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Managing Roadsides 1 - Assessment

Neil Dufty



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Managing Roadsides **Assessment**

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Why are roadside environments important?

There are approximately 180,000 km of public roads in New South Wales (NSW). Coupled with other linear reserves such as travelling stock reserves (TSRs), rail corridors and infrastructure easements (including electricity lines, gas pipelines), it is estimated that NSW linear reserves cover about 6% of the State's area.

Apart from covering a large area, the State's roadside reserves contain significant native biodiversity, including ecological communities that are not represented in national parks, public reserves or private land. In rural areas, roadside reserves may constitute the only remaining intact natural environment in the district due to extensive clearing for broadacre farming and other land uses.

Roadside reserves provide invaluable wildlife habitats and corridors, especially when linked with other native vegetation remnants in the landscape and provide connectivity which may assist in addressing threats, including those associated with climate change. Other values of roadside reserves include:

- Transport routes (e.g. for stock)
- Agistment during drought
- Fire control lines
- Carbon sinks
- Places of Indigenous culture and heritage
- Sites of historic heritage
- Geological heritage
- Aesthetic appeal and recreational opportunities
- Sites for research and education.

Managing roadside environments in NSW

Reserves along main roads in NSW are managed by the NSW Roads and Maritime Services; local councils are responsible for the management of local (minor) roads and their reserves.

Managing roadside areas is complex due to a number of competing values and issues. Conservation needs must be balanced with road safety, soil stability, water runoff, legal requirements, bushfire risk, infrastructure corridors (water, power, telecommunications), cultural values, firewood collection, grazing, recreational values (horse riding, hiking, bike riding), educational values and development needs.

The NSW Environmental Planning and Assessment Act 1979 outlines requirements for environmental assessment in relation to roads in NSW. Works on existing roadsides will be covered under the Local Environment Plan (LEP) and no permit is required. However, local councils do have a responsibility to undertake due diligence in relation to managing environmental values, including threatened species, usually by way of an assessment called a Review of Environmental Factors (REF), and are their own consent authority in this regard.

If it is considered that a significant environmental impact may occur, then further assessment and mitigation measures are required and the assessment may be directed to the Environment Minister (NSW and/or Commonwealth) for determination. Note that for main roads, the NSW government agency Roads and Maritime Services is the determining authority.

There are other legislative requirements relating to specific aspects of roadside reserve management including:

- Bushfire management (*NSW Rural Fires Act 1997*)
- Threatened species (*NSW Threatened Species Conservation Act 1995, Commonwealth Environmental Protection and Biodiversity Conservation Act 1999*)

- Weed management (*NSW Noxious Weeds Act 1993*)
- Protection of public lands (*NSW Local Government Act 1993*)
- Pollution of land or waterways (*NSW Protection of the Environment Operations Act 1997*).

In addition to carrying out the legislative requirements, local councils are encouraged to take a more proactive approach to roadside environmental management. This approach involves the use of Roadside Vegetation Management Plans (RVMPs) or similar. These plans enable the identification of important roadside environments and coordinated strategies to conserve them. This holistic planning approach means that the risks to the important natural assets are understood and better managed.

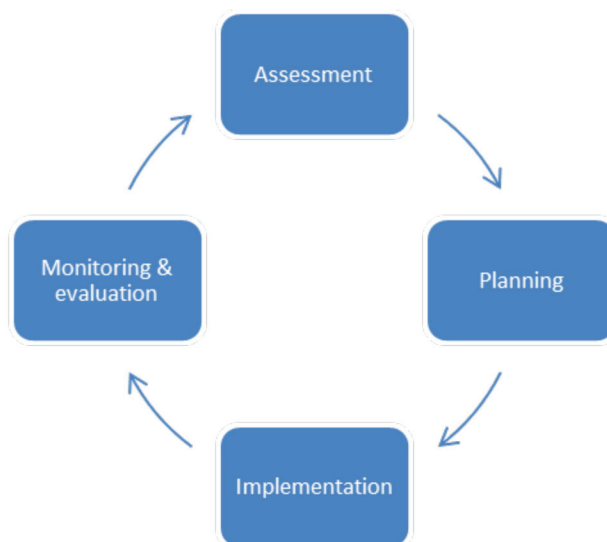
These guidelines have been prepared for local councils seeking to achieve best practice in roadside environmental management through the use of RVMPs. However, the guidelines will also be of relevance to managers of other linear reserves which, by nature of their shape and issues, have similar management requirements.

