



Derwent Valley Roadside Weed Management Plan

2016 VERSION 2



For further information about this plan please contact the Derwent Catchment Natural Resource Management Committee via: facilitator@derwentcatchment.org.

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Introduction

This weed management plan is a working document which can be updated as new information becomes available. The authors have followed a practical methodology and have outlined a *two phase approach* covered in the working section of this report (Section 5):

Phase 1: Priority sites for immediate weed control

Phase 2: Eradication zones: areas targeted for on-going weed eradication efforts due to low levels of infestation and proximity to natural or commercial values

The recommendations are summarized in tables 6.1 to 6.7 as objectives and actions. The concluding section of this plan offers an assessment of the budget that will be required to facilitate effective control at priority sites and eradication zones.

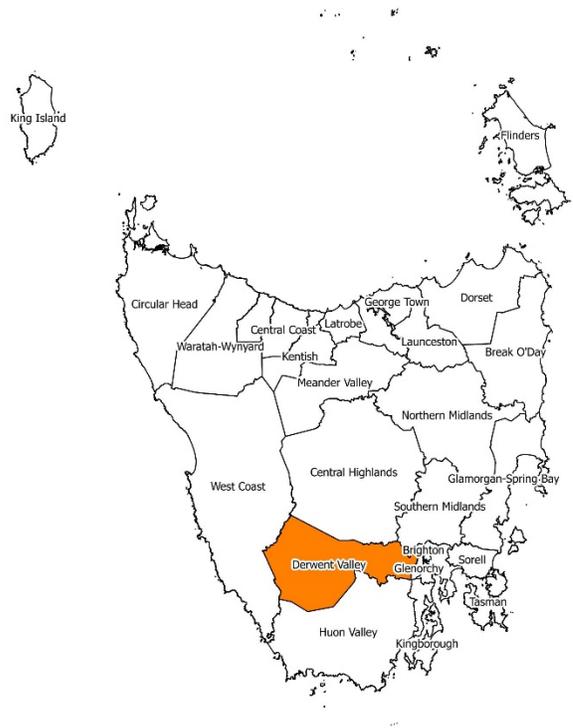
This document was designed to allow incorporation of on-going stakeholder input via the collection of data which can be integrated into this plan as progress is made towards implementation of activities. This aims to ensure all roadside weed priorities are recorded so control works can be more effectively planned and budgeted for into the future. This document is the second iteration of this plan and updates include improved budgeting information.

This plan also supports the implementation of individual statutory Weed Management Plans and relies heavily on the Southern Tasmanian Weed Management Strategy for direction. The plan provides a strategy for managing weed threats on-ground by identifying priority weeds and the regionally specific causes of weed spread.

1.1 The region

The Derwent Valley municipality encompasses 4111 km² and is located in the central south of Tasmania. It shares borders with the municipalities of Brighton, Glenorchy City and Southern Midlands to the east, Central Highlands to the north, West Coast to the west and the Huon Valley Council to the south.

Land use is varied and includes agriculture (production of beef, sheep, hops, cherries, poppies, essential oils and vegetable seeds, freshwater aquaculture and dairying), forestry (plantation and native forest harvesting and downstream processing), conservation and tourism (including Mount Field National Park and part of the Southwest Wilderness world Heritage area), hydroelectricity production and urban/rural residential areas.



1.2 Key stakeholders

There are several key stakeholders and land managers in the Derwent Valley municipality. The Derwent Valley Council is the principle manager of local community infrastructure including roads, waste collection, public recreation facilities and area planning. The Council is responsible for weed management across council owned land and council managed roads. Department of Infrastructure, Energy and Resources (State Growth) are responsible for maintenance and works along the State managed road network.

The Department of Primary Industries, Parks, Water and Environment (DPIPWE), Biosecurity Section is responsible for the “protection of industries, environmental and public well-being, health, amenity and safety from the negative impacts of pests, diseases and weeds”. Biosecurity Tasmania work in partnership with community and industry, invasive species is part of their portfolio. DPIPWE are also responsible for National Parks which form a large component of the Derwent Municipality. This responsibility includes weed management across the protected area estate.

