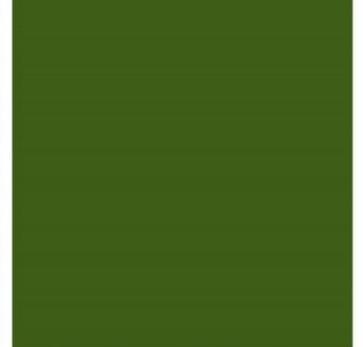


State Roads Weed Management Strategy 2016 – 2026



Revision History

Prepared by	Dave Sayers (NBES)	Date
Consultation	Tori Harvey (State Growth), Jill Jones (State Growth))	
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EXECUTIVE SUMMARY

This weed strategy has been prepared to guide weed management with the State road reservation into the future. The State road network spans over 3,600 kilometres and is used by a wide variety of the travelling public, business and industry sectors. The Department of State Growth commissioned the preparation of a State Roadside Weed Management Strategy as well as three regional Weed Service Delivery Plans (WSDP) with the aim of moving from a more reactive weed management approach to a more strategic, cost effective and long term approach. Weed management actions under the Strategy and Plans will aim to enhance environmental condition within the State road reservation and improve social and economic outcomes for the broader community.

The Department of State Growth also acknowledges its responsibilities under the *Weed Management Act 1999*. This Strategy and the associated Regional Plans strengthens the Departments approach to managing these responsibilities.

This strategy identifies eight strategic objectives that will underpin weed management into the future.

- Objective 1 – Best Practice Management
- Objective 2 – Planning
- Objective 3 – Integrated Weed Management
- Objective 4 – Risk Management
- Objective 5 – Stakeholder Engagement and Partnerships
- Objective 6 – Education and Training
- Objective 7 – Construction Works and Compliance
- Objective 8 – Weed Mapping and Data Management
- Objective 9 – Monitoring and Review

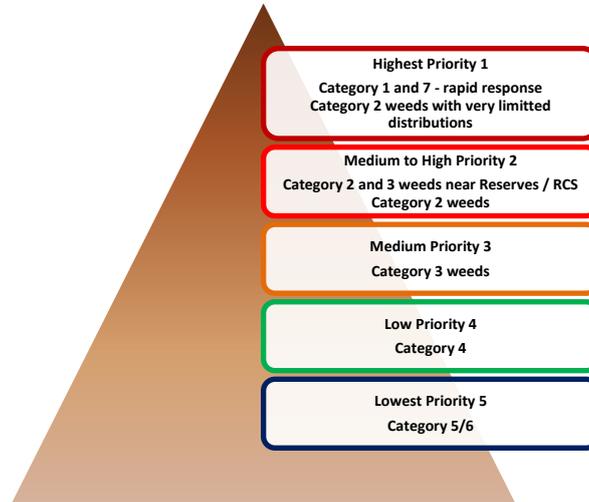
Weeds have been prioritised into seven categories under this strategy which are summarised as follows:

- Category 1** Species currently not present in Tasmania but are climatically suited. Non-naturalised species on WONS, Declared or weed alert lists elsewhere.
- Category 2** Restricted distribution and/or limited occurrences on roadsides but more widespread elsewhere. Includes Naturalised species on Declared/WONS, or weed alert lists.
- Category 3** Widespread distribution and/or many occurrences on roadsides. Includes naturalised species on Declared/ WONS, or weed alert lists. Generally more conspicuous and well known by the public.
- Category 4** Widespread distribution and/or many occurrences on roadsides. Includes naturalised species on Declared/ WONS, or weed alert lists. Generally less conspicuous or well known by the public.
- Category 5** Environmental weeds (Not WONS, Declared or on weed alert lists)
- Category 6** Agricultural weeds and minor weeds (Not WONS, Declared or on weed alert lists)
- Category 7** Species currently not present in Tasmania and Tasmanian climate currently unsuitable.

Category 2 and 3 weeds form the focus of the strategy and the related service delivery plans. Priority Management Areas have also been identified where areas of the road reserve are adjacent or in close proximity to:

- Specific reserve types within the Tasmanian Reserve Estate, and
- State Growth’s Roadside Conservation Areas (RCA)

The following chart shows the management priorities based on the weed category and Priority Management Areas.



The strategy identifies three approaches to managing weeds. These include:

- Weed led approach
- Site led Approach
- Stakeholder led approach

Weed or site led approaches were identified based on the weed species, category assigned and location. To further assist the site led approach, all roads under State control were analysed by their Link number and given a rating based on these factors. The split of weeds into these management types within the Weed Service Delivery Plans aims to assist further prioritisation and yearly budgeting.

Key Actions under each Strategy Objective have been tailored to the roadside management context. Key actions include:

Key Actions
<ul style="list-style-type: none"> • Implement the three regional Weed Service Delivery Plans which guide weed management across the State. • Implement weed work plans for site under the priority weed program. • Highly sensitive roadsides weed sites should be clearly marked onsite. • Align weed management with mowing schedule and practices and other fire risk management activities as far as practicable. • Provide appropriate guidance and training to all staff and contractors involved in weed management. • Ensure adequate skills, knowledge and certification is present within all those implementing weed control/eradication activities (i.e.: Certificate III in Weed Management or suitable qualifications). • Include a variety of methods in weed control programs as required. • Ensure there are protocols in place for a rapid response to new high priority weed incursions in conjunction with key stakeholders. • Ensure Construction Environmental Management Plans (CEMP) consider high priority weed species and sites and contractors integrate best practise management into construction related activities. • Compliance to be incorporated into selected projects (for construction, roadside maintenance and targeted weed management projects). • Keep the current State Growth weed dataset up to date. • Communicate and coordinate priority weed works with key stakeholders where possible.

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Glossary

DPIPWE	Department of Primary Industries, Parks, Water & Environment
IWM	Integrated Weed Management
NBES	North Barker Ecosystem Services
PWS	Parks & Wildlife Service
TSPA	Tasmanian Threatened Species Protection Act 1995
WCMP	Weed Construction Management Plan
WONS	Weeds of National Significance
WMA	Tasmanian Weed Management Act 1999
WMP	Weed Management Plan
WSDP	Weed Service Delivery Plan
WWP	Weed Work Plan

1 AIM

To deliver a more strategic, cost effective and long term approach to weed management that enhances environmental condition within the State road reservation and improves social and economic outcomes for the broader community. State Growth also aims to deliver weed management activities that maximise compliance under the *Weed Management Act 1999* and improve communication and collaboration with other weed management stakeholders in achieving all of the above.



2 INTRODUCTION

Since Tasmania first became settled by Europeans, roads have been an increasingly important component of Tasmanian settlement. The State road network now totals over 3,600 kilometres and is used by a wide variety of the travelling public, business and industry sectors. The Department of State Growth (State Growth) is responsible for managing the state-wide network and associated road reserve, including vegetation found within it. Dispersal of introduced plant species across these transport routes and management of the resulting infestation is a significant and challenging issue.

The magnitude of the weed problem in the State road reserve is not always evident to the untrained eye. The most obvious issues to the public are often more widespread and eye-catching weeds which are evident on their daily trips; however weeds that may be a high priority due to their potential impacts and limited distribution are in many cases less easily seen.

Prioritising weed and weed management actions across the State road reserve is an important step in more efficiently and effectively dealing with the continued spread of weeds across the State road transport corridor. Until now, the Department has not had a state-wide weed strategy or regional weed delivery plans to assist decision makers prioritise and implement targeted on-ground weed works on a continuing basis.

In seeking to address this issue, North Barker Ecosystem Services (NBES) were contracted by State Growth to prepare a State Road Weed Management Strategy, as well as three regional Weed Service Delivery Plans. The aim of this strategy is to assist decision making when undertaking weed management operations across the State road network.



Plate 1 – weed infestation near Bagdad on the Midland Highway

3 BACKGROUND



The Department of State Growth is the Tasmanian Government agency responsible for the management of the State's classified road system. This responsibility extends to the management of roadside weeds within the State road reserve and sits within a broader State and Federal framework for managing the continued spread of weeds.

Historically, management of weeds in the State road reserve has largely been focused on species and infestations which pose the greatest threat to road safety factors such as visibility, road integrity and amenity in key population areas. Each maintenance region has made decisions about weed treatments based on internal knowledge as well as external requests for control. Works on less obvious but higher priority weeds, has been incorporated into regional maintenance programs on a more limited basis where funding has allowed. Where State Growth Roadside Conservation Sites (RCS) exist, specific management plans and programs have been put in place.

This strategy aims to move the Department beyond this approach and provide guidance on prioritising weed species and weed management locations, improve internal and field processes and direct dedicated resources towards high risk weed issues. Beneath this strategy sits three regional Weed Service Delivery Plans (WSDP) that inform targeted management of weeds within the maintenance regions.

State roads and reserves

The State road network includes approximately 3,600 kilometres of roads and associated roads reserves. As occurs elsewhere roads are identified by unique names and numbers. To assist management of the extensive network, the Tasmanian Road Positioning Information System (TRIPS) was developed. Under this system individual roads have been dissected into approximately 10km lengths, called Links. Links are further broken down into Chainages which represent lengths defined by two identifiable land marks or road infrastructure items. As such the Link and Chainage system can be used to identify lengths of road or specific locations within the network. The State Growth weed project has used TRIPS to identify weed infestation locations within the road reserve. Reference to this system is found in this Strategy as well as the Weed Service Delivery Plans.

State roads traverse a range of landscapes and all of the Tasmanian bioregions (Figure 1). While the majority of vegetation within the roadside is heavily altered due to past road construction or historical farming activities prior to road construction, native vegetation of varying type and condition remains. Within the road reserve there are a number of significant conservation sites which contains native vegetation communities threatened under either the Tasmanian *Nature Conservation Act 1995* or threatened ecological communities under the national *Environmental Protection and Biodiversity Conservation Act 1999*. The Department of State Growth implements Roadside Conservation Site Management Plans at these sites to improve the condition and thereby conservation value of these areas.

Additionally, there are also numerous parks, reserves, covenants and other land tenures with significant flora and fauna values adjacent to State roadsides.

Weed Data within the road network

When the State Growth weed project was initiated, it became apparent that reliable weed data was not consistent across the three maintenance regions. Stage I was therefore commissioned and NBES was engaged to undertake a data review. Key objectives of Stage I were to:

- Improve understanding of the quality and quantity of weed data available for the State road reserve,
- Assess compatibility of weed data from a variety of internal and external sources,
- Investigate viability of mapping outputs from data available,
- Identify priority weeds in each of the maintenance regions, and
- Provide summary information and recommendations regarding the data findings to inform future stages of the project.

Stage I results demonstrated that the weed dataset was not high enough quality to allow for an accurate representation of the weed distribution and prioritisation across the State road network. In particular the North West and North East road network required additional surveys. NBES undertook roadside weed surveys throughout these two regions during April 2015 in order to enhance the quality of the weed dataset¹.

¹NBES (2015a, b)



Figure 1 - State road network and maintenance regions

4 WEEDS, LEGISLATION & RELATED DOCUMENTS



4.1 What is a weed

The national weed strategy defines a weed as follows:

A weed is considered pragmatically as a plant that requires some form of action to reduce its harmful effects on the economy, the environment, human health and amenity.

4.2 Why manage weeds

The impact of weeds on the Australian economy has been estimated at \$4 billion per year². This cost includes direct weed control and yield reductions to crops. Costs not included are those not easily valued such as impact to nature conservation, tourism, landscape amenity as well as impacts to health such as allergic reactions, poisoning of animals, impacts to waterways or habitat for feral species. Roadsides are one of the main transport vectors for the spread of weeds. Controlling weeds along roadsides, while having the obvious benefit of reducing impacts as discussed above, also helps improve public safety and condition of the roads. Reducing fire risk is another key objective. Large swards of introduced grasses in particular can result in a greater biomass of fuel.

4.3 Tasmanian Weed Management Act 1999

This is the core piece of weed management legislation within Tasmania. The Act defines a list of 'declared' weeds that:

- Present a threat to Tasmania but are not yet naturalised
- Present a threat but are currently of limited distribution
- Are widely distributed requiring management due to their threat to the native environment and/or agriculture

Currently 115 weeds have been declared within Tasmania with an additional 32 species currently being proposed for declaration. 103 of these declared weeds have a presence within the State road network.

The *Weed Management Act 1999* (WMA) also provides a Statutory Weed Management Plan (WMP) and establish a regulatory framework for each of these declared weeds. The WMP places each weed into either Zone A or Zone B within each municipality. The management objectives for each zone are:

- Zone A – Eradication
- Zone B – Containment (preventing spread to other areas free of that weed)

² The Australian Weed Strategy

Under the WMA, landholders/managers have a legal requirement to control weeds on their land according to the zoning. In many cases the classification reflects the extent of the particular weed within a municipality, however it should be noted that in some cases municipalities may have requested a Zone B be changed to a Zone A because they have a municipal wide eradication program in place.

The statutory weed management plans also allow for Zone B weeds to effectively change to Zone A weeds depending on what is happening on either the adjoining land or adjoining municipality. Situations where this applies include:

- Any Zone B property sharing a border with a Zone A municipality,
- Any property free of the declared weed in question within Zone B require a buffer be put in place to prevent spread to adjoining properties,
- Any group of properties within Zone B for which the owners have developed and are implementing a local integrated Weed Management Plan for the declared weed,
- Any property within Zone B where the declared weed is impacting negatively upon any community or flora or fauna species listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and/or the Tasmanian Threatened Species Protection Act 1995.

Weed Inspectors under the Act are given powers to enforce the requirements of the Act; they can be employees under state or local government. Failure to abide with the Act can result in a requirement notice being issued by an Inspector, requiring a landholder/ manager to undertake specific weed management actions. Ignoring such a notice can lead to an infringement notice.

4.4 Weeds of National Significance

The *Australian Weed Strategy* identifies a list of 33 Weeds of National Significance (WONS). National and State Strategies have been developed for some of the WONS that are present within the State road network. Best Practise Manuals also exist for various WONS. Individual landowners and managers are ultimately responsible for managing WONS. State governments are responsible for overall legislation and administration. Federal government funding for weed control is largely informed by the WONS strategic goals.

12 of the WONS have a recorded presence within the State road network. These are asparagus fern, athel pine, bridal creeper, boneseed, English and canary brooms, African boxthorn, Chilean needle grass, serrated tussock grass, blackberry, willows and gorse.

All WONS are now declared under the WMA and all jurisdictions have agreed to declare all future WONS species even if that weed is unlikely to occur in that jurisdiction. The intent of this action is to prevent the sale and trade of any WONS species.

4.5 National Environmental Alert List

Plant species that are in the early stages of establishment with the potential to become a significant threat to biodiversity are shown on the National Environmental Alert List³. 11 of these species are declared under the *Tasmanian Weed Management Act 1999*. To date there are 28 non-native weeds on this list of which 11 have some known potential distribution within Tasmania (Appendix 2 on page 61) and 5 are regarded as naturalized in Tasmania.

³ accessed via <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/alert.html>

4.6 Tasmanian Weed Management Strategies

Tasmania's weed management strategy (*WeedPlan*) is the overarching weed plan for the state, although this plan is now substantially out of date. On a regional level there are three key regional weed strategies within Tasmania. These are

- Southern Tasmanian Weed Strategy 2011- 2016
- Weed Management Strategy – Northern Natural Resource Management Region 2012
- Cradle Coast Regional Weed Management Strategy 2010

All of these Strategies are generally based on principles adopted from the *Australian Weeds Strategy 2007* developed by the Australian Weeds Committee. These are:

1. Weed management is an essential and integral part of the sustainable management of natural resources for the benefit of the economy, the environment, human and amenity.
2. Combating weed problems is a shared responsibility that requires all parties to have a clear understanding of their roles.
3. Good science underpins the effective development, monitoring and review of weed management strategies.
4. Prioritisation of and investment in weed management must be informed by a risk management approach.
5. Prevention and early intervention are the most cost-effective techniques for managing weeds.
6. Weed management requires coordination among all levels of government in partnership with industry, land and water managers and the community regardless of tenure.
7. Building capacity across government, industry, land and water managers, and the community is fundamental to effective weed management.

Successful implementation of this strategy is underpinned by the following additional principles:

- A. Adequate resources are required to coordinate and administrate implementation of the strategy and associated plans;
- B. Communication and coordination with key stakeholders around longer-term actions is essential;
- C. Agreed best practice integrated weed management principles (as above) are used to control weeds;
- D. Developing and implementing appropriate hygiene practices is fundamental;

These principles are integrated into the key strategies detailed in section 8 of this strategy.

4.7 Chemical Legislation & Regulations

The use of agricultural and veterinary chemicals in Tasmania is controlled under the Agricultural and Veterinary Chemicals Act 1995. It is a legal requirement that contractors/employees who use these chemicals for weed management are suitably qualified in their application (i.e. Chemcert trained). Contractors must also be licensed commercial operators and obtain certificates of competency. It is the responsibility of all operators to also follow instructions on labels, or permit instructions for off-label use.

4.8 Plant Quarantine Act 1997

This piece of legislation provides for the quarantine of plants and restricts the entry of pests and diseases into Tasmania

4.9 Other documents of relevance

Tasmania has numerous other strategies which include weed management such as Council bushland, weed or coastal strategies. The following are additional information and documents applicable to this strategy (see Reference List for full details):

- Council Planning Schemes and weed management strategies and plans
- Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania, 2015, DPIPWVE
- A Roadside Vegetation Management Strategy for Tasmania, 1990, Greening Australia
- Weeding Roadsides: A guide to effective management on roadsides (undated), Goninon
- Roadside Weed Manual, 1997, Department of Transport
- Maintenance Objectives for Roadsides, 1995, Department of Transport
- Roadside Vegetation Management 1996, concept document by G Parker

Figure 2 provides a summary of the hierarchical process that underpins the development of weed strategies within Australia. It should be noted that roadside weed strategies are unique in that they are focused on narrow, linear areas that cover many regions and municipalities.

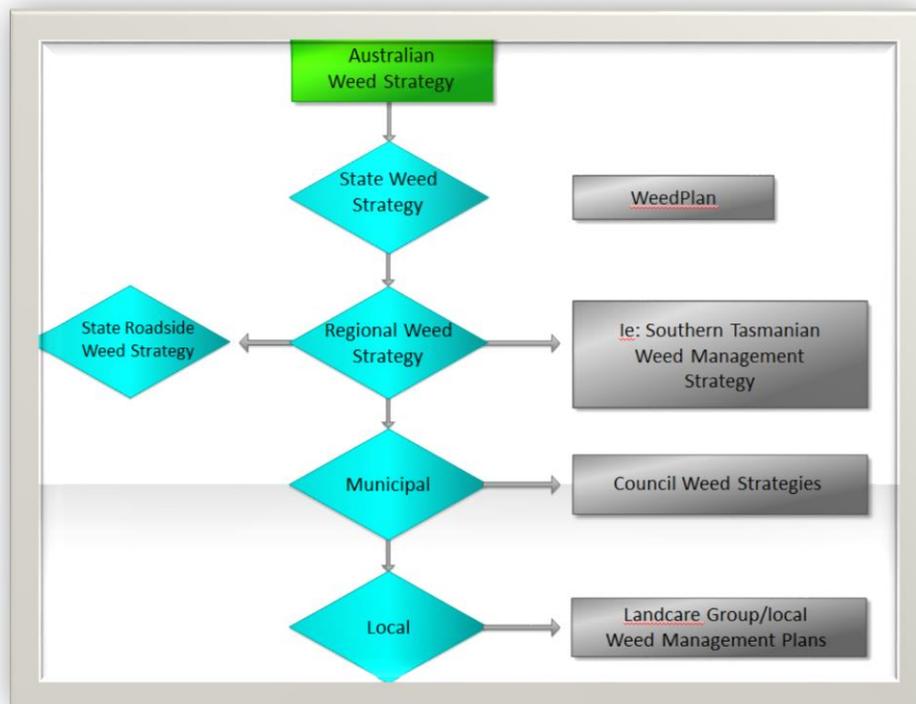


Figure 2 – Process that underpins development of Weed Strategies

5 WEEDS OF TASMANIAN ROADSIDES



Tasmania is home to a wide range of introduced plants. Over 1000 introduced plants have been recorded within Tasmania with many of these also occurring along Tasmanian roadsides. Some of these are well established and widespread while others are more recent introductions occurring in small populations, with varying levels of threat.