Towards best practice in roadside environmental management

There are four stages that lead to best practice in roadside environmental management:

1. Assessment
2. Planning
3. Implementation
4. Monitoring and evaluation

The stages should be carried out in a cycle as shown below.



The four stages in best practice roadside environmental management

This guide outlines the first stage in developing a plan - assessment.

Roadside environmental assessment

As noted, local councils have a responsibility as part of due diligence to carry out an environmental assessment of roadside works as required, for example for road construction and widening. A useful guide to conducting this type of assessment is the Biodiversity Guidelines produced by Roads and Maritime Services: www.rms.nsw.gov.au/environment/downloads/biodiversity_guidelines.pdf.

However, a broader assessment approach, ideally across the whole Local Government Area (LGA), is required to develop a RVMP or similar plan. The aim of this approach is to identify 'high', 'medium' and 'low' conservation roadside areas which will direct and prioritise actions in the RVMP.

There are four suggested steps in the environmental assessment for the development of RVMPs:

1. Collecting existing information
2. Conducting the assessment in the field
3. GIS mapping
4. Identification of conservation status

The assessment should be conducted by suitably qualified and experienced council staff and/or consultants.

1. Collecting existing information

Before commencing the roadside environmental assessment fieldwork, it is important to collect information for reference and background purposes. This information can include:

- Knowledge of the local community including residents, community groups (e.g. Landcare), local council staff, Local Land Services (LLS) staff, and other NSW government agency staff
- Environmental assessment reports (e.g. REFs)
- GIS map layers
- Aerial photographs
- Relevant research papers and articles
- Online knowledge banks e.g. NSW BioNet: www.bionet.nsw.gov.au.
- LEPs and other plans
- Local guides, including plant species guides.

2. Conducting the assessment in the field

The recommended assessment technique to help develop a RVMP is called a 'windscreen' survey. Assessment using this technique is not meant to produce the definitive guide to every plant on the roadside; it is intended to indicate the main indigenous and introduced species, ecological communities, wildlife habitat values, and whether or not the vegetation is degraded or threatened with potentially degrading management practices. There is also an opportunity to identify other roadside features with management implications such as soil degradation, heritage features, and other items of significance.

The timing of the assessment is important, with spring being the preferred season as most species flower at this time, making plant identification easier. Not all species are visible year round, and this can affect the assessment and may need to be taken into consideration.

The roadside assessment sheet provided below is designed to enable consistent collection and recording of data over vast lengths of road from varying roadside vegetation communities.

The assessment sheet is divided into three sections: the header (A), scored boxes (B to F) and an unscored section (G to N). Information required to locate each roadside or section must be recorded in the header. Scored boxes must be completed to determine the management category. The unscored section is for information which is useful to determine conservation values, but is not required for determining a management category. Information requested here is optional depending on the information available and the botanical knowledge of the assessor.

Tips for using the assessment sheet

1. You will need a Global Positioning System (GPS) Unit and the assessment sheet (provided as an Excel spreadsheet at the REC website – details below). You will also need guides to local vegetation.
2. Choose a starting point.
3. Drive one kilometre (check with vehicle odometer) down the road to familiarise yourself with the vegetation and its distribution. Consider where to start a new assessment sheet.
4. Drive back to road starting point and take GPS coordinates using a GPS Unit.
5. Drive slowly along the road and begin filling in the sheet (note this could be done using a laptop or tablet). Occasionally, you will need to identify plant species, determine the native content of ground cover, and measure the width of the road.
6. When filling in the assessment sheet it is important to:-
 - Ensure the header is completed, as this is critical to site location;
 - Record features of the roadside as accurately as possible;
 - Calculate the management category (A, B or C).
 - Take care of traffic when driving slowly and when crossing the road.
 - Use appropriate Personal Protective Equipment (PPE) such as high visibility vests.
7. Drive to the end point (either the end of the vegetation corridor being assessed or the end of the road) and record the GPS coordinates.

