landcarer.

The surveys involved driving the roads and assessing the conservation significance of roadsides based on the criteria detailed above. Aspects such as the nature of adjoining landuse, the presence of erosion, evidence of burning and grazing, and the presence of structural habitat such as logs, leaf litter and trees with hollows were also noted. Categories were generally assigned to sections of road of at least 100m in length, even where such sections had a patchy or variable vegetation coverage. The assessment sheet used for the roadside surveys is reproduced in Appendix A.

### **1.7.5 Consulting with Stakeholders and the Community**

Upon the completion of the roadside surveys, an open forum meeting was held to provide stakeholders and the community with an opportunity to comment on the initial categorisation of roadsides and on the draft management strategies. Feedback from the stakeholders was positive, with suggestions being made regarding aspects of the structure and composition of the final plan.

### 1.7.6 Preparing Roadside Vegetation Category Profiles

The final Roadside Category Profiles were drafted in consultation with Council with regard to stakeholder feedback.

### 1.7.7 Preparing Management Options

The Roadside Vegetation Management Plan was drafted in consultation with Council and other key stakeholders.

Liaison with Local Aboriginal Land Councils identified a need for Council, other road maintenance providers or infrastructure providers to consult with the relevant Aboriginal representatives for comments on proposed roadside maintenance or construction activities (Appendix B). In many instances, knowledge of the exact location of sites of significance is unknown (database is increasing) or Local Aboriginal Land Council (LALC) representatives are reluctant to release this information without information regarding the proposed works.

## 1.8 Limitations of Survey

A number of limitations in the surveys undertaken should be noted. These exist due to the seasonal timing, prevailing climatic conditions, and the physical limitations of undertaking exhaustive surveys, given funding and time constraints.

It is highly likely that the seasonal timing (Spring) and drought conditions, the time the surveys were undertaken, would have influenced the apparent prevalence of certain species. This is due to the influence of season and drought on the flowering and dormancy of many species, which would have affected the relative ease of sighting and recording the species. This is particularly the case for annual plants, such as many weed species.

Two further factors contribute to the potential for threatened species which occur in the roadsides to remain undetected. These factors include the relative rarity of threatened species, making them hard to identify, and the pace at which the surveys were necessarily undertaken. The roadside surveys therefore only provide information on the relative 'ecological health' of those areas, and are not an indicator of the presence of threatened species. Threatened species may be present in any roadside areas of the shire regardless of the roadside category assigned.

# 2

## Key Influencing Processes and the Causes of These Processes

### 2.1 Outline

This section outlines the main factors which influence the condition of roadside vegetation. These factors relate directly to strategies for roadside management.

Key influencing processes include:

- Disturbance and Edge Effects
- Habitat loss
- Soil erosion
- Weed infestation

### 2.2 Key Influencing Processes

#### 2.2.1 Disturbance and Edge Effects

Disturbance is the main threatening process for roadside vegetation, and often allows other more insidious factors to come into play, such as weed infestation and soil erosion. The main causes of disturbance include any activity that involves the removal of vegetation and/or the movement, exposure or compaction of soil such as (but not limited to) road and infrastructure construction and maintenance works, bushfire management activities, grazing and firewood collection.

One of the main issues with disturbance is that it tends to increase the edge effects associated with areas of vegetation. The term 'Edge Effects' describes the change in environmental conditions such as light, drainage, and wind effects which occurs when a new edge is created at the boundary of a vegetated area. The impact of these changes are numerous. They impact directly on the vegetation by increasing water stress and wind exposure, and indirectly by changing species composition and allowing weed species to invade or overtake the area. Roadside areas in a near natural condition are often most at risk due to the significant change that occurs with disturbance.

#### 2.2.2 Habitat Loss

Habitat loss may occur in a number of ways including through the removal of trees and dead wood, regular burning, slashing and soil compaction. Many of these factors can occur slowly over time and gradually erode the habitat value of roadsides.

### 2.2.3 Soil Erosion



*Severe Soil Erosion  
Threatening to Undermine a  
Road*

Soil erosion has influences both within the roadside and beyond. The erosion of soil that occurs upon the removal of ground cover plants can impact on roadside vegetation by burying seedlings and scouring soil from existing plants. Furthermore, the sedimentation of streams and rivers caused by erosion has major implications for the management of water quality and aquatic habitat.

### 2.2.4 Weed Infestation

Weed infestation threatens the viability of roadside vegetation due to competition with native species for resources and the alteration of environmental conditions. Weed infestation also has monetary costs for Council and local landholders. Avoiding weed infestation is far cheaper than removal.

Environmental weeds have a number of characteristics that enable them to infest native vegetation. They:

- Are hardy and grow well, even when left without water or fertiliser;
- Take over in the garden situations and require regular pruning;
- Reproduce in large numbers from seed, cuttings or suckers;
- May have succulent fruit which birds eat and then deposit the seeds in the bushland; and,
- Are capable of producing large amounts of seed that germinates readily.

Landholders and Local Councils are obliged to carry out relevant control measures for weed species listed under the Noxious Weeds Act 1993. Additionally the North Coast Weed Advisory Committee has issued a list of 187 weed species that are considered to be having adverse impacts on native vegetation communities or ecosystems in the North Coast region (Appendix E). It is therefore wise to take all actions possible to discourage those environmental weed species so as to lessen their impact in the future.

## 2.3 Causes of Key Influencing Processes



*Road in the Landscape*

The main agents of these influencing processes include:

- Road construction and maintenance;
- Infrastructure installation and maintenance;
- Stockpiling;
- Roadside grazing;
- Fire;
- Firewood collection; and,
- Slashing.

### **2.3.1 Road Construction and Maintenance Activities**

Road construction and maintenance activities can impact on roadside vegetation in a number of ways. These impacts include those caused directly through the removal of vegetation, soil disturbance and compaction, and indirectly through the introduction of weeds, and impacts associated with stockpiling. A number of strategies are available for the management of these impacts, and these are detailed in Section 4.

### **2.3.2 Infrastructure Installation and Maintenance**

Like road construction and maintenance activities the installation and maintenance of essential services, such as electricity and telecommunications infrastructure can, if improperly managed, have negative impacts on roadside vegetation. These impacts include those caused directly through the removal of vegetation, soil disturbance and compaction and directly through the introduction of weeds, and impacts associated with stockpiling. While the main infrastructure providers already have some strategies in place, the Roadside Management Plan aims to further facilitate best practise and coordination between roadside users.

### **2.3.3 Stockpiling**

Stockpiles can have significant impacts on roadside vegetation through altering light and moisture conditions of the site, introducing weeds, smothering groundcover species, altering drainage patterns and causing soil compaction.

### **2.3.4 Roadside Grazing**

The impact of roadside grazing depends largely on the condition of the roadside vegetation. Along roadsides which are in a near-natural condition grazing can have a number of negative impacts through introducing weeds, damaging understorey plants and causing soil erosion and compaction.

In some situations, such as where weed infestation is already present, light grazing can assist in keeping the infestation from becoming more severe. In comparison, roadsides which are highly disturbed may benefit from regular grazing by reducing fire and road safety hazards. However, wherever roadside grazing does occur, ensuring road safety for all road users is the overriding concern.

### **2.3.5 Fire Impacts**

While much of Australia's native vegetation is adapted to fire, fire events occurring too frequently can threaten the long term viability of vegetation communities. Where fire events are too frequent, such as through regular fire control burns, regeneration can be stalled and community species



composition altered by the repeated killing-off of seedlings, while also damaging established trees.

There are also vegetation communities, such as rainforest, which will not tolerate fire. Introducing fire into these areas can result in the total change of vegetation communities, and so threaten the viability of a range of species.



*Removal of Trees from  
Roadside*

### **2.3.6 Firewood Collection**

Uncontrolled fire wood collection can slowly erode the habitat value of roadside areas through the removal of habitat, including dead standing trees, and fallen timber, and through the gradual alteration of soil health which also results.

### **2.3.7 Slashing**

Slashing associated with road maintenance can impact on native vegetation in a number of ways including causing soil disturbance and compaction, destroying small plants, damaging tree roots and contributing to the spread of noxious and environmental weeds.

# 3

## Roadside Vegetation Management Categories

### 3.1 Outline

While there are a range of management issues which have relevance to the management of roadside areas, the implications of these issues depend upon the existing condition of the roadside vegetation. Three Roadside Vegetation Management Categories were developed to reflect the different management approaches required, based on the current condition and conservation significance of the roadside vegetation. The Roadside Vegetation Management Category Profiles which follow, provide the key defining features of each Roadside Vegetation Management Category. Illustration 3.1 shows the extent of each of the categories within the Kyogle LGA. An enlarged version of this illustration is provided in Appendix C.

### 3.2 Vegetation Communities on Roadsides



*Rainforest Community within the Roadside*

The Kyogle Shire contains a range of native vegetation communities, including woodland and open forest types, rainforest and wetlands.

After grassland, the most common vegetation community present on the roadsides of Kyogle Shire are open forest communities, composed of a mixed overstorey consisting of species such as Forest Red gum, Tallowood, Broad-leaved Apple, and Ironbark (several species). The presence of understorey species were often dependent largely on the fire frequency and grazing history of the area. Mixed rainforest communities are also present in the roadsides of the Shire but are less common. A list of common species encountered during roadside surveys is provided in Appendix D, however, the list is not exhaustive.

Due to the limitations of the survey work, the categories defined below and shown on the accompanying map should not be considered as an indication of the presence or absence of Threatened Species (refer to Section 1.8 Limitations of Survey). The likely occurrence of Threatened Species should be considered as being equal across all roadsides, regardless of the Roadside Vegetation Management Category.

Roadside vegetation in urban areas should be considered on a case by case basis as vegetation within these areas could have significant community or amenity value (examples include: avenue of honour, planted by founding fathers, shade tree).

### 3.3 Roadside Vegetation Management Category Profiles

#### 3.3.1 Roadside Vegetation Management Category A – Conservation Zone



*Typical Conservation Zone Roadside*

Conservation Zone areas are characterised by having vegetation in a near-natural, relatively undisturbed condition, often with the original vegetation structure intact or in good condition. They are usually fairly self-sustaining/perpetuating and dynamic environments that require little maintenance to remain in good condition.

In addition, areas 20m either side of major water courses or drainage lines are recognised as Conservation Zone areas due to their importance in erosion and water quality issues. These areas may occur within other category zones are not mapped due to mapping limitations.

*Conservation Zone areas possess two or more of the following key characteristics:*

- Canopy, understorey and groundcover layers usually intact;
- High plant diversity;
- Presence of rare or threatened species;
- Low weed levels;
- High habitat value: logs and leaf litter; trees with hollows and/or dead standing trees; rocks and crevices; and/or being a habitat corridor; and/or,
- Areas containing “significant sites” such as European or Aboriginal heritage items and/or rare or threatened species.

