1.0 INTRODUCTION

The Shire of Dalwallinu is located 250 km north-east of Perth in Western Australia’s northern wheatbelt region, otherwise known as the Midlands region. The Shire covers an area of 7,187 square km and supports a population of approximately 1,767 people. It is serviced by 1,939 km of roads, of which 449 km are sealed (W.A. Local Government Directory, 2003-2004). The Dalwallinu townsite is the administrative centre for the Shire; other localities include Kalannie, Wubin, Pithara and Buntine.

The area experiences a Mediterranean climate with an average annual rainfall of 360mm. Seasonal temperatures are characterised by warm summers, with maxima averaging from the high twenties, and mild winters, with maxima in the mid teens. Mean daily maximum and minimum temperatures and rainfall statistics are shown below.

![Figure 1 – Mean daily maximum and minimum temperature (°C) and rainfall (mm) in the Shire of Dalwallinu, based on climate averages from the Dalwallinu weather station 008039 (commenced 1912; Last record: 2003).](image)

The primary land use is agriculture, which accounts for 575,482 hectares of land or 78% of the Shire. There are 8,917 hectares of A-Class Conservation Reserves in the Shire, representing 1.24% of land area. Other local industries include bulk fertiliser services, shearing, gypsum mining, Ostrich farming and cedar blind manufacture (Shire of Dalwallinu, www.dalwallinu.wa.gov.au/geography/landuse&.htm).

82.3%, or 595,418 ha of the Shire is located within the Intensive Land-use Zone (ILZ), an area dominated by intensive agricultural enterprises such as cropping and grazing.
with some horticulture, intensive livestock production and resource protection. The remaining 17.7% (128, 263 ha) of the Shire is located within the Extensive Land-use Zone (ELZ), which is dominated by grazing and mining activities (Shepherd, Beeston & Hopkins, 2001). These zones are illustrated in Figure 2.

![Figure 2- Land-use zones in Western Australia (Department of Agriculture WA, 2004).](image)

Tourism plays an important role with the area's spectacular natural resources being a major attraction. Dalwallinu is the first town on *The Wildflower Way*, a well-known Western Australian tourist route which stretches north to Mullewa. The prime season for wildflowers is between July and October. Each year thousands of wildflower enthusiasts and nature lovers make the journey to enjoy the rare and beautiful sight of flowers literally carpeting the countryside. Other salient features of the area include the Old Courthouse Tourist Information Centre, Wubin Wheatbelt Museum, The Old Well and Petrudor Rock.

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A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines
1.1 Flora and Fauna
Based on WA Herbarium records, over 900 species of plants have been recorded from the Shire of Dalwallinu. These include 108 species of Acacia, 48 species of Eucalypt, 48 species of Grevillea, 34 species of Melaleuca, 20 species of Eremophila and 23 species of Verticordia, see Appendix 4.

The unique flora seen in the remnant bushland on roadsides rival horticultural varieties of exotic origin and require less water and fertiliser. They have evolved to cope with the low nutrient status of the Western Australia soils and a low annual rainfall with long dry summers.

![Verticordia picta](http://florabase.calm.wa.gov.au/help/photos#reuse)

**Verticordia picta**

*The Painted Featherflower (Verticordia picta) can be seen flowering in Dalwallinu between July and November.*


Threatened and priority fauna observed in the Shire of Dalwallinu, based on information from the Department of Conservation and Land Management, indicates that ??? species have been recorded or sighted throughout the Shire,

1.2 Remnant Vegetation Cover
Within the Intensive Land-use Zone (see Figure 2), the Shire of Dalwallinu retains 12% of its original native vegetation cover. These remnants are located in a variety of tenures, from nature and crown reserves to privately owned bushland. Flora and fauna living in these isolated remnants require connectivity throughout the landscape to find nesting sites, food, shelter and to breed. As a consequence, the presence of native vegetation in transport corridors is of vital importance. The presence of bush corridors to connect these areas is paramount to the survival of our native flora and fauna. A comparison of remnant vegetation in Dalwallinu and with surrounding Shires can be seen in Table 1.

<table>
<thead>
<tr>
<th>Shire</th>
<th>Percentage of Vegetation Cover Remaining</th>
<th>Area (Ha) of Vegetation Cover Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalwallinu</td>
<td>12.0%</td>
<td>71,228</td>
</tr>
<tr>
<td>Mukinbudin</td>
<td>14.0%</td>
<td>39,021</td>
</tr>
<tr>
<td>Westonia</td>
<td>21.5%</td>
<td>57,813</td>
</tr>
<tr>
<td>Kellerberrin</td>
<td>7.4%</td>
<td>14,214</td>
</tr>
<tr>
<td>Trayning</td>
<td>8.4%</td>
<td>13,811</td>
</tr>
<tr>
<td>Merredin</td>
<td>11.8%</td>
<td>38,551</td>
</tr>
</tbody>
</table>

Table 1. Remnant vegetation remaining in the Shire of Dalwallinu and surrounding Shires (Shepherd et al. 2001).

Note: Does not account for areas of these Shires occurring within the Extensive Land-use Zone (ELZ), i.e. pastoral areas of these Shires.

National Objectives and Targets for Biodiversity Conservation 2001-2005 (Environment Australia, 2001) stated that vegetation associations represented by less than 30% remnant vegetation cover are considered ecologically endangered and in need of protection and restoration wherever they are located. There are 9 vegetation associations below the 30% target of vegetation coverage and 2 with less than 10% remaining in the Shire of Dalwallinu, see Table 2. National targets for biodiversity conservation (2001-2005) state the need to have protection measures in place for those vegetation associations that are below 30%. Vegetation associations with less than 10% are considered endangered whilst those between 10-30% are considered vulnerable and those between 30-50% are considered depleted (of the pre 1750 extent).
2.0 VALUES OF ROADSIDES

Since the settlement of Western Australia by Europeans, large areas of native vegetation in the south west of the state have been cleared for agriculture, roads, settlements, and other development. The fragmentation of the more or less continuous expanse of native vegetation communities by clearing has resulted in the isolation of plant and animal populations which have become severely disadvantaged by becoming isolated within a mosaic of man-made biogeographical islands of small native vegetation remnants. These are typically unreliable for sustaining wildlife due to food shortages, disease and reduced genetic diversity caused by a diminishing gene pool. Nevertheless, the presence of native vegetation along roadsides can often assist in alleviating this isolation effect by providing connectivity between bush remnants, thereby facilitating the movement of biota across the landscape.

Remnant vegetation includes more than just trees, comprising a diverse mix of trees, shrubs and ground covers (creepers, grasses and herbs) which when intact provide valuable food and shelter for local biodiversity. Existing native vegetation generally requires less maintenance if left undisturbed.

Remnants in transport corridors are also valuable because they:
• are often the only remaining example of original vegetation within extensively cleared areas;
• are easier to maintain and generally less fire prone than introduced vegetation;
• provide habitat for many native species of plants, mammals, reptiles, amphibians and invertebrates;
• provide wildlife corridors linking other areas of native vegetation;
• often contain rare and endangered plants and animals. Currently, roadside plants represent more than 80 per cent of the known populations of 40 of the declared rare species, and three of these are known only to exist in roadside populations;
• provide the basis for our important wildflower
tourism industry. The aesthetic appeal of well-maintained roadsides should not be overlooked, and they have the potential to improve local tourism and provide a sense of place;

- often contain sites of historic or cultural significance;
- provide windbreaks and stock shelter areas for adjoining farmland by helping to stabilise temperature and reduce evaporation.
- assist with erosion and salinity control, and not only in the land adjoining the road reserve per se;
- are generally far less of a fire threat than annual weeds;
- provide a benchmark for the study of soil change throughout the advancement of agriculture;
- provide a valuable source of seed for regeneration projects. This is especially pertinent to shrub species, as clearing and grazing beneath farm trees often removes this layer;

**Approval of the local shire and a CALM permit are required prior to collection.**

In a time of rapid change, where the demands placed on the natural resources are numerous, it is vital that there is a coordinated management of lands across all tenures and boundaries to ensure the sustainability and integrity of the natural biota ecosystem processes, agricultural lands and service infrastructure.