Weeds such as lovegrasses, needle grasses, serrated tussock, ragwort, broom species, boneseed, gorse, blackberry, Spanish heath and African boxthorn represent just some of the weeds posing significant implications on roadsides. Species such as Texas needle grass and African lovegrass are more recent introductions with low distributions at present, however their existence along high traffic volume roadsides means they threatened to extend their spread.

5.1 Minimising spread in road environments

Roads are a vector for weed spread across the State with weed seed and propagules being spread via machinery used on construction projects, maintenance works, vehicular movement on and off roadways and via seed within road gravel or soil moved.

To minimise the risks posed by roadside weeds, the 'Weeding roadside – A guide to effective weed management on roadsides' (Goninon) outlines the following methods to employ:

- Avoid slashing weeds after they have developed seeds
- Clean earthmoving equipment, especially when moving to new areas
- Use gravel from a local area to prevent the introduction of new weed species
- If a gravel dump hasn't been used recently and there is a large number of weeds present, scrape off the top layer and don't use it. Deep burial is an option for material containing weeds and their propagules (seeds, roots and stem fragments)
- Control weeds that occur near quarry dumps and quarries to prevent seeds finding their way into the gravel
- Inspect the roadside after construction works and kill the weeds that emerge at the edge of the work site
- Rehabilitate and revegetate areas that have been disturbed with appropriate native species. Control weeds in these areas after planting. This is very important as many revegetation projects fail due to poor management and ultimately become weedy
- Consider mulching to prevent erosion and weed establishment in disturbed sites
- When undertaking maintenance move from the weed free to the weediest end of roadside. This will reduce the spread of weeds along the road.

While this Strategy acknowledges and provides some information on the risks of weed spread and hygiene management further consideration and work will be required in this area in the future,

6 WEED PRIORITISATION



Seven weed prioritisation categories were identified as part of Stage I of State Growth's weed project. This prioritisation process considered a number of factors including:

- climate suitability;
- whether the weed species is naturalised or not;
- listing status under the WMA (~~WONS⁴, Declared⁵ or other alert lists~~); and
- distribution/ abundance

The factors determining each prioritisation category and an appropriate weed management response are depicted in Figure 3 and 4, and described in Table 2.

Key Point

All known weeds have been placed in Category 2 to 6 (Category 1 and 7 are not known to occur in Tasmania). Category 2 and 3 species are the key focus of the three Regional Weed Service Delivery Plans.

The full list of Category 2 and 3 weeds can be seen in Tables 3 and 4.

⁴ WONS - Weed of National Significance List, Commonwealth Government

⁵ Declared under the *Tasmanian Weed Management Act 1999*

Figure 3: Weed Species Prioritisation Categories & Management Approaches

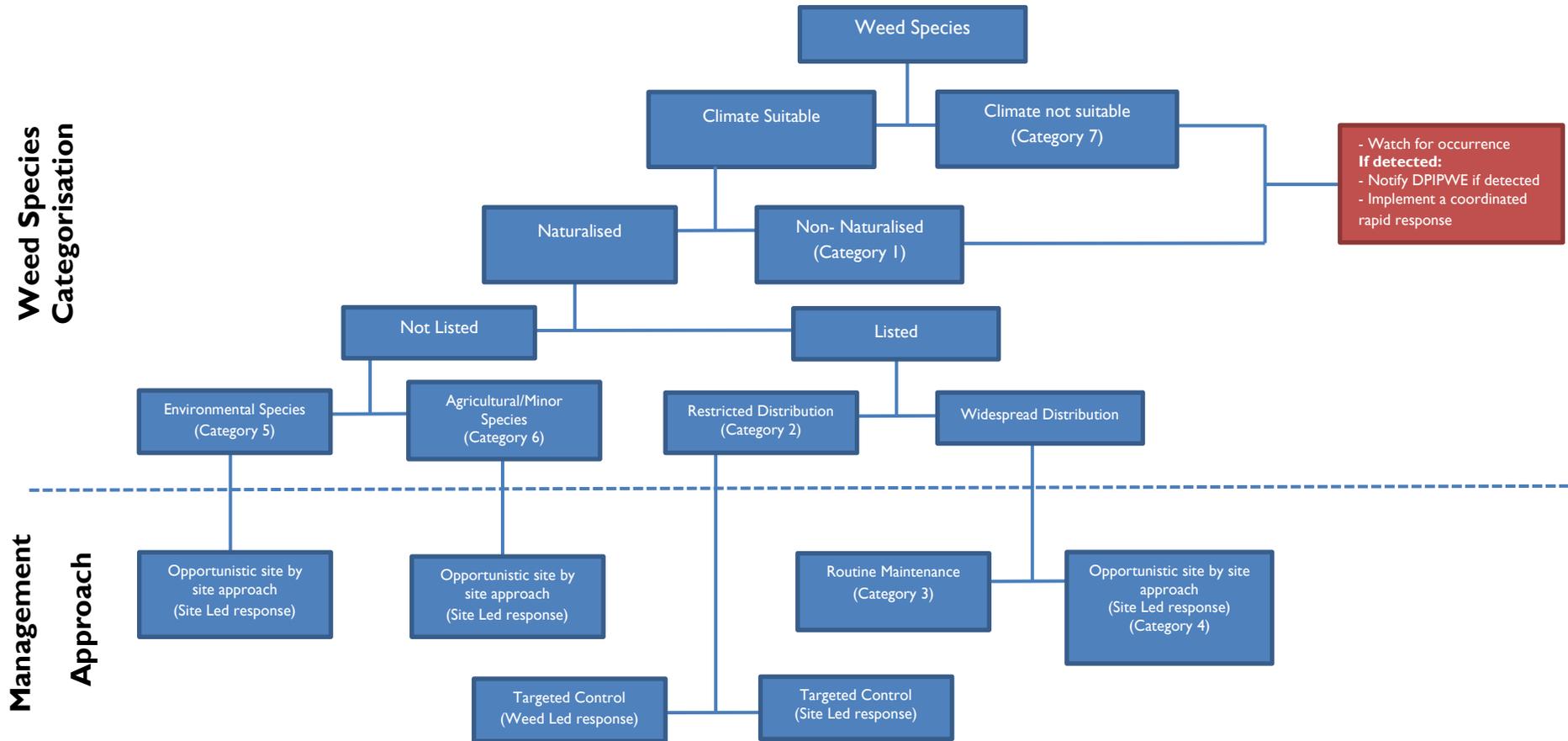


Table I - Weed Species Prioritisation Categories

Prioritisation Category	Weed Description	Response	Objective	Number of species State-wide	Number of species recorded State roadsides
1	<ul style="list-style-type: none"> Species currently not present in Tasmania but are climatically suited Non-naturalised species on WONS, Declared or weed alert lists elsewhere* 	<ul style="list-style-type: none"> If detected, co-ordinated rapid response undertaken in consultation with DPIPWE, local council, adjacent landowners and other relevant stakeholders Undertaken by specialist contractor Direction through Environment Development Approvals 	<ul style="list-style-type: none"> Eradication (rapid response) 	<ul style="list-style-type: none"> 49 	<ul style="list-style-type: none"> none
2	<ul style="list-style-type: none"> Naturalised species on WONS, Declared or weed alert lists* Restricted distribution and/or limited occurrences on roadsides but more widespread elsewhere Includes weeds regarded as a serious threat by DPIPWE or weeds declared in the future 	<ul style="list-style-type: none"> Targeted response, undertaken in consultation with DPIPWE, local council, adjacent landowners and other relevant stakeholders for isolated populations. Limit further spread of those that have a wider distribution Undertaken by specialist contractor Direction from Environment Development Approvals Consider management factors on site by site basis 	<ul style="list-style-type: none"> Eradication or limit spread 	<ul style="list-style-type: none"> 45## 	<ul style="list-style-type: none"> 24
3	<ul style="list-style-type: none"> Naturalised species on WONS, Declared or weed alert lists* Widespread distribution and/or many occurrences on roadsides More conspicuous and well known by the public 	<ul style="list-style-type: none"> Control subject to budgets Does not require specialist expertise Suitable for routine maintenance contractor in accordance with Weed Service Delivery Plans. Common targets of routine maintenance programs in the past. 	<ul style="list-style-type: none"> Containment 	<ul style="list-style-type: none"> 9## 	<ul style="list-style-type: none"> 9
4	<ul style="list-style-type: none"> Naturalised species on WONS, Declared or weed alert lists* 	<ul style="list-style-type: none"> Targeted opportunistically, based on management by other stakeholders, public 	<ul style="list-style-type: none"> Containment (site or situation) 	<ul style="list-style-type: none"> 11## 	<ul style="list-style-type: none"> 11

Prioritisation Category	Weed Description	Response	Objective	Number of species State-wide	Number of species recorded State roadsides
	<ul style="list-style-type: none"> • Widespread distribution and/or many occurrences on roadsides • Generally less conspicuous or well known by the public. 	<p>requests or location specific context, subject to budgets#.</p> <ul style="list-style-type: none"> • Could require specialist expertise or could be suitable for routine maintenance in consultation with Environment Development Approvals. 	specific)		
5	<ul style="list-style-type: none"> • Environmental weeds • Not WONS, Declared or on weed alert lists 	<ul style="list-style-type: none"> • No legislative requirements for control but can have detrimental impact on natural values • Based on listing status, control is a lower priority. Works may be undertaken opportunistically in response to stakeholder management, public requests or location specific context, subject to budgets#. 	<ul style="list-style-type: none"> • Containment (action where resources are available) 	<ul style="list-style-type: none"> • 36 	<ul style="list-style-type: none"> • 32
6	<ul style="list-style-type: none"> • Agricultural type weeds • Other minor weeds • Not WONS, Declared or on weed alert lists 	<ul style="list-style-type: none"> • No legislative requirements for control • Usually controlled as best practice management of agricultural crops, not generally controlled outside of these areas • Based on listing status, control is a lower priority. Works may be undertaken opportunistically in response to stakeholder management, public requests or location specific context, subject to budgets#. 	<ul style="list-style-type: none"> • Containment (lowest priority and only actioned if resources are available) 	<ul style="list-style-type: none"> • 21 	<ul style="list-style-type: none"> • 19
7	<ul style="list-style-type: none"> • Non-naturalised (species currently not present in Tasmania) 	<ul style="list-style-type: none"> • Considered unlikely to require a response due to unsuitability of Tasmanian climate. 	<ul style="list-style-type: none"> • Eradication 	<ul style="list-style-type: none"> • 21 	<ul style="list-style-type: none"> • none

Prioritisation Category	Weed Description	Response	Objective	Number of species State-wide	Number of species recorded State roadsides
	<ul style="list-style-type: none"> Tasmanian climate currently unsuitable 	<ul style="list-style-type: none"> If detected, rapid response undertaken by specialist contractor overseen by Environment Development Approvals Manager. 			

* - NEWAL - National Environmental Weed Alert List, Commonwealth Government

* - WAS - Tasmanian Weed Alert Network Weed Alert Species

- Control will need to consider site specific context, adjacent control initiatives/issues and realistic management responses. These could include but are not limited to the following factors agricultural programs /organic farms, public chemical sensitivities, specific weed control programs, adjacent conservation areas, public requests/complaints, State Growth regional priorities, and WH&S associated with site based control among other possible factors and eventualities.

Some species are included in both categories – i.e.: Zone A – Category 2, Zone B Category 3 or 4 depending on species

The above prioritisation was applied across all road Links within the regions and full details including regional species lists are within the regional Weed Service Delivery Plans.

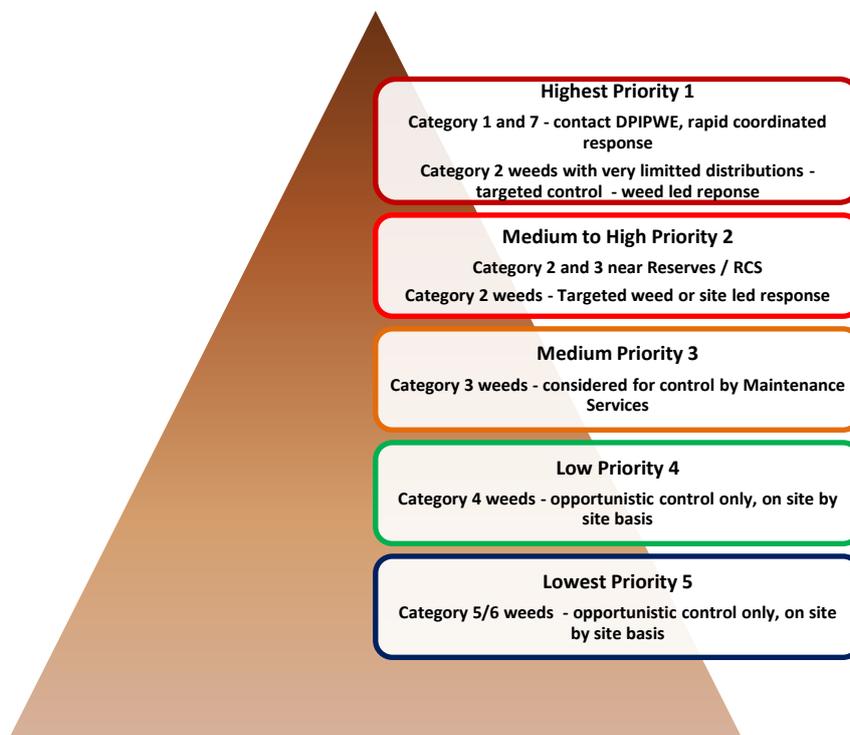


Figure 4 - Weed Prioritisation

Table 2 - Category 2 weeds state-wide

Botanical name	Common Name	Category 2 within these Municipalities	Region presence	Figure
<i>Allium vineale</i>	crow garlic	All municipalities	NE	Figure 4 on 44
<i>Amaranthus albus</i>	tumble weed	All municipalities	S	Figure 4 on 44
<i>Amsinckia sp.</i>	amsinckia	All municipalities	Not recorded in road reserve	
<i>Anthemis cotula</i>	stinking mayweed	All municipalities	Not recorded in road reserve	
<i>Asparagus asparagoides</i>	bridal creeper	All municipalities	S, NE, NW	Figure 4 on 44
<i>Asparagus scandens</i>	asparagus fern	All municipalities	NE	Figure 4 on 44
<i>Asphodelus fistulosus</i>	onion weed	All municipalities	S	Figure 4 on 44
<i>Berberis darwinii</i>	Darwin's barberry	All municipalities	S	Figure 5 on 45
<i>Calluna vulgaris</i>	heather	All municipalities	S, NW	Figure 5 on 45
<i>Carduus nutans</i>	nodding thistle	All municipalities	S	Figure 5 on 45
<i>Carex albula</i>	NZ hair sedge	All municipalities	Not recorded in road reserve	
<i>Carex flagellifera</i>	NZ sedge	All municipalities	Not recorded in road reserve	
<i>Carthamus lanatus</i>	saffron thistle	All municipalities	S	Figure 5 on 45

Botanical name	Common Name	Category 2 within these Municipalities	Region presence	Figure
<i>Cenchrus longisetus</i>	feathertop	All municipalities	S	Figure 6 on page 46
<i>Cenchrus macrourus</i>	African feather grass	All municipalities	S	Figure 6 on page 46
<i>Chrysanthemoides monilifera subsp. monilifera</i>	boneseed	Derwent Valley, Central Highlands, Southern & Northern Midlands, Glamorgan Spring Bay, Brighton, Tasman	S, NE, NW	Figure 12 on page 52
<i>Cirsium arvense var. arvense</i>	Californian thistle	Devonport, Dorset, King Island Launceston and Glamorgan / Spring Bay	S, NE, NW	Figure 13 on page 53
<i>Coprosma robusta</i>	karamu	All municipalities	S	Figure 6 on page 46
<i>Cortaderia sp. (incl. Austrodeira richardii)</i>	pampas grass	All municipalities	S, NE, NW	Figure 5 on page 45
<i>Cuscuta sp.</i>	dodder	All municipalities	Not recorded in road reserve	
<i>Cytisus scoparius</i>	English broom	Glamorgan/Spring Bay, Flinders & King Island.	S, NE, NW	Figure 14 on page 54
<i>Datura sp.</i>	datura	All municipalities	Not recorded in road reserve	
<i>Echium plantagineum</i>	paterson's curse	All municipalities	S, NE	Figure 6 on page 46
<i>Echium vulgare</i>	viper's bugloss	All municipalities	S	Figure 6 on page 46
<i>Egeria densa</i>	egeria	All municipalities	Not recorded in road reserve	

Botanical name	Common Name	Category 2 within these Municipalities	Region presence	Figure
<i>Elodea canadensis</i>	Canadian pondweed	All municipalities	Not recorded in road reserve	
<i>Emex australis</i>	spiny emex	All municipalities	Not recorded in road reserve	
<i>Equisetum sp.</i>	horsetail	All municipalities	Not recorded in road reserve	
<i>Eragrostis curvula</i>	African lovegrass	All municipalities	S, NE	Figure 9 on page 49
<i>Fallopia japonica</i>	Japanese knotweed	All municipalities	Not recorded in road reserve	
<i>Foeniculum vulgare</i>	fennel	Circular Head, Dorset, Flinders and Glamorgan / Spring Bay, King Island & West Coast	S, NE, NW	Figure 17 on page 57
<i>Genista monspessulana</i>	Montpellier broom	Glamorgan / Spring Bay, King Island & Flinders.	S, NE, NW	Figure 14 on page 54
<i>Pilosella aurantiaca subsp. aurantiaca</i>	orange hawkweed	All municipalities	S, NE, NW	Figure 7 on page 47
<i>Hypericum perforatum</i>	St John's wort	All municipalities	S, NE, NW	Figure 7 on page 47
<i>Hypericum tetrapterum</i>	square-stemmed St John's wort	All municipalities	Not recorded in road reserve	
<i>Leycesteria formosa</i>	Elisha's tears	Break O'day, Brighton, Central Highlands, Flinders, Derwent Valley, George Town, Glamorgan / Spring Bay, King Island, Launceston, Meander Valley, Northern Midlands,	S, NE, NW	Figure 15 on page 55

Botanical name	Common Name	Category 2 within these Municipalities	Region presence	Figure
		Sorell, Southern Midlands & Tasman		
<i>Moraea sp.</i>	cape tulip	All municipalities	Not recorded in road reserve	
<i>Myriophyllum aquaticum</i>	parrot's feather	All municipalities	Not recorded in road reserve	
<i>Nassella leucotricha</i>	Texas needlegrass	All municipalities	S	Figure 7 on page 47
<i>Nassella neesiana</i>	Chilean needlegrass	All municipalities	S	Figure 7 on page 47
<i>Nassella trichotoma</i>	serrated tussock	All municipalities	S, NE	Figure 8 on page 48
<i>Oenanthe pimpinelloides</i>	meadow parsley	All municipalities	Not recorded in road reserve	
<i>Onopordum sp.</i>	onopordum thistles	All municipalities	Not recorded in road reserve	
<i>Rubus fruticosus</i>	blackberry	Flinders & King Island.	S, NE, NW	Figure 11 on page 51
<i>Salpichroa organifolia</i>	pampas lily of the valley	All municipalities	Not recorded in road reserve	
<i>Senecio jacobaea</i>	ragwort	All municipalities except Central Coast, Central Highlands, Derwent Valley, Devonport, Huon Valley, Kentish, King Island, Kingborough, Latrobe, Meander Valley, Sorell & Tasman.	S, NE, NW	Figure 19 on page 59
<i>Solanum elaeagnifolium</i>	silver-leaf nightshade	All municipalities	Not recorded in road	

Botanical name	Common Name	Category 2 within these Municipalities	Region presence	Figure
			reserve	
<i>Solanum marginatum</i>	white-edged nightshade	All municipalities	Not recorded in road reserve	
<i>Solanum triflorum</i>	cut leaf nightshade	All municipalities	Not recorded in road reserve	
<i>Tamarix aphylla</i>	athel pine	All municipalities	S	Figure 8 on page 48
<i>Ulex europaeus</i>	gorse	Devonport, Dorset, Flinders, Kentish, King Island, Sorell, Tasman and Waratah / Wynyard.	S, NE, NW	Figure 18 on page 58
<i>Urospermum dalechampii</i>	Mediterranean daisy	All municipalities	S	Figure 8 on page 48
<i>Xanthium sp.</i>	burrs	All municipalities	Not recorded in road reserve	

Table 3 - Category 3 weeds statewide

Botanical name	Common Name	Category 3 within these Municipalities	Region presence	Figure
<i>Chrysanthemoides monilifera subsp. monilifera</i>	boneseed	Those not listed in Table 2	ALL	Figure 12 on page 52
<i>Cytisus scoparius</i>	English broom	Those not listed in Table 2	ALL	Figure 16 on page 56
<i>Erica lusitanica</i> **	Spanish heath	All Municipalities	ALL	Figure 20 on page 60

Botanical name	Common Name	Category 3 within these Municipalities	Region presence	Figure
<i>Foeniculum vulgare</i>	fennel	All Municipalities	ALL	Figure 17 on page 57
<i>Genista monspessulana</i>	montpellier or canary Broom	Those not listed in Table 2	ALL	Figure 14 on page 54
<i>Leycesteria formosa</i>	Elisha's tears	Those not listed in Table 2	ALL	Figure 15 on page 55
<i>Lycium ferocissimum</i>	African boxthorn	Those not listed in Table 2	ALL	Figure 10 on page 50
<i>Rubus fruticosus</i>	blackberry	All Municipalities	ALL	Figure 11 on page 51
<i>Ulex europaeus</i>	gorse	Those not listed in Table 2	ALL	Figure 18 on page 58

** Spanish heath is also Zone 2 under WMA in some municipalities but since the declaration has infested these areas therefore treated only as Category 3 under this strategy.