### 3.3.2 Roadside Vegetation Management Category B – High Recovery Potential Zone



*Typical High Recovery Potential Zone Roadside*

High Recovery Potential areas are characterised by having a history of slight disturbance, often with only the canopy or the understorey layer remaining. Weed infestation may be present, but the areas display vegetation otherwise in good condition that may respond well to active management. Regeneration efforts may have the potential to improve the conservation significance of the areas and can also have long-term cost-benefits.

*High Recovery Potential areas possess two or more of the following key characteristics:*

- Some elements of the natural vegetation remain – canopy or understorey still present;
- Medium to high weed levels;
- May contain some habitat value – the presence of logs and leaf litter, trees with hollows and/or dead standing trees, and/or rocks and crevices;
- Natural regeneration may be occurring; and/or
- May contain rare or threatened species.

### 3.3.3 Roadside Vegetation Management Category C – Highly Modified Zone



*Typical Highly Modified Zone Roadside*

Highly modified roadside vegetation areas are usually clear of native vegetation or have only a few trees scattered along them. They often have high levels of maintenance, due to the prevalence of exotic vegetation and weeds. These areas may be the most suitable for roadside grazing and are the preferred sites for road maintenance and service stockpiles. Whilst establishing native vegetation would improve the conservation significance of these areas, such work would be prohibitively expensive and may be prone to failure due to the prevalence of weeds, soil erosion, and/or due to established land use practices. Only where a combined and coordinated effort from landholders, Council and State Government agencies would regeneration efforts be effective.

*Highly modified areas possess two or more of the following key characteristics:*

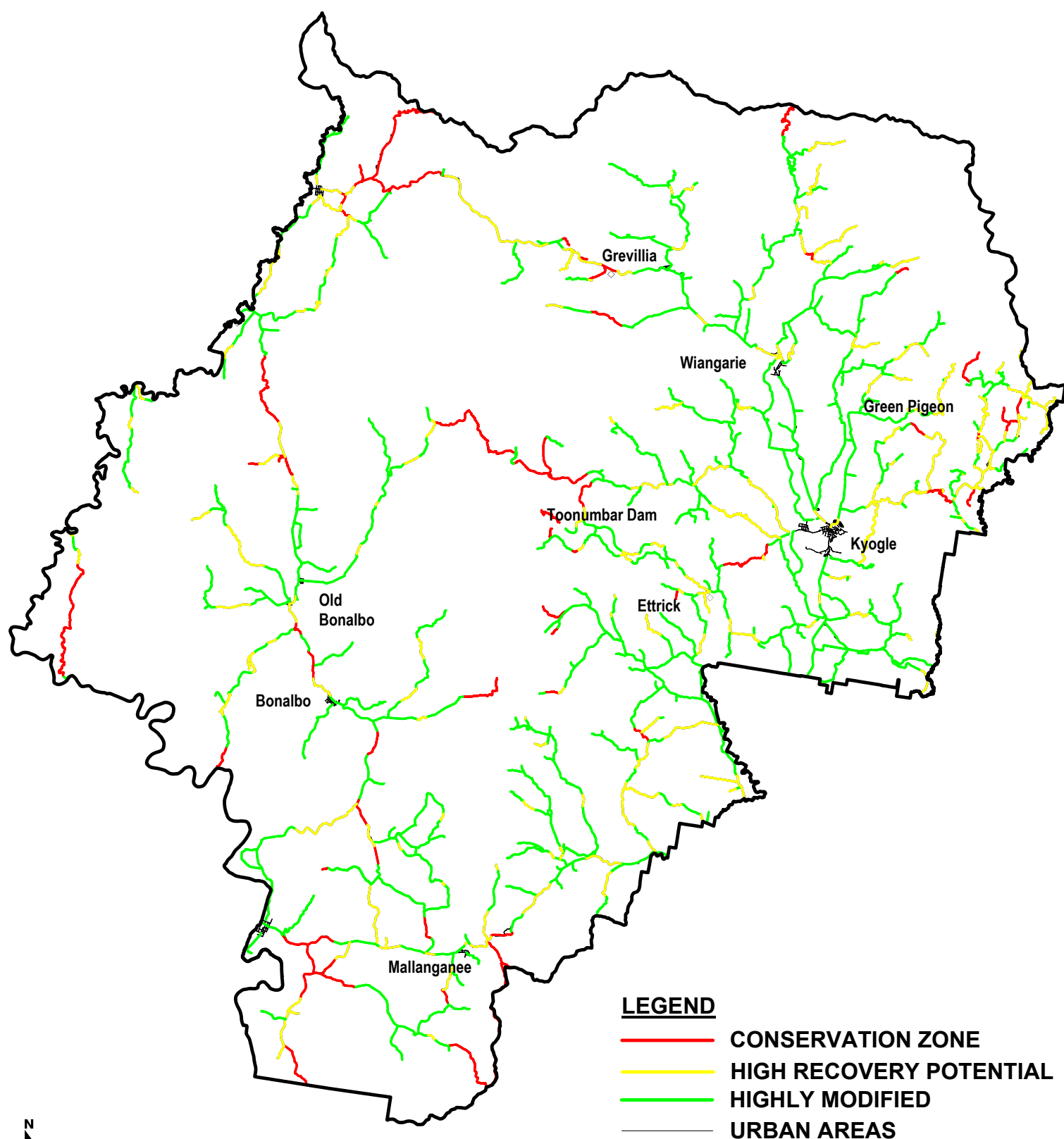
- Highly modified and degraded vegetation;
- May have high levels of weed infestation;
- May be heavily grazed or subject to erosion;
- Often surrounded by land with similar characteristics; and/or
- May contain rare or threatened species.

### 3.4 Category Summary Statistics

As indicated in Table 3.1, the majority of roads in Kyogle LGA fall under the category of 'Highly Modified'. However, a substantial proportion (approximately 40 %) of roadsides have been categorised under either 'Conservation Zone' or 'High Recovery Potential' confirming this important resource for the community and the environment.

**Table 3.1 Roadside Category Statistics**

CATEGORY	ROADSIDE VEGETATION MANAGEMENT CATEGORY		
	A	B	C
Length of Road (Km)	108.0	197.7	486.4
Number of Sections	67	186	326
Estimated Area (Ha)	215.9	395.5	972.8
Proportion of all Kyogle Roads	13.6%	25.0%	61.4%



**LEGEND**

- CONSERVATION ZONE
- HIGH RECOVERY POTENTIAL
- HIGHLY MODIFIED
- URBAN AREAS

N  
0

15000m

Illustration

3.1



# 4

## Roadside Vegetation Management Strategies

### 4.1 Outline

The following section provides specific management strategies to apply in each of the three Roadside Vegetation Management Categories (as defined in Section 3.3):

- A Conservation Zone
- B High Recovery Potential Zone
- C Highly Modified Zone

When an activity is proposed to occur within the roadside, reference should be made firstly to the roadside category map (refer to Illustration 3.1 or Appendix C), then to the Strategy Matrix below and to the specific roadside management strategies that are described below.

### 4.2 Strategy Matrix

ISSUES	MANAGEMENT CATEGORY		
	A	B	C
Road Construction	RC	RC	RC
Infrastructure Providers	IP	IP	IP
Stockpiles	S1	S1	S2
Erosion	E	E	E
Vegetation Loss	V1	V1	V2
Habitat Loss	H	H	H
Stock Grazing	G1	G2	G2
Weed Management	W1	W2	W3
Firewood Collection	FC	FC	FC
Bush Fire Management	BF1	BF1	BF2
Revegetation	RV1	RV2	RV3

### 4.3 Roadside Vegetation Management Strategies

#### 4.3.1 Road Construction and Maintenance

- RC** - Same for all categories – follow Roadside Construction and Maintenance Guidelines (refer Section 5).

#### 4.3.2 Infrastructure Providers

- IP** - Same for all categories – follow Infrastructure Installation and Maintenance Guidelines (refer Section 6).



#### 4.3.3 Stockpiles

- S1** - Avoid locating stockpiles in these areas. Mark the limits of the stockpile, and install appropriate sediment controls. Do not push stockpile materials into roadside vegetation.
- S2** - Give preference to locating stockpiles in these areas. Install appropriate sediment controls to reduce erosion.

#### 4.3.4 Erosion

- E** - Same for all categories. Strategies for minimising the risk and impact of erosion include:
  - Minimising Disturbance – Refer to Section 5.2 of this plan;
  - Preventing Erosion – Refer to Section 5.5 of this plan; and
  - Managing Stockpiles – Refer to Section 4.3.3, Sections 5.6 and 6.4 of this plan.

#### 4.3.5 Vegetation Loss

- V1** - Minimise clearing required. Consider habitat values. Assess for threatened species. Tag trees for removal/lopping by field staff. When lopping use the three-cut method to minimise damage (Section 5.3).
- V2** - Minimise clearing required. Assess for Threatened Species. When lopping use the three-cut method (Section 5.3).

#### 4.3.6 Habitat Loss

- H** - Same for all categories. Before undertaking works assess habitat values, including the presence of:
  - Logs/leaf litter;
  - Trees with hollows;
  - Rocks/crevices;
  - Dead standing trees; and
  - Habitat corridors.

Retain and protect these aspects where possible, without compromising safety and job requirements. While the habitat values of areas in 'Highly Modified' category roadsides have been greatly reduced, any remaining large remnant trees, dead standing trees and/or trees with hollows should be retained where possible.

#### 4.3.7 Stock Grazing

- G1 - Grazing prohibited
- G2 - Grazing allowed on merit - apply to Council



*Grazing in 'Highly Modified'  
Category Roadside*

Farmers who wish to graze stock in the roadside must obtain a grazing permit from Council and the Rural Lands Protection Board, and must display signs and attend stock at all times.

#### 4.3.7 Firewood Collection

- F - Same for all categories - Firewood Collection Prohibited

Excess timber in the roadside will be chopped, stockpiled and signposted by Council officers in an accessible location, for members of the public to collect.

#### 4.3.8 Bush Fire Management

Bush Fire Management is the primary responsibility of the local Rural Fire Service, however the following strategies are recommended for inclusion in the Shire Bushfire Risk Management Plan:

- BF1 - Avoid establishing these areas as fire breaks, and establish on adjacent land where possible.
- BF2 - Give preference to establishing fire breaks

#### 4.3.9 Weed Management

- W1 - Use only low impact weed removal methods such as scrape and paint, or hand removal. Take measures to reduce the potential to spread weeds. Refer to Section 5.7 and Appendix E.
- W2 - Use weed management methods appropriate to the location, and the level of weed infestation. Give preference to low impact methods to reduce the potential for soil disturbance. Take measures to reduce the potential to spread weeds. Refer to Section 5.7 and Appendix E. Light Grazing may be an appropriate weed management technique.
- W3 - Use weed management methods appropriate to the location. Take measures to reduce the potential to spread weeds. Refer to Section 5.7 and Appendix E. Grazing may be an appropriate weed management technique.