*Roadsides are the vital link . . . and a priceless community asset.*
3.0 LEGISLATION

Uncertainty often exists in the minds of many with regard to the ‘ownership’, control and management of ‘the roadside’. This problem is also exacerbated by the multitude of legislative reference to activities within a transport corridor.

The Department of Conservation and Land Management (CALM) has the legislative responsibility to manage and protect all native flora and fauna in Western Australia. It is important to note that all flora and fauna is protected under provisions of the *Wildlife Conservation Act* 1950 and cannot be taken unless it is taken in a lawful manner. In addition to the general provisions relating to protected flora under the *Wildlife Conservation Act*, special protection is afforded to flora that is declared as rare or threatened under section 23F of the *Wildlife Conservation Act*.

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

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

Commonwealth legislation:
- *Environment Protection and Biodiversity Conservation Act* 1999

It is recommended that a cautionary approach be taken when working within roadsides, and that the relevant authority be contacted if there is any doubt about the management or protection of heritage or conservation values present in the roadsides.
The Environmental Protection Amendment Act 2003, proclaimed by parliament on the 18th November 2003, will require greater adherence to legislative requirements before native vegetation is cleared. This legislation will provide for two types of permits which will provide for permission to clear native vegetation, however they will have certain conditions attached to them. For example, the road managing authority may be required to prepare, implement and adhere to a roadside or specific tenure management plan. Before any native vegetation is cleared it is incumbent on the project manager or land manager to ensure that the proposed clearing is being carried out under the terms and conditions of the pending legislation, as there are transitional provisions within it, which are retrospective from 26th June 2002.
4.0 ROADSIDE CONSERVATION IN THE SHIRE OF DALWALLINU

4.1 Collection of native plant material from roadsides

The Shire of Dalwallinu does not generally allow the collection of wildflowers or seed from native plants within road reserves. Exceptions may be granted for special cases, and for particular species. The council has no policy on this issue but has given permission to the Environment Society to collect seed for revegetation purposes. Under the *Wildlife Conservation Act* the Department of Conservation and Land Management may issue a licence following Shire approval.

Collecting seed from a roadside may be the only option in cases where there are no other sources of seed for revegetation, although, it has the potential to impact negatively on the roadside flora. Collection of native plant material from roadsides:

- further depletes the already scarce resource,
- can detract from the integrity of the roadside,
- reduces the amount of seed available for natural regeneration,
- reduces the ability of the area to regenerate after disturbances such as fire, and
- threatens roadside plant communities with the potential introduction and spread of two major threats – *Phytophthora* dieback and weeds.

4.2 Declared Rare Flora (DRF)

Declared Rare Flora (DRF) refers to species, or populations of native plants that are of great significance and should be treated with special care when road and utility service, construction or maintenance is undertaken. Populations of DRF along roadsides are designated Special Environmental Areas (SEA's) and are marked out by yellow stakes with an identification plate welded on. See figures 12 and 13.

It is the responsibility of the road manager to ensure these markers are installed, and guides for this are outlined in ‘Guidelines for Managing SEA’s in transport corridors’, available from the Roadside Conservation Committee.

The DRF sites register in the Shire of Dalwallinu needs to be checked for the presence of appropriate markers, and the location be made known to all involved in the management and planning of works within the roadside environment.

For more information regarding DRF it is advisable to contact the Flora Officer for the Merredin District (08) 9041 2488. If roadworks are to be carried out near DRF sites, or the yellow stakes have been disturbed, it is advisable to contact CALM at least one week in advance.
As of November 2003, the Shire of Dalwallinu had 17 populations of DRF species on roadsides, with 14 of these sites vested in the Shire. Species of DRF recorded from the Shire of Dalwallinu include:

- Daviesia dielsii
- Pityrodia axillaris
- Grevillea pythara
- Eremophila pinnatifida
- Grevillea bracteosa
- Boronia ericifolia
- Caladenia drakeoides
- Eremophila sargentii
4.3 High Conservation Value Roadsides as Flora Roads

A flora road is one which has special conservation value because of the vegetation contained within the road reserve. The managing authority may decide to declare a Flora Road based on the results of the survey of roadside conservation value. Roadsides determined as having high conservation value in the Shire of Dalwallinu include:

- **ROADS**

(Not a complete list, consult the 2004 Roadside Conservation Value Map)

These, and other roads may be investigated further to see if they warrant a declaration as a Flora Road. This has a twofold effect of drawing the attention of tourists to the high conservation value roadside and it also alerts all that work in the roadside environment that the marked section of roadside requires due care to protect the values present.

In order to plan roadworks so that important areas of roadside vegetation are not disturbed, road managers should know of these areas. It is suggested that the Shire establish a *Register of Roads Important for Conservation* (see section 7.4).

**Tourism**

Attractive roadside drives are an important drawcard in this, the "Wildflower State". Declared Flora Roads will, by their very nature, be attractive to tourists and would often be suitable as part of a tourist drive network.

Consideration should be given to:
- Promoting the road by means of a small brochure or booklet,
- Showing all Flora Roads on a map of the region or State,
- Using specially designed signs to delineate the Flora Road section (contact the RCC).
Management
Management objectives should involve disturbing the roadside flora as little as possible, consistent with the provision of a safe and efficient roadway. The management of Flora Roads should aim to:

- Minimise disturbance,
- Control weeds,
- Encourage natural regeneration.

The management techniques referred to in Section 7.0 of this report can be employed to minimise disturbance to roadside vegetation. Most importantly, staff should be instructed and supervised so that incremental widening does not occur at every pass of the grader.

Environmental assessments (pre-construction check-lists) should be completed prior to any upgrading work, to assist with planning for flora preservation. Fire management should be undertaken in such a way so as to take into account the ecological needs of the flora. Where rehabilitation is contemplated, local native species should always be used.
4.4 Weeds

Weeds are plants that are growing outside their natural range and competing with native plants for nutrients, space, water and light. Weeds often invade roadsides and interfere with the growth and survival of native plants. The effect of weed infestations on native plant populations is severe, and causes flow on effects for native fauna. Once native plants begin to diminish, due to heavy competition, native fauna suffers due to reduced availability of habitat and food. Once weeds become established in an area, they become a long-term management issue, costing many dollars to control or eradicate.

The WA Herbarium records ?? weed species in the Shire of Dalwallinu, see Appendix 4.

The Shire of Dalwallinu works with the Department of Agriculture to control some weed species, for example there is a weed eradication program targeting Saffron Thistle (Carthamus lanatus) within road reserves. Saffron thistle is controlled using a mixture of Round-up and Simazene. Unfortunately, roadside areas that have been sprayed may suffer from re-infestations, particularly where there has been little or no weed control carried out in adjoining lands.

A low level of weed growth, due to unfavourable weather has meant that the Shire has not sprayed weeds within roadsides for two years. With the more favourable weather in 2003 weed populations have subsequently been more competitive and invasive therefore, the weed eradication program will restart in 2004. The Shire will be targeting African lovegrass (Eragrostis curvula), an invasive roadside weed. African lovegrass tends to grow on the edge of the bitumen, and slowly breaks it up by root penetration. This becomes problematic when attempting to grade the shoulders, as it is difficult to remove without also damaging the bitumen.

The Roadside Conservation Value map and weed overlays will assist the Shire in coordinating strategic weed control projects, with the highest priority to protect and preserve the high conservation value roadsides, and working towards rehabilitating those with a lower conservation value.
Throughout the roadside survey, six weed species were recorded, and their locations mapped. Roadside weed populations of Paterson’s Curse, Wild Oats, Capeweed, Wild Radish, Wild Turnip and Rye Grass can be observed in the weed overlays provided with the Roadside Conservation Value map (2004). Figure 11 also provides some indication of the number of kilometres of roadside that each weed was observed along.
4.5 Phytophthora Dieback

The *Phytophthora* species dieback is made up of several types of introduced fungi. About one third of native plants in Western Australia’s south-west are susceptible, including species of Banksia, Hakea, Eucalyptus, Melaleuca, Verticordia, Acacia and Grevillea.