In prioritising and delivering management actions under each regions Weed Service Delivery Plans, the Department has a number of additional considerations to take into account. These considerations include location in terms of both adjoining land uses and location based WH&S risks, control costs, and management initiatives by other land managers / stakeholders. To help balance these considerations and prioritise management actions from year to year, three different approaches to weed management prioritisation and associated control have been developed. These approaches are not necessarily exclusive, and in many cases will be complementary. Additionally, communication with appropriate stakeholders will form part of each approach.

6.1 Weed Led approach to management

A Weed Led approach targets specific high risk weed species due to their potential economic and/or environmental impact. These species are not widespread and have a lower abundance. As such, for these species eradication in the road network is a feasible long term goal. Examples (but not limited to) include bridal creeper (*Asparagus asparagoides*), orange hawkweed (*pilosella aurantiacum*), heather (*Calluna vulgaris*) African lovegrass (*Eragrostis curvula*), Texas needlegrass (*Nassella leucotricha*) and Chilean needlegrass (*Nassella neesiana*). This approach to weed management applies to a number of Category 2 weeds.

The location of Priority 2 and 3 weeds are shown in Appendix 1.

6.2 Site Led approach to management

Site Led management focuses on particular areas for control where sites contain a number of Category 2 and 3 weeds and may be in close proximity to a Priority Management Area. Priority Management Areas have been identified where areas of the road reserve are adjacent or in close proximity to:

- Tasmanian Reserve Estate Reserves with an IUCN (International Union for Conservation of Nature) category rating of I to IV, and
- State Growth's Roadside Conservation Areas (RCA)

The Tasmanian Reserve Estate incorporates both formal and informal reserves, public reserves including National Parks, Forest Reserves, Conservation Areas and Regional Reserves, and private reserves including Conservation Covenants and Sanctuaries. Several other minor categories are included but not listed here. Reserves with an IUCN (International Union for Conservation of Nature) category rating of I to IV have been included while those with a protected area management category V and VI have been excluded. Those areas not classified into any of the IUCN categories have also been removed⁶. Appendix 4 on page 74 details the IUCN categories in more detail. Figure 5, below shows the location of Priority Weed Management Locations.

The regional WSDP's include a ranking by road Link where by Category 2 and 3 weeds and their proximity to a Priority Management Areas for each region was scored. The scoring was based on the following:

- 4 points for each Category 2 weed
- 2 points for each Category 3 weed
- 5 points for the presence of a Category 2 weed near a Priority Management Area
- 5 points for the presence of a Category 3 weed near a Priority Management Area

⁶ For a detailed description of what falls into a IUCN category visit http://www.iucn.org/about/work/programmes/gpap_home/gpap_quality/gpap_pacategories/

The same value was given for both Category 2 and 3 weeds present near a Priority Management Area as regardless of the distribution of that weed, the potential impact to biodiversity values is equal. Table 4 shows the Ten Highest rated road Links under a Site Led weed response within the State road network

A Site Led management approach may also include weeds from Category 4 to 6 where a deemed benefit exists, such as eradicating all weeds adjacent a high value conservation area.

Weed and Site Led management will be prioritised on a regional basis

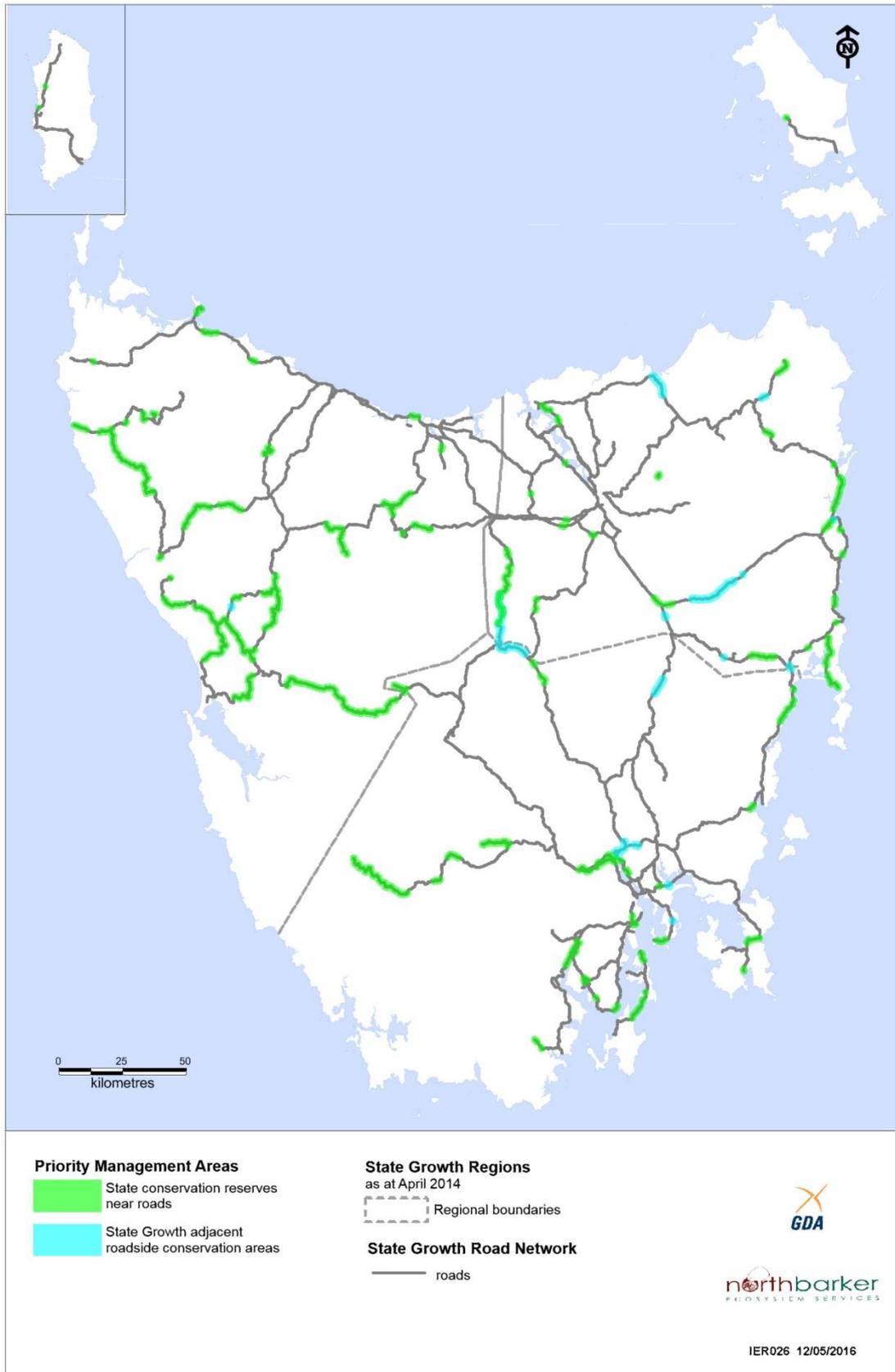


Figure 5 - Priority Weed Management Areas

Table 4 – Ten Highest rated road Links under a Site Led weed response within the State road network

Road Name	Road No	Link No	Category 2 rating	Category 3 rating	Total Weed Value	Cat 2 near Reserve / RCA	Cat 3 near Reserve / RCA	Rating
Huon Hwy	A0168	34	20	12	32	5	5	42
Tasman Hwy	A0113	36	20	8	28	5	5	38
Tasman Hwy	A0113	23	16	10	26	5	5	36
Tasman Hwy	A0113	11	16	8	24	5	5	34
Tasman Hwy	A0113	7	16	12	28	0	5	33
Bass Hwy	A0249	39	12	16	28	0	5	33
Midland Hwy	A0087	14	12	10	22	5	5	32
Tasman Hwy	A0113	33	12	8	20	5	5	30
Arthur Hwy	A0142	73	12	8	20	5	5	30
Railton MR	A1251	94	8	12	20	5	5	30

A full list of State Road Links and their ratings is in Appendix 3 on page 63.

6.3 Stakeholder Led approach to management

There are many organisations and community groups implementing a variety of weed management programs across the state. These programs provide an additional opportunity to enhance weed management outcomes across the State road reserve. State Growth will provide support to these collaborative efforts where priorities are aligned.

The interaction between Weed Led, Site Led and Stakeholder Led management will be considered and prioritised on a regional basis given several factors including the mix and number of Weed Led species in the region, the overlap between Site Led and Weed Led priorities and Stakeholder Led Priorities and the budget for management on any given year. Some priorities under each of these areas may be picked up through construction projects in any given year also.

7 STRATEGIC OBJECTIVES



The development and implementation of weed control strategies are generally based on a set of principles that flow from the national to municipal level as outlined in Figure 2. The following section outlines some key objectives that are consistent with the overall principles of strategic weed management. The goal in implementing actions derived from these key objectives is to

optimise the integration of effort and resources of the various stakeholders and in doing so optimise weed management outcomes for all.

8.1 Objective 1 – Best Practice Management

The Department of State Growth aims to implement a targeted weed program based on best available data, integrated methods that respond to best practice weed principles, and collaboration with stakeholder. In doing so the Department aims to deliver a best practise weed management approach.

The need to embrace best practices with a view to greater efficiency and effectiveness of weed control is foremost and comes with the benefit of maximising cost effectiveness. Large gains in effectiveness and efficiency should first be sought in the application of proven best practices. This is particularly important in managing weeds across the State road network where control is often the main objective to minimising further spread.

Greater efficiency and effectiveness results in savings in time and money. Poor practises will result in continued inefficiencies in weed management, additional costs (in the long term especially) and results in little innovation. In a sense, the application of best practice is in itself innovation for organisations that do not currently achieve it.

Below are a number of practices that are well recognised for increasing effectiveness in weed treatment.

1. A planned weed control program on an annual and seasonal basis;
 - This may be in the form of preparing weed work plans prior to tackling site or weed led control/eradication or Weed Construction Management Plans for construction works. Mowing regimes should be created with knowledge of highly sensitive weed locations and timing amended.
2. Rapid response to priority weeds;
 - New incursions should be managed swiftly in conjunction with DPIPWE and other relevant stakeholders;
Accurate weed mapping is important, as is good communication with other key stakeholders.
3. Current record keeping of weed locations that have been subject to treatment;
 - Including date of treatment, treatment applied, weed(s) treated and area treated (This should form part of the weed work plan);
4. Target eradication of Category 2 isolated outliers – done in conjunction with other key stakeholders where necessary;
5. Where priority weeds are also outside the road network, liaise with stakeholders;
6. Weed management must include a commitment to secondary and tertiary treatment, including revegetation where appropriate.
 - Implement integrated weed management methods to reduce the control effort required – for example:
 - i. Mix treatments to reduce risk of resistance;
 - ii. Minimise weed habitat or provide good access for management by utilising landscape design, for instance batters and roadsides that are easy to mow.
 - iii. Revegetate where appropriate
7. Improve hygiene - cleaning weed seeds from tools, equipment, machinery, vehicles, pets, clothing and boots contributes strongly to arresting weed spread;

8. Focus on completing all stages of treatment (primary through to rehabilitation) of an achievable number of sites (i.e.: don't take on too many projects at once, rather select the most important projects and see those out – success is greater if the focus is maintained on a more realistic number and strategic selection of sites);
9. Minimise site disturbance (particularly important in road construction/improvement projects – only disturb areas necessary for the project);
10. Utilising ChemCert trained, DPIPWVE approved licensed commercial operators and; and
11. Selecting, applying and storing chemicals appropriately and safely.

Refer to Appendix 6 for further discussion on best practice weed hygiene.

Key Actions

- Weeds should be managed based on their prioritisation with this strategy and the relevant WSDP.
- The weed program and work plans should include all necessary information to achieve results, i.e. site location, target species, timing on control, method, follow up etc.
- Consider timing of the roadside mowing regime to occur prior to Priority weeds flowering or a sufficient time period following treatment (Refer to WSDP).
- Highly sensitive roadsides weed sites should be clearly marked. How these areas are tackled as part of the yearly mowing regime should be factored into planning.
- Communicate with relevant parties to integrated weed management options.
- Ensure Construction Environmental Management Plans (CEMP) consider weed priorities and contractors integrate best practise management in construction related activities.
- ChemCert training should be a minimum requirement for all weed managers and contractors.

8.2 Objective 2 – Planning

State Growth's weed management efforts aim to reflect strategic level planning outlined in this Strategy as well as the regional level priorities detailed in the regional Weed Service Delivery Plans. Guidance and information provided in these documents aims to deliver informed, pragmatic and adaptive management into the future.

Strategic planning at the highest level provides guidance on the principles and objectives of weed management. Planning at the implementation scale provides for delivery of outcomes. Plans need to be pragmatic enough to allow flexibility and be able to accommodate management efforts that are responsive to changing priorities, seasonality and community aspirations. Therefore the development and implementation of program plans needs to be well considered to accommodate flexibility but also clearly direct works in line with strategic priorities and best practice methods. Monitoring is crucial to forward planning in that it allows managers to gauge effectiveness and accommodate improvements. In these ways annual program plans become a valuable resource and performance management tool to measure achievements against the WSDPs and Strategy.

The greater the level of consistency between the high level strategic framework and site treatment plans the more likely that success will flow. Consistency between the two levels ensures that managers and practitioners at all levels are working from the same principles toward the same goals.

Key Actions

- Implement the three Weed Service Delivery Plans which guide weed management across the regions.
- Implement weed work plans for site and weed led programs. A WWP outlines the aims and objectives, methods and how the project will be monitored including photo points assessment.
- When setting yearly goals, target less projects so that these projects are better implemented and ensure secondary and tertiary treatments are included. The weed database should be kept up to date so that more accurate decisions are made on priorities.
- Work in weed management with mowing and fire risk management activities.

8.3 Objective 3 – Integrated Weed Management

Delivery of priority weed management in the State Growth road reserve aims to improve environmental condition through the use of integrated weed management methods applied to priority species and locations.

Integrated weed management (IWM) is a term used to describe the long term management of weeds using a combination of different management and control techniques and species prioritisation for control to maximise management outcomes. An IWM approach considers weed species ecology, density and the land-use situation in which it occurs. This approach also aims to address the underlying causes of a weed infestation, rather than just focusing on controlling visible weeds. It does this by targeting the different stages of the weed's lifecycle and undertaking measures that will prevent weed reproduction, reduce emergence, promote seed bank depletion and minimise weed competition with desirable vegetation.

Herbicide use is an important tool in weed management, however over the past few decades its use has been poorly considered with an increasing dependence on its use as the only means for weed removal. The application of integrated weed management acknowledges that alternatives may be required but that in some instances herbicide use is essential. The risks associated with herbicide use must be managed appropriately. The repeated use of the same chemicals on re-emerging plants can lead to herbicide resistant populations. The application of a more diverse range of control techniques can reduce this risk.

Furthermore, the use of herbicides can create patches of bare ground suitable for the recolonisation of weeds, which can lock the weed manager unwittingly into a cycle of control and reestablishment. Something has to change to break this cycle. Repetitious seasonal programs may be appropriate in some circumstances where alternatives are limited, for example road edge weed management. In other circumstances, such as weed led management, the aim of the treatment plan must be to reduce the weed management effort and ultimately eradication of the weed at the site, not simply to control what is there at one point in time.

Alternative means of weed control should be considered for every weed control project. The following measures are applicable to different circumstances and their feasibility needs to be judged on a case by case basis. For example, some can be applied to primary control, while others are more suited to secondary control or preventative measures.

- I. Selective herbicide;

2. Biocontrol – species specific insect pests and plant diseases;
3. Mulch – effective in preventing germination;
4. Steam – effective on annuals or germinants;
5. Tilling – stimulates a germination response that can be re-tilled, sprayed or mulched;
6. Physical removal/ grubbing, followed by stamping down soil – a chemical free alternative where the number of plants is low and the action is feasible;
7. Cut and paste – excellent technique for targeting relatively large individuals; and
8. Rehabilitation – provides shading cover and competition to minimise germination and establishment;

Roadside weed spraying is currently employed to manage the road shoulder. This approach protects the road edge, and manages public and worker safety. At present there are few alternatives that achieve the same outcome and deliver a cost effective result, however rotating the type of herbicide used will be important in the future to reduce herbicide resistance issues. Other management techniques around the world should also be considered.

Key Actions

- Review current weed practices against best practices and ensure adequate skills and knowledge are present within all those implementing weed control/eradication programs.
- Include a variety of methods in weed control programs as far as practical.
- Going forward consider options in relation to roadside (shoulder) spraying program.
- Review the types of herbicide used when planning the weed work program.
- Staff / contractors must be suitably qualified

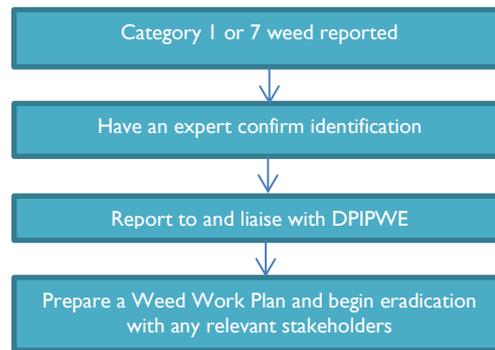
8.4 Objective 4 – Risk Management

The Department of State Growth will adopt a risk based approach to weed management consistent with this Strategy and priorities in the WSDP's. Risks will be assessed on a continuing basis.

Prevention and early detection

Prevention, early detection/eradication followed by control or containment is the ultimate risk management objective for weeds. Effective mitigation of risks provides an opportunity to protect important places from weed invasion or minimise spread and therefore resources needed for weed management. However, a challenge for early detection is the ability to identify new weeds that managers are not familiar with or often looking for.

Early detection across the State road network is a difficult task given the amount of roadside that is not surveyed regularly; however where new priority weeds are identified, all effort and resources should be put into eradication. Any Category 1 weeds detected should be targeted with a rapid response in conjunction other key stakeholders. Table 5 identifies the process from observation to eradication.