#### 4.3.10 Revegetation

- RV1** - Natural regeneration should be sufficient in these areas, although extending the areas may be desirable in some locations. Conservation Zone Areas are likely to be good sources of seed stock for regeneration projects, however consult with Council, your Local Landcare Coordinator and NPWS before collections are made, to ensure the collection is appropriate and that the amount taken is sustainable.
- RV2** - Give preference to establishing regeneration projects in these areas. Only plant native species appropriate to the area.
- RV3** - Regeneration efforts are unlikely to be successful without coordination between local landholders, Council and Government Agencies.

# 5

## Road Construction and Maintenance Guidelines

### 5.1 Outline

This section provides guidelines for construction and maintenance activities associated with road works. The guidelines provided in this section should be followed uniformly across all Roadside Vegetation Management Categories, although they will apply in greater measure to Category A and B roadsides.

There are a number of legislative requirements that need to be considered in association with this plan. An outline of the key pieces of legislation has been provided in Section 8, however the list provided should not be considered exhaustive and further legislation may apply depending upon the activity undertaken. Additionally, all activities associated with this plan should be undertaken within Workcover and Occupational Health and Safety Guidelines.

A number of strategies are available to minimise negative environmental impacts associated with road construction and maintenance activities, applied during the planning and design stage and while works are occurring.

### 5.2 Plan Roadworks to Minimise Disturbance

The following measures to minimise the disturbance of roadside vegetation should be taken in the planning of roadwork activities:

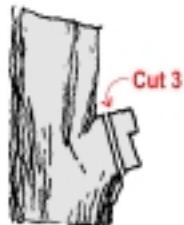
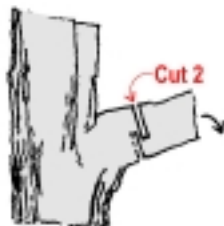
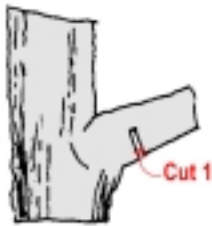
- Identify any areas of significant vegetation within the work area and establish temporary fencing to avoid disturbing the area/s;
- Establish designated areas for turning vehicles, preferably in places with no native vegetation;
- Avoid parking or storing materials in roadsides in 'Conservation Zone' or 'High Recovery Potential' categories;
- Use smallest machinery/road plant possible to adequately complete the job, so as to minimise disturbance; and,
- Remove road spoil from road reserve to minimise weed invasion, avoid unnecessary reshaping of table drains.

### 5.3 Vegetation Management

Before tree removal consider: the safety of staff, road users and property; the habitat value of the trees; the tree's historical significance; and the effect of tree removal on the appearance of the roadside.

Where tree removal is required the following key recommendations should be followed:

- Check Council's vegetation removal controls and follow correct procedures;
- Minimal clearing required for safety and sight distance;
- Fell trees into construction zone, not into undisturbed vegetation;
- Cut and stockpile excess timber in a cleared and accessible area for public to remove, to minimise need for disposal. However, be mindful of the habitat value of fallen timber;
- If material must be burnt keep clear from existing vegetation;
- Chip and mulch native shrubs and light tree branches to distribute native seed on construction site – do not chip and mulch weeds; and,
- When pruning use the three cut method.



*The Three-Cut Method*

The following additional measures can be taken to reduce impacts of native vegetation associated with roadwork activities:

- Avoid 'Cleaning up' (removing) fallen tree limbs and minimise the removal of leaf litter, unless necessary for road safety or OH&S concerns. Remove fallen timber where considered 'excessive', such as where the quantity may suppress natural regeneration, cause soil compaction, significantly inhibit water infiltration, or pose an unacceptable fire hazard (also refer to Firewood Collection Guidelines Section 4.3.7);
- Keep out of drip line of trees where possible, to avoid soil compaction and damage to tree roots; and
- Be aware of smaller, ground level plants such as orchids, grasses, and lilies as they are important habitat and food sources for native animals.

In undertaking revegetation works:

- Co-ordinate with Landcare groups to protect and augment existing plantings, a standard list of regener;
- Only plant locally indigenous plants in 'High Recovery Potential' and 'Conservation Zone' category roadsides. Check with local Landcare Coordinators for appropriate species (see contacts list in Appendix F); and
- Focus revegetation works to supplement existing habitat corridors (refer to priority areas list in Section 9).

## 5.4 Slashing Guidelines

Regular slashing/mowing can inhibit natural regeneration by killing seedlings and compacting the soil. When young trees and shrubs become established they will shade out grasses and reduce the need for slashing (NREC 1996).

To minimise impacts associated with slashing:

- Slash only what is necessary for road and fire safety;
- Mark out and protect young seedlings when slashing (essential);
- Slash only to the back of the table drain to avoid damage of native vegetation outside of the road formation;

- Plan slashing to reduce fuel loads, rather than slashing once fuel loads are high; and
- Plan slashing so as to not spread weeds. For example start where infestation is low and move to problem areas, and clean-down equipment before leaving problem areas.

## 5.5 Preventing Erosion

The following measures should be taken to avoid soil erosion:

- Avoid disturbance – ground cover holds soil and slows erosive water flow;
- Limit earthworks to the construction zone, ensure soil is disturbed for shortest time possible;
- Introduce revegetation controls as soon as possible, leaving batters rough, and seeding with native species;
- Establish adequate drainage systems; and,
- Use sediment collection measures and ensure they remain effective.

## 5.6 Managing Stockpiles

The following measures should be taken to minimise the potential impacts of stockpiling:

- Locate stockpiles on 'Highly Modified' roadsides where possible. Avoid placing on roadsides in 'High Recovery Potential' and 'Conservation Zone' categories;
- Avoid establishing stockpiles in close proximity to waterways;
- Mark the limits of the stockpile, and install appropriate sediment control measures where required; and,
- Do not push stockpile materials into roadside vegetation, and do not assume that a temporary stockpile will not damage understorey plants.

## 5.7 Weed Management

Avoid spreading weeds by:

- Planning maintenance works to move from low infestation to higher infestation and clean down machinery before moving on;
- Slash or mow noxious or environmental weeds prior to flowering;
- Follow the weed profile sheets provided for appropriate control measures;
- Where soil disturbance must occur, revegetate with native species as soon as possible to discourage weed invasion; and,
- Chemical control options must be undertaken by personnel holding a current chemical users certificate.

## 5.8 Topsoil Management

Topsoil removed from 'High Recovery Potential' and 'Conservation Zone' category roadsides should be stockpiled and re-spread after works have been completed. This will allow seed stored within the topsoil to remain in the area and revegetate the area. Also avoid bringing topsoil which may be contaminated by weed seed into weed free areas, particularly into 'Conservation Zone' and 'High Recovery Potential' roadsides.

Ideally topsoil should not be stockpiled for more than 12 months to ensure seed viability remains.

## 5.9 Clean Down Machinery

Before moving earthmoving machinery or vehicles onto another site remove all soil and seed by:

- Scraping or brushing off loose soil;
- Washing down with high pressure water so as to use as little water as possible; and,
- Wash down away from creeks and drainage lines, preferably onto grassed areas (NREC 1996).

# 6

## Infrastructure Installation and Maintenance Guidelines

### 6.1 Outline

The guidelines provided in this section relate to activities associated with the installation and maintenance of essential services such as electricity and telecommunications infrastructure. The guidelines should be followed uniformly across all Roadside Vegetation Management Categories, although they will apply in greater measure to Category A and B roadsides.

There are a number of legislative requirements that need to be considered in association with this plan. An outline of the key pieces of legislation has been provided in Section 8, however the list provided should not be considered as being exhaustive and further legislation may apply depending upon the activity undertaken. Additionally, all activities associated with this plan should be undertaken within Workcover and Occupational Health and Safety Guidelines.

### 6.2 General



*Infrastructure clearance*

The following measures to minimise the disturbance of roadside vegetation should be taken in the planning of work activities:

- Liaise with Council prior to works proceeding, outline the extent of activity, level of disturbance required and mitigation measures to be used;
- Investigate alternative routes for services – give preference to locating infrastructure in 'Highly Modified' Vegetation Management Category areas (Illustration 3.1);
- Mark out and work within the construction zone;
- Establish designated areas for turning vehicles, preferably in places with no native vegetation;
- Avoid parking or storing materials in roadsides in 'Conservation Zone' or 'High Recovery Potential' categories;
- Use smallest machinery/road plant possible to adequately complete the job, so as to minimise disturbance;
- Remove road spoil from road reserve to minimise weed invasion, avoid unnecessary reshaping of table drains; and,
- Minimise tree removal by installing Aerial Bundled Cable in 'High Recovery Potential' and 'Conservation Zone' roadsides where feasible and cost-effective.



### 6.3 Vegetation Management

Where tree removal is required the following key recommendations should be followed:

- Clear to the minimum required;
- Fell trees into construction zone, not into undisturbed vegetation;
- Chip and mulch native light shrubs and light tree branches to distribute native seed on construction site – do not chip and mulch weeds; and,
- When pruning use the three cut method (refer to Section 5.3).
- 
- The following additional measures can be taken to reduce impacts of native vegetation associated with work activities:
- Avoid 'Cleaning up' (removing) fallen tree limbs, unless necessary for road safety, and minimise the removal of leaf litter;
- Keep out of drip line of trees where possible, to avoid soil compaction and damage to tree roots; and,
- Be aware of smaller, ground level plants such as orchids, grasses, and lilies as they are important habitat and food sources for native animals.

### 6.4 Managing Stockpiles

The following measures should be taken to minimise the potential impacts of stockpiling:

- Locate stockpiles on 'Highly Modified' roadsides where possible. Avoid placing stockpiles on roadsides in 'High Recovery Potential' and 'Conservation Zone' categories;
- Mark the limits of the stockpile, and install appropriate sediment control measures where required; and,
- Do not push stockpile materials into roadside vegetation, and do not assume that a temporary stockpile will not damage understorey plants.

### 6.5 Topsoil Management

Where excavation in the roadside is required, topsoil removed from 'High Recovery Potential' and 'Conservation Zone' category roadsides should be stockpiled and re-spread after works are completed. This will allow seed stored within the topsoil to remain in the area and revegetate. Also avoid bringing topsoil which may be contaminated by weed seed into weed free areas, particularly into 'Conservation Zone' and 'High Recovery Potential' roadsides.