The *Phytophthora* fungus infects the roots and inhibits the uptake of water and nutrients, eventually causing death. It is more widespread and severe in the higher rainfall zone and waterlogged sites. The Shire of Dalwallinu is not a known *Phytophthora* dieback risk area as it has an annual rainfall of less than 600mm.

*Phytophthora* spreads by the movement of spores in water, or by the spread of infected soil. The spores can be introduced to uninfected areas by human activities, particularly through the soil carried on vehicle tyres or footwear.

Human activities, such as routine maintenance or construction, have the potential to spread *Phytophthora* fungi. Currently, there is no practical method of eradicating *Phytophthora* once it is established in an area.

The Dieback Working Group has published a booklet, *Managing Phytophthora Dieback in Bushland: A guide for Landholders and Community Conservation Groups* (2000), that provides detailed information on minimising the risk of introducing or spreading *Phytophthora*. 
5.0 ASSESSMENT PROCESS

5.1 Methods
The methods to assess and calculate the conservation value of the roadside reserves are described in Assessing Roadsides: A guide for Rating Conservation Value (Jackson, 2002). The process involves scoring a set of pre-selected attributes, which, when combined, represent a roadside’s conservation status. A list of these attributes is presented on a standard survey sheet, see Appendix 2. This provides both a convenient and uniform method of scoring.

Ideally, the survey is undertaken by a group of local volunteers, who, aided by their knowledge of the area, are able to provide an accurate and cost effective method of data collection. Community participation also ensures a sense of ownership of the end product, which increases the likelihood of its acceptance and use by the local community and road managers (Lamont and Blyth, 1995).

The majority (476.2 km) of the Shire of Dalwallinu’s 1,939 km of roadsides were assessed for their conservation status and mapped. Fieldwork was carried out throughout November 2003.

The enthusiastic efforts of the volunteer surveyors, local coordinator Christine Jones and the support provided by Council ensured that this project was successfully completed.

5.2 Quantifying Conservation Values
The following attributes were used to produce a quantitative measure of conservation value:

- native vegetation on roadside;
- extent of native vegetation along roadside;
- number of native species;
- weed infestation;
- value as a biological corridor; and
- predominant adjoining land use.

Each of these attributes was given a score ranging from 0 to 2 points. Their combined scores provided a conservation score ranging from 0 to 12. The conservation values, in the form of conservation status categories, are represented by the following colour codes
<table>
<thead>
<tr>
<th>Conservation Value</th>
<th>Conservation Status</th>
<th>Colour Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 – 12</td>
<td>High</td>
<td>Dark Green</td>
</tr>
<tr>
<td>7 – 8</td>
<td>Medium High</td>
<td>Light Green</td>
</tr>
<tr>
<td>5 – 6</td>
<td>Medium Low</td>
<td>Dark Yellow</td>
</tr>
<tr>
<td>0 – 4</td>
<td>Low</td>
<td>Light Yellow</td>
</tr>
</tbody>
</table>

Table 3: Colour codes used to depict the conservation status of roadsides.

The following attributes were also noted but did not contribute to the conservation value score:

- width of road reserve;
- width of vegetated roadside;
- presence of utilities/disturbances;
- dominant native species;
- dominant weed species;
- fauna observed;
- general comments.

It is felt that the recording of these attributes will provide a community database that would provide information useful in many spheres, such as local government and community interest groups.

5.3 Mapping Conservation Values

A computer generated map (using a Geographic Information System, or GIS), depicting the conservation status of the roadside vegetation and the width of the road reserves within the Shire of Dalwallinu was produced at a scale of 1:100,000. The data used to produce both the map and the following figures and tables are presented in Appendix 3.

Data obtained from the Department of Conservation and Land Management, Main Roads WA and the Department of Agriculture was used in the base map, and depicts the location of remnant vegetation on both the Crown estate and privately owned land.

The roadside conservation values map initially provides an inventory of the status quo of the condition of the roadside vegetation. This is important as the quality of roadside vegetation has far reaching implications for sustaining biodiversity, tourism and Landcare values.

Moreover the data and map can be incorporated as a management and planning tool for managing the roadsides per se, as it enables the condition of roadside vegetation to be easily assessed. This information can then be used to identify environmentally sensitive areas, high conservation roadsides or strategically important areas, and thus ensure
their conservation. Conversely, it enables degraded areas to be identified as areas important for strategic rehabilitation or in need of specific management techniques and weed control programs.

The map can also be used as a reference to overlay transparencies of other information relevant to roadside conservation. This enables the roadside vegetation to be assessed in the context of its importance to the shire’s overall conservation network. Other overlays, such as the degree of weed infestation, or the location of environmentally sensitive areas or future planned developments, could also be produced as an aid to roadside management.

Weed control along a roadside
Photo MRWA

As well as providing a road reserve planning and management tool, the roadside conservation value map can also be used for:

- Regional or district fire management plans;
- Tourist routes, i.e. roads depicted as high conservation value would provide visitors to the district with an insight to the flora of the district;
- Landcare and/or Bushcare projects would be able to incorporate the information from this survey into ‘whole of’ landscape projects.

The survey data and map can be used in developing regional or district fire management plans
6.0 SURVEY DATA RESULTS

A summary of the general roadside conditions in the Shire of Dalwallinu is presented in Table 4. The survey data has been combined to provide the total kilometres, and percentages, of roadside occupied by each of the conservation status categories and the attributes used to calculate the conservation values. As roadsides occur on both sides of the road, roadside distances (km) are equal to twice the actual distance of road travelled.

Table 4: Summary of the roadside conditions in the Shire of Dalwallinu.

The ‘width of road reserve’ attribute indicates the total width of the road reserve, including the road formation, drains and the roadsides, i.e. from ‘fence to fence’. Of the 952.5km of roads surveyed in 2003, the width of 75kms (15.7%) of road reserve was unknown, which is common when a road passes through unfenced land, such as Nature reserves. Approximately 28% (134.9km) of the roads surveyed measured 40m in width, and 55.9% (266.4km) were 20m in width.

Figure 2- Width of Road Reserves in the Shire of Dalwallinu (2003)
The ‘width of vegetated roadside’ value provides an insight into the width of the vegetation occurring within roadsides in the Shire of Dalwallinu. Roadsides where the vegetation width was greater than 20m covered 0.77% (7.4km) of the Shire. 22.8% (217.3km) of roadsides supported vegetation between 5-20m in width, and 70.7% (673.8km) of roadsides contained native vegetation between 1-5m in width. The width of vegetation was unknown for 5.7% (54.1km), which is common when a road passes through unfenced land, such as Nature reserves.

Figure 3- Width of vegetated roadsides in the Shire of Dalwallinu.
Roadside sections of high conservation value covered 65.1% of the length of roadsides surveyed (619.9 km). Medium-high conservation value roadsides accounted for 23.3% of the total surveyed (221.5 km), medium-low conservation roadside covered 5.9% of the total surveyed (55.9 km). Areas of low conservation value occupied 5.8% of the roadsides surveyed (55.2 km), Table 4, Figure 4.

Figure 4 – Conservation status of roadsides in the Shire of Dalwallinu.

The number of native vegetation layers present, either the tree, shrub or ground layers determines the ‘native vegetation on roadside’ value. Sections with two to three layers of native vegetation covered 94.3% of the roadside (898.0 km). 5.5% had only one layer (52.3 km) and 0.2% had no layers of native vegetation (2.2 km), Table 4, Figure 5.