There is no set length of roadside to be assessed prior to beginning a new assessment sheet. A minimum of 500 metres may be a useful guide, unless a more detailed assessment is required. In areas where there is uniformity of vegetation and other conditions, one assessment sheet could be applied to long distances. If shorter distances are assessed, this will result in many assessment sheets and a large number of units to identify on the ground and map.

It is unnecessary to start a new assessment sheet if the roadside consists of frequent minor changes which can be explained on the sheet in the comments section. Similarly, for short sections with distinctive management characteristics (for example, a significant site, road management activity, or watercourse), it is best to treat this as an anomaly, rather than have a separate management category. Make detailed notes on the assessment sheet, identifying the location.

Indicate at the top of the sheet why the new sheet was started. This information helps anyone who follows in your steps to locate the section on the ground. Use GPS coordinates to locate where you have started a new sheet. Consider recording changes in road type (sealed and unsealed) or road width.

If there are significant changes in the vegetation on one side of the road and not the other, do not start a new assessment sheet. Record in the comments section and note the GPS coordinates.

Always start a new assessment sheet for a new road.

The Roadside Assessment Sheet and guide to completing the assessment are provided below.

Roadside assessment sheet

A. Road Name/Number.....

Date...../...../.....

Start GPS Coordinates

Road Type: Sealed

Unsealed

End GPS Coordinates

Assessor.....

Section Number.....

<div><div>B. Width of road reserves</div><div>Tick one line for each side of road</div><table><thead><tr><th></th><th>Score</th><th>L</th><th>R</th></tr></thead><tbody><tr><td>Unfenced</td><td>0</td><td>.....</td><td>.....</td></tr><tr><td>1-5 metres</td><td>1</td><td>.....</td><td>.....</td></tr><tr><td>6-21 metres</td><td>2</td><td>.....</td><td>.....</td></tr><tr><td>21+ metres</td><td>3</td><td>.....</td><td>.....</td></tr></tbody></table></div>		Score	L	R	Unfenced	0	1-5 metres	1	6-21 metres	2	21+ metres	3	<div><div>C. Condition of indigenous vegetation</div><table><thead><tr><th></th><th>Score</th><th>L</th><th>R</th></tr></thead><tbody><tr><td>Degraded</td><td>1</td><td>.....</td><td>.....</td></tr><tr><td>Modified</td><td>2</td><td>.....</td><td>.....</td></tr><tr><td>Near natural</td><td>3</td><td>.....</td><td>.....</td></tr></tbody></table></div>		Score	L	R	Degraded	1	Modified	2	Near natural	3	<div><div>D. Introduced species</div><div>Include trees, shrubs, herbs, grasses</div><table><thead><tr><th></th><th>Score</th><th>L</th><th>R</th></tr></thead><tbody><tr><td>Dominant</td><td>0</td><td>.....</td><td>.....</td></tr><tr><td>Scattered throughout</td><td>1</td><td>.....</td><td>.....</td></tr><tr><td>Isolated clumps</td><td>2</td><td>.....</td><td>.....</td></tr><tr><td>Few or more</td><td>3</td><td>.....</td><td>.....</td></tr></tbody></table></div>		Score	L	R	Dominant	0	Scattered throughout	1	Isolated clumps	2	Few or more	3																											
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Adjusting the Assessment Sheet to Suit Your Area

In some regions the dominant growth forms vary considerably. Some areas may have heathland or shrubland as the dominant communities, while others may have a large proportion of natural grassland. Historical verification may be required to ascertain the natural vegetation structures. A lack of trees and trees with hollows in such cases requires alteration of Parts E and F, to avoid devaluing these communities. Increasing the value of the native grasses component to score 3 will allow remaining habitat components to be retained, while allowing a maximum value of 5 to be achieved for a grassland community.

The options for Part E (Regeneration) are as follows:

1. Delete box E altogether if no tree forms are naturally present. Reduce the Roadside Management Category scores by 2 each.
2. Replace "Are there young native trees present?" with "Are there regenerating shrubs present?" for a shrub or heathland dominant region. Scoring remains the same.