# 7

## Bush Fire Management and Guidelines for Landholders and Landcare Groups

### 7.1 Guidelines for Landholders

Any 'works' undertaken within the road reserve by members of the public must have the consent of the Council (under S.138 of the Roads Act 1993). Furthermore the removal of vegetation (excluding noxious weed species) requires the approval from Department of Land and Water Conservation (DLWC) under the Richmond Regional Vegetation Management Plans (Draft 2002).

The following guidelines should be followed by rural landholders with regard to the roadside:

- Gain permission from Council before the construction of access roads and driveways, drainage works and the removal of trees within the road reserve;
- Minimise tree disturbance during fencing operations;
- Firewood removal is prohibited in 'High Recovery Potential' and 'Conservation Zone' category roadsides. Firewood will be stockpiled in an accessible location by Council should there be excessive timber in the roadside;
- Follow established grazing permit procedures (Consult Council); and,
- Grazing in 'Conservation Zone' roadsides is prohibited to avoid disturbance and reduce risks of weed invasion.

### 7.2 Landcare Group Guidelines

Roadsides can play an important part in linking habitat areas and providing habitat refuge areas for native species. Revegetation of roadside areas can also have benefits for adjoining landholders through providing effective windbreaks. For revegetation works to be successful however, it is important that works are well planned and that all stakeholders are informed.

To maximise the efforts in undertaking regeneration/revegetation works it is recommended that preference be given to:

- 'High Recovery Potential' roadsides;
- Areas within identified Habitat Corridors;
- Linking sections of 'High Recovery Potential' and/or 'Conservation Zone' roadsides;
- Riparian areas (stream and river corridors); and,

- Problem sites, such as where active erosion is occurring.

Before works commence it is important to:

- Consult with Landcare Coordinators regarding your plans, to ensure that they are most likely to succeed, and to gain assistance that may be available;
- Inform Council of the proposed works and ensure Council requirements are met; and,
- Obtain information from infrastructure providers regarding the location of services.

Assistance that may be available from Landcare Coordinators includes:

- Information on species selection, collection, propagation and planting methods; and,
- Seeking of funding and access to free labour where available.

Roadside revegetation areas should be clearly signposted and the perimeter marked out to avoid persons accidentally disturbing the plantings.

### 7.3 Fire Management Guidelines

Fire management is the responsibility of the local Bush Fire Management Committee (BFMC). The Rural Fires Act (1997) requires that the BFMC prepare a Bushfire Risk Management Plan for the Shire, covering all land classes and tenures including roads and roadsides. The Act (S.66) also enables the local authority (Kyogle Council) to require private landholders to undertake bush fire hazard reduction works on private land, and to specify the way in which this done.

The preparation of Bushfire Risk Management Plans should be undertaken in a strategic fashion involving the establishment of clear objectives such as:

- Prevent roadside fires from occurring;
- Contain roadside fires – limit the spread of fires originating in the roadside;
- Manage the safety of road users – provide for safe evacuation and fire access routes; and,
- Provide effective fire control lines – to inhibit the lateral movement of fires.

Effective fire management techniques include burning, slashing, spraying, grazing and grading. Decisions regarding the appropriate type and location of bush fire protection measures, in relation to roadside areas, should be taken in consideration, matters such as:

- Roadside Conservation Category (refer to map);
- History of fires and roadside ignitions in the area;
- Likely course of fire behaviour if a fire was to leave the roadside;
- Extent and potential for effective fire prevention works on adjacent lands;
- Response time of fire fighting crews in reaching the location;

- Whether the road is identified as an essential evacuation route or fire access road;
- Consequences if the fire is not controlled on the roadside; and,
- Whether the Roadside Fire Management Objective can be realistically achieved.

(Source: CFA 2002)

While the protection of life and property are the primary concerns for bushfire management, the conservation significance of roadside vegetation should be taken into account when managing fire risk. Approaches may include, where appropriate:

- Avoid establishing roadsides as firebreaks in 'High Recovery Potential' and 'Conservation Zone' roadsides, and instead establish on adjacent properties where possible;
- Slash fire breaks rather than bulldozing or ploughing, to reduce erosion; and,
- Protect areas where native regrowth is occurring by slashing rather than burning.

# 8

## Legislation and Other Considerations

A wide range of legislation, policies and plans relate to the management of roadside vegetation. The following sections provide an overview of legislative, policy and planning matters relevant to roadside vegetation management with regard to the functional role of road corridors in Kyogle Shire. The legislative provisions, policies and plans listed should not be considered as an exhaustive list, but rather an indication of key matters that may apply to works within the road corridor. Additional legislative or policy matters may apply depending on the activity proposed.

### 8.1 Commonwealth Legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the major piece of environmental legislation administered by the Commonwealth. The EPBC Act protects matters of national environmental significance and Commonwealth land. As such, it establishes a framework for Commonwealth assessment of proposed actions that are likely to have significant impacts on matters of national environmental significance or on Commonwealth land. Matters of national environmental significance that are triggers for Commonwealth assessment and approval relevant to roadside vegetation management in Kyogle Shire are;

- World Heritage properties;
- wetlands listed as Ramsar wetlands of international importance;
- nationally threatened species and communities listed under the EPBC Act (note that these species may not be the same as those listed under state legislation); and
- migratory species listed under the EPBC Act (these are migratory species protected under international agreements).

Where such areas may be significantly impacted by a proposed activity, Commonwealth approval may be required.

### 8.2 NSW State Legislation

There is a range of NSW State legislation that may be applicable to roadside vegetation management. A summary of the key relevant legislation and its implications is set out in Table 8.1.

**Table 8.1 Key NSW Legislation**

<b>Act</b>	<b>Implications for Roadside Vegetation Management</b>
<b><i>Crown Lands Act 1989</i></b>	Sets out requirements for the development and conservation of Crown Land. Roadside activities involving Crown Land must be consistent with the provisions of this Act.
<b><i>Environmental Planning and Assessment Act 1979</i></b>	Provides the framework for the assessment of proposed roadside works. Assessment is required under Part 5 of the Act for works located within the road reserve, with works located outside the road reserve requiring assessment under Part 4 of the Act.
<b><i>National Parks and Wildlife Act 1974</i></b>	<p>Consent is required from the NPWS to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to, an Aboriginal relic or place.</p> <p>Appropriate approvals are required to harm threatened species, populations, ecological communities and their habitats and critical habitat.</p>
<b><i>Native Vegetation Conservation Act 1997</i></b>	<p>Controls the clearance of native vegetation via Regional Vegetation Management Plans.</p> <p>Vegetation clearance undertaken outside of the exemptions provided under the Act (see below) require approval under the relevant Regional Vegetation Management Plan (Draft Richmond Regional Vegetation Management Plan).</p> <p>Exemptions from approval apply to:</p> <ul style="list-style-type: none"> <li>▪ Council under the Roads Act 1993;</li> <li>▪ The Rural Fire Service, under the Rural Fires Act 1997 and State Emergency or Rescue Management Act 1989; and</li> <li>▪ Infrastructure providers undertaking 'minimal removal' of native vegetation, under Exemption 11 of the Draft Richmond Regional Vegetation Management Plan.</li> </ul>
<b><i>Noxious Weeds Act 1993</i></b>	Requires Council to carry out relevant control measures for noxious weed species.
<b><i>Rivers and Foreshores Improvement Act 1948</i></b>	Permit may be required where works are proposed within 40 m of a watercourse.

<b><i>Roads Act 1993</i></b>	<p>Allows the roads authority to carry out road work on any public road for which it is the authority and on any other land under its control.</p> <p>Allows the roads authority, despite any other Act or law to the contrary, to remove or lop any tree or other vegetation that is on or overhanging a public road if it is necessary to do so for the purpose of carrying out road work or removing a traffic hazard.</p> <p>Requires Council consent for activities undertaken by members of the public within the road reserve.</p> <p>The RTA may exercise the functions of the roads authority for classified roads.</p>
<b><i>Rural Fires Act 1997</i></b>	<p>Provides a framework for bushfire hazard reduction activities to be carried out. Such activities required within roadside areas must be carried out in a manner consistent with the provisions of the Act. See Section 7.3 for further information.</p>
<b><i>Threatened Species Conservation Act 1995</i></b>	<p>Lists threatened species. Impacts on threatened species, populations, ecological communities or their habitat and must be considered prior to carrying out works and works may need to be licensed.</p>
<b><i>Fisheries Management Act 1994</i></b>	<p>A permit is required if roadworks involve any dredging or reclamation within a waterway.</p>

### 8.3 Environmental Planning Instruments

#### Interim Development Orders (IDOs)

*Interim Development Order No.1 – Shire of Kyogle* and *Interim Development Order No.1 – Shire of Terrania* are the local environmental planning instruments applicable in Kyogle Shire. These instruments contain a number of provisions which regulate development activities within Kyogle Shire, including provisions relating to vegetation management. The provisions of the relevant IDO relating to vegetation management must be considered where development consent is required to carry out works within the road corridor.

#### North Coast Regional Environmental Plan

The *North Coast Regional Environmental Plan 1988* contains a number of provisions relating to the environment and heritage. The provisions relating to vegetation should be considered in relation to proposed works within the road corridor.

### **State Environmental Planning Policy No. 44 – Koala Habitat Protection**

SEPP 44 contains provisions to encourage the conservation and management of areas of Koala habitat to ensure the current distribution of Koalas is maintained. The provisions of this SEPP must be considered where Koala habitat may be impacted by proposed works within the road corridor.

## **8.4 Other Policies and Plans**

### **Country Energy Vegetation Management Plan**

This vegetation management plan considers a range of issues relating to the provision and maintenance of electricity infrastructure with regard to vegetation. The environmental guidelines of the plan should be considered when undertaking activities related to the provision of electricity infrastructure along roadsides.

In addition, consideration should be given to Country Energy's planting guidelines within the vegetation management plan where roadside vegetation rehabilitation works are proposed.