Figure 5– Native vegetation on roadsides in the Shire of Dalwallinu.
Roadside vegetation with extensive cover, i.e. greater than 80%, occurred along 27.8% of the roadsides surveyed (265.0 km). Survey sections with 20% to 80% vegetation cover accounted for 60.3% of the roadsides (574.7 km). The remaining 11.8% had less than 20% native vegetation (112.9 km), and therefore, a low ‘extent of native vegetation’ value, see Table 4, Figure 6.

**Figure 6 – Extent of native vegetation along roadsides in the Shire of Dalwallinu.**

The ‘number of native species’ score provided a measure of the diversity of the roadside vegetation. Survey sections with more than 20 plant species spanned 554.4 km (58.2%) of the roadside. Roadside sections with 6 to 19 plant species accounted for 324.9 km (34.1%) of the roadside. The remaining 73.1 km (7.7%) contained less than 5 plant species, see Table 4, Figure 7.

**Figure 7 – Number of native plant species within roadsides in the Shire of Dalwallinu.**
Roadsides determined to have high value as biological corridors (as determined by the roadside surveyors) were present along 78.8% (750.9 km) of the roadside, medium value made up 11.8% (112.8 km), and roadsides with low value as a biological corridor occurred along 9.3% (88.8 km) of the roadsides surveyed, see Table 4, Figure 8.

![Value as a Biological Corridor](image)

**Figure 8 – Value as a biological corridor.**

Light levels of weed infestation were observed on 29.1% (277.0 km) of the roadsides surveyed, medium level weed infestation occurred on 36.8% (350.6 km) of the roadsides and 34.1% (325.0 km) were heavily infested with weeds, see Table 4, Figure 9.

![Level of Weed Infestation](image)

**Figure 9 – Weed infestation.** Light weed infestation = weeds less than 20% of total plants. Medium weed infestation = weeds 20 to 80% of the total plants. Heavy infestation = weeds more than 80% of the total plants.
Uncleared native vegetation was present on 12.1% (115.5km) of the land adjoining roadsides, whilst 82.1% (782.3 km) of roadsides surveyed were adjoined by land that had been completely cleared for agriculture. 1.8% (17.6 km) of the roadsides surveyed were bordered by land that was cleared for agriculture, but contained a scattered distribution of native vegetation. Drains were the predominant adjoining landuse for 2.4% (22.7 km) of the roadsides surveyed, urban/industrial landuses adjoined 1.2% (11.5 km), and railway reserves adjoined 0.3% (2.9 km) of the roadsides surveyed, see Table 4, Figure 10.

![Predominant Adjoining Landuse](image)

**Figure 10 – Predominant adjoining land use.**

Roadside populations of the following nominated weeds are indicated on clear overlays accompanying the 2003 RCV map:

- Cape weed;
- Pimpernel;
- Paterson’s curse;
- Wild oats
- Barley grass
- Skeleton weed

Wild Mustard was also recorded under the category ‘Other weeds’, and is represented in Figure 11, with the other 6 nominated weed species observed along roadsides in the Shire.

Of the 6 nominated weeds surveyed throughout 2003, Wild oats were the most highly recorded weed category, occurring along 1004.0 km of roadsides. Cape weed was present along 720.7 km of the roadsides surveyed, whilst Paterson’s curse was recorded along 568.9 km of roadside. Barley grass was the next most commonly recorded weed,
occurring along 338.4 km, Mustard was present along 75.5 km, Skeleton weed 32.2 km, and Pimpernel 28 km of roadside, see Figure 11.

Figure 11 – Occurrence of nominated weeds along roadsides in the Shire of Dalwallinu
7.0 MANAGEMENT TECHNIQUES

The primary aim of road management is the creation and maintenance of a safe, efficient road system. However, the following management procedures are recommended and should be adopted. The following section provides management recommendations that will assist in retaining and enhancing roadside conservation value. These guidelines are taken from the Roadside Conservation Committee’s Roadside Manual and the Roadside Handbook.

The Executive Officer of the Roadside Conservation Committee is also available to assist on all roadside conservation matters, and can be contacted on (08) 9334 0423.

<table>
<thead>
<tr>
<th>High Conservation Value Roadsides</th>
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<tbody>
<tr>
<td><strong>Management Goal</strong></td>
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<td><strong>Management Goal</strong></td>
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<td><strong>Management Guidelines</strong></td>
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**Minimal disturbance can be achieved by:**
- Adopting a road design that occupies the minimum space;
- Diverting the line of a table drain to avoid disturbing valuable flora;
- Pruning branches, rather than removing the whole tree or shrub;
- Not dumping spoil on areas of native flora;
- Observing dieback control measures as required;
- Apply the Fire Threat Assessment (Roadside Manual) before burning roadside vegetation;
- Use methods other than fuel reduction burns to reduce fire threat; if roadside burning must be undertaken, incorporate it into a district fire management program;
- Encourage adjacent landholders to set back fences to allow roadside vegetation to proliferate;
- Encourage adjacent landholders to plant windbreaks or farm tree lots adjacent to roadside vegetation to create a denser windbreak or shelterbelt;
- Encourage revegetation projects by adjacent landholders.

**7.1 Environmental Guidelines**
An Environmental Guidelines has been developed through collaboration with Main Roads Western Australia, the Western Australian Local Government Association and the Roadside Conservation Committee. It is anticipated that this document will be accepted as an industry standard for all working or interested in roadside conservation. This document provides defined parameters for all roadside management works and also provides the local community with an overview of management practices that will ensure the sustainability of native roadside vegetation. Please contact the Roadside Conservation Committee on 9334 0423 for further information.

**7.2 Tree Roads**
Tree roads are defined as those roadsides with a sufficient density of mature trees to create an attractive tunnel effect. Besides the aesthetic benefits, these areas also provide valuable habitat for birds and other arboreal fauna. Since mature trees are slow growing and hard to replace, care should be taken to conserve these avenues wherever possible. The following points should be considered when working on tree roads:
- prune offending branches rather than remove the whole tree;
- cut branches off close to limb or tree trunk;
- divert line of table drain to avoid disturbing tree roots;
- import fill to build up formation, rather than using side-borrow from roadside;
- when using herbicide for weed control on the roadside do not use a soil residual type, such as Simazine or Atrazine. Eucalypts are especially sensitive to these;
encourage the adjoining landholders to plant shelter belts on their property that will complement the roadside vegetation.

7.3 Special Environment Areas

A Special Environmental Area is a section of roadside, which has such significance that it requires special protection. Reasons for establishing Special Environmental Areas can include:
- Protection of rare or threatened species of native plants;
- Protection of sites that have other high conservation, scientific or aesthetic values;
- Protection of Aboriginal or European cultural sites.

Special Environmental Areas can be delineated by the use of site markers. See Figures 9 and 10 for design and placement of SEA markers. Workers who come across a ‘Special Environmental Area’ marker in the field should not disturb the area between the markers unless specifically instructed. If in doubt, the Supervisor, Shire Engineer or CEO should be contacted.

Western Power and West Net rail also have systems for marking sites near power or rail lines. Examples of these are seen in the figure below.

![Figure 12 - Special Environmental Area site marker.](image-url)
7.4 Special Environmental Area Register

To ensure that knowledge of rare flora and other sites does not get lost due, perhaps, to staff changes, a Local Authority should establish a Special Environmental Area Register. This should outline any special treatment, which the site should receive, and be consulted prior to any work being initiated in the area.

The Special Environmental Area Register should be consulted by the appropriate person prior to starting work on any particular road, to ensure that inadvertent damage does not occur. All Special Environment Area sites should be marked on the Shire map, which records Roadside Conservation Value.

Local Government is encouraged to permanently mark Special Environmental Areas to prevent inadvertent damage to the rare flora or other values being protected. Markers of a uniform shape and colour will make recognition easier for other authorities using road reserves.

Figure 13 - Marking Special Environment Area (SEA) sites in the field. In this case, a declared rare flora (DRF) site has been marked.