Forestry Tasmania has significant land holdings in the municipality and are responsible for weed management across their estate. Norske Skog also has extensive plantation areas, which often abound State Forest. Norske Skog are a global company who operate a newsprint mill at Boyer on the outskirts of New Norfolk. Norske are responsible for weed management across their plantation estate. There are also other large businesses within the Derwent Valley region which contribute to land management. Many agricultural land managers are active in weed management and outside the bounds of State Forest and the Protected Area system agriculture is the predominant land use.

NRM South are a regional Natural Resource Management body who partner with government, landowners, research organisations and community groups to help manage Tasmania's natural resources. Biosecurity and weed management is a core area of investment and program activity for NRM South.

The local community are also actively engaged in weed management in the Derwent Valley. The Derwent Catchment NRM Committee (DCNRMC) is involved in ongoing weed management and partners with Derwent Valley & Central Highlands Councils, NRM South, government agencies and local landowners and residents to deliver local NRM outcomes. This plan is prepared by DCNRMC with support from Derwent Valley Council and NRM South.

Friends of the Lachlan River are a small community group with active members who invest time in weed eradication and revegetation projects within the region. Bushwatch is another local community group who participate in weed control. Friends of Mount Field, also undertake environmental projects to conserve the integrity of their local national park. There are other small community groups and individuals who contribute to weed management in the area.

1.3 Legal requirements of landholders

The *Weed Management Act 1999* was proclaimed on 1 September 2000. It is the principal legislation concerned with the management of declared weeds in Tasmania. This legislation states that landholders must take all reasonable measures to prevent their land being infested with a declared weed and prevent a declared weed on their land from spreading. All landholders must also meet the management requirements as outlined in Statutory Weed Management Plans in order to comply with the *Weeds Management Act 1999*.

The objectives of the Act are:

- (a) minimise negative effects of weeds on the sustainability of Tasmania's productive capacity and natural ecosystems; and
- (b) promote a strategic and sustainable approach to weed management; and
- (c) encourage community involvement in weed management; and
- (d) promote the sharing of responsibility for weed management between government, natural resource managers, the community and industry in Tasmania.

1.4 Principles of weed management

Best practice principals revolve around minimizing weed spread and reducing the risk of new introductions. Preventing the introduction and spread of weeds is the most effective form of weed management. Many thousands of dollars can be saved by basic precautions, such as good hygiene practices.

Weed management requires a continuous, long-term commitment. Early detection of weed infestations followed by immediate control is the most successful weed management practice. It is also important to work from areas of low infestation and to address individual outliers before moving to more dense infestations. This approach ensures that light infestations do not become more difficult to address or provide a source of on-going infestation. Topography should also be considered moving from upslope to downslope to reflect the movement of water in the landscape. It is also important to factor in maintenance of weed control efforts as part of budget allocation to successfully tackle weed problems.

A key component of successful weed management is cooperation between landholders and land users to ensure a strategic approach. Legally, landowners and land users are both responsible for weed management and collective action is necessary where boundaries meet and adjacent land owners impact upon or are impacted by others. Similarly, cooperation between government agencies and landholders is vital to establish the research, educational and legislative framework required for successful weed management. This plan focuses on Council and landholder responsibilities however additional efforts will occur to ensure that all stakeholders are engaged in the process and informed of weed control activities to develop a collaborative approach across the Municipality and between municipalities.

2 Project scope

The Derwent Catchment NRM Committee was commissioned to develop a strategic weed management plan for the Derwent Valley Council that was practically based and would allow strategic management of weeds throughout the municipality. This plan encourages an integrated approach to ensure weeds on roads and adjacent roadside land is being controlled.

Weed management in the region is currently undertaken by the Derwent Valley Council, Department of Primary Industries, Parks, Water and Environment (DPIPWE), Department of Infrastructure, Energy and Resources (State Growth), Forestry Tasmania, Hydro Tasmania, private industry, community groups and landowners.

The focus of this project was to map and prioritise declared weeds across the Municipality. Other weeds of significance were captured to create a more comprehensive picture of the extent of commonly occurring invasive species.