# 9

## Recommendations

A number of management initiatives should be adopted or promoted to ensure the appropriate overall management of roadside vegetation in Kyogle LGA. These include:

- Adopt this Plan;
- Nominate a contact officer/position to co-ordinate the implementation of this Plan;
- Publish this Roadside Vegetation Management Plan within Council, other roadside managers and the community;
- Compile and regularly update a register of stakeholders (Appendix F) for notification and consultation about roadside activities;
- Advise community groups (e.g. Landcare) and landholders of roadside projects;
- Initially, implement a signage program for all areas categorised as 'Conservation Zone' with the view to continuing signage of other areas undergoing regeneration works;
- Enlist appropriate specialist skills (e.g. ecologist) for roadside activity plan preparation;
- Advise and liaise with appropriate stakeholders during roadside activity plan preparation (may include on-site meetings);
- Obtain any permits that may be required by legislation (Section 8);
- Initiate training programs for work crews including indigenous species identification, regeneration techniques, weed identification and control techniques;
- Ensure site rehabilitation projects are completed and maintained until plants are established and self-maintaining and remove any temporary structures;
- Initiate a monitoring system for rehabilitation projects;
- Review this Plan regularly (e.g. every 5 years) or after substantial works in road reserves; and,
- Endeavour to incorporate a standard target budget (e.g. 5%) to all major roadside projects for revegetation/rehabilitation requirements.

Specifically, a number of matters were identified for immediate action by Kyogle Council.

Priority matters include:

- Prepare and install appropriate signage of all areas categorised as Conservation Zones (refer GIS file).
- Relocate the following existing stockpiles from category A (Conservation Zone) and B (High Recovery Potential) roadsides:

Stockpile Name	Location	Roadside Category
Dairy Flat	MR83 (Summerland Way) section 306	B
Ferndale Road	Ferndale Road section 296A	B
Mount Lindsay	MR83 (Summerland Way) section 307	A
Tabulam	SH16 (Bruxner Highway) section 478	A
Van Mouriks	SH16 (Bruxner Highway) section 469	B

- Repair known sites of severe erosion (e.g. Rodgers Road, Section 398);
- Revegetate gaps in habitat corridors (Table 9.1, refer also to Richmond Regional Vegetation Management Plan); and,
- Assist in augmenting restoration of habitat corridors and riparian zones (priority areas) as identified by Landcare and DLWC.

### Additional Recommendations

Kyogle Council should investigate the feasibility of establishing a plant nursery, or establishing a commercial arrangement with private nurseries, to provide appropriate indigenous species for revegetation and stabilisation works associated with council operations in the roadside.

### Funding Opportunities

Revegetation and rehabilitation is often a costly activity. While co-ordination with other stakeholders and community groups may assist in spreading costs, funding needs must be sought. Funding opportunities are available from a wide range of sources and applications should target objectives of the funding bodies. For example, funding application should target opportunities identified in:

- Catchment Blueprints (DLWC);
- Richmond Regional Vegetation Plan (DLWC);
- Land for Wildlife; and,
- National Heritage Trust funding.

**Table 9.1** Priority revegetation sites (located within identified regional habitat corridors)

Road Name	Roadside Management Plan Section Number
Atkins Road	39
Askews Dip Road	379
Babyl Creek Road	240A
Bruxner Highway (SH16)	471A
Buchananas Road	35
Cawongla Road	48A
Collins Creek Road	72A
Ferndale Road	124A
Findon Creek Road	147A, 147C
Gabal Road	33
Grady's Creek Road	126A
Green Pidgeon Road	90A
Hartley's Road	103
Hootens Road	380
Johnstones Road	13
Kyogle Road (MR141)	455A, 459, 461
Lillian Rock Road	31
Link Road	41
Long Creek Road	149A
Lynches Creek Road	114A
Main Creek Road	128A
Peacock Creek Road	407A
Richmond Range Road	248
Robb Road	32
Sargents Road	52, 52B
Stoney Chute Road	44
Summerland Way (MR83)	296A, 297A, 301, 304, 305, 306,
Warrazambil Creek Road	120A
Williams Road	11, 14, 16, 18, 19,

\* Refer to GIS file for location of sections

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A

# Roadside Assessment Sheet

## Kyogle Roadside Assessment Sheet

Road Name / Number: .....

Section Number:	Date:
Road Type: <input type="checkbox"/> Sealed <input type="checkbox"/> Unsealed	

### Photo Reference:

### Vegetation Structure:

- |   |  |                                      |
|---|--|--------------------------------------|
| <input type="checkbox"/> Grassland            | <input type="checkbox"/> Scattered Trees | <input type="checkbox"/> Shrubland   |
| <input type="checkbox"/> Open Woodland        | <input type="checkbox"/> Woodland        | <input type="checkbox"/> Open Forest |
| <input type="checkbox"/> Closed Forest        | <input type="checkbox"/> Planting        | <input type="checkbox"/> Wetland     |
| <input type="checkbox"/> No native vegetation |  |                                      |

### Density of tree cover:

- ☐ 0-10% ☐ 10 - 30 % ☐ 30 - 70% ☐ 70 - 100%

### Vegetation Condition:

Veg Condition:	1 – severely degraded    2 – highly modified    3 – regeneration occurring 4 – significant regeneration    5 – near natural			
Veg Layers:	<input type="checkbox"/> canopy	<input type="checkbox"/> shrubs	<input type="checkbox"/> ground layer	<input type="checkbox"/> complex/vines
Tree Age and Regeneration:	<input type="checkbox"/> trees cleared	<input type="checkbox"/> mature trees only	<input type="checkbox"/> slight regeneration	<input type="checkbox"/> all ages – extensive regeneration
Understorey:	<input type="checkbox"/> understorey removed	<input type="checkbox"/> scattered shrubs	<input type="checkbox"/> clumps regenerating	<input type="checkbox"/> shrub layer intact/ no natural understorey

### Weeds:

Weed Species:	<i>e.g. Lantana, Paramatta grass, Tecoma stans, Mother of Millions, Camphor laurel, Wandering jew, Cadaghi, Pine, Privets, Madeira vine, Balloon vine, Cats claw creeper, Moth vine</i>
---------------	---

### Habitat Value:

Habitat Corridor	<input type="checkbox"/> Regional	<input type="checkbox"/> Sub-regional	<input type="checkbox"/> Local
trees with hollows			
logs/leaf litter			
rocks/crevices			
dead standing trees			

**Adjacent Land:**

<input type="checkbox"/> Cleared	<input type="checkbox"/> Residential	<input type="checkbox"/> Scattered Trees
<input type="checkbox"/> Uncleared	<input type="checkbox"/> Riparian	<input type="checkbox"/> Bushland
<input type="checkbox"/> Farmland	<input type="checkbox"/> Plantation Exotic	<input type="checkbox"/> Plantation Natural
	<input type="checkbox"/> National Park	

**Management Issues:**

Issue:	Comment:
Road Maintenance:	<i>e.g. batters, drainage, road safety,</i>
Services	<i>e.g. telstra and countryenergy</i>
Management notes:	<i>e.g. evidence of burning, roadside grazing, roadside unfenced, erosion, rubbish</i>
Special Sites:	<i>e.g. cultural heritage, travelling stock routes, rare or threatened species,</i>
Local Landcare Group:	

**Dominant Native Tree Species Present:**

**Dominant Native shrub and groundcover species present:**

**Further Management Notes:**



# B

## Local Aboriginal Land Council Contacts and Jurisdiction

**Casino Boolangle Local Aboriginal Land Council**

Contact: Bernie Walker

Ph: 6662 6286

Fax: 6662 6290

Postal Address: PO Box 1047, CASINO, NSW 2470

Address: 110 Walker St CASINO NSW 2470

email: cblalc@hotmail.net.au

**Gugin Gudduba Local Aboriginal Land Council**

Contact: Ron Randall

Ph: 6632 1056

Fax: 6632 2324

Postal Address: PO Box 597 KYOGLE NSW 2474

Address: Unit 2/84 Summerland Way KYOGLE NSW 2478

**Muli Muli**

Contact: Matthew Green

Ph: 6635 1487

Fax: 6635 1498

Postal Address: PO Box 68, WOODENBONG NSW 2476

Address: Muli Muli Crs WOODENBONG NSW 2476

**Jubullum**

C/- North Coast Regional Aboriginal Land Council

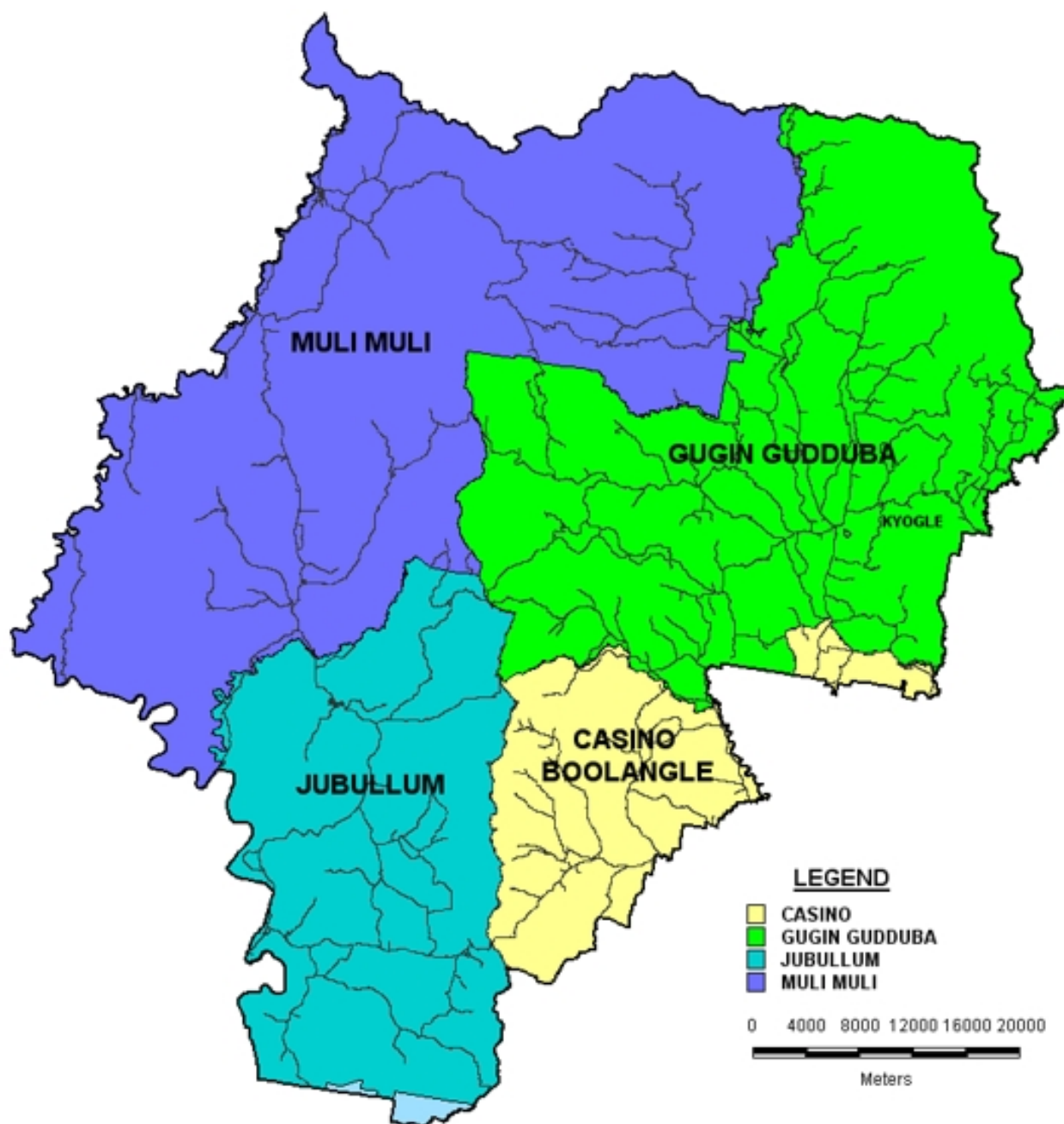
Contact: Harold Love or Lisa Bolt

Ph: 6622 1010

Fax: 6622 1931

Postal Address: PO Box 494, LISMORE, NSW 2480

Address: 25 Orion St LISMORE NSW 2480



C

# Roadside Vegetation Management Categories

Enlarged version of Illustration 3.1

D

# Common Flora Species Observed in Kyogle LGA

Common native species observed during surveys.