Another factor in the assessment that may need altering in different regions is the minimum section length. Consider altering this to suit topography. In hilly areas, a 500 metre minimum section length may be too large to accurately map vegetation changes. Field trials will determine appropriate section lengths.

Limitations with the assessment methodology

No assessment method is perfect. Limitations with this technique include:

- Assessment is subjective
- Unable to produce totally consistent information
- Cannot identify every species of plant
- Difficulties in knowing when to change sheets
- In many cases it is difficult or impossible to assess corridor connections without the use of aerial photographs or satellite images
- A bias toward tree and shrub-covered areas
- Emphasis on identification of plant communities rather than species may speed up the assessment and improve accuracy.

Guide to completing the assessment sheet

Part A: The Header

Road Name/Number: Refer to the road register of the local council.
Date: Date of survey.
Road Type: Tick whether the road is sealed or unsealed. This information may be useful for establishing a priority for management activities. Sealed roads generally carry more traffic and vehicles travel faster. Vegetation on unsealed roads is often covered in dust, affecting its habitat value.

Assessor: Assessor's name.
Start GPS coordinates: Record GPS coordinates.
End GPS coordinates: Record GPS coordinates.
Section Number: Indicate which section, in sequence, is being assessed.

Parts B to G: Scoring

Parts B to G require the assessor(s) to observe and record various features on the road reserve. These features are scored for both the left and right hand sides of the road and tallied to obtain a total score for each side (Part G). This score corresponds to the score ranges provided for each management category.

- A 14+
- B 10-13
- C 1-9

Part B - Width of Road Reserves

The management category may be different for each side of the road.

Estimate the distance between the outer edge of the table drain and the fenceline. Pace the width to get a feel for distance - one average adult step is approximately 1 metre. Note that a road reserve over 21 metres may be a Travelling Stock Reserve. Record the width of the road reserve if more than 21 metres.

The width of the road reserve indicates the current use of the road, and the worth of the reserve as a vegetation corridor. Narrow corridors are more difficult to manage as they are under greater pressure from weeds and other effects of neighbouring land.

Part C - Condition of Vegetation

This is a complex attribute produced by a range of factors including plant health, current and past use, and floristic changes. Make a subjective judgement on how much the vegetation community has changed from its natural condition. To do this, you will need to be familiar with the range of community types in the area. A degraded vegetation community will consist almost entirely of exotic species which may not be in a stable condition. Infestation by native woody species can also be a response to degradation. A modified community comprises native species under pressure from exotic weed species. Without intervention the community will be degraded. A near natural plant community consists of healthy, locally-native species and requires minimal intervention from managers to control weed infestation.

Part D - Introduced Species

Assess the extent of weed infestation and the pattern of weeds. Weeds include exotic trees, shrubs, herbs and grasses. Weeds can also be native plants outside their normal distribution. The pattern of weeds is relevant to management, as weeds scattered throughout are more difficult to manage than isolated patches. It would be useful to have a picture list of common weed species for easier identification.

Part E - Regeneration

Scoring regeneration measures the plant community's health and viability. Near natural plant communities will rarely have extensive regeneration due to lack of disturbance. A diversity of species and ages undergoing regeneration is a sign of a healthy plant community. The degree of regeneration can be related to the current land use - for example, grazing generally suppresses regeneration of tree and shrubs. Extensive regeneration can also be an indicator of disturbance. In regions where trees are not the dominant growth form, adjustment of Part E is required (see Adjusting Assessment to Suit Your Area).

Part F - Potential Fauna Habitat

The features listed may provide habitat for a range of animal species. Features should be scored only if they are common in the section of road; that is, one or more every 50 metres. Creeks and wetlands need only be scored once. In regions where trees are not the dominant growth form, adjustment of Part F is required (see Adjusting Assessment to Suit Your Area).

Part G - Roadside Category

Total the score for the right and left hand side of the roadside section assessed.

Category A (14+) is a roadside in good condition, which is relatively stable and requires minimal intervention. These roadsides potentially have a high conservation value.

Category B (10-13) is typical of roadsides.

Category C (1-9) are roadsides that are degraded.