3 Methodology

Weed distribution data (points and polygons) were collected using GPS & Geographical Information System (GIS) by vehicle along Derwent Valley Council maintained roads, council land and private land adjacent to roadways in core areas of the Derwent Valley. Gordon River Road was also included due to its proximity to the World Heritage Area. This road is managed by the Department of State Growth. The survey was conducted in peak flowering time. Information was also collected on the area occupied by the weed, the number of individuals and the infestation density, as per the Natural Values Atlas record proforma (DPIPWE).

The survey focused on declared weed species listed under the Tasmanian *Weed Management Act 1999* as well as 2 non-declared species, Sweet briar and Cumbungi (Table 3.1). Sweet briar was abundant and widespread, commonly co-occurring with Blackberry, for this reason the two species have been mapped together and additional isolated occurrences of sweet briar recorded. Cumbungi was a common weed associated with farm dams and roadside drains. It has been included due to the management requirements of Council in regard to roadside drains.

The survey included garden escapes, listed as environmental weeds (Table 3.2). Other non-declared weed species are found within the Municipality, and these are included in Table 3.3 to provide Council with a better understanding of weed distribution. This survey did not, however, capture detailed distribution information for these non-declared species.

Table 3.1 Recorded weed species

Species name	Common name	Status
<i>Carduus pycnocephalus</i> & <i>Carduus tenuiflorus</i>	Slender & winged slender thistles	Declared
<i>Cirsium arvense</i>	Californian thistle	Declared
<i>Coprosma robusta</i>	Karamu	Declared
<i>Crysanthemoides monilifera</i>	Boneseed	Declared
<i>Cytisus scoparius</i>	English broom	Declared
<i>Echium plantagineum</i>	Paterson's curse	Declared
<i>Erica lusitanica</i>	Spanish heath	Declared
<i>Foeniculum vulgare</i>	Fennel	Declared
<i>Genista monspessulana</i>	Canary broom	Declared
<i>Leycesteria formosa</i>	Elisha's tears	Declared
<i>Lycium ferocissimum</i>	African boxthorn	Declared
<i>Marrubium vulgare</i>	Horehound	Declared
<i>Rosa rubiginosa</i>	Sweet briar	Non-declared
<i>Rubus fruticosus</i>	Blackberry	Declared
<i>Salix species</i>	Willow	Declared
<i>Typha species</i>	Cumbungi	Non-declared
<i>Ulex europeus</i>	Gorse	Declared

Table 3.2 Recorded environmental weeds

Species name	Common name
<i>Arum italicum</i>	Italian arum
<i>Centranthus ruber</i> subsp. <i>ruber</i>	Red valerian
<i>Cotoneaster</i> species	Cotoneaster
<i>Crocasmia x crocosmiiflora</i>	Monbretia
<i>Digitalis purpurea</i>	Foxglove
<i>Ilex aquifolium</i>	Holy
<i>Lepidium draba</i>	White weed
<i>Lupinus arboreus</i>	Tree lupin
<i>Pittosporum</i> x	Pittosporum
<i>Sedum rupestre</i>	Blue stonecrop
<i>Vicia major</i>	Blue periwinkle

Table 3.3 Observed non-declared species

Species name	Common name	Status on weed index
<i>Arctotheca calendula</i>	Cape weed	Non-declared
<i>Brassica rapa</i>	Turnip	Non-declared
<i>Cirsium vulgare</i>	Spear thistle	Non-declared
<i>Crataegus monogyna</i>	Hawthorn	Non-declared
<i>Gazania linearis</i>	Tufted gazania	Non-declared
<i>Malva parvifolia</i>	Marshmallow	Non-declared
<i>Reseda lutea</i>	Cutleaf mignonette	Non-declared
<i>Verbascum thapsus</i>	Great mullein	Non-declared

The weed distribution information collected was then used to identify priority areas for control and areas suitable for eradication zones. The term eradication zone is used to describe areas that will be targeted for the removal of all declared weeds. These areas that require priority management within the region were determined by:

- low levels of weed infestation; and
- proximity to areas that:
 - have significant commercial values; or
 - have significant for biodiversity conservation

4 Limitations

Due to budget constraints not all State Growth roads have been mapped and the remote roads adjacent to public land beyond Maydena have not been surveyed. Styx Road which primarily travels through state forest has also not been surveyed across its full extent. It would prudent to include these areas as part of a review of this plan.