COMMON NAME	SCIENTIFIC NAME	PLANT FORM
Bangalow Palm	<i>Archontophoenix cunninghamiana</i>	T
Banksia	<i>Banksia integrifolia</i>	T
Black Bean	<i>Castanospermum australe</i>	T
Blady Grass	<i>Imperata cylindrica</i> var. <i>major</i>	G
Blue Flax Lily	<i>Dianella caerulea</i>	G
Blue Quandong	<i>Elaeocarpus grandis</i>	T
Bracken Fern	<i>Pteridium esculentum</i> **	G
Broad-leaved Apple; Applegum	<i>Angophora subvelutina</i>	T
Broad leaved Paperbark	<i>Melaleuca quinquenervia</i>	T
Brown Bolly Gum	<i>Litsea australis</i>	T
Brushbox	<i>Lophostemon confertus</i>	T
Celerywood	<i>Polycias elegans</i>	T
Cockspur Thorn	<i>Maclura cochinchinensis</i> **	G
Common Silkpod	<i>Parsonia straminea</i>	V
Cordyline	<i>Cordyline</i> spp.	G
Deciduous Fig	<i>Ficus superba</i> var. <i>henneana</i>	T
Dogwood	<i>Jacksonia scoparia</i>	S
Five Leaf Water Vine	<i>Cissus hypoglauca</i> ***	V
Foambark	<i>Jagera pseudorhus</i> var. <i>pseudorhus</i>	T
Forest Red Gum	<i>Eucalyptus tereticornis</i>	T
Forest She-oak	<i>Allocasuarina torolsa</i>	T
Grass Tree	<i>Xanthorrhoea</i> spp.	S
Green Wattle	<i>Acacia irrorata</i>	S
Grey Box	<i>Eucalyptus moluccana</i>	T
Grey Ironbark	<i>Eucalyptus siderophloia</i>	T
Guioa	<i>Guioa semiglauc</i>	T
Hoop Pine	<i>Araucaria cunninghamii</i>	T
Kangaroo Grass	<i>Themeda australis</i> ***	G
Creek Lilly Pilly	<i>Acema smithii</i>	T
Maidenhair Fern	<i>Adiantum formosum</i>	G
Maiden's Wattle	<i>Acacia maidenii</i>	T
Mistletoe	<i>Muellerina celastroides</i> **	V
Moreton Bay Fig	<i>Ficus macrophylla</i>	T
Native Cherry	<i>Exocarpos cupressiformis</i>	T
Native Frangipani	<i>Hymenosporum flavum</i>	T
Native Ginger	<i>Alpinia caerulea</i> ***	G
Native Raspberry	<i>Rubus parvifolius</i>	S
Native Sarsparilla	<i>Smilax australis</i>	V
Poison Peach/Native Peach	<i>Trema aspera</i>	T
Port Jackson Fig/Rusty Fig	<i>Ficus rubiginosa</i>	T
Prickly Alyxia	<i>Alyxia ruscifolia</i>	T
Red Ash	<i>Alphitonia excelsa</i>	T
Red Bloodwood	<i>Corymbia gummifera</i>	T

COMMON NAME	SCIENTIFIC NAME	PLANT FORM
Red Cedar	<i>Toona australis</i>	T
Red Kamala	<i>Mallotus philippensis</i>	T
River Oak	<i>Casuarina cunninghamii</i>	T
Rough-leaf Elm	<i>Aphananthe philippensis</i>	T
Rough-shelled Bush Nut	<i>Macadamia tetraphylla</i> *	T
Sally Wattle/Blackwood	<i>Acacia melanoxylon</i>	T
Sandpaper Fig	<i>Ficus coronata</i> ***	T
Saw Sedges	<i>Ghania</i> spp.	G
Scrambling Lilly	<i>Geintoplesium cymosum</i>	V
Silky oak	<i>Grevillea robusta</i>	T
Spiny-headed Mat Rush	<i>Lomandra longifolia</i> ***	G
Spotted gum	<i>Eucalyptus maculata</i>	T
Steel Box	<i>Eucalyptus rummeryi</i>	T
Strangler Fig	<i>Ficus watkinsiana</i>	T
Swamp Fern	<i>Blechnum indicum</i>	G
Sweet Pittosporum	<i>Pittosporum undulatum</i> **	T
Tall Abutilon	<i>Abutilon grandifolium</i>	T
Tallowood	<i>Eucalyptus microcorys</i>	T
Teak	<i>Flindersia australis</i>	T
Tuckeroo	<i>Cupaniopsis anacardioides</i>	T
Weeping Callistemon	<i>Callistemon viminalis</i>	T
White Bolly Gum	<i>Neolitsea dealbata</i>	T
White Fig	<i>Ficus virens</i>	T
White Sally	<i>Acacia floribunda</i> **	T
Wombat Berry	<i>Eustrephus latifolius</i>	V

\* listed as vulnerable under the *Threatened Species Conservation Act 1995*

\*\* weed potential

\*\*\* plants suitable for embankment stabilisation works



**Common non-indigenous (or potential weed) species observed during surveys.**

COMMON NAME	SCIENTIFIC NAME
Balloon Vine	<i>Cardiospermum grandiflorum</i> *
Blue Billy Goat Weed	<i>Ageratum houstonianum</i> *
Broad-leaved Privet	<i>Ligustrum lucidum</i> *
Bush Lemon	<i>Citrus limon</i> *
Camphor Laurel	<i>Cinnamomum camphora</i> ** (W4(d))
Castor Oil Plant	<i>Ricinus communis</i> *
Cat's Claw Creeper	<i>Macfadyena unguis-cat</i> *
Celtis, Chinese Celtis, Chinese Elm, Hackberry	<i>Celtis sinensis</i> *
Passionfruits	<i>Passiflora</i> spp.*
Crofton Weed	<i>Ageratina adenophora</i> ** (W3)
Desmodium	<i>Desmodium</i> sp.*
Farmers Friends/Cobblers Pegs	<i>Bidens pilosa</i> *
Fireweed	<i>Senecio madagascariensis</i>
Giant Parramatta Grass	<i>Sporobolus fertilis</i> syn. <i>Sporobolus indicus</i> var. <i>m</i> <sup>1**</sup> (W3)
Groundsel bush	<i>Baccharis halimifolia</i> ** (W2)
Honey Locust	<i>Gleditsea triacanthus</i> *
Jacaranda	<i>Jacaranda mimosifolia</i> *
Johnson Grass	<i>Sorghum halepense</i> ** (W2)
Lantana	<i>Lantana camara</i> ** (W3)
Madeira Vine, Lamb's Tail	<i>Anredera cordifolia</i> *
Mistflower	<i>Ageratina riparia</i> ** (W3)
Morning Glory Vines	<i>Ipomea</i> spp.*
Moth Vine	<i>Araujia hortorum</i>
Oleander	<i>Nerium oleander</i>
Pine (Slash and Monterey)	<i>Pinus ellioti</i> * and <i>P. radiata</i> *
Purple Top	<i>Verbena bonariensis</i> *
Rhodes Grass	<i>Chloris gayana</i> *
Scotch Thistle	<i>Onopordum acanthium</i>
Small-leaved Privet	<i>Ligustrum sinense</i> *
Tobacco Bush	<i>Solanum mauritianum</i> *
Willow	<i>Salix</i> spp.** (W4(g))
Winter Senna, Cassia, Arsenic Bush.	<i>Senna pendula</i> var. <i>glabrata</i> *

<sup>1</sup> known to occur in area but not recorded during surveys (refer to section 1.8 Limitations of Survey)

\* Environmental weed as defined by North Coast County Council (2000)

\*\* Noxious weed as described by *Noxious Weeds Act 1993* (W2 = The weed must be fully and continuously suppressed and destroyed; W3 = The weed must be prevented from spreading and its numbers and distribution reduced; W4 = The action specified in the declaration must be taken in respect of these weeds)

E

# Weed Control Methods and Environmental Weeds as Identified by North Coast County Council

### Common Weed Control Methods

Species	Legal Status	Slashing	Hand	Cut/Scrape and Paint	Stem inject	Foliar Spray	Other
Bamboo		✗	✓			✓	
Balloon Vines			✓	✓	✓	✓	✓
Blue Billygoat Weed		✓	✓				
Broadleaved Pepper			✓	✓	✓	✓	
Camphor Laurel	W4(d)		✓	✓	✓	✓	✓
Castor Oil Plant			✓	✓	✓	✓	✓
Cats Claw Creeper			✗	✓		✓	✓
Celtis; Chinese Celtis, Chinese Elm, Hackberry			✓	✓	✓	✓	
Cobblers Pegs; Biddens		✗	✓			✓	
Cocos or Queen Palm			✓	✓	✗	✗	✓
Coffee			✗	✓	✓	✗	
Coral Trees			⌘		✓		
Crofton Weed; Mist Flower	W3	✗	✓			✓	
Giant Parramatta Grass; Giant Rats Tail Grass	W3	✗				✓	
Green Cestrum	W2	✗		✓		✓	
Groundsel Bush	W2		✓	✓		✓	
Guava			✓	✓	✓	✓	
Honeysuckle			✗	✓		✗	
Johnson Grass	W2	✗				✓	
Umbrella Trees			✓	✓	✓	✓	✓
Lantana	W3	✓	✓	✓	✓	✓	
Madeira Vine		✗	✓	✓		✓	✓
Milk Vine; Moth Vine; Poison Choko		✗	✓	✓	✓	✓	✓
Morning Glory Vines				✓		✓	✓
Mother-of-millions		✗	✓			✓	
Ochna; Mickey Mouse Plant			✓	✓	✓	✓	
Olives			✓	✓	✓	✓	✓
Pampas Grass	W2	✗	✓			✓	
Passionflowers			✓	✓		✓	
Pine (Slash and Monterey)			✓	✓	✓		
Privets			✓	✓	✓	✓	✓
Senna; Cassia; Arsenic			✓	✓	✓	✓	✓

Bush.							
Tobacco Bush			✓	✓	✓	✓	
Yellow Bells; Tecoma Stans							
Thorny Poinciana			x	✓	✓	x	

Notes:

☞ = Method may be successful, depending on timing, stress levels of weed plants, season etc.