Parts H to M: Unsourced Assessment

Parts H to M are designed to assist in the formulation of RVMPs, by providing some background information and highlighting special considerations. Many of these parts are optional and some can be completed by looking at maps and reports. It is important to include as much information as possible, to highlight the issues and concerns of a particular roadside. The Assessment Sheet does not specify left and right hand side of the road, so it is important to include details of particular sites of interest.

Part H - Threatened Species and Endangered Ecological Communities

Indicate species or community name and GPS coordinates. Indicate whether the section has been checked for Threatened Species and Endangered Ecological Communities to ensure coverage - refer to www.environment.nsw.gov.au/threatenedspecies and www.bionet.nsw.gov.au.

Part I - Wildlife Corridor

Identify whether the section of roadside connects areas of natural bushland greater than 10 hectares. This may require checking maps or aerial photographs.

Roadsides often form corridors of habitat that allow for the movement of fauna and flora across the landscape. Revegetation of a roadside may be a management objective of the particular section, and can be included in the roadside management plan.

Part J - Introduced Species

Indicate the dominant introduced species present in the roadside section. Botanical or common names can be used.

Introduced species present on a roadside indicate the management techniques required for the section. A list of noxious and common weed species can be compiled prior to roadside assessment and used to make identification and recording easier. Assigning code numbers to commonly found weeds can avoid repetitive recording of species names.

Part K - Indigenous Species

Indicate the dominant indigenous species present in the roadside section. Botanical or common names can be used.

Indigenous species will give an indication of the vegetation type dominant in the area, and the sort of management which may be required. Assigning code numbers to commonly found indigenous species can avoid repetitive recording of species names.

Part L - Road Management Activities

Identify the location and type of roadside management activities present in the roadside section. These may include road works, drainage works, dams or watering points, stockpiles, soil dumps, gravel pits, firebreaks, picnic and parking areas, rubbish and timber collection. It is also important to highlight areas with soil erosion, scalded areas and salinity.

In a RVMP, there may be an opportunity to rationalise roadside activities and allocate areas which may be more appropriate for various activities.

Part M - Comments

Indicate other factors which are important from a management point of view. This may include cultural/historical elements, adjoining vegetation or land use which impacts on the management of the roadside including weeds, native vegetation and improved pasture. Other factors to note include rabbit burrows, soil erosion, noxious weeds, condition of adjoining fences, or sites with particularly good views across the landscape. Notes for previous sections can be included here.



Darwinia biflora is a threatened species found in some roadside reserves (photo: NSW Roads and Maritime Services)

3. GIS mapping

Geographic Information Systems (GIS) are an effective way of storing, displaying and analysing the results of the roadside assessment, and can accommodate a large amount of information at flexible scales.

A GPS unit can be used to record the locations of each roadside assessment by storing the coordinates of the start and end points of each road section containing a vegetation corridor. When imported into the GIS application and converted into a spatial format (that is, a point layer), these coordinates can be used to identify changes in road sections or vegetation types for further analysis of management and conservation values.

Importing & Converting GPS coordinates

The method for importing the GPS coordinates of each roadside assessment will depend on the data collection set up of the GPS unit.

When setting up a GPS unit, you can choose to collect your data in either a geographic coordinate system or a projected coordinate system. Geographic coordinate systems, such as WGS 1984 or GDA 1994, use latitude and longitude coordinates in Degrees Minutes Seconds (DMS) or Decimal Degrees (DD). Projected coordinate systems, such as Map Grid of Australia (MGA), use Eastings and Northings coordinates. It does not matter which coordinate system you use as the end result will be the same; the only difference is in the process of importing your coordinates into a GIS and converting them into a spatial dataset, which will be explained in the following two sections.

First, you will need to transfer the coordinates from the GPS unit to your computer – usually this is done by connecting your GPS unit to the computer through a USB port. If a spatial dataset has already been created on the GPS unit into which coordinates for each point can be saved, you can simply copy the layer to your computer and open it in the relevant GIS application (e.g., .shp file in ArcGIS or .tab file in MapInfo). If the coordinates have been recorded as a series of waypoints, you will need to open the GPS file and copy the waypoints into a spreadsheet program such as Microsoft Excel. You can then prepare the tabular data of the recorded GPS coordinates in a .csv file format for importing into the GIS application and converting into a spatial dataset. Use the following notes for instructions on how to do this.