Table 5 – Rapid Response**Weed categorisation and spread**

Since the inception of the Tasmanian *Weed Management Act 1999* (WMA), many declared weeds have further spread across the road network, such as Spanish heath (*Erica lusitanica*). In many municipalities this weed is listed as a Zone A weed where eradication is the objective. Since the zoning of declared weeds, many have continued to spread and in some cases eradication is unlikely to be achievable. For the purpose of this strategy the categorisation of weeds has given consideration to the previous weed risk assessment, the WMA as well as their current distribution. The placement of weeds within categories of priority is flexible and where new weeds are found, declared or zoning changed this information should be incorporated into the applicable weed categorisation. There are also a number of weeds currently declared under the WMA that are not known with the road network.

Key Actions

- Respond to weeds on a priority basis as identified in the WSDPs.
- Communicate the need for weed and other maintenance contractors to be alert for new species weed incursion or new infestations on high priority low distribution weeds.
- Ensure there are protocols in place for a rapid response to new weed species detected or spread of high priority, low distribution weeds and in conjunction with key stakeholders.
- Work with DPIPW where a species may warrant declaration under the WMA and to review the current zoning of declared weeds across municipalities.

8.5 Objective 5 – Stakeholder Engagement and Partnerships

Communication, coordination and collaboration is integral to the long term success of weed management objectives. State Growth aims to develop and maintain a focus on these aspects of implementation to enhance on-ground efforts and outcomes.

Weeds stretch across various land tenure boundaries which makes control and eradication difficult. The road network is one of the biggest corridors for the spread of weeds across the State. Current distributions suggest weed issues are generated in populated areas and spread linearly along creek systems and roads, with spot invasions also resulting from animal and wind dispersal. New weed populations then establish wherever suitable conditions exist. As such weed dispersal vectors and propensity to establish are factors independent of tenure

boundaries. Effective weed management programs need to be integrated across all tenures, private and public.

Agency/private landholder engagement

Strong weed management outcomes rely on good stakeholder relationships, good work practices and collaboration with the respective landowners and managers. Whilst this Strategy falls under the control of the Department of State Growth, collaboration with other agencies and private landowners will be important particularly where eradication of a species is the primary goal. On a case by case basis, State Growth should communicate the nature and precise location of weed management activities and work with other agencies and / or private landholders as part of weed and site led activities.

It is acknowledged that agencies and land owners/ managers often face financial constraints in seeking to do the extent of weed management which is often required. Improved outcomes can be achieved through cooperative agreements between stakeholders which include monitoring and follow up treatments.

Without mutually beneficial cooperation, independent weed management priorities may diverge and are unlikely to deliver best practice, strategic weed management.

Council partnerships

Councils are also road managers and as such deliver weed initiatives across roadsides and other areas of their municipality. Mutually beneficial weed management projects may exist with Councils where control efforts are collaborative, resources leveraged and local knowledge and oversight incorporated. For example, State Growth has an agreement Glamorgan Spring Bay Council to include priority weed management on State roads within their council boundaries. These types of partnerships can have substantial benefits as long as the priorities for weed management are aligned and methods and safety procedures are agreed.

Key Actions

- State Growth is to foster cooperative projects with various landowners/managers and agencies, in which resources and knowledge may be shared.
- Funded service agreements with Councils provide an instrument to achieve cross-ownership outcomes. Where appropriate, continue to develop joint agreements for management of roadside vegetation.
- Review roadside slashing management and provide guidance / training to staff and contractors.
- Distribute this strategy and relevant sections of the WSDP to relevant Councils and service authorities.

8.6 Objective 6 – Education and Training

Priority weed management initiatives within the State Growth road reserve will aim to utilise knowledgeable and experienced weed professionals with appropriate qualifications. Inclusions of education and training initiatives will aim to increase the

knowledge and information base of all personnel associated with weed management across the Department.

Education

Attitudes about what constitutes a high risk weed and how these are managed vary greatly from one individual to another. Education can make an important contribution to the weed control effort. It is important to communicate the weed prioritisation and roadside weed management focus from this Strategy and the related WSDP's to all relevant State Growth staff, contractors, key stakeholders and interested sectors of the community. Much can be gained by awareness and an understanding of what is a risk, why and where they occur. If the ultimate aim of education is an understanding of the weed management issues and efforts, then more people are likely to either contribute to the solution or no longer contribute to the problem. In this context, the spread of understanding, through education, will produce better weed management outcomes.

Training

Staff and contractors who regularly undertake construction or maintenance works in the road reserve, need to be engaged in training related to the roadside weed management strategy and plans. Contractors delivering weed control as part of the State Growth weed program will require specific information and training on priorities and standards for delivery and safety working in a road environment.

Over time personnel, procedures, regulations and techniques changed or are updated. Thus, periodic training is required to keep up key people up to date with best practices. Where required training may include ChemCert, equipment use, hygiene principles and practicalities, weed identification and control techniques and traffic management and safety. Contractors and sub-contractors should adopt a set of minimum training requirements to ensure they are meeting best practice weed management.

Key Actions

- Engage with key stakeholders on weed priorities and management sites and actions
- Provide training on weed identification, prioritisation and hygiene principles and practices.
- All contractors to meet Chemcert requirements.
- Minimum training standard should be expected by Contractors (i.e.: Certificate III in Weed Management or suitable qualifications).
- New weed data uploaded to NVA to increase the information base for other stakeholders.

8.7 Objective 7 – Construction Works and Compliance

The Department will place equal emphasis on weed detection and control during road construction as maintenance. Review and improvement to contractual documentation for road construction, as it relates to weed management, will be continuing focus of the Department.

Road maintenance and construction works across the road network contributes to the spread of invasive species throughout the state. Improvements are required from both contractors and relevant government agencies in order to minimise this spread.

Improvements to contract specifications for construction works will assist in clearly defining what is expected from contractors. This includes detailed weed management plans delivered by experienced weed contractors and hygiene plans. Involving environmental staff from start to finish of the project including auditing environmental issues will significantly contribute to outcomes.

Contractors should meet best practice guidelines and be able to show how their employees have been trained in matters relating to weed management and hygiene. The level of detail required by contractors on a project could be based on a risk rating such as follows:

- High Risk – Project which contain Category 2 weeds or where a project contains a road link with a Medium to High rating (refer to WSDP's).
- Low & Medium Risk – All other projects.

Contract specifications would be more stringent for High risk locations and works which require more detailed management planning and a higher expectation for weed management pre / during / post works.

Compliance is a key part of making improvements to weed management. Building some compliance checks into yearly works helps target improvement. Whilst financial constraints dictate how much compliance can occur, it is important that some form of compliance is integrated to improve the efficiency and effectiveness of weed management and hygiene.

Key Actions

- State Growth to review specifications and contract clauses for construction works to strengthen contractor requirements for weed and hygiene management.
- Compliance to be incorporated into selected projects (for construction, roadside maintenance and targeted weed management projects).

8.8 Objective 8 - Weed mapping and data management

Review and update to weed data will be undertaken on a periodic basis to enable the Department to continue to deliver an informed, adaptive priority weed program. State Growth will aim to support investment into this work at appropriate intervals.

Good decision making relies on an accurate and up-to-date weed database and mapping. Part of the process in preparing this weed strategy and associated regional WSDP was the preparation of a weed GIS dataset based on available data as well as data collected during drive by road surveys. The current roadside weed dataset is a GIS file available in either MapInfo or ArcGIS format. In order to keep this dataset up-to-date it should be updated at 6 monthly intervals to include recent observations from the Natural Values Atlas (records that are within the road reserve) and new plants/ infestations identified within the road reserve. Sites or species that have been treated should also have information recorded. There are two main options to record treatment.

1 – Maintain a separate GIS file for treatment.

2 – Include additional fields within the current dataset to add treatment information. One field could be simply a 'yes/no' to treatment with another column allowing for more detail.

Recording and data-basing weed management efforts and results are critical to assessing success. The gathering of baseline weed data and subsequent primary and secondary treatments will develop into a valuable record and planning resource and help to improve future approaches to weed control. From baseline data a manager can undertake measurements, set targets and generate performance indicators. This information can also be used to produce informative maps of weed distribution and their treatment to aid communication with DPIPWE, Councils and other stakeholders and inform new staff in the future about what treatment has occurred.

Feeding weed location information back into the NVA from the State Growth weed database will also serve to improve communication and collaboration with other stakeholders.

Key Actions

- Keep the current State Growth weed dataset up to date. This will involve including records from the Natural Values Atlas that are within the road reserve as well as new identifications from the field on a 6 monthly cycle.
- Upload new State Growth weed records to the NVA
- Develop a GIS file for “high priority” weed management sites on an annual basis (that reflected the annual priority weed program), to clearly delineate special management zones for maintenance and construction contractors
- Update WSDP road ratings for new weed records on a periodic basis.

8.9 Objective 9 – Monitoring and Review

The Department aims to commit resources to ensure that the process of implementation, monitoring, incorporation of new information, review and updating of plans and programs can be undertaken in order to achieve lasting results.

Tracking success can be difficult. Very few areas are unlikely to remain entirely free of weeds in the long term. Thus it is through review of composition, distribution and abundance, as well as resources applied, that we can judge success. Methods like photo point monitoring are valuable in assessing success of an individual location. Once there is sufficient data to detect change due to management effort, then success can be measured.

The effectiveness of the Strategy and Plans is dependent on the ability to implement, monitor, respond to information gained, review and update. There is an inherent risk with all strategic planning that relevance and impetus fades with time. Monitoring and evaluation of various aspects of delivery as well as progress against the Plans and Strategy must be undertaken to demonstrate achievement and inform adaptive management. Under an adaptive management framework new implementation ideas may originate, current ideas may prove inefficient or ineffective. Understanding where and how this is happening and adapting methods and priorities is the only way to continue to move towards long term goals.

Performance indicators can be useful measures of progress within annual delivery programs as well as strategies and plans, however defining and measuring S.M.A.R.T indicators can be more difficult when managing weeds within a large road network. Ideally some level of quantitative or measureable performance is required to track progress against program and

strategic goals. Actions like spot checks on maintenance / construction works can be useful to track compliance ensure a move to best practise methods.

When measuring the success of targeted weed eradication or control, secondary and tertiary treatments are critical and must be recorded and monitored.

While some changes or updates will be routinely required to accommodate regulatory changes and the like, other changes should be based on field data and respond to the performance measures identified for the regional weed programs.

Key Actions

- Ensure weed observations database reflects current knowledge of distribution.
- Make changes to this strategy and regional WSDP where necessary based on changes to regulations, experiences and progress.
- Adopt an adaptive management framework for delivery of the regional weed programs.
- Ensure a rapid response system is in place if / when new priority weeds are observed.
- Regulate stronger weed hygiene measures for maintenance and construction activities.
- Improve training for staff and contractors. Minimum level of qualifications including Chemcert should be mandatory. Provide weed identification and prioritisation of weeds training.

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APPENDIX 1 – LOCATION OF CATEGORY 2 AND 3 WEEDS

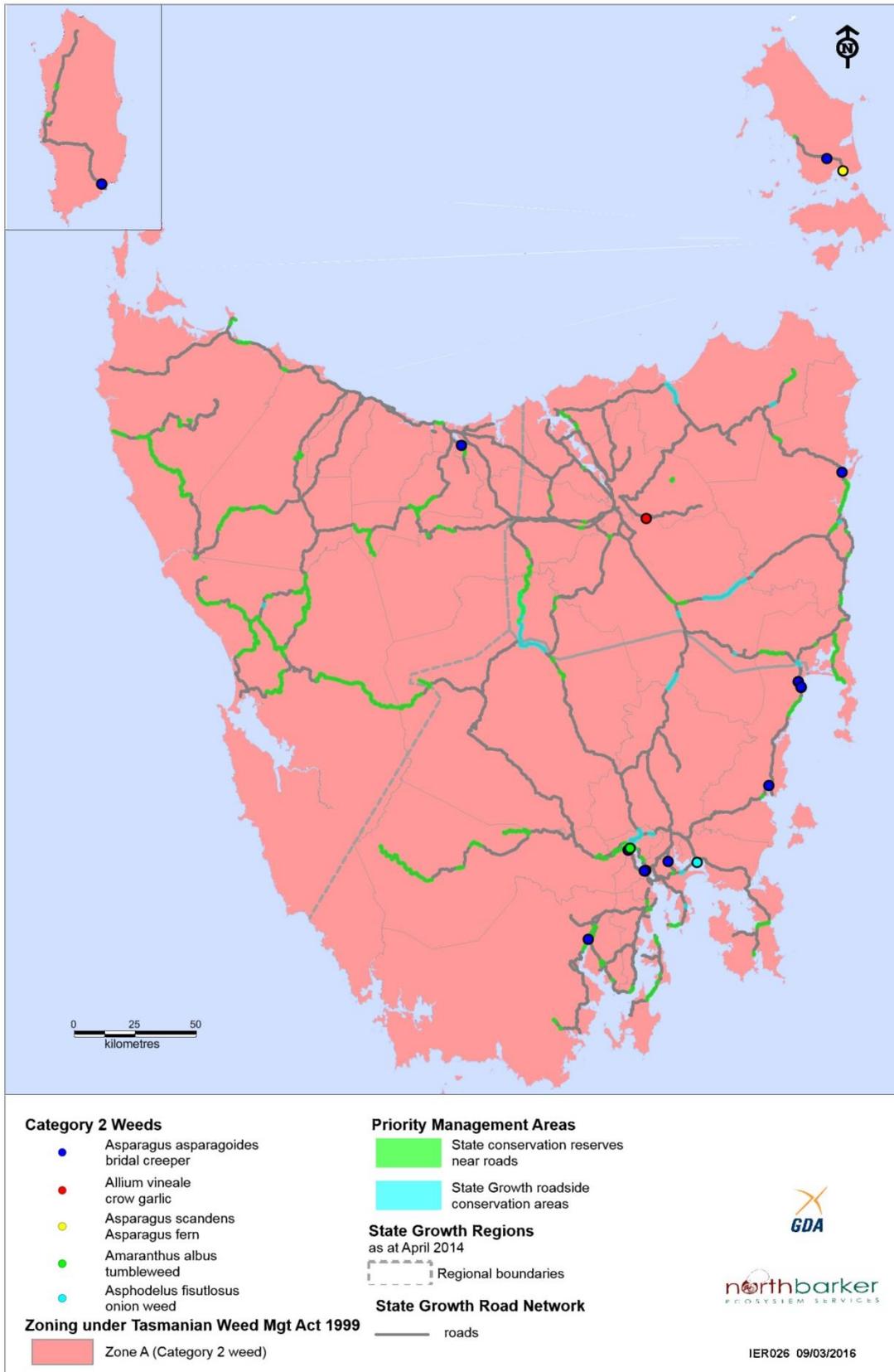


Figure 4 - Category 2 weeds (bridal creeper, crow garlic, asparagus fern, tumbleweed and onion weed)

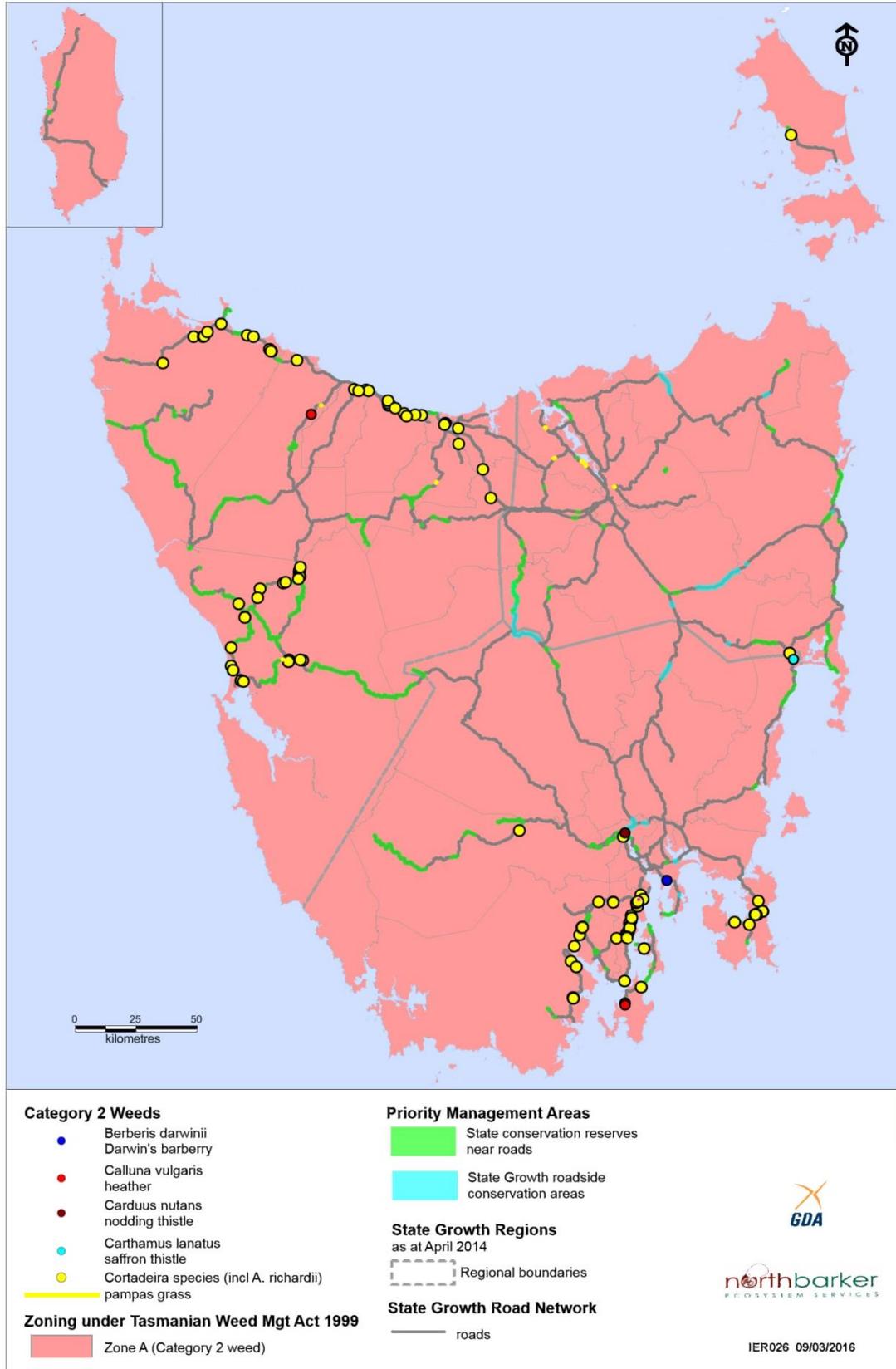


Figure 5 - Category 2 weeds (Darwin's barberry, heather, nodding thistle, saffron thistle and pampas grass)