Although all care was taken to capture data of weed locations, the nature of this survey (being undertaken by vehicle driving slowly along the road) means the possibility of smaller stature weeds, some grasses and weeds not in flower may have been overlooked.

5 Regional priorities

This section of the plan discusses the likely causes of weed spread around the region and identifies the priority weed species for eradication. We recommend a *two phase approach* to begin to address the weed issues in the Derwent Valley. Phase 1 - eradicate priority weeds at key sites and; Phase 2 - work within identified eradication zones to removal declared and environmental weeds.

Priority sites are listed in both table and map form to provide easily accessible location and distribution information. Eradication zones for ongoing weed eradication efforts are provided in map form with tables specifying the weed types and extent of individual infestations (see Maps 5-10).

Despite being a declared weed, Blackberry due to its widespread distribution has not been included as a priority for management. This species is most often associated with fence lines and waterways and will need to be progressively managed over time moving from areas of low to high infestation. The most heavily affected areas were around the Lachlan community and the main (State Growth) roads.

Roadsides are currently maintained by Council and State Growth however the focus is on the road verges for safety reasons. This however means that the remaining area of road easement does not have an active weed control program. The majority of weeds observed were found to occur in these areas beyond the road verge and were often associated with fence lines. Roads act as a major pathway through the landscape for weed dispersal.

5.1 Causes of weed spread

Weeds are typically spread by propagules which can be transported by wind, water, animals and people. Understanding the lifecycles of weed species is important in implementing effective management. This relates to timing for control, removal of plants and developing appropriate hygiene protocols. Hygiene protocols for reducing weed spread are currently limited for the Municipality. This is seen as a key cause for increasing weed spread.

5.1.1 Vehicles, machinery & equipment

Machinery and vehicles are known to be a major vector for weed spread. Earthmoving equipment or maintenance machinery, such as slashers, can carry thousands of viable seeds and fragments to new areas. There were several sites where it was apparent that the isolated weed infestation was introduced by slashing and roadside maintenance. For example, this was noticeable when Spanish Heath was

adjacent to the road at the end of no-through roads along more remote valleys with no visible alternative source population.

5.1.2 Contaminated sand and gravel

Another major vector is contaminated sand and gravel. Road maintenance often includes the movement of material from quarries around the Municipality. This is a common problem associated with all road construction across Australia. In response to this known problem, quarry hygiene programs have been developed in other regions. The Cradle Coast Regional Weed Management Strategy 2011 includes a case study from the Circular Head Quarry Hygiene Program where the Council Weeds Officer, with field support from Forestry Tasmania, inspected 29 quarries for declared and environmental weeds as well as *Phytophthora* root-rot disease.

Of the 29 quarries visited, 22 contained weeds declared under the *Weed Management Act* 1999 and many were also being used as a dumping ground for unwanted topsoil, road works waste etc. Each quarry owner received a written report on the hygiene status of their quarry, with recommendations on weed control and quarry management. The quarries which contained declared weeds had a 2-year review and in most cases, actions have been taken and weed control programs have been put in place. This is a good example of a municipal initiative, working in cooperation with the other relevant agencies to achieve a positive result. Given the distribution pattern of weeds in the Municipality and the observed patterns of spread this would be a beneficial approach to adopt.

5.1.3 Transported livestock feed

Due to fire or drought events, there are times where feed is required to be brought in from other regions. Unfortunately this is also a pathway for unwanted weeds to be introduced to an otherwise clean area. There are commonly accepted strategies for managing this risk:

- Check the origin of your hay or grain stockfeed: has it come from a known weed infested area?
- Keep records of purchased hay or grain stockfeed
- Store and Feed-out in a confined area away from drainage lines (stock containment areas) to reduce the likelihood of weeds being spread throughout your property
- Monitor storage and feed-out areas regularly and be suspicious of unfamiliar plants that germinate for the next 12 months

It is important to consider these strategies and to communicate widely about control methods at times of drought, fire and flood to prevent unwanted weed introductions.