Preparing GPS coordinates for importing into a GIS application

In order to represent the points you have collected during the roadside assessment in a map, the tabular data that was copied from the GPS unit into a spreadsheet needs to be re-formatted into a .csv file that is suitable for importing and converting into a spatial format for display in a GIS application, such as ArcGIS or MapInfo.

When working with .csv files in ArcGIS or MapInfo, it is necessary to make sure the worksheet is cleared of any formatting and all field headings do not contain spaces or characters such as commas or hyphens. Underscore is generally used in lieu of a space. It is recommended that acronyms or abbreviated versions are used for field names. Note: this formatting may already be built into the fields by the GPS unit and may not need to be altered.

If the points have been collected using a geographic coordinate system (WGS 1984 or GDA 1994), the latitude and longitude fields have to be in a Decimal Degrees (DD) format. If they are in a DMS format (e.g. DD°MM'SS"), they will need to be converted into DD format by separating the DMS values into separate cells with numeric values only using the Text to Columns function and applying the following formulas:

Latitude = - (Degrees + (Minutes/60) + (Seconds/3600)). The negative indicates that the point is located in the southern hemisphere.

Longitude = Degrees + (Minutes/60) + (Seconds/3600).

The Latitude column should look like -33.12345 and Longitude column should look like 151.12345. It does not matter how many decimal points there are – the more decimal points, the more precise the coordinate.

As with the field names, when saving the .csv file the name should have no spaces or characters. Once the .csv file is in a suitable format, it can be opened in ArcGIS or MapInfo and converted into a point layer (.shp file in ArcGIS or .tab file in MapInfo).

Converting GPS coordinates into a spatial dataset

When creating a feature class from a .csv file, make sure the Y coordinate is set to the Latitude column and the X coordinate is set to the Longitude column. Set the spatial reference to a geographic coordinate system (WGS 1984 or GDA 1994, depending on which coordinate system the GPS unit was set to). Once the dataset is created, you will need to transform the spatial reference into a projected coordinate system (GDA 1994 MGA Zone **) in order to display the layer with other datasets. Refer to Box 1 for more information on coordinate systems.

Box 1. Coordinate Systems and Projections

Coordinate systems are used to locate spatial entities on projected maps. There are two main coordinate systems: Cartesian and Geographic. Cartesian coordinates denote the location of a point in a 2 or 3 dimensional **planar** system, e.g. X, Y and Z axes. Geographic coordinates denote the location of a point on the Earth's surface in a spherical **polar** system, e.g. latitude and longitude. Generally, the WGS 1984 or **GDA 1994** coordinate systems are used in Australia. **WGS 1984** is a universal coordinate system for use anywhere in the world and GDA 1994 is a coordinate system specific to Australia.

Projections allow us to 'lay the world flat' and represent the spherical, three-dimensional surface of the Earth in a flat, two-dimensional fashion. Projected coordinate systems locate points on the Earth's surface using Eastings and Northings coordinates. There are many types of projections, however the most commonly used for national map grids in GIS is **Universal Transverse Mercator (UTM)**, e.g. Map Grid of Australia (MGA). MGA uses a map datum that has the same name as one of the geographic coordinate systems, **GDA 1994**, and UTM zones to locate coordinates. The zones for Australia are shown in the image below.



Source: Geoscience Australia

The reason we set a predefined geographic coordinate system (**WGS 1984 or GDA 1994**) when converting our .csv file into a spatial dataset is because the latitude and longitude values used to represent the locations of points in a dataset are geographic coordinates. In order to be able to display the points in the dataset with other spatial datasets on a single map in the area we are interested in, they generally need to be in the same projection. This means that the dataset's projection needs to be transformed into a universal projected coordinate system. The most commonly used in Australia is **GDA 1994 MGA**, with an appropriate UTM zone, e.g. **GDA 1994 MGA Zone 56** for the east coast of Australia.