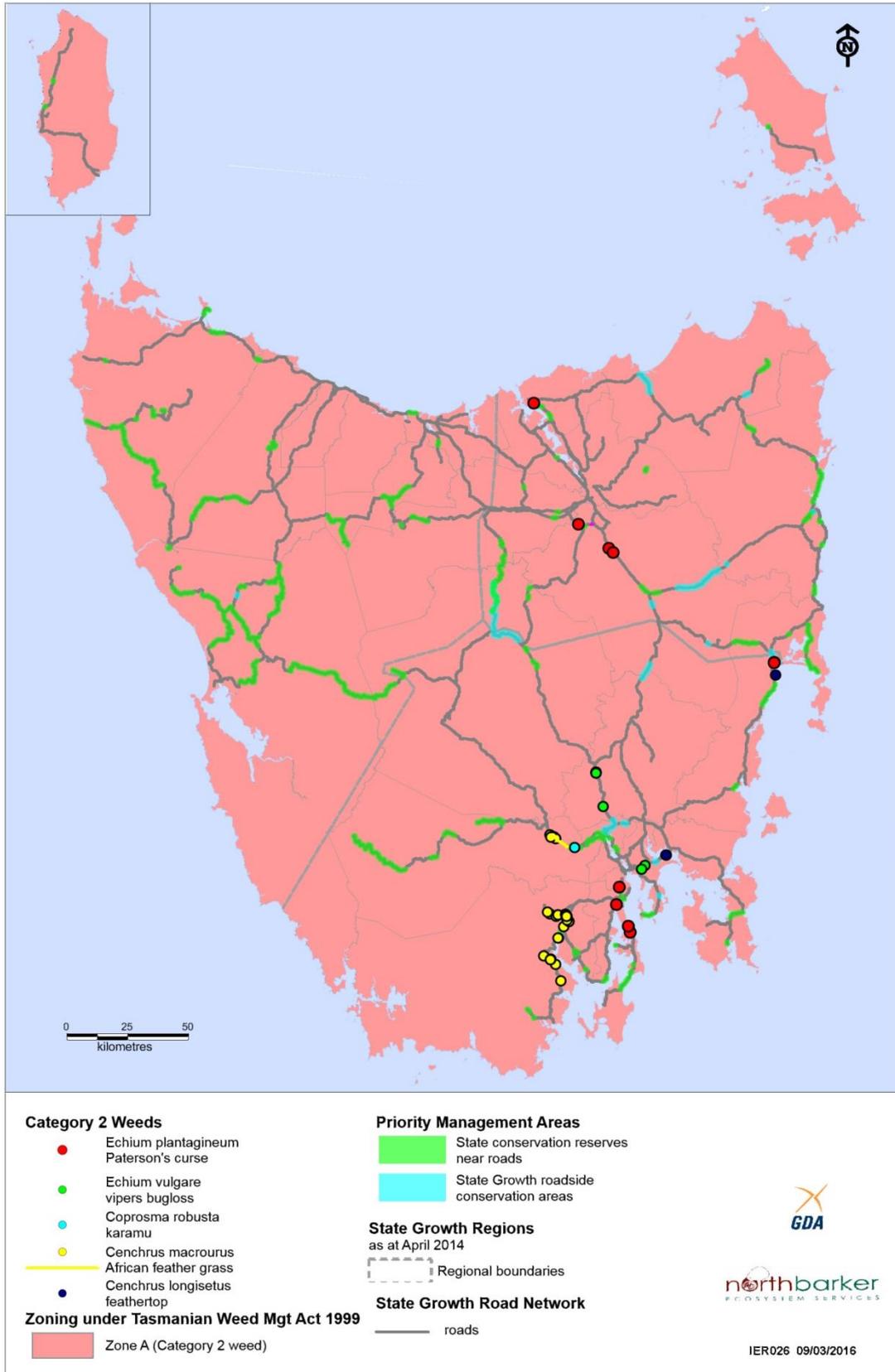


Figure 6 - Category 2 weeds (Paterson's curse, viper's bugloss, karamu, African feather grass and feathertop)

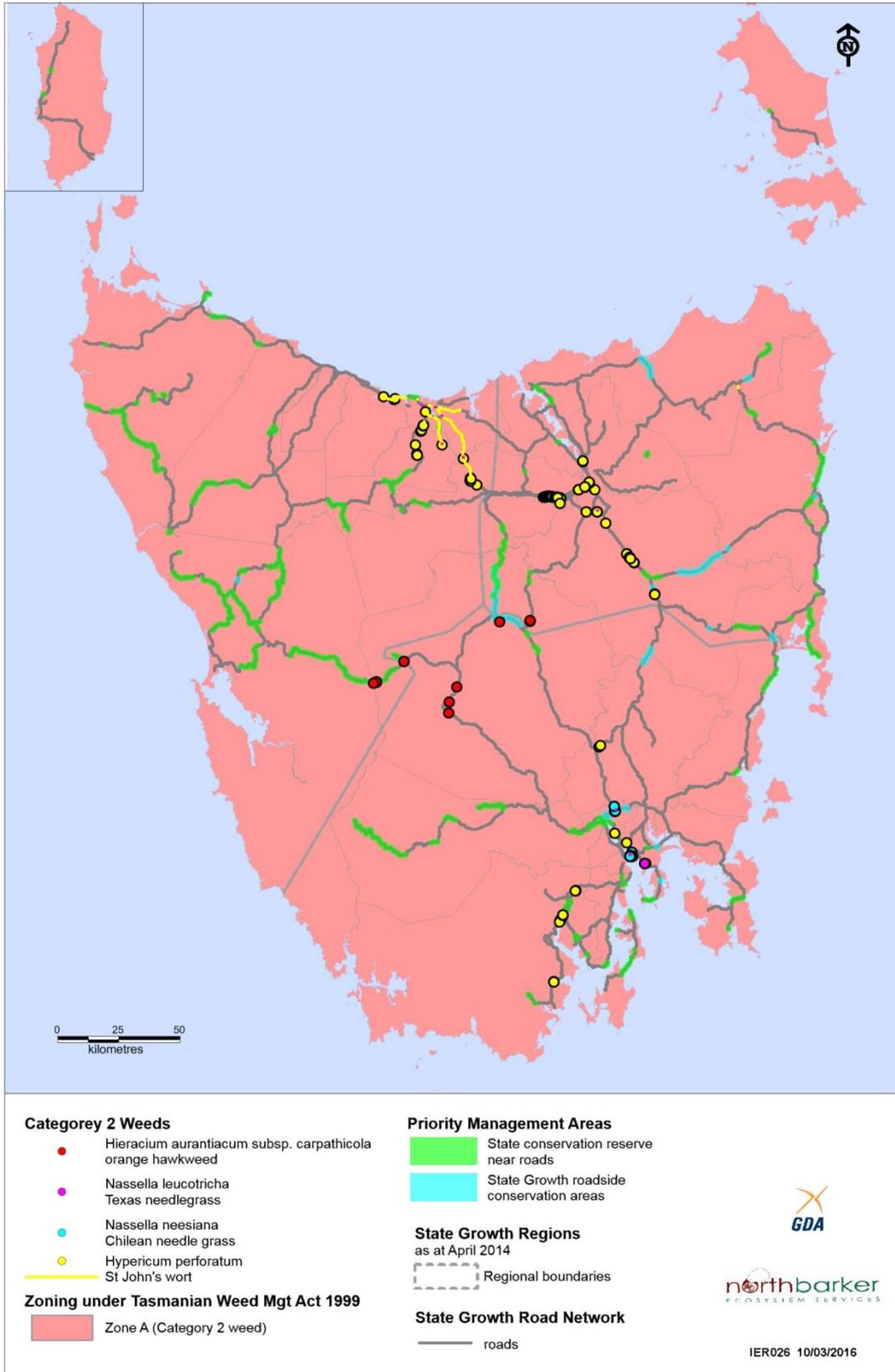


Figure 7 - Category 2 Weeds (hawkweed, Texas needlegrass, Chilean needlegrass and St John's wort)

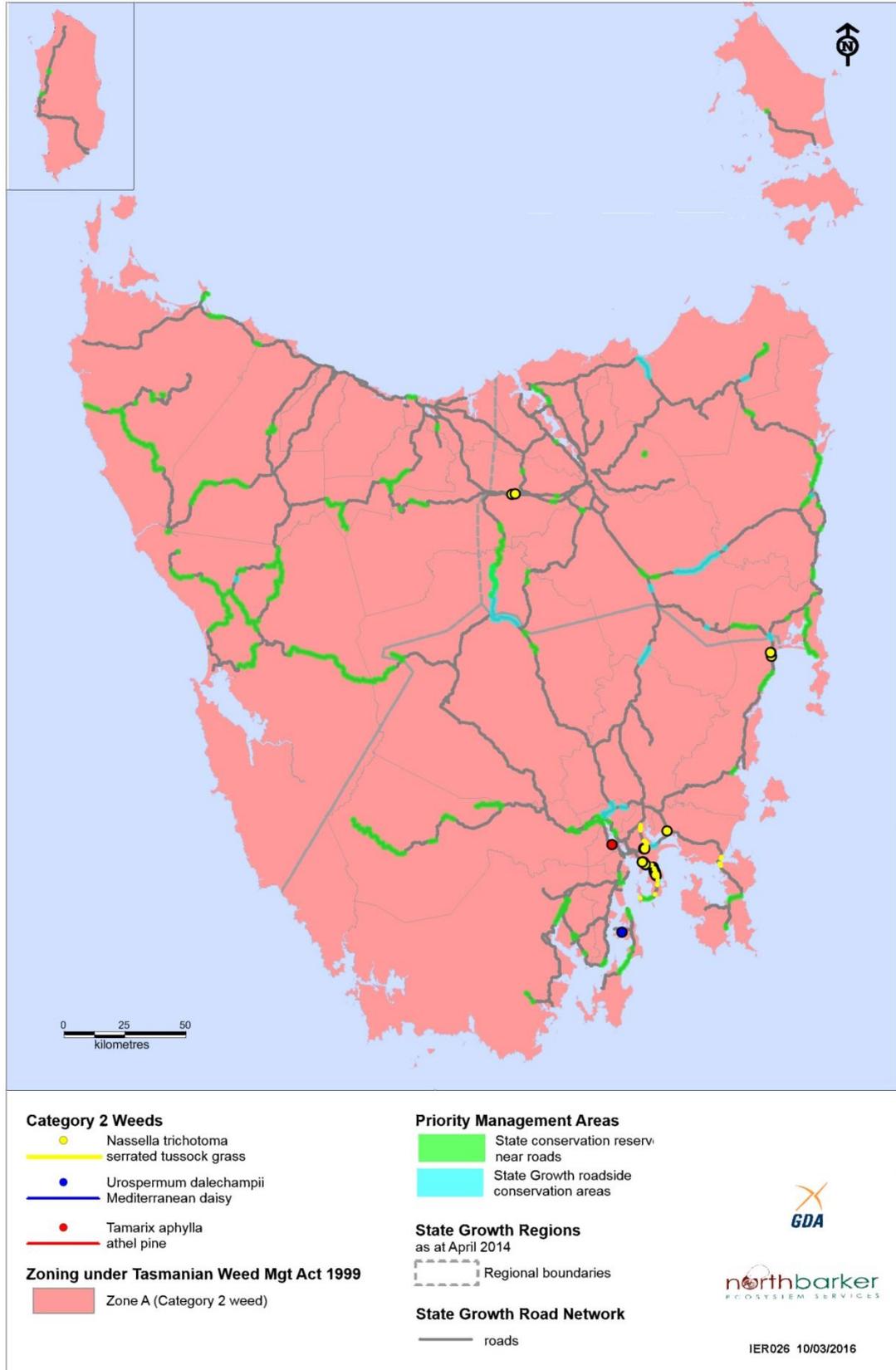


Figure 8 - Category 2 weeds (serrated tussock grass, athel pine and Mediterranean daisy)

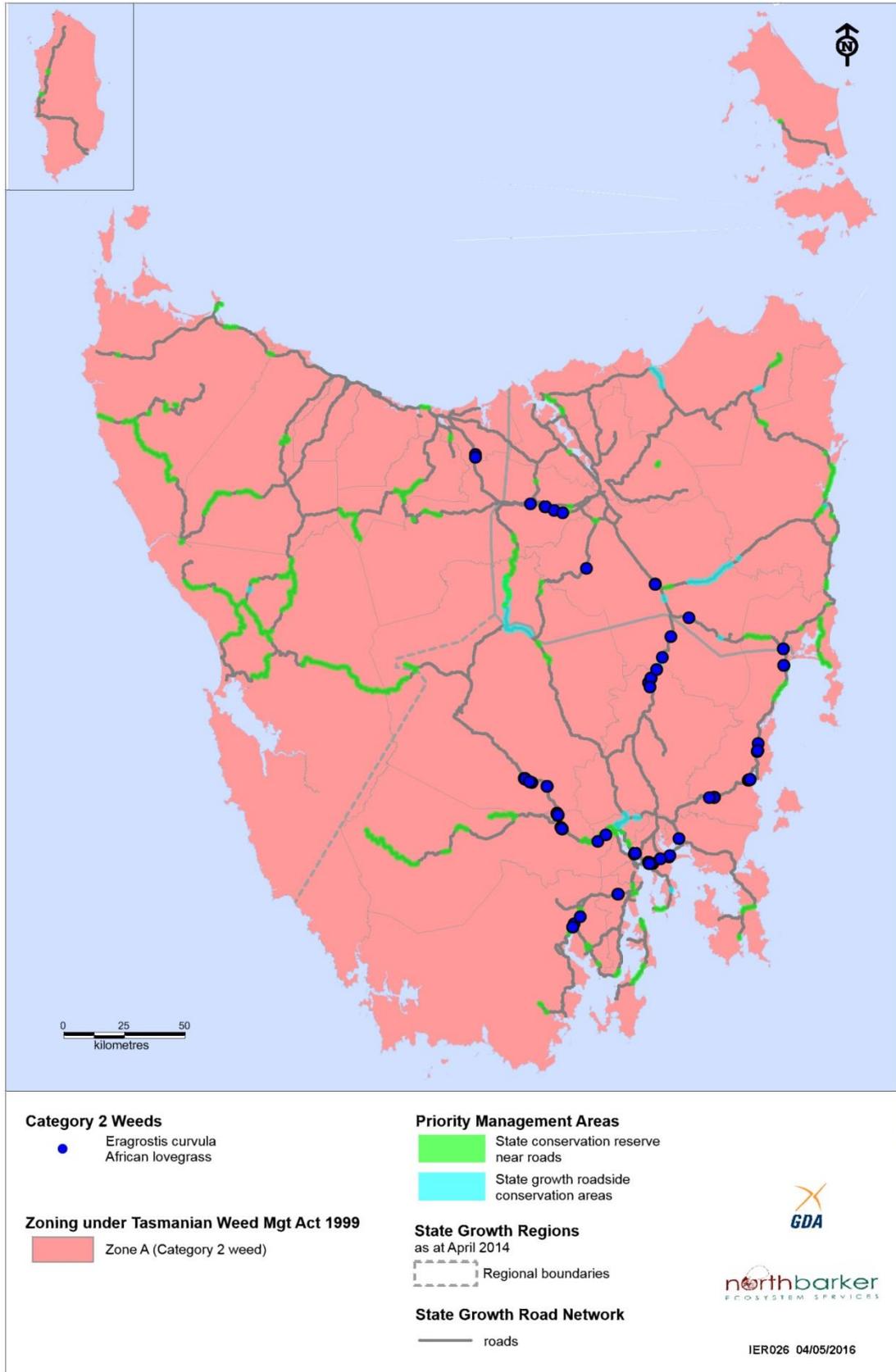


Figure 9 - Category 2 weeds (African lovegrass)

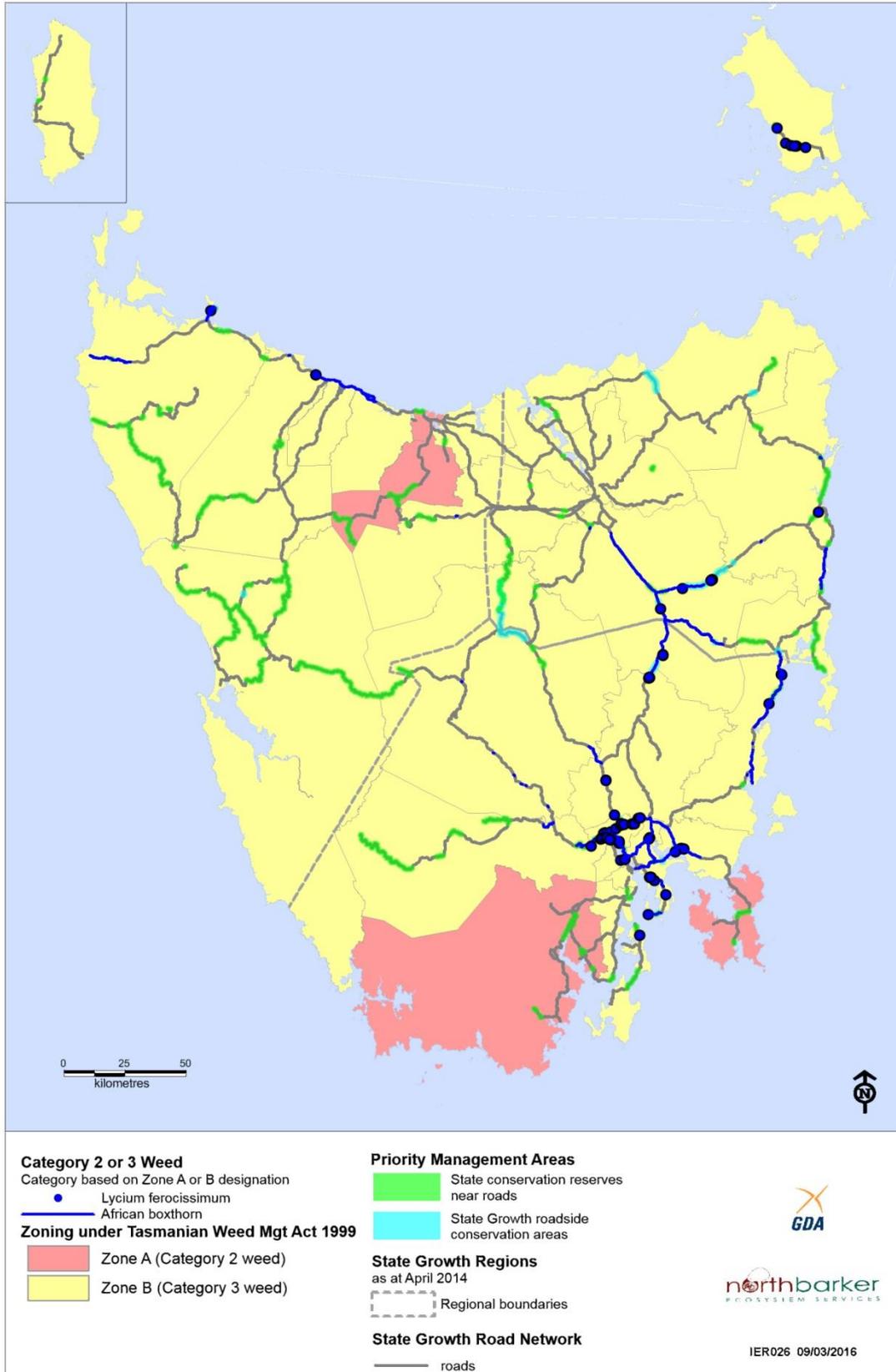


Figure 10 - Category 2 or 3 weed (African boxthorn)



Figure 11 - Category 2 or 3 weed (blackberry)

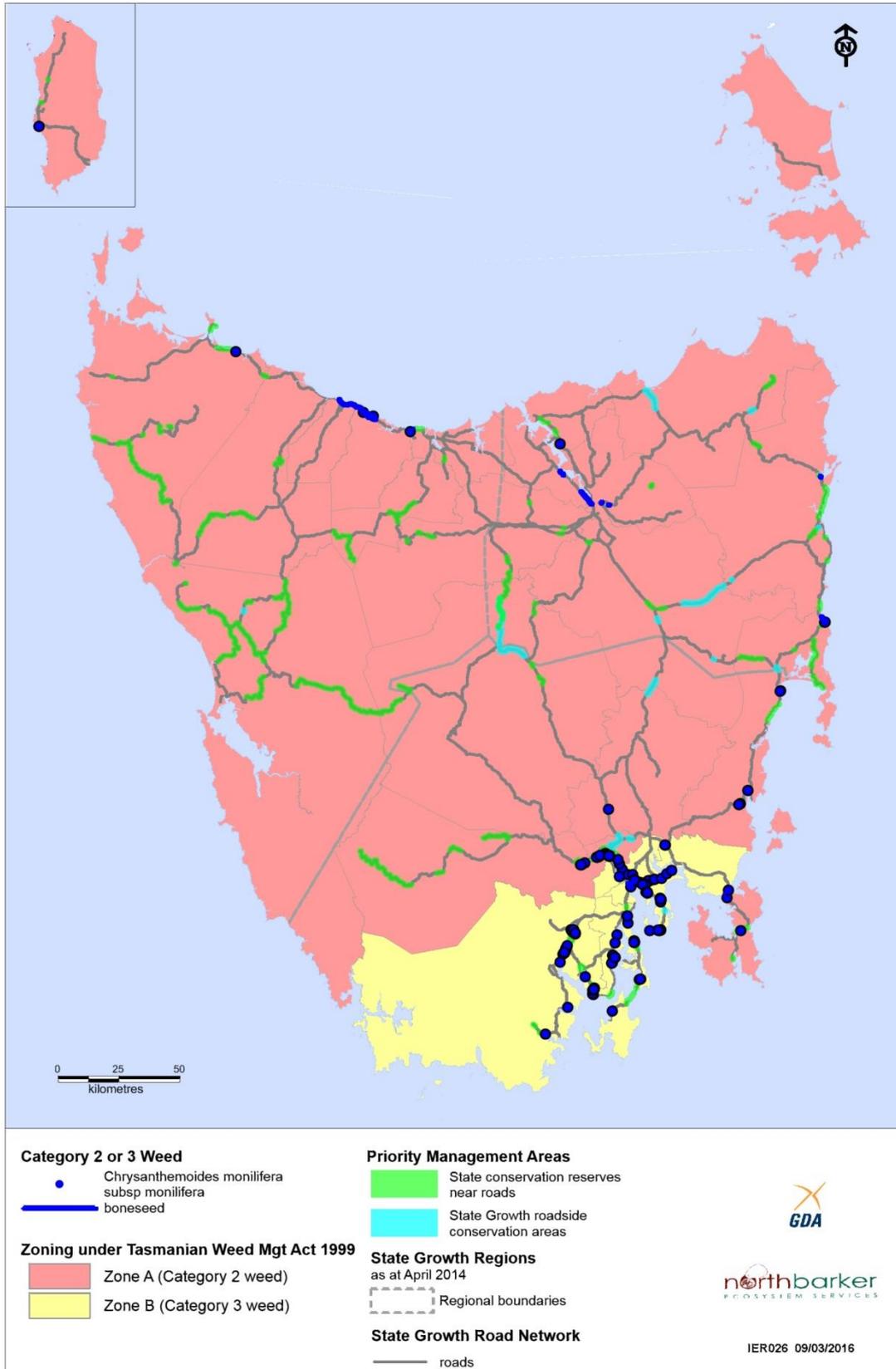


Figure 12 - Category 2 or 3 weed (boneseed)