5.1.4 Garden escapes

Environmental weeds are often garden escapes and are usually spread by: birds, suckering of the plants to nearby areas; and garden waste dumped inappropriately. In the past 30 years at least 35% of all plants that have become environmental weeds in Tasmania were deliberately introduced as garden plants. Strategies to combat this problem include: community education programs and green waste collection schemes.

Monbretia is a good example of an environmental weed that is spreading in the region, particularly within drains and areas of low lying water. This species is a hybrid of two tropical South African species and was originally produced in France. Monbretia is very hard to eradicate as it can re-sprout from small fragments of bulbs (corms). Although this species is not declared, it is an emerging threat as it easily out-competes native plants, particularly in native bushland and riparian areas. It should be monitored and removed where possible.

5.2 *Priority species*

Sixteen declared weeds and 11 environmental weeds under the Tasmanian *Weed Management Act 1999* were recorded during the survey. Seven declared species have been identified in this plan as priority weeds. These species have been identified as priority weeds due to the lesser extent of occurrence across the Municipality. The seven declared species are as follows:

Karamu (*Coprosma robusta*) has a limited distribution in Tasmania the plant being known from only five sites. Currently this species is found along the Derwent River, surrounding and throughout New Norfolk. Karamu is a priority as it currently has a limited foothold in Tasmania. Unlike many weeds, this species can successfully invade healthy and intact damp and wet forests. The Statutory Weed Management Plan for Karamu indicates that in the Derwent Valley this species is classed as Zone A - 'isolated occurrences' and management measures suggest to implement an integrated control program for eradication and prevent future occurrences.

Boneseed (*Crysanthemoides monilifera*) is a persistent problem in several coastal areas of Tasmania. It is also found in the Tamar Valley and in and around Hobart. Elsewhere it occurs occasionally as a weed of disturbed bushland and coastal vegetation. Only nine sites were recorded as part of the survey along

roads in the Derwent Valley. This species is also a Weed of National Significance (WoNS). The Statutory Weed Management Plan for Boneseed indicates that in the Derwent Valley this species is classed as Zone A - 'isolated occurrences' and management measures suggest to implement and integrated control program for eradication and prevent future occurrences.

Two infestations of **Paterson's Curse** (*Echium plantagineum*) were detected, both small and easily controlled. This species occurs in all agricultural areas of Tasmania as small scattered infestations and can be toxic to livestock. The Statutory Weed Management Plan for Paterson's curse indicates that in the Derwent Valley this species is classed as Zone A - 'isolated occurrences' and management measures suggest to implement and integrated control program for eradication and prevent future occurrences.

Spanish Heath (*Erica lusitanica*) has significant infestations in many areas of Tasmania; Tamar and Meander Valley, Devonport and Smithton; Collinsvale, the Channel area and the Huon Valley. This declared weed increases fire hazard as it is extremely combustible. The Statutory Weed Management Plan for Spanish heath indicates this species is classed as Zone B - 'widespread infestations'. Priority infestations identified in this plan are currently manageable in eradication terms and would prevent this species from becoming an overwhelming problem outside of the Collinsville area.

Elisha's Tears (*Leycesteria formosa*) was only recorded from two locations. This species occurs in wet forests and woodlands in Tasmania's north-east, north-west, west and south and is capable of invading both disturbed and undisturbed bush. The large habit of this plant is an easy candidate for cut-and-paste eradication and quick action will limit the spread. The Statutory Weed Management Plan for Elisha's Tears indicates that in the Derwent Valley this species is classed as Zone A - 'isolated occurrences' and management measures suggest to implement an integrated control program for eradication and prevent future occurrences.

African Boxthorn (*Lycium ferocissimum*) is found throughout most agricultural areas of Tasmania it is common along fence lines and beneath overhead wires as well as along roadsides railways and waterways. Surprisingly only 8 sites were recorded as part of the roadside survey, and although the Statutory Weed Management Plan for African Boxthorn indicates this species is classed as Zone B - 'widespread infestations' the survey results indicate it is nevertheless a priority for eradication.