If the GPS unit was already set to UTM projection (GDA 1994 MGA) you will need to set the X Field to Easting and Y Field to Northing. Set the spatial reference to a Projected Coordinate System (GDA 1994 MGA Zone **). You will not need to transform the projection to display the layer with other datasets in the GIS application as it is already in a projected coordinate system.

** The UTM Zone will be 54, 55 or 56, depending on which zone the location of your roadside assessments fall into. This is important for ensuring your points are placed in the correct geographic location. Refer to Figure 2 for the location of LGAs in UTM zones across NSW.

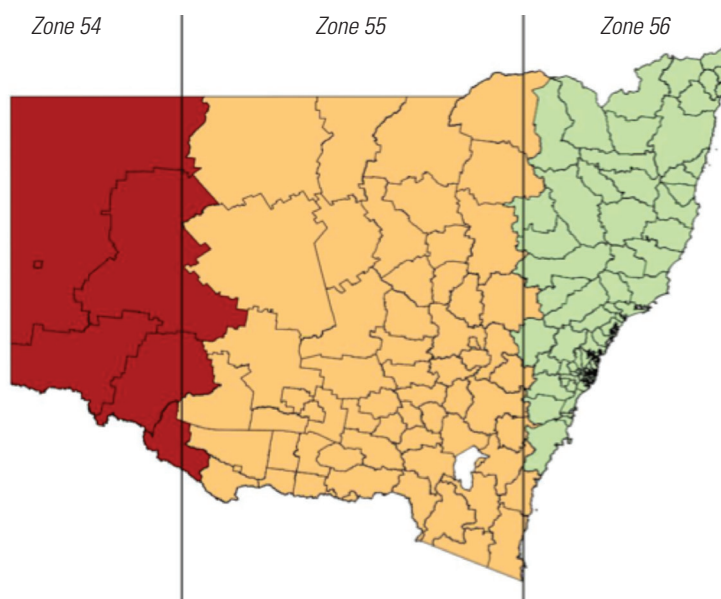


Figure 2: Location of LGA boundaries within UTM zones in NSW.

Shapefiles and tab files can be converted into .kml or .kmz files for display in Google Maps or Google Earth. Note that .kml or .kmz files need to be in a latitude & longitude coordinate system (WGS84) to be displayed in these mapping platforms.

Adding attributes to analyse roadside assessment data

Once the GPS coordinates have been converted into a point layer, you can use the points and aerial photography to locate the roadside assessments and digitise the vegetation corridors assessed for further analysis. This can be done either by creating a polygon layer and digitising the boundary of each vegetation corridor, or by creating a line layer and digitising a line segment between the start and end points of each vegetation corridor.

After creating your polygons or line segments to represent the roadside vegetation corridors that were assessed, you can append the data recorded during the assessment in the attribute table of the layer. Open the attribute table of the layer and add fields for each part:

- Road name
- Road type
- Section number
- Date
- Assessor
- Width of road reserve
- Vegetation Condition
- Distribution of introduced species
- Regeneration
- Potential fauna habitat
- Roadside category
- Threatened species and endangered ecological communities
- Wildlife corridor
- Names of introduced species
- Names of indigenous species
- Road management activities
- Comments

As with field names of the GPS data, keep field names short and simple; do not use spaces or characters and keep length of names to a minimum. Assign appropriate field types and lengths, e.g. section number would be numeric and only require a length of 4 or 5, whereas comments would be text and require a length of at least 50 or 100 characters.

These attributes, once recorded, can be used to map roadside management categories and conservation values, such as species requiring management including rare, threatened or exotic species, road sections requiring management including for maintenance or construction, and significant sites such as areas with cultural or natural heritage values. Mapping the management categories and conservation status establishes a record of the roadside vegetation corridors. This information can be used for planning and implementation of management strategies, investigation of known or potential environmental impacts and for monitoring and evaluation.

You can overlay your points and digitised layers with other spatial datasets, including LEP zoning and planning, soils and geology, NSW Wildlife Atlas and water bodies, to assist with this process and enhance the assessment of roadside management and conservation practices in your LGA or area of interest.

For displaying and maintaining your data and maps, use a map scale based on the sort of roads being assessed and the size of the LGA or study area. In general, a scale of 1:100,000 or smaller is used, otherwise detail is lost.