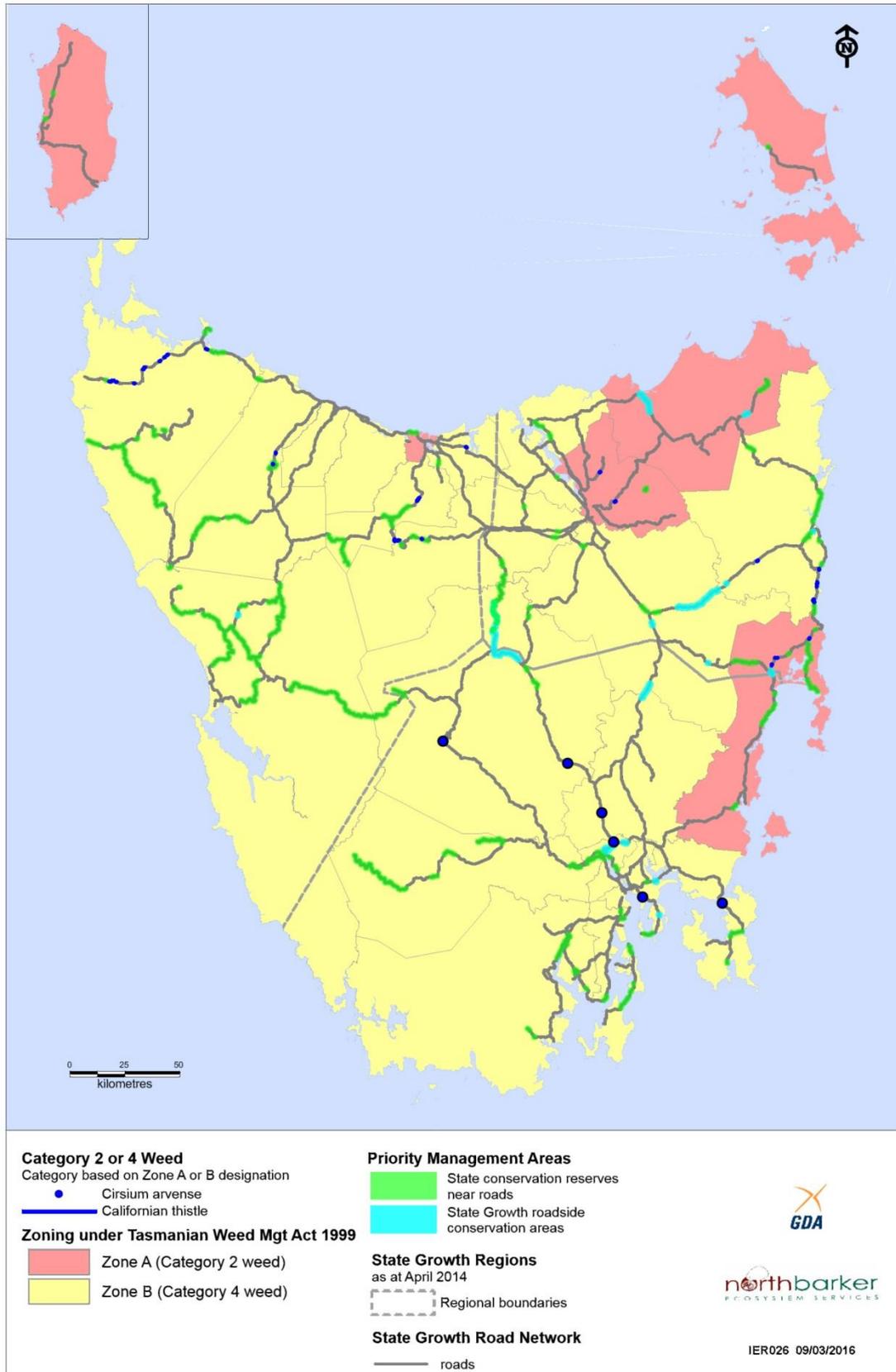


Figure 13 - Category 2 or 3 weed (Californian thistle)



Figure 14 - Category 2 or 3 weed (Montpellier or canary broom)

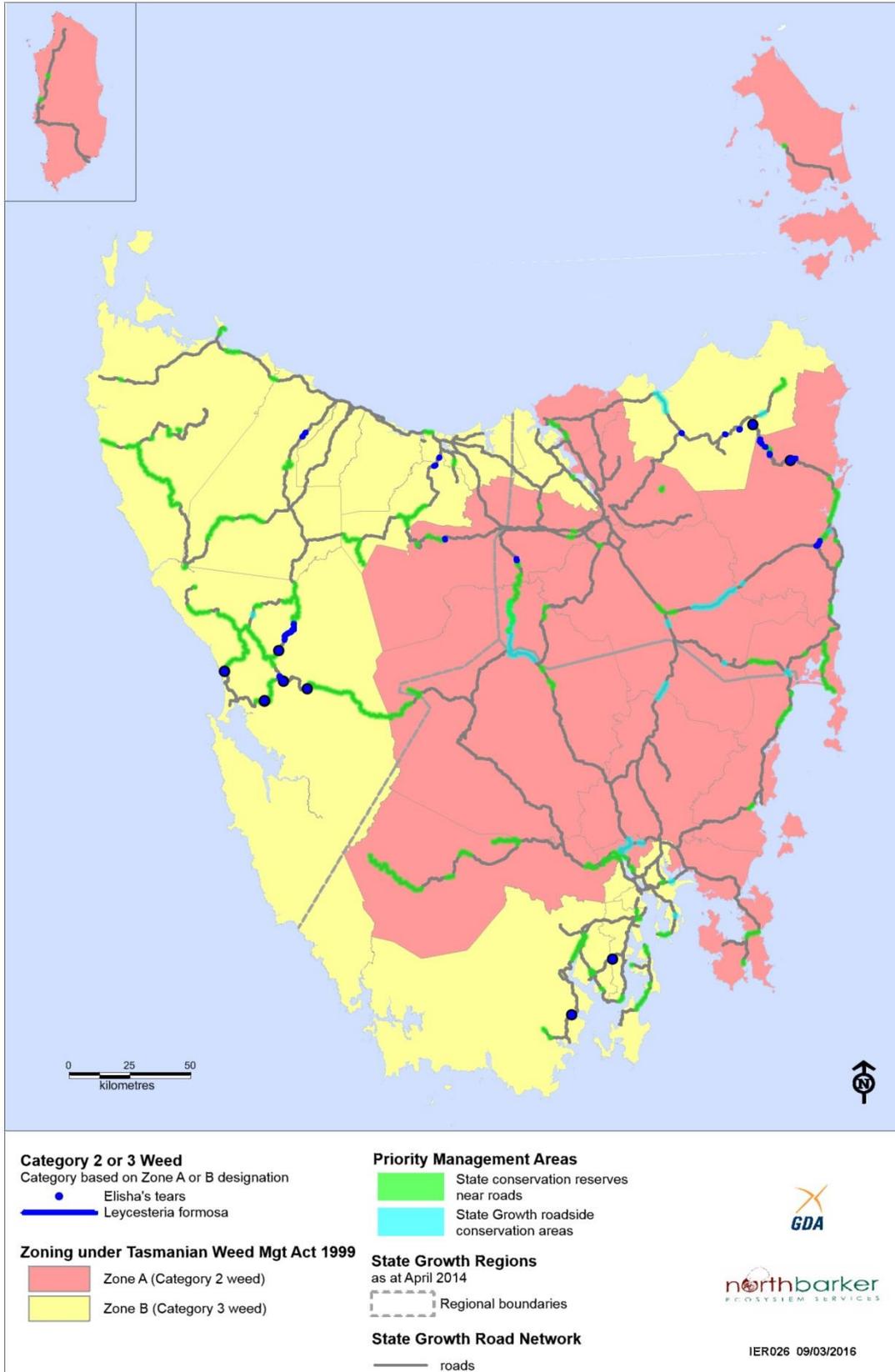


Figure 15 - Category 2 or 3 weed (Elisha's tears)



Figure 16 - Category 2 or 3 weed (English broom)

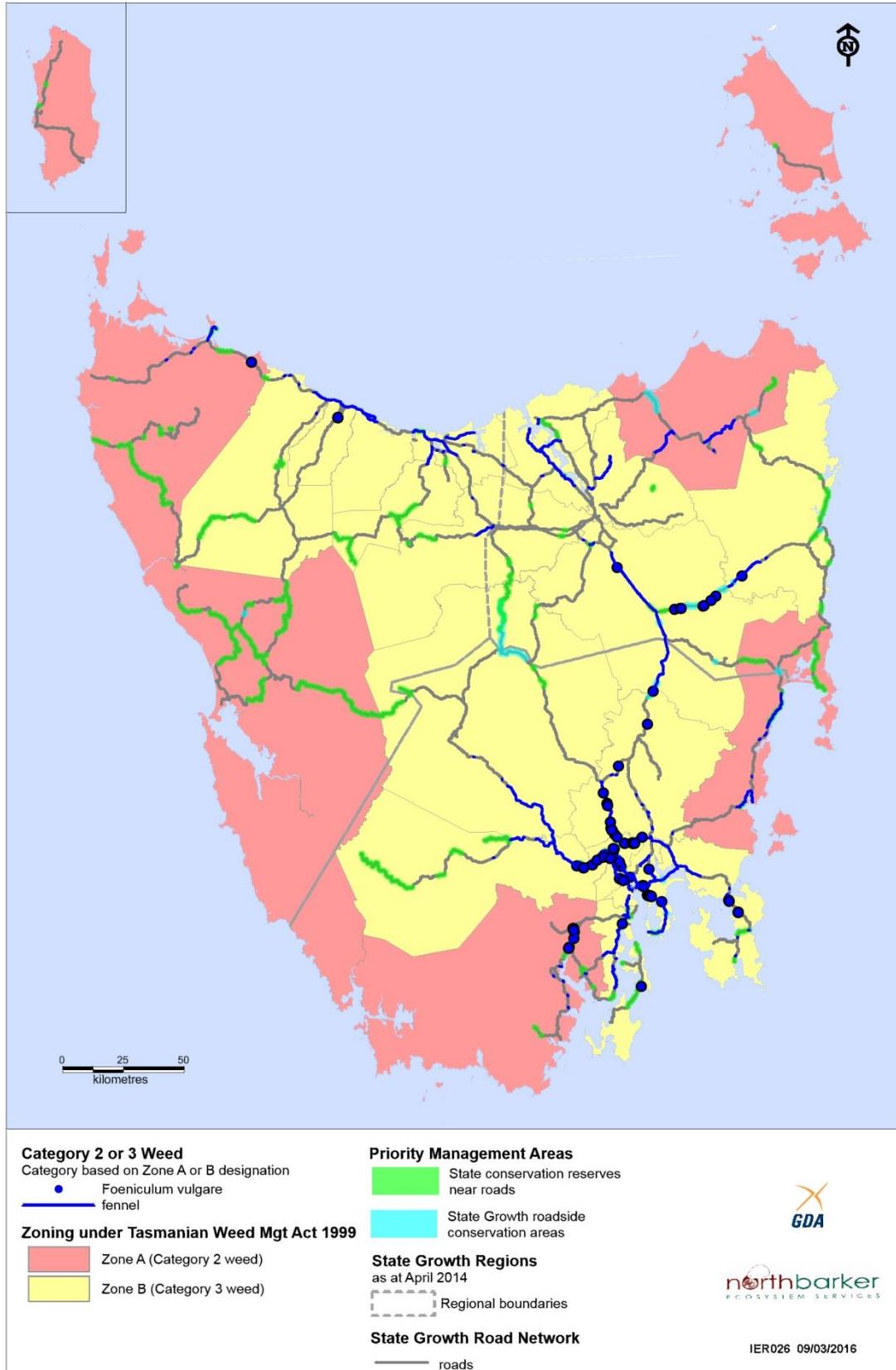


Figure 17 - Category 2 or 3 weed (fennel)

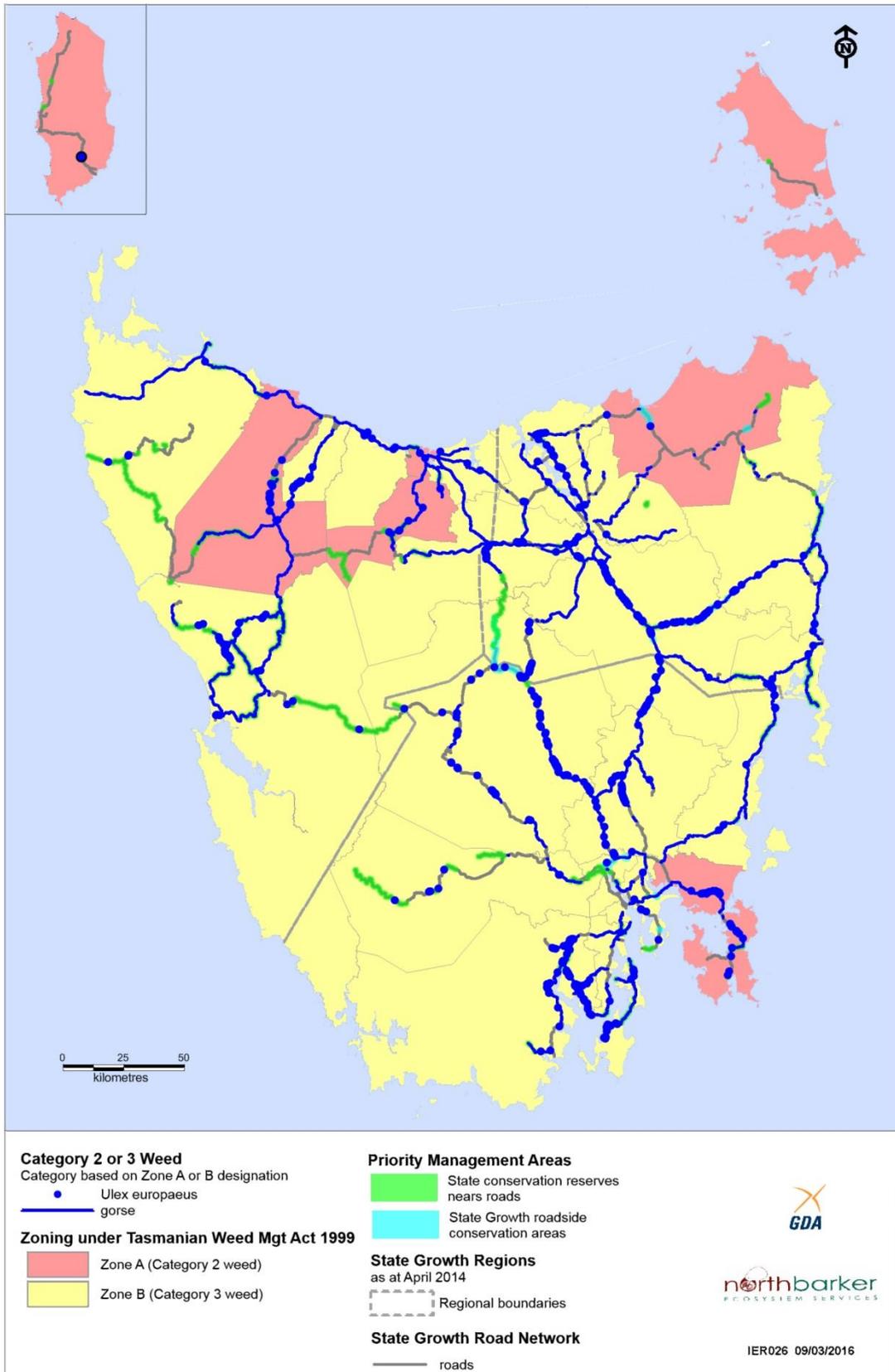


Figure 18 - Category 2 or 3 weed (gorse)

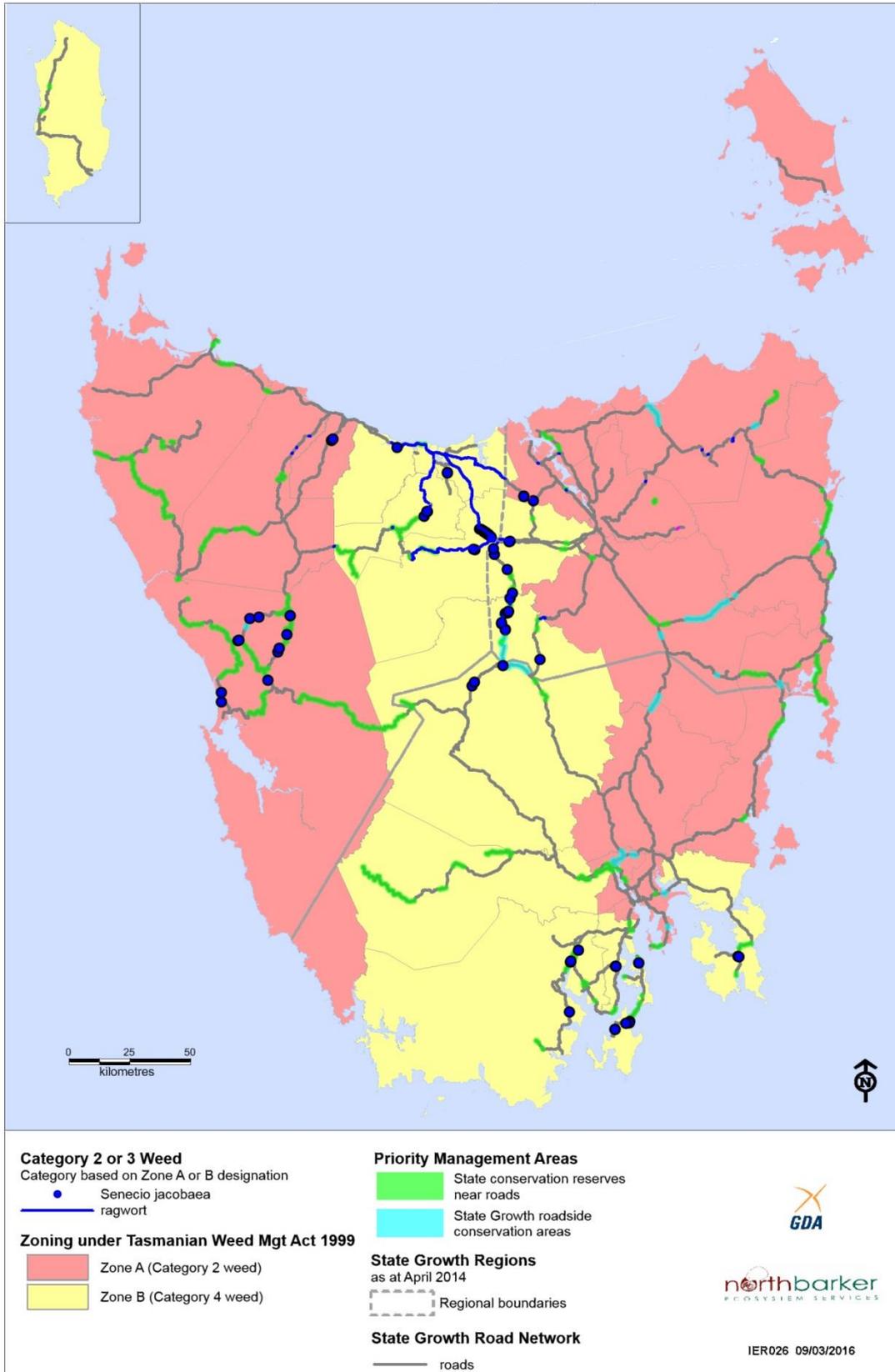


Figure 19 - Category 2 or 4 weed (ragwort)