Similarly, **Horehound** (*Marrubium vulgare*) was only located from a couple of sites, however it is likely that this species occurs more widely on areas of cleared land. It is listed as a Zone B species according to

the Statutory Weed Management Plan. Horehound is weed of pasture and crops and is particularly troublesome in the Midlands grazing areas.

5.3 Priority sites

A selection of priority sites have been identified as the first phase of control to be implemented from this plan. The priority sites are listed in they have low levels of weed infestation in proximity to areas that have significant commercial values or are significant for biodiversity conservation.

Table 5.1 and illustrated in Map 2. These infestations are either of priority species outlined in section 5.2 above, or have been designated as a priority because they have low levels of weed infestation in proximity to areas that have significant commercial values or are significant for biodiversity conservation.

Table 5.1 Priority weed eradication sites

Weed name	Location	Area occupied	Easting GDA	Northing GDA
Karamu	Several sites along Derwent – please refer to Map 3			
Boneseed	On roadside 800 m from Lyell Hwy on Molesworth Rd	5m2	509637	5263035
	Lyell Hwy picnic – rest area 100s of plants around and through cliff area	10000m2	518296	5266907
	Howell Drive – verges at end of road	250m2	504145	5264693
	Peppermint Hill Lookout – off side of turning circle – one plant	2m2	504403	5262952
	Dean’s Road on way to tip – northern side of road	10m2 5m2	504661 504627	5262890 5262850
	Turner’s Road – one plant 160 m from 90 degree bend	2m2	517417	5266837
	Bridgeview Rd – 370 m from Lyell Hwy One plant	2m2	517939	5267118
	Forest Rd – 500 m from Lyell Hwy From this site back down to Hwy	5m2 Intermittent	518070 518086	5266502 5266553
	Tarrant’s Rd off Lyell Hwy Juveniles for 30 m down road several patches in roadside property and from here along roadsides for 500 m down to Lyell Hwy	Intermittent 200m2	517839 518085	5266657 5266559
	Paterson’s Curse	Meadowbank Rd (Gordon River Rd	10m2	488616

	end) – directly on roadside			
	Near railway track off Gordon River Rd out of Westerway on way to National Park	20m2	482388	5274529
Spanish Heath	Tubbs Rd – 300 m from Collins Cap Rd turn off – spreading into intact bush	200m2	510547	5259247
	Back River Rd – 4 sites			
	300 m above Handscome Cave Rd turn off – 3 plants	5m2	506101	5269099
	100 m before Blackwells Rd turn off	10m2	506274	5269691
	300 m above Blackwells Rd turn off	200m2	506416	5270063
	120 m from end of road	100m2	506394	5271149
	Braslins Rd – 250 m from Grahams Rd turn off – one plant	2m2	504743	5271260
Elisha's Tears	Corner Meadowbank Rd & Gordon River Rd – in private paddock just off junction between roads	200 m2	488590	5274681
African Boxthorn	Between Blackhills Rd & Cawthorn's Lane on the Lyell Hwy, South of Gretna	25m2	495289	5272472
	On corner of Molesworth Rd & Lyell Hwy – in paddock on hill opposite river	5m2	508884	5263330
	In paddock and road verge - Corner of Geiss Lane and Lyell Hwy (road before Rowbottoms Rd)	500m2	515786	5263330
	Rowbottoms Rd (Lyell Hwy end) on road side	2m2	516393	5267886
	Turners Rd – 2 plants in different spots	2m2	517278	5266725
		2m2	517402	5266805
	Bridgeview Rd off Lyell Hwy	2m2	517945	5267122
	Tarrant's Rd off Lyell Hwy	2m2	518135	5267011
	Forest Rd off Lyell Hwy – multiple sites	50m2	517715	5265996
		Along fence line	200m2	517882
Both sides of Rd in paddock		20m2	517988	5266375
	Scattered juveniles			
Horehound	Forest Rd off Lyell Hwy – roadside incursion	30m2	517765	5266112
	Glen Du Rd – 2km from end of road – heavy infestation both sides	250m2	508778	5258091
Canary Broom	Tubbs Rd – 30 m from Collins Cap Rd turn off – juveniles sprouting from dead adult	25m2	510511	5259516
	Back River Rd – 1km from end of road	5m2	506330	5270679