If you collect a large amount of data during your roadside assessments, you may like to consider using a database to store and maintain your data. However, this information can easily be stored in the attribute table of your points or digitised layer.

For more information on how attribute data can be useful in roadside vegetation assessments, see the HCCREMS users guide on the GIS roadside attribute layer developed for their roadside environment program:
www.hccrems.com.au/hccrems/media/RESOURCES/Roadside/GIS_users_guide_Sample.pdf.

4. Identification of conservation status

At the end of the assessment process, all roadsides will be given a management category. There will also be site-specific information (Parts H to M in the assessment sheet), highlighting the presence of endangered species, erosion problems or significant cultural sites. Applied to each of these elements will be general management strategies as well as more specific prescriptions relating to sites.

Some management strategies are applicable across all categories of roadsides. These may include fire management strategies, which require knowledge of the natural systems occurring in the region, and an assessment of fire risk. Litter and firewood collection are other issues with consistent strategies regardless of the management category.

Using GIS to overlay the management categories (Part G in the assessment sheet) with the unscored attributes (Parts H to M in the assessment sheet), the following conservation status levels can be identified:

High Conservation Value (HCV) Roadsides

These are roadsides that are in Management Category A or, in some cases Management Category B, and have important unscored attributes including threatened species and Endangered Ecological Communities.

The HCV roadsides in Management Category A are roadsides remaining mostly in their natural state. They are usually the easiest and cheapest types of roads to manage over the long-term. Current management practice has not had an adverse effect on the natural condition and the area can continue to be managed in a similar way.

The HCV roadsides in Management Category B must have significant unscored attributes to warrant inclusion in this category. This is the category which will benefit most from active management. These sites have the best chance of being returned to a near-natural state. The level of degradation is usually manageable within cost constraints. Restoring roadsides to a near-natural state has cost-benefits, as natural vegetation requires little maintenance and suppresses the growth of weeds.

In extreme cases, areas in Management Category C could be included in HCV roadside. For example, a threatened orchid could be found in degraded roadside thus warranting inclusion as a HCV roadside.

Medium Conservation Value (MCV) Roadsides

These are roadsides from Management Categories A or B that do not have significant unscored attributes. They still have environmental values such as wildlife corridors and aesthetic appeal.

Low Conservation Value (LCV) Roadsides

These are roadsides in Management Category C. From a nature conservation perspective, they are the most modified or degraded roadsides. They may have other uses compatible with their condition such as grazing. The resources required to change the conditions of roadsides in Category C are high and generally beyond those available.

Examples

Over half of the local councils in NSW have conducted roadside environmental assessments using a similar process to that described above. Some of these councils provide assessment details on their websites. Recommended sites are:

- Mid-Western Regional Council
www.midwestern.nsw.gov.au/Environmental-Services/Environmental-Projects-1.
- Hunter & Central Coast Regional Environmental Management Strategy (Hunter Councils)
www.hccrems.com.au/Programs/Roadside-Environments/Program-History---Achievements.aspx#EvaluationOfRoadsides.

The Roadside Environment Committee

The NSW Roadside Environment Committee (REC) was established in 1994 by the NSW Government in recognition of the environmental values of linear reserves including roadsides. The REC is an umbrella body of state agencies and environment groups that promotes and coordinates leading practice in linear reserve environmental management across the State. The REC identifies issues, and with land managers, works towards solutions.

The REC has taken a strategic approach to improving linear reserve environmental management in NSW. To do this, it has developed, implemented and evaluated a series of three-year strategic plans.

The objectives of the current REC strategic plan are:

- to achieve consistent, high quality of environmental management of NSW linear reserves
- to engage with key stakeholders and communities to improve linear reserve environmental management in NSW
- to address issues related to the management of linear reserve environ NSW.

The REC website is at www.rms.nsw.gov.au/environment/roadsideenvironcommittee.

For more information

If you would like more information on roadside environmental planning and management, funding opportunities for projects or contacts within other organisations please contact the Executive Officer of the NSW Roadside Environment Committee.

Neil Dufty
REC Executive Officer
Phone: (02) 9354 0300
Mobile: 0437 130 283
Email: ndufty@molinostewart.com.au



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