When notified of a population needing marking, the Local Authority should contact the appropriate Department of Conservation and Land Management Regional or District office for assistance to ensure the exact site location and correct positioning of marker posts.
8.0 ROADSIDE PLANNING, STRATEGIES AND ACTION PLANS

8.1 Planning
The RCC is able to provide good models of Roadside Management Plans and encourages all shires to adopt this practice of planning for roadside conservation. The following actions greatly enhance likelihood of a plan that changes behaviour and results in on-ground actions:

- **Community support** encourage ongoing community involvement and commitment by establishing a local Roadside Advisory Committee or working group within the Shire Environmental Committee;
- **Contract specifications** maintain roadside values by developing environmental specifications for inclusion in all tender documents or work practices;
- **Community education** use of innovative and pertinent material can increase community understanding of roadside values;
- **Training** promote local roadside planning initiatives and gain acceptance and understanding by involving shire staff, contractors, utility provider staff and the community in workshops, seminars or training days. The Roadside Conservation Committee can provide this training.

Training develops recognition and understanding of roadside values and highlights best work practices. Workshops are developed to ensure that local issues and environments are dealt with and they include site visits to high conservation remnants, current projects and works.

The objective of all roadside management planning should be to:

- **Protect**
  - native vegetation
  - rare or threatened flora or fauna
  - cultural and heritage values
  - community assets from fire

- **Maintain**
  - safe function of the road
  - native vegetation communities
  - fauna habitats and corridors
  - visual amenity and landscape qualities
  - water quality

- **Minimise**
  - land degradation
  - spread of weeds and vermin
  - spread of soil borne pathogens
  - risk and impact of fire
  - disturbance during installation and maintenance of service assets

- **Enhance**
  - indigenous vegetation communities
  - fauna habitats and corridors
8.2 Strategies

The development of a strategy enables potentially competing uses to coexist and ensures that roadsides are managed in a coordinated approach. When producing regional strategies the RCC suggests that:

- Organisational support from local government is essential from the outset;
- Strategies should take no longer than 12 months to produce (including a period for community comment);
- Communities need to be provided with background information to make formal decisions.

Management strategies should be produced to address local issues, rather than be to a standard format. Issues can be categorised as:

- **Functional**
  - Fire prevention
  - Installation and maintenance of services
  - Road construction and maintenance
  - Stockpile and dumpsite management
  - Vegetation removal
  - Vehicle and machinery activity
  - Water supply catchments

- **Cultural and Recreational**
  - Cultural and heritage values
  - Horse riding
  - Visual amenity and landscape values
  - Wayside stops

- **Landcare**
  - Apiculture
  - Insect Pests
  - Pest animals
  - Ploughing, cultivating or grading
  - Revegetation and site rehabilitation
  - Weeds

- **Conservation**
  - Protecting and conserving remnant native vegetation
  - Rare, threatened or significant flora and fauna
  - Regeneration of native plant communities
  - Roadside marking of special environmental areas
  - Unused road reserves
  - Wetlands
  - Wildlife habitat
  - Wildlife corridors
8.3 Roadside Action Plans
A Roadside Action Plan is prepared for an individual road and contains a works program that will enable conservation values and other road uses to be managed compatibly.

Roadside Action Plans are based on the guidelines that are produced as part of the roadside strategy.

The RCC suggests that Roadside Action Plans be:
- short term documents (to be reviewed within 2 years);
- prepared on a need basis;
- prepared after consultation with major stakeholders;
- a maximum of 2 pages per road;
- names a person or agency responsible for implementing the management recommendations.

Roadside Action Plans may, for example, aim to eradicate invasive weeds such as African Lovegrass from roadsides. Weed overlays may be helpful in identifying strategic locations.
References

Western Australian Department of Agriculture, South Perth.


Appendix

1
APPENDIX 1


Vegetation classed as "remnant vegetation" has one or more of the following characteristics:

* Most closely reflects the natural state of vegetation for a given area.
* Has an intact understorey (if forest or woodland).
* Has minimal disturbance by agents of human activity.

Vegetation classed as "modified vegetation" has one or more of the following characteristics:

* Degraded understorey (i.e. reduction in the number of native species, includes weeds).
* Obvious human disturbance, i.e. clearing, mining, grazing, weeds.
* Affected by salt.
* Narrow corridors of vegetation (usually along roads and railway lines or windbreaks), which are more likely to be affected by edge effects.

Vegetation classed as "scattered vegetation" has:

* No understorey
* Parkland cleared i.e. scattered single trees.
* No significant signs or chance of regeneration.
Appendix

2
### APPENDIX 2

#### Standard Survey Sheet

<table>
<thead>
<tr>
<th>Survey to Determine the Conservation Value of a Road</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
</tr>
<tr>
<td><strong>Observer(s)</strong></td>
</tr>
<tr>
<td><strong>Road Name</strong></td>
</tr>
<tr>
<td><strong>Nearest named place</strong></td>
</tr>
<tr>
<td><strong>Shire</strong></td>
</tr>
<tr>
<td><strong>Direction of travel</strong></td>
</tr>
<tr>
<td><strong>Section no.</strong></td>
</tr>
<tr>
<td><strong>Jersey line</strong></td>
</tr>
<tr>
<td><strong>Length of section</strong></td>
</tr>
<tr>
<td><strong>Starting point</strong></td>
</tr>
<tr>
<td><strong>Ending point</strong></td>
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</tbody>
</table>

#### Extent of Native Vegetation Along

<table>
<thead>
<tr>
<th>Name</th>
<th>Raia Flora known to be present</th>
<th>Rare Flora known to be present</th>
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<tr>
<td></td>
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</table>

#### Width of Road Reserve

<table>
<thead>
<tr>
<th>Side of the road</th>
<th>Width of Vegetation roadside (m)</th>
<th>Length of section (m)</th>
<th>Nature of section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

#### Survey to Determine the Conservation Value of a Road

<table>
<thead>
<tr>
<th>No. of Different Native Species</th>
<th>Utility/Disruption</th>
<th>Dominant species (if known)</th>
<th>Conservation Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dominant species</td>
</tr>
</tbody>
</table>

#### Predominant Adjoining Land Use

| Urban industrial trees         | Highway reserve Parallel to road |
| Physical cover of structure    | Other                          |

#### Landscape Value

<table>
<thead>
<tr>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Reasons</th>
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</table>

#### General Comments

<table>
<thead>
<tr>
<th>Avenue of trees</th>
<th>High</th>
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</thead>
<tbody>
<tr>
<td>Reasons</td>
<td></td>
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</tbody>
</table>

#### Vegetation

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Value as a Biological Corridors</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mostly weeds (over 60% total)</td>
</tr>
<tr>
<td></td>
<td>Ground layer (total weeds)</td>
</tr>
<tr>
<td></td>
<td>Dominant weeds (if known)</td>
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</tbody>
</table>

#### Conservation Status

<table>
<thead>
<tr>
<th>Disturbances continuous</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disurbances isolated</td>
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</table>

A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines
Appendix 3
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines
Appendix