	Dirt road at end of Kensington St	25m2	503836	5262109
	Rowbottoms Rd – 100 m from Longview Lane turn off – large plants	50m2	516791	5267238
Crack Willow	Ringwood Road – juveniles starting to take hold, area free otherwise	120m2	506424	5258850

5.4 African feathergrass

African feather grass (*Pennisetum macrourum*) is a weed of roadsides, waste areas, river banks and poorly maintained pastures. It is a large tussock-forming grass growing to 2 m high, with an extensive root system down to 1 m in depth, and numerous rhizomes (underground stems) up to 2 m in length. These rhizomes give rise to new shoots around the parent tussock, enabling a single plant to spread quickly. The rhizomes can also die back and sit dormant in the soil for up to a decade, reappearing when suitable conditions are presented. Rivers that heavily fluctuate such as the Derwent are perfect habitat, as the water movement breaks up rhizomes and moves them around.

In Tasmania, the stronghold for the species is the Derwent Valley and Channel regions. There are also records from the West Coast near Queenstown.

This species is extremely difficult to eradicate and has not been listed as a priority for Derwent Valley Council as part of this plan. Eradication of African feather grass from this region will require a highly coordinated approach with a substantial budget. Most of the records are on private land in the Derwent region. The major infestation follows the Derwent River from Plenty to Hayes and then there are intermittent records from Hayes to Boyer. There is also records along the Plenty River and Glenfern Creek.

All infestations were sprayed between 1979-1982 but unfortunately due to the tenacious nature of the plant it reappeared and spread. Additional follow up has been attempted.

From an infrastructure protection perspective, very few areas are in roadside and roadside drains.

5.5 *Eradication zones*

For the purposes of this plan, eradication zones are classified as areas to be targeted for ongoing weed eradication efforts. These areas may have a combination of weed species present but the density and/or area of infestation is such that active control is viable. These are the starting points for the reduction of weeds across the Municipality. Effectively controlling these zones will ensure the more dense areas of weed infestation are contained and do not extend out.

Seven eradication zones have been identified. These are prioritised by lower levels of weed infestation and their proximity to areas that have significant commercial or biodiversity values. Eradication zones: 1. Uxbridge, 2. Mt Lloyd, 3. Mt Charles, 4. Ironstone gully and Ringwood, 5. Black Hills, 6. Maydena, 7. Molesworth (Map 4). Maps 5-10 provide specific information for each eradication zone.

6 Objectives & Actions

This section outlines the specific tasks required to achieve the goals identified in the Regional Priorities (Section 5). All priority actions presume that weed management is considered to be an ongoing part of asset maintenance and will be factored into annual budgets. It is however acknowledged due to the scale of weeds and the relative costs of management that external sources of funding will be sought to help achieve management outcomes. The priorities within this plan are primarily focused on a commencement phase which attempts to start where resourcing requirements will be lowest to achieve desired outcomes.

Table 6.1 Objective 1. Eradicate priority weeds at sites identified in Table 5

Matter for consideration	No.	Actions	Responsibility	Timeframe
Rapid response	1.1	Contact private landowners/land managers (where necessary) to implement control - NB: these sites are generally small & manageable	Council & private landowners	As soon as practical
Coordination between community groups & programs	1.2	Collaborate with Green Army and local community groups to maximise labor opportunities	Council, Green Army, Friends of the Lachlan River	As soon as practical
Support best practice weed management	1.3	Revisit these sites at one-year intervals to complete eradication	Council & private landowners	Annually for five years

Table 6.2 Objective 2. Control weed species identified in eradication zones

Matter for consideration	No.	Actions	Responsibility	Timeframe
Current weed management priorities	2.1	Create eradication zone priority works program based on best practice principals of weed management.	Council – DCNRMC	Two years
Control & prevention methods	2.2	Implement biological control methods that are available	NRM South, Council, land managers	As advised
Support best practice weed management	2.3	Revisit these sites at one-year intervals to complete eradication	Council & private landowners	Annually for five years

Table 6.3 Objective 3. Implement effective weed hygiene measures to prevent spread throughout region