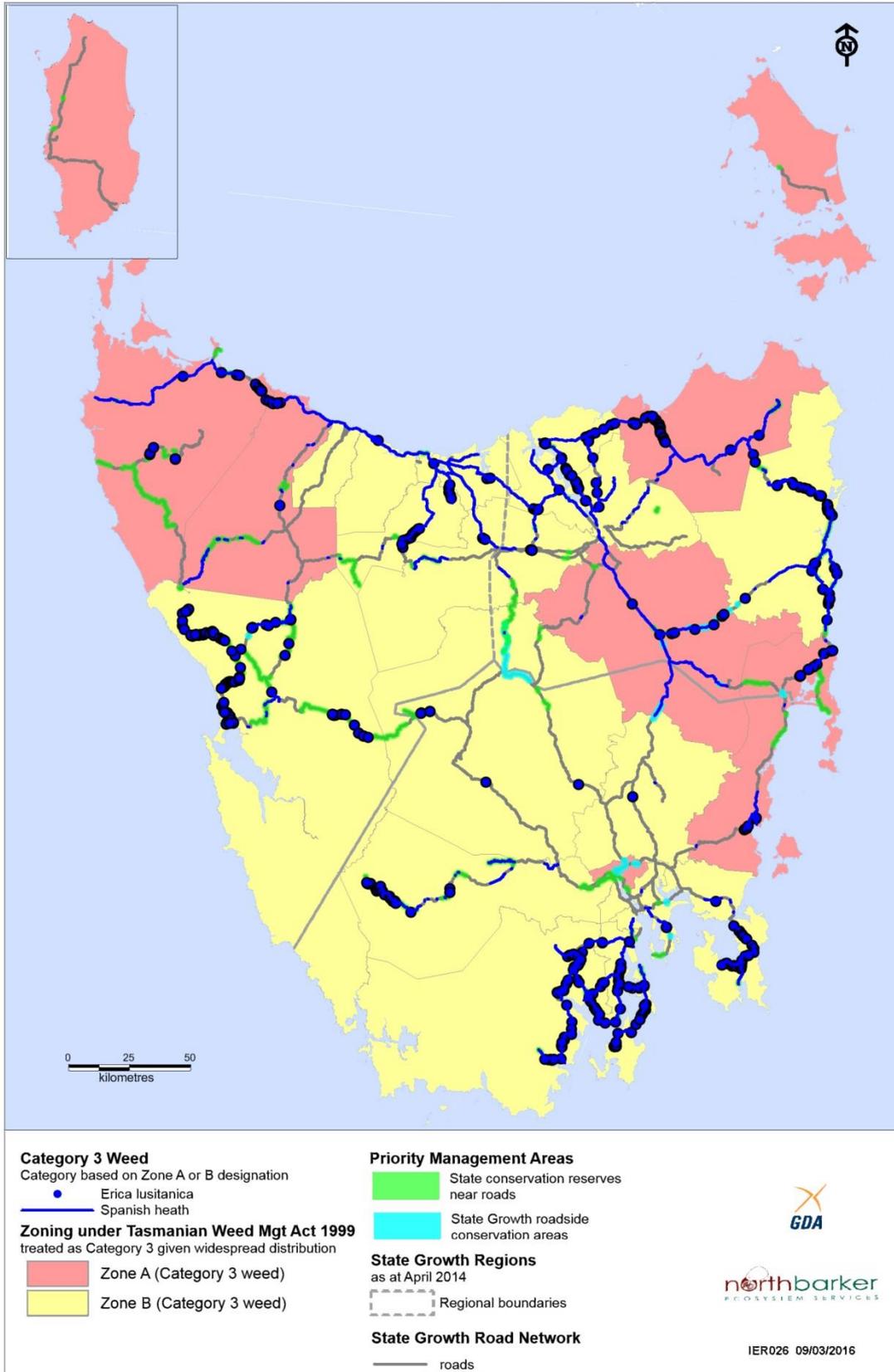


Figure 20 - Category 2 or 3 weed (Spanish heath)

APPENDIX 2 – NATIONAL ENVIRONMENTAL ALERT LIST

Species	Common Name	Information
<i>Asystasia gangetica</i>	Chinese/Philippine violet	Restricted to NSW at this time
<i>Barleria prionitis</i>	Barleria, Porcupine flower	Prefers wet dry tropics of northern Australia
<i>Bassia scoparia</i>	Kochia, Tumbleweed	As naturalised parts of temperate Asia and infestations has been recorded near carrot crops near Deloraine and Devonport. Declared Weed
<i>Calluna vulgaris</i>	Heather	Known near Kingston and Bruny Island with past observations near Lake Augusta in Central highlands and near Meander in the north. Naturalised in New Zealand Declared Weed
<i>Chromolaena odorata</i>	Siam Weed	Currently confined to northern Qld
<i>Cynoglossum creticum</i>	Blue hound's tongue	Only known from near Eden, NSW
<i>Cyperus teneristolon</i>	Sedge, Cyperus	Only known from Katoomba, NSW along a creek line
<i>Cytisus multiflorus</i>	White spanish broom	Only definitive records are from 3 sites in central Victoria. May be well adapted to Tasmania's climate Declared Weed
<i>Dittrichia viscosa</i>	False yellowhead	Recorded on the south coast of WA Declared Weed
<i>Equisetum spp.</i>	Horestails	Naturalised in NSW, one of the world's worst weeds. Known from some small locations in northern Tasmania Declared Weed
<i>Gymnocarpus spilanthoides</i>	Senegal tea plant	Weed of tropical and subtropical areas
<i>Pilosella aurantiacum</i>	Orange hawkweed	Known from NSW to Victoria as well as Central Highlands, and Fern Tree near Hobart which is the largest infestation. Has also been noted at Snug. Declared Weed
<i>Koelreuteria elegans subsp. formosana</i>	Chinese rain tree	Naturalised in subtropical Qld near Brisbane and Noosa to NSW
<i>Lachenalia reflexa</i>	Lachenalia	Known from southern WA
<i>Lagarosiphon major</i>	Oxygen weed	All previous records are believed to have been eradicated; however Tasmania is

Species	Common Name	Information
		within its potential distribution range. Declared Weed
<i>Nassella charruana</i>	Uruguay needle grass	Known from a few small infestations on the northern outskirts of Melbourne. Potential distribution includes north-eastern Tasmania. Declared Weed
<i>Nassella hyalina</i>	Cane needle grass	Major infestations occur near Melbourne and central Victoria. Potential Distribution is not yet known but is closely related to serrated tussock and chilean needle grass, care should be taken in Tasmania Declared Weed
<i>Pelargonium alchemilloides</i>	Pelargonium	Very localised in south-western Australia
<i>Pereskia aculeata</i>	Leaf cactus	Known from scattered sites in coastal south-eastern QLD and NSW. Potential is in sub tropical riparian vegetation
<i>Piptochaetium montevidense</i>	Uruguayan rice grass	Naturalised at Cherry Lake, southern Victoria. Tasmania not thought to be within potential distribution range
<i>Praxelis clematidea</i>	Praxelis	Known from central and northern QLD
<i>Retama raetam</i>	White weeping broom	Naturalised in SA.
<i>Senecio glastifolius</i>	Holly leaves Senecio, pink ragwort	Known from WA and central NSW. Is a serious weed of New Zealand Declared Weed
<i>Senegalia catechu</i>	Cutch tree	A weed of the Northern Territory. Prefers tropical and subtropical climates.
<i>Thunbergia laurifolia</i>	Laurel clock vine	A weed of tropical and subtropical regions in QLD
<i>Tipuana tipu</i>	Pride of Bolivia, tipuana	Invasive in north eastern NSW and QLD. Widely planted tree around Australia.
<i>Trianoptiles solitaria</i>	Subterranean cape sedge	Only known from one site in a suburb of Melbourne
<i>Vachellia karroo</i>	Karoo thorn	Not known from Tasmania but has considerable potential to become a troublesome weed across a large portion of southern Australia.

APPENDIX 3 –SITE LED ROAD RATINGS BY ROAD LINK ACROSS THE STATE

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Huon Hwy	A0168	34	20	12	32	5	5	42
Tasman Hwy	A0113	38	20	8	28	5	5	38
Tasman Hwy	A0113	23	16	10	26	5	5	36
Tasman Hwy	A0113	11	16	8	24	5	5	34
Bass Hwy	A0249	39	16	12	28	0	5	33
Tasman Hwy	A0113	7	16	12	28	0	5	33
Midland Hwy	A0087	14	12	10	22	5	5	32
Arthur Hwy	A0142	73	12	8	20	5	5	30
Railton MR	A1251	94	12	8	20	5	5	30
Tasman Hwy	A0113	33	12	8	20	5	5	30
Lyell Hwy	A0197	8	8	10	18	5	5	28
Lyell Hwy	A0197	5	12	6	18	5	5	28
Midland Hwy	A0087	74	8	10	18	5	5	28
Sheffield MR	A1031	18	8	10	18	5	5	28
West Tamar Hwy	A0252	41	8	10	18	5	5	28
Bass Hwy	A0249	63	8	14	22	0	5	27
Anthony MR	A1714	23	4	12	16	5	5	26
Boyer SR	A2218	94	8	8	16	5	5	26
Channel Hwy	A0155	94	4	12	16	5	5	26
Esk MR	A1125	21	4	12	16	5	5	26
Anthony MR	A1714	48	4	10	14	5	5	24
Bruny MR	A1222	5	4	10	14	5	5	24
Cethana TR	A2603	5	4	10	14	5	5	24
Channel Hwy	A0155	3	4	10	14	5	5	24
Henty MR	A1633	94	4	10	14	5	5	24
Rokeby MR	A1167	9	12	12	24	0	0	24
Tea Tree SR	A2289	6	4	10	14	5	5	24
Zeehan Hwy	A0472	94	4	10	14	5	5	24
East Derwent Hwy	A0029	29	8	10	18	0	5	23
South Arm SR	A2069	5	8	10	18	0	5	23
Tasman Hwy	A0113	60	8	10	18	0	5	23
Anthony MR	A1714	94	4	8	12	5	5	22
Bass Hwy	A0249	43	12	10	22	0	0	22
Bridport MR	A1400	5	4	8	12	5	5	22
Brooker Hwy	A0090	94	4	8	12	5	5	22
Bruny MR	A1222	74	4	8	12	5	5	22
Channel Hwy	A0155	49	4	8	12	5	5	22
Lyell Hwy	A0197	6	4	8	12	5	5	22

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Murchison Hwy	A0485	5	4	8	12	5	5	22
Murchison Hwy	A0485	12	4	8	12	5	5	22
Murchison Hwy	A0485	20	4	8	12	5	5	22
Murchison Hwy	A0485	26	4	8	12	5	5	22
Murchison Hwy	A0485	82	12	10	22	0	0	22
Arthur Hwy	A0142	68	8	8	16	5	0	21
Bass Hwy	A0249	73	8	8	16	0	5	21
East Derwent Hwy	A0029	95	8	8	16	0	5	21
Huon Hwy	A0168	46	4	12	16	0	5	21
Illawarra MR	A1468	5	8	8	16	0	5	21
Lyell Hwy	A0197	81	4	12	16	0	5	21
Midland Hwy	A0087	55	4	12	16	5	5	21
Midland Hwy	A0087	68	4	12	16	0	5	21
Arthur Hwy	A0142	44	12	8	20	0	0	20
Bass Hwy	A0249	28	12	8	20	0	0	20
Bass Hwy	A0249	46	8	12	20	0	0	20
Bass Hwy	A0249	52	8	12	20	0	0	20
Bass Hwy	A0249	71	8	12	20	0	0	20
Midland Hwy	A0087	85	8	12	20	0	0	20
Preservation SR	A2295	5	8	12	20	0	0	20
Sheffield MR	A1031	7	4	6	10	5	5	20
Tasman Hwy	A0113	68	4	6	10	5	5	20
West Tamar Hwy	A0252	94	8	12	20	0	0	20
Colebrook MR	A1154	5	4	10	14	5	0	19
Esk MR	A1125	35	14	0	14	0	5	19
Esk MR	A1125	99	4	10	14	0	5	19
Glen Huon MR	A1183	5	4	10	14	0	5	19
Lennon MR	A1620	5	8	6	14	0	5	19
Murchison Hwy	A0485	69	4	10	14	0	5	19
South Arm SR	A2069	37	4	10	14	0	5	19
Tasman Hwy	A0113	42	8	6	14	0	5	19
Zeehan Hwy	A0472	5	4	10	14	0	5	19
Arthur Hwy	A0142	31	8	10	18	0	0	18
Arthur Hwy	A0142	56	8	10	18	0	0	18
Bass Hwy	A0249	35	8	10	18	0	0	18
Batman Hwy	A0278	6	8	10	18	0	0	18
Heemskirk TR	A2645	5	4	4	8	5	5	18
Henty MR	A1633	34	8	10	18	0	0	18
Huon Hwy	A0168	68	8	10	18	0	0	18
Huon Hwy	A0168	78	8	10	18	0	0	18
Lake SR	A2100	53	4	4	8	5	5	18

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Lyell Hwy	A0197	56	4	4	8	5	5	18
Meander Valley SR	A2025	24	4	4	8	5	5	18
Midland Hwy	A0087	80	4	18	14	0	0	18
Sheffield MR	A1031	30	8	10	18	0	0	18
Sheffield MR	A1031	94	4	14	18	0	0	18
Stony Rise MR	A1358	5	12	6	18	0	0	18
Tasman Hwy	A0113	74	8	10	18	0	0	18
Tasman Hwy	A0113	76	8	10	18	0	0	18
Bass Hwy	A0249	68	4	8	12	0	5	17
Bass Hwy	A0249	76	4	8	12	0	5	17
Bass Hwy	A0249	92	0	12	12	0	5	17
Bruny MR	A1222	51	0	12	12	0	5	17
Channel Hwy	A0155	61	0	12	12	0	5	17
East Tamar Hwy	A0265	41	4	8	12	0	5	17
Esk MR	A1125	5	0	12	12	0	5	17
Illawarra MR	A1468	94	4	8	12	0	5	17
Lyell Hwy	A0197	84	0	12	12	0	5	17
Mole Creek MR	A1374	96	4	8	12	0	5	17
South Arm SR	A2069	94	4	8	12	0	5	17
Stanley Hwy	A0359	5	0	12	12	0	5	17
Tasman Hwy	A0113	38	8	4	12	0	5	17
Bass Hwy	A0249	22	8	8	16	0	0	16
Colebrook MR	A1154	21	8	8	16	0	0	16
East Derwent Hwy	A0029	6	8	8	16	0	0	16
Huon Hwy	A0168	58	8	8	16	0	0	16
Lake SR	A2100	85	4	2	6	5	5	16
Lyell Hwy	A0197	12	8	8	16	0	0	16
Lyell Hwy	A0197	60	4	2	6	5	5	16
Midland Hwy	A0087	62	4	12	16	0	0	16
Murchison Hwy	A0485	90	8	8	16	0	0	16
Tasman Hwy	A0113	91	8	8	16	0	0	16
Anthony MR	A1714	5	0	10	10	0	5	15
Arthur Hwy	A0142	94	4	6	10	0	5	15
Boyer SR	A2218	6	4	6	10	0	5	15
Bridport MR	A1400	28	0	10	10	0	5	15
Channel Hwy	A0155	69	0	10	10	0	5	15
Gordon River MR	A1727	27	4	6	10	0	5	15
Hastings Caves TR	A2522	94	0	10	10	0	5	15
Lady Barron MR	A1565	5	8	2	10	5	0	15
Lyell Hwy	A0197	88	0	10	10	0	5	15
Midland Hwy	A0087	49	4	6	10	0	5	15

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Murchison Hwy	A0485	31	0	10	10	0	5	15
Tasman Hwy	A0113	44	4	6	10	0	5	15
Tasman Hwy	A0113	48	0	10	10	0	5	15
Tasman Hwy	A0113	70	4	6	10	0	5	15
Waratah MR	A1617	28	0	10	10	0	5	15
Waratah MR	A1617	93	0	10	10	0	5	15
Algona MR	A1578	6	4	10	14	0	0	14
Bass Hwy	A0249	16	8	6	14	0	0	14
Bass Hwy	A0249	25	4	10	14	0	0	14
Bass Hwy	A0249	32	4	10	14	0	0	14
Bass Hwy	A0249	79	4	10	14	0	0	14
Bruny MR	A1222	94	4	10	14	0	0	14
Channel Hwy	A0155	10	4	10	14	0	0	14
Channel Hwy	A0155	18	4	10	14	0	0	14
Channel Hwy	A0155	29	4	10	14	0	0	14
Flagstaff Gully SR	A2300	5	4	10	14	0	0	14
Frankford MR	A1044	5	4	10	14	0	0	14
Frankford MR	A1044	94	4	10	14	0	0	14
Huon Hwy	A0168	6	4	10	14	0	0	14
Midland Hwy	A0087	16	4	10	14	0	0	14
Murchison Hwy	A0485	63	4	10	14	0	0	14
Southern Outlet Hwy	A0171	5	4	10	14	0	0	14
Southern Outlet Hwy	A0171	10	4	10	14	0	0	14
West Tamar Hwy	A0252	26	4	10	14	0	0	14
Bass Hwy	A0249	11	4	4	8	0	5	13
Birralee MR	A1701	94	0	8	8	0	5	13
Bridport MR	A1400	16	0	8	8	0	5	13
Gladstone MR	A1507	5	0	8	8	0	5	13
Glenstone MR	A1105	5	0	8	8	0	5	13
Henty MR	A1633	54	0	4	4	0	5	13
Lyell Hwy	A0197	62	0	8	8	0	5	13
Lyell Hwy	A0197	75	0	8	8	0	5	13
Mole Creek MR	A1374	98	0	8	8	0	5	13
Poatina MR	A1604	40	4	4	8	0	5	13
Tasman Hwy	A0113	40	0	8	8	0	5	13
Tasman Hwy	A0113	46	0	8	8	0	5	13
Tasman Hwy	A0113	51	0	8	8	0	5	13
Tasman Hwy	A0113	53	0	8	8	0	5	13
Tasman Hwy	A0113	56	0	8	8	0	5	13
Waratah MR	A1617	46	0	8	8	0	5	13
Waratah MR	A1617	63	0	8	8	0	5	13