4
**APPENDIX 4**

Native Plant species in the Shire of Dalwallinu

*Note – Not a fully comprehensive list.  
* indicates weed species.*

<table>
<thead>
<tr>
<th>Native Plant species in the Shire of Dalwallinu</th>
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</thead>
<tbody>
<tr>
<td>Acacia acanthoclada subsp. acanthoclada</td>
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<tr>
<td>Acacia aciphylla</td>
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<td>Acacia acuminata</td>
</tr>
<tr>
<td>Acacia acuminata subsp. acuminata ms</td>
</tr>
<tr>
<td>Acacia acuminata subsp. burkittii ms</td>
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<td>Acacia acutata</td>
</tr>
<tr>
<td>Acacia anastrophylla var. anastrophylla</td>
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<tr>
<td>Acacia anastrophylla var. lissophylla</td>
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<tr>
<td>Acacia andrewsii</td>
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<td>Acacia anthochaera</td>
</tr>
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<td>Acacia ashbyae</td>
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<tr>
<td>Acacia assimilis subsp. assimilis</td>
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<td>Acacia beauverdiana</td>
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<td>Acacia bidentata</td>
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<td>Acacia cylindrica P3</td>
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<td>Acacia daveisioides</td>
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<td>Acacia deficiens ms</td>
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<td>Acacia dissona var. indoloria P3</td>
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Acacia synoria ms
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Acacia trinalis ms P1
Acacia tysonii
Acacia ulicina
Acacia victoriae
Acacia yorkrakinensis
Acacia yorkrakinensis subsp. acrita
Acacia ? aulacophylla
Acacia ? fragilis
Acacia ? microbotrya
Acacia ? nigripilosa subsp. ? nigripilosa ms
Acetosa vesicaria
Actinobole uliginosum
Actinostrobus arenarius
Actinotus humilis
Actinotus superbus
Actites megalocarpa
Adenanthos drummondii
Allium ampeloprasum
Allocasuarina acutivalvis
Allocasuarina acutivalvis subsp. acutivalvis
Allocasuarina acutivalvis subsp. prinsepianna
Allocasuarina campestris
Allocasuarina corniculata
Allocasuarina dielsiana
Allocasuarina humilis
Allocasuarina microstachya
Alyogyne pinoniana
Alyxia buxifolia
Amphibromus nervosus
Amphipogon caricinus
Amphipogon strictus
Andersonia heterophylla
Andersonia lehmanniana subsp. pubescens
Angianthus micropodioides P3
Angianthus tomentosus
Anigozanthos flavidus
Anthocercis anisantha subsp. anisantha
Anthocercis littorea
Anthrocorche pannosa
Aotus tietkensii
Argyroglottis turbinata
Aristida contorta
Arthropodium dyeri
Asphodelus fistulosus
Astartea clavifolia P2
Astartea heteranthera
Astroloma glaucescens
Astroloma serratifolium
Astroloma serratifolium var. horridulum
Atriplex bunburyana
Atriplex holocarpa
Atriplex hymenotheca
Atriplex paludosa subsp. baudinii
Atriplex semibaccata
Atriplex semilunaris
Atriplex vesicaria
Austrodanthonia caespitosa
Austrostipa nitida
Austrostipa trichophylla
Avena barbata
Avena fatua
Baeckea benthamii ms
Baeckea crispiflora
Baeckea cryptandroides
Baeckea cryptomonas ms
Baeckea elderiana
Baeckea grandiflora
Baeckea grandis
Baeckea megafaora ms
Baeckea muricata
Baeckea recurva ms
Baeckea sp.Wubin(M.E.Trudgen 5404)
Banksia attenuata
Banksia benthamiana P4
Bassia scoparia
Beaufortia bracteosa
Beaufortia elegans
Beaufortia interstans
Bellida graminea
Blennospora drummondi
Boronia adamsiana R
Boronia coeruleus
Boronia coeruleus subsp. spicata
Boronia ericifolia P2
Borya constricta
Borya nitida
Borya sphaerocephala
Bossiaea peduncularis
Brachypodium distachyon
Brachyscome ciliaris
Brachyscome ciliocarpa
Brachyscome iberidifolia
Brachyscome perpusilla
Brachyscome pusilla
Brassica tournefortii
Bromus rubens
Brunonia australis
Bursaria occidentalis
Caladenia cristata P4
Caladenia drummondi
Caladenia radialis
Caladenia roei
Caladenia vulgata ms
Calandrinia eremaea
Calandrinia primuliflora
Callitris glaucophylla
Calothamnus chrysantherus
Calothamnus gilesii
Calothamnus quadrifidus
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calothamnus quadrifidus var. &quot;unsorted&quot;</td>
<td>Conospermum brownii</td>
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<td>Calotis hispidula</td>
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<td>Chemelaucium drummondii</td>
<td>Dampiera alitissima</td>
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<td>Chemelaucium drummondii subsp. drummondii ms</td>
<td>Dampiera eriocephala</td>
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<td>Chemelaucium drummondii subsp. hallii ms</td>
<td>Dampiera juncea</td>
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<td>Chemelaucium micranthum</td>
<td>Dampiera lavandulacea</td>
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<td>Chemelaucium pauciflorum</td>
<td>Dampiera luteiflora</td>
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<tr>
<td>Chemelaucium pauciflorum subsp. thryptomenioides ms</td>
<td>Dampiera stenostachya</td>
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<tr>
<td>Chemelaucium pauciflorum thryptomenioides ms</td>
<td>Dampiera tenuicaulis var. tenuicaulis</td>
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<tr>
<td>Cheilanthes aff. austrotenuifolia</td>
<td>Dampiera tomentosa</td>
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<td>Cheilanthes austrotenuifolia</td>
<td>Dampiera wellsiana</td>
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<tr>
<td>Cheilanthes sieberi subsp. sieberi</td>
<td>Darwinia capitellata</td>
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<tr>
<td>Chenopodium melanocarpum</td>
<td>Darwinia chapmaniana ms R</td>
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<td>Chenopodium pumilio</td>
<td>Darwinia halophila ms</td>
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<td>Chondrella juncea</td>
<td>Darwinia purpurea</td>
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<td>Chorizema aciculare subsp. laxum</td>
<td>Daucus glöchidiatus</td>
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<td>Chorizema racemosum</td>
<td>Daviesia benthamii subsp. benthamii</td>
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<td>Chorizema rhynchorotris</td>
<td>Daviesia cardiophylla</td>
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<tr>
<td>Chrysitrix distigmatosa</td>
<td>Daviesia dielsii P2</td>
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<td>Chrysocoryne trifida</td>
<td>Daviesia grahamii</td>
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<td>Chthonocephalus pseudovex</td>
<td>Daviesia hakeoides subsp. subnuda ms</td>
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<td>Clematis delicata ms</td>
<td>Daviesia nematophylla</td>
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<td>Codonocarpus cotinifolius</td>
<td>Daviesia nudiflora subsp. amplexens</td>
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<td>Comesperma drummondii</td>
<td>Daviesia nudiflora subsp. nudiflora</td>
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<td>Comesperma integerrimum</td>
<td>Daviesia triflora</td>
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<td>Comesperma scoparium</td>
<td>Dianella revoluta</td>
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<td>Comesperma spinosum</td>
<td>Dianella revoluta var. divaricata</td>
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<td>Comesperma volubile</td>
<td>Dicrastylis fulva</td>
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<td>Commersonia pulchella</td>
<td>Dicrastylis parvifolia</td>
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<td>Commersonia stowardii</td>
<td>Dicrastylis reticulata</td>
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<td>Conospermum amoenum subsp. amoenum</td>
<td>Didymanthus roei</td>
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<td>Conospermum boreale subsp. ascendens ms</td>
<td>Dithyrostegia amplexicaulis</td>
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<tr>
<td>Conospermum polycephalum</td>
<td>Dodonaea adenophora</td>
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<tr>
<td>Conospermum stoechadis subsp. stoechadis</td>
<td>Dodonaea bursariifolia</td>
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</table>
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