Matter for consideration	No.	Actions	Responsibility	Timeframe
Distributing weedy species	4.1	Develop & implement Derwent Valley Quarry Hygiene Program	Relevant industry, Council	Two years
	4.2	Review of wash-down facilities & practices in the region – seek additional project funding	DCNRMC on behalf of Council	Five years

Table 6.4 Objective 4. Target other causes of weed spread in the region

Matter for consideration	No.	Actions	Responsibility	Timeframe
Waste disposal	5.1	Identify and promote appropriate garden waste and weed disposal sites – without cost to the user	Council	Five years
Community education & awareness	5.2	Prepare and distribute livestock feed contamination detection & management pamphlet to relevant farm managers in association with drought and or fire events	DCNRMC on behalf of Council	As required
	5.3	Distribute environmental weeds pamphlet with other council information annually	DCNRMC on behalf of Council	Annually

Table 6.5 Objective 5. Active implementation of data collection and management

Matter for consideration	No.	Actions	Responsibility	Timeframe
Weed management information	6.1	Develop and implement a weed information collection system for operations staff and the weed officer	Council – DCNRMC- NRM South	Five years

7 Monitoring & Evaluation

Monitoring & evaluation is an important part of effective weed management as it provides a measure for tracking progress and determining which control methods are successful. It also allows accurate budgeting of annual works associated with weed management. We have summarized the monitoring and evaluation actions in the table below.

Table 7.1 Objective 1. Monitor to understand the changing state of weed infestation in the region

Matter for consideration	No.	Actions	Responsibility	Timeframe
Weed control effectiveness	1.1	Review weed management plan to measure performance against priority sites	Council – DCNRMC	2016
Tracking progress over time	1.2	Implement photo point monitoring system at control sites	Council – DCNRMC	2016

8 Budget

An estimate of the budget required to undertake control at the Priority sites is provided in this section (Table 8.1). This budget is requested for the 2016-17 financial year.

Table 8.1 Budget requirements for Priority Sites

Weed name	Comments	Additional work time (days)	Cost based on \$70 per hour contractor services
Karamu	Current project and future program ongoing investment from Derwent Estuary Program need coordination annually with existing program	3	1,680
Boneseed	Granton roadsides – all small infestations – will require landholder notifications	3	1,680
	Lyell Hwy picnic – rest area Green Army and follow up	2	1,120
Paterson's Curse	Meadowbank Rd – small infestation	1	560
	Westerway – monitor and follow up		
Spanish Heath	Several small sites and landholder notification required	2	1,120
Elisha's Tears	Meadowbank Rd – small infestation that could be done in conjunction with Paterson's Curse as in same area – will require landholder notification		Inc. in Paterson's Curse estimate
African Boxthorn	Several sites – some big plants – landholder notifications required and also removal	5	2,800
Horehound	Small sites	1	560
Canary Broom	Four sites – all roadside	1	560
Crack Willow	Ringwood Road –	3	1,680 + (revegetation

	juveniles – require removal and revegetation		costs)
Total			11,760

The budget requirements for the eradication zones have been developed in coordination with the Derwent Valley Council's Maintenance Supervisor. It is recommended that these control works occur over 2 years.

Eradication Zone	Road distance in km	Average time	Time x 2 staff (hours)	Labour cost	Herbicide (lt)	Herbicide cost	Total cost	Tenure
Uxbridge	33.5	3km/hour	23	\$1,340	1200	\$850	\$2,190	Council
Mount Lloyd	7.2	3km/hour	5	\$300	250	\$177	\$477	Council
Mount Charles	8.4	3km/hour	6	\$333	250	\$177	\$500	Council
Ironstone gully and Ringwood	13	3km/hour	9	\$522	300	\$212	\$634	Council
Black Hills	12.4	3km/hour	8	\$495	300	\$212	\$707	Council
*Maydena	22.5	3km/hour	15	\$900	600	\$425	\$1,325	State Growth
Molesworth	36	3km/hour	24	\$1,500	1200	\$850	\$2350	Council
Total costs				\$5,390		\$2,903	\$8,293	

- To be requested by Council from State Growth

9 References

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