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Arthur Hwy	A0142	5	4	8	12	0	0	12
Arthur Hwy	A0142	9	4	8	12	0	0	12
Bass Hwy	A0249	44	4	8	12	0	0	12
Bass Hwy	A0249	56	0	12	12	0	0	12
Bass Hwy	A0249	60	0	12	12	0	0	12
Bass Hwy	A0249	82	0	12	12	0	0	12
Bass Hwy	A0249	89	4	8	12	0	0	12
Brooker Hwy	A0090	8	4	8	12	0	0	12
Esk MR	A1125	67	0	12	12	0	0	12
Esk MR	A1125	78	0	12	12	0	0	12
Ferry MR	A1646	6	4	8	12	0	0	12
Frankford MR	A1044	21	4	8	12	0	0	12
Frankford MR	A1044	39	4	8	12	0	0	12
Glen Huon MR	A1183	94	4	8	12	0	0	12
Goodwood MR	A1675	5	4	8	12	0	0	12
Grass Tree Hill SR	A2182	5	0	12	12	0	0	12
Henty MR	A1633	9	4	8	12	0	0	12
Huon Hwy	A0168	17	4	8	12	0	0	12
Huon Hwy	A0168	26	4	8	12	0	0	12
Lilydale MR	A1073	8	0	12	12	0	0	12
Lilydale MR	A1073	51	4	8	12	0	0	12
Lilydale MR	A1073	94	0	12	12	0	0	12
Lyell Hwy	A0197	14	4	8	12	0	0	12
Lyell Hwy	A0197	95	4	8	12	0	0	12
Mersey MR	A1536	5	4	8	12	0	0	12
Mersey MR	A1536	6	4	8	12	0	0	12
Midland Hwy	A0087	20	4	8	12	0	0	12
Midland Hwy	A0087	24	4	8	12	0	0	12
Murchison Hwy	A0485	58	4	8	12	0	0	12
Nicholls Rivulet MR	A1248	5	4	8	12	0	0	12
Ridgley Hwy	A0500	25	4	8	12	0	0	12
Scotts SR	A2179	5	4	8	12	0	0	12
Sheffield MR	A1031	59	4	8	12	0	0	12
South Arm Hwy	A0498	6	0	12	12	0	0	12
Tasman Hwy	A0113	18	8	4	12	0	0	12
Tasman Hwy	A0113	66	4	8	12	0	0	12
Tasman Hwy	A0113	78	4	8	12	0	0	12
Tasman Hwy	A0113	80	4	8	12	0	0	12
Tasman Hwy	A0113	82	4	8	12	0	0	12
Tasman Hwy	A0113	86	4	8	12	0	0	12
West Tamar Hwy	A0252	63	0	12	12	0	0	12

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Cradle Mt DR	A2674	56	4	2	6	0	5	11
East Tamar Hwy	A0265	50	0	6	6	0	5	11
Esk MR	A1125	47	0	6	6	0	5	11
Gladstone MR	A1507	94	0	6	6	0	5	11
Lake Leake MR	A1442	48	0	6	6	0	5	11
Lake Leake MR	A1442	94	4	2	6	0	5	11
Lyell Hwy	A0197	65	0	6	6	0	5	11
Lyell Hwy	A0197	68	0	6	6	0	5	11
Lyell Hwy	A0197	71	0	6	6	0	5	11
Lymington MR	A1206	5	0	6	6	0	5	11
Murchison Hwy	A0485	75	4	2	6	0	5	11
Poatina MR	A1604	94	0	6	6	0	5	11
Tasman Hwy	A0113	20	0	6	6	0	5	11
Tasman Hwy	A0113	58	0	6	6	0	5	11
Zeehan Hwy	A0472	51	0	6	6	0	5	11
Bass Hwy	A0249	94	0	10	10	0	0	10
Bridport MR	A1400	42	4	6	10	0	0	10
Channel Hwy	A0155	37	0	10	10	0	0	10
East Tamar Hwy	A0265	60	4	6	10	0	0	10
East Tamar Hwy	A0265	15	4	6	10	0	0	10
Frankford MR	A1044	57	0	10	10	0	0	10
Frankford MR	A1044	74	0	10	10	0	0	10
Freestone Point DR	A2894	5	0	10	10	0	0	10
Lake Leake MR	A1442	5	0	10	10	0	0	10
Lyell Hwy	A0197	33	0	10	10	0	0	10
Lyell Hwy	A0197	35	4	6	10	0	0	10
Lyell Hwy	A0197	43	4	6	10	0	0	10
Macquarie Heads DR	A2820	5	0	10	10	0	0	10
Midland Hwy	A0087	57	0	10	10	0	0	10
Midland Hwy	A0087	90	4	6	10	0	0	10
Midland Hwy	A0087	96	4	6	10	0	0	10
Mole Creek MR	A1374	6	0	10	10	0	0	10
Murchison Hwy	A0485	94	0	10	10	0	0	10
Nubeena SR	A2043	5	4	6	10	0	0	10
Poatina MR	A1604	67	4	6	10	0	0	10
Port Sorell MR	A1329	7	0	10	10	0	0	10
Ranelagh SR	A2072	5	0	10	10	0	0	10
Tasman Hwy	A0113	12	4	6	10	0	0	10
Tasman Hwy	A0113	16	4	6	10	0	0	10
Tasman Hwy	A0113	64	4	6	10	0	0	10
Tasman Hwy	A0113	88	0	10	10	0	0	10

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Tasman Hwy	A0113	72	4	6	10	0	0	10
Coles Bay TR	A2632	94	0	4	4	0	5	9
Gordon River MR	A1727	66	0	4	4	0	5	9
Gordon River MR	A1727	80	0	4	4	0	5	9
Heemskirk TR	A2645	31	0	4	4	0	5	9
Heemskirk TR	A2645	58	0	4	4	0	5	9
Heemskirk TR	A2645	94	0	4	4	0	5	9
Henty MR	A1633	74	0	4	4	0	5	9
Lake Dobson TR	A2535	5	0	4	4	0	5	9
Lake Dobson TR	A2535	94	0	4	4	0	5	9
Lake SR	A2100	42	0	4	4	0	5	9
Lake SR	A2100	49	0	4	4	0	5	9
Olivers TR	A2616	94	0	4	4	0	5	9
Bass Hwy	A0249	6	4	4	8	0	0	8
Bass Hwy	A0249	3	4	4	8	0	0	8
Bass Hwy	A0249	54	0	8	8	0	0	8
Bass Hwy	A0249	85	0	8	8	0	0	8
Birralee MR	A1701	8	0	8	8	0	0	8
Blessington MR	A1112	43	4	4	8	0	0	8
Blessington MR	A1112	65	4	4	8	0	0	8
Blessington MR	A1112	94	4	4	8	0	0	8
Bridport MR	A1400	58	0	8	8	0	0	8
Channel Hwy	A0155	82	0	8	8	0	0	8
East Tamar Hwy	A0265	21	0	8	8	0	0	8
Elephant Pass MR	A1743	94	0	8	8	0	0	8
Esk MR	A1125	57	0	8	8	0	0	8
Esk MR	A1125	94	0	8	8	0	0	8
Fingerpost MR	A1691	5	0	8	8	0	0	8
Gladstone MR	A1507	51	0	8	8	0	0	8
Gordon River MR	A1727	6	0	8	8	0	0	8
Gordon River MR	A1727	19	0	8	8	0	0	8
Gordon River MR	A1727	36	0	8	8	0	0	8
Grass Tree Hill SR	A2182	94	0	8	8	0	0	8
Hastings Caves TR	A2522	5	0	8	8	0	0	8
Huon Hwy	A0168	94	0	8	8	0	0	8
Lake SR	A2100	5	0	8	8	0	0	8
Lake SR	A2100	90	0	8	8	0	0	8
Lyell Hwy	A0197	16	0	8	8	0	0	8
Lyell Hwy	A0197	28	0	8	8	0	0	8
Lyell Hwy	A0197	38	4	4	8	0	0	8
Midland Hwy	A0087	31	0	8	8	0	0	8

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Midland Hwy	A0087	43	0	8	8	0	0	8
Midland Hwy	A0087	26	4	4	8	0	0	8
Mole Creek MR	A1374	94	0	8	8	0	0	8
Mole Creek MR	A1374	99	0	8	8	0	0	8
Mud Walls SR	A2290	44	0	8	8	0	0	8
Murchison Hwy	A0485	39	0	8	8	0	0	8
Murchison Hwy	A0485	45	0	8	8	0	0	8
Murchison Hwy	A0485	52	0	8	8	0	0	8
Nicholls Rivulet MR	A1248	94	0	8	8	0	0	8
Nubeena SR	A2043	32	0	8	8	0	0	8
Pipers River SR	A2263	51	0	8	8	0	0	8
Port Sorell MR	A1329	94	0	8	8	0	0	8
Ridgley Hwy	A0500	5	0	4	4	0	0	8
Ridgley Hwy	A0500	15	0	8	8	0	0	8
Ridgley Hwy	A0500	35	0	8	8	0	0	8
Ridgley Hwy	A0500	45	0	8	8	0	0	8
Ridgley Hwy	A0500	55	0	4	4	0	0	8
Ridgley Hwy	A0500	65	0	4	4	0	0	8
Ringarooma MR	A1086	5	4	4	8	0	0	8
Spring Hill MR	A1730	7	0	8	8	0	0	8
Tasman Hwy	A0113	15	4	4	8	0	0	8
Tasman Hwy	A0113	25	0	8	8	0	0	8
Tasman Hwy	A0113	29	0	8	8	0	0	8
Tasman Hwy	A0113	31	0	8	8	0	0	8
Tasman Hwy	A0113	95	4	4	8	0	0	8
Tea Tree SR	A2289	94	0	8	8	0	0	8
Tunnack MR	A1138	57	0	8	8	0	0	8
Waratah MR	A1617	5	0	8	8	0	0	8
Corinna DR	A2823	5	0	2	2	0	5	7
Gordon River MR	A1727	50	0	2	2	0	5	7
Gordon River MR	A1727	73	0	2	2	0	5	7
Gordon River MR	A1727	88	0	2	2	0	5	7
Gordon River MR	A1727	93	0	2	2	0	5	7
Lake Leake MR	A1442	70	0	2	2	0	5	7
Lake Leake MR	A1442	84	0	2	2	0	5	7
Lake SR	A2100	70	0	2	2	0	5	7
Olivers TR	A2616	5	0	2	2	0	5	7
Poatina MR	A1604	25	0	2	2	0	5	7
Arthur Hwy	A0142	26	4	2	6	0	0	6
Bass Hwy	A0249	21	0	6	6	0	0	6
Bass Hwy	A0249	21	0	6	6	0	0	6

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Bridport MR	A1400	74	0	6	6	0	0	6
Bridport MR	A1400	94	0	6	6	0	0	6
Bruny MR	A1222	18	0	6	6	0	0	6
Colebrook MR	A1154	33	0	6	6	0	0	6
East Tamar Hwy	A0265	25	0	6	6	0	0	6
East Tamar Hwy	A0265	35	0	6	6	0	0	6
Elephant Pass MR	A1743	5	0	6	6	0	0	6
Gordon River MR	A1727	12	0	6	6	0	0	6
King Island MR	A1219	83	4	2	6	0	0	6
Lady Barron MR	A1565	44	4	2	6	0	0	6
Lake Leake MR	A1442	17	0	6	6	0	0	6
Lake Leake MR	A1442	36	0	6	6	0	0	6
Lake SR	A2100	12	0	6	6	0	0	6
Lake SR	A2100	94	0	6	6	0	0	6
Leighlands SR	A2085	5	0	6	6	0	0	6
Lollara MR	A1196	5	0	6	6	0	0	6
Lyell Hwy	A0197	20	0	6	6	0	0	6
Lyell Hwy	A0197	23	0	6	6	0	0	6
Lyell Hwy	A0197	25	0	6	6	0	0	6
Lyell Hwy	A0197	48	0	6	6	0	0	6
Lyell Hwy	A0197	77	4	2	6	0	0	6
Massy-Greene DR	A2855	5	4	2	6	0	0	6
Midland Hwy	A0087	37	0	6	6	0	0	6
Mole Creek MR	A1374	51	0	6	6	0	0	6
Mud Walls SR	A2290	36	0	6	6	0	0	6
Mud Walls SR	A2290	40	0	6	6	0	0	6
Mud Walls SR	A2290	50	0	6	6	0	0	6
Pipers River SR	A2263	5	0	6	6	0	0	6
Pipers River SR	A2263	94	0	6	6	0	0	6
Poatina MR	A1604	5	4	2	6	0	0	6
Poatina MR	A1604	12	4	2	6	0	0	6
Poatina MR	A1604	54	0	6	6	0	0	6
Tasman Hwy	A0113	84	0	6	6	0	0	6
Tunnack MR	A1138	5	0	6	6	0	0	6
Tunnack MR	A1138	94	0	6	6	0	0	6
Bell Bay MR	A1581	5	0	4	4	0	0	4
Blessington MR	A1112	25	0	4	4	0	0	4
Cradle Mt TR	A2577	41	0	4	4	0	0	4
Evandale MR	A1109	5	0	4	4	0	0	4
Gordon River MR	A1727	58	0	4	4	0	0	4
King Island MR	A1219	58	4	0	4	0	0	4

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
King Island MR	A1219	94	4	0	4	0	0	4
Lady Barron MR	A1565	92	4	0	4	0	0	4
Lake SR	A2100	18	0	4	4	0	0	4
Lake SR	A2100	30	0	4	4	0	0	4
Lake SR	A2100	99	0	4	4	0	0	4
Lyell Hwy	A0197	46	0	4	4	0	0	4
Lyell Hwy	A0197	51	0	4	4	0	0	4
Marlborough SR	A2443	5	0	4	4	0	0	4
Marlborough SR	A2443	44	0	4	4	0	0	4
Massy-Greene DR	A2855	6	4	0	4	0	0	4
Meander Valley SR	A2025	4	0	4	4	0	0	4
Meander Valley SR	A2025	7	0	4	4	0	0	4
Meander Valley SR	A2025	46	0	4	4	0	0	4
Meander Valley SR	A2025	48	0	4	4	0	0	4
Meander Valley SR	A2025	55	0	4	4	0	0	4
Meander Valley SR	A2025	80	0	4	4	0	0	4
Meander Valley SR	A2025	90	0	4	4	0	0	4
Pardoe DR	A2849	5	0	4	4	0	0	4
Poatina MR	A1604	92	0	4	4	0	0	4
South Arm SR	A2069	5	0	4	4	0	0	4
Tasman Hwy	A0113	4	0	4	4	0	0	4
Tasman Hwy	A0113	6	4	0	4	0	0	4
Tasman Hwy	A0113	27	0	4	4	0	0	4
Tasman Hwy	A0113	62	0	4	4	0	0	4
West Tamar Hwy	A0252	5	4	0	4	0	0	4
Colebrook MR	A1154	34	0	2	2	0	0	2
Corinna DR	A2823	40	0	2	2	0	0	2
Corinna DR	A2823	92	0	2	2	0	0	2
Domain Hwy	A0126	5	0	2	2	0	0	2
Forth MR	A1552	3	0	2	2	0	0	2
Gordon River MR	A1727	43	0	2	2	0	0	2
King Island MR	A1219	70	0	2	2	0	0	2
Lake Leake MR	A1442	58	0	2	2	0	0	2
Lake Leake MR	A1442	99	0	2	2	0	0	2
Lake SR	A2100	22	0	2	2	0	0	2
Lake SR	A2100	35	0	2	2	0	0	2
Lyell Hwy	A0197	30	0	2	2	0	0	2
Lyell Hwy	A0197	53	0	2	2	0	0	2
Pine MR	A1497	6	0	2	2	0	0	2
Poatina MR	A1604	5	0	2	2	0	0	2
Reece Dam TR	A2658	5	0	2	2	0	0	2

Road Name	Road No	Link No	Cat 2 Value (4 per weed)	Cat 3 Value (2 per weed)	Total Weed Value	Cat 2 near Reserve/RCS (Yes = 5)	Cat 3 near Reserve/RCS (Yes = 5)	Rating
Tarkine Forest TR	A2650	10	0	2	2	0	0	2
Tarkine Forest TR	A2650	20	0	2	2	0	0	2
Tarkine Forest TR	A2650	30	0	2	2	0	0	2
Tarkine Forest TR	A2650	50	0	2	2	0	0	2
Youl MR	A1662	5	0	2	2	0	0	2

APPENDIX 4 – IUCN RESERVES

The following is an extract from the IUCN website defining the types of categories of reserve.

IUCN protected area management categories classify protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation.

Ia Strict Nature Reserve (included)

Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.

E.g.: Conservation Covenants, Albatross Island Nature Reserve

Ib Wilderness Area (included) and II National Park (included)

Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

Under the Tasmanian Reserve Estate, both Ib and II are combined

E.g.: Southwest National Park, Franklin-Gordon Wild Rivers National Park

III Natural Monument or Feature (included)

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

E.g.: Styx Tall Trees Forest Reserve, Hastings Caves State Reserve

IV Habitat/Species Management Area (included)

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

E.g.: Ringarooma River Forest Reserve, Break O'Day Forest Reserve

V Protected Landscape/ Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

E.g.: Hastings Bay Conservation Area, Lighthouse Point Conservation Area

VI Protected area with sustainable use of natural resources

Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

E.g.: Meredith Range Regional Reserve, Huon Estuary Marine Conservation Area

APPENDIX 5 – WEED HYGIENE

Good weed hygiene measures are important to minimise the further spread of weeds, in particular Category 2 weeds. Planning roadside work and hygiene measures are necessary to minimise the further spread of priority weeds. The following are some key points to improve weed hygiene for roadside works.

Planning

Planning roadside works in close proximity to Category 2 weeds should consider the timing of the actions. For example, roadside maintenance works such as slashing that is undertaken after the main late summer flush of flowering and seeding of Chilean or Texas needle grass will aid the species spread.

By managing works, infestations can also be managed more efficiently. Slashing and earthworks should be undertaken before the species main flowering period. This may be difficult in some circumstances where alternatives need to be considered. In these circumstances, undertaking works in the clean areas first and working towards the infestation is recommended. Clearly visible roadside marking of highly sensitive areas would aid contractors in avoiding these areas.

Contracts

When any contractual agreement is entered into for maintenance or roadworks, contractors should demonstrate how high levels of machinery hygiene will be maintained i.e.: submit a hygiene plan with their tender and have it approved and included as part of the construction environmental management plan or other relevant contract clauses. The following points should be considered:

- Machinery must be clean when entering and leaving designated infested zones.
- Nominate locations for clean down points and understand what the clean down procedures are.
- Contractors to provide proof of clean down protocols.
- Contractors to be able to identify the species being targeted for minimal spread where practicable.

Site office

Contractors should use their site office location also for the storage of machinery and clean down procedures. The location of the site office should also be weed free. This location should preferably be used for the storage of materials used for roadside works.

Clean-down areas

Where the site office is not to be used for clean-down, locations should be nominated along the roadside. The following points should be considered in selecting the clean down site.

- Location of site is not close to Priority Management Areas.
- Not in or next to significant native vegetation or species habitat.
- Type of machinery (large machinery require larger areas for clean-down).
- Locate outside of the infested area and where the land slopes towards the infestation
- Ensure run off does not enter a waterway (aim for a minimum 30 m buffer)
- Mud free site
- Allow enough space to move vehicle
- Potential hazard (i.e.: powerlines, pipes)
- Discussion with landowner

Roadside slashing however is more complex as the machinery travels large distances and may come into contact with a variety of priority weeds. To minimise spread, it is ideal to have numerous strategically located wash-down points. These locations should be planned early and clearly marked or signed to help direct operators where to undertake these procedures.

Clean Down Procedures

The following points should be considered when implementing clean-down procedures

- Machinery is clean of debris
- Work from clean areas finishing with infested areas
- Use pre-selected clean down locations
- Agree on the process to disposing contaminated waste
- Select level location for clean down
- What type of clean down will be used i.e.: water, air or brush,

There are a number of weed hygiene tools that are available commercially. As an example of options available refer to <http://www.fleetwash.com.au>

Further Resources

- Weed Hygiene Action Plan – Cradle Coast NRM www.cradlecoastnrm.com
- Weed Management and Hygiene Guidelines
<http://dpiwwe.tas.gov.au/Documents/Weed%20%20Management%20and%20Hygiene%20Guidelines.pdf>
- Agriculture Victoria
<http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds/weedstop-vehicle-hygiene-program/machinery-hygiene>



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