Dodonaea caespitosa
Dodonaea divaricata
Dodonaea inaequifolia
Dodonaea larreoides
Dodonaea viscosa subsp. angustissima
Drosera macrantha
Drosera macrantha subsp. macrantha
Drosera macrophylla
Drosera pallida
Drosera ramellosa
Drosera stolonifera subsp. rupicola
Drosera stricticaulis
Drummondita hassellii
Drummondita hassellii var. hassellii
Dryandra conferta var. conferta
Dryandra fraseri var. fraseri
Dryandra purdieana
Duboisia hopwoodii
Ecdieiocolea monostachya
Emex australis
Enchylaena lanata
Enchylaena tomentosa var. tomentosa
Enteropogon acicularis
Eragrostis dielsii
Eremaea beaufortioides
Eremaea eectacioclada
Eremaea pauciflora subsp. pauciflora
Eremaea pauciflora var. longophylla
Eremaea pauciflora var. pauciflora
Eremophila caperata ms
Eremophila clarkei
Eremophila decipiens
Eremophila decipiens subsp. decipiens ms
Eremophila deserti
Eremophila drummondi
Eremophila glabra
Eremophila granitica
Eremophila lehmanniana
Eremophila miniata
Eremophila oldfieldii subsp. angustifolia ms
Eremophila oldfieldii subsp. oldfieldii
Eremophila oppositifolia
Eremophila oppositifolia subsp. angustifolia ms
Eremophila oppositifolia var. angustifolia ms
Eremophila pinnatifida ms R
Eremophila sargentii P2
Eremophila serrulata
Eremophila subflocosa subsp. lanata ms
Eremophila vernicosa ms X
Eriachne ovata
Erichsenia uncinata
Eriochilus scaber subsp. scaber ms
Eriostemon brucei subsp. brucei
Eriostemon deserti
Eriostemon glaber
Eriostemon nutans P1
Eriostemon sericeus
Eriostemon thryptomenoides
Eriostemon tomentellus
Erodium cygnorum
Erodium cygnorum subsp. cygnorum
Erymophyllum glossanthus
Erymophyllum tenellum
Eucalyptus aequioperta
Eucalyptus aff. leptophylla
Eucalyptus aff. rigidula
Eucalyptus albida
Eucalyptus baudiniana
Eucalyptus brachycorys
Eucalyptus burracoppinensis
Eucalyptus capillosa subsp. capillosa
Eucalyptus capillosa subsp. polyclada
Eucalyptus celastroides subsp. virella
Eucalyptus ceratocorys
Eucalyptus crucis subsp. lanceolata
Eucalyptus ebbanoensis subsp. ebbanoensis
Eucalyptus erythronema var. marginata
Eucalyptus eudesmioides subsp. eudesmioides
Eucalyptus ewartiana
Eucalyptus gracilis
Eucalyptus hypochlamydea subsp. ec dysiastes
Eucalyptus hypochlamydea subsp. hypochlamydea ms
Eucalyptus kochii subsp. kochii
Eucalyptus kochii subsp. plenissima
Eucalyptus leptopoda subsp. arctata
Eucalyptus loxophleba subsp. lissophloia
Eucalyptus loxophleba subsp. supralaevis
Eucalyptus macrocarpa subsp. macrocarpa
Eucalyptus myriadena subsp. myriadena
Eucalyptus obtusiflora
Eucalyptus oldfieldii
Eucalyptus petraea
Eucalyptus polita
Eucalyptus pyriformis
Eucalyptus rigidula
Eucalyptus salicola
Eucalyptus salubris
Eucalyptus sargentii subsp. sargentii
Eucalyptus semivestita ms
Eucalyptus sheathiana
Eucalyptus stowardii
Eucalyptus striaticalyx
Eucalyptus subangusta
Eucalyptus subangusta subsp. pusilla
Eucalyptus subangusta subsp. subangusta
Eucalyptus subangusta subsp. virescens P1
Eucalyptus synandra R
Eucalyptus tenera
Eucalyptus transcontinentalis
Eucalyptus wandoo subsp. pulverea
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

Eucalyptus x carnabyi P4
Euphorbia drummondii
Exocarpos aphyllus
Exocarpos sparteus
Frankenia cinerea
Frankenia pauciflora
Frankenia setosa
Gahnia aristata
Gahnia drummondii
Gastrolobium appressum R
Gastrolobium bennettsianum
Gastrolobium calycinum
Gastrolobium floribundum
Gastrolobium laytonii
Gastrolobium rotundifolium P1
Gastrolobium spinosum
Gastrolobium spinosum var. grandiflorum
Gastrolobium spinosum var. spinosum
Geleznowia verrucosa P3
Gilberta tenuifolia
Gilruthia osbornei
Glischrocaryon aureum
Glischrocaryon aureum var. angustifolium
Glischrocaryon roei
Glycine clandestina
Gnephosis setifera P1
Gnephosis tenuissima
Gnephosis trifida
Gnephosis uniflora
Gompholobium obcordatum
Gonocarpus nodulosus
Goodenia berardiana
Goodenia convexa
Goodenia helmsii
Goodenia incana
Goodenia mimuloides
Goodenia occidentalis
Goodenia perryi P1
Goodenia pinifolia
Goodenia tripartita
Goodenia watsonii subsp. watsonii
Grevillea acacioides
Grevillea acuaria
Grevillea apiciloba subsp. apiciloba
Grevillea armigera
Grevillea asparagoides P3
Grevillea biformis subsp. biformis
Grevillea bicornata
Grevillea brachystachya
Grevillea bracteosa P2
Grevillea candicans P3
Grevillea didymobotrya subsp. didymobotrya
Grevillea dielsiana
Grevillea dryandoides subsp. dryandoides R
Grevillea eremophila
Grevillea eriobotrya P3
Grevillea eriostachya
Grevillea eryngioides
Grevillea excelsior
Grevillea extorris
Grevillea granulosa P3
Grevillea hakeoides subsp. stenophylla
Grevillea hapantha subsp. recedens
Grevillea huegelii
Grevillea junciifolia subsp. temulenta
Grevillea kenneallyi P1
Grevillea leucopteris
Grevillea levis
Grevillea nana
Grevillea nana subsp. abbreviata P2
Grevillea obliquistigma subsp. funicularis
Grevillea obliquistigma subsp. obliquistigma
Grevillea paniculata
Grevillea paradoxa
Grevillea petrophiloides
Grevillea pinaster
Grevillea pinifolia P1
Grevillea polybotrya
Grevillea pterosperma
Grevillea pythara R
Grevillea rosieri P2
Grevillea sarissa subsp. sarissa
Grevillea shutdowniana subsp. shuttleworthiana
Grevillea tenuiloba P2
Grevillea teretifolia
Grevillea umbellulata subsp. acerosa
Grevillea umbellulata subsp. umbellulata
Grevillea uncinulata subsp. uncinulata
Grevillea yorkrakinensis
Gunniopsis glabra
Gunniopsis intermedius
Gunniopsis quadrifida
Gunniopsis rubra P1
Gunniopsis septifraga
Gyrostromon racemiger
Gyrostromon ramulosus
Gyrostromon reticulatus X
Gyrostromon subnudus
Hakea erecta
Hakea francisciana
Hakea invaginata
Hakea minyma
Hakea preissii
Hakea recurva subsp. recurva
Hakea scoparia
Halgania cyanae
Halgania integerrima
Halgania lavandulacea
Halgania viscosa
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