Contact Far North Coast Weeds ([www.fncw.nsw.gov.au](http://www.fncw.nsw.gov.au)) or NSW Agriculture ([www.agric.nsw.gov.au/weeds](http://www.agric.nsw.gov.au/weeds)) for more information.

Foliar Spraying may only be an effective control method on seedlings or regrowth for some species.

Cut/Scrape and Paint method: Cutting is recommended on larger, woody stemmed plants while scraping is more suitable for vines and thin stemmed weed species.

## North Coast Environmental Weed Survey - 2000

As a response to a survey of organisations and individuals involved in environmental weeds, the NSW North Coast Weed Advisory Committee's Environmental Weed Taskforce identified 187 weeds as having, or with the potential to have, a significant impact on native vegetation on the NSW North Coast.

The following table lists the weeds sorted in order of their potential impact. The weeds were rated by each organisation, or individual against the impact criteria where C1 = Current major, C2 = Current minor, P1 = potential major and P2 = potential minor impact on native vegetation communities.

Ranking	SURVEY RESPONSES – SORTED BY MAJOR POTENTIAL THEN MINOR POTENTIAL IMPACT						
	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	P1+C1P1+C2P1. C2P1.	P1+P2+C1P2+C2P2
1	Anredera cordifolia	Madeira Vine, Lamb's Tail	29	22	5	22	2
2	Ligustrum sinense	Small Leaf Privet	28	23	3	20	0
3	Ipomoea indica	Purple Or Blue Morning Glory	27	19	6	19	2
4	Cinnamomum camphora	Camphor Laurel	29	25	3	19	1
5	Macfadyena unduis-cati	Cat's Claw Creeper	24	16	5	18	1
6	Ligustrum lucidum	Broad Leaf Privet	27	20	6	19	0
7	Tradescantia albiflora	Wandering Jew, Wandering Creeper, Trad	31	20	9	18	5
8	Celtis sinensis	Celtis, Chinese Celtis, Chinese Elm, Hackberry	22	9	11	17	2
9	Syagrus romanzoffianum	Cocos Palm, Queen Palm	25	9	13	16	4
10	Lantana camara	Lantana	29	27	1	17	3
	Asparagus densiflorus, A. aethiopicus, Protasparagus	Asparagus Fern, Sperengi Fern, Protasparagus, Sprenger's Asparagus					
11	aethiopicus		24	15	6	16	2
	Alternanthera	Alligator Weed					
12	philoxeroides		17	2	4	16	0
13	Gloriosa superba	Glory Lily	19	9	7	16	1
14	Schefflera actinophylla	Umbrella Tree	28	7	16	15	8
	Cabomba caroliniana	Cabomba, Fanwort Carolina, Watershield, Fish Grass, Washington Grass, Watershield					
15			17	3	11	16	1
16	Asparagus plumosus	Climbing Asparagus Fern	20	12	6	15	1
17	Schinus terebinthifolia	Broadleaf Pepper Tree	17	5	8	15	0
18	Lonicera japonica	Japanese Honeysuckle	26	8	18	15	6
	Cardiospermum	Balloon Vine					
19	grandiflorum		26	20	5	14	2
	Chrysanthemoides monilifera	Boneseed, Bitou Bush, Biefou, Brother Berry, Higgin's Curse, Jungle Flower, Salt Bush					
20			29	27	1	15	1
21	Asparagus africanus	Asparagus Fern	18	10	6	14	1
22	Coffea arabica	Coffee	22	0	20	13	6

Ranking	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	P1+C1P1+C2P1. P2+C1P2+C2P2
23	<i>Ipomoea cairica</i>	Mile-A-Minute, Five-Leaved Morning Glory.	25	15	9	13
24	<i>Ochna serrulatta</i>	Ochna, Mickey Mouse Plant.	28	14	13	13
	<i>Thunbergia grandiflora</i>	Thunbergia, Blue Trumpet Vine, Bengla Clock Vine, Blue Skyflower, Blue Trumpet Vine, Clock Vine, Sky Flower, Sky Vine	18	3	8	13
25						4
26	<i>Baccharis halimifolia</i>	Groundsel, Groundsel Bush.	31	17	13	14
	<i>Senna pendula</i> var. <i>glabrata</i>	Winter Senna, Cassia, Arsenic Bush.	27	16	10	12
27						6
28	<i>Eichhornia crassipes</i>	Water Hyacinth	20	13	6	12
	<i>Salvinia molesta</i>	Salvinia, Kariba Weed, Giant Salvinia	21	11	9	11
29						6
	<i>Ageratina riparia</i>	Mistflower, Mist Weed, Creeping Crofton	26	18	7	11
30						0
31	<i>Cytisus scorparius</i>	English Broom, Scotch Broom,	16	5	9	10
	<i>Caesalpinia decapetala</i>	Mysore Thorn, Thorny Poinciana, Hofymer Vine/Bush	19	1	16	10
32						3
33	<i>Asparagus scandons</i>	Asparagus Fem	15	7	6	10
	<i>Delairea odorata</i>	Cape Ivy	17	2	15	9
34						6
	<i>Duranta repens</i>	Durant, Duranta, Blue Sky Flower, Pigeon Berry.	15	1	13	9
35						3
36	<i>Wedilia trilobata</i>	Singapore Daisy	17	3	11	9
	<i>Asparagus asparegoides</i>	Bridal Creeper, Bridal Veil Creeper, Baby Smilax, Smilax	15	6	7	9
37						3
38	<i>Nephrolepis cordifolia</i>	Fishbone Fern	29	4	24	8
	<i>Erythrina crista-galli</i>	Cockscomb Coral Tree. Indian Coral. Confused With E. Indica	24	7	16	9
39						7
	<i>Buddleja davidii</i> &/or <i>B. Madagascarensis</i>	Buddleia	17	2	15	8
40						4
41	<i>Paspalum wettsteinii</i>	Broad-leaf Paspalum	12	8	2	8
	<i>Salix nigra</i>	Black Willow	16	2	13	8
42						4
	<i>Oleo europaea</i> subsp <i>africana</i>	Common Olive	13	2	8	8
43						3
44	<i>Ageratina adenophora</i>	Crofton Weed	29	21	7	9
	<i>Pinus ellioti</i>	Slash Pine	18	4	13	7
45						6
46	<i>Pinus radiata</i>	Monterey Pine	15	4	10	7
	<i>Solanum seaforthianum</i>	Climbing Nightshade	20	2	18	7
47						5
48	<i>Salix</i> Spp.	Willows	15	4	10	7
	<i>Tecoma stans</i>	Yellow Elder	13	1	12	8
49						3
50	<i>Sporobolus fertilis</i>	Giant Parramatta Grass	14	10	3	8
	<i>Cryptostegia grandiflora</i>	Rubber Vine, Rubbervine	8	2	2	7
51						0

Ranking	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	P1+C1P1+C2P1. C2P1.	P2+C1P2+C2P2
52	Araujia sericiflora	Moth Plant, Cruel Plant, Kapok Vine, Calico Vine	27	5	21	6	15
53	Bryophyllum spp.	Mother-Of-Millions, Resurrection Plant	31	5	25	7	14
54	Psidium cattleianum	Cherry Guava	14	0	11	6	6
55	Murraya paniculata	Orange Jessamine	16	0	15	6	5
56	Ageratum houstonianum	Blue Billygoat Wed	16	6	10	7	4
57	Rubus fruticosus	Blackberry	18	9	9	6	5
58	Equisetum spp.	Common Horsetail, Field Horsetail, Scouring Rush	9	0	5	6	3
59	Eugenia uniflora	Brazilian Cherry	12	1	9	6	3
60	Gleditsia triacanthus	Honey Locust	11	1	8	6	4
61	Sporobolus pyramidalis	Giant Rats Tail	9	1	7	7	1
62	Ulex europaeus	Furze, Gorse, Whin	11	0	11	6	1
63	Passiflora suppleta	White Passionfruit.	25	5	19	5	12
64	Senna X floribunda	Smooth Senna	14	5	8	5	6
65	Eucalyptus torelliana	Cadaghi	14	2	11	5	5
66	Aristolochia elegans	Dutchman's Pipe	14	3	10	5	2
67	Myriophyllum aquaticum	Parrot's Feather, , Thread Of life	9	2	6	6	2
68	Setaria sp.	Setaria	9	4	4	5	2
69	Ipomoea alba	Moonflower	8	1	7	5	2
70	Mimosa pigra	Mimosa, Giant Sensitive Plant	7	0	5	5	1
71	Erythrina X syriaca	Coral Tree	19	6	12	4	10
72	Passiflora suberosa	Corky Passionfruit	21	5	16	4	9
73	Ricinus communis	Castor Oil Plant	26	10	16	4	10
74	Commelina benghalensis	Commelina	15	2	13	4	7
75	Cortaderia selloana	Pampas Grass, Common Pampas Grass, Silvergrass	21	1	19	4	8
76	Hypericum perforatum	St John's Wort, Goatweed, Klamath Weed, Perfoliate St John's Wort	11	0	8	4	6
77	Watsonia meriana	Bulbil Watsonia, Watsonia,	13	3	10	4	6
78	Koeleria paniculata	Golden Rain Tree	11	1	7	4	5
79	Thunbergia alata	Black-Eyed Susan	20	3	16	4	5
80	Titania diversifolia	Japanese Sunflower	11	0	10	4	5
81	Andropogon virginicus	Whisky Grass	15	8	6	5	3
82	Desmodium intortum	Green-leaved Desmodium	8	0	8	4	3
83	Desmodium uncinatum	Silver-leaved Desmodium	8	1	7	4	3
84	Urochloa mutica	Para Grass	7	3	2	4	3
85	Cotoneaster spp.	Cotoneaster	11	3	8	4	2
86	Pennisetum setaceum	Fountain Grass	8	0	4	4	2