Halosarcia fimbriata
Halosarcia halocnemoides
Halosarcia halocnemoides subsp. caudata
Halosarcia indica subsp. bidens
Halosarcia lepidosperma
Halosarcia leptoclada subsp. inclusa
Halosarcia peltata
Halosarcia pergranulata
Halosarcia pergranulata subsp. pergranulata
Halosarcia pruinosa
Halosarcia pterygosperma subsp. pterygosperma
Halosarcia syncarpa
Halosarcia undulata
Hedynohis rhagadioloides
Hemiandra aff. pungens
Hemiandra gardneri R
Hemigenia diplanthera
Hemigenia macphersonii
Hemigenia sp.Edah(J.W.Green 1601)
Hemigenia sp.Jibberding(J.D’Alonzo 418)
Hemigenia sp.Paynes Find(A.C.Beauglehole 49138)
Hemigenia westringioides
Hemiphora elderi
Hibbertia acerosa
Hibbertia aff. crassifolia
Hibbertia aff. gracilipes
Hibbertia arcuata
Hibbertia drummondii
Hibbertia exasperata
Hibbertia glomerosa
Hibbertia lividula
Hibbertia nutans
Hibbertia rostellata
Hibbertia rupicola
Homalocalyx aureus
Homalocalyx caerucatus
Homalocalyx thyrtomnenoides
Hordeum glaucum
Hyalochlamys globifera
Hyalosperma demiissum
Hyalosperma glutinosum
Hyalosperma glutinosum subsp. glutinosum
Hyalosperma glutinosum subsp. venustum
Hyalosperma zacchaeus
Hybanthus eapacroides
Hybanthus floribundus
Hybanthus floribundus subsp. floribundus
Hydrocotyle calicarpa
Hydrocotyle pilifera var. glabrata
Hydrocotyle rugulosa
Hypocharis glabra
Isoetes caroli
Isoetes inflata
Isoetes tripus
Isoetopsis graminifolia
Isopogon divergens
Isopogon scabriusculus subsp. stenophyllus
Isopogon scabriusculus subsp. stenophyllus ms
Isotropis cuneifolia
Isotropis drummondii
Isotropis juncea
Jacksonia acicularis ms
Jacksonia arida ms
Jacksonia fasciculata
Jacksonia macrocalyx
Jacksonia nematoclada
Jacksonia rhadinocolada
Jacksonia velutina P4
Juncus aridicola
Keraudrenia hermanniiifolia
Keraudrenia integrifolia
Kunzea pulchella
Lachnostachys coolgardiensis
Lachnostachys eriobotrya
Lachnostachys verbascifolia var. verbascifolia
Lamarckia aurea
Lawrencella davenportii
Lawrencella rosea
Lawrenzia squamata
Laxmannia paleacea
Lechenaultia biloba
Lechenaultia macrantha
Lepidobolus preissianus subsp. volubilis ms
Lepidosperma aff. resinorum
Lepidosperma costale
Lepidosperma resinorum
Lepidosperma scabrum
Lepidosperma squamatum
Leptomeria preissiana
Leptosema aphyllum ms
Leptosema davesioides
Leptosema tomentosum ms
Leptospermum roei
Leucopogon cuneifolius
Leucopogon gracilimus
Leucopogon hamulosus
Leucopogon nutans
Levenhookia leptantha
Levenhookia pusilla
Lobelia heterophylla
Lobelia rarifolia
Lobelia winfridae
Logania flaviflora
Lomandra micrantha subsp. teretifolia
Lysinema ciliatum
Lysinema ciliatum forma Central
wheatbelt(S.Paust 898)
Lysiosepalum rugosum
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

Pimelea forrestiana
Pimelea imbricata var. piligera
Pimelea sulphurea
Pittosporum phylliraeoides var. microcarpa
Pityrodia axillaris P1
Pityrodia bartlingii
Pityrodia halganiacea
Pityrodia lepidota
Pityrodia teckiana
Pityrodia terminalis
Plantago debilis
Platysace maxwellii
Platysace trachymenioides
Plectrachne rigidissima
Podolepis canescens
Podolepis capillaris
Podolepis kendallii
Podolepis lessonii
Podotheca angustifolia
Podotheca chrysantha
Podotheca gnaphalioides
Podotheca uniseta P2
Pogonolepis muelleriana
Pogonolepis stricta
Polypogon monspeliensis
Prasophyllum cyphochilum
Prasophyllum gracile
Prasophyllum sargentii
Prostanthera campbellii
Prostanthera eckersleyana
Prostanthera semiteres subsp. intricata
Psammomoya choretroides
Pseudanthus intricatus ms
Ptilotus drummondii var. drummondii
Ptilotus drummondii var. minor
Ptilotus eriostichus
Ptilotus exaltatus var. exaltatus
Ptilotus exaltatus var. villosus
Ptilotus gaudichaudii var. "unsorted"
Ptilotus gaudichaudii var. gaudichaudii
Ptilotus holosericeus
Ptilotus obovatus var. "unsorted"
Ptilotus obovatus var. obovatus
Ptilotus polystachyus
Ptilotus polystachyus var. polystachyus
Quineta urvillei
Radyera ferragei
Raphanus raphanistrum
Regelia velutina
Reseda lutea
Rhagodia drummondii
Rhagodia preissii subsp. preissii
Rhodanthe chlorocephala subsp. rosea
Rhodanthe chlorocephala subsp. splendida
Rhodanthe citrina
Rhodanthe heteranthera
Rhodanthe laevis
Rhodanthe manglesii
Rhodanthe maryonii
Rhodanthe pygmaea
Rhodanthe spicata
Rhodanthe stricta
Ricinocarpos velutinus
Roycea divaricata
Rulingia cuneata
Rulingia densiflora
Rulingia luteiflora
Santalum acuminatum
Santalum spicatum
Sarcozona praecox
Scabevola hamiltonii
Scabevola humifusa
Schismus barbatus
Schoenia cassinianna
Schoenia filifolia subsp. filifolia
Schoenus armeria
Schoenus hexandrus
Schoenus sp. smooth culms(K.R.Newbey 7823)
Scholtzia drummondii
Sclerolaena diacantha
Sclerotegia disarticulata
Sclerotegia moniliformis
Senecio glossanthus
Senecio lautus
Senna cardiosperma subsp. flexuosa
Senna cardiosperma subsp. stowardii
Senna glutinosa subsp. charlesiana
Senna pleurocarpa var. angustifolia
Setaria verticillata
Siloxerus multiflorus
Siloxerus pygmaeus
Sisymbrium irio
Sisymbrium orientale
Solamnum elaeagnifolium
Solamnum hoplopetalum
Solamnum lasiophyllum
Solamnum nummularium
Solamnum oldfieldii
Solamnum orbiculatum subsp. orbiculatum
Sonchus oleraceus
Sonchus tenerrimus
Spartothamnella puberula P2
Spergula pentandra
Spergularia rubra
Spyridium majoranifolium
Stackhousia monogyna
Stenanthemum intricatum
Stenanthemum pomaderroides
Stenopetalum filifolium
Stylidium adpressum
A survey of the roadside conservation values in the Shire of Dalwallinu and roadside management guidelines

Stylobasium australis
Stypandra glauca
Styphelia tenuiflora
Swainsona beasleyana
Swainsona colutoides
Synaphea interioris
Templetonia aculeata
Templetonia sulcata
Teucrium sessiliflorum
Thelymitra antennifera
Thelymitra campanulata
Thelymitra nuda
Thelymitra sargentii
Thomasia tremandroides
Thryptomene aspera subsp. Paynes
Find(C.A.Gardner 11996)
Thryptomene australis
Thryptomene cuspidata
Thryptomene denticulata
Thryptomene hyporhytis
Thryptomene kochii
Thryptomene mucronulata
Thryptomene racemulosa
Thyridolepis mitchelliana
Thysanotus aff. patersonii
Thysanotus manglesianus
Thysanotus patersonii
Thysanotus rectantherus
Trachymene cyanopetala
Trachymene omata
Trachymene pilosa
Tragus australianus
Trichanthodium skirrophorum
Trifolium glomeratum
Triglochin calcitrapum subsp. incurvum ms
Triglochin mucronatum
Triglochin stowardii P2
Triodia rigidissima
Trymalium daphnifolium
Uldinia ceratocarpa
Urodon capitatus
Velleia cyanopotamica
Velleia discophora
Velleia rosea
Verreauxia reinwardtii
Verticordia acerosa var. preissii
Verticalia auriculata
Verticordia brachyphylla
Verticordia chrysantha
Verticordia chrysanthella
Verticordia densiflora var. densiflora
Verticordia endlicheriana var. manicula
Verticordia eriocephala
Verticordia grandis
Verticordia halophila
Verticordia helmsii
Verticordia mitchelliana
Verticordia monadelpha var. monadelpha
Verticordia muelleriana subsp. muelleriana P3
Verticordia nobilis
Verticordia picta
Verticordia plumosa var. brachyphylla
Verticordia pritzzeli
Verticordia rennieana
Verticordia roei subsp. meiogona P1
Verticordia staminosa subsp. staminosa R
Verticordia tumida subsp. tumida
Verticordia venusta P3
Vittadinia dissecta var. hirta
Waitzia acuminata var. acuminata
Waitzia nitida
Westringia cephalantha
Wrixonia prostantheroides
Wurmbea drummondii P4
Wurmbea tenella
X Drakodenia ornata ms P1
Xanthorrhoea gracii
Xanthosia bungei
Zygophyllum simile