Ranking	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	<b>P1+C1P1+C2P1.</b>	<b>P2+C1P2+C2P2</b>
87	<i>Pinus caribea</i>	Caribbean Pine	6	1	4	<b>4</b>	2
88	<i>Sorghum halepense</i>	Johnson Grass	9	1	7	<b>4</b>	3
89	<i>Pyracantha fortuneana</i>	Chinese Firethorn	6	1	5	<b>4</b>	0
90	<i>Impatiens walleriana</i>	Common Name: Balsam, Impatiens, Busy Lizzy	24	1	22	<b>3</b>	13
91	<i>Solomon mauritianum</i>	Tobacco Bush	27	9	17	<b>3</b>	10
92	<i>Canna indica</i>	Canna Lily,	22	3	19	<b>3</b>	8
93	<i>Ambrosia artemisiifolia</i>	Ragweed	17	4	12	<b>3</b>	7
94	<i>Tabebuia chrysantha</i> or <i>T. argenter</i>	Golden Trumpet Tree	12	0	8	<b>3</b>	6
95	<i>Macroptilium atropurpureum</i>	Siratro	10	2	7	<b>3</b>	5
96	<i>Acacia baileyana</i>	Cootamundra Wattle	8	0	6	<b>3</b>	3
97	<i>Genista monspessulana</i>	Cape Broom, Canary Broom, Montpellier Broom,	6	1	4	<b>3</b>	2
98	<i>Melinis minutiflora</i>	Molasses Grass	8	1	6	<b>3</b>	2
99	<i>Pyracantha angustifolia</i>	Orange Firethorn	4	1	3	<b>3</b>	1
100	<i>Pyracantha crenulata</i>	Nepal Firethorn	3	1	2	<b>3</b>	0
101	<i>Passiflora edulis</i>	Common Or Edible Passionfruit	23	1	21	<b>2</b>	11
102	<i>Euphorbia cyathophora</i>	Painted Spurge	12	2	9	<b>2</b>	7
103	<i>Lilium formosunum</i>	Formosa Lily	10	1	7	<b>2</b>	6
104	<i>Paspalum urvillei</i>	Giant Paspalum	13	4	8	<b>3</b>	5
105	<i>Pennisetum purpureum</i>	Elephant Grass, Bana Grass, Barner Grass	11	3	7	<b>2</b>	5
106	<i>Rivina humilis</i>	Coral Berry	13	5	8	<b>2</b>	5
107	<i>Axonopus compressus</i>	Broadleaf Carpet Grass	7	1	5	<b>2</b>	4
108	<i>Acacia saligna</i>	Golden Wreath Wattle	5	0	5	<b>2</b>	3
109	<i>Paspalum dilatatum</i>	Paspalum	5	1	3	<b>2</b>	2
110	<i>Rosa rubiginosa</i>	Sweet Briar, Eglantine, Sweet Briar Rose	6	1	5	<b>2</b>	2
111	<i>Eragrostis curvula</i>	Love Grass	5	0	4	<b>2</b>	2
112	<i>Celtis occidentalis</i>		0 2	0	1	<b>2</b>	0
113	<i>Miconia calvenscens</i>	Miconia	2	0	0	<b>2</b>	0
114	<i>Rubus rugosus</i> var <i>thwaitesii</i>	Kerry Berry	2	0	2	<b>2</b>	0
115	<i>Pittosporum undulatum</i>	Sweet Pittosporum, New Zealand Daphne	10	0	9	<b>1</b>	9
116	<i>Jacaranda mimosifolia</i>	Jacaranda	11	1	10	<b>1</b>	8
117	<i>Opuntia stricta</i>	Erect Prickly Pear, Common Prickly Pear, Araluen Pear, Common Pest Pear, Gayndah Pear, Spiny Pest Pear	19	1	18	<b>1</b>	8
118	<i>Crocosmia X crocosmiiflora</i>	Montbretia	12	0	12	<b>1</b>	5



Ranking	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	P1+C1P1+C2P1. C2P1.	P2+C1P2+C2P2
119	<i>Digitaria didactyla</i>	Queensland Blue Couch	8	1	5	1	5
120	<i>Zantedeschia aethiopica</i>	Arum Lily, Calla Lily	9	0	7	1	5
121	<i>Arundo donax</i>	Giant Danube Reed, Giant Reed	8	1	7	1	4
122	<i>Cyperus</i> spp	Various	5	0	4	1	3
123	<i>Glycine javanica</i>	Glycine	4	0	3	1	3
	<i>Panicum maximum</i> var	Guinea Grass					
124	<i>maximum</i>		5	0	4	1	3
125	<i>Cyperus eragrostis</i>	Umbrella sedge	6	0	5	1	2
126	<i>E. tenuifolia</i>	Elastic Grass	4	0	3	1	2
127	<i>Leycesteria formosa</i>	Himalayan Honeysuckle	3	0	3	1	2
	<i>Tamarix aphylla</i>	Tamarisk, Athel Pine, Athel					
128		Tree, Flowering Cypress	4	1	1	1	2
129	<i>Themeda quadrivalvis</i>	Grader Grass	4	0	3	1	2
130	<i>Ardisia crenata</i>	Ardisia	2	0	1	1	1
131	<i>Bidens pilosa</i>	Farmers friends	2	1	1	1	1
132	<i>Cyperus papyrus</i>	Papyrus	2	0	2	1	1
133	<i>Sorghum</i> spp.	(Sorghum hybrids)	3	0	2	1	1
134	<i>Acer negundo</i>	Box elder	1	0	1	1	0
135	<i>Ailanthus altissima</i>	Tree of heaven	1	0	1	1	0
136	<i>Coprosma repens</i>	taupata	1	0	1	1	0
137	<i>Erica lustianica</i>	Spanish Heath	1	0	1	1	0
138	<i>Lagunaria patersonia</i>	Norfolk Island Hibiscus	1	0	1	1	0
139	<i>Morus alba</i>	Mulberry	1	1	0	1	0
	<i>Panicum maximum</i> var	Hairy Panic					
140	<i>trichoglume</i>		2	0	1	1	0
141	<i>Phoenix canariensis</i>	Canary Island Date Palm	1	0	1	1	0
142	<i>Populus alba</i>	White Poplar	1	1	0	1	0
	<i>Senna alata</i>	Candle Bush, Emperor's Candlesticks, Ringworm shrub, Ringworm bush, Ringworm Senna, Empress Candle Plant Christmas Candle, Seven Golden Candlesticks,					
143		Candlestick Senna	2	0	2	1	0
144	<i>Eriobotrya japonica</i>	Loquat	20	1	18	0	14
145	<i>Hedera helix</i>	Ivy, English Ivy	14	1	13	0	7
146	<i>Gazania rigens</i>	Gazania	8	0	8	0	4
147	<i>Paspalum conjugatum</i>	Johnson River Grass	6	0	5	0	4
148	<i>Cestrum parqui</i>	Green Cestrum	2	0	2	0	2
149	<i>Acacia podalyrifolia</i>	Queensland silver wattle	2	0	2	0	1
150	<i>Acetosa sagittata</i>	Turkey Rhubarb	1	0	1	0	1
151	<i>Agave americana</i>	Centrui Plant	2	1	0	0	1

Ranking	Botanical name	Common name	# of responses	C1+C1P1 +C1P2	C2+C2P1 +C2P2	P1+C1P1+C2P1. C2P1.	P2+C1P2+C2P2
152	<i>Albizzia distachya</i>	Cape Leeuwin wattle	1	0	1	0	1
153	<i>Aleurites moluccana</i>	Candle-nut tree	1	0	1	0	1
154	<i>Alocasia aroides</i>	Elephant's Ears	1	0	1	0	1
155	<i>Arundinaria spp</i>	Creeping Bamboo	1	0	1	0	1
156	<i>Cestrum nocturnum</i>	Night-scented jessamine	1	0	1	0	1
157	<i>Chloris guayana</i>	Rhodes grass	1	1	0	0	1
158	<i>Citrus limon</i>	lemon	1	0	1	0	1
159	<i>Crotolaria semperflorens</i>	Indian Rattle-Box	1	0	1	0	1
160	<i>Harpephyllum caffrum</i>	Kaffir plum	1	0	1	0	1
161	<i>Leonotis leonurus</i>	Lion's ear	1	1	0	0	1
162	<i>Morus nigra</i>	Black mulberry	1	0	1	0	1
163	<i>Paulownia tomentosa</i>	Paulownia	1	1	0	0	1
164	<i>Pennisetum clandestinum</i>	Kikuyu	1	1	0	0	1
165	<i>Phyllostachis aureus</i>	Running Bamboo	1	1	0	0	1
166	<i>Polygala myrtifolia</i>	Milkwort	1	0	1	0	1
167	<i>Prunis persica</i>	Peach	1	1	0	0	1
168	<i>Psidium guajava</i>	Guava	1	0	1	0	1
169	<i>Pueraria lobata</i>	Kudzu	1	0	1	0	1
170	<i>Raphiolepis indica</i>	Indian Hawthorn	1	0	1	0	1
171	<i>Robina pseudoacacia</i>	Black Locust	1	0	1	0	1
172	<i>Robinia pseudoacacia</i>	Black Locust	1	1	0	0	1
173	<i>Sanseveiria trifasciata</i>	Mother-in-Law's Tongue	1	0	1	0	1
174	<i>Sapium sebiferum</i>	Chinese Tallow Tree	1	0	1	0	1
175	<i>Senecio macroglossus</i>	German Ivy	1	0	1	0	1
176	<i>Tibouchina granulosa</i>	Lassiandra	1	0	1	0	1
	<i>Toxicodendron</i>	Rhus					
177	<i>succedaneum</i>		1	0	1	0	1
178	<i>Verbena bonariensis</i>	Purple-top	1	1	0	0	1
179	<i>Cenchrus echinatus</i>	Mossman River Grass	1	0	0	0	0
180	<i>Chloris gayana</i>	Rhodes Grass	1	0	0	0	0
	<i>Colocasia esculanta cv</i>	Purple Taro					
181	<i>fontanesii</i>		1	0	0	0	0
182	<i>Eodia ellergana</i>		1	1	0	0	0
183	<i>Inga</i>	Icecream Bean	1	1	0	0	0
184	<i>Pyrostegia venusto</i>	Flame Vine	1	0	0	0	0
	<i>Schinus areira</i>	Pepper Tree, Californian Pepper Tree, Pepper Corn Tree,					
185		Pepperina	1	0	1	0	0
186	<i>Tradescantia zebrina</i>	Striped Wandering Jew	1	0	1	0	0
187	<i>Tropaeolum majus</i>	Nasturtium	1	0	0	0	0

Results compiled by Bruce Scott, Coordinator, NSW North Coast  
Environmental Weed Taskforce

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# Stakeholder Contact List

### Contact List For Kyogle Roadside Vegetation Management